

**Geopolitical Risk Index, Inflation and Exchange
Rate on Economic Growth: Does the Relationship
matter Evidence from Turkey**

Maryam Hafiz Iliyasu Wali

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

Master of Science
in
Banking and Finance

Eastern Mediterranean University
January 2020
Gazimağusa, North Cyprus

Approval of the Institute of Graduate Studies and Research

Prof. Dr. Ali Hakan Ulusoy
Director

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

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.

Prof.Dr. Salih Katircioğlu
Supervisor

Examining Committee

1. Prof. Dr. Salih Katircioğlu

2. Asst. Prof. Dr.Setareh Katircioğlu

3. Asst. Prof. Dr. Nigar Taşpınar

ABSTRACT

In this study, we examine the impact of geopolitical risk index, inflation and exchange rate on economic growth in the case of Turkey. The geopolitical risk, inflation, exchange rate and economic growth nexus is not without ambiguity. Based on this proposition, this study investigate whether changes in geopolitical risk index, inflation and exchange rate would have significant impact on economic growth in the case of Turkey or not. We are of the opinion that increase/decrease in geopolitical risk index, inflation and exchange rate might influence changes in economic growth. In order to achieve study objective and provide answers to this study research questions as stated in chapter 1, we employ annual frequency data sourced from World Bank Development (*online*) over the periods of 1985-2017, using Autoregressive Distributed Lag model for estimates and Toda and Yamamoto (1995) for Granger non-causality analysis. In addition, we employ gross fixed capital formation to proxy for domestic investment for *ceteris paribus* purpose and control for omitted variable bias.

Conclusively, based on the empirical results that an increase and/or decrease in geopolitical risk index and inflation have no impacts on economic growth in the case of Turkey. It appears economic growth/development of Turkey is immune to geopolitical risk and fluctuation in price level. Consequently, policymakers should pay more attention to pressing growth determinants that such as exchange rate and domestic investment for a rapid and sustainable economic growth both in the short-run and long run respectively.

Keywords: Geopolitical risk; inflation; exchange rate, economic growth; Turkey.

ÖZ

Bu çalışmada Türkiye'de jeopolitik risk endeksi, enflasyon ve döviz kurunun ekonomik büyüme üzerindeki etkisini inceleyeceğiz. Jeopolitik risk, enflasyon, döviz kuru ve ekonomik büyüme bağı belirsizlik olmadan değildir. Bu önermeye dayanarak, bu çalışma, jeopolitik risk endeksi, enflasyon ve döviz kurundaki değişikliklerin Türkiye'nin ekonomik büyümesi üzerinde önemli bir etkisi olup olmayacağını araştırmaktadır. Jeopolitik risk endeksi, enflasyon ve döviz kurundaki artış/düşüşün ekonomik büyümedeki değişiklikleri etkileyebileceği görüşündeyiz. 1. bölümde belirtildiği gibi çalışma amacına ulaşmak ve bu çalışma araştırma sorularına cevap vermek amacıyla, 1985-2017 dönemlerinde Dünya Bankası Kalkınmasından (çevrimiçi) elde edilen yıllık frekans verilerini, tahminler için Otogressif Distributed Lag modelini ve Granger kamüsallık dışı analizleri için Toda ve Yamamoto(1995) modelini kullanıyoruz. Buna ek olarak, biz yurtiçi i için vekiil brüt sabit sermaye oluşumu istihdam.

Kesin olarak, jeopolitik risk endeksi ve enflasyonun artması ve/veya düşmesinin Türkiye'nin ekonomik büyümesi üzerinde hiçbir etkisi olmadığı ampirik sonuçlara dayanmaktadır. Türkiye'nin ekonomik büyümesi/gelişmesi jeopolitik risk ve fiyat seviyesindeki dalgalanmaya karşı bağışık görünüyor. Sonuç olarak, politika yapıcılar, hem kısa hem de uzun vadede hızlı ve sürdürülebilir bir ekonomik büyüme için döviz kuru ve yerli yatırım gibi acil büyüme belirleyicilerine daha fazla dikkat etmelidirler.

Anahtar Kelimeler: Jeopolitik risk; enflasyon; döviz kuru, ekonomik büyüme; Türkiye.

DEDICATION

This thesis is dedicated to Almighty Allah and my family.

ACKNOWLEDGMENT

I give all glory to Almighty Allah for His guidance and protection throughout my study in North Cyprus and for His direction towards this thesis. My appreciation will not be complete without mentioning my able and kind-hearted thesis supervisor in the person of Prof. Salih Katricioglu for his patience and constructive criticism. In addition, I deeply appreciate all the Faculty members at the Department of Banking and Finance, Eastern Mediterranean University, who has in one way or another contributed to the success of my graduate program.

In addition, my love and regards go to my parent and siblings for standing by, their words of encouragements and financial support at all time. I cannot thank you enough and may Allah continue to bless you all for me. Lastly, to all my friends that made this possible, you guys rock!

TABLE OF CONTENTS

ABSTRACT.....	iii
ÖZ.....	iv
DEDICATION.....	v
ACKNOWLEDGMENT.....	vi
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
LIST OF ABBREVIATIONS.....	xi
1 INTRODUCTION.....	1
1.1 Background to the Study.....	1
1.2 Statement of the Problem.....	3
1.3 Research Question.....	4
1.4 Objective of the Study.....	5
1.5 Hypothesis.....	5
1.6 Justification for the Study.....	5
1.7 Scope of the Study.....	7
1.8 Organization of the Study.....	7
2 LITERATURE REVIEW.....	9
2.1 Economic Growth.....	9
2.2 Determinants of Economic Growth.....	10
2.3 Exchange Rate.....	11
2.4 Determination of Exchange Rates.....	11
2.5 Inflation.....	12
2.6 Geopolitical Risk.....	13

2.7 Economic Growth and Exchange Rate.....	14
2.8 Economic Growth and Inflation.....	15
2.9 Geopolitical Risk, Exchange Rate, Inflation and Economic Growth.....	16
3 RESEARCH METHODOLOGY.....	19
3.1 Data Source.....	19
3.2 Vector Autoregressive Model (VAR).....	20
3.3 Unit Root Test.....	20
3.4 Cointegration and the Error-Correction Mechanism: Granger Causality Test...22	
4 RESULTS AND EMPIRICAL DISCUSSION.....	24
4.1 Descriptive Statistics.....	24
4.2 Unit Root Test Results.....	25
4.3 ARDL and Bounds Testing Estimation Results.....	27
4.4 Granger Causality Test Results.....	32
5 CONCLUSION AND RECOMMENDATIONS.....	36
5.1 Conclusion.....	36
5.2 Recommendations.....	37
REFERENCES.....	39

LIST OF TABLES

Table 1: Descriptive Statistics.....	25
Table 2: Unit Root Test Results.....	27
Table 3: Bound Testing Results.....	28
Table 4: ARDL Economic Growth Estimation (1, 0, 0, 0, and 0) Model.....	29
Table 5: Diagnostic Test Results.....	31
Table 6: Granger non-Causality Results (Toda & Yamamoto, 1995).....	34

LIST OF FIGURES

Figure 1: CUSUM and CUMUM squared plots (stability test).....32

LIST OF ABBREVIATIONS

ADF	Augmented Dickey and Fuller
CPI	Consumer Price Index
DI	Direct Investment
ECM	Error Correction Model
EXR	Exchange Rate
GDP	Gross Domestic Product
GPR	Geopolitical Risk Index
GFCF	Gross Fixed Capital Formation
INFLA	Inflation
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
OLS	Ordinary Least Square
OECD	Organization for Economic Co-operation and Development
US	United States

Chapter 1

INTRODUCTION

1.1 Background to the Study

Economic growth is like an ideal body temperature of 98.6⁰F. If the body temperature is lesser than the ideal, one is sick. Contrarily, if the body temperature is greater than the ideal, one is still sick. The trend of growth in potential output of the trade cycle is an ideal economic growth. However, actual output in this cycle represents the influence of certain macroeconomic variables causing fluctuations in economic activity. Hence either of positive or negative output gap is inevitable. It is not impossible for an economy to experience positive output gap. This happens when an economy is producing more than its maximum potential. However, this phenomenon is transient because, in response to high aggregate demand, machinery and workers may be overworked and consequently economic activity experiences downward trend. In this contemporary world, an economy that attains outrightly no or inadequate growth will definitely face these important problems: poverty, unemployment and low welfare (Aydın, Esen & Bayrak, 2016), which are symptoms of negative output gap.

