The Relationship between Money, Inflation, Banking Sector Development and Economic Growth: Case Study of the Republic of Turkey

Sam Theophilus Wilson

Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirement for the degree of

Master of Science
in
Banking and Finance

Eastern Mediterranean University
July, 2016
Gazimagusa, North Cyprus

Approval of the Institute of Graduate Studies and Research

Prof. Dr. Cem Tanova
Acting Director

I certify that this thesis satisfies the requirements as a thesis for the degree of Master of Science in Banking and Finance

Assoc. Prof. Dr. Nesrin Özataç
Chair, Department of Banking and Finance

We certify that we have read this thesis and that in our opinion it is fully adequate in scope and quality as a thesis for the degree of Master of Science in Banking and Finance

Assoc. Prof. Dr. Nesrin Özataç
Supervisor

Examining Committee

1. Prof. Dr. Eralp Bektaş
2. Prof. Dr. Salih Katircioğlu
3. Assoc. Prof. Dr. Nesrin Özataç

ABSTRACT

This research applied the four steps test model to investigate the relationship between money (M2), inflation (ICP) and banking sector development (DC) on economic growth (GDP) using Turkey as a case study. The annual data from 1960-2014 was extracted from the World Bank Development Indicator and used for the purpose of this empirical analysis.

The unit root test of ADF and PP show that all of the variables are integrated order of I(1). The Johansen co-integration test shows that there exist cointegration between the variables and the vector error correction test show that there is along-run and short-run relationship between the variables. The Granger causality test indicates that there is a bi-directional relationship between economic growth (GDP) and money (M2), a unit directional relationship from banking sector development (DC) to economic growth (GDP) and a unidirectional relationship from inflation (ICP) to banking sector development (DC). However, we found no relationship between inflation (ICP) and economic growth (GDP).

Keywords: Money Supply, Inflation, Banking Sector Development and Economy Growth

ÖZ

Bu kağıt para (M2), enflasyon (ICP) ve ekonomik büyüme (GSYİH) Türkiye'de bir vaka çalışması olarak kullanarak Bankacılık Sektörü geliştirme (DC) arasındaki ilişkiyi araştırmak için dört adım test modeli uygulanır. 1960-2014 yıllık verilerden Dünya Bankası kalkınma gösterge çıkarılan ve bu araştırma amacıyla kullanılır. Birim kök testi ADF ve PP Haritayı tüm değişkenlerin bir I(1) entegre sırasını vardır, Johansen eş entegrasyon testi cointegration değişkenler arasında mevcut ve vektör hata düzeltme test göster değişkenler arasında uzun vadede ve kısa vadede bir ilişki olduğunu gösterir. Son test Granger Nedensellik testi ekonomik büyüme (GSYİH) ve para (M2), Bankacılık Sektörü geliştirme (DC) ekonomik büyüme (GSYİH) gelen bir birim yönlü ilişki ve Bankacılık Sektörü geliştirme (DC) için enflasyon (ICP) gelen bir birim yönlü bir ilişki arasında bir çift yönlü ilişki olduğunu gösterir. Ancak, hayır bulundu.

Anahtar kelimeler: Para Arzı, Enflasyon, Bankacılık Sektörü kalkınma ve Ekonomik Büyüme

This thesis is dedicated to Almighty God and my beautiful daughter.

Miss. Samfort Wadah Wilson

ACKNOWLEDGMENT

I give all the glory to Almighty God for being faithful to His words in my life.

My sincere appreciation goes to Assoc. Prof. Dr. Nesrin Özataç for her guidance in preparing this thesis.I am also grateful to Dr. Nigar Taşpınar for her valuable assistance and criticism in making this research a success. I would not have done this without her immeasurable support.

I sincerely appreciate, Hon. Lenn Eugene Nagbe, Minister of Information, Culture and Tourism, without whom I would not have had this life changing opportunity. My dear friend and immediate boss Hon. M. Boakai Jaleiba, Assistant Minister for Technical and Vocational Training, Ministry of Youth and Sports, Republic of Liberia, thanks for making this dream a reality. My appreciation to the entire senior management team of the Ministry of Youth and Sports for my preferment.

To my loving and caring family, I say thank you for your continuous love and support.

My darling Samfort Wadah Wilson whose birthdays I missed due to my absent from home, my love for you is beyond measure.

Finally, I deeply appreciate allProfessors, assistants, and my coursemates of the department of Banking and Finance for their immesurable support. God bless you all!

TABLE OF CONTENTS

ABSTRACT ……...iii

ÖZ……... ……...iv

DEDICATION……..v

ACKNOWLEDGMENT……...viii

LIST OF TABLES……...ix

LIST OF FIGURES……..x

LIST OF ABBREVIATION……xi

1 INTRODUCTION…….1

2 THEORETICAL CONSIDERATIONS OF THE STUDIES…….....5

2.1 Inflation and Economic Growth……6

2.2 Banking Sector Development and Economic Growth……..7

2.3 Money and Quasi money and Economic Growth…….8

3 THE ECONOMY OF TURKEY…….....9

3.1 The Republic of Turkey……9

3.2 Economic Outlook of the Republic of Turkey……12

3.3 Inflation in Turkey……..14

3.4 Money and Quasi Money as Percent of GDP of Turkey……15

3.5 Domestic Credit of Turkey…….....16

4 DATA AND DATA METHODOLOGY…….18

4.1 Types and Sources of Data…….....18

4.2 Methodology…….....18

4.1.1 Empirical Model……...19

4.1.2 Unit Roots Test…….....19

4.1.3 Co-integration Test……...20

4.1.4 Error CorrectionModel…….....21

4.1.5 Granger CausalityTest…….....21

5 EMPIRICAL RESULTS……..23

5.1 Unit Roots Test……..23

5.2 Co-integration test……..24

5.3 Level Coefficient and Erro Correction Model…….....25

5.4 Granger Causility Test…….....28

6 CONCLUSION AND POLICY IMPLICATIONS…….. ……..29

6.1 Conclusion…….29

6.2 Policy Implication……..30

REFERENCES……...33

LIST OF TABLES

Table 5.1: ADF Test for Unit Roots……..23

Table 5.1.2: PP Test for Unit Roots……..…….24

Table 5.2: Johansen Co-integration Test……25

Table 5.3: Error Correction Model…….26

Table 5.4: Granger Causality Test…….....28

LIST OF FIGURES

Figure 3.1: Gross Domestic Product (GPD) 1960 – 2014……..12

Figure 3.2: Inflation Consumers Prices (ICP) 1960 -2014……..... …….14

Figure 3.3: Money and Quasi Money as % of GDP (M2) 1946 -2014……...15

Figure: 3.4: Domestic Credit to the Private Sector (DC) 1960 – 2014……...17

LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criteria
ECM	Error Correction Model
GDP	Gross Domestic Product
ICP	Inflation Consumer Prices
M2	Money and Quasi Money
PP	Philip-Perron
SIC	Schwartz Information Criteria
VECM	Vector Error Correction Model

Chapter 1

INTRODUCTION

Since gross domestic product is very important and is one of the major tools used to determine the soundness, weakness, growth and downward trend of the economy of any country (Picardo, 2013), several research has been conducted to understand the existing relationship between gross domestic product and other economics variables; that include but not limited to the following; inflation, oil prices, rate of unemployment, female literacy rate, stock prices and interest rate.

