NEAR EAST UNIVERSITY

INSTITUTE OF SOCIAL SCIENCE

DEPARTMENT OF BANKING & FINANCE

THE RELATIONSHIP BETWEEN MONETARY POLICY INSTRUMENTS AND TURKISH STOCK MARKET

IN ACCORDANCE WITH THE REGULATION OF THE GRADUATE SCHOOL OF SOCIAL SCIENCE

MASTER THESIS

QABIL ZRAR

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SUPERVISOR: ASSIST. PROF. DR. TURGUT TÜRSOY

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DECLARATION

I declare that this dissertation is the product of my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Name, Surname: Qabil Zarar

Signature: ……

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DEDICATION

This work is dedicated to my parents. All I have and will accomplish are only possible due to their love and sacrifices.

ABSTRACT

This paper investigates the impact of changes in selected variables (short term interest rate, exchange rate, inflation rate, money supply) on all share price index in the Turkish stock market. The monthly data were analyzed over a time span from January 2003 to December 2013, taking in consideration the transition period in the Turkish economy. A Multivariate Regression Model computed on Standard ordinary least square (OLS) formula has been used to estimate the relationship between the variables.

There are significant relationships exist between all share price index with interest rate and exchange rate variables. Unfortunately, there are no significant relations between inflation rate and money supply with all share price index. It was found that exchange rate and interest rate had negative influence on all share price index. The model was approved to be clear the diagnostic tests (Autocorrelation, Hetroscedactisity, Ramsey reset test and Multicollinearity). Moreover, the study model that constructs to explain the concern relationship can explain 34% of change in the price of the all share price index in Turkey.

Key Words: All share price index (ASPI), short term interest rate, exchange rate, money supply, inflation rate, multivariate regression model, Ordinary least square (OLS).

OZET

Bu çalışma Türk borsasındaki Hisse Senedleri Fiyat Endeksindeki seçilmiş değişkenlerdeki (kısa vadeli faiz oranı, döviz kuru,enflasyon oranı,para arzı) etkiyi araştırmaktadır. Aylık veriler Ocak 2003 ten Aralık 2013 e kadar olan zaman dilimi içerisinde Türkiye ekonomisinin geçiş dönemi de gözönünde bulundurularak analiz edilmiştir. Değişkenler arasındaki ilişkiyi değerlendirmek için Çok Değişkenli Gerileme Modeli Standart sıradan en küçük kare formulünde kullanılarak hesaplanmıştır.

Hisse senedi fiyat endeksi, faiz oranı ve döviz kuru değişkenleri arasında önemli bir ilişki vardır.Ne yazık ki,enflasyon oranı ve para arzının hisse senedi fiyat endeksiyle arasında önemli bir ilişki yoktur. Döviz kuru ve faiz oranlarının H.S.F.E'ye olumsuz etki yaptığı saptanmıştır. Model tanısal testler (Otokorelasyon, Hetroscedactisity, Ramsey testi ve çoklu bağlantı reset) açık olması kabul edildi. Dahası, değişkenler arasındaki ilişkiyi açıklamak için tasarlanmış çalışma modeli Türkiye'deki hisse senedi fiyat endeksindeki %34 lük fiyat değişimini açıklayabiliyor.

Anahtar kelimeler : Hisse senedi fiyat endeksi(HSFE), kısa dönem faiz oranları, döviz kuru, para arzı, enflasyon oranı, Çok değişkenli regresyon model, sıradan en küçük kare(SEKK).

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LIST OF ABBREVIATIONS

ESM	Emerging Stock Market
EMH	Efficiency Market Hypothesis
PVM	Present Value Model
APT	Arbitrage Pricing Model
GDP	Gross Domestic Product
IMF	International Monetary Fund
GNP	Gross National Product
BIST	Borsa Istanbul Stock Exchange of Turkey
CAPM	Capital Assets Pricing Model
OLS	Ordinary Least square
CBRT	Central bank republic of turkey
INR	Interest Rate
IFR	Inflation Rate
EXR	Exchange Rate
M2	Money supply

CHAPTER ONE

1. INTRODUCTION AND IDENTIFICATION OF THE PROBLEM

1.1 Introduction

Optimization of monetary policy instruments and stock market is of paramount importance and in the current environment most governments strive to enhance sound policies that enhance economic activity. High volatility in monetary policy instruments will result in severe detrimental effect on economic performance and equity market. Numerous studies have carried out in developed nations to analyses the relationship between different monetary policy instruments and stock markets. They are limited empirical investigations on emerging markets. According to Chen, Roll and Ross (1986, 59), the selection of relevant macroeconomic variables requires judgment and we draw upon both existing theory and existing empirical evidence (Humpe and Mcmillan 2007, 6).Short term interest rates, inflation rate, exchange rate and money supply are the variables to be analyzed in relation with the Istanbul stock market due to their importance as monetary policy instruments. Many investors believe that fluctuation in these factors either has a positive or negative impact on the stock price and they (investors) make decisions on investment on the basis of these factors (Issahaku, Ustarz, and Domanban,, 2013, 1050).

Turkish economy has been ailing for decades due to social-economic problems which resulted in low economic activity for the country. The financial crisis of 2008 affected most currencies globally and the Turkish lira was also a victim. Interest rate, unanticipated inflation rate all took a knock on the economy and the money supply system paralyzed.

The Turkish government is undertaking structural reforms to position Istanbul as one of the best economy in the world. Setting highest goals by the government will require a strong association between the stock market and its responds to monetary policy instruments. Monetary policy indicators that have major impact on the economy are countless and one of key policies that drive the economy is the monetary policy. Core

aspects of the monetary policy that requires serious scrutiny and close link with stock market include the interest rate, inflation, exchange rate and money supply. International investors are being charmed by the performance of Turkish economy as of the sound and viable investment destination. Investor confidence is up the ladder and in 2013 the country attracted around US$195 billion of portfolio investments. Investors assess the stock market and how it response to continued volatility in monetary policy instruments. A close analysis of interest rate, inflation rate, money supply and exchange rate is crucial as it impacts shareholders return on their investments. This study analyses the relation between monetary policy instruments namely; Short-term interest rate (SINT), Money supply (M2), Inflation rate, and Exchange rate (EXC) and the whole Turkish share price index, for the period span from January 2003 to December 2013.

1.2 Motivation and Contribution

The study will examine the relationship between Turkish stock market activities by identifying variables that affect particularly the All Share Price Index of the market. Considering that the All Share Price Index represents the performance of all 401 listed companies in the Turkish stock market. The index consists of all stocks traded on Borsa İstanbul markets. Moreover this index may show a better reflection of the stocks market affection from the Turkish economy's restructuring period and how it affected the overall activity of the market. Hence, attempt to analyze the effect of macroeconomic variables that includes monetary policy instruments on the whole Turkish stock price index. As a result of changes in monetary policy during the tested period, it assumed that the variables of interest may have effect over Turkish stock market.

1.3 Objectives of the Study

The essential objective of the study is to examine the relation between the All Share Price Index in Turkish stock market and the monetary policy instruments.

The specific objectives are:

(i) To determine monetary policy instruments influencing ASPI.

(ii) Detect the significant variables and their percents of influence on ASPI.

1.4 Research Hypotheses

The hypothesis that this study seek to verify are as stated below:

H0a: There is no significant impact of INR on ASPI.

H1a: There is significant impact of INR on ASPI.

H0b: There is no significant impact of INF on ASPI.

H1b: There is significant impact of INF on ASPI.

H0c: There is no significant impact of M2 on ASPI.

H1c: There is significant impact of M2 on ASPI.

H0d: There is no significant impact of EXC on ASPI.

H1d: There is significant impact of EXC on ASPI.

1.5 Research Methodology

The study will examine the relationship between Turkish stock market activities by identifying variables that affect particularly the All Share Price Index of the market by employing monthly data for the period January 2003 to December 2013. This study uses the computer software E-Views for applying the econometric analysis. Ordinary Least Squares regression is applied on the series.

1.6 Significance of the Study

As an attempt to add to the growing body of empirical studies on the role of the macroeconomic environment and the stock market's activity and to answer the question of whether or not the selected variables influence the stock market in the case of Turkey, this study will use developed econometric techniques to empirically investigate this question.

Based on the results of this study investors and policy makers may see a reason to improve the financial system in an attempt to achieve higher levels of return and less risks.

1.7 Structure of the Thesis

The Thesis is composed of six chapters. After this introductory chapter, the remainders of this thesis are organized as follow:

Chapter 2; puts the light on the recent economic conditions of Turkey and illustrates some of its major economic indicators. Moreover it discusses a brief overview of the Turkish stock market. Moreover this chapter

Chapter 3; provide and discusses the theory linking between macroeconomic factors and the stock market activity in the economic literature. Starting with the Efficient Market Hypothesis (EMH), Present Value Model (PVM), Arbitrage Pricing Theory (APT) and other related theories. Moreover this chapter discusses the empirical finding of previous research that studied the influence of monetary policy variables on stock market. These studies are divergent and diversified among developed, developing and emerging countries.

Chapter 4; the aim of this chapter is to express the selected variables that are studied in this study and explain the applied econometric techniques that were used in the analysis.

Chapter 5; the aim of this chapter is applying econometric techniques and discuss the result.

Chapter 6; set out the main conclusions from this empirical research and suggest some recommendations for future research.

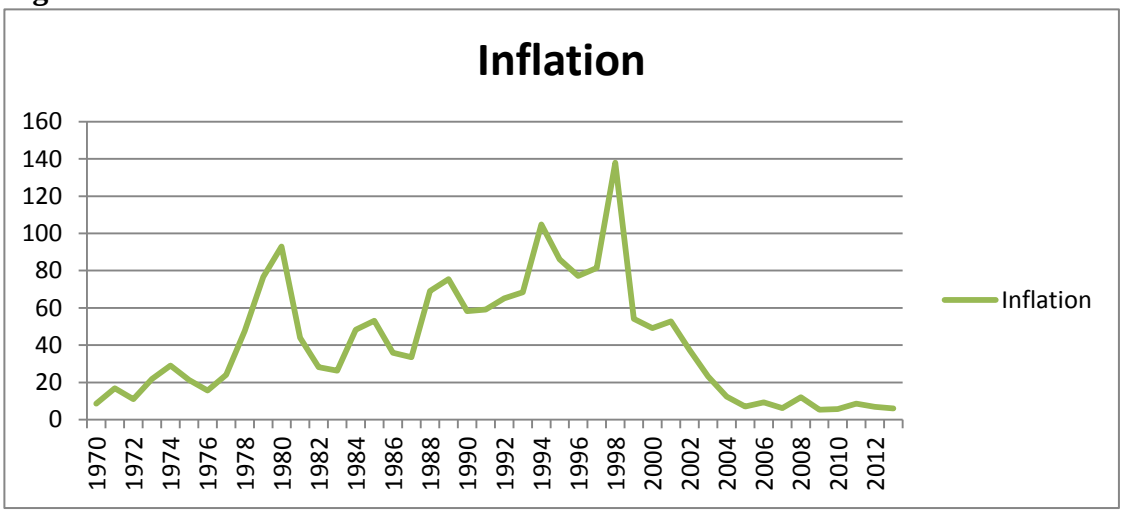
CHAPTER TWO

2. GENERAL INTRODUCTION ABOUT TURKISH ECONOMY AND STOCK MARKET

2.1 Structure of Turkish Economy

Due to macro prudential policies and sound regulations on its economy and financial systems, Turkey managed to turn around its economy after a series of crisis exposure. The recession that hit the Turkish economy during the late 1970's as a result of the problem in balance of payment forced the government to adopt a new industrialization strategy which made it able to reducing this problem. Between the period 1970's and 1980's this promising economy experienced a relatively high inflation coupled with unsuccessful disinflation attempts. The average inflation rate was 29 percent in the 1970's, 35-40 percent in the early 1980's and 60-65 percent in the late 1980's.

Figure2.1InflationRate



Source: World Bank Database.