Prominent among the macroeconomic aims is steady and sustained economic growth as well as stable economy. Real GDP per-capita is a measure of economic growth. It is an appropriate measure because it eliminates the influence of price instability and it helps to ascertain that rise in GDP per capita is real. A stable economy stems from stable price level and exchange rate. The experience of 127 countries pooled shows

that rapid growth decelerates high inflation rates, deflation and moderate inflation go with slow growth, while hyper-inflations are associated with sharp downturns (Samuelson, Nordhaus 2010). Change in exchange rate has great effect on domestic economy and this effect is dependent on the Marshall-Lerner condition and J-curve effect. The two conditions show no specific effect of exchange rate on economic growth. In the same vein, change in exchange rate can alter inflation rate. Geopolitical risk is multidimensional and its three dimensions (political, economic and natural) can influence economic growth (Bohl, Taylor et al 2017).

Turkish GDP per capita is running faster to catch up with the more advanced OECD economies. With a GDP of approximately US\$770 billion, Turkey is one of the G20 because it is the 18th-largest economy in the world. From 2000 to 2018, per capita GDP in Turkey is more than double from US\$4,200 to \$9,445. Turkey is a member of the OECD and an increasingly important donor of Official Development Assistance (World Bank, 2019). “Even with a series of adverse shocks including severe geopolitical tensions at the southeastern border and an averted coup attempt in 2016, GDP growth averaged nearly 7% over 2010-17. Turkey’s labor productivity now exceeds those of most other catching-up OECD member states, notwithstanding low-productivity, informal activity, especially in agriculture are still predominant” (OECD Economic Survey of Turkey, 2018).

Despite the tremendous growth in the past 20 years, Turkish economy cannot be exonerated from significant development challenges such as decline in educational quality, influx of Syrian refugees, lira depreciation, fall in investor confidence, high inflation rate (20%) and high level of external debt (world bank, 2019). Turkey now faces the challenge of surviving economic recession while generating new and

sustainable drivers of future growth. In view of this growth with challenges that this research work attempt to ascertain the effect of geopolitical risk, exchange rate and inflation rate on economic growth of Turkey. Examining the long run effects of these macroeconomic variables on growth is also of concern.

1.2 Statement of the Problem

The geopolitical risk, inflation, exchange rate and economic growth nexus is not without ambiguity. A. W. Philip, a British economist invariably established that there is an indirect relationship between the rate of inflation and the level of unemployment. This mean inflation can bring about economic growth since it is capable of reducing unemployment level. However, the experience of certain economies has made modern economists to introduce stagflation which shows that the coexistence of high inflation rate and high unemployment level is not impossible. Hence high rate of inflation would rather stagnate an economy than make it grow. In recent time, the inflation rate in Turkey is well over 20% according to World Bank (2019).

Exchange rate and economic growth relationship is without any direction. Theoretically, fall in exchange rate reduces import thereby increasing net export, which automatically raises aggregate demand, hence accelerating economic growth. Rodrik (2008) particularly maintains that the connections between undervalued RER and growth are largely positive in emerging economies (like Turkey).

Theoretical perspectives differ ranging from nonexistence of any relationship connecting these variables, to a direct relationship, and even to an indirect one. Turkish economy is quite sensitive to the exchange rates because the transformation in Turkish

economy is such that it has started to use more imported inputs in the production activity especially in 2000s.

Balcilar, Bonato, Demirer, and Gupta (2018) asserted that geopolitical risk determines investment decision greatly as it is believed to have the capacity to alter trade cycles, financial markets and economic directions. Das, Kannadhasan, and Bhattacharyya (2019) further buttress this idea as their study reveals that geopolitical risk is an influential indicator of economic market reaction to shocks or volatility. The normative believe of most economists is that geopolitical risk augments market portfolio characterized by shocks resulting from sudden and large increase in risk (Apergis & Apergis, 2016; Apergis, Bonato, Gupta, & Kyei, 2018; Caldara & Iacoviello, 2016; 2018).

Since the independence of Turkey several decades ago, Turkey has introduced a number of policies, program and projects to accelerate economic growth and ensure economic stability. What then has become of them? Why is inflation rate still relatively high? Why is lira falling compared to other currencies? How has geopolitical risk decelerated the growth rate of Turkish economy?

1.3 Research Question

Apart from geopolitical risk which has an exact relationship with economic growth, the effect of exchange rate and inflation rate on economic growth is not specific hence the relationship thereof ranges from one economy to another. Hence this research work tends to answer the following questions:

- a) What is the nature of relationship between economic geopolitical risk and economic growth in Turkey?

- b) What is the nature of relationship between inflation rate and economic growth in Turkey?
- c) What is the nature of relationship between exchange rate and economic growth in Turkey?

1.4 Objective of the Study

The broad objective of this research work is to examine how Turkish economy has grown over the years despite the influence of geopolitical risk, high inflation rate and exchange rate volatility. And specifically, the study aims at the following objectives:

- a) To examine the effect of geopolitical risk on economic growth in Turkey.
- b) To examine inflation rate and economic growth nexus in Turkey.
- c) To ascertain the nature of effect of exchange rate volatility on economic growth in Turkey.

1.5 Hypothesis

The null hypothesis of the research work is stated as:

- a) $H_0 =$ There is no relationship between geopolitical risk and economic growth in Turkey.
- b) $H_0 =$ There is no relationship between inflation rate and economic growth in Turkey.
- c) $H_0 =$ There is no relationship between exchange rate and economic growth in Turkey.

1.6 Justification for the Study

It is an obvious that geopolitical risk, inflation rate, exchange rate and economic growth relationship is inexact, thereby opening doors for research works. Turkey is an emerging economy and achieving sustained and substantial growth is paramount

despite the influence of geopolitical risk, exchange rate volatility and high inflation rate.

There are several researches on inflation and economic growth among the emerging economies but there has been no unanimity on the relationship between the two macroeconomic variables. Similarly, no definite empirical relationship between exchange rate and economic growth has been established, it varies from one economy to another. It is only in theory we ascertained that exchange rate depreciation (fall in exchange rate) is capable of accelerating economic growth given the Marshall-Lerner condition and J-curve effect. It is only the relationship between geopolitical risk and economic growth that without doubt is established. The reason being that geopolitical risk decelerate growth irrespective of the level of development of such a country. Studying Turkish economy (being an emerging economy) in the light of the nature of geopolitical risk, exchange rate, inflation rate and economic growth relationship is the crux of this research work.

The measurement of geopolitical risk adopted justifies this research. Here, geopolitical risk index is adopted to cover its three dimensions that is economic, political and natural risks. And all these three dimensions deplete both foreign and domestic investment which in turn slows down economic growth.

In recent years, the growth rate of Turkish economy has been tremendous, qualifying the economy as part of the G20 as it is the 18th largest economy in the world. This study is justified by examining the influence of geopolitical risk, exchange rate and inflation rate on the growth process of Turkey. Similarly, geopolitical risk, exchange

rate, inflation rate and economic growth's short run and long run relationships are examined.

1.7 Scope of the Study

We think of geopolitical risk as emanating from three interconnected systems: (a) political, (b) economic, and (c) social. The most appropriate measuring approach for geopolitical risk is therefore index because it covers its three dimensions. So, in relation to geopolitical risk, this research covers its three aspects within the index that is adopted.

