

**REPUBLIC OF TURKEY
ISTANBUL GELISIM UNIVERSITY
INSTITUTE OF GRADUATE STUDIES**

Department of Economics and Finance

**THE IMPACT OF INFLATION ON ECONOMIC
GROWTH – THE CASE OF TURKEY**

Master Thesis

AZZAM ABDULLAH HASAN AIDAROS

Supervisor

Asst. Prof. Dr. BASAK OZARSLAN DOGAN

Istanbul – 2023

THESIS INTRODUCTION FORM

Name and Surname : AZZAM ABDULLAH HASAN AIDAROS

Language of the Thesis : English

Name of the Thesis : The Impact of Inflation on Economic Growth – The Case of Turkey

Institute : Istanbul Gelisim University Institute of Graduate Studies

Department : Economics and Finance

Thesis Type : Master

Date of the Thesis : 19/10/2023

Page Number : 60

Thesis Supervisors : Asst. Prof. Dr. BASAK OZARSLAN DOGAN

Index Terms : Inflation, Capital, Labour, World Uncertainty Index, Economic Growth, ARDL Boundary Test

Turkish Abstract : Bu çalışmanın temel amacı, Türkiye'de 1990–2022 döneminde enflasyon oranının Türkiye'nin ekonomik büyümesi üzerindeki etkilerini ARDL sınır testi aracılığıyla ampirik olarak incelemektir.

Distribution List : 1. To the Institute of Graduate Studies of Istanbul Gelisim University
2. To the National Thesis Center of YÖK (Higher Education Council)

Signature

AZZAM ABDULLAH HASAN AIDAROS

**REPUBLIC OF TURKEY
ISTANBUL GELISIM UNIVERSITY
INSTITUTE OF GRADUATE STUDIES**

Department of Economics and Finance

**THE IMPACT OF INFLATION ON ECONOMIC
GROWTH – THE CASE OF TURKEY**

Master Thesis

AZZAM ABDULLAH HASAN AIDAROS

Supervisor

Asst. Prof. Dr. BASAK OZARSLAN DOGAN

Istanbul – 2023

DECLARATION

I hereby declare that in the preparation of this thesis, scientific ethical rules have been followed, the works of other persons have been referenced in accordance with the scientific norms if used, there is no falsification in the used data, any part of the thesis has not been submitted to this university or any other university as another thesis.

AZZAM ABDULLAH HASAN AIDAROS

... / ... / 2023



TO ISTANBUL GELISIM UNIVERSITY
THE DIRECTORATE OF GRADUATE EDUCATION INSTITUTE

The thesis study of Azzam Abdullah Hasan AIDAROS titled as The Impact Of Inflation On Economic Growth –The Case Of Turkey has been accepted as MASTER in the department of Economics and Finance by out jury.

Director

Asst. Prof. Dr. Basak OZARSLAN DOGAN

(Supervisor)

Member

Asst. Prof. Dr. Sukran KAHVECI

Member

Asst. Prof. Dr. Mehmet DINC

APPROVAL

I approve that the signatures above signatures belong to the aforementioned faculty members.

... / ... / 20..

Prof. Dr. Izzet GUMUS

Director of the Institute

SUMMARY

Inflation is a serious threat to the Turkish economy. Inflation, one of the main macroeconomic problems, plays a critical role in affecting the economic success of a country. The main purpose of this study is to empirically examine the effects of the inflation rate on Turkey's economic growth for the period 1990–2022 in Turkey through the ARDL bounds test. The results of the analysis show that inflation, measured by consumer prices, has a positive and significant long-term effect on economic growth. However, when the square of inflation is used as a regressor, its effect becomes negative and statistically significant as well. This confirms an inverted U-shaped relationship between economic growth and inflation. Other variables thought to impact economic growth in the study include the labour force, capital-to-GDP ratio, and the world uncertainty index. It has been concluded that the labour force and capital have a positive effect on economic growth in the long run; however, the coefficient of the labour force is statistically insignificant. Meanwhile, the world uncertainty index significantly hampers long-term economic growth. The error correction model (ECM) reveals that both inflation and the labour force have a beneficial impact on Turkish economic progress in the short run. In addition, according to the diagnostic test statistics performed in the study, the model was found to be stable without serial correlation or changing variance problems. The findings show that controlling inflation, managing capital-to-GDP ratio effectively, addressing global uncertainty, and considering the role of the labour force are crucial in policy makers' efforts to promote sustainable economic growth. These results provide policy makers with important information to design effective strategies and policies to promote economic growth in Turkey.

Key Words: Inflation, Capital, Labour, World Uncertainty Index, Economic Growth, ARDL Boundary Test

ÖZET

Enflasyon Türkiye ekonomisi için ciddi bir tehdittir. Temel makroekonomik sorunlardan biri olan enflasyon, bir ülkenin ekonomik başarısını etkilemede kritik bir rol oynamaktadır. Bu çalışmanın temel amacı, Türkiye'de 1990–2022 döneminde enflasyon oranının Türkiye'nin ekonomik büyümesi üzerindeki etkilerini ARDL sınır testi aracılığıyla ampirik olarak incelemektir. Analiz sonuçları, tüketici fiyatlarıyla ölçülen enflasyonun ekonomik büyüme üzerinde uzun vadede pozitif ve anlamlı bir etkiye sahip olduğunu göstermektedir. Ancak enflasyonun karesi regresör olarak kullanıldığında etkisi negatif ve istatistiksel olarak da anlamlı hale gelmektedir. Bu, ekonomik büyüme ile enflasyon arasında ters U şeklinde bir ilişkiyi doğrulamaktadır. Çalışmada ekonomik büyümeyi etkilediği düşünülen diğer değişkenler arasında işgücü, sermaye/GSYİH oranı ve dünya belirsizlik endeksi yer alıyor. Uzun vadede işgücü ve sermayenin ekonomik büyüme üzerinde pozitif etkiye sahip olduğu; ancak işgücünün katsayısı istatistiksel olarak anlamsızdır. Bu arada, dünya belirsizlik endeksi uzun vadeli ekonomik büyümeyi önemli ölçüde engelliyor. Hata düzeltme modeli (ECM), hem enflasyonun hem de işgücünün kısa vadede Türkiye'nin ekonomik gelişimi üzerinde olumlu bir etkiye sahip olduğunu ortaya koymaktadır. Ayrıca çalışmada yapılan tanısıl test istatistiklerine göre modelin seri korelasyon veya değişen varyans sorunları olmaksızın kararlı olduğu görülmüştür. Bulgular, enflasyonun kontrol edilmesinin, sermaye–GSYİH oranının etkili bir şekilde yönetilmesinin, küresel belirsizliğin ele alınmasının ve işgücünün rolünün dikkate alınmasının, politika yapıcıların sürdürülebilir ekonomik büyümeyi teşvik etme çabalarında hayati önem taşıdığını göstermektedir. Bu sonuçlar politika yapıcılara Türkiye'de ekonomik büyümeyi teşvik edecek etkili strateji ve politikalar tasarlama konusunda önemli bilgiler sağlamaktadır.

Anahtar kelimeler: Enflasyon, Sermaye, Emek, Dünya Belirsizlik Endeksi, Ekonomik Büyüme, ARDL Sınır Testi

TABLE OF CONTENTS

SUMMARY	i
ÖZET.....	ii
TABLE OF CONTENTS.....	iii
ABBREVIATIONS	v
LIST OF TABLES	vi
LIST OF GRAPHICS	vii

CHAPTER ONE

INTRODUCTION

1.1. Aim and Objectives of the Study.....	5
1.2. Problem Statement.....	5
1.3. Research Questions.....	5
1.4. Hypothesis Development.....	6

CHAPTER TWO

REVIEW OF LITERATURE

2.1. Inflation and its Impact on Economic Growth	7
2.2. Inflation's Impact on the Turkish Economic Growth.....	14
2.3. Literature Review Summary.....	16

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Research Approach.....	17
3.2. Research Philosophy.....	18
3.3. Research Design	18
3.4. Data Collection	19
3.5. Data Analysis.....	20
3.6. Ethical Considerations	20

CHAPTER FOUR

EMPIRICAL FINDINGS

4.1. Descriptive Statistics	22
4.2. Correlation Analysis	25
4.3. Time Series Analysis	28
4.4. The Unit Root Test	30
4.5. ARDL Model Analysis	31
4.5.1. ARDL main results.....	34

4.5.2. ARDL bounds test 35
4.5.3. ARDL Long–Term Results 36
4.5.4. ARDL Error Correction Model Results 37
4.5.5. Autocorrelation Test 37
4.5.6. Heteroscedasticity Test..... 38
4.5.7. CUSUM and CUSUMSQ Charts 38

CHAPTER FIVE
CONCLUSION

5.1. Policy Recommendations 42
REFERENCES 44



ABBREVIATIONS

ADF	:	Augmented Dickey-Fuller Test
ARDL	:	Auto Regressive Distributed Lag Model
COVID-19	:	CORona VIRus Disease of 2019
CPI	:	Consumer Price Index
CPISQ	:	Square of Consumer Price Index
CUSUM	:	Cumulative Sum
CUSUMSQ	:	Cumulative Sum of Squares
ECM	:	Error Correction Model
GDP	:	Gross Domestic Product
GDPPER	:	Gross Domestic Product Per Capita
OLS	:	Ordinary Least Squares
WUI	:	World Uncertainty Index