Inflation is a major factor in the growth theory of every country. Several studies in the review of the literature analyses the effect of the relationship between the growth of the economy and inflation. Inflation is a major factor in the overall economy stability in both high and middle income countries having a huge impact in determining the overall stability of the economies of countries.

Inflation by definition is the persistent increase in the level of prices of basic commodities and sevrices as the purchasing power of currency decline. The increase in inflation can lead to uncertainty in the macroeconomic (Feldstein, 1982; Khan and Senhadj, 2001; Ocran, 2007). The idea of analysing the relationship betwwen economy growth, inflation and money supply has its origin from a study conducted by Tobin (1965). He postulates that there is a link between money, real capital and fixed saving. He argues that the rate or level of inflation in any given economy is a

key determinat factor of the real value of money. Tobin argument is structure as such " Higher inflation rate has an impact on the overall output of the economy and the value of capital investment (Ireland, 1994). Inflation creates a decrease in the purchasing ability of as the result of the loss in value of money, which reduces the value of real income thereby resulting in a decrease in the quality of livelihood. However, inflation is not altogether bad news, according to Hasanov, if a country has zero inflation or disinflation it may lead to negative economic growth by reducing the motivation of producers (Hasanov,2011).

The review of prevoius studies also indicates that there is a relationship between money supply as indicated by money and quasi-money and economy growth. The supply of money is very vital to the growth of every economy. Money supplies and its velocity are regarded as the key determinants of economy growth. (Sidrauski,1967), indicated that, money has a utility function. He argues that inflation can also be created as the result of an increase in money supply, which will have an impact on economy growth (Fisher, 1983:1). There are other studies that discovered in their emprical analysis, that there is no relationship between supply of money and economy growth. According to Minsky(1957) and Kaldor (1988) they argued that, the demand for money is not influenced by its availability in the economy, therefore there exist no relationship between the two. However, Friedman and Schwartz (1963) show results that suggest that the supply of money can lead to changes in real output. The review of prevoius studies also show that there exist a relationship between growth in the economy and the development of the banking sector. Credit made by banks to the private sector is use as an indicator for growth in the banking sector in the thesis. The banking sector is a very key component of economy growth (Schumpter 1952). It creates and provides financial resources, bridging the gap

between deficit and surplus spenders in the economy. Growth in the banking sector can lead to growth in the economy because it creates the environment for entrepreneurship to flourish, which leads to employment and improvement in livelihood (King and Levin, 1993).

Almost every academic book written in the field of economic has a discussion on the factors that lead to economic growth. The number of variables that are used to determine economic growth is countless. Due to its peculiar nature, almost everything has been adjudged as a factor that leads to its increase or decrease. The survivability of every nation on earth depends on the soundness and vibrancy of its economy (Kormendi and Meguire, 1985).

The essence of this exercise is to show the impact of the three macroeconomics variables on economic growth in Turkey. This topic is very vital because of the current and most recent trend of the state of the economy of most countries in the world today. Like most countries, Turkey has experienced a constant wave of inflations in its economy (Turkish Statistical Institute), as such it become expedient to understand what impact has inflationhad on the growth of its economy.

The Turkish economy has experience a 3.8 percent expansion in GDP growth since the last quarter of 2014, and has stayed above the market expectations of 2.8 percent. The annual growth rate of Turkey GDP is averaged at 3.90% since 1999, experiencing it's all time high in the first half of 2010of 12.60% and recording its lowest of -14.70 in the first half of 2009.

Turkey has also experienced a boom in her banking sector, with the number of privately owned banks increasing dramatically (Turkish Statistical Institute). The number of international banks has also increased, thereby making it vital to investigate the impact of the boom in the banking sector especially the credit made by these banks to the private sector on the growth of the economy. The impact of the supply or circulation of money in the economy on economic growth cannot be overlooked, hence the need to investigate its impact growth of the economy.

This research is structured as follow: Literature of existing studies on the relationship between inflation consumer prices, money and quasi money as % of GDP, domestic credit made by the bank to the private sector and gross domestic product will be discussed in the following section. The focus of the next section will be on the data and divided it into two sections; methodology and data, the empirical method, findings of the research and the last section makes the conclusion and policy implications.

This research investigate the relationship between money, inflation, development of the banking sector and its impact the growth of the economy using the Republic of Turkey as a case study. GDP was proxy as an indicator of economic growth, inflation by inflation consumer prices and domestic credit made by banks to the private sector investors was used as a proxy for development in the banking sector, while money and quasi-money were used as the indicator for money. The studies cover the period from 1960 to 2014.

Chapter 2

THEORITICAL CONSIDERATIONS AND EMPIRICAL STUDIES

The relationship between money and economy growth, inflation and economic growth, and development in the banking sector and economy growth has claimed the attention of many researchers and academic scholars, both in practice and theory. The review of previous findings show that there are mixed results on the findings. This research seeks to analyses these branches of the literature by investigating the impact of the relationship that exist between all four of the variables, both in the past, the present and attempt to make an estimation of the future.

In order to investigate this relationship between the four macroeconomics variables using the Republic of Turkey as a case study, this research investigate the relationship between money and quasi money as % of GDP to represent money supply, inflation consumer prices to represent Inflation, domestic credit to the private sector investors by banks as the indicator for development in the banking sector and GDP as the indicator for economy growth.

2.1Inflation Consumer Prices and Economic Growth

One of the major characteristic of the economy of Turkey has been constant inflation which is an obstacle to economic growth. Inflation prevents saving, create uncertainty about future prices and create increase tax burden by raising profit and income artificially. However, these factors impede economic growth.

Inflation is very costly in the economy, its create price instability, which indicate that the only way to avoid instability in the price level in any economy is to have zero inflation something that is almost impossible in real economic sense. The economy benefit a lot from price stability, which also leads to growth in the economy, Hakiko and Haggins (1985). The review of previous literature has shown that there are three possible hypothesis: (see Samargandi, Fidimus and Ghosh, 2015; Jedidi, Boujebene and Helali, 2014; Ngare, Nyamongo and Misati, 2014; Pradhan, Arvin, Norman and Hall, 2014). Inflation can lead to economy growth, Darrat (1988) and Pradhan, Dasgupta and Samadhan (2013) find results that support the supply-leading hypothesis (SLH) which suggest that inflation in the economy can create growth. The demand-following hypothesis suggested by Nguyen and Wang (2010) and Kim, Lim and Park (2013) say that economy growth runs toward inflation, which mean that demand in the economy can create inflation. The feedback hypothesis argue that economy growth and inflation depends on each other, its maintained that the two macroeconomics variables reinforces each other and that they are mutually dependent (Baillie, Chung and Tiesau, 1996; Andres and Hernando, 1997; Andres, Hernando and Lopez-Salido 2004; Nguyen and Wang, 2010; Kar, Nazlioglu and Agir, 2011) and agrees with the feedback hypothesis.