To allow for in-depth analysis of the nexus of macroeconomic variables in this research, 30 years of data is considered. That is, it represents a threshold above which the number of observations is no longer considered small. Therefore, 30 years of data covering 1987 to 2017 for geopolitical risk index, inflation rate, exchange rate and economic growth.

Similarly, if economic growth is described as rise in real GDP per capita emanating from expansion in production capacity, it would be inappropriate to adopt GDP per capita rather than real GDP per capita as a measure of economic growth.

1.8 Organization of the Study

This study is divided into five chapters. The first chapter is introduction which launches the reader into the intent of the research work. It consists of background to the study, statement of the problem, research question and objective of the study, justification for the study and scope of the study. The literature review is contained in chapter two where the various concepts and dimensions of variables embedded in the research work are clarified. The empirical and theoretical link between globalization

and poverty reduction are also reviewed in this chapter as well. The chapter three focuses on the methodology employed in this study. It describes the data source, models of the research work and estimation technique. The presentation and analysis of data and discussion of result are contained in chapter four, while conclusion and recommendations are in the last chapter.

Chapter 2

LITERATURE REVIEW

2.1 Economic Growth

Economic growth is synonymous to an increase in short run output of an economy. This is sometimes referred to as actual economic growth. Growth in this sense is propelled by increase in aggregate demand. Potential economic growth is a long run increase in output of an economy, sustained by expansion in production capacity of such an economy. Such an increase can be achieved as a result of a rise in the quantity and quality of factors of production. Hence, economic growth is described as the short run increase in an economy's output and a long run increase in production capacity of an economy's output. Denison (1962) insisted that economic growth is an increase in real GDP per capita that is an increase in national output per head that is measured at a constant price. Aptly put, economic growth is defined as an increase in real GDP per capita emanating from expansion in production capacity of an economy. This means economic growth is only genuine when rise in GDP is not the result of fall in the population nor rise in inflation rate, rather emanating from expansion in production capacity of an economy to produce more goods and services. And this is the importance of real GDP per capita in the definition of economic growth. With this fact, this research adopts real GDP per capita as a measure of economic growth.

2.2 Determinants of Economic Growth

Acemoglu (2009) separated economic determinants from non-economic determinants of economic growth. This research does not play down the importance of non-economic determinants (political and administrative systems, cultural and social factors, geography, government efficiency, institutions, and demography) in the growth process of a country, rather believe that they accentuate the economic determinants of growth. The economic determinants of growth include human resources, natural resources, capital accumulation and technology. An increase in all these factors (determinants) will effortlessly bring about economic growth.

The four wheels of growth (human resources, natural resources, capital accumulation and technology) can be grouped into two, that is, stock of capital (capital accumulation and technology) and labor (human resources and natural resources), which coincides with Solow neoclassical growth model using an aggregate production function:

$$Y = K^{\alpha} (AL)^{1-\alpha}$$

Where Y = Gross Domestic Product,

K = Stock of capital

L = Labor

A = Productivity of labor which grows at a rate that is exogenously.

The Solow neoclassical growth model is simplified into AK growth model which lends credence to output per worker as a major determinant of economic growth.

$$y = Ak^{\alpha}$$

Where k = output per worker (a function of amount of capital per worker).

By Solow neoclassical growth model, we mean a growth model in which there are diminishing returns to each factor of production but constant returns to scale to all the

factors of production. Here, long run economic growth is by an exogenous technological change.

2.3 Exchange Rate

International trade is impossible without an interplay of different national currencies. The foreign exchange rate is nothing more than the price of one currency in terms of another. The foreign exchange rate is determined in the foreign exchange market (floating exchange rate system), which is the market where different national currencies are exchanged for another.

Exchange rate is majorly determined market forces and government. Changes in demand for and supply of a currency will cause a change in the price of the currency in the case of floating exchange rate and will even put upward or downward pressure on a fixed exchange rate. Government may as well decide to alter a fixed exchange rate or influence an exchange rate within a managed float in order to achieve a macroeconomic aim. For instance, government may set a high exchange rate to reduce inflationary pressure.

2.4 Determination of Exchange Rates

Basically, exchange rate can be determined by market forces or government or combination of the two. A floating exchange rate is one determined by market forces. The price of the currency is determined by the relative strengths of the demand for and supply of the currency. While an increase in demand for the currency will at least put upward pressure on its value (currency appreciation), an increase in its supply will put downward pressure on its value (currency depreciation). In a fixed exchange rate system, the value of the currency is determined by the government. A reduction in the value of a fixed exchange rate to a lower level is known as currency devaluation. A

reevaluation occurs when the government raises the exchange rate to a new higher fixed rate. A major disadvantage of a fixed exchange rate is the need to keep reserve, so as to maintain the exchange rate fixed.

A hybrid of floating and fixed exchange rates is a managed float which involves a government allowing the exchange rate to be determined by market forces within a given band, which has upper and lower limits. If the exchange rate is within the limits, no action is necessarily taken. What necessitate government action is when the market forces set exchange rate below the lower limit or above the upper limit.

2.5 Inflation

An upward movement in the representative price index of goods and services is inflation. The implication of this definition is that inflation occurs when the general level of prices is rising. Inflation does not mean that every price is rising or that they are rising at the same rate. What it does mean is that, on average, prices are rising at a particular rate. One obvious implication of inflation is that, when price level increases, the value of money falls, which in turn plummets its purchasing power.

With Philip's curve, inflation deflates unemployment level and accelerates economic growth, but not all degrees of inflation will help accomplish this feat. A low and stable rate of 2% (creeping inflation) is generally regarded as normal because it encourages investment and accelerates economic growth. And this makes inflation to be necessary evil. On the other hand, hyperinflation is a continuous skyrocketing in prices to an unimaginable high level. This is often taken to be an inflation rate that exceeds 50% and above. This degree of inflation discourages investment, increases unemployment level and causes economic stagnation (Zimbabwe is a typical example, 2005-2010).

Today, inflation is calculated by using price indexes which means the weighted averages of prices of thousands of separate products. Consumer Price Index (CPI) is a measure cost of market basket of consumer goods and services relative to the cost of the bundle during a particular base year. GDP deflator which is a corollary measure adopts price of all of the different components of GDP (consumption, investment, government expenditure and net exports), which is a more comprehensive composite measure compared to CPI.

2.6 Geopolitical Risk

Geopolitics as a term is a product of several definitions, and over the time it has been employed to describe the practice of state control and competition for territory. Albeit, in recent times, power struggles among diverse set of agents including corporate entities, rebel groups, and political parties have also been classified as part of geopolitics. Owing to this fact, the contemporary use of the word "geopolitics" encompasses a distinct set of events with a wide range of unspecific effects, from terrorist attacks, climate change, Brexit and the Global Financial Crisis. To aptly define geopolitical risk, it is pertinent to identify situations in which the struggles among different agents over territories cannot be resolved peacefully and democratically. Accordingly, we define geopolitical risk as the risk associated with wars, terrorist acts, and tensions between states that affect the normal and peaceful course of international relations (Caldara, Dario and Matteo Iacoviello, 2018). Geopolitical risk is not only limited to the risk that these events materialize, but also the new risks associated with an escalation of existing events.

Geopolitical occurrences such as the US-Turkey, US-Russia, Russia-Ukraine, US-China, US-Saudi-Iran, Syrian, North Korean and Yemen conflicts as well as the

struggle for European fragmentation have raised concerns and called increased attention to the direct and indirect economic effects of geopolitical risks (Shahbaz *et al.*, 2018). Consequently, geopolitical risk is currently classified as one of the top five business threats in the world (PwC, 2018).