LIST OF TABLES

Table 1. Turkey 's Economic Overview	3
Table 2. Data, Definitions, and Sources	20
Table 3. Descriptive Statistics	22
Table 4. The Correlation Matrix	26
Table 5. ADF Test Results	31
Table 6. ARDL Results	34
Table 7. ARDL Bounds Test Results.....	36
Table 8. Long–Run Results.....	36
Table 9. Short–Run Results	37
Table 10. Serial Correlation Test Results.....	37
Table 11. Heteroskedasticity Test Results	38



LIST OF GRAPHICS

Graphic 1. Growth Rate of Turkish GDP.....	4
Graphic 2. GDP Per Capita Growth	28
Graphic 3. CPI Inflation	29
Graphic 4. The World Uncertainty Index.....	29
Graphic 5. Capital to GDP Ratio	30
Graphic 6. Total Labour Force.....	30
Graphic 7. CUSUM Chart.....	39
Graphic 8. CUSUMSQ Chart	40



CHAPTER ONE

INTRODUCTION

In recent years, the Turkish economy has faced some challenges, including high inflation, currency depreciation, and political instability. These challenges have been exacerbated by the COVID-19 pandemic, which has had a significant impact on Turkey's tourism industry and disrupted global supply chains (Tien, 2021). To address these challenges, the Turkish government has implemented a range of policies, including fiscal stimulus measures, monetary policy adjustments, and structural reforms aimed at improving the business environment and attracting foreign investment. Additionally, the government has prioritized infrastructure investments, particularly in the transportation sector, to support economic growth. Despite these efforts, the Turkish economy continues to face significant challenges, including high inflation, a large current account deficit, and political uncertainties (Mishchenko et al., 2018). The government's policies and actions will play an important role in determining the future trajectory of the Turkish economy.

In the 1970s, many Latin American countries, as well as other countries around the world, experienced high levels of inflation. This period, often referred to as the "Latin American debt crisis" or the "lost decade," was marked by economic instability and a decrease in growth rates (Ahmad, 2022). During this time, the prevailing belief was that moderate inflation could have positive effects on economic growth. This belief was based on the idea that inflation could stimulate spending and investment, as people and businesses would be motivated to spend their money before its value decreased further (Girdzijauskas et al., 2022). However, the high and persistent inflation experienced in many Latin American countries in the 1970s challenged this view (Ehigiamusoe et al., 2019). The negative effects of high inflation on economic growth became more apparent as inflation rates soared. High inflation eroded the purchasing power of consumers, reduced investment, increased uncertainty, and created distortions in the economy. As a result, economic growth rates declined significantly in many countries (Ngouhouo & Nkemgha, 2018). This experience led to a re-evaluation of the relationship between inflation and economic growth. Economists

and policymakers started to recognize the detrimental effects of high inflation on long-term economic performance. As a result, there was a shift in thinking towards the importance of price stability and the need to control inflation.

Many countries, including those in Latin America, implemented economic reforms aimed at reducing inflation and stabilizing their economies. These reforms included implementing tighter monetary policies, fiscal discipline, and structural adjustments. Over time, these measures helped to bring down inflation rates and restore economic stability (Hakim & Seraj, 2021). The experience of high inflation in the 1970s in Latin American countries and elsewhere played a significant role in shaping the understanding that high and persistent inflation can have negative effects on economic growth, leading to a shift in policy priorities towards price stability.

Inflation can have both positive and negative effects on economic growth, depending on the degree and nature of inflation. In general, moderate levels of inflation can stimulate economic growth by encouraging investment, as people may seek to invest in assets that are expected to appreciate in value more quickly than the rate of inflation (Živkov et al., 2020). Additionally, inflation can increase nominal GDP, as higher prices lead to higher revenues for businesses. However, high or unpredictable inflation can have negative effects on economic growth. This is because high inflation can erode the purchasing power of individuals and businesses, leading to reduced consumer spending and investment. Additionally, high inflation can lead to higher interest rates, which can make borrowing more expensive and limit the ability of businesses and individuals to invest and grow (Karahan & Olak, 2022). Furthermore, inflation can lead to increased uncertainty, which can be a deterrent to investment. This is because inflation makes it harder for businesses to predict their future costs and revenues, making it more difficult to plan for the future and make investment decisions.

The Turkish government has implemented various economic policies to address these challenges, including efforts to reduce inflation, increase foreign investment, and diversify the economy. Some of the key sectors driving economic growth in Turkey include manufacturing, construction, and services such as finance, healthcare, and tourism.

Table 1. Turkey's Economic Overview

Turkey	2023
Population, million	85
GDP, current US\$ billion	906
GDP per capita, current US\$	10,661.2
Life Expectancy at Birth, years	75.8

Source: World Bank – 2023 <https://www.worldbank.org/en/country/turkey/overview>

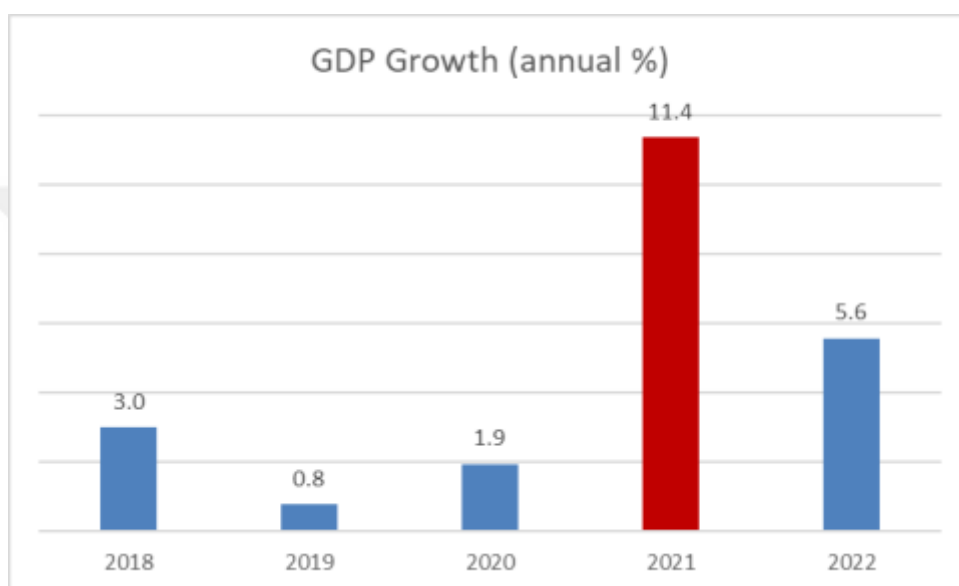
During the period between 1990 and 2017, Turkey implemented several reforms, reaped the benefits of high rates of economic development, and came closer to upper-middle-income status while simultaneously lowering levels of poverty.

The percentage of people living in poverty at or below the threshold defined by the World Bank as \$5.50 per day for a person fell by 75% between 2002 and 2018, reaching an all-time low of 8.5 percent. However, for the past ten years, the impetus behind reform has waned, and efforts have switched towards preserving development through credit booms and demand stimulation. As a result, productivity growth has halted, which has increased both the country's internal and external vulnerabilities. Since August 2018, the existing high levels of private sector debt, continuous current account deficits, high inflation, and high unemployment have all become substantially worse as a result of the instability in the macro-financial system.

Turkey's gross domestic product (GDP) is around \$906 billion, making its economy the 19th largest in the world. It is a substantial contributor to official development assistance (ODA), in addition to being a member of the G20 and the OECD. Between the years 2006 and 2017, Turkey implemented significant reforms and saw strong growth rates, both of which contributed to the country's advancement into the upper-middle income bracket and the reduction of poverty (Musarat et al., 2021). The percentage of people living in poverty, defined as having a daily income of less than \$6.85, almost reached an all-time low of 9.8% between the years 2006 and 2020. However, over the course of the past ten years, the impetus behind reform has waned, and efforts have switched towards supporting development through loan booms and demand stimulation. As a result, productivity growth has slowed, which has increased both internal and external vulnerabilities (Kankpeyeng et al., 2021). Since August 2018, the existing high levels of private sector debt, continuous current

account deficits, high inflation, and unemployment have all become substantially worse as a result of the instability in the macro-financial system.

Inflation has had a meaningful impact on the Turkish economy in recent years. In 2018, Turkey experienced a sharp increase in inflation, with the annual inflation rate reaching over 25% at its peak. While inflation has since declined, it remains relatively high, with an annual rate of around 20% as of early 2023 (World Bank, 2023). GDP growth in the Turkish economy is as follows:



Graphic 1. Growth Rate of Turkish GDP

Source: World Bank (2023)

There are various factors that can contribute to inflation, such as an increase in demand for goods and services, a decrease in the supply of goods and services, or an increase in the cost of production, such as wages or raw materials (Bahrini & Qaffas, 2019). Inflation can also be influenced by government policies, such as changes in interest rates or monetary policies. Inflation can have significant impacts on the economy and individuals. For example, high inflation can reduce the purchasing power of consumers, erode the value of savings, and increase uncertainty about the future. Conversely, low inflation or deflation can lead to reduced consumer spending and investment, which can slow economic growth (Vasylieva et al., 2018). The impact of inflation on economic growth depends on the degree and nature of the inflation, as well as the policies and actions taken by governments and central banks to manage inflation.