2.2 Banking Sector Development and Economic Growth

Domestic credit is the total credit supplied by financial institutions to the private sectors investors on an annual basis, the financial comprises of banks, financial institutions; such as money lenders, insurance company and pension funds. The focus of the research is base the number of domestic credit made by banks to the private sectors. The researcher intend to analyze the impact of bank credit provided to the private sector on economy growth. Studies has shown that, there is a mixed reaction

about the relationship visa via the impact of the former on the latter. Financial market, most importantly banks is very key to economy growth. Schumpeter(1952) argues that the banking sector create and supply financial resources effectively which, create the opportunity for entrepreneurship to flourish thereby creating investment in capital, building of innovation technique in production and the spurring of technological advancement. All of the above mentioned lead to economy growth. (King and Levine, 1993; Allen and Ndikumama, 1998) suggested that economy growth can be created by growth in the financial sector, which means that growth in the banking sector which a component within the overall financial sector and all of the major sources of founding in the economy can lead to economy growth. The interdependence hypothesis theory suggest that banking sector development and economy growth is reciprocal. Patrick(1996) argues that countries that are underdeveloped can gain economy growth by developing their financial sector which will intron lead the improvement in the supply of credit opportunities to investors in the private sector thereby creating a middle class that will subsequently lead to growth in the economy and developed countries economies are demand-following, he further suggested that study has shown that economy growth can be the leading indicator of the financial sector growth in many developed countries.

2.3 Money and Quasi Money and Economic Growth

Money supply or quasi money is frequently referred to as the sum total of the amount of the legal tender or currency of a country in circulation outside of the banks, demand deposit that are kept by the central government and foreign currency deposit that are not made by the central government.

The supply of money is not influence by the demand made for money, therefore there exist no relationship between the two, as well as the interest rate in the country Minsky (1957) and Kaldor (1988).

Friedman and Schwartz (1963) found in their analysis that changes in real output is at the result of the fluctuations in the supply of money in the economy. By this they are suggested that, the real output will increase if the supply of money increases and will also decrease if the supply of money in the economy decreases.

Clower (1957) developed a model suggesting the money is an instrument of exchange in the economy, postulating that the only real use any economy has for money is for the purpose of medium of exchange. Recession can be created by overly controlling the supply of money in the economy, which will subsequently lead to no growth in the economy (Paul Volcker, former president of FED). That money supply increases as people in the economy begin to experience an improvement in real income Thilwall (1987). Growth of money is cause by the growth rate in the economy (McCallum 1988). He further argue that central banks will normally reduce the supply of money in the economy when it's suspected that there will be an general raise in the level of inflation in the economy.

Chapter 3

THE ECONOMY OF TURKEY

3.1 The Republic of Turkey

The Republic of Turkey is consider a geostatic country with a parliamentary form of republic. The location of Turkey at the intersection of Europe and Asia has made many demographers and scholar to refer to its location as Eurasia. The republic of Turkey is border by eight countries, Azerbaijan, Syria, Bulgaria, Armenia Greece, Iran, Iraq and Georgia.

Turkey has developed a reputation as a military and economic power in its region and the world at large, with membership in major international organizations playing a vital role in ensuring the political and economic stability within its region, Europe, Asia and the world at large.

Turkey has a population of 74.7 million people (TURKSTAT, 2011). She hold membership in OECD, G-20, Council of Europe, OSC, NATO and OIC, she also an associate member of the ECC and a founder member of the United Nations (TURKSTAT, 2015).

The republic of Turkey is one of the world largest GDP by PPP countries sitting at 17^{th} place and also has one of the world largest nominal GDP sitting at 18^{th} place (IMF, 2014).

Turkey is a powerhouse in the world of international trade, her major exports are automobiles, iron, textiles and clothing, chemical and pharmaceuticals and white goods. Turkey is also a leading member in the ship building business (TURKSTAT, 2015). Most of Turkey export goes to the following countries; Germany receive 9.6% of all export coming from Turkey, Iraq is next in line with 6.9%, follow by the United Kingdom that receive 6.3%, next is Italy consumer 4.5% of all export coming from Turkey, France receive 4.1% of all product produced in Turkey, while the United States of America collects 4% Russia receive 3.8%, Spain 3%, United Arab Emirates 3% and lastly Iran collects 2.5% Turkish produce goods(TURKSTAT 2015). The overall export of Turkey has decline by 1180.61 USD million that is an 11.1% decreased in December of 2015 from 13328.34 USD million in 2014. However, Turkey export to EU member states went up by 1.3% totaling 5428 USD million (TUKSTAT, 2015).

Turkey had a total import of 17984.21 USD million which resulted into a negative balance of trade amounting to -6182.60 USD million. The overall import of Turkey in from 21788.278 USD million in 2014 to 17984.21 USD million in 2015, which constitute a 17.5% decline. Turkey major import partners are; China USD 2.15 billion, Germany USD 2.38 billion, Russia USD 1.686 billion and the United States of America USD 961 million (TURKSTAT, 2015)

The republic of Turkey gross domestic product (GDP) stood at 798.43 USD billion in 2014, which represent 1.29% of the economy of the world. Turkey GDP average from 1960 t0 2014 is 208.26 USD billion, she experience its highest ever in recorded GDP of 823.24 USD billion in 2013 and its lowest of 8.o2 USD billion in 1961 (World Bank, 2014).

The economy of Turkey has experience a year on year 4% increase up to September 2015, which was prior to a 3.8% increase in the previous quarter of the year, beating the market expectation of 2.8%, this was the highest recorded growth rate in Turkey since 2014. The Turkish economy expanded by 1.3% as compared to the previous growth of 1.4%.GDP annual growth rate average 3.90% since 1999, recording its highest ever of 12.60% in the first half of 2010 and the lowest ever of -14.70% in 2009 first half, which was largely due to the global financial crisis (TURKSTAT, 2015).

The unemployment rate of Turkey stood at 10.5% in November of 2015, which is lower than the previous year figure of 10.7%. The average unemployment rate of Turkey since 2005 is 9.99%, she recorded her highest level unemployment of 14.80% in February of 2009 and the lowest of 7.30% in 2012 June (TURKSTAT, 2015). The employment rate of Turkey has increase from 46.10% in October of 2015 to 46.20% in November of the same year. The average employment rate of Turkey from 2005 to 2015 is 42.25%, Turkey recorded her all-time highest rate of employment of 46.20 in November of 2015 and lowest of 39.90% in April of 2010 (TURKSTAT, 2015).

The total debt of Turkey was last measured at 45.14 USD million in 2012 (World Bank 2013), this include the entire stock of government obligation both domestic and foreign. Public debt was expected to decline to 33.2% of GDP in 2015 from its previous value of 33.5% in 2014 (EC winter Economic forecast, 2015).

Turkey average debt to GDP from 2000 to 20014 stood at 49.49%, with its all-time high of 77.90% in 2001 and the lowest of 33% in 2014(Eurostat, 2015). Turkey

extended debt stood at 405985 USD million in the third quarter of 2015, which was an increase from its previous value of 405223 USD million in the second quarter of the year. The average extended debt of Turkey from 1989 t0 2015 is 172558.47 USD million, recording it all-time high of 405985 USD million in 2015 and its lowest of 43911 USD million in 1989 (TURKSTAT).

3.2The Economic Outlook of the Republic of Turkey

Turkey like most countries has had an unstable economy resulting into its annual GDP growth being volatile. Turkey has experience several decline in her GDP growth, notable amongst them are the decline in 1978, 1994, 1999 and 2001, the previous mentioned years are recorded as the biggest economic crisis in the history of Turkey (Sahin, 2009).