2.7 Economic Growth and Exchange Rate

“large current account deficit has been a major hinderance for achieving a sustainable growth in Turkey. Turkish economy is heavily dependent on imported inputs, being an emerging economy (Rostow’s stages of development). The investment in this economy is a function of foreign savings. The sensitivity of Turkish economic activity and prices to fluctuations in capital flows and international commodity prices is another vulnerability of the economy to exchange rate volatility. Hence, in this environment, exchange rate appears to be one of the key variables reflecting the conditions of the economy. In addition to unfavorable external position of the economy mentioned above, relatively high and unstable rate of inflation is one of the underlying factors responsible for exchange rate volatility, thereby putting economic agents in a position where their major economic decisions are more complicated” (Nazlı Toraganlı, Cihan Yalçın, 2012). The summary of this enunciation is that exchange rate plays a great role in growth process. And this happens through aggregate demand given the Marshall-Lerner condition and J-curve effect.

A fall in exchange rate (depreciation/devaluation) makes import dearer and export cheaper, thereby increasing net exports ($X - M$) which in turn raises aggregate demand. And a rise in aggregate demand is capable of accelerating actual economic growth. This process is only possible given the Marshall-Lerner condition which state that for a fall in exchange rate to reduce current account deficit or increase current

account surplus (increase in net exports), the sum of price elasticity of demand for export and import must be greater equal to or greater than unity and vice versa. Similarly, J-curve effect states that a fall in exchange rate will first worsens current account deficit (improves current account surplus) and later reduces current account deficit (reduces current account surplus). The rationale behind is that price elasticity of exports and imports are less elastic in the short run and more elastic in the long run. Aggregate demand analysis, Marshall-Lerner condition and J-curve effect ascertain that currency depreciation or devaluation is capable of accelerating economic growth over the long run. However, most emerging economies depend on imported inputs from other countries of the world to drive economies of which Turkey is not exempted. Hence, empirically, the relationship economic growth and exchange rate is without ambiguity.

2.8 Economic Growth and Inflation

Over the past 30 years, Turkey economy has not experienced hyperinflation but its inflation has been greater than the world average (Aykut Kibritçioğlu, 2004). The degree of inflation rate in Turkey has neither been hyperinflation nor creeping inflation. Over the years, the Turkish inflation rate has the consequence of budget deficit, monetization, huge military expenditures, political instability, exchange rate volatility etc.

Price stability is an important government macroeconomic aim and its barometer is inflation rate. “in general, price stability refers to a low and stable inflation rate that does not influence economic agents’ decisions in relation to investment, consumption, and saving as well as preferences. The crux of policy measure here is that general level of prices should be prevented from increasing or decreasing more than specific limit

values. Price stability is an impetus for ensuring economic and social stability in the medium and long term and assuring sustainable development. The conclusion here is that economic, political and social structures of a country may be adversely affected, if it fails to establish price stability in its economy” (Celil Aydın et al, 2016).

The relationship between economic growth and inflation is without direction. The reason being that growth-inflation relationship is determined by period, the country, and the inflation rate in consideration as well as the econometric method adopted. Though A. W. Philip established an inverse relationship between inflation rate and unemployment, it is just expedient to conclude that inflation accelerate economic growth. Modern economists have enunciated that it is not impossible for an economy to experience high inflation rate as well as high unemployment level (stagflation). The conclusion here is that high inflation rate decelerates economic growth.

2.9 Geopolitical Risk, Exchange Rate, Inflation and Economic Growth

Geopolitical risk is not only the main determinant of investment decisions only but also other economic decisions because it has the capacity to permanently or temporarily alter trade cycles, financial markets and economic directions (Balcilar, Bonato, Demirer, and Gupta, 2018). To infer that geopolitical risk is a major indicator of economic market reaction to shocks or volatility is not absurd, as pointed out by Das, Kannadhasan, and Bhattacharyya, 2019. The thought of contemporary economists that geopolitical risk changes market portfolio characterized by shocks resulting from sudden and large increase in risk is not without fact.

It is an established fact that shock and volatility whether temporary or permanent are the major impacts of geopolitical risk which in turn influence exchange rate, inflation and economic growth. The nexus among these variables is not specific. In addition, serial correlation among the variables is not impossible because a causal relationship between inflation and exchange rate just as geopolitical risk influences other variables in this model as well.

One would hardly find a research work that combines these crucial variables in a single model. As a matter of fact, geopolitical risk is a new phenomenon in the world of economics and its measurement began few years ago. Even its measurement is based on perception rather than being tied to any specific set of indicators because threat of adverse events or their realization has significant effect on geopolitical risk. Akadiri et al (2018) employed modified version of the Granger causality approach advanced by Toda and Yamamoto (1995) to examine the direction of causality among the newly introduced geopolitical risk index, tourism and economic growth in the case of Turkey and concluded that one standard deviation shock to geopolitical risk has an evident short- and long-run negative effect on tourism and economic growth. Tourism is an enormous branch of industry that drives Turkish economy. It employs more than 3 million people and as well provide foreign exchange earning worth of US\$20 billion, which means if geopolitical risk has negative impact on tourism, economic growth will also decelerate.

Aksoy (1982) on the other hand, aims to test the monetarist and structuralist theories of inflation by using Turkish annual data for the period of 1950 – 1979. His major conclusion is that the relationship between supply of money and price level is non-proportional, rather depends on both the inflationary expectations and the nature of

foreign exchange availability. In addition, he found an evidence that relative price shock works through supply of money rather than creating cost-push pressure. The empirical analysis of inflation in the Turkish economy according to Aksoy is an indication that geopolitical risk handwriting on the wall of inflation and exchange rate in this economy. Any shock or volatility created by geopolitical risk influences inflation rate and exchange rate. Though we ascertain that geopolitical risk is capable of skyrocketing inflation rate in Turkey if not properly checked, we cannot say the same thing for exchange rate because it casts doubt to the mind of every scholars and that is an evident relevance of this research work.

Chapter 3

RESEARCH METHODOLOGY

3.1 Data Source

A prominent variable in this model is geopolitical risk. Geopolitical risk is determined by many factors and to capture these determinants, a composite index is adopted. Caldara and Iacoviello (2016) are the first to constructively measure geopolitical risks using index constructed monthly. The index was created from searches of electronic archives of major newspapers for related word to geopolitical risk indicators such as: nuclear threats, war acts and terrorist acts, war threats and terrorist threats. Monthly counts of newspaper articles with these words are conducted. The 2000-09 decade is then set to a mean value of 100 via a normalization such that any value greater than 100 reflect higher level of geopolitical risks than those recorded in the 2000-09 decade, and any value lower than 100 is an indication of lower levels of geopolitical risk than those observed in the 2000–2009 decade.

Real GDP per capita is employed to capture economic growth. The purpose of this is to eliminate the influence of inflation rate on the income per head in Turkey. Any econometric model that does not capture labor productivity while estimating economic growth may give spurious result. According to Solow-growth model, labor productivity is vital in a growth model because output per worker is a major determinant of economic growth. Hence, labor productivity is employed in this model.

In addition, we employ gross fixed capital formation to proxy for domestic investment for ceteris paribus purpose and control for omitted variable bias.

$$RGDP_i = f(GR_i, INFLA_i, EXR_i, DI_i)$$

Where:

$RGDP_i$ = Real GDP per capita

GR_i = Geopolitical risk index

$INFLA_i$ = Inflation (Price Level)

EXR_i = Exchange rate

DI_i = Domestic investment

This model is log-linearized in the below equation to avoid heteroscedasticity and spurious result.

$$\ln RGDP_i = \beta_0 + \beta_1 \ln GR_i + \beta_2 \ln INFLA_i + \beta_3 \ln EXR_i + \beta_4 \ln DI_i + \varepsilon_i$$

3.2 Vector Autoregressive Model (VAR)

To achieve the objectives of this research work, this study adopts the use of the modified version of the Granger causality approach advanced by Toda and Yamamoto (1995) that generates robust and consistent causality Wald test statistic even when series are naturally integrated at level zero $I(0)$, integrated at first order $I(1)$ and/or mixed-order $I(0)/I(1)$. This approach to causality testing possesses more computational merits than the conventional causality testing. It is built on the vector regressive (VAR) structure $(k + dmax)$, where k is the optimum order in the VAR system. The $dmax$ on the other hand, is the optimum order of integration. For this study, we specified Toda and Yamamoto as follow in Eqs.