1.1. Aim and Objectives of the Study

The majority of nations' macroeconomic policies continue to aim for stable economic expansion and price stability. To foster long-term economic growth and preserve the value of the national currency, central banks place a premium on maintaining price stability when conducting monetary policy (Umaru and Zubanji, 2012). Recently, policymakers and macroeconomists have debated whether inflation hinders economic development. Multiple studies have demonstrated that inflation reduces economic growth whereas some argue that inflation's effects are negligible at the statistical level. Therefore, the following are a few objectives in this regard.

- To examine the impact of inflation on economic growth in Turkey over the period 1990 to 2022.
- To measure the degree of responsiveness of Turkish economic growth (GDP) to changes in the WUI.
- To establish the relationship between inflation, capital, labour, world uncertainty index, and per capita GDP in Turkey.

1.2. Problem Statement

The key problem we are trying to analyze, and research is to determine whether inflation promotes or harms economic growth and to assess the relationship between inflation and the GDP per capita in Turkey and the impact of inflation on economic growth in Turkey over the period 1990 to 2022.

1.3. Research Questions

Following are the research questions of the study that are entirely based on the aim and objectives of the study.

- How to examine the impact of inflation on economic growth in Turkey over the period 1990 to 2022?
- How to establish the relationship between inflation and GDP growth rate in Turkey?

- What is the relationship between the World Uncertainty Index and the GDP growth rate in Turkey?

1.4. Hypothesis Development

Following are the hypothesis statements that have been considered in the following study, and these are based on the discussion presented in the literature review.

- H1: There is no significant relationship between the inflation rate and the per capita GDP of Turkey.
- H2: There is no significant relationship between the capital and the per capita GDP of Turkey.
- H3: There is no significant relationship between labour and the per capita GDP of Turkey.
- H4: There is no significant relationship between the World Uncertainty Index and the per capita GDP of Turkey.

CHAPTER TWO

REVIEW OF LITERATURE

The impact of inflation on the growth of an economy is a complex issue that has been widely debated in economic literature. While some studies have suggested that inflation can have positive effects on economic growth, the majority of the literature points to the negative impact of inflation on economic growth.

2.1. Inflation and its Impact on Economic Growth

Azam & Khan (2020) investigated the relationship between inflation and economic growth across a sample of 27 countries. The sample consisted of 16 developing economies (Panel-1) and 11 developed economies (Panel-2). The study spanned the time 1975–2018. The researchers utilized the fixed effects and feasible generalized least squares (FGLS) methodologies to ascertain the threshold level of inflation and its subsequent influence on economic growth. The empirical results indicate a statistically significant inverse relationship between inflation and economic growth, particularly when the inflation rate surpasses specific thresholds. The turning point in Panel-1 was determined to be at a rate of 12.23%, whereas in Panel-2 it was observed to be at a rate of 5.36%. It is worth noting that the impact of inflation on economic growth was particularly significant in Panel-2.

Hossin (2015) performed research on the connection between inflation and GDP growth in Bangladesh. The study used yearly data on real GDP and GDP Deflator (inflation-proxy) from 1961–2013. Several statistical procedures, including the co-integration test, error-correction models, and the Granger-Causality test, were used in the empirical investigation. The empirical data showed that inflation had a detrimental effect on economic growth in Bangladesh over the long run. As a result, rising inflation has a deleterious effect on GDP in the long term. In addition, a statistically significant and long-lasting positive causal association was discovered between GDP and inflation, demonstrating that economic expansion had a favourable effect on inflation. The research also found that economic growth contributes to inflation, suggesting that price increases are to be expected as the economy develops. It's vital to remember,

however, that inflation begins to impede the economy's expansion once it reaches a certain high point.

The major goal of the research by Sekwati & Dagume (2023) was to analyze the impact of unemployment and inflation on the South African economy. Quarterly data were used for analysis from 1994–2018. Unit root tests utilizing the Augmented Dickey–Fuller and Phillips–Perron procedures were run to kick off the study. According to the results of these methods, the levels of all the variables originally indicated a unit root but thereafter remained stable once the first differencing was applied. Next, a Johansen co–integration test was run to check for a lasting connection between the variables. The findings supported the existence of a long–term connection between the variables of interest. Finally, the researchers evaluated the effect of inflation and unemployment on economic growth using a Vector Error Correction Model (VECM). The VECM study verified the detrimental impact of inflation and unemployment on economic expansion in South Africa.

Using data from 79 developing nations throughout the globe between 2002 and 2018, Uddin & Rahman (2023) analyzed the effects of corruption, unemployment, and inflation on economic development. Panel unit root tests (PUT), pooled mean group (PMG), fully modified ordinary least squares (FMOLS), and dynamic least squares (DOLS) were all used to estimate data in the research. According to PUT estimations, all the variables display a spectrum of integration orders. Corruption, unemployment, and lack of political stability all have a negative impact on GDP per capita, according to PMG, FMOLS, and DOLS estimations. However, GDP per capita increases when there is inflation, good administration, and the rule of law.

Liaqat et al. (2022) determined the link between oil price inflation and economic progress. The research assessed whether oil prices help or hurt economic growth. To prove the observed association, core, and control variable data series from 1972 to 2020 were used. The Autoregressive distributed lag (ARDL) model was used to estimate empirical data after the Augmented Dickey–Fuller Test confirmed a unit root and co–integration. The benchmark model revealed that rising oil costs reduce economic growth in emerging countries like Pakistan, both short–term and long–term.

Oil price inflation in Pakistan raises the economy's general price level but does not boost economic growth in the short or long term.

Inflation and economic growth in Sub-Saharan African nations were studied by Chindengwike (2023) in a time series analysis covering the years 1970–2021. The Consumer Price Index was used in the study along with the Vector Error Correction Model (VECM) and Granger–Causality methods. The results show that inflation and economic growth have a positive short-term correlation but a negative long-term correlation. Furthermore, the causality test in this study shows that economic growth causes inflation and that FDI follows economic growth in a unidirectional fashion.

Inflation's impact on Nigeria's economic growth was investigated by Adaramola & Dada (2020). Numerous factors, including real GDP, inflation, interest, the exchange rate, economic openness, money supply, and government consumption expenditures, were analyzed by the researchers using the autoregressive distributed lag (ARDL) approach. The research looked at data from 1980 to 2018. The research found that inflation and the real exchange rate significantly hampered economic expansion in Nigeria. The interest rate and money supply, on the other hand, have a significant and favourable impact on economic expansion. There is no other factor in the model that has a statistically acceptable effect on economic growth in Nigeria. Furthermore, the study of causality demonstrates that interest rate, exchange rate, and government consumption expenditures are all unidirectional connections, demonstrating that these factors have an influence on GDP. Inflation, openness, and GDP have not been shown to be related to one another, though.

Sanga et al. (2022) examined Tanzania's economic growth and inflation. The researchers used 1970–2020 data. They used the VECM to investigate cointegration and short- and long-term dynamics. The Augmented Dickey–Fuller test indicated that the model had a unit root and that all variables were stationary and integrated at the same order, $I(1)$. The research found a considerable negative error correction, requiring an annual adjustment rate of 28.31 percent to reach long-term equilibrium. Short-term effects of the expanded money supply, interest rates, and exchange rate on GDP were negative, minor, and inverse, respectively. Inflation targeting also improved GDP

somewhat. The enlarged money supply, exchange rates, and interest rates boosted economic growth over time. In contrast, inflation targeting hurt GDP significantly.

Runganga (2022) examined Zimbabwe's threshold level and inflation–growth link. The research used 1981–2018 yearly data. The Dynamic Ordinary Least Squares (DOLS) output showed that inflation hurts economic growth, whereas gross capital accumulation in GDP helps it. The Engle–Granger test also showed a long–term correlation. Conditional least squares analysis shows that inflation and economic growth are non–linear. The research found that inflation over 4% hurts economic growth. Inflation below 4 percent boosts economic growth significantly. Inflation exceeding the threshold negates this favourable impact. Low inflation may also boost Zimbabwe's economy.

Sarel (1996) delved into the possible non-linear effect of inflation on the growth of the economy. There was strong evidence that the traditional connection between inflation and economic expansion had broken down, as shown by the results. At an annual inflation rate of 8%, this change would become noticeable. It has been shown that inflation has no noticeable effect on growth and may even have a tiny beneficial effect when it goes below this level. The predicted impact on growth rates, however, becomes considerable, strong, and very impactful after the inflation rate rises over 8%. The study also notes that ignoring this structural change results in a threefold bias in the anticipated impact of inflation on GDP.