Turkey experience her first major financial crisis in 1978 which was due to the global economic crisis that came as a result of the hacked in the price of petroleum product on the world market. Turkey as a huge imported of petroleum products during the period was affected badly, as well as other countries involve in the importation of petroleum products at the time.

Turkey was hit by her second major financial crisis in 1994, more than half of her international reserves of the central bank was lost due to current account deficit. Millions of jobs were lost due to crisis. The Asian countries of 1998 also affected Turkey, investor pullout of the country out of fear of being hit by the crisis that hit Russia. This led to a difficult moment in the history of the country. The earthquake of 1999 also had an enormous impact on the social and economic condition of Turkey. However Turkey was able to recover quickly from the shocked of the quake

by adopting programs of the international monetary fund (IMF), employing fiscal reforms and ensuring political stability. The attention of foreign investors was quickly drawn to the country at the result of the IMF programs adopted and the reform that were made. The success was short live, as Turkey like most countries of the world soon became a victim of the global financial crisis of 2008 that begun in the United States of America.

However, since the close of the global economic meltdown in 2008 that also affected the economy of Turkey, the country seem to be experience a upward and downward trend in economic growth but has not seen any major crisis, GPD is kind of stable of recent. The GDP of Turkey has experience an increased since 2010, moving from 731.71 USD million in 2010 to 774.75 in 2012, 823.24 USD million in 2013, there was a little decline in 2014 to 798.43 USD million.

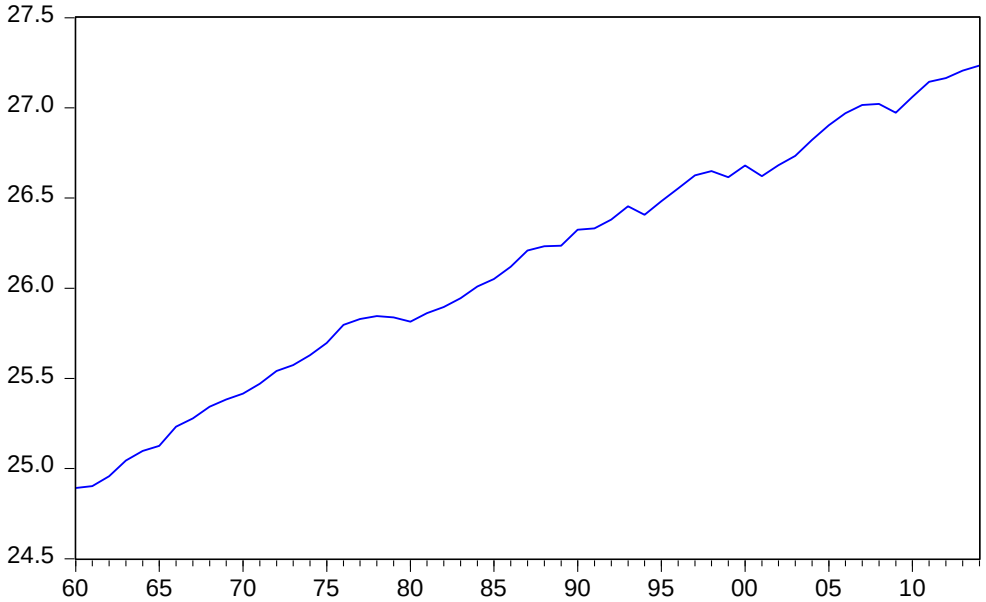

Figure. 3.1 GDP USD 1960-2014
Source: World Bank, 2015.

The per capital income of GDP in Turkey in 2014 stood at 8871.91 representing 70% of the world's average. The average per capital income of GDP in Turkey is 4914.64 USD.

3.3Inflation in Turkey

Turkey had a very low and less volatile inflation in 1960, this lasted until 1978 when she was hit by her first financial crisis that was the beginning of her inflationary problems.

In 1980, Turkey experience a fluctuation in her rate of inflation (World Bank, 2015), however her decision to adopt programs of the IMF led to a reduction in the rate of inflation dropping it by 5-7 % (World Bank, 2011).

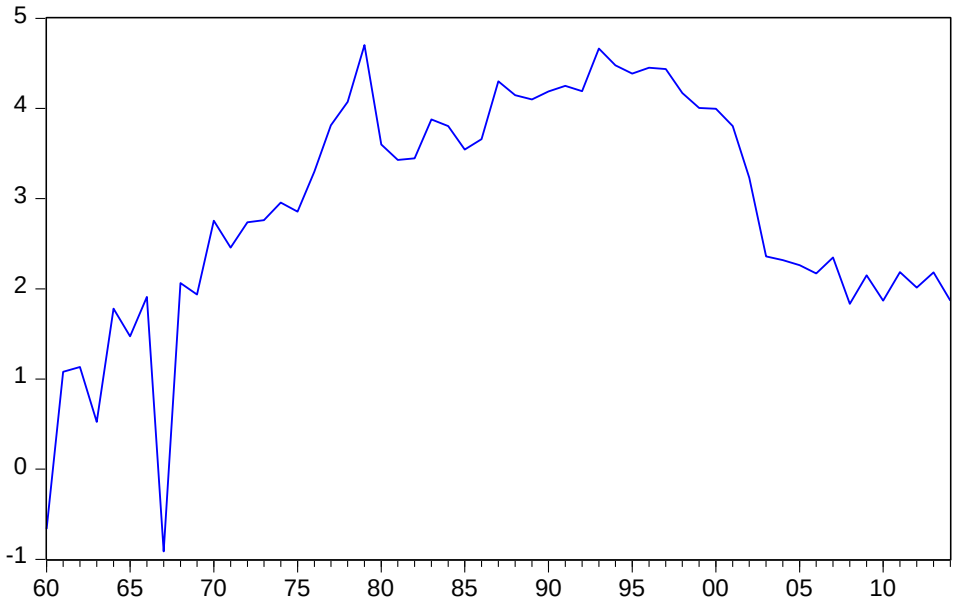

Figure. 3.2 Inflation Consumer Prices USD 1960-2014
Source: World Bank Data 2015

The story has since change, of late Turkey has experience an increase of 9.58%in the year on year consumer prices. Consumer prices move from 8.81% in December of 2015 to 9.58% in January of 2016 falling short of the market consensus. This is the highest value recorded since May of 2014, the price of basic consumer items like , food, housing and transportation has increased dramatically, consumer prices has increased by 1.8%.