It can be seen from the above Figure 2.2 that the inflation rate was always having and upward trend and very high during the periods of severe crisis namely 1994 and 2001. In 1980 it marked the first initial reform to control inflation through liberalization of the economy and supporting export growth. Due to the unsustainable nature of the fiscal and the external deficit, the economy experienced a major crisis in early 1994 (Ertuğrul and

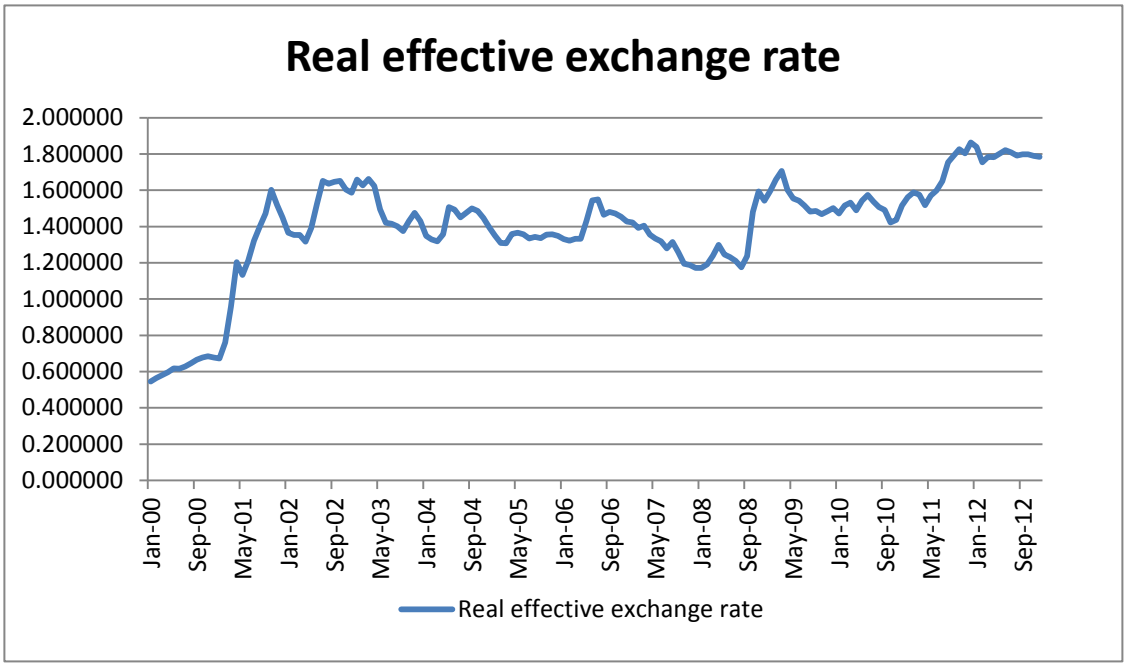
Selçuk, 2001, 3). The financial system of Turkey proved to be very fragile as it received several substantial back up funding from external institutions like the IMF. In early 1980s it can be pronounced that the government embarked on structural adjustments to stabilize the economy. The first phase of reforms was followed by gradual move into the trade liberalization in 1984 (which culminated in Customs Union with the EU eleven years later) and liberalization of capital account in 1989 (Boratav and Erine,2001,4). The reforms promoted open economy in which macroeconomic environment where both current and capital accounts are completely liberated. During 1983-87 export revenue increased at an annual rate of 10.8% and gross domestic product rose to annual of 6.5% (Boratav and Erine,2001,6) . And with the inception of a comprehensive stabilization programs in January 1980, an outward oriented development strategy was acknowledged and external balance became a major concern of governments as protracted current account imbalances made the government more sensitive about the sustainability of external imbalance (Ertuğrul and Selçuk, 2001, 6). In 1988, the economy was ushered into a new phase where the growth performance remained inactive.

The annual GDP growth fell down by 2.1 percent comparing with the previous period (1980-1987) despite 4.4 percent increase in the annual average growth rate of industrial value. During early 80's the model economy became a textbook case of "boom-bust" growth performance with a relatively lower average growth rate and high volatility in the 1990's. The deterioration in the economy could be attributed to the unsuccessful disinflationary efforts and debt financing policies of the government. Even though, efforts joined to savage the Turkish lira from further depreciating in order to control the inflation, restrictions were put in place to borrow easily from the domestic markets (Ertuğrul and Selçuk, 2001, 6). The instability in the GDP growth seen as a major factor that underpinned the country's economy triggered the uncertainty and the risk premium in the economy at that period.

The last crises terminated the country's long lasting experience with some form of managed exchange rate and free floating regime became inevitable. Foreign exchange risk was at the end left to the markets putting in place incentives for responsible investment decisions that would prevent excessive risk taking (Gormez, 2008, 83). Fiscal and monetary policies in line with structural reforms in the new economic

program were formulated. They aimed to place the country's economy on the track of structure to sustained low-inflationary growth (Gungen, 2010, 317). In other words, the essential goal of such incepted policies was to make the economy more elastic to adverse shocks, less volatile to crises, more equitable in income distribution, and more conductive to foreign and domestic investment.

Figure2.2 Real effective exchange rate

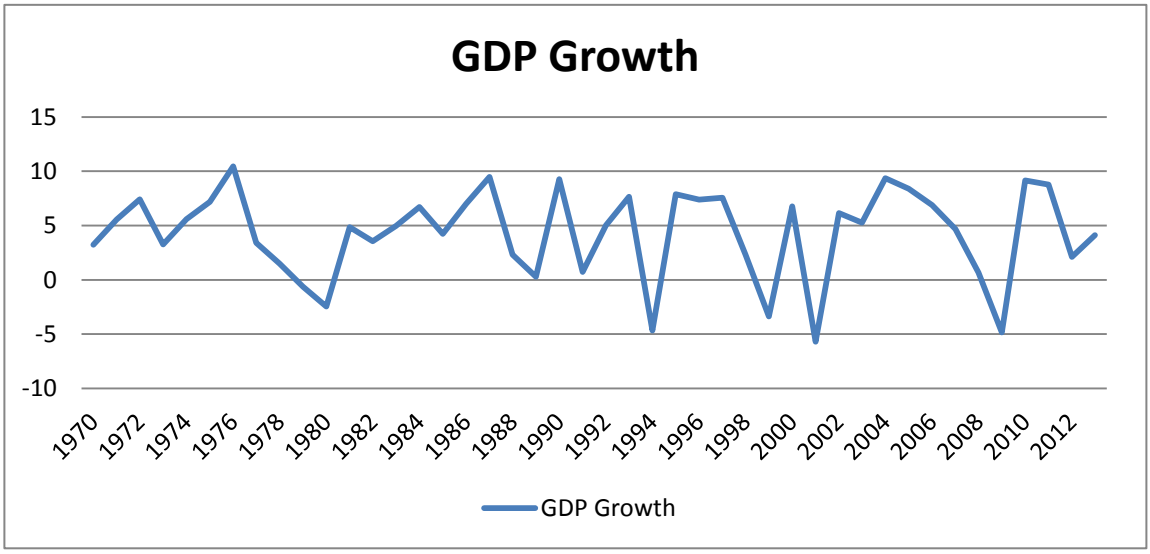


Source: World Bank Database

The new programs included the extensive re-capitalization of the banks as well as re-structuring of state-owned banks. The priority was given to enhance the role of private sector. A decision was then taken to drive-out state involvement from production and manufacturing to pave way for private sector. After the 2001 crises, the policymakers were given the opportunity to pay more attention on the microeconomic problem which fuelled the crises. The increasing pressure of competition and the need to develop an extensive set of risk controls became expected problems for banks, following the macroeconomic problems which arise in the late 1990's and early 2000's. Due to this, a stabilization program was set for the banking sector including, sustaining profitability under heightened global volatility, managing foreign exchange risk under a floating exchange rate regime when private sector was heavily indebted in foreign currency and

at least expands locally to compete among challenges for banks, to meet the new economic conditions.

Figure2.3 GDP Growth



Source: World Bank Database

At this juncture it is crucial to turn on the major economic events in history of Turkish economy and reveal more insight on the turbulent economy experienced for decades with special attention given to 1994, 2000 and 2008 as the periods of severe economic crisis in Turkey. The 1994 Currency or Liquidity crisis had some detrimental negative effects on the economy. High interest rates, lower depreciation and heavy internal and external short-term borrowings were the typical characteristics of the financial environment between 1989-1994 (Ertuğrul and Selçuk, 2001, 13). The financial crisis of 1994 also marked the new size of state owed banks as before the crisis state banks where in better position in terms of efficiency performance as compared to private banks but after the crisis the vice versa was significant. The Central Bank introduced quick policy reversal to lower interest rate; high depreciation policy and cancellation of the Treasury Auctions compel the banking sector system to quick arrangement of foreign denominated assets and liabilities. These policies affected the demand of foreign currency and this lead to the events of the 1994 crisis. The Turkish lira devalued to around 13%. State banks lost almost 90% of their net worth during the 1994 crisis (Ertuğrul and Selçuk, 2001, 18). The immediate remedy was for Central Bank to allow

state owned banks to sell foreign currency to privately owned banks. The general conclusion of the crisis before and after (1994) is that the financial sector remained exposed and vulnerable to internal and external shocks. In July 1998, the Turkish government started to implement a disinflation program under the guidance of IMF based on the Staff Monitored Program (SMF). Although the inflation rate and fiscal imbalances were managed to a reasonable level the program suffered a knock to handle the pressures of interest rate. In 1999 marked the establishment of the Banking Regulation and Supervision Agency (BRSA) which was tasked to monitor and regulate banks.

In addition to these new regulatory efforts the government undertook some measures to remove distortions created by the state owned banks. Commercialisation of Zaraat Bank, Halk Bank and Emlak Bank, and eventually privatisation of them tied up to a special action plan (Ertuğrul and Selçuk, 2001, 20). In the middle of addressing the 1994 crisis the Turkish economy was struck with another financial crisis of 2000. It was well known on the corridors of commercial banks that one bank called Demir Bank was in serious financial problems. The bank had a substantial government securities portfolio. Due to difficulties in borrowings from the money market on November 20, 2000, Demir Bank started a fire-sale on government bonds in order to obtain liquidity (Ertuğrul and Selçuk, 2001, 20). Other smaller market makers in government securities followed the same act and decline in Central Bank reserves pushed the interest rates upwards.

Injection of more liquidity on the market by the Central Bank only precipitated the continued increase in interest rates as overnight interest rates (simple annual) reached its peak of 800 percent on December 4, 2000. The only avenue left to restore stability was to approach the IMF through its program of Supplementary Reserve Facility. The IMF "emergency" team and the government officials announced on December 5, 2000 that the IMF was considering an additional USD 7.5 billion loan to Turkey to support the on-going program (Ertuğrul and Selçuk, 2001, 21).

The Turkish government grabbed this opportunity and took bold commitment of structural reforms on the public finance, privatization, monetary policy to mention but a few as key reforms towards economic growth. The IMF agreed to advance the loan to

restore stability in the economy. After the 2001 crisis, Turkey embarked on a new IMF supported arrangement. Two major reforms, related with the monetary policy approach, that were implemented in the aftermath of the crisis can be listed as follows (Alp and Elekdağ, 2011: 7-8): The heavily managed and fixed exchange rates regimes of the past were abandoned in favor of floating exchange rates. The CBT started its transition, and in 2006, officially implemented a full-fledged inflation targeting regime which would serve as the economy's nominal anchor. As early as 2001 the Central Bank reserves returned to their pre-crisis level, decrease in interest rates, stability restoration in banking sector more than before the crisis was embraced. The nominal exchange rate, inflation rate, interest rate, and Turkish Euro bonds spreads all followed a significant downward trend (Őzatay, 2002, 4). The last crisis witnessed was the global financial crisis of 2008 and as any other emerging economy; The Global Crises affected badly the Turkish economy by reducing aggregate demand together with the sharp fall in commodity prices and inflation and by limiting financing instruments and bank's credit channels and financing policies. The government of turkey announced mid-term economic program during the global crisis-2008.This program reduced the risk and uncertainties towards the future of the Turkish economy. It is obvious that the expectations with regards to the economic development of Turkey were successfully managed by the government through the fiscal discipline and monetary policies. Turkish Central Bank played very important role during the crises. Turkish Central Bank Policies aimed at the restoring of price, financial and economic stability in public sector by using the policy tools such as interest rate, liquid funds, and reserve ratio requirements in order to increase the total demand in economy when economy was in recession because of the crises. The Turkish Central Bank reduced the interest rates in November of 2008 and, in this regard it implemented the expansionary monetary policies during the global crises because of the shortage of demand in the market. During the crises, the anxiety about inflation target policies has already been declined because of the shortages of the aggregate demand. Thus, it prepared the appropriate economic environment for the central bank to focus on the financial stability (Ayhan gunay, 2011, 94). Another reason why the Turkish Central Bank was so successful in Turkey was that Turkish contractor

and investors and households which are the major economic player, trusted very much the Turkish Economy during the crises.

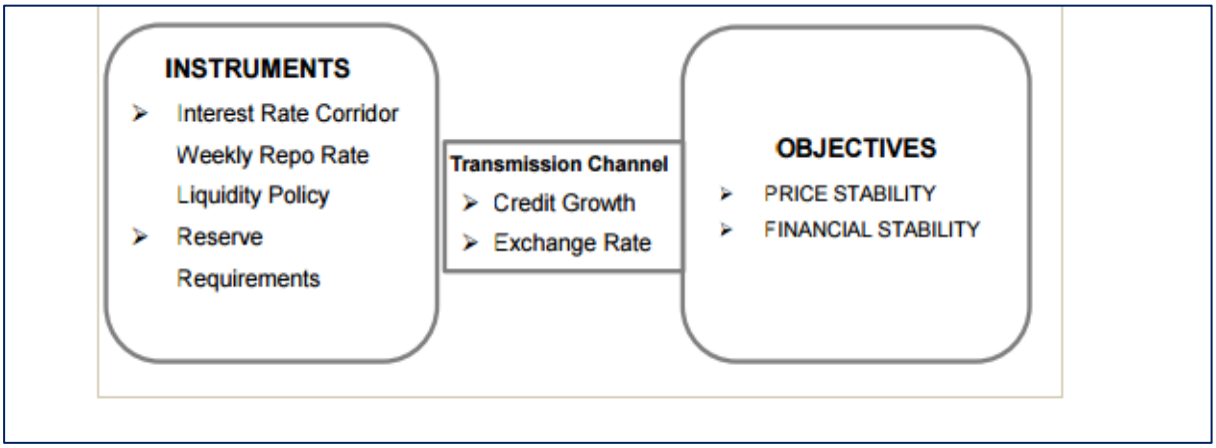
2.2 Monetary Policy Reforms by Central Bank of Turkey (CBT)

Monetary policy refers to the use of those official instruments which are at the action of the Central Bank to regulate availability; cost and use of money and credit with the objective to achieve the optimum levels of output and employment; price stability; balance of payment equilibrium or any other goal of government's economic policy (Vaish, 2005, 249). The objectives of monetary policy are numerous and the core of them to mention a few in every economy are, price stability, economic growth, full employment, balance of payment, and exchange rate. Turkish economy as mentioned earlier it went through severe economic crisis and the Central Bank of Turkey (CBT) designed numerous reforms to address the downward trend in the economic activity. Reforms were ranging from restructuring of state-owned banks, control of foreign exchange market, inflation rate, interest rate remedies and debt sustainability were part of this key policy. Right after the twin crises, Turkey took key structural reforms: weak banks were taken over by the Savings Deposits Insurance Fund (SDIF) and excluded from the banking system (Őztay, 2002, 5).