Using a large dataset that covered both established and emerging economies, Eggoh & Khan (2014) performed their research. To investigate the connection between inflation and economic expansion, they used the Panel Smooth Transition Regression (PSTR) and dynamic Generalized Method of Moments (GMM) methods. The article focuses on two major facets of this connection. Nonlinearity is first explored, and several thresholds are then identified, both for the whole dataset and for subgroups defined by income. Second, it pinpoints specific national macroeconomic variables that affect this nonlinearity. Their study's empirical results back up both hypotheses, confirming that a country's financial development, capital accumulation, trade openness, and government spending all play a role in shaping the nonlinearity of the

inflation-growth connection. Furthermore, these unique aspects of each nation help account for substantial differences in how this nonlinear connection manifests itself.

Tien (2021) explored how inflation and GDP growth in Vietnam interacted in a research report. The research posited a nonlinear connection between the two variables. The results indicate the existence of a threshold, which occurs at a 6% inflation rate. The impacts of hyperinflation on GDP growth were shown to become negative above this level. Below the threshold, however, very low inflation also had detrimental effects on GDP growth. Research has repeatedly shown that inflation has a detrimental influence on GDP growth. These findings support the idea that the Vietnamese government would benefit from targeting an inflation rate of 6% to boost GDP expansion.

Pollin & Zhu (2006) used nonlinear regression estimates for 80 countries from 1961 to 2000 to discover a link between inflation and economic progress. They examined middle-income and low-income nations across four decades. Research shows that sluggish GDP growth relates to greater inflation up to 15-18 percent. When separating income data by decades, the findings differ. When macroeconomic policies emphasize demand management to boost growth, inflation, and growth are increasingly correlated. This affects monetary policy. Inflation-targeting strategies, which attempt to keep inflation between 3-5 percent, are unjustified for middle-income and low-income nations. Research questions the efficacy of such measures and suggests rethinking them.

A study into the idea that there is a negative association between the growth rate of the economy and the amount of inflation in the long term was carried out and presented in the article that was written by Valdovinos (2003). At first, throughout the process of examining the primary data, it did not seem that there was any clear connection between inflation and growth over time. However, after using the Baxter and King filter to separate the short-term and long-term aspects of the data, it became obvious that there was a statistically inferable negative correlation between the two time series.

The study conducted by Ayyoub et al. (2011) aimed to reassess the existence of a correlation between inflation and economic progress within the specific context of

Pakistan. The primary objective of the study was to conduct an empirical analysis of the influence of inflation on the economic growth of the nation. Furthermore, the researchers aimed to examine whether inflation has a consistent impact on economic growth or if it demonstrates heterogeneous patterns at different levels. To accomplish this objective, the investigation employed yearly time-series data encompassing the timeframe spanning from 1972–73 to 2009–10. The analysis was performed utilizing the OLS procedure. The results indicate a statistically evident and inverse association between inflation and economic progress in the context of the Pakistani economy. The findings of the study advocate that once inflation surpasses a specific threshold, it negatively impacts the growth of GDP, thereby underscoring the adverse consequences of high inflation on the overall economy.

Bick (2010), in his work, uses a modified version of Hansen's panel threshold model to reevaluate the connection between inflation and economic expansion in emerging nations. The research presents the idea of regime intercepts and explores the possible bias that might result from not using these easily accessible regressors when calculating the regression slope and the threshold values. The results indicate that the regime intercept in the inflation-growth relationship is crucial, suggesting that it significantly affects the outcomes.

Bittencourt (2012) examined how macroeconomic performance, notably inflation rates, affected economic development in four Latin American nations. These nations had hyperinflation in the 1980s and early 1990s but differed in development. Study data spanned the period 1970–2007. The outcome of the empirical analysis confirmed anecdotal assertions that inflation has hurt regional growth. Excessive inflation has neutralized the Mundell–Tobin effect, resulting in high costs for regional economic activity. The analysis showed that inflation hurts economic growth and has hurt the region's economy, countering the Mundell–Tobin benefit.

The impacts of inflation on economic progress were studied by López–Villavicencio & Mignon (2011), who delved into data from a wide variety of countries, including both developed and developing nations. To estimate the connection, the researchers used panel data using smooth transition and dynamic GMM models. Strong proof that inflation's effect on economic growth is nonlinear is shown by the

study's results. That is to say, the connection is not a straight line. Instead, growth is negatively impacted beyond a certain inflation rate. However, for developed nations, inflation below this level is beneficial to economic expansion.

Significant and ongoing inflation can have a detrimental effect on the development of the economy. When inflation is excessive, it can cause a decline in buying power, a reduction in the value of savings, and a rise in the degree of uncertainty regarding the future (Adeleye & Eboagu, 2019). This can result in decreased spending by consumers, lower investment levels, and slower overall economic growth. Furthermore, excessive inflation can cause interest rates to rise, which might discourage borrowing and investment, so further limiting economic development (Azam et al., 2019). Even while some degree of inflation might be advantageous to economic growth, persistently excessive inflation can be harmful to economic growth. To strike a balance between the beneficial and negative effects that inflation has on economic growth, central banks will frequently strive to keep the inflation rate low and constant.

The article by Parker (2018) uncovers evidence that there has been a major shift in the dynamics of inflation in advanced countries during the 1990s. Specifically, he shows that inflation has become less responsive to variations in productivity and more sensitive to alterations in inflation expectations and monetary policy. He believes that this shift may be related to changes in both the formation of the worldwide economy as well as variations in the method that central banks conduct monetary policy.

Olson (2022) in his study sheds light on the complicated and ever-changing nature of the dynamics of inflation, drawing attention to the significance of both global and national-level components in the process of comprehending inflationary patterns. He claimed that the degree to which inflation hinders economic expansion is directly proportional to the degree to which inflation rates have risen in recent years. He discovered that inflation rates that are higher than forty percent have a considerable detrimental influence on the expansion of the economy.

The enquiry by Mishchenko et al. (2018) on the same topic is also available. This study investigates how inflation impacts economic growth and provides evidence for the principal tactics for boosting the efficiency of the anti-inflation policy

implemented by central banks. The association between the rate of inflation and the growth rate of the real GDP is analysed based on figures provided by the International Monetary Fund (IMF) using the example of 158 countries to gauge the level of inflation over which there is a damaging effect on the pace at which the economy expands. It was discovered that the inflation rate of 6.0 percent was the inflation rate at which the growing rate of the economy of the global economy started to decrease or slow down between the years 2010 and 2017.

The research by Ahmad (2022) is also rather intriguing. The goal of this research is to reevaluate the association between inflation and economic growth in Pakistan from 1985 to 2019 using an experimental approach. To examine the impact of inflation on Pakistan's economic growth and trade, this research used the Wald and F-Bound tests to examine long-term correlations between these variables. Long-term associations between these factors were also investigated using these tests. To do so, we used the Autoregressive Distributive Lag (ARDL) technique. Our research shows that inflation dampens long-term economic development and also reduces the purchasing power of foreign buyers and sellers. Findings show that although low inflation is good for business and economic growth, excessive inflation in the double-digit range is bad for Pakistan's economy. The analysis found that inflation is still over its neutral level. The mistake-correction word "- 0.16" suggests that the 16 percent annualized growth in the short run of the economy has been revised downward. The expression "- 0.16" in particular. The study's findings also show that inflation and the unpredictability of Pakistan's terms of trade are inversely related. The conditions of trade deteriorate as inflation rates rise and vice versa. It shows that although a high inflation rate is bad for business and economic development, a moderate and steady inflation rate is good for trade and helps a nation flourish. This is demonstrated by the fact that a high rate of inflation has been shown to be harmful to economic growth and commerce.

2.2. Inflation's Impact on the Turkish Economic Growth

Inflation and economic expansion in Turkey were the subject of research by Erbaykal & Okuyan (2008). The years 1987 through 2006 were used for the statistical evaluation. The researchers used Pesaran et al.'s (2001) Bounds Test to investigate

whether these factors were linked over time. The statistical analysis revealed that the two series were cointegrated. Using the developed ARDL models, they found a statistically negligible long-term link but did find a negative and statistically acceptable short-term relationship. The researchers used Toda Yamamoto's causality test to dig further into the chain of events that led to the two series. The results proved that inflation does not cause economic expansion. However, a link was shown between economic expansion and price increases.

A study conducted by Ozpence (2016) intended to examine the potential causal inflation-growth relationship within the Turkish economy during the period spanning from 2003 to 2015. The investigation employed the Vector Autoregressive Model (VAR) and conducted a Granger causality test to examine the association between these variables. The findings indicate a unidirectional causal link between economic progress and inflation. This discovery sets the study apart from prior research conducted in Turkey. During the period under investigation, Turkey witnessed an economic expansion primarily driven by domestic demand. This growth can be attributed to the adoption of the 2002 Emergency Action Plan, which was implemented in response to the economic crisis of 2001 and the subsequent global economic downturn. Hence, these study's findings are consistent with the prevailing economic conditions of that period.