The average inflation rate of Turkey is 36.65%. Turkey inflation consumer prices (annual %) stood at 8.85% in 2014 (World Bank, 2014). Inflation as determine by CPI show the percentage change per annual of the cost of the consumer acquisition of a set of goods or services on average that are either fixed or changes during a specified period, usually on an annual basic (Laspeyres, 1875)

3.4Money and Quasi Money as % of GDP of Turkey

There has been a decreased in the supply of money in the economy of Turkey in the last several years. The latest reduction in M2 was from 1205997970.60 Thousand TRY in December of 2015 to 1195802786.10 Thousand TRY in January of 2016. M2 recorded its all-time high of 120991775.30 Thousand TRY in September of 2015 and its' lowest of 236620702 Thousand TRY in January of 2006 (World Bank, 2016)

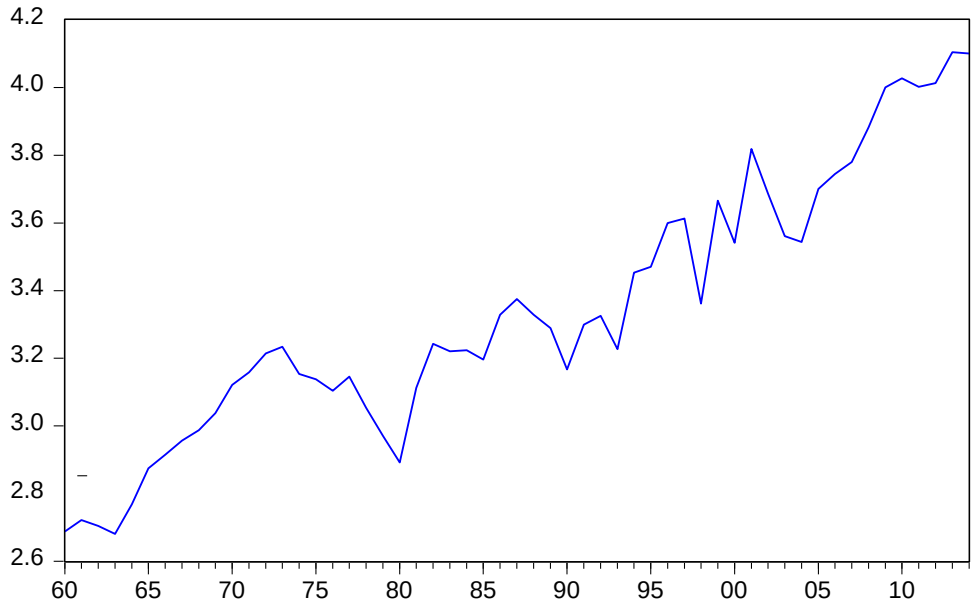

Figure. 3.3 Money and Quasi as % of GDP USD 1964 – 2014
Source: World **B**ank Data 2015

Money and quasi money as % of GDP in Turkey stood at 60.39 in 2014 (World Bank 2015)

Money and quasi money is the sum total of all currency in circulation, demand deposit that don't belong to the central government, all time, savings and foreign currency deposit of resident sector that are not of central government. The reference of money supply as M2 is in line with the International Monetary Funds (IMF) line 34 and 35 international financial statistics (IFS).

3.5Domestic Credit made by Banks to the Private Sector

Domestic credit to the private sector is the sum total of all finances supply by financial institutions to investors in the private sector, resources such as loans, trade credit and other account receivable, purchase of non-equity securities that are capable of establishing claim of repayment. Some countries include the credit to public institutions as a part of domestic credit.

Institutions that are consider financial institutions are deposit money banks, monetary authorities, finance and leasing companies, money lenders, foreign exchange companies, pension funds and insurance corporations.

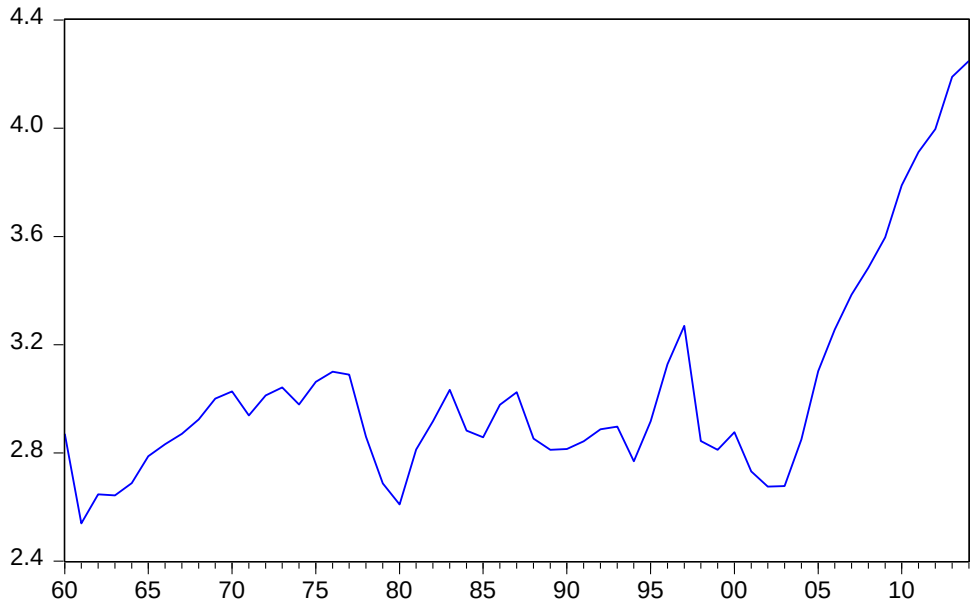

Figure. 3.4 Domestic Credit made by Banks to the Private Sector 1960 -2014
Source: World Bank Data 2015

Turkey domestic credit to the private sector stood at 74.51 in 2014 (World Bank, 2015). Turkey has experience a persistence improvement in the number of financial credit made by banks to investors in the private sector.

In 2000 Turkey was hit by the biggest banking crisis in her history, in November that year banks begin to shut down interbank credit lines to bank in Turkey that was consider vulnerable. This led to the withdrawer of funds by foreign investors in Turkey. Investors started to selloff their equities and treasury bills due to fear of experience lost Akuz and Boratou (2003).

Chapter 4

DATA AND METHODOLOGY

4.1 Data

The period of the study in this paper is from 1960 – 2014 and its annual data of turkey for money and quasi money as the indicator for money, inflation consumer prices as indicator for inflation, domestic credit made by bank to the private sector as indicator for banking sector development and gross domestic product as indicator for economic growth. The data was attracted from the World Bank development indicator.

4.2 Methodology

In an attempt to investigate the relationship between the four macroeconomics variables, GDP, Inflation, money and banking sector development various types of test was used, Augmented Dickey-Fuller (1981)and Philips & Perron (1988) test of unit roots were used to investigate the variables stationary orders integration. Johansen co-integration test was also used to analyze the equilibrium of the long-run relationship between the variables within the model Johansen and Juselius (1990). The Vector error correction model was used to estimate the long-run and short-run coefficient of the variables and finally the Granger causality test was used to show the unit or bi-directional of the relationship among the variables Granger (1988).

4.3 Empirical Model

This paper suggest that money, inflation and banking sector development might be a determinants of gross domestic product (GDP) using the republic of Turkey as a case in point.

The existing functional relationship can be shown as follow:

GDP = f (M2, ICP, DC)…….1

Where, GDP is the function of money and quasi money, inflation consumer prices and domestic credit made by banks to the private sector. These variables are represented by it logarithmic term in order to the relationship as indicated:

$$\ln GDP_t = \beta_0 + \beta_1 \ln M2_t + \beta_2 \ln ICP_t + \beta_3 \ln DC_t + \mu_t \ldots\ldots\ldots 2$$

Where, lnGDP, lnM2, lnICP and lnDC are natural log of economic growth, money, inflation and banking sector development respectively. Ut represent the error term, βo is the constant coefficient that represent the intercept term of the model equation and β_1 represent the slope of the coefficient of lnGDP.

4.3.1Unit Roots Test

As mentioned in the methodology section, unit root test is used to investigate whether a time series data is stationary or non-stationary. In the paper two types of unit root test were used, Augmented Dickey-Fuller and Philip-Perron test to determine the order of integration of the variables in the model.