2.2.1 New approach Monetary Policy 2010

Since the global financial crisis did not spare the Turkish economy; it was important to design and implement sound contemporary macroeconomic policies and regulations to enhance stability in the economy. As such, the Central Bank of Turkish Republic has been applying new approach of monetary policy since the end of 2010 . While formulating the new monetary policy, the CBT was mainly motivated by two main developments following the global crisis: (i) the changing landscape of central banking at global scale, (ii) the extraordinary global conditions and heightened capital flow volatility (Kara.2012, 22).

Figure.2.2. CBT's Policy Instruments and Objective



Source: Adapted from the CBT, working paper (2012)

Since 2010, the CBT have adopted a new policy framework, Figure 2.2. The CBT adopted new policy mix; the new policy mix entailed the joint use of the interest rate corridor between overnight borrowing and lending rates, liquidity policies and required reserves in addition to short term policy rates (Eşkinat, 2013, 2). (Kara ,2012.6) summarized the main tools utilized within the new policy framework as follows:

- Interest rate corridor; one week repo rate and liquidity management tools
- Required Reserves and more recently reserve option mechanism.

This was a new policy framework, and as such they were deficiency in terms of economic literature and hence the CBT had to enhance communication policy. To increase the communication about the transmission mechanism, the CBT defined and highlighted two immediate variables: credit and exchange rate (Kara, 2012, 7). Through the use of the corridor and liquidity facilities, the CBT control the marginal cost of credit at a high frequency for banks that have liquidity shortfalls and it makes it possible for the CBT to adjust interest rates on a daily basis so as to smooth out the volatility in short term capital flows and exchange rate (Kara, 2012, 7). The CBT can hedge the depreciation of the Turkish lira through the supply of less liquidity and let short-term rates rise during global crisis and banks encouraged to sell foreign exchange to meet liquidity needs. As an additional tool, the CBT allows banks to keep a certain ratio of Turkish lira required reserves in foreign exchange or gold (Minir,Sunnel,Task,2012,1-6).

To ensure inflation is at controlled levels that promote investment, the price stability mechanisms are well monitored by the CBT. Supply side economics (high productivity) in the economy is well encouraged with favorable conditions that promote capital inflows through Foreign Direct Investment (FDI).

The CBT sound structural reforms, beyond reasonable doubt have place Turkey on new platform as one of the best emerging market on the world. (Eşkinat, 2013, 10) noted the effectiveness and outcomes of the new policy framework by the CBT;

- The new policy framework has proved perfectly efficient in smoothing out the adverse effects of capital flow mobility.
- New policy mix has been successful in engineering a soft lending and rebalancing of the economy without hampering the price stability objective.
- Current account deficit started shrinking without undergoing crisis for the first time in recent history of the Turkish economy.
- Turkish experiences deserve a close attention as an example of how the existing inflation targeting frameworks can be modified to allow for more room regarding macroeconomic and financial stability.

2.3 Borsa Istanbul Stock Exchange

The Borsa Istanbul (BIST) was established in early 1986. The BIST is the only securities exchange in Turkey established to provide trading in securities. The BIST was governed by an executive Council composed of five members elected by general assembly. One of the five appointed as the chairman and chief executive officer of the BIST by the government on Oct 25, 1997. BIST as a professional organization enjoys a high degree of self-regulation. Its revenue is generated from fees charged on transactions, listing procedures and miscellaneous services. The profit of the BISE are retained to meet the expenses or to undertake investments and are not distributed to any third parties. The BIST has its own budget. Turkish securities market has its roots in the second half of the 19th century. Also created a medium for European investors who were seeking higher return in the vast ottoman markets, following the proclamation of the Turkish Republic on the ruins of the Ottoman Empire; a new law was enacted in 1992 to recognize the

fledging capital markets under the new name of “Istanbul securities and foreign exchange Burse”.

At the early phase of 1980’s is a market improvement in Turkish capital markets which accordingly gave birth to the Turkish Capital Market Law in 1981. One year later, the main regulatory body responsible for the supervision of regulation of the Turkish securities market, the capital market Board based in Ankara, was established. A new decree was issued in Oct 1983 foreseeing the setting up of securities exchange in Turkey. The Regulations for the establishment and functions of securities exchange was published in official gazette in October 1984. The regulations concerning operational procedures were approved in the subsequent extraordinary meeting of the general assembly of the Istanbul Stock Exchange was formally inaugurated at the end of 1985.

CHAPTER THREE

3. LITERATURE AND EMPIRICAL REVIEW

3.1 Theoretical Review

This linkage between the monetary policy variables and stock prices has well been looked at in an existing related literature. Theoretical basis explaining how stocks should be valued has extensively reviewed in literature.

Various theories have been developed to explain the association between the stock market and the monetary policy variables. The efficient market hypothesis suggests the current value of stocks should reflect all the available information in the market. They only reflect the current information, meaning that all the previous information has no effect on stock price. This literature review provides a discussion for the various theories that have analyzed monetary policy variables' effect on the stock market. There are various theories that have been developed to describe the relationship between those variables and the stock exchange. These theories include the Capital Assets Pricing Model (CAPM), Efficient Market Hypothesis, the Arbitrage Pricing Theory (APT) and present value model (PVM).

3.1.1 Efficient Market Hypothesis (EMH) Theory

According to the Efficient Market Hypothesis, the prices of assets or stock should be based on all the market information at any particular time. In this case, any investment in the stock market will not yield abnormal profits. The current price of the stock must reflect all the current information, and therefore the previous information has no meaning. The shifts in the stock market are examined using the new relevant information. This theory was introduced by Fama between (1965 and 1970). The theory suggests that it is nearly impossible for investors to constantly overcome a perfect capital market. However, the stock prices do not always reflect all the available information making the theory a subject of discussion. A stock market will be efficient if resources are efficiently allocated in the stock market. This is an economic perspective of the efficient market hypothesis. The variations in the price of stocks in the stock market should reflect the underlying economic fundamentals. Interventions from the

policymakers interrupt the activities of the stock market, and thus it becomes inefficient. From an economic point of view, an efficient stock market will appear through the efficient allocation of economic resources. For example, if the share prices of a financially weak company are not priced correctly, will not be used new saving inside the financially weak industry. From the EMH, the benchmark of asset price fluctuation fairly reflects underlying economic fundamentals. Livich, (2001, 217) argues that may the market will be disrupt through policy makers intervention, lead it to be inefficient. Studies have revealed that investors' ability to earn higher risked adjusted income on an investment is ruined by the changes in the macroeconomic variables Moolman and du Toit, (2005, 77). In such case the form of EMH usually is not used as strict fact it used as guidelines (Fama, 1991, 1575).

3.1.2Capital Assets Pricing Model

The market conditions associated with the particular asset are main dependents of stability this asset prices. This is usually used to determine the risky asset prices, and this is the basic concept behind William Sharpe (Capital Assets Pricing Model), but it was subsequently investigated independently by other economic theorists. They based their work on the diversification and modern portfolio theory which was earlier developed by Harry Markowitz. The model is simplified through mathematical assumptions that are based on various assumptions. These assumptions are based on the fact that the model describes the mechanisms used by investors to establish the expected asset returns (Fama& French, 2004, 25).The stock market is usually affected by market imperfections including taxes and short-term regulations.

The CAPM model assumes that those imperfections do not exist. Moreover, it is assumed that all the investors have costless and simultaneous access to market information. The asset market is also assumed to be frictionless. The model also relies on the assumption that the market is perfectly competitive, and there is perfect pricing and divisibility of all assets. The number of assets is definite and their volumes are assumed to be fixed within the specified time. The assets are assumed to be free of external and internal risks at a regular risk free rate. The model also assumes that normal distributions can be used to full describe the distribution of assets return. Moreover, the

expectation of all investors regarding assets return is assumed to be uniform. Finally, the model assumes that the investors are people who optimize the anticipated utility at the end of their period wealth.

The above assumptions draw various conclusions regarding the market conditions. The market portfolio is efficient and is suitable for the requirements of all the investors. This includes the distinctive common fund for all risky assets. The efficiency of the market portfolio renders all other portfolio of risky assets inferior. All the investors in the market have a similar composition for their portfolio of risky assets. Finally, it is concluded that all the investors are exposed to equal and risk-free lending and borrowing rate.

In order to develop the CAPM model, there must be a compromise between risk and expected return. The quantification of this compromise is one of the challenges experienced during the development of the modern financial economics. According to Fama and French (2004, 25), investment in risky assets generally provides higher returns as compared to investment in risk free assets. In spite of this fact, the quantification of risk and the associated rewards presented problems until the development of the capital Asset Pricing Model. Between 1963 and 1964, William Sharpe constructed on Markowitz's Modern Portfolio Theory model to develop the CAPM. This was a simple model that was used to relate the anticipated asset returns with its anticipated risk. There are two types or risks that are associated with investments, which include the systematic risk and unsystematic risk (Fama&French, 2004, 25).

Systematic risks involve risks such as inflation, recessions, and political conflicts among others. It is not possible to diversify such risks by investing in a portfolio. These risks are also known as non-diversifiable or market risks. Unsystematic risks are those that can be diversified, and they are not associated with the general market shifts. This type of risk is also referred to as specific or diversifiable risk. Assuming that the assets can be expressed as a linear function of the market and a random variable "ε", the total risk associated with the empirical return is given as:

$$R_j = B_j R_m + \varepsilon_i$$

In the expression above, the first term of the equation represents the total risk and the second term represents the market risk. The random variable, which is independent of the market, is represented by the last term in the expression. The following expression provides the variance of the total risk.

$$\sigma_j^2 = b_j^2\sigma_m^2 + \sigma_\varepsilon^2$$

In the expression the first term on the right hand side of the equation is the systematic risk while the second term represents the unsystematic risk. The unsystematic risk can be eliminated through portfolio diversification (Fama and French, 2004; 25). This is not possible with the market risks. The Capital Assets Pricing Model assumes a mean-variance efficient portfolio that is equal to the market portfolio. Therefore, the equation for the model can be expressed as follows:

$$E(R_i) = R_f + B_{im}\{E(R_m) - R_f\} \ldots . i = 1,2, \ldots N$$

In the above expression, E(Ri) represents the expected asset returns, Rf represents the risk free return, E(Rm) represents the expected return on the marker portfolio, and βim is the beta of the asset market. The expression takes into consideration the sensitivity of the assets to the systematic risk. The beta of the asset market is an indication of a stock's relative volatility. The volatility of a stock is the rate of variation in its price over a specified period (Fama& French, 2004, 25).

3.1.3Arbitrage Pricing Theory (APT)

This theory was developed due to the various limitation of the Capital Asset Pricing Model (CAPM). This theory provides information that explains the pricing of assets based on the associated risk. The theory was introduced by Ross between 1976 and 1977 in order to be used as an alternative to CAPM. According to Poon and Taylor (1991, 619), CAPM suggests that the anticipated return or asset prices can be obtained through a single common factor. On the contrary, the Arbitrage Pricing Theory suggests that anticipated returns or asset prices can be obtained through multiple macroeconomic factors. One of the shortcomings of the CAPM is that the beta of the asset market does not provide information regarding the cross-section of expected returns as related to

momentum and anomalies. The Arbitrage Pricing Theory is a multi-factor model that was developed to overcome these challenges. This model does not require the identification of the market portfolio. Although the number of factors is not clear, it can either be specified or established using a test.