In their analysis of a quarterly dataset spanning 2003–2017, Karahan & Olak (2020) relied on a newly created model known as the Nonlinear Autoregressive Distributed Lag (NARDL) model. The estimates showed that inflation had a negative effect on economic expansion over the long term. The reverse correlation between inflation and GDP growth is supported by these data, lending credence to the Classical viewpoint. Consequently, Turkey's long-term economic development depends on price stability being maintained. Authors added that, instead of allowing excessive inflation as the Keynesian approach would have it, anti-inflationary strategies are essential to ensure sustained economic development in the Turkish economy. As a corollary, it follows that the Inflation Targeting (IT) Monetary Policy, in place in Turkey since 2001, provides a substantial justification for the Central Bank of the Republic of Turkey (CBRT).

Aydin et al. (2016) conducted a study that investigated the inflationary effect on the economic growth of five Turkish Republics (namely Azerbaijan, Kazakhstan, Kyrgyzstan, Uzbekistan, and Turkmenistan) during their transitional phase. The research employed a dynamic panel data analysis technique, specifically employing a threshold approach. The study encompassed the period from 1992 to 2013. The study's results indicated the presence of a non-linear correlation between inflation and the rate of economic growth. The researchers have identified the threshold at which inflation begins to impact economic growth as 7.97%. When the inflation rate surpasses this threshold, it has a detrimental impact on economic progress. In contrast, when the inflation rate falls below this threshold, it exerts a positive impact on economic output. The findings of this study underscore the substantial influence that elevated levels of inflation can exert on the rate of economic expansion. Hence, the attainment of sustainable growth assumes utmost significance as it serves a pivotal function in augmenting the efficacy of monetary policies and safeguarding stability.

2.3. Literature Review Summary

The studies reviewed in the literature primarily examined the correlation between inflation and economic growth. Most of these studies concluded that inflation has a deteriorating impact on the growth of the countries under consideration. An intriguing finding was that inflation's effect on economic growth becomes negative once it surpasses a certain threshold level. Prior to reaching this threshold, inflation was found to have a favourable effect on economic progress. Consequently, many of the studies concluded that the relationship between inflation and economic growth is non-linear. It was also noted that the ARDL model was frequently chosen for analysis in the selected studies.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter outlines the research methodology that has been used in the current thesis. From data collection to ethical considerations to the analysis of data, all methods have been thoroughly discussed.

3.1. Research Approach

The present research has used an approach that is rational. The main reason to consider the deductive research approach is due to principles of logical reasoning that specifically involve testing hypotheses derived from existing theories or established knowledge. Deductive research in the present study also allowed the author to test hypotheses regarding the correlation between inflation level and the growth of the Turkish economy. By systematically examining the relationships between these variables and testing specific predictions, deductive research helped to validate or refute existing theories. At the same time, the deductive research approach provided a structured and focused approach to investigation. It allowed the author to formulate specific hypotheses (discussed in Chapter 1) and design research methods that directly address the research questions.

The deductive research approach in the following study followed a standardized and replicable methodology. By clearly defining variables, hypotheses, and research procedures, deductive research enables to replicate the study and validate the findings, thereby contributing to the accumulation of scientific knowledge. Deductive research is more efficient in terms of time and resources compared to exploratory or inductive research. Since deductive research starts with existing theories and knowledge, researchers can build upon existing work and focus on collecting data to test specific hypotheses, saving time and effort. Deductive research in the following study aims to establish generalizable findings. By testing hypotheses using representative samples and rigorous research methods, deductive research can provide insights that can be applied to broader populations or contexts.

3.2. Research Philosophy

In the existing study, positivism research philosophy has been undertaken. Positivism in the current study can be explained as a research philosophy that emphasized the use of empirical evidence and scientific methods to understand and explain phenomenon. Positivism research philosophy promotes objectivity in research by emphasizing the use of systematic and rigorous methods to collect and analyse data regarding inflation and economic growth. It aimed to minimize biases and personal opinions, allowing researchers to focus on observable facts and evidence. Positivism research philosophy also emphasized the importance of empirical evidence in research. By relying on observable data, positivist research aims to provide reliable and valid findings that can be tested, replicated, and verified by others.

Positivism research philosophy strives for generalizability, aiming to establish universal laws or theories that can be applied beyond the specific context of the study. By using large sample sizes and statistical techniques, positivist research seeks to draw conclusions that are applicable to a broader population or setting. Positivist research also helped in the following study to identify causal relationships between inflation and economic growth and make predictions based on empirical evidence. It aims to understand the underlying mechanisms and patterns that govern phenomena, enabling researchers to predict future outcomes or behaviours. In the following study, the positivism research philosophy utilized quantitative research methods, such as statistical analysis, to collect and analyse data. This allowed for the measurement and quantification of variables, facilitating precise and numerical analysis.

3.3. Research Design

Considering the above discussion, the present study is based on the quantitative research design. Quantitative research in the following study is due to a variety of reasons. For instance, quantitative research aims to generate objective and replicable results by employing statistical analysis and numerical data. This allowed for a systematic examination of relationships, patterns, and trends among variables. Quantitative research often involves collecting data from a large sample size, which increases the likelihood of obtaining representative results that can be generalized to a broader population. In the same manner, the following study has focused on collecting

a large sample size to explain the results to reflect the population. This is particularly useful when researchers aim to make predictions or draw conclusions about a larger population based on their sample.

Quantitative research in this study employed statistical analysis techniques that allow for the examination of the strength and significance of relationships between inflation and the economic growth of Turkey. This enables identification of the patterns, trends, and associations, providing a more rigorous understanding of the phenomena under study. The quantitative research design included measures to control for confounding variables and minimize biases. This enhances the precision and accuracy of the study's findings, enabling to draw more reliable conclusions. It's important to note that the choice of research design is aligned with the research question, objectives, and the nature of the phenomenon being studied. Quantitative research design is particularly well-suited for studies seeking to establish statistical relationships, generalize findings, and quantify phenomena.

3.4. Data Collection

Data may be gathered from a variety of sources, but the most common are primary sources and secondary sources. First-hand information is data that comes straight from the source. The study's purpose determines the methods used to collect primary data. On the contrary, secondary data consists of information that has previously been made public via a number of channels. This type of data is being used in purposes. In the following study, data is collected from secondary sources. There are various reasons to consider secondary sourced data to explain how inflation and economic expansion (growth) are related to one another. For instance, secondary data collection is more cost-effective compared to primary data collection, as it eliminates the need to invest resources in designing and conducting data collection activities from scratch. Existing data sources are often readily available at a lower cost or even free of charge.

It has also saved time that is being taken in the assessment of pre-collected and pre-processed data without the need to go through the entire data collection process. This is especially useful because the time was limited to analyzing trends and patterns over a longer time period.

In the current study, secondary data is collected from the database of the World Bank database named World Development Indicators (WDI), the official website of the World Uncertainty Index. The time period of the data is maintained from 1990 to 2022. In this way, 33-year data is extracted for the variables of the GDP per person of Turkey, inflation data, capital, labour, and the world uncertainty index. The techniques to perform analysis are discussed in the next segment. Further details of the variables are given in the table below:

Table 2. Data, Definitions, and Sources

Variable	Defining Variable	Sourced From
GDPPER	GDP per capita (constant 2015 US\$)	World Bank – WDI
CPI	Inflation, consumer prices (annual %)	World Bank – WDI
WUI	World Uncertainty Index, uneven GDP weighting is used to calculate this index.	WUI official website
LABOR	Total Labor force	World Bank – WDI
CAPITAL	Capital / GDP	World Bank – WDI

Source: Developed by the author

3.5. Data Analysis

As described in the above discussion, it has been considered that the following study is based on a quantitative perspective. In this way, there is a need to consider statistical procedures. Examining the connection between price increases and the GDP expansion of Turkey, the ARDL bounds testing approach to cointegration has been applied whereas the short-run relationship has been examined using the error correction model.

3.6. Ethical Considerations

Quantitative research, like all other types of research, must adhere to the highest ethical standards. In the present study, ethical considerations like integrity, honesty, and transparency are maintained. The following study also adheres to professional standards and ethical guidelines set by relevant research institutions or associations. Avoid conflicts of interest and disclose any potential biases or financial relationships that may influence the study. Various ethical evaluations and institutional review board (IRB) approvals were also granted before commencing the study. These bodies evaluate the ethical implications of the research and ensure that it meets ethical standards. The findings of the present research are represented accurately and

transparently. In this manner, results and interpretations are clearly distinguished and shared timely. Adhering to these ethical considerations promotes the well-being, dignity, and rights of research participants, ensures research integrity, and contributes to the credibility and validity of quantitative research. It is crucial to consult relevant ethical guidelines and seek guidance from research ethics committees or professionals to address specific ethical considerations in a particular research context.



CHAPTER FOUR

EMPIRICAL FINDINGS

The findings of the current examination are presented and discussed in this chapter. Scientific references have been used to support the findings, and diagnostic tests have been performed to further consolidate the results of the study.