3.3 Unit Root Test

The assumptions of the Classical Linear Regression Model (CLRM) require that both y_t and x_t to have a zero and constant variance (that is stationary). In the existence of

non-stationarity then the results obtained from a regression of this kind are totally spurious and these regressions are called spurious regressions.

Most macroeconomic time series are in form of trend, therefore in most cases are non-stationary. The challenge with data that not stationary is that they cannot be estimated using standard OLS regression, if not the procedures can easily lead to incorrect conclusions. If OLS regression is employed on non-stationary data, though it will produce very high values of R^2 and very high values of t-ratios while the variables used in the analysis would still establish no precise interrelationships.

The Augmented Dickey-Fuller (ADF) is adopted to test for unit roots for all the variables captured in this model. The distribution theory supporting the Dickey-Fuller tests is based on the assumption that the error terms are statistically independent and have a constant variance, thereby eliminating non-stationarity in the data. Hence, ADF methodology ensures that the error terms are uncorrelated and that they really have a constant variance.

For this purpose, this study carried out time series unit root tests using the Augmented Dickey and Fuller (1979) popularly called ADF unit root test and the Kwiatkowski-Phillips-Schmidt-Shin (1992) popularly called KPSS unit root test as confirmatory unit root test for sound empirical analysis. The ADF (1979) unit root test is specified under the null hypothesis of the presence of unit root against its alternative hypothesis of stationarity. In addition, the ADF (1979) had been argued to suffer power loss, thus most researchers do carry out KPSS (1992) unit root test which has an opposite unit root test specifications. Therefore, KPSS (1992) serves as a confirmatory unit root test.

Besides, the rejection of a null hypothesis indicates absence of a unit root and by implication we can conclude that such variable(s) is stable either at a level or first difference. It is paramount to note that, when a variable is stationary at level, this indicate an existence of a natural cointegration, otherwise such a variable would be differenced (either first or second) in order to achieve stationarity properties of such variables for a reliable, sound and robust policy implications. However, the reverse is the case when dealing with KPSS (1992). In a nutshell, time series can either be stationary at level $I(0)$, first difference $I(1)$ i.e., integration at first order, or partially integrated $I(0), I(1)$.

3.4 Cointegration and the Error-Correction Mechanism: Granger Causality Test

A spurious regression usually has a very high coefficient of determination (R^2), t statistics which seems to provide significant estimates, but the results may give no economic meaning whatsoever. The reason being that the OLS estimates may not be consistent, and therefore the tests of statistical inference are invalid. One way to solve this is to take the difference of the data in order to ensure stationarity of our variables (this brings in Vector Autoregressive Model). With this, correct parameters of estimates are obtained and the spurious equation problem is resolved. However, what we have obtained is only short run relationship between the two variables which give no information about the long run behavior of our model. In order to establish these long run relationships (which is the main interest of economists) among these variables cointegration and ECM are employed.

Granger causality test is a form of cointegration test introduced by Granger in 1981 to show a link between non-stationary processes and the concept of long run equilibrium

worthy of notice. Engle and Granger in 1987 further formalized this concept by introducing a very simple test for the existence of cointegration (that is long run equilibrium) relationships. By definition, cointegration requires that the variables be integrated of the same order. Thus, the first step is to test each variable to determine its order of integration. The Augmented Dickey-Fuller tests can be applied in order to infer the number of unit root in each of the variables.

Chapter 4

RESULTS AND EMPIRICAL DISCUSSION

4.1 Descriptive Statistics

In this section we report the results and embark on empirical discussions. For sound and reliable economic analysis of the variables under observations, we started with the descriptive summary statistics as reported in Table 1. The descriptive statistics reported the mean, the median, maximum and the minimum data values, the standard deviation, Skewness, Kurtosis and Jarque-Bera respectively.

One important descriptive statistic test in Table 1 is the Jarque-Bera statistic. The JB test as popularly called is often in econometric analysis used to conduct normality test. This test is specified under the null hypothesis that the variable(s) under consideration is not normally distributed against its alternative hypothesis of normal distribution. Thus, if the probability value (p -value) is less than significance values that is, at a ($p < 0.01$), ($p < 0.05$) and ($p < 0.10$) then we accept the null hypothesis and conclude that, the variable(s) is non-linear in nature, and vice versa. The purpose of carrying out the normality is to avoid the problem of having spurious regression analysis. In a situation, whereby variables follows non-linear relationship and are force under linear assumption, this might render such policy suggestions inferred from such estimations useless and unreliable. Thus, based on the insignificance of the p -value as reported in Table 1 for all the variables under observation, we conclude that the variable(s) follow

normal distribution pattern as we reject the null hypothesis of an existence of a non-linear relationships among variables.

Table 1: Descriptive Statistics

Mean	9276.487	111.371	39.229	90.340	1.500
Median	8241.176	100.177	36.732	89.220	1.040
Maximum	15068.98	176.116	105.215	115.838	3.530
Minimum	5659.395	70.202	6.250	65.993	5.460
Std. Dev.	2765.931	30.709	31.315	13.644	9.690
Skewness	0.695	0.570	0.390	0.001	0.838
Kurtosis	2.295	2.137	1.744	1.917	2.348
Jarque-Bera	3.443	2.894	3.096	1.659	4.583
Probability	0.178	0.235	0.212	0.436	0.101
Sum	315400.6	3786.618	1333.789	3071.585	5.120
Sum Sq. Dev.	2.52E+08	31121.05	32361.89	6144.108	3.100
Observations	34	34	34	34	34

Source: Authors Computation

4.2 Unit Root Test Results

In conducting time series econometric analysis, it is paramount to conduct pre-estimation analysis via unit root test. This is crucial, as it will help researcher to know the stationarity properties of the variable(s) under observation. In addition, the test is used to determine whether trending time series variable(s) should be regressed on the deterministic function of time or first differenced in order to render such variable(s) stable (stationary) or not.

As discussed earlier in chapter 3 of this study that in empirical analysis, a unit root test is usually conducted to examine whether time series variable(s) is not stable (non-stationary) and thus have a unit root. It is paramount to state here that, the decision whether a series is non-stationary or stationary depends on the rejection/acceptance of the null hypothesis. The non-rejection of the null hypothesis under the unit root test is

often specified as an existence of a unit root among the variable(s) this is against the alternative hypothesis which is either specified as stationary, explosive root and trend stationary depending on the nature of the test conducted.

For this purpose, this study carried out time series unit root tests using the Augmented Dickey and Fuller (1979) popularly called ADF unit root test and the Kwiatkowski-Phillips-Schmidt-Shin (1992) popularly called KPSS unit root test as confirmatory unit root test for sound empirical analysis. The ADF (1979) unit root test is specified under the null hypothesis of the presence of unit root against its alternative hypothesis of stationarity. In addition, the ADF (1979) had been argued to suffer power loss, thus most researchers do carry out KPSS (1992) unit root test which has an opposite unit root test specifications. Therefore, KPSS (1992) serves as a confirmatory unit root test. Besides, the rejection of a null hypothesis indicates absence of a unit root and by implication we can conclude that such variable(s) is stable either at a level or first difference. It is paramount to note that, when a variable is stationary at level, this indicate an existence of a natural cointegration, otherwise such a variable would be differenced (either first or second) in order to achieve stationarity properties of such variables for a reliable, sound and robust policy implications. However, the reverse is the case when dealing with KPSS (1992). In a nutshell, time series can either be stationary at level $I(0)$, first difference $I(1)$ i.e., integration at first order, or partially integrated $I(0), I(1)$.

Based on the result reported in Table 2, all the series, except geopolitical risk are stationary at first difference. That is, we could not reject the null hypothesis of a unit root at levels for real GDP, inflation, gross fixed capital formation and exchange rate

at all significance levels respectively. Thus, we conclude that, the variables are partially integrated, that is, the series are of mixed order.