The APT assumes that the securities are sufficient in order to allow firm-specific risks to be diversified away. The theory also assumes that the returns from the security can be explained using a multi-factor model. Moreover, it assumes that persistent arbitrage opportunities do not exist in well-functioning security markets. The term arbitrage is used to describe a situation where investors make risk-free profits through the exploitation of security mispricing, without a net investment. The market cannot be in equilibrium if security prices provide arbitrage opportunities. If this case occurs, the prices will be under pressure to adjust and remove the risk-free profits. The arbitrage is dependent on the law of one price which suggests that all economically equivalent assets are supposed to have the same market price. The Arbitration Pricing Theory (APT) can be represented using the expression below:

$$E(R_i) = R_f + B_{j1}\gamma_1 + B_{j2}\gamma_2 + \cdots + B_{jk}\gamma_k$$

The expected return on asset is represented by E (R_i) while Rf, β_{j1}, and λ_k represent the risk-free rate or return, sensitivity of risk j to risk factor k, and risk premium for factor k respectively. The theory does not specify the limit for the number of factors or specify the factors. It assumes that the factors lead to systematic variation of the asset returns from their anticipated values. These factors include interest rates, GDP growth, and inflation among others. The effect of these factors is not uniform but differs across assets. APT is a multi-factor theory, which means that there is more than one source of systematic risk. This is opposed to the CAPM whereby it is assumed that there is only one source of systematic risk.

3.1.4 Present Value Model (PMV)

The Present Value Model (PMV) or Discount Cash Flow Model, was formulated by (Smith, 1925), and is considered as a substitute theory to capital asset pricing. The model emphasize that the present value of capital asset is based on its future cash flow (dividend), and also these cash flow is attributed to the future discount rate. The PVM

provides a theoretical foundation linkage between macro-economy and stock prices. Moreover, the linkage among the macroeconomic factor and stock price is more clear, since factors affecting whether the future dividend or the discount rate or both, will be affected by the present stock price. PVM is expressed as follow:

$$P_{it} = \sum_{n=1}^{\infty} \frac{E(D_{it} + n)}{(1 + K_i)^n}$$

Where: P_{it}denotes the present price of the asset at time t, D_{it} denotes the discounted future cash flows and $(1 + K_i)$ represents the discount factor. The PVM states that the sum of the discounted future cash flow of any asset is equal to this asset's current price (Moolman and du Toit, 2005, 77).

3.2 Empirical Review

The censuses around monetary policy variables and its impact on the prices in stock market has been confirmed and widely accepted in the financial theory. Many attempts have been done and still going to study these affects in details and in an empirical way. Effects of announcing discount rate on interest rate and stock prices were the main focus of Waud (1970, 50). He used the data for discount rate and the Standard &Poor's 500 for the period from 1952:6 to 1967:6. He assumed that what is meant by the notion of an announcement effect, associated with Federal Reserve's discount rate changes, is an effect that alters the expectations of businessmen, financial institutions, and other economic factors about the future course of the economy. He found a significant and immediate response of stock prices to discount rate changes.

Sellon (1980, 3) discussed the assumption that changes in the discount rate given by the Federal Reserve Bank may affect prices in the stock market. He justified this by showing that an increase in the fed's discount rate restricts the ability of lending by banks and vice versa. Secondly, he states that the Fed's discount rate not only affects the banks but also may affect the confidence of the borrowers themselves.

Smirlock and Yawitz (1985, 1141) studied the relationship of both technical and nontechnical discount rate changes and their influence on the stock prices. Their study revealed that the technical discount rate variations are endogenous whilst non-technical variations contain information about monetary policy. For the pre 1979 period they found no evidence of announcement effects. Contrary, for the post-1979 period they found significantly negative announcement effect, but only for nontechnical discount rate changes.

Chen, Roll, and Ross (1986, 383) conducted a study on the basis of the Arbitrary Pricing Theory (APT) using a multivariate regression model. The macroeconomic variables regressed on the USA stock market returns index were namely exchange rate, money supply, long/short interest rate and the industrial production index. These variables were selected due to their influence on the future cash flow of the stocks directly or their influence on the cash-flow's risks.

Hardouvelis (1987, 131) tested the response of stock prices to the announcement of15 representative macroeconomic variables (Ml, discount rate, surcharge rate, free reserves, inflation rate proxied by both CPI and PPI, consumer credit, personal income, industrial production index, unemployment rate, durable goods order, index of leading indicators, , retail sales, housing starts, and trade deficit).

Pilinkus (2009, 1827), analysed the relationship between selected macroeconomic factors and two of the Lithuanian stock indexes namely (OMX, VILNIUS). He used 40 macroeconomic factors covering the period of study from December 1999 to March 2008. After applying Granger causality test the results showed that there is granger causality between OMX price index and some macroeconomic factors namely: consumer goods and money supply (M1 and M2).

Bulmash and Trivoli (1991, 61) investigated the time-lagged interaction between US. With many independent variables, along with a variety of assumed time lags, their model is large with an extensive degree of statistical multicollinearity or autocorrelation. They used an autoregressive procedure, and their results indicate that the actual inflation measured by the CPI is spurious; the monetary effects (M2) are positively related for short lags but negatively correlated for longer lags. Furthermore, they report that both short-term and long-term interest rates have a negative impact on the stock prices.

Issahaku and Ustarz (2013, 1044), investigated the macroeconomic indicators of Ghana's economy and its effect on the stock market over the period starting from Jan 1995 to Dec 2010. After applying the Vector Error correction model to the selected variables namely: exchange rate, money supply, inflation rate and foreign direct investment, the results revealed the existence of a long run relation between the stock price and foreign direct investment, also the existence of a short run relation with the interest rate. Moreover inflation and money supply showed both long and short run relationships with the stock price of Ghana

.

Dhakal, Kandil, and Sharma, (1993, 52) aimed to investigate the impact of the aggregate money supply in the United States of America on the activity of New york stock exchange. They implemented the study on a Vector Autoregressive Model hence added some other convenient factors to the model namely: inflation rate, interest rate and real GDP. Their findings came in line with the casual relationship from money supply to stock prices. However they also found that stock prices do have a notable influence on the industrial real output in USA economy.

Habibullah and Baharumshah (1996, 121) employed tri-variant Cointegration approach to check the ability of aggregate money supply (M2, M1) and real output (GDP) to predict changes in stock prices in Malaysia. They used monthly data covering the time period of January 1978 to September 1992. The Cointegration analysis suggested that there is no Cointegration relation among money supply, GDP and the Malaysian stock

prices. This suggests that the stock price indexes in Malaysia, during the period of study, have already reflected all past information regards the selected macroeconomic factors, money supply and real GDP, which confirms the efficient market hypothesis.

Rjoub (2012, 4) examined the dynamic relationship between exchange rates, US stock prices as a world market and the Turkish stock prices index, for the period span from August 2001 to August 2008. By applying Vector Auto regression (VAR) framework, the finding revealed that there was a long run relationship. Also Granger causality test indicated that there are bidirectional relationships between exchange rates and stock prices. Also the shocks were temporary on the Turkish stock prices; US stock price and exchange rates as indicated by the impulse responses.

Ahmet and Abdioglu (2010, 601) empirically examined the linkage between the stock price of (ISE-100) and some macroeconomic factors particularly: consumer price index as a proxy of inflation (CPI), the Foreign exchange rate, aggregate money supply (M1), Industrial production index and gold prices. The study was applied From March 2001 to June 2010 on a monthly basis. By using long run Granger non-causality techniques, the result showed that there is long run causality from (ISE-100) to all macroeconomic variables selected in one direction.

Kandir (2008, 16), studied the inter relation among changes in the Turkish stock market and a group of macroeconomic factors such as the foreign exchange rate, money market interest rate (IR), money supply (M2), the consumer price index (CPI), industrial production index also gold and oil prices on the Turkish stock market represented by the (ISE-100) index for the period spans from Jan 2003 to Mar 2010 via applying a multiple regression model. The findings revealed that all the macroeconomic factors had a negative effect on the Istanbul stock exchange (ISE-100) index returns except the money supply showed a positive influence on ISE 100 index return. Moreover, CPI and gold price did not show any significant effect on (ISE-100) index.

Çağli and Halaş (2010, 48), investigate the relationship between stock price index (ISE-100) and a group of related factors namely: exchange rate, GDP, industrial production index, inflation rate, money supply (M2), interest rate and oil price. By applying Gregory-Hansen test for the period span from January 1998 to December 2008. The result revealed a long run relationship, between deployed the variables and ISE100 for the tested period with a presence of structured break.

Zugul and Sahin (2009, 16), investigated whether there is cooperation concerning the (ISE-100) index and some macroeconomic variables as; exchange rate, money supply (M1), deposits interest rate and inflation for the period spans from January 2004 to December 2008. The findings revealed that money supply, exchange rate and interest rate have a negative relationship with stock return index. On the other hand, the findings reveal a positive relationship between price levels and (ISE-100) index for the analyzed period.

Ozbay (2009, 10), investigated the casual relationship between stock price (Index 30) and macroeconomic factors as; interest rate, inflation, and exchange rate, money supply and the real economy spanning between January 1998 - December 2008 of ISE. The findings revealed that overnight interest rate, consumer price index, current deficit as percentage of GDP and foreign sales do granger-cause stock prices. Moreover, it indicated that stock prices do granger-cause money supply, overnight interest rate, and exchange rate. Also revealed negatively that the purchase price index and positively that the in turkey, foreign transactions determined stock prices.

Erbaykal (2008, 13), investigated the association between the stock price (ISE-100) Index and consumption expenditure, industrial production, employment level, fixed investment and consumer price index, covering the period from January 1989 to February 2006. The findings revealed a negative association between the inflation and stock price. With an exception of industrial production index, employment level and

fixed investment which were statistically significant, a positive relationship was revealed between the other macroeconomic variables and the stock prices.

Kaplan (2008, 374) investigated the correlation between the stock market performance, real macroeconomic activity and dynamic response of real economic activity to shocks in the stock prices of the Turkish economy from the period of 1987 to 2006 on a quarterly basis. The study finally revealed a long-run relationship between the real economic activity of Turkey and its stock prices over the studied period.

Erdem (2005, 987) examined the instability spillover from inflation, interest rate, exchange rate, money supply and industrial production to Istanbul Stock Exchange's stock prices index. The study analyzed the period span from January 1991 to January 2004. The findings revealed that there is a significant unidirectional spillover from macroeconomic variables to stock prices indexes except for the services index. Also, the findings showed a positive volatility spillover in cooperation with the exchange rate and both the (ISE-100) and industrial indices.

Subburayan and Srinivasan (2014, 12) investigated the long-run relations between macroeconomic factors and CNX Bank returns Index. Macroeconomic variables such as the foreign exchange rate, short term interest rate and inflation rate were chosen for the analysis. The study was conducted on monthly time series data gathered from the related Institutions for the time span of 2004 to 2013. ADF Unit root test, Johansen Cointegration test and Granger causality test were implemented on the data. It was that the Bank stock returns have a long-run relationship with the selected macroeconomic factors. No Granger causality linkages between CNX Bank index and both the short-term Interest rate and Inflation. In contrast unidirectional Granger causality existed between CNX Bank's return Index and exchange rate. Moreover exchange rate and Interest rate both affected positively on the CNX Bank's Index stock returns.

Saeed&Akhter (2012, 1) performed econometric diagnostic tests to indicate that the data used to determine the impact of macroeconomic factors on banking index in Pakistan had no econometric problem. Whereas oil prices were revealed to have a positive impact on the banking index, variables such as short term interest rate, money supply as well as exchange rates were revealed to have a negative impact on the banking index. The regression results indicated that Industrial Production, Short Term Interest Rate, Exchange Rate, and Money Supply affected the banking index negatively whereas oil prices had a positive impact on the Banking index.

Buyuksalvarci (2010, 70) analyzed the effects of macroeconomic variables on the Turkish stock exchange market in the Arbitrage Pricing Theory framework. He investigate seven macroeconomic variables consumer price index, money market interest rate, gold price, industrial production index, oil price, foreign exchange rate and money supply on the Turkish stock market ISE 100 index for the period spans from January 2003 to March 2010 via applying multiple regression model. The findings revealed that interest rate, industrial production index, oil price, foreign exchange rate have a negative effect on ISE 100 index return while money supply positively influences ISE 100 index return. On the other hand, inflation rate and gold price do not appear to have any significant effect on ISE 100 index.

Foong, Lok and Hoon (2012, 41), the study examined the impact of selected macroeconomic variables on the stock returns of bank industries in Malaysia. The monthly data for the period of 2006-2010 collected from Malaysia's Negera Bank were empirically analyzed. Ordinary least squares applied showed statistically significant relationship between the selected macroeconomic variables and the stock returns of the various banks. Stock returns of the various banks were affected by the exchange rate where as a considerable effect of money supply was shown on banks' stock returns.

Raymond (2009, 18) empirically examined the long run and short run relationship between macroeconomic factors namely: money supply (M2, M3), interest rate, and exchange rate and inflation rate and stock price (JSE index) in Jamaica. By using time series analysis Vector Error Correction Model (VECM) and Johansen co-integration, used monthly time period data from January 1997 to December 2007. The results indicate that the long run relationship between macroeconomic factors and JSE index, also indicate that its positively influenced among JSE index and inflation rate, money supply (M3) and negatively by exchange rate interest rate and money supply (M2). Further, the result shows that short run relationship, between JSE index and macroeconomic factors are interest rate and money supply (M2, M3). Also indicate that the shocks for all factors affected on stock price by applying impulse response procedure.