4.1. Descriptive Statistics

As a preliminary analysis, descriptive statistics have been calculated to examine the overall condition of the study variables. Only the variables used in the ARDL model are included in the descriptive statistics analysis. The calculations were performed using EVIEWS–13, as reported below:

Table 3. Descriptive Statistics

Statistic	GDPPER	WUI	LABOR	CAPITAL	CPI
Mean	8333	0.09	25507649	25.49	36.44
Median	7843	0.09	22818051	25.91	16.33
Maximum	13991	0.23	34427719	29.86	105.21
Minimum	5257	0.02	19657574	17.95	6.25
Std. Dev.	2606	0.04	4785086	3.22	32.30
Skewness	0.59	1.05	0.64	-0.54	0.59
Kurtosis	2.10	4.67	1.89	2.45	1.78
Jarque–Bera	3.01	9.96	3.93	2.05	3.94
Probability	0.22	0.01	0.14	0.36	0.14
Sum	274994	3.13	841752417	841.14	1202.64
Sum Sq. Dev.	2.17E+08	0.06	7.33E+14	332.26	33382.94
Observations	33	33	33	33	33

Source: Generated by the author

The table above provides descriptive statistics for five variables: GDPPER, WUI, LABOR, CAPITAL, and CPI. These statistics offer insights into the distribution and characteristics of each variable.

Starting with the mean, it represents the average value of each variable. For GDPPER, the mean is 8333, indicating the average per capita GDP. The CPI (Consumer Price Index) has a mean of 36.44, representing the average level of inflation. The mean of CAPITAL is 25.49, indicating the average capital available in Turkey, while the mean of WUI (World Uncertainty Index) is 0.09, representing the average water usage. The average volume of labour force (LABOR) in Turkey is 25507649 workers.

The median is another measure of central tendency that represents the middle value of each variable. The median for GDPPER is 7843, indicating that half of the values are below this level. For CPI, the median is 16.33, suggesting that the distribution is bent towards the right. The median of CAPITAL is 25.91, while the median of WUI is 0.09. Lastly, the median value of labour force (LABOR) is 22818051.

The maximum and minimum values highlight the range of each variable. The maximum GDPPER value is 0.105, representing the highest per capita GDP observed. The maximum CPI is 542.439, indicating the highest level of inflation. The maximum IR is 67.000, representing the highest interest rate recorded. Lastly, the maximum WUI is 10.613, indicating the highest level of water usage.

Conversely, the minimum values represent the lowest observations for each variable. The minimum GDPPER is 5257, indicating a small per-head income. The minimum CPI is 6.25, implying a low level of inflation. The minimum CAPITAL is 17.95, representing the lowest capital rate recorded. While the minimum WUI is 0.02, indicating the lowest level of water usage. Finally, the lowest ever recorded labour force (LABOR) volume is 19657574 individuals.

The standard deviation endows a measure of the dispersion of data points around the average (mean). A greater standard deviation signals a higher degree of flexibility in the data. The standard deviation for GDPPER is 2606, suggesting relatively stable variability. However, the CPI has a large standard deviation of 32.30, indicating substantial variation in inflation levels. The standard deviation of CAPITAL is 3.22, implying moderate variability, while the WUI has a low standard deviation of 0.04. In the end, LABOR has a standard spread of 4785086 individuals from the mean.

Skewness quantifies the symmetry of the scattering. A negative skewness signifies a longer left tail, while a positive skewness suggests a longer right tail. GDPPER has a skewness of 0.59, indicating a left-skewed distribution. The CPI has a skewness of 0.59, suggesting a vastly skewed distribution to the right. The skewness of CAPITAL is -0.54, indicating a slight left skew, while the WUI has a skewness of 1.05, also indicating a slight right skew. At last, LABOR has a moderate right-skewness of 0.64 points.

Kurtosis measures the mass of the tails in a scattering. A higher kurtosis value indicates heavier tails and potentially more outliers. GDPPER has a kurtosis of 2.10, indicating a spread with heavier tails. The CPI has a kurtosis of 1.78, also suggesting a distribution with relatedly smaller tails. The kurtosis of CAPITAL is 2.45, indicating a distribution with relatively higher tails with a possibility of outliers, while the WUI has a kurtosis of 4.67, suggesting relatively very higher tails. The kurtosis for labour is 1.89, showing relatively higher tails.

The Jarque–Bera statistic tests whether the data follow a normal distribution. A higher value indicates a departure from normality. The Jarque–Bera statistic for GDPPER is 3.01, suggesting a deviation from normality but not substantial. The CPI has a Jarque–Bera statistic of 3.94, indicating a slight departure from normality. The CAPITAL has a Jarque–Bera statistic of 2.05, suggesting a deviation from normality, but not as pronounced as the CPI. The WUI has a Jarque–Bera statistic of 9.96, indicating a relatively high departure from normality. Finally, LABOR has a slight departure from normality, almost close to CPI.

The probability associated with the Jarque–Bera (JB) statistic represents the implication level of the test. A low probability suggests that the data significantly falls under a non–normal distribution. The probability associated with GDPPER is 0.22, nullifying the hypothesis of no normality. However, the CPI has a probability of 0.14, indicating no traces of non–normality. The probability associated with CAPITAL is 0.36, again suggesting no existence of significance, while the WUI has a probability of 0.01, indicating a relatively low level of significance and absence of non–normality at a 1% level. The variable LABOR exhibits non–normality because of an insignificant p–value. Therefore, all variables have normally distributed observation.

The sum represents the total value of each variable across all observations. The sum of GDPPER is 274994, representing the total per capita GDP. The sum of CPI is 1202.64, indicating the cumulative level of inflation. The sum of CAPITAL is 841.14, representing the total capital over the period. The sum of WUI is 319.871, indicating the total uncertainty over time. Lastly, LABOR has a sum of 841752417 over the period.

The sum of squared deviations measures the variability of the data points around the mean. The sum of squared deviations for GDPPER is $2.17E+08$, representing the total variability of per capita GDP. The sum of squared deviations for CPI is 33382.94, indicating a large variability in inflation levels. The sum of squared deviations for CAPITAL is 332.26, representing the total variability of CAPITAL. The sum of squared deviations for WUI is 0.06, indicating a low variability in the uncertainty. Finally, LABOR reveals relatively higher variability by $7.33E+14$ points.

Finally, the number of observations represents the sample size for each variable. In this case, all variables have 33 observations, indicating that the statistics are calculated based on a sample of 33 data points for each variable.

To sum up, descriptive statistics offer insightful information about the distribution and characteristics of the variables. They reveal the average values, variability, skewness, kurtosis, and deviations from normality for GDPPER, CPI, CAPITAL, WUI, and LABOR. Understanding these statistics aids in evaluating the fundamental tendencies, ranges, and variations of the variables, thereby facilitating a deeper comprehension of the data.

4.2. Correlation Analysis

Correlation investigation is a statistical procedure for inspecting the association between two or more variables. It assesses the degree of association or correlation between variables and evaluates if they have a linear relationship. Correlation analysis may help understand how changes in one variable affect changes in another. A correlation coefficient, which measures the intensity and direction of the association, is the outcome of a correlation study. The Pearson correlation coefficient (r), which runs from -1 to 1 , is the most often used correlation coefficient. A positive result indicates a positive correlation, meaning that as one variable increases, so does the other. A negative result indicates a negative correlation, meaning that when one variable increases, the other variable tends to decrease. A correlation value of 0 indicates that there is no association between the variables or that the relationship is exceedingly faint.

Table 4. The Correlation Matrix

	GDPPER	WUI	LABOR	CAPITAL	CPI
GDPPER	1				
WUI	0.38	1			
LABOR	0.97	0.45	1		
CAPITAL	0.74	0.28	0.66	1	
CPI	-0.58	-0.33	-0.52	-0.45	1

Source: Author's Estimations

The correlation matrix displayed in the above table shows the relationships between different variables: GDPPER (Gross Domestic Product Per Capita Growth), CPI (Consumer Price Index), CAPITAL (Capital to GDP ratio), WUI (World Uncertainty Index), and LABOR (Total Labour Force). Each coefficient shown in the table has a different meaning as discussed below.

Starting with GDPPER, the correlation coefficient of 1.000 along the diagonal represents the correlation of GDPPER with itself, which is always perfect and equal to 1. This implies that GDPPER is perfectly correlated with itself, as expected.

Moving on to CPI, the correlation coefficient of -0.58 with GDPPER indicates a high negative correlation between the Consumer Price Index and GDPPER Growth. This suggests that there is a high tendency for an expansion in the CPI to be associated with a substantial decrease in GDPPER, plus the relationship is particularly strong.

Next, the correlation coefficient of 0.74 between CAPITAL and GDPPER is analyzed. This positive correlation suggests that there is a strong direct relationship between Capital to GDP ratio and Gross Domestic Product Per Capita Growth. In other words, as the CAPITAL increases, there is a high tendency for the GDPPER to increase, and vice versa.

Coming to the WUI, the correlation coefficient of 0.38 with GDPPER indicates and relatively strong positive correlation between the World Uncertainty Index and GDPPER. This suggests that during the study period, uncertainty and GDP moved in the same direction.

Looking at the correlation between LABOR and GDPPER, a correlation coefficient of 0.97 can be seen, indicating a highly positive correlation. This suggests that as the total labour force increase, GDP per head also increases. In simpler terms, labour force of the country helps increase the overall growth of the country.