Table 2: Unit Root Test Results

ADF	Level	First Difference
RGDP	1.386 (0.998)	-5.205*** (0.000)
INF	-0.924 (0.767)	-5.581*** (0.000)
GPR	-3.301*** (0.022)	-5.828*** (0.000)
GFCF	1.165 (0.997)	-5.024*** (0.000)
EXR	-1.718 (0.413)	-6.539*** (0.000)
KPSS		
RGDP	1.386*** (0.998)	-5.205 (0.000)
INF	-0.924*** (0.767)	-5.581 (0.000)
GPR	-3.301*** (0.022)	-5.828 (0.000)
GFCF	1.165*** (0.997)	-5.024 (0.000)
EXR	-1.718*** (0.413)	-6.539 (0.000)

4.3 ARDL and Bounds Testing Estimation Results

Having confirmed the integration order of the series under investigation, econometric approach of Autoregressive Distributed Lag (ARDL) Bounds testing model becomes the appropriate estimation technique to be adopted. The ARDL Bounds testing model as popularly called is suitable for time series that are either integrated at first differenced or partially integrated. In addition, it provides short-run and long run estimates for sound and reliable empirical analysis.

On the other hand, the ARDL bound testing model produces unique bound testing cointegration coefficient. The generated cointegration coefficient is crucial to examine potential co-movement of the variable(s) under observation. Thus, an existence of a cointegration relationships, indicate that, even if the series wandered in the short-run, they would converge towards a steady state equilibrium path in the long run, which is essential for sound policy recommendations. Furthermore, it is paramount for time

series variables to possess cointegration equilibrium relationships in the long run. Lastly, the ARDL Bounds testing approach generate lower and upper confidence intervals statistics at a 1%, 2.5% 5%, and 10% levels. The decision whether there is an existence of a cointegration relationship or not depends on the relationship between the F-Bound test statistic and these critical values. If the F-Bound test statistics fall outside the bound (i.e. confidence interval) then we conclude that, there is an existence of a cointegration relationship among the series and vice versa.

Results as reported in Table 3 shows that, there is an existence of a cointegration equilibrium relationship among the series in the long run. This conclusion of is made based on the rejection of a null hypothesis of the F-Bounds test statistic. The F-Bound test statistic of 21.350 as reported in Table 3. We observed that, the F-Bounds test statistic as reported below fall outside the bounds and confidence interval. Thus, we are of the opinion that cointegration relationship exists among the variables under observation.

Table 3: Bound Testing Results

F-Bounds Test			Null Hypothesis: No levels relationship	
Test-	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	21.350	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: *author computation*

Having substantiated the cointegration equilibrium relationship among the time series under observation, we proceeded with the ARDL economic growth model as reported in Table 4. The purpose of this estimation is to show the impact of geopolitical risk,

exchange rate and inflation on economic growth in the case of Turkey. ARDL estimates would reveal the sign and magnitude of the relationships that exist between the dependent variable for this analysis, economic growth and its explanatory variables. For ceteris paribus purpose and sound empirical analysis, we employed gross fixed capital formation as a control variable, in order to adjust for the omitted variable bias issue mostly encounter in econometric models, while for sensitivity analysis we employed foreign direct investment.

Table 4: ARDL Economic Growth Estimation (1, 0, 0, 0, 0) Model.

Variable	Coeff.	p-Value
Short-run		
<i>LNGPR</i> **	0.031	0.135
<i>LNINFLA</i> **	-0.028***	0.000
<i>LNEXR</i> **	-0.134***	0.004
<i>LNGFCF</i> **	0.214***	0.000
<i>LNFDI</i> **	-5.00E-05	0.995
Adjustment Coeff	-0.541***	0.000
Long-run		
<i>LNGPR</i>	0.057	0.125
<i>LNINFLA</i>	-0.052***	0.000
<i>LNEXR</i>	-0.248***	0.001
<i>LNGFCF</i>	0.396***	0.000
<i>LNFDI</i>		
R2	0.992	
Log-Likelihood	76.585	
Dub-Watson	2.251	

Note: Variables are significant at *** 0.01 significance level. The estimation are conducted considering automatic selection. Model selection followed AIC.

Results as reported in Table 4 reported the short-run estimates for the ARDL Bounds testing model at the upper part of Table 4, while the long-run estimates are reported at the lower parts of Table 4. Following these results, it was observed that, geopolitical risk index have a positive but insignificant impact on economic growth of Turkey both in the short-run and long run respectively. In addition, we observe that inflation have

a negative and significant impact on economic growth in the case of Turkey. Results as reported in Table 4 although with a strong relationship between economic growth and inflation rate show that a 1% increase in inflation rate would decrease economic growth by 0.028% and 0.052% in the short- and long run at a ($p < 0.01$) significance level, with a huge impact in the long run. This is an indication that, the economy of Turkey is not insulated from the adverse impact of inflationary pressure on economic performance. Thus, fluctuation in prices does have a significant impact on the economy both in the short-run and long run.

In addition, results also show that exchange rate and gross fixed capital formation proxied for domestic investment had significant impact on economic growth in the case of Turkey. Results as reported in Table 4 although with a strong relationship between economic growth and exchange rate show that a 1% increase in exchange rate would decrease economic growth by 0.134.% and 0.248% in the short- and long run at a ($p < 0.01$) significance level, with a huge impact in the long run. As exchange rate increases, Turkish Lira depreciates. It is expected that as Turkish Lira depreciates, there should be increase in demand for Turkey products with trading partners, thus increase in export. However, this is not the case in Turkey as the emerging economy is not developed enough to gain from currency devaluation. Similarly, it appears depreciation of Turkish Lira does not necessarily decrease demand for foreign goods. Due to the nature of Turkish economy, as Turkish Lira depreciate via increase in exchange rate, this leads to decrease in output and thus decrease in economic growth. It appears depreciation of Turkish Lira had no economic role to play on the economy of Turkey as reported in economic literature.

Interesting, we observed that domestic investment exercise a strong positive and statistically significant impact on economic growth in the case of Turkey. Results show that, a 1% increase in domestic investment lead to 0.214% increase in the short-run and 0.396% increase in the long run, with huge impact in the long run. This is an indication that, domestic investment has strong and significant impact on economic growth of Turkey. Thus, policymakers in charge of designing, formulating and executing investment policy in the region should pay more attention to the enhancement of domestic investment. SMEs should be improved and encourage, while access to business loan for locals should be embraced for sustainable economic growth both in the short- and long run, while FDI have no significant impact on economic growth both in the short- and long-run respectively. Lastly, the speed of adjustment is also significant at a ($p < 0.01$). This indicate that deviation from the long-run path is corrected 54% annually.

Conclusively, based on the empirical results, we are of the opinion that an increase and/or decrease in geopolitical risk index and inflation have no impacts on economic growth in the case of Turkey. It appears economic growth/development of Turkey is immune to geopolitical risk and fluctuation in price level. Consequently, policymakers should pay more attention to pressing growth determinants that such as increase in general price level, exchange rate and domestic investment for a rapid and sustainable economic growth both in the short-run and long run respectively.

Table 5: Diagnostic Test Results

Test	Coefficient/p-Value
Breusch-Godfrey Serial Correlation	1.435 (0.257)
Heteroscedasticity	0.867 (0.515)
Normality	0.809 (0.667)

Table 5 reports results for sensitivity check carried out. This is done to check whether our model is reliable and robust for policy recommendations or not. In order to achieve this purpose we test whether the specified economic growth model is free from serial correlation problem, heteroscedasticity and that the model is normally distributed. Interestingly, the insignificance of the diagnostic tests conducted as reported in Table 5, indicate that, the model is not suffering from serial correlation issue, model is homoscedastic and follow normal distribution pattern.