The Phillip-Perron test is a little advance than the Augmented Dickey-Fuller test because it takes into consideration residual variance that is robust in regard to auto-

correlation Katircioglu (2009). The most common model of unit root test is with trend and intercept as suggested by Enders (1995).

The unit root test model can be displayed by this formula:

$$\Delta Y_t = a_t + a_2 + \sum_i^p = \beta_j + \text{j-i} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots 3$$

Y represent the dependent variable, α represent the drift, μ is the Gaussians white noise and P represent the lag level. Akaike Information criterion or other info criterion is used to determine whether there are error in white noise by checking the number of lag "P" of the dependent variable Katircioglu et al. (2009).

The null hypothesis of the ADF and PP test is that the series is non-stationary. We reject the null hypothesis if the test critical level is not more negative than the t-statistic and there prob. value is significant. If the null hypothesis is rejected at level, our next step will be to take the first difference of the series and rerun the test. We say the series integrated of order of zero I (0) when it's stationary at level and is said to be I(1) when it is stationary at its first difference.

4.3.2 Co-Integration Test

The possibility of a long-run relationship among variables in a model is investigated by conducting a co-integration test. This research uses the Johansen, Johansen &Juselius (1990) co-integration test method to investigate the long-run relationship among the variables in this series that might seem to have the similar order of integration.

In order to have a co-integration there must be at least one co-integration vector between the variables. The Johansen co-integration test takes into account the initial point in the vector auto-regression (VAR) order of P given by this formula:

$$Y_t = \mu_t + A_1 Y_{t-1} + \ldots\ldots A_{pY_{t-p}} + \mu_t \text{ for t } = 1\ldots\ldots\ldots\ldots\ldots 4$$

Y_t, Y_{t-1} pare are vectors of the level and lagged values of P variables respectively. They are I(1) in this model;A1 A pare are coefficient matrices with (PxP) dimension; μ is the intercept vector, μ_t is the vector of random error. The trace statistic are obtained by using the Eigen values (Johansen & Juselius, 1990)

The trace statistic (λ Trace) can be determined by the below formula:

λ trace = -T$\sum$ ln (1-λ;), i = r + 1,…..n-1

Below are the null hypothesis:

Ho: V = 0 H_1: V ≥ 1

Ho: V ≤ 1 H_1: V ≥ 2

Ho: V ≤ 2 H_1: V ≥ 3

4.3.3 Vector Error Correction Model

The vector error correction model test show the long-run and short-run coefficient of the variables and its speed of adjustment. It can be represented by the below formula:

$$\Delta \text{ lnGDP} = \beta_0 + \sum_{i-1}^{n} \beta_1 \ln GDP_{t-j} + \beta_2 \Delta \ln M2_{t-j} + \beta_3 \Delta \ln ICP_{t-j} + \beta_4 \Delta \ln DC_{t-j} + \beta_5 \mathcal{E}_{t-1} + \mu_t$$

Δ shows the change in GDP, M2, ICP and DC variables and $\mathcal{E}_{t-1}$ is the period of lag error correction term ECT. ECT in the formula indicates the speed of the disequilibrium between the long-run and short-run values of the dependent variable

is removed each period. The ECT sign must be negative to be sure the model is working Katircioglu (2010).

4.3.4 Granger Causality Test

This test identity's' the direction of the relationship among the variables. The relationship can be either unidirectional or bidirectional.

The test is conducted by using the vector error correction (VEC) framework if there exist a co-integration relationship among the variables Katircioglu et al. (2007). If there exist a co-integration vector in the model the Granger's causality test is employ using the VAR approach.

The estimate of the test has the following equations:

$$\Delta \ln Y_t = C_0 + \sum_{i=1}^{k} \beta_1 \Delta \ln Y_{t-i} + \sum_{i=1}^{k} \& \Delta \ln Z_{t+j} + \varphi, ECT_{t-1} + \mu_t$$

$$\Delta \ln Z_t = C_0 + r_1 \Delta X_{t-1} + \sum_{i=1} \Delta \ln Y_{t-1} + \phi\, ECT_{t-1} + \mu_t$$

Y and Z are the series consideration, and are coefficients of ECT that indicate the error correction term in both model, first difference of the variables is indicated by Δ.

Equation 1 suggest that Y (Independent Variable) granger causes Z (dependent variable) if φ is statistically significant and equation 2 suggest that Z (independent variable) granger causes Y (dependent variables) if ϕ is statistically significant. The joint null hypothesis is determined by the f-statistic and the significance of the error correction estimated by using the t-test.

Chapter 5

EMPIRICAL RESULTS

5.1 Unit Root Test

The result of the ADF and PP test conducted on the variables in the paper show that the series is integrated order of I (1), which indicates that the series is stationary at first difference.

The below tables show the output of both testing procedures:

Table 1: ADF test of unit root

Statistic	**GPD**	**lag**	**M2**	**lag**	**DC**	**lag**	**ICP**	**lag**
τ_T (ADF)	-2.759	(0)	-3.205	(0)	-0.351	(0)	0.224	(0)
τ_μ (ADF)	-1.099	(0)	-0.339	(1)	0.843	(0)	-3.148	(0)
T (ADF)	8.249	(0)	2.251	(1)	1.502	(1)	-0.734	(0)
Statistical (1^{st}D)	GPD	lag	M2	lag	DC	lag	ICP	lag
τ_T (ADF)	-7.514*	(0)	-9.439*	(0)	-6.328*	(0)	-12.439*	(0)
τ_μ (ADF)	-7.416*	(0)	-9.510*	(0)	-6.263*	(0)	-11.961*	(0)
T (ADF)	-2.757	(0)	-8.864*	(0)	-5.989*	(0)	-12.056*	(0)

Note: GPD, M2, DC, CPI and ICP represent economic growth, money, domestic credit by banks to the private sector, and inflation respectively. ττ represent trend and intercept, τμ represent only intercept and τ don't consider trend and intercept(none). *.** *** represent rejection at α 1%, 5% and 10% respectively.

Table 2:PP test of unit root

Statistical GPD		**lag**	**M2**	**lag**	**DC**	**lag**	**ICP**	**lag**
τ_T (PP)		-2.780	(1)	-3.108	(1)	- 0.589	(2)	-2.637 (7)
τ_μ (PP)	-1.250(1)		-0.185	(14)	0.733	(3)	-3.102	(4)
T (PP)	8.493	(2)	5.044	(23)	1.304	(6)	-0.671	(16)

Statistical (1^{st} D)	GDP	lag	M2	lag	DC	lag	ICP	lag
τ_T (PP)	-7.538*	(3)	-12.826*	(14)	-6.326*	(5)	37.667*	(5)
τ_μ (PP)	-7.418*	(2)	-12.548*	(13)	-6.263*	(4)	-11.981*	(8)
T (PP)	-3.886	(4)	-8.876*	(3)	-6.008*	(2)	-12.029*	(8)

Note: GPD, M2, DC, CPI and ICP represent economic growth, money, domestic credit by banks to the private sector, and inflation respectively. ττ represent trend and intercept, τμ represent only intercept and τ don't consider trend and intercept(none). *.** *** represent rejection at α 1%, 5% and 10% respectively.