The correlation coefficient between WUI and LABOR is 0.45. This positive correlation suggests that there is a moderate positive linear relationship between the World Uncertainty Index (WUI) and the LABOR variable. When WUI goes up, LABOR tends to go up as well, and vice versa, although it's not a very strong relationship.

The correlation coefficient between WUI and CAPITAL is 0.28. This positive correlation suggests that there is a weak positive linear relationship between the World Uncertainty Index (WUI) and the CAPITAL variable. When WUI goes up, CAPITAL tends to go up as well, and vice versa, but the relationship is relatively weak.

The correlation coefficient between WUI and CPI is -0.33 . This negative correlation suggests that there is a moderate negative linear relationship between the World Uncertainty Index (WUI) and the CPI variable. When WUI goes up, CPI tends to go down, and when WUI goes down, CPI tends to go up, though it's not a very strong relationship.

The correlation coefficient between LABOR and CAPITAL is 0.66. This positive correlation indicates a relatively strong positive linear relationship between the LABOR and CAPITAL variables. When LABOR goes up, CAPITAL tends to go up, and when LABOR goes down, CAPITAL tends to go down. This makes sense because the level of capital in a country is supposed to raise the labour force, more capital requires more labour, and vice versa.

The coefficient of correlation between LABOR and CPI is -0.52 . This negative correlation suggests a moderate negative linear relationship between the LABOR and CPI variables. When LABOR goes up, CPI tends to go down, and when LABOR goes down, CPI tends to go up, interestingly, this is a very strong relationship.

Lastly, the correlation coefficient between CAPITAL and CPI is -0.45 . This negative correlation suggests a reasonable negative linear relationship between the CAPITAL and CPI variables. An increase in CAPITAL makes the CPI fall, and when CAPITAL goes down, CPI tends to rise, although it's not a very strong relationship.

4.3. Time Series Analysis

The changes in the rate of inflation, GDP Per Capita growth rate, capital, labour force, and world uncertainty index can be analyzed graphically as shown in this section.

The GDPPER exhibited a rising trend over the period. However, there were also notable declines during the early 2000s, 2008–09, and 2020. Inflation initially followed a decreasing trend, but from 2004 to 2016, it remained relatively stable. Afterward, it began to increase sharply, particularly after the COVID–19 pandemic in 2020. The world uncertainty index displayed mixed trends throughout the study period, with consistently high levels for most of that time. Capital to GDP experienced significant declines in the early 2000s, 2008–09, and 2020, similar to the GDPPER. Lastly, the labour force continued to grow during the period; however, a substantial decline was observed during the COVID–19 pandemic era.



Graphic 2. GDP Per Capita Growth

Source: World Development Indicators



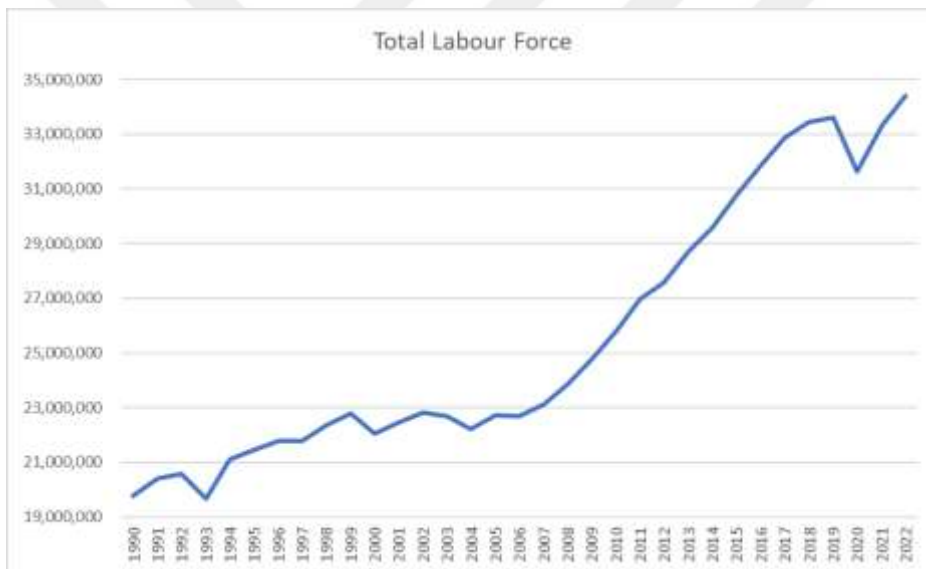
Graphic 3. CPI Inflation
 Source: World Development Indicators



Graphic 4. The World Uncertainty Index
 Source: World Uncertainty Index



Graphic 5. Capital to GDP Ratio
Source: World Development Indicators



Graphic 6. Total Labour Force
Source: World Development Indicators

4.4. The Unit Root Test

The augmented dickey–fuller (ADF) test has been used to determine the stationarity of the variables used in the ARDL model. The table below contains the p–value obtained by using the ADF test.

Table 5. ADF Test Results

Variable	P-Values	
	At Level	At First Difference
GDPPER	0.9998	0.0007***
WUI	0.0097***	0.0000***
LABOR	0.9927	0.0002***
CAPITAL	0.3635	0.0000***
CPI	0.6597	0.0150**
CPISQ	0.5071	0.0176**

Source: Generated by the author

Note: *** indicates 1% significance and ** indicates 5% significance.

The table shows that at the level, the variable WUI is stationary because its p-value is less than 5%. However, GDPPER, LABOR, CAPITAL, CPI, and CPISQ (CPI square) do not exhibit stationarity at the level, as indicated by their insignificant p-values. Nevertheless, when the first difference of all the series was calculated, they became stationary. In the current ADF unit root test, the Swartz Information Criteria (SIC) was employed, and a constant was included in the analysis. CPISQ remained non-stationary even after taking the first difference and including a constant. However, after introducing both a trend and a constant in the first difference, CPISQ achieved stationarity. The value p-value corresponding to the CPISQ at the first difference, shown in the table, is achieved by adding both constant and trend. The rest of the values in the table are achieved by only adding the constant.

4.5. ARDL Model Analysis

A situation where a dependent variable is regressed on its own previous values is referred to as an autoregressive model (AR). The autoregressive distributed lag (ARDL) model considers not only the lags of the dependent variable as independent variables but also the independent variables and their respective lags. Pesaran et al. (2001) introduced Autoregressive Distributed Lag (ARDL) bounds testing as a new method for cointegration. This method is especially well-suited for small sample sizes. The ARDL model is utilized to analyze the short- and long-term relationships between various time series. It includes a sufficient number of delays to capture the underlying system that generates data. When all series involved are either stationary at the level $I(0)$, stationary at the first difference $I(1)$, or a combination of both, ARDL is applicable. As described by Pesaran & Shin (1995), the Error Correction Mechanism

(ECM) reveals the short-term relationship and adjustments toward the long-run equilibrium while preserving long-run information.

Before executing an ARDL model, it is necessary to consider several assumptions. First, none of the series should exhibit stationarity at the I(2) level of the second difference. Second, the assumption that there is no serial correlation between error terms must hold. Thirdly, an appropriate latency duration must be selected. Finally, the model must exhibit dynamic stability.

Using the ARDL model, the following regression equation has been estimated.

$$\begin{aligned} \text{LogGDPPER}_t = & \beta_0 + \beta_1 * \text{WUI}_t + \beta_2 * \text{LogLABOR}_t + \beta_3 * \text{CAPITAL}_t \\ & + \beta_4 * \text{CPI}_t + \beta_5 * \text{CPISQ}_t + \mu_t \end{aligned} \quad (1)$$

Where GDPPER represents the gross domestic product per capita, used as a proxy for economic growth, and CPI denotes the consumer price index, a measure of inflation measured as an annual percentage change. In addition, CPISQ (square of CPI) is also added to account for the effect of the higher levels of CPI on growth. WUI represents the world uncertainty index. LABOR accounts for the total labour force of Turkey over the period. Capital is the ratio of Turkish capital to GDP. The term μ represents the error term. The term β_0 represents the constant, while β_1-4 denotes the slope coefficients.

Cointegration was used in the study that looked at the economic impact of inflation on GDP per capita growth. The relationship model is described in the following equation:

$\Delta \text{LogGDPPER}$

$$\begin{aligned}
&= \beta_0 + \sum_{i=1}^m \beta_1 \Delta \text{LogGDPPER}_{t-p} + \sum_{i=1}^n \beta_2 \Delta \text{WUI}_{t-p} \\
&+ \sum_{i=1}^o \beta_3 \Delta \text{LogLABOR}_{t-p} + \sum_{i=1}^p \beta_4 \Delta \text{CAPITAL}_{t-p} + \sum_{i=1}^q \beta_{5i} \Delta \text{CPI}_{t-p} \\
&+ \sum_{i=1}^r \beta_{6i} \Delta \text{CPI}_{t-p} + \sum_{i=1}^s \beta_{7i} \Delta \text{CPISQ}_{t-p} + \beta_8 \text{LogGDPPER}_{t-1} \\
&+ \beta_9 \text{WUI}_{t-1} + \beta_{10} \text{LogLABOR}_{t-1} + \beta_{11} \text{CAPITAL}_{t-1} + \beta_{12} \text{CPI}_{t-1} \\
&+ \beta_{13} \text{CPISQ}_{t-1} + \varepsilon_t \tag{2}
\end{aligned}$$

Equation 2's p-length expression shows the time lag associated with the bounds test method, which must be calculated. Next, F-statistics is applied to the first-period values of the dependent and independent variables to look for evidence of a cointegration connection. The following are the test's hypotheses:

$$H_0: \beta_7 = \beta_8 = \beta_9 = \beta_{10} = \beta_{11} = \beta_{12} = \beta_{13}$$

$$H_1: \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10} \neq \beta_{11} \neq \beta_{12} \neq \beta_{13}$$

The hypothesized value of F-statistics based on the above is used to check for cointegration (Pesaran et al., 2001). The estimated F-statistics should be compared to the minimum and maximum critical values. A cointegration connection can't be determined between the variables if the statistical value is less than the upper critical value. Cointegration is assumed to occur if the estimated F-statistical value is larger than the crucial upper value.