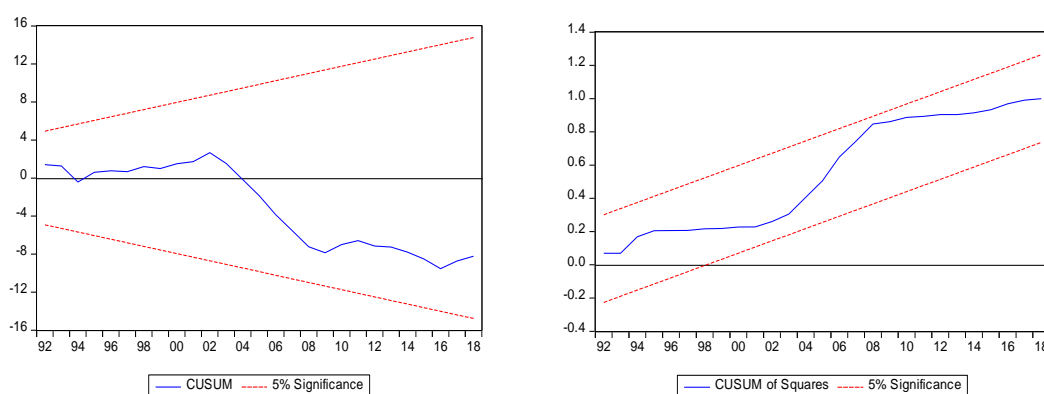


Figure 1: CUSUM and CUMUM_squared plots (stability test).

In addition, we conduct the stability test via the CUSUM and CUMUM_squared plots as shown in Figure 1. As observed in the plots, the tick blue lines falls in-between the 5% confidence intervals for both CUSUM and CUMUM_squared plots indicating that the economic growth model specified for this analysis is sound, robust, stable and that the estimated coefficients obtained are consistent. Consequently, the model is appropriate for policy recommendations.

4.4 Granger Causality Test Results

Having carried out the sensitive check of the specified model, we proceed with the predictive test. The Granger causality approach adopted for this model is as suggested by Toda and Yamamoto (1995). Like the ARDL Bound testing model that

accommodate partially integrated time series variables, Toda and Yamamoto (1995) Granger causality test approach is also robust whether the series are stationary at level $I(0)$, first difference $I(1)$ i.e., integration at first order, or partially integrated $I(0)$, $I(1)$. Thus, we adopted this causality methodology based on the partially integrated properties observed from the unit root test conducted.

Results as reported in Table 6 indicate a unidirectional causality running from inflation to economic growth at a ($p < 0.01$) significance level, from exchange rate to economic growth at a ($p < 0.10$) significance level and from domestic investment (gross fixed capital formation) to economic growth at a ($p < 0.10$) significance level respectively. These results indicate that inflation, exchange rate and domestic investment are useful predictor of economic growth. That is, inflation, exchange rate and domestic investment have predictive power on economic growth. Thus, it will be theoretically right to infer that, an increase and/or decrease in inflation, exchange rate and domestic investment influences increase and/or decrease in economic growth in the case of Turkey.

Table 6: Granger non-Causality Results (Toda & Yamamoto, 1995).

Null Hypothesis	Chi-sq.	P-value	Causality	Direction
$RGDP \rightarrow INFLA$	4.145	0.125	No	...
$INFLA \rightarrow RGDP$	9.226***	0.009	Yes	Uni.-
$RGDP \rightarrow GFCF$	2.410	0.299	No	...
$GFCF \rightarrow RGDP$	5.192*	0.075	Yes	Uni.-
$INFLA \rightarrow GFCF$	6.258*	0.073	Yes	...
$GFCF \rightarrow INFLA$	4.999*	0.082	Yes	Bi-
$INFLA \rightarrow GPR$	0.644	0.706	No	...
$GPR \rightarrow INFLA$	0.575	0.749	No	Neutral-
$INFLA \rightarrow EXR$	0.647	0.723	No	...
$EXR \rightarrow INFLA$	2.241	0.326	No	Neutral-
$GPR \rightarrow GFCF$	1.080	0.582	No	...
$GFCF \rightarrow GPR$	0.989	0.609	No	Neutral-
$GPR \rightarrow EXR$	0.536	0.764	No
$EXR \rightarrow GPR$	3.554	0.169	No	Neutral-
$GFCF \rightarrow EXR$	2.970	0.226	No
$EXR \rightarrow GFCF$	3.417	0.181	No	Neutral-
$RGDP \rightarrow EXR$	3.461	0.177	No
$EXR \rightarrow RGDP$	4.714*	0.094	Yes	Uni.-
$RGDP \rightarrow GPR$	0.428	0.806	No
$GPR \rightarrow RGDP$	0.291	0.864	No	Neutral-

The \rightarrow indicates non-Granger causality among variables. Causality are found *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.10$ significance level.

However, we found neutrality hypothesis between economic growth and geopolitical risk index. This indicate that, geopolitical risk index does not necessarily

influence/predict economic growth and vice versa. In an economy where there is a proper plan to absorb both internal and external shock to economic growth, increase or decrease in geopolitical risk index may not have any significant impact on economic growth, while increase in economic growth of such nation may not necessarily influence or attract geopolitical risk.

Furthermore, results as reported in Table 6 also show a bidirectional causality relationship between inflation and domestic investment at a ($p < 0.10$) significance level. This implies that, inflation have predictive power on domestic investment and vice versa. Thus, increase and/or decrease in the level of inflation would decrease and/or increase domestic investment. On the other hand, we found neutrality hypothesis between inflation and geopolitical risk index and between inflation and exchange rate. These results indicate that inflation does not necessarily predict changes in exchange rate and geopolitical risk index and vice versa.

Lastly, we found neutrality hypothesis between geopolitical risk index and exchange rate, between geopolitical risk index and domestic investment, and between exchange rate and domestic investment respectively. This implies that, geopolitical risk index does not necessarily influence or predict changes in domestic investment/exchange rate and vice versa. Thus, increase and/or decrease in geopolitical risk index would not have significant impacts on domestic investment and exchange rate in the case of Turkey. On the other hand, we also found neutrality hypothesis between exchange rate and domestic investment. These results indicate that changes in exchange rate does not necessarily predict changes in domestic investment and vice versa.

Chapter 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

In this study, we examine the impact of geopolitical risk index, inflation and exchange rate on economic growth in the case of Turkey. The geopolitical risk, inflation, exchange rate and economic growth nexus is not without ambiguity. Based on this proposition, this study investigate whether changes in geopolitical risk index, inflation and exchange rate would have significant impact on economic growth in the case of Turkey or not. We are of the opinion that increase/decrease in geopolitical risk index, inflation and exchange rate might influence changes in economic growth. In order to achieve study objective and provide answers to this study research questions as stated in chapter 1, we employ annual frequency data sourced from World Bank Development (*online*) over the periods of 1985-2018, using Autoregressive Distributed Lag model for estimates and Toda and Yamamoto (1995) for Granger non-causality analysis. In addition, we employ gross fixed capital formation to proxy for domestic investment for *ceteris paribus* purpose and control for omitted variable bias.

Going by the impact of inflation in an economy whether developed, developing and emerging economies, one would expect that, increase in the level of inflation is capable of enhancing unemployment level. The experience of certain economies has made modern economists to introduce stagflation which shows that the coexistence of high inflation rate and high unemployment level is not impossible. Hence high rate of

inflation would rather stagnate an economy than make it grow. In recent time, the inflation rate in Turkey is well over 20% according to World Bank (2019).

Theoretically, a decline in exchange rate reduces import thereby increasing net export, which automatically raises aggregate demand, hence accelerating economic growth. Rodrik (2008) particularly maintains that the connections between undervalued RER and growth are largely positive in emerging economies (like Turkey).

On the other hand, theoretical perspectives varies ranging from nonexistence of any relationship connecting these variables, to a direct relationship, and even to an indirect one. Turkish economy is highly sensitive to the exchange rates because Turkish economy was transformed in a way that it has started to use more imported inputs in the production activity especially in 2000s. Finally, since independence, Turkey has introduced a number of policies, program and projects to accelerate economic growth and ensure economic stability. However, it seems much has not be benefitted from these policies.