Shahbaz, Shamim and Aamir (2010, 103), the study sought the interactions among Pakistan's financial sector's performance and macroeconomic factors using both the Fully Modified Ordinary Least Square (FMOLS) method to test for cointegration in the long-run and the Error Correction method to test for the existence of a short run relation. Before further analysis, the stationary of the series were defined using Ng-Perron unit root test. Findings reveal that a rise in both government spending and foreign remittances increased the performance of the financial sector. Moreover trade openness associated with capital inflows opened new opportunities to improve the development of the Pakistani financial markets. On the contrarily, appreciation in inflation rates and the high savings rate decreased the efficiency in the overall financial sector.

Paul and Mallik (2003, 23), the researchers investigated the relationship between macroeconomic factors and the banking and finance's stock prices using quarterly data during the period Q1/1988 to Q2/1990. The study conducted cointigration tests and an error correction model were used to determine the long run relationship between stock price and the selected macroeconomic factors. The study revealed a cointegration

between the banking and finance stock prices and the three economic factors. The interest rate had a negative effect and in contrast a positive effect of GDP was shown on the stock prices. Moreover, inflation did not show any significant effect.

Kasman (2003, 70) empirically introduced the dynamic linkage between the aggregate stock price indices and exchange rate on the Turkey. By using time series techniques, the sample have been determined accordance the sectors namely: Financial sector index and Production sector index are start from January 2, 1991, Service sector index start from January 4, 1997. Also, national index 100 starts from November 4, 1990. Last day for all indices are November 29, 2002. The findings reveals that there is a long run relationship between stock indices and exchange rate, also the result shows that there is causality linkage from exchange rate to industry sector.

Aggarwal (1981, 126) explain the relationship between the dollar exchange rates and change and stock prices. He used monthly data U.S. stock price data and the effective exchange rate for the period 1974-1978.and used simple regression model for analysing data Results, which were based on simple regressions, showed that stock prices have negative relation with dollar exchange rate.

Sohail and Zakir (2010, 181), this study explored both the short run and long run effect of five macroeconomic factors on the General Index of Karachi stock exchange using Johansen cointegration technique and vector correction model. This study used monthly data from Nov 1991 to Jun 2008. The study revealed a positive impact of consumer price index, the real effective exchange rate, as well as industrial production index on the stock prices. Contrary, the issue of money (money supply) and the quarterly treasury bills rates had a negative effect in the long run. The VECM revealed that it spent more than eight months to eliminate the disequilibrium. The variance decompositions showed that consumer price index and money supply had greater forecast error than the industrial production index, the three month treasury bills rate and the real effective exchange rate for the General Index.

Humpe and Macmillan, (2009, 111) investigate the dynamic relationship between stock price and macroeconomic variables such as: money supply, long term interest rate, inflation rate and industrial production index as a comparison between US and Japan stock market, used monthly data from January 1965 to June 2005. By using Johansen cointegration test, the findings reveals that there is positively impact between US stock price and industrial production index and negatively by inflation rate and long term interest rate, also there is no significant influence between US stock price and money supply. Further the result shows that there is positively relation between Japanese stock price and industrial production index, but negatively by money supply. On the other hand, it suggests that there is negatively relation among industrial production index to interest rate and inflation rate.

Wiboonprapat (2005, 158), this study analyzed the stock price movement of the financial industry in which fall into three sectors that were tracked by the following indexes: (a) Banking sector index, (b) Finance and Securities sector index, and (c) Insurance sector index, on the Stock Exchange of Thailand (SET) over a 10-year period starting in Jan 1995 to Dec 2004. This study employed three major analysis techniques. The three techniques were (a) Durbin-Watson test statistic, (b) Generalized Autoregressive Conditional Heteroscedasticity in Mean methodology (GARCH-M), and (c) the Granger causality test. The study was designed to analyze the movement of the SET Index and three financial industry group indexes (Banking sector index, Finance and Securities sector index, and Insurance sector index).First, the Durbin-Watson test statistic was used to analyze the autocorrelation within each sector. Second, the GARCH-M model was used to analyze the relationship between the variances of each financial sector series and the SET Index. Third, the Granger causality test was used to analyze Granger causality among sectors in the financial industry.

Table 3.1: summary of empirical review

Study	methods	Variables	Results	countries
Sohail and Zakir	Johansen cointegratio n technique	consumer price index,	The result indicates a positive impact of (consumer price index, the	Pakistan

(2010)	and vector correction model	exchange rate ,industrial production index, money supply, treasury bills rate	real effective exchange rate, Industrial production index on the stock prices. Money supply and the treasury bills rates had a negative effect in the long run.	
Paul and Mallik (2003)	cointigration tests and an error correction model	Gross domestic product(GDP), interest rate, inflation rate	The interest rate had a negative effect and in contrast a positive effect of GDP was shown on the stock prices. Inflation did not show any significant effect.	Australian
Shahbaz, Shamim and Aamir (2010)	Fully Modified Ordinary Least Square (FMOLS) method	(government spending ,foreign remittance)	Findings reveal that a rise in both government spending and foreign remittances increased the performance of the financial sector.	Pakistan
Foong, Lok and Hoon (2012)	Ordinary least squares technics	(exchange rate , money supply)	Stock returns of the various banks were affected by the exchange rate where as a considerable effect of money supply was shown on banks' stock returns	Malaysia
Kasman, (2003)	Johansen co-integration and casualty test.	Exchange rate	The findings reveals that there is a long run relationship between stock price indices and exchange rate, also the result shows that there is causality linkage from exchange rate to industry sector.	Turkey
Saeed& Akhter	Ordinary least	(Money Supply, Exchange Rate,	oil prices were revealed to have a positive impact on	Pakistan

(2012)	squares technics	Industrial Production, Short Term Interest Rate and Oil prices)	the banking index, variables such as short term interest rate, money supply as well as exchange rates were revealed to have a negative impact on the banking index	
Subburayan and Srinivasan (2014)	Johansen Cointegration test and Granger causality test	(exchange rate, Inflation rate, Interest rate)	Bank stock returns have a long-run relationship with the selected variables. No Granger causality linkages between CNX and short-term Interest rate and Inflation. Granger causality existed between CNX and exchange rate. Moreover, exchange rate and Interest rate both affected positively on the Bank's Index stock returns.	Indian
Erdem (2005)	Autoregressive distributed lag method	(inflation, interest rate, exchange rate, money supply and industrial production)	The findings revealed that there is a significant unidirectional spillover from macroeconomic variables to stock prices indexes except for the services index	Turkey
Erbaykal (2008)	Multivariate regression (APT)	(consumption expenditure, industrial production, employment level, fixed investment and consumer price index)	The findings revealed a negative association between the inflation and stock price. a positive relationship was revealed between the other macroeconomic variables and the stock prices.	Turkey
Ozbay	Casualty	(interest rate, inflation, and	indicated that stock prices do granger-cause money	Turkey

(2009)	test	exchange rate, money supply , the real economy)	supply, overnight interest rate, and exchange rate. Also revealed negatively that the purchase price index and positively that the in turkey.	
Zugul and Sahin (2009)	Multivariate regression(APT)	(exchange rate, money supply (M1), deposits interest rate and inflation rate)	The findings revealed that money supply, exchange rate and interest rate have a negative relationship with stock return index. the findings reveal a positive relationship between price levels and (ISE-100) .	Turkey
Çağli and Halaş (2010)	Gregory-Hansen test	(exchange rate, GDP, industrial production index, inflation rate, money supply (M2), interest rate and oil price)	The result revealed a long run relationship, between deployed the variables and ISE100 for the tested period with a presence of structured break.	Turkey
Kandir, (2008)	Multivariate regression (APT)	foreign exchange rate, money market interest rate (IR), money supply (M2), the consumer price index (CPI), industrial production index also gold and oil prices	The findings revealed that all the macroeconomic factors had a negative effect on the Istanbul stock exchange (ISE-100) index returns except the money supply showed a positive influence on ISE 100 index return. Moreover, CPI and gold price did not show any significant effect on (ISE-100) index	Turkey

Ahmet and Abdioglu (2010)	Long run Granger non causality techniques	consumer price index as a proxy of inflation (CPI), the Foreign exchange rate, aggregate money supply (M1), Industrial production	The result showed that there is long run causality from (ISE-100) to all macroeconomic variables selected in one direction.	Turkey
Habibullah and Baharumshah (1996	tri-variant Cointegration approach	money supply (M2, M1) and real output (GDP)	The Cointegration analysis suggested that there is no Cointegration relation among money supply, GDP and the Malaysian stock prices.	Malaysia
Dhakal, Kandil, and Sharma, (1993)	Vector Autoregressive Model	(Inflation rate, interest rate and real GDP. money supply)	Their findings came in line with the casual relationship from money supply to stock prices. However they also found that stock prices do have a notable influence on the industrial real output in USA economy	United States of America
Issahaku and Ustarz (2013)	Vector Error correction model	(exchange rate, money supply, inflation rate and foreign direct investment)	the existence of a long run relation between the stock price and foreign direct investment, also the existence of a short run relation with the interest rate. Moreover inflation and money supply showed both long and short run relationships with the stock price	Ghana
Buyuksalvarci, (2010)	multivariate regression (APT)	consumer price index, money market interest rate, gold price, industrial production index, oil price, foreign	The findings revealed that interest rate, industrial production index, oil price, foreign exchange rate have a negative effect on ISE 100 index return while money supply positively influences	Turkey

		exchange rate and money supply	ISE 100 index return.	
Bulmash and Trivoli (1991)	an autoregressive model	Inflation(CPI), short-term and long-term interest rates Money supply(M2)	The results indicate that the actual inflation measured by the CPI is spurious; the monetary effects (M2) are positively related for short lags but negatively correlated for longer lags. Furthermore, they report that both short-term and long-term interest rates have a negative impact on the stock prices	United states of America
Pilinkus (2009)	Granger causality test	consumer goods and money supply (M1 and M2)	the results showed that there is granger causality between OMX price index and some macroeconomic factors	Lithuanian
Raymond, (2009)	Vector Error Correction Model (VECM), Johansen co-integration and impulse response procedure	money supply (M2, M3), interest rate, exchange rate and inflation rate	-The findings reveal that the long run relationship between macroeconomic factors and JSE index, also indicate that its positively influenced among JSE index and inflation rate, money supply (M3) and negatively by exchange rate interest rate and money supply (M2). -Indicate that it‟s positively - Influenced among JSE index and inflation rate, money supply (M3) and negatively by exchange rate interest rate and money supply (M2). Further, the result shows that short run relationship, between JSE index and macroeconomic factors are interest rate and money supply (M2, M3). -The shocks for all factors affected on stock price.	Jamaica

Chen, Roll, and Ross (1986)	multivariate regression model	exchange rate, money supply, long/short interest rate and the industrial production index	These variables were selected due to their influence on the future cash flow of the stocks directly or their influence on the cash-flow's risks	United states of America
Aggarwa (1981)	simple regression model	Dollar exchange rates and stock prices.	He used monthly for the period 1974-1978. Results, which were based on simple regressions, showed that stock prices have negative relation with dollar exchange rate.	United stated of America
Kaplan (2008)	Vector Error Correction Model (VCEM) and Impulse response analysis	real economic activity	The study showed the existence of a long run relationship between real economic activity and the stock prices.	Turkey
Humpe and Macmillan, (2009)	Johansen cointegration test	money supply, interest rate, inflation rate and industrial	- Positively influence between (US) stock price and industrial production index and negatively by inflation rate and long term interest	united sated of America and Japan
Rjoub (2012)	Vector Auto regression (VAR) framework	exchange rates, US stock prices	The finding the long run relationship. Also Granger causality relationships between exchange rates and stock prices. Also the shocks were temporary on the Turkish stock prices; US stock price and exchange rates as indicated by the impulse responses.	Turkey

CHAPTER FOUR

4. METHODOLOGY

4.1 Introduction

This chapter explains the methods in which the research was carried out and the tools employed. It centres on the research methodology used in the study, this is considered a very important chapter due to the fact that it makes a huge different on the quality from any research work (Anyanwu, 2003, 126). It is also seen as the background through which the findings of a research work is deregulated and it concludes the content of any reader in understanding the analysis carried out in the course of the study, moreover it also will aid help to clarify the procedures used for the research. As we mentioned before, investigate precise events or economic factors that may effect on the asset prices that attributed to the EMH and APT. That allowed investigating a wide range of pertinent events at the economics level, whether macroeconomic or microeconomic of a stock market. Further, the present value model (PVM) that have supported for the selected variables in most of relevant empirical studies. Namely: short term interest rate, exchange rate, inflation rate and money supply.

4.2 Research Tools

This research will employ the use of E-Views program for computing the relevant data for the purpose of this study for the analysis, and will be further explained. An ordinary least square (OLS) multiple regression model will be adopted specifically. The benefit of using ordinary least square (OLS) settles on the fact that it shows a blue property which is the best linear unbiased estimator (Gujarati, 1998, 209).

4.3 Variables Descriptions and Expect Relationship

These variables and terms will be used in this part to examine our study, they are explained as follows.