5.2 Johansen Co-Integration Test

The unit roots test results show that the series is stationary at first difference, the importance of the Johansen co-integration test cannot be over emphasized. Below are a jest of the result of the Johansen co-integration test conducted on the variables in the series, which indicates that there are 5 co-integration equation(s) at 5% level and 3 co-integration equation(s) at 3% level.

The below table show the full results at indicated by the test:

Table 3: Johansen co-integration test result at lag 1

Hypothesis (1%)	Eigenvalue	Trace statistic	critical level (5%)	Critical level
None** 76.07		0.45664	98.22263	68.52
At most 1** 54.44		0.410537	65.89633	47.21
At most 2** 35.65		0.312037	37.88351	29.68
At most 3* 20.04		0.202414	18.06045	15.41
At most 4* 6.65		0.108276	6.073702	3.76

Note: the trace test indicates 5 co-integration equation(s) at the 5% level. Trace test indicates 3 co-integration equation(s) level at the 1% level. *, ** denotes rejection of the null hypothesis at the 5% and 1% level respectively.

5.3 Level of Coefficient and Error Correction Model Estimation Results

The Johansen co-integration test analysis show that there are integration between the dependent variable GDP and the independent variables M2, ICP and DC, hence the need to estimate the level of (run- term) coefficient of the model GDP =f (M2,ICP, DC) and the ECM to determine the short- term relationship and its ECT. The results show that there is a long term relationship between GDP, M2, ICP and DC. The ECT is 8.9496% and that GPD, M2, ICP and DC will converge at a long-run equilibrium level by 8.9496% speed of adjustment. The result also indicates a short-term relationship between the variables at lag 2.

Below is the full results of the table:

Table 4: Error correction model

Co-integration Eq:	CointEq1
LnGDP	-1.000000
LnM2 (-1)	-1.578226 (0.17264) [9.14182]
Ln ICP (-1)	0.141385 (0.03520) [4.01705]
Ln DC (-1)	0.339219 (0.18762) [1.80797]
C	21.46983
Correction Error	**D (GDP)**
CointEq1	- 0.089496 (0.03205) [-2.79218]
D (lnGDP (-1))	0.061064 (0.18999) [3.32141]
D (lnGDP (-2))	0.059121 (0.17824) [0.33170]
D (lnM2 (-1)	-0.044968 (0.08653) [0.511970]
D (lnM2 (-2))	-0.121682 (0.07236) [1.68158]
D (lnICP (-1))	0.019937 (0.00829) [40461]

D (lnICP (-2))	0.004165 (0.00767) [0.54298]
D (lnDC (-1))	0.18345 (0.07018) [2.61384]
D (lnDC (-2))	0.011824 (0.05756) [0.20542]
C	0.047938 (0.01225) [3.91343]
R-Squared	0.573392
Adj. R-Squared	0.239118
Sum Sq. resids	0.048051
S.E Equation	0.033824
F. Statistic	2.780834
Log likelihood	107.8705
Akaike AIC	-3.764248
Schwarz SC	-3.389009
Mean Dependent	0.043790
S.D Dependent	0.038776

Determinant resid covariance (dof adj.)	2.82E-08
Determinant resid covariance	1.20E-08
Log likelihood	179.0943
Akaike Information criterion	5.195934
Schwarz criterion	3.544881

5.4 Granger Causality Test

At the completion of the co-integration and ECM analyses, it was established that there are co-integration vectors between the variables; the next step is to conduct a Granger causality test on the VECM as stated in the empirical model section. The intent of this test to pin-point the direction of the relationship between the variables.

The test results show that there is a bi-directional relationship between GDP and M2, a unit-directional relationship from DC to GDP and a unit-directional relationship from ICP to DC. It further indicates that there is no relationship between ICP and GDP.

Below is the full table indicating the results of the Granger causality test.

Table 5: Granger causality test
Lag: 2

Null hypothesis	Obs.	F. statistic	Prob. value
LnM2 does not Granger cause lnGDP	53	5.11469	0.0097***
LnGDP does not Granger cause lnM2		2.6869	0.0775***
LnICP does not Granger cause lnGDP	53	2.01552	0.1444
LnGDP does not Granger cause lnICP		0.73218	0.4862
LnDC does not Granger cause lnGDP	53	5.31509	0.0082***
LnGDP does not Granger cause lnDC		1.30227	0.2813
LnICP does not Granger cause lnM2	53	0.42462	0.6565
LnM2 does not Granger cause lnICP		0.98676	0.3802
LnDC does not Granger cause lnM2	53	0.64062	0.5314
LnM2 does not Granger cause lnDC		1.02078	0.3680
LnDC does not Granger cause lnICP	53	0.00672	0.9933
LnICP does not Granger cause lnDC		3.55081	0.0365**

*, ** and *** show rejection at 1%, 5% and 10% respectively.

The null hypothesis of the test indicates that there is non-causality between the variables. If the null hypothesis is rejected, it indicate that the independent variable Granger-causes the dependent variable or the reverse.

Chapter 6

CONCLUSION AND POLICY IMPLICATION

6.1 Conclusion

The objective of this research is to investigate the relationship between money, inflation, banking sector development and economic growth in Turkey. Using data extracted from the world bank development indicator for Turkey from 1960 – 2014 the relationship between money and quasi money as money, inflation consumer prices as inflation, domestic credit made by banks to the private sector as banking sector development and GDP as economic growth was clearly determined. As expected based on previous studies there is a positive and negative relationship between the four macroeconomic variables.

The Augmented Dickey-Fuller and Philip-Perron unit root test indicate that all of the data is stationary at level I(1) which mean that they are integrated order of one, which is common with most economic time series data. Johansen co-integration test show that there is a long-run relationship among the variables and that there are 5 co-integration equation(s) at 5% level and 3 co-integration equation(s) at 1% level. The Granger causality test discovered that there is a bi-directional relationship between GDP and M2, a unidirectional relationship from DC to GDP and a unit directional relationship from ICP to DC.

Findings in regards to a non-causality relationship between ICP (inflation) and GDP contradict previous studies (see Hakiko and Haggins, 1985; Samargandi, Fidimus and Gush, 2015; Boujebene and Aelali 2014; Ngare, Nyamongo and Misata, 2014). However our findings is consistent with other previous studies (see Nyugen and Wang 2010; Kim, Lim, Park, 2013; King and Levine, 1993; Allen and Ndikumama, 1998).

A possible explanation for the contradiction in our findings with previous studies might be due to the difference in time period of the studies and the data used in the studies. Our findings show that that domestic credit (banking sector development) and money and quasi money (money) can lead to an improvement in gross domestic product (economic growth). This is an indication that if the access to credit by banks to the private sector is improve and the flow of money in the economy of Turkey improves, the country will experience an economy boom. It is safe to conclude that economic growth in Turkey is greatly impacted by inflation, money and banking sector development.

6.2 Policy Implications

The Republic of Turkey, like many other developing economies has had its share of economic and political setbacks. Since the early 1940s, Turkey has had a mixed of political and economic ups and downs. However, in the previous decade Turkey experience a level of stability on both the economic and political front.

Turkey is one of the few countries that were not affected by the global economic crisis that started in 2008, which was in part due to her limited involvement in foreign stock markets and mortgage back securities the primary source of the crisis. Most Turkish banks and financial institutions held their assets locally thereby causing them to stand firm during the global economic meltdown.