Finally, empirical results show that an increase and/or decrease in geopolitical risk index and inflation have no impacts on economic growth in the case of Turkey. It appears economic growth/development of Turkey is immune to geopolitical risk and fluctuation in price level. Consequently, policymakers should pay more attention to pressing growth determinants that such as general increase in price level, exchange rate and domestic investment for a rapid and sustainable economic growth both in the short-run and long run respectively.

5.2 Recommendations

First, from a policy standpoints, we are of the opinion that in pursuance of sound and reliable policies for rapid and sustainable economic growth of Turkey, the governments, policymakers and private individuals should continue to promote an all-inclusive economic policies and strategic sustainable economic development policies that has been put in place to minimize, manage and control both internal and external shocks associated with geopolitical risks that might influence economic activities, delay production and trigger unfavorable outcomes in economic performance.

Second, there is a need for policymakers to encourage SMEs as it contribute extensively to the economic growth of Turkey. Access to loan facilities and encouragement of women participation in agriculture and small retail business would go a long way in promoting economic growth and development of the region.

Lastly, it appears the economy of Turkey need to put in place sound and efficient pricing system. Price regulation is one of the macroeconomic objectives and government or monetary authorities would work to achieve and the efforts of the Turkish policymakers and government appears to have not done enough in regulating prices and thus curb the impact of inflation on Turkish economy. This is displaced in the effort put in place by the government of Turkey to curtailed excessive increase in prices of goods and services during the era of devastating Turkish Lira devaluation that recently occurred. Although, we observed that the government of Turkey was able to regulate prices in such a way that the effect of the devaluation was minimally felt by its citizen.

REFERENCES

- Adams, K. M. (2001). Danger-zone tourism: Prospects and problems for tourism in tumultuous times. In: P. Teo, T. C. Chang, & K. C. Ho (Eds.), *Interconnected Worlds: Tourism in Southeast Asia*, Oxford: Pergamon, pp. 265-281.
- Achouak B., Ousama S., Mourad Z. (2018). Exchange rate volatility and economic growth: *Journal of economic integration* Vol.33 No.2.
- Agiomirgianakis, G., Serenis, D., & Tsounis, N. (2017). Effective timing of tourism policy: The case of Singapore. *Economic Modelling*, 60, 29-38.
- Akadiri, S. S., Lasisi, T. T., Uzuner, G., & Akadiri, A. C. (2018). Examining the causal impacts of tourism, globalization, economic growth and carbon emissions in tourism island territories: Bootstrap panel Granger causality analysis. *Current Issues in Tourism*, 1-15. doi: 10.1080/13683500.2018.1539067
- Antonakakis, N., Gupta, R., Kollias, C., & Papadamou, S. (2017). Geopolitical risks and the oil-stock nexus over 1899–2016. *Finance Research Letters*, 23, 165-173.
- Balcilar, M., Bonato, M., Demirer, R., & Gupta, R. (2018). Geopolitical risks and stock market dynamics of the BRICS. *Economic Systems*, 42(2), 295-306.

- Balli, F., Uddin, G. S., & Shahzad, S. J. H. (2019). Geopolitical risk and tourism demand in emerging economies. *Tourism Economics*, 1-9. doi: 10.1177/1354816619831824
- Bassil, C., Saleh, A. S., & Anwar, S. (2019). Terrorism and tourism demand: A case study of Lebanon, Turkey and Israel. *Current Issues in Tourism*, 22(1), 50-70.
- Bohl D. K., Taylor L. H., (2017). *Understanding and Forecasting Geopolitical Risk and Benefits*: Pardee Centre for International futures, University of Denver.
- Breusch, T. S., & Pagan, A. R. (1980). The Lagrange multiplier test and its applications to model specification in econometrics. *The Review of Economic Studies*, 47(1), 239-253.
- Caldara, D., & Iacoviello, M. (2018). *Measuring Geopolitical Risk*. International Finance Discussion Paper No.1222, Board of Governors of the Federal Reserve System.
- Das, D., Kannadhasan, M., & Bhattacharyya, M. (2019). Do the emerging stock markets react to international economic policy uncertainty, geopolitical risk and financial stress alike? *The North American Journal of Economics and Finance*, 48, 1-19.
- Divisekera, S. (2003). A model of demand for international tourism. *Annals of Tourism Research*, 30(1), 31-49.

- Drakos, K., & Kallandranis, C. (2015). A note on the effect of terrorism on economic sentiment. *Defence and Peace Economics*, 26(6), 600-608.
- Eberhardt, M., & Teal, F. (2010). *Productivity Analysis in Global Manufacturing Production*. Economics Series Working Paper No. 515, Department of Economics.
- Enders, W., & Sandler, T. (1996). Terrorism and foreign direct investment in Spain and Greece. *Kyklos*, 49(3), 331–352.
- Fahimi, A., Saint Akadiri, S., Seraj, M., & Akadiri, A. C. (2018). Testing the role of tourism and human capital development in economic growth. A panel causality study of micro states. *Tourism Management Perspectives*, 28, 62–70.
- Gil-Alana, L. A., Mudida, R., & de Gracia, F. P. (2014). Persistence, long memory and seasonality in Kenyan tourism series. *Annals of Tourism Research*, 46, 89–101.
- Katircioglu, S. T. (2009). Revisiting the tourism-led-growth hypothesis for Turkey using the bounds test and Johansen approach for cointegration. *Tourism Management*, 30(1), 17–20.
- Kwiatkowski, D., Phillips, P. C., Schmidt, P., & Shin, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root? *Journal of Econometrics*, 54(1–3), 159–178.

- Lanouar, C., & Goaid, M. (2019). Tourism, terrorism and political violence in Tunisia: Evidence from Markov-switching models. *Tourism Management*, 70, 404–418.
- Liu, A., & Pratt, S. (2017). Tourism's vulnerability and resilience to terrorism. *Tourism Management*, 60, 404–417.
- Liu, H., & Song, H. (2018). New evidence of dynamic links between tourism and economic growth based on mixed-frequency granger causality tests. *Journal of Travel Research*, 57(7), 899–907.
- Lutkepohl, H. (2006). Structural vector autoregressive analysis for cointegrated variables. *Allgemeines Statistisches Archiv*, 90(1), 75–88.
- Omar, A. M., Wisniewski, T. P., & Nolte, S. (2017). Diversifying away the risk of war and cross-border political crisis. *Energy Economics*, 64, 494–510.
- Perles-Ribes, J. F., Ramon-Rodriguez, A. B., Moreno-Izquierdo, L., & Torregrosa Marti, M. T. (2018). Winners and losers in the Arab uprisings: A mediterranean tourism perspective. *Current Issues in Tourism*, 21(16), 1810–1829.
- Roudi, S., Arasli, H., & Akadiri, S. S. (2018). New insights into an old issue—examining the influence of tourism on economic growth: Evidence from selected small island developing states. *Current Issues in Tourism*, 1–21.

- Saha, S., Su, J. J., & Campbell, N. (2017). Does political and economic freedom matter for inbound tourism? A cross-national panel data estimation. *Journal of Travel Research*, 56(2), 221–234.
- Sandler, T., & Siqueira, K. (2006). Global terrorism: Deterrence versus pre-emption. *Canadian Journal of Economics/Revue canadienne d'économique*, 39(4), 1370–1387.
- Sonmez, S. F. (1998). Tourism, terrorism, and political instability. *Annals of Tourism Research*, 25(2), 416–456.
- S.S. Akadiri, et al. (2019) Does causality between geopolitical risk, tourism and economic growth matter? Evidence from Turkey. *Journal of Hospitality and Tourism Management*
- Tekin, E. (2015). The impacts of political and economic uncertainties on the tourism industry in Turkey. *Mediterranean Journal of Social Sciences*, 6(2 S5), 265.
- Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics*, 66(1–2), 225–250.
- Wu, T. P., & Wu, H. C. (2019). The link between tourism activities and economic growth: Evidence from China's provinces. *Tourism and Hospitality Research*, 19(1), 3–14.