Table 4.1: Expected relationship of variable

Independent variables	Positive	Negative
Short term interest rate		-
Money supply	+	-
Inflation rate		-
Exchange rate		-

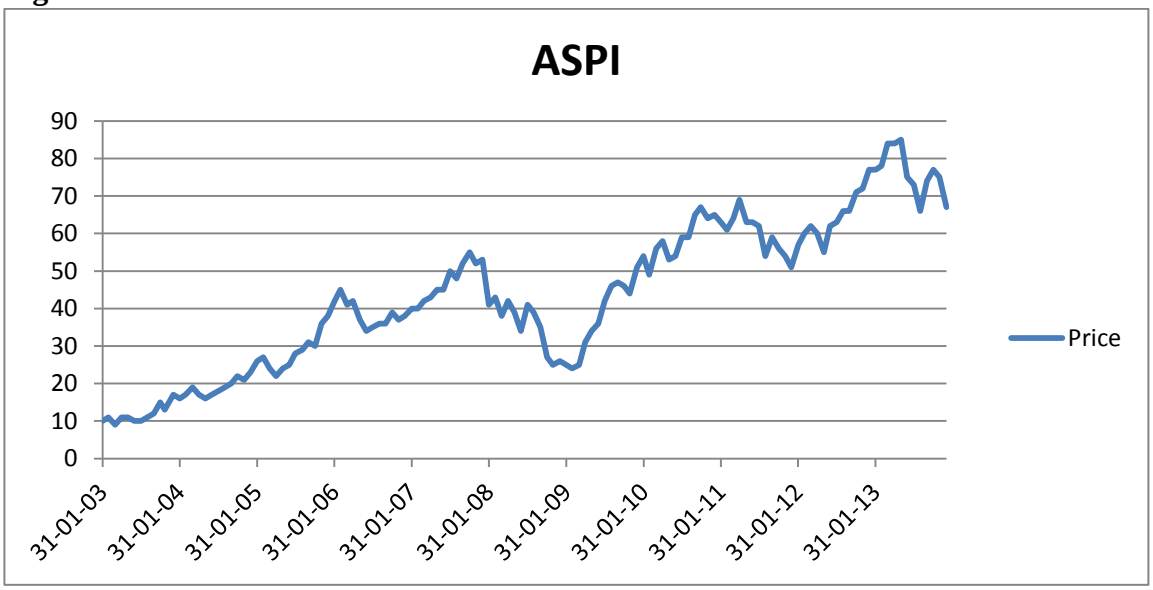
4.3.1 All Share Price Index

Thousands of stocks are traded daily all over the world from New York stock exchange to Japans stock exchange. Each and every stock represents the performance of its company and reflects how well this company is doing in its business. However stocks which are grouped in one group, a stock complied of a joint of individual stocks is the main indicator of the overalls performance of the market. Economists and governments and foreign investors use these general stocks as a measure of the countries prosperity or poverty. Borsa Istanbul stock exchange acquires a number of stock indexes in which reflect the Turkish economy or particular sectors of it. In this study we are interested in the all share index ASPI[1]which echoes the performance of all 401 listed companies in the Turkish stock market. The index consists of all stocks traded on Borsa İstanbul markets, except Investment Trusts. Thus, ASPI is expected to provide better insight into the overall performance of the Turkish stock market and any fundamental changes

[1] $E_t = \frac{\sum_{i=1}^{n} F_{it} * N_{it} * H_{it} * K_{it}}{B_t}$, where, $E_t$is value of the index at time t, N is number of constituent stocks, F_{it} is Price of stock i at time t, H_{it} is Free float ratio used in index calculation of the stock "i" at time t, B_t is divisor of the index at time t,Kit: Coefficient of the stock "i" at time t, (see BIST Stock Indices Ground Rules).

within the Turkish economy. Figure 4.1 below shows the overall performance of ASPI during the studied period.

Figure 4.1: All Share Price Index



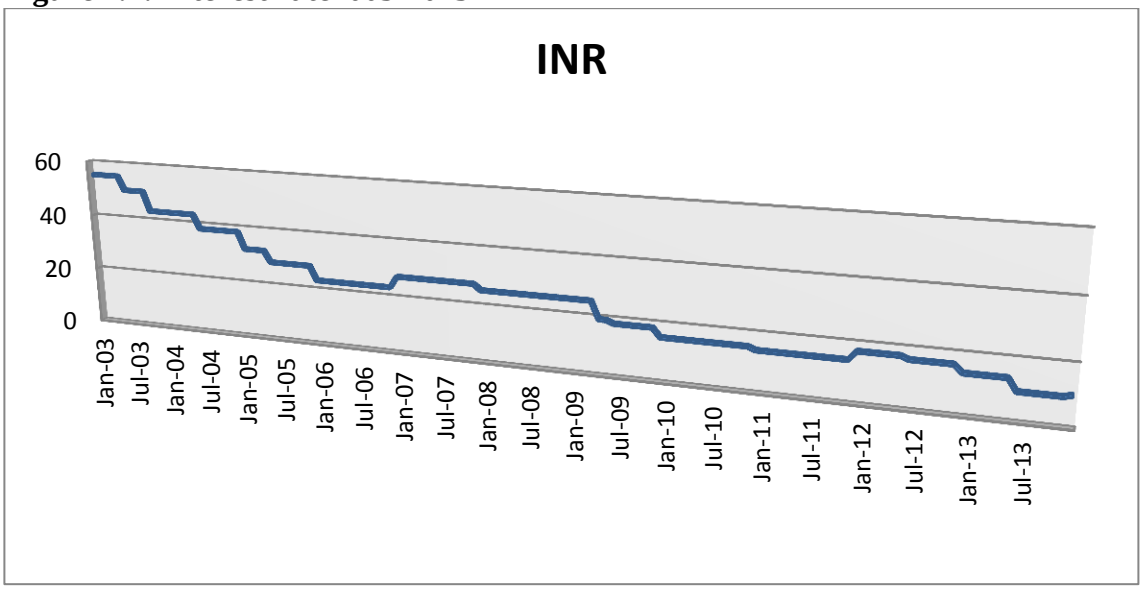
Source: BIST Index Data.

4.3.2 Interest Rate (INR)

According to the rational expectations of economic theory stock, stock prices are a representation of the discounted present value of a company's future cash flows. So an increase in interest rate is expected to be followed by an increase in the required rate of return on any investment due to the expected increase in its risks. Therefore this increases the cost of capital and takes a share of the company's potential profits. The appreciation in cost decreases the profits earned and so decreases the demand on the stock prices, so its price falls (Bjornland Hilde and Leitemo, 2009, 275).

This study uses the short-term interest rate as proxy for Turkish economy to investigate the relationship among a short-term interest rate and stock prices in Turkish economy. At the beginning of 2002 Turkey was using two nominal anchors are inflation target and monetary target, that announced by CBRT, this mechanism in effect of full-fledged inflation target framework for monetary policy implementation until 2006. The Short-term interest rate has been become the major policy tools of the monetary policy to avoid the inflation (Civcir, 2009, 16).

Figure 4.2: Interest rate2003-2013.



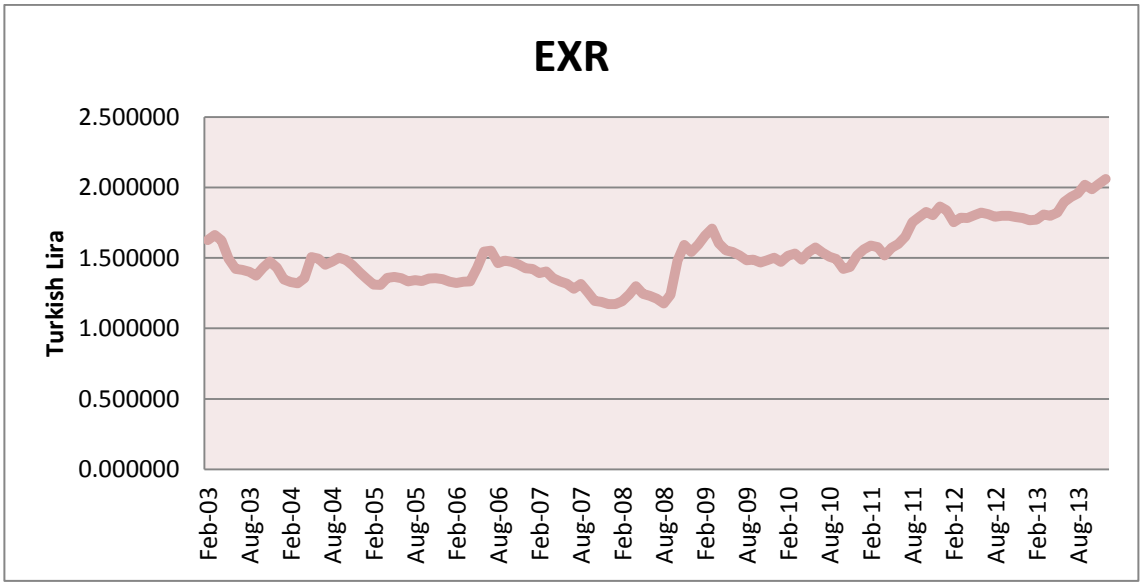
Source: Turk stat.

4.3.3 Exchange Rate (EXR)

The exchange rate of any country has to do with the rate at which one unit of the currency of one country can be exchanged for a unit of the currency of another country, for instance whereby one United States Dollar ($1) is to 2.62 as at 16th of March 2015. According to the classic economic theory, an interaction between exchange rate and stock prices is possible to exist. This theory depends on the understanding of stock prices as a representation of the discounted present value of a company's future cash flows. Assuming this company is in an efficient market, according to Efficient Market Hypothesis any action affecting the firm's future cash flows will affect the stock prices of this company. In other words the changes in the exchange rate might have effect on the future cash flows and therefore on the company's stock prices.

Many literatures have examined the relationship among exchange rate and the stock market. Bukuksalvarci, (2010, 70) reveals a negative relationship between exchange rate and (ISE-100). Including the exchange rate in model studied might contribute a better understanding of how exchange rate effect on stock prices within an emerging economy such as the Turkish economy.

Figure 4.3: Turkish Lira Exchange rate2003-2013.

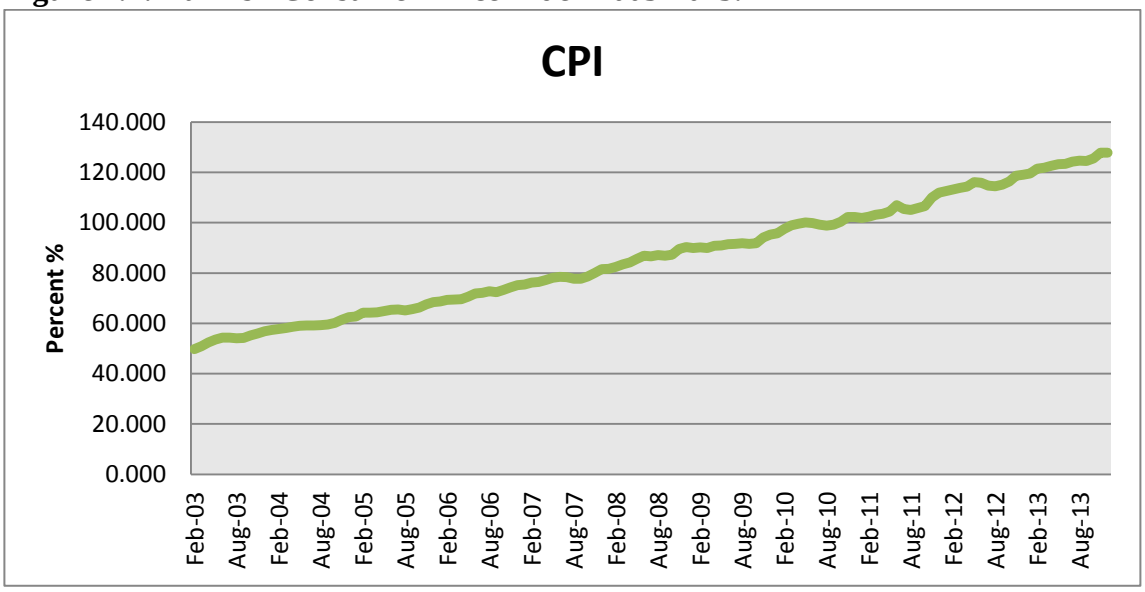


Source: IFS

4.3.4. Inflation (Consumer Price)

Inflation defined as a general increase in price levels accompanying with a fall in the purchasing value of money is another major macroeconomic factor influencing the stock market. In the economic literature, expected Inflation is distinguished from unexpected Inflation. The diversification among both types did not show any difference in studies analysing Inflations effect on prices or returns of stock market. They all found a negative relation with stock prices particularly the early studies done by Fama, (1981) and others also confirmed the same relationship (Lee, 1992, Protopapadak, 2003; Rapach et al., 2005). According to Fama, (1981) Lee, (1992) the estimated negative coefficient on inflation often becomes insignificant when real output and money supply measures are added into the stock returns regression. In this study the change in the consumer price Index is the indicator taken to represent the general price changes in Turkey as illustrated in the figure below

Figure 4.4: Turkish Consumer Price Index 2003-2013.