The findings of the empirical studies in this thesis shows that domestic credit, the indicator for banking sector development contribute to the increase in GDP in Turkey, which is a good news for the Turkish economy. However the Central Bank of Turkey and the Ministry of Finance that are both responsible for the monetary and fiscal policy of Turkey needs to more to sustained the gains made in the sector by creating a more credit friendly environment and instituting policy that will protect both the financial institutions that are supplying the credit and the individuals or institutions that are receiving the credit.

The study results show a negative relationship between money supply and GPD, indicating that the increase in money supply has a negative impact on GDP, this is not surprising considering the current decline in the Turkish lira against major currencies like the British pounds and the American dollars. Economists has shown that the increase or over supply of money in circulation in any economy can have a negative impact on the value of such currency and the economy in general. This negative relationship between money supply and GDP is a reasonable explanation for the decline in value of the Turkish lira and policy makers needs to take appropriate actions to resolve it. The Central Bank of Turkey needs to reduce the amount of Turkish lira currently in circulation as a mean of protecting the lira from further

decrease in value. This could be done by issuing government securities such as bonds and treasury bills.

Finally, the results of this thesis show a positive relationship between inflation and GDP, this can be attributed to the fact that financial instructions such as banks have in place strong inflation protection mechanism. As mentioned earlier the growth in the banking sector is experience a boom in Turkey, therefore its ability to protect itself against inflation has reduce the impact of inflation in the economy which explain the positive relationship between GDP and inflation. Financial institutions lean money on a floating rate basic thereby cancelling out any impact inflation might have had on the increase or decrease of interest rate. However, this is not sustainable, policy makers need act fast to curve the level of drop in the value of the Turkish lira. The decline in value of the lira is bad for commerce and could affect the ability of businesses especially those that use foreign currency to import good to pay back their loan which will in turn offset the gains made by the banking sector visa via the economy.

Another important factor is the political instability in the country couple with dispute with Russia and the increase in terrorist attacks. This is a worrying sign for the Turkish economy. The Turkish government needs to work over time to resolve the current political tension in the country and engage with regional and world body to resolve the crisis with Russia. There is also an increasing need to improve counter-terrorism measure or it could hurt the economy by driving away foreign investors who might think that the country is not safe.

REFERENCES

Anwar, S. & Nguyen, L. (2010). Foreign Direct Investment and Economic Growth in Vietnam. Asia Pacific Business Review, 16: (1), 183-202.

Andres, J., & Hernando, I. (1997). Does inflation harm economic growth? Evidence for the OECD. NBER working paper no. 6062

Bozkurt, C. (2014). Money, Inflation and Growth Relationship: The Turkish Case. *International Journal of Economics and Financial. 4*(2), 309–322. Retrieved from http://econjournals.com/index.php/ijefi/article/view/750.

Dickey, D & Fuller, W. A.(1981) Likelihood Ratio for Autoregressive Time Series with unit root Econometrica. 49, 1057-1072

Darrat, A. F. (1988). Does inflation inhibit or promote growth? Some time series evidence. Journal of Business and Economics. 27(4), 113–134

Engle, R. F. & Granger, C. W. J. (1987). Co-integration and Error Correction: Representation, Estimation, and Testing, Econometrica. 55, 251-276.

Fischer, S. (1993). The role of macroeconomic factors in growth. Journal of Monetary Economics. 32(3), 485–512

Granger, C. W. J. (1988). Some Recent Developments in a concept of Causality, Journal of Econometrics. 39, 199-211.

Gokmenoglu, K., & Taspinar, N. (2015). The Relationship between Industrial Production , GDP , Inflation and Oil Price : The Case of Turkey. *Procedia Economics and Finance*.*25*(May), 497–503. http://doi.org/10.1016/S2212-5671(15)00762-5

Jedidia, K. B., Boujelbene, T., & Helali, K. (2014). Financial development and economic growth: New evidence from Tunisia. Journal of Policy Modelling, 36(1), 883–898.

Jonansen, S.(1988). Statistical analysis of cointegration vector. Journal of economic dynamics and control. 12, 231-254

Johansen, S. Juselius, K. (1990) Maixmum likelihood estimation and inference on co-integration with application to the demand for money, Oxford Bulletin of Economics and Statistic. 52, 169-209

Johansen, S. & Juselius, K. (1990). Maximum Likelihood Estimation and Inference on Co-Integration with Application to the Demand for Money, Oxford Bulletin of Economics and Statistics. 52, 169-209.

Katircioglu, S. (2010). International Tourism, Higher Education, and Economic Growth: the Case of North Cyprus. The World Economy. 33 (12): 1955-1972.

Katircioglu, S. (2009). Trade, Tourism and Growth: The Case of Cyprus, Applied Economics, 41 (21): 2741-50.

Katircioglu, S., Kahyalar, N. & Benar, H. (2007), Financial Development, Trade and Growth Triangle: The Case of India, International Journal of Social Economics. 34 (9): 586-598.

Kormendi, R. C., & Meguire, P. G. (1985). Macroeconomic determinants of growth: cross-country evidence. *Journal of Monetary Economics*. http://doi.org/10.1016/0304-3932(85)90027-3

Kim, S., Lim, H., & Park, D. (2013). Does productivity growth lower inflation in Korea? Applied Economics. 45(29), 2183–2190

King, R., & Levine, R. (1993). Finance and growth: Schumpeter might be right. The Quarterly Journal of Economics. 108(3), 717–737

Kasman, S., & Kasman, A. (2015). Bank competition, concentration and financial stability in the Turkish banking industry. *Economic Systems*.*39*(3), 502–517. http://doi.org/10.1016/j.ecosys.2014.12.003

Kormendi, R. C., & Meguire, P. G. (1985). Macroeconomic determinants of growth: Cross-country evidence. Journal of Monetary Economics. 16(2), 141–163

Ngare, E., Nyamongo, E. M., & Misati, R. N. (2014). Stock market development and economic growth in Africa. Journal of Economics and Business. 74(1), 24–39.

Nguyen, T. T., & Wang, K. (2010). Causality between housing returns, inflation and economic growth with endogenous breaks. Journal of Chinese Economic and Business Studies. 8(1), 95–115.

Pradhan, R. P., Dasgupta, P., & Samadhan, B. (2013). Finance development and economic growth in BRICS: A panel data. Journal of Quantitative Economics, 11(1–2), 308–322

Pradhan, R. P., Arvin, M. B., Hall, J. H., & Bahmani, S. (2014). Causal nexus between economic growth, banking sector development, stock market development, and other macroeconomic variables: The case of ASEAN countries. *Review of Financial Economics*, *23*(4), 155–173. http://doi.org/10.1016/j.rfe.2014.07.002

Philip, P. & Perron, P.(1988) Testing for unit root in time series. Biometrica, 75, 335-346TURKSTAT, 2011, http:// www. turkstat.gov.tr

Sahin, H. (2009), Türkiye Ekonomisi, 10. Baskı, Ezgi Kitabevi, Bursa, Türkiye.

Samargandi, N., Fidrmuc, J., & Ghosh, S. (2015). Is the relationship between financial development and economic growth monotonic? Evidence from a sample of middle-income countries. World Development, 68(1), 66–81.

TURKSTAT, (2011). http://www.turkstat.gov.tr (July, 2011).

World Bank, 2016, http:// databank.worldbank.org