Source: IFS Data

4.3.5 Money supply (M2)

A major economic indicator effecting the stocks fluctuations in price is the total amount of money in circulation. In economic terms speaking this amount is represented by the aggregate money supply M1 or M2 or M3. The most formally used in analysis is M2, which represents M1 in addition to more less liquid exchange mediums like savings deposits, money market mutual funds and other time deposits.

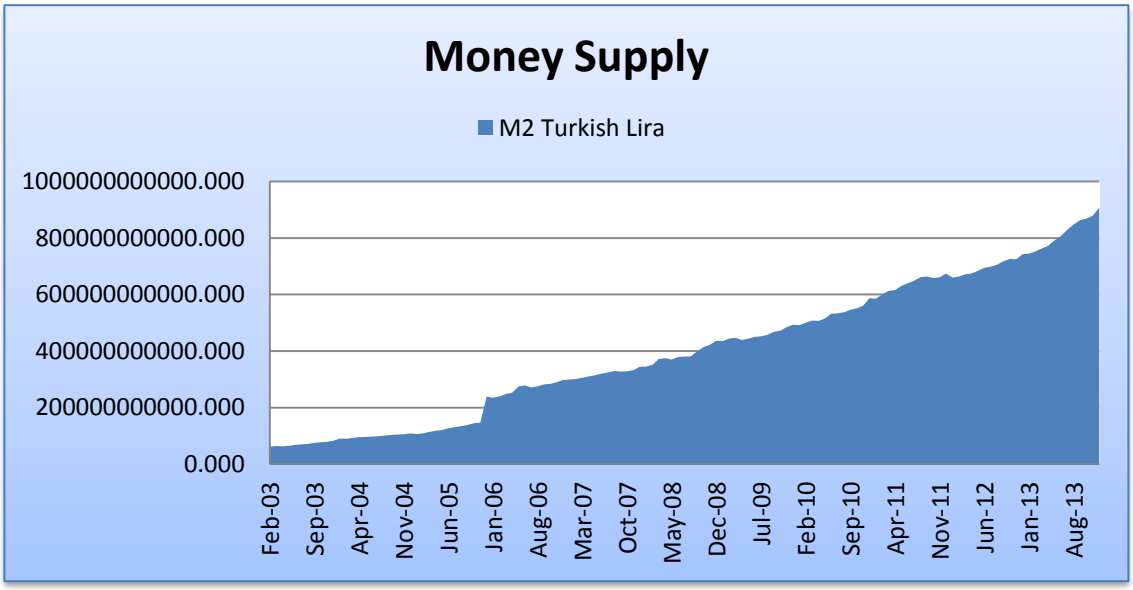
Fridman and Schwartz (1963, 32) through the modern quantity theory of money suggest that there is directly proportional relationship between money supply and the price level stock market. Thereby, that indicates any exogenous shock, that increase the money supply changes the equilibrium case of money with respect to other assets that included in the portfolio. Thus, lead to adjust the proportion of asset holders in the portfolio taking the form of money balance. As a result, this adjustment changes the demand for other assets that compete with money balances such as equity shares. Therefore, an increase in money supply would increase an excess supply of money balances which leads to an excess demand for shares. Hence, share prices are expected to rise.

Moreover, Bernank and Kuttner (2005, 122) has been clarifies that the price of stock is a function of its monetary value and the expected risk associated with holding the stock. As a result, a stock is considered to be attractive if its monetary value is high or the

expected risk of the stock is low. Therefore, the money supply would increase the real interest rate, in this case the increase in the discount rates due to the increase the real interest rate which lead to decrease the value of stock. Another explanation advocates of the relationship between share prices and the changes in the money supply, if the increase in money supply lead up to inflation as well as contributes to inflation uncertainty. Thus, it may have a negative influence on the stock prices. As we mentioned previously, reviewed different empirical studies that has been conducted in Turkey stock market in a vary time spans, such as empirical study that indicate there is a negative relationship between money supply and (ISE-100) index.

In this study, aggregate money supply, M2, consists of currency in circulation + demand deposits plus time deposits and certificates of deposits. Because Turkey is an important emerging market, examining this proxy is expected to give an inclusive view of the role that the monetary aggregate M2 plays in explaining price fluctuations in the Turkish stock market.

Figure 4.5: Turkish Aggregate money supply 2003-2013.



Source: IFS Data.

4.4 The Methods Used For Evaluation

4.4.1 Ordinary Least Square Multiple Regression

OLS will be used for predicting the worth of the dependent which is the Stock All Share Price Index from the values of the independent variables which are M2, INR, EXR and

INF to determine if there exists a relationship with ASPI, and also to know their significant level.

Our general function of Ordinary Least Square (OLS) regression technique is,

ASPI = (M2, INR, EXR and INF)

Whereby the Linear specification of the equation will therefore become;

$$ASPI = \beta_0 + \beta_1 M2_t + \beta_2 INR_t + \beta_3 EXR_t + \beta_4 INF_t + \beta_5 Dum \quad + \varepsilon_t$$

Whereby ASPI – represents All Share Price Index

M2- Aggregate Money Supply

INR- represents Short Term Interest Rate

EXR- represents Exchange Rate

INF- represents Inflation (Consumer Price)

DUM- represents Dummy Variable for particular date

Whereby Ɛ = the error term.

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$, and β_5 are the parameters to be measured and estimated. Some variables will be in natural logarithmic state and in their first difference as they will be clarified in the next chapter.

4.5 Robustness check of OLS estimates

The estimated model will be evaluated based on the economic criteria. This is carried out in order to inform us on the signs of the parameter if it conforms to the given economic theories or if it doesn't. Most especially on the variables b1, b2, b3…etc, which are with the expectations of being positive or negative, depending on how it relates to the growth of the Turkish economy.

4.5.1 Autocorrelation test

Autocorrelation or serial correlation is a situation whereby the error term of a particular time period is correlated with another error term of another particular time period. When the error term of one time period which is correlated with the time period of a previous error term, it is considered to be a first-order autocorrelation, this is more common in most application of econometrics rather than the higher or second order autocorrelation. Though negative correlation is possible, but most of the economics time series give positive autocorrelation .In other words, autocorrelation happens once the errors square measure related to the period during this case, we will think about the disturbances totally for various observations as being drawn from different distributions that aren't informative distributions.

To detect for serial-correlation in our expected model the Breusch–Godfrey serial correlation LM test will be applied to test for autocorrelation in the errors of our regressed model.

The null hypothesis of this test is that there is no serial correlation of any order up to p (Godfrey, L. G., 1978, 1303). What distinguishes this test from other test of detecting auto-correlation is that the Breusch and godfrey test is excluded from restrictions on other test like Durbin's *h* statistic test and is statistically more powerful.

Breusch and Godfrey[2]states that, if the below auxiliary regression model is fitted given the calculated residual sum of squaresR^2,

$$\mu_t = \alpha_0 + \alpha_1 X_{t,1} + \alpha_2 X_{t,2} + \rho_1 \mu_{t-1} + \rho_2 \mu_{t-2} + \cdots \rho_\rho \mu_{t-\rho} + \epsilon_t$$

Then the following asymptotic approximation can be used for the distribution of the test statistic

$$nR^2 \sim X_\rho^2$$

No serial correlation of any order up to ρ is when the null hypothesis holds

$$H_0 : \{ \rho_i = 0 \; for \; all \; i \}$$

[2] Godfrey, L. G. (1978). "Testing Against General Autoregressive and Moving Average Error Models when the Regressors Include Lagged Dependent Variables". Econometrica 46: 1293–1302.

4.5.2 Heteroscedasticity

Heteroscedasticity refers to circumstances during which the variability of one variable is not equal across the varieties of values of other variables which predicts it. A take in look at homoscedasticity of error terms determines whether or not a regression model's ability to predict a depended variable is consistent across all values of that depended variable. Heteroscedasticity, within the context of regression and different constant analyses, is specifically associated with error terms.

4.5.3 Dummy Variables

A Dummy variable or Indicator Variable is a synthetic variable created to represent associate attribute with 2 or additional distinct categories/levels. Dummy variables is terribly helpful to select up the consequences of circumstances that solely apply to a while periods and not others once operating with statistic information. Dummy variables may also be seen as those that area unit created by researchers so as to incorporate non-quantitative factors in an exceedingly regression model. These factors will distinguish two additional classes, in such the simplest way that every dummy variables takes one worth for the class we tend to contemplate, and zero worth for the remainder of classes. In other words, what we tend to mean is that a sample is divided into 2 or additional partitions during which some or all of the coefficients could take issue. In this study a dummy variable is given to consider the change in the Turkish lira value after 2005 and also a dummy variable is used to take in consideration the economic recession in 2008 M1. Zivot Andrews test was applied to determine structural breaks on the variables.

4.5.4 Multi-Collinearity

Multi-Collinearity from the name basically means that among the explanatory variables of an estimated regression model there is an exact and perfect linear relationship in present. For instance if there were a k number of variables regressed in some model with the explanatory variable X_1, X_2, X_k(where $X_1 = 1$ for all observations to allow for the intercept term), if the following condition is satisfied, the existence between the variables of a perfect linear relationship is said to be:

$$\gamma_1 X_1 + \gamma_2 X_2 + \ldots\ldots + \gamma_k X_k = 0,$$

$where \gamma_1, \gamma_2, \gamma_k$ are constants such that not all of them are zero simultaneously.

In cases of near or high multicollinearity in the expected model, we may come across some consequences like the Precise estimations of the parameters may be insufficient due to the high variances and co-variances of the data., Insignificance of the "t-test statistics" for some or all the estimated coefficients and the acceptance of the null hypothesis due to wide confidence intervals of the "t- test statistics".The presence or degree of multi-collinearity in this study has been detected by Correlation test.

4.5.5 Stationary test

$$\Delta Y_t = \mu + \beta Y_{t-1} - \sum_{j=1}^{n} a_t \Delta Y_{t-j} + \varepsilon_t$$

Where $Y_t$differenced variables in question, μ is a constant term. $\boldsymbol{\varepsilon_t}$is a white noise residual and n is the lagged values of ΔY_t to control for higher-order correlation. ADF test, is done under the assumption that a unit root exists (i.e. the series are non-stationary); the null hypothesis states that the series are non-stationary β= 0 and the alternative hypothesis states that the series are stationary. We also apply the Phillips and Perron (1988, 335) unit root tests which differs from the ADF tests mainly in how it deals with serial correlation and Heteroskedasticity in the series of errors. In particular, the PP test ignores any serial correlation in the tested series.

4.5.6 Ramsey's RESET Test

Ramsey's test is a one of the analysis techniques that test the specification and stability of the estimated model. RESET test was proposed by Ramsey, (1969, 350) and stands for "Regression Specification Error Test" .It tests for the following types of specification errors:

- Omitted variables; X does not include all relevant variables.

- Incorrect functional form; some or all of the variables in y and X should be transformed to logs, powers, reciprocals, or in some other way.
- Correlation between X and simultaneous equation considerations, combination of lagged y values and serially correlated disturbances.

RESET test is based on an augmented regression model

$$y = X\beta + Z\gamma + \varepsilon$$

The test of specification error evaluates the restriction $\gamma = 0$, Z represents a matrix consist of variables that are not in the original specification. Moreover we can also test for incorrect functional form of the estimated model, for example

$$y = \beta_1 + \beta_2 x + \beta_3 x^2 + \varepsilon$$

Under such specification errors, Ordinary Least Squares estimators will be biased and inconsistent, and conventional inference procedures will be invalidated. Ramsey, (1969, 350) showed that any or all of these specification errors produce a non-zero mean vector for ε. Therefore, the null and alternative hypotheses of the RESET test are

$$H_0: \varepsilon \sim N\ (0, \sigma^2), \qquad H_1: \varepsilon \sim N\ (\mu, \sigma^2) \ldots \mu \neq 0$$

4.6 Justification of the Model

The coefficient of multiple determinations (R2) this is used in checking the goodness of fit from the regression results.

4.7 Data Required and Source

The data used for this analysis will mostly be sourced from World Bank, and the International Financial Statistics as well as Istanbul stock Exchange .This study covers the period from (2003-2013). The data are monthly or time series data.

CHAPTER FIVE

5. DATA ANALYSIS

5.1 Stationary Tests

The results of the Augmented Dickey Fuller (ADF) tests, (1979) and Phillips and Perron (1988) tests in which investigate the nature of the data are reported in table 5.1 it has been argued that almost all variables used have a unit root. The absence of the unit root that help to determine a certain characteristics of the underlying data sequence generating process. In case there is no unit root (stationary), fluctuation around a constant long-run average that mean the series has a finite variance and it isn't based on time.

Table 5.1: Stationary tests

Variable		ADF (t-stat)	Prob.	PP (t-stat)	Prob.	Decision
Share index	Level	-2.600361	0.2810	-2.689224	0.2429	I(1)
	Difference	-11.79218	0.0000*	-11.79218	0.0000*	
EXR	Level	-2.7386	0.2231	-2.4203	0.3674	I(1)
	Difference	-8.564694	0.0000*	-8.131636	0.0000*	
INR	Level	-2.599231	0.2815	-2.5795	0.2903	I(1)
	Difference	-12.26552	0.0000*	-12.30212	0.0000*	
INF	Level	-2.938345	0.1541	-1.784770	0.7067	I(1)
	Difference	-8.507412	0.0000*	-21.88171	0.0000*	
M2	Level	-1.335323	0.8746	-1.283264	0.8876	I(1)
	Difference	-12.39720	0.0000*	-12.39786	0.0000*	

* denotes Significance at 1% level based on critical values. All test at constant and trend.

From the unit root tests we conduct that all the variables are stationary at first difference. So it's better to continue the OLS regression on stationary data, to avoid the possibility of a spurious regression.

5.2 Multi-Collinearity test

Correlation is a statistical measure that allows for the investigation of linear association between two or more quantitative variables. Pearson's correlation coefficient denoted as (r) measures the strength of the linear relationship among the studied variables. From the formula below it is conducted that the outcome of this correlation analysis must be (+1) and (-1). If positive correlation was indicated then that is interpreted as both variables increase and decrease simultaneously. On the other hand if negative correlation was indicated this clears that an increase in one variable will decrease in the other. The significance of the correlation test will not be much in consideration as the significance will be tested by the regression analysis, so only the direction of the correlation will be considered. The following is the mathematical expression of correlation formula.

$$r = \frac{\sum_{i=1}^{n}(X_i - X_{bar})(Y_i - Y_{bar})}{\sqrt{\sum_{i=1}^{n}(X_i - X_{bar})^2}\sqrt{\sum_{i=1}^{n}(Y_i - Y_{bar})^2}}$$

It's good to note that it's not about the presence or absence of multi-collinearity rather than the degree of this linear relation between the variables (Gujarati, 1998, 216).From the correlation matrix below, we can see that the correlation between the explanatory variables is not present at a high level.

Table 5.2: correlation matrix of independent variables

	DM2	DLOGINR	DLOGINF	DEXR
DM2	1.000000	-0.225074	-0.061715	0.068100
DLOGINR	-0.225074	1.000000	0.037295	0.047063
DLOGINF	-0.061715	0.037295	1.000000	0.078952
DEXR	0.068100	0.047063	0.078952	1.000000

5.3 Model Estimation

The table below shows the empirical results of the estimated parameters and its t-statistics with other diagnostic tests of equation. From the F-statistics probability we can conclude that our model is significant at 1% level, meaning that the explanatory variables have an effect on the change in the dependent variable. The result gotten from the estimation technique is presented in the table below:

Table 5.3: Estimated Model

Independent variable	Expected sign	Coefficient & t-statistical
D(EXR)	-	-0.811793*** (6.030928)
DLOG(INF)	-	-0.652478 (0.814601)
DLOG(INR)	-	-0.284238** (2.480013)
D(M2)	-	-0.210995 (1.383650)
DUM1	+	0.172766** 2.274696
DUM2	-	-0.274308*** (3.618570)
C	+	0.023205** 2.451964
R-squared	0.34	
Adjusted R-squared	0.31	
F-statistic	10.94	
Durbin-Watson stat	2.54	
Prob(F-statistic)	0.000	

Note: *, **and ***indicate significance at the 10%, 5%, and 1% levels, respectively.

5.4 Calculations for the Selected Methods

5.4.1 Analysis of Results Based on Economic Criteria

- **Short Term Interest Rate:** The coefficient of INR is -0.284, and negatively significant. This result shows there is a negative and significant relationship with ASPI. An increase in the short term interest rate will increase the cost of capital because it increases the investors required rate of return. This risk may decrease the demand on the ASPI and therefore decreases its price. This negative relation is consistent with the findings of (Buyuksalvoci, 2010, 70; Zugul and Sahin, 2009, 16) from the Turkish stock market.t.

- **Exchange Rate:** The result of the EXR is negatively significant with a coefficient of -0.8117. This explain that during the period under study depreciation in the local currency tends to affect the expectations of investors whom hold ASPI stock's, by exposing these portfolios to more exchange rate risk investors require a higher rate of return which increases the price consequently. The negative relation is consistent with previous empirical literatures such as: (Kasman, 2003, 70: Raymond, 2009, 18). Our result is consistent with the traditional theory explaining the relation between exchange rate and stock prices. An appreciation in exchange rates increases the firm's debt of foreign currency and by this the firm's costs of production are increased, so the prices increase. This is especially true when in countries that depend on importing raw materials of production like Turkey (Aggarwal, 1981, 126).

- **Inflation (INF):** with the result for coefficient for INF which is -0.652, this result shows that there is a negative relationship with ASPI but insignificant relationship. During the restructuring period 2002-2007 uncertainty in expectations spread among investors in Turkey. So due to inflation uncertainty (or what's called unexpected inflation) at that time period, a higher risk premium was generated. This risk led up to equity prices to fall as demand on them

decreased, thereby showing a negative influence on ASPI stock price. Humpe, A., & Macmillan, P. (2009, 111).

- **Money Supply:** The coefficient of M2 is -0.2109, but is not significant. This result shows there is a negative and insignificant relationship with ASPI. The modern quantity theory of money suggests that there is directly proportional relationship between money supply and the price level. Policy makers in Turkey after the crisis of 2001 gave more attention to the economy. They entered a restructuring period until 2007 which changed the monetary policy trying to decrease the inflation rate at that time. So an increase in the money supply may have led to inflation uncertainty at that time period, generating a higher risk premium. This risk led up to equity prices to fall as demand on them decreased, also the money supply would increase the real interest rate, in this situation the increase in the discount rates due to the increase the interest rate which lead to decrease the price of stock. Thereby showing a negative influence on ASPI stock price. This negativity result was also found in Zugul and Sahin (2009, 19) findings and Ozbay (2009, 10) findings conducted on Turkish stock market

5.5 Analysis based on statistical criteria

5.5.1 Justification of the model

The coefficient of multiple determinations (R^2): this is used in checking the goodness of fit from the regression results, the value of R^2 is 0.34. Whereby the predictor variables explains 34% of change in ASPI, Which means that on the long run 34 % of the variations in all share price index are explained by the independent variables that is the INR, EXR, INF and M2. Therefore the 66 % left can be related to the effect of other factors not present in the model. At this rate we can say that our model is accurately expected.

5.5.2 Autocorrelation

Table5.4 L.M serial correlation test

Breusch-Godfrey Serial Correlation LM Test	
Prob. Chi-Square(12)	**0.1495**

From the Breusch-Godfrey Serial Correlation test we can reject the alternative hypothesis and accept the null hypothesis, meaning that Model is clean from serial correlation between the variables.

5.5.3. Heteroscedasticity

Consequences of Heteroskedasticity 1) OLS estimates remain unbiased. 2) Variance of the OLS estimator is inflated. 3) OLS is not BLUE. When error variances aren't constant, there is Heteroscedasticity. Once there's Heteroscedasticity, OLS estimations places a lot of weight on the observations with massive error variances than those with smaller error variances. Breusch-Pagan-Godfrey test is adopted to test for Heteroscedasticity as the table shows below we reject the alternative hypothesis, meaning there is no Heteroscedasticity at 5% level in our model.

Table 5.5: Heteroscedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey	
Prob. Chi-Square(6)	**0.1313**

5.5.4 Ramsey RESET test

From our Ramsey test we reject the alternative hypothesis and accept the null hypothesis that our model is well specified. Moreover it is confirmed that our model is linear since we rejected the hypothesis of non-linearity.

Table 5.6 R.R.TEST

F- statistics	**2.305930**	**Prob. F(1,123)**	**0.1314**
Log likelihood ratio	**2.433172**	**Prob. Chi-square(1)**	**0.1188**

CHAPTER SIX

6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The present study has been undertaken to investigate the impact of changes in selected variables namely: Inflation, Exchange rate, Money supply and short term Interest rate, on All Share Price Index in the Turkish stock market for the time span from January 2003 to December 2013. This period took in consideration the transition in the Turkish economy. A Multivariate Regression Model computed on Standard Ordinary Least Squares (OLS) technics has been used to estimate the impact. Based on regression coefficient, it was found that Inflation rate, Exchange rate, Money supply and short term Interest rate all had negative influence on ASPI. So the results of the present study support the findings of previous studies regards the Turkish economy and regards other economies. The model was approved to be clear Autocorrelation, hetroscedactisity, Ramsey rest test and multicollinearity tests. The selected independent variables in our model can explain 34% of change in the price of the all share price index in Turkey.

6.2 Recommendation

Our study implemented multiple regression analysis and some stability tests to test the model like autocorrelation and hetroscedactisity. However our findings revealed that the selected independent variables in our model can explain only 34% of change in the price of the all share price index in Turkey. Apply advanced analysis technique to confirm and precise the results. We recommend using more advanced analysis techniques to reach a more efficient model and apply other econometric techniques.

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APPENDEXES

APPENDEX 1: ORDENER LEAST SQUARE REGRASSION MODEL

Dependent Variable: DLOG(INDEX)				
Method: Least Squares				
Date: 05/01/15 Time: 13:52				
Sample (adjusted): 2 132				
Included observations: 131 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXR)	-0.811793	0.134605	-6.030928	0.0000
DLOG(INF)	-0.652478	0.800979	-0.814601	0.4169
DLOG(INR)	-0.284238	0.114612	-2.480013	0.0145
D(M2)	-0.210995	0.152492	-1.383650	0.1690
DU1	0.172766	0.075951	2.274696	0.0246
DU2	-0.274308	0.075806	-3.618570	0.0004
C	0.023205	0.009464	2.451964	0.0156
R-squared	0.346221	Mean dependent var		0.014520
Adjusted R-squared	0.314586	S.D. dependent var		0.091141
S.E. of regression	0.075456	Akaike info criterion		-2.278591
Sum squared resid	0.706000	Schwarz criterion		-2.124954
Log likelihood	156.2477	Hannan-Quinn criter.		-2.216161
F-statistic	10.94441	Durbin-Watson stat		2.544203
Prob(F-statistic)	0.000000			

APPENDEXII: AUTOCORRELATION TEST

Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	1.392088	Prob. F(12,112)		0.1800
Obs*R-squared	17.00292	Prob. Chi-Square(12)		0.1495
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 05/01/15 Time: 13:58				
Sample: 2 132				
Included observations: 131				
Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXR)	-0.198804	0.147822	-1.344881	0.1814
DLOG(INF)	0.723571	0.839598	0.861807	0.3906
DLOG(INR)	-0.014426	0.115641	-0.124744	0.9009
D(M2)	-0.011292	0.156408	-0.072199	0.9426
DU1	-0.002109	0.078535	-0.026855	0.9786
DU2	-0.022069	0.075441	-0.292526	0.7704
C	-0.003948	0.009529	-0.414333	0.6794
RESID(-1)	-0.350397	0.101796	-3.442133	0.0008
RESID(-2)	-0.043050	0.098982	-0.434931	0.6644
RESID(-3)	0.001125	0.100249	0.011221	0.9911
RESID(-4)	-0.153812	0.103481	-1.486380	0.1400
RESID(-5)	-0.050762	0.103774	-0.489163	0.6257
RESID(-6)	0.052742	0.102152	0.516309	0.6067
RESID(-7)	-0.048523	0.106724	-0.454663	0.6502
RESID(-8)	-0.047889	0.108683	-0.440635	0.6603
RESID(-9)	-0.076147	0.106145	-0.717386	0.4746
RESID(-10)	-0.037911	0.105018	-0.360992	0.7188
RESID(-11)	-0.031052	0.105879	-0.293281	0.7699
RESID(-12)	0.070096	0.101898	0.687908	0.4929
R-squared	0.129793	Mean dependent var		4.34E-18
Adjusted R-squared	-0.010061	S.D. dependent var		0.073694
S.E. of regression	0.074064	Akaike info criterion		-2.234409
Sum squared resid	0.614366	Schwarz criterion		-1.817396
Log likelihood	165.3538	Hannan-Quinn criter.		-2.064958
F-statistic	0.928059	Durbin-Watson stat		1.907039
Prob(F-statistic)	0.546961			

APENDEXIII: HETROSCADASTICITY TEST

Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	1.679401	Prob. F(6,124)		0.1315
Obs*R-squared	9.845199	Prob. Chi-Square(6)		0.1313
Scaled explained SS	12.02859	Prob. Chi-Square(6)		0.0613
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 05/01/15 Time: 14:06				
Sample: 2 132				
Included observations: 131				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003929	0.001103	3.560519	0.0005
D(EXR)	-0.002809	0.015694	-0.178991	0.8582
DLOG(INF)	0.130306	0.093386	1.395352	0.1654
DLOG(INR)	-0.034004	0.013363	-2.544760	0.0122
D(M2)	0.008378	0.017779	0.471225	0.6383
DU1	-0.005862	0.008855	-0.662016	0.5092
DU2	-0.004985	0.008838	-0.564052	0.5737
R-squared	0.075154	Mean dependent var		0.005389
Adjusted R-squared	0.030404	S.D. dependent var		0.008934
S.E. of regression	0.008797	Akaike info criterion		-6.576776
Sum squared resid	0.009597	Schwarz criterion		-6.423139
Log likelihood	437.7788	Hannan-Quinn criter.		-6.514346
F-statistic	1.679401	Durbin-Watson stat		1.375062
Prob(F-statistic)	0.131451			