After determining a cointegration relationship based on the F-statistic derived from equation 2, equations 3 and 4 are estimated, and long-term estimates of the model's estimates are generated, and the ARDL error correction model, which displays the short-run estimates is analyzed.

$$\begin{aligned}
LogGDPPER = & \beta_0 + \sum_{i=1}^m \beta_{1i} LogGDPPER_{t-p} + \sum_{i=1}^n \beta_{2i} \Delta WUI_{t-p} \\
& + \sum_{i=1}^o \beta_{3i} \Delta LogLABOR_{t-p} + \sum_{i=1}^p \beta_{4i} \Delta CAPITAL_{t-p} \\
& + \sum_{i=1}^q \beta_{5i} \Delta CPI_{t-p} + \sum_{i=1}^r \beta_{6i} \Delta CPISQ_{t-p} + \varepsilon_t \quad (3)
\end{aligned}$$

$$\begin{aligned}
LogGDPPC = & \beta_0 + \sum_{i=1}^m \beta_{1i} LogGDPPER_{t-p} + \sum_{i=1}^n \beta_{2i} \Delta WUI_{t-p} \\
& + \sum_{i=1}^o \beta_{3i} \Delta LogLABOR_{t-p} + \sum_{i=1}^p \beta_{4i} \Delta CAPITAL_{t-p} \\
& + \sum_{i=1}^q \beta_{5i} \Delta CPI_{t-p} + \sum_{i=1}^r \beta_{6i} \Delta CPISQ_{t-p} + \beta_7 ECT_{t-1} \quad (4)
\end{aligned}$$

4.5.1. ARDL main results

The output of the ARDL(1,0,2,0,1,0) model is as follows, where the trend component and constant are used as fixed regressors:

Table 6. ARDL Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOGGDPPER(-1)	0.1978	0.0395	5.0109	0.0001
WUI	-0.1844	0.0775	-2.3790	0.0274
LOGLABOR	0.3025	0.1212	2.4956	0.0214
LOGLABOR(-1)	-0.2796	0.1559	-1.7934	0.0880
LOGLABOR(-2)	0.1089	0.0981	1.1096	0.2803
CAPITAL	2.0986	0.1432	14.6543	0.0000
CPI	0.2978	0.0688	4.3273	0.0003
CPI(-1)	0.0630	0.0334	1.8858	0.0739
CPISQ	-0.3304	0.0731	-4.5212	0.0002
C	4.0680	1.9449	2.0916	0.0494
@TREND	0.0203	0.0032	6.2773	0.0000

R-squared	0.9984	Mean dependent var	9.0088
Adjusted R-squared	0.9976	S.D. dependent var	0.2943
S.E. of regression	0.0145	Akaike info criterion	-5.3559
Sum squared resid	0.0042	Schwarz criterion	-4.8470
Log-likelihood	94.0159	Hannan-Quinn criter.	-5.1900
F-statistic	1231.4990	Durbin-Watson stat	1.9900
Prob(F-statistic)	0.0000		

Source: Generated by the author using EVIEWS

The main results of the ARDL model are displayed in the above table. In this model GDP per capita (a proxy of economic growth) is taken as the dependent variable. The outcome reveals that the first lag of GDP per capita has a 1% statistically significant and favorable impact on the GDP per capita. The World Uncertainty Index (WUI) has a 5% significant and decaying effect on economic growth. Labor force (LABOR) has a positive impact but when it is lagged by one or two periods, its effect becomes insignificant at a 5% level of significance. The CAPITAL has a 1% significant favorable impact on economic growth. The consumer price index (CPI) and the square of CPI (CPISQ) promote economic growth at 1 and 10% levels of significance respectively. The trend component and the constant are also statistically valid and positive.

4.5.2. ARDL bounds test

The bound test helps determine whether the series have long-term relationships. It is performed before employing the ARDL cointegration method. If the bound test indicates cointegration, the ARDL cointegration is performed. If not, the cointegration test is not conducted. Cointegration is typically indicated when the F-statistic value for a bound test is greater than the upper bound at a significance level of 5%. If the calculated F-statistic is less than the lower bound, cointegration is not present. If the F-statistic lies between the minimum and maximum values, cointegration cannot be determined conclusively.

Table 7. ARDL Bounds Test Results

Significance	Lower Bound	Upper Bound
10%	2.49	3.38
5%	2.81	3.76
2.50%	3.11	4.13
1%	3.50	4.63
Test Statistic	Value	K
F–statistic	35.26767	5

Source: Generated by the author using EVIEWS

Null Hypothesis: There is no evidence of the long run relationship

To test the above hypothesis, it is evident that the value of the F–statistics exceeds the upper bounds at critical levels of 1%, 2.5%, 5%, and 10%. Consequently, the null hypothesis has been rejected, thereby accepting the alternative hypothesis of supporting the long–run relationship. Given the evidence of a long–run relationship, the study proceeds to apply the cointegration and error correction model (ECM).

4.5.3. ARDL Long–Term Results

The table below presents the ARDL long–run results.

Table 8. Long–Run Results

Variable	Coefficient	Std. Error	t–Statistic	Prob.
WUI	-0.2298	0.0994	-2.3118	0.0316***
LOGLABOR	0.1643	0.1451	1.1322	0.2709**
CAPITAL	2.6162	0.2157	12.1272	0.0000
CPI	0.4497	0.0733	6.1364	0.0000
CPISQ	-0.4118	0.0959	-4.2964	0.0004
@TREND	0.0253	0.0037	6.8245	0.0000

Source: Generated by the author using EVIEWS

Note: *** and ** indicate 1% and 5% significance, respectively

The long-run results show that the WUI has a deteriorating impact on the economic growth of Turkey with a 5% statistical validity. Labor has a favorable but statistically meaningless long-run impact on economic growth. In addition, CAPITAL impacts the growth of the Turkish economy favorably at a 1% statistical acceptance level in the long term. Inflation (CPI) has an increasing influence on Turkish economic progress. However, when it is squared (CPISQ), the effect becomes negative and statistically meaningful as well. This confirms that the growth-CPI relationship is non-linear. The trend component also has a significant effect on the economic expansion.

4.5.4. ARDL Error Correction Model Results

The short-term ARDL results have been commuted using the error correction model (ECM). The empirical results provided by this model are displayed in the table below.

Table 9. Short-Run Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.088306	0.226514	18.04883	0.0000***
D(LOGLABOR)	0.302514	0.095509	3.167400	0.0048***
D(LOGLABOR(-1))	-0.108876	0.085952	-1.266708	0.2198
D(CPI)	0.297767	0.025116	11.85552	0.0000***
ECM	-0.802151	0.044776	-17.91468	0.0000***

Source: Generated by the author using EVIEWS

Note: *** indicate 1% significance

The error correction model (ECM) results in the above table reveal that the ECM component is negative and significant confirming the existence of the long-term relationship and convergence towards the long-term equilibrium. Thus, around 80% of the adjustment was made during the previous period. The factor LABOR affects the growth positively at a 1% statistical acceptance rate. While its lag does not have any meaningful impact in the short run. Inflation, in the short run, favors the Turkish economy.

4.5.5. Autocorrelation Test

Prior to drawing conclusions about the results, it is crucial to verify for serial or autocorrelation, as serial correlation can lead to an underestimation of the standard errors. The present study employed the Breusch-Godfrey serial correlation test to examine the presence of serial correlation. The results are stated below.

Table 10. Serial Correlation Test Results

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.1324	Prob. F(2,10)	0.8768
Observed R-squared	0.4495	Prob. Chi-Square(2)	0.7987

Source: Generated by the author using EVIEWS

Null Hypothesis: There is no evidence of serial correlation

To test the hypothesis mentioned above, the p-value of the observed R-square can be utilized. Since the p-value is greater than 5%, it is concluded that the null hypothesis must be accepted and followed. Therefore, no evidence of serial correlation is found.

4.5.6. Heteroscedasticity Test

Heteroscedasticity can result in incorrect standard errors, leading to the generation of false conclusions. The presence of heteroscedasticity violates the basic assumption of homoscedasticity in classical linear regression, which assumes equal error variance. The Breusch–Pagan–Godfrey test is used to check for heteroscedasticity, and the results are displayed in the table below.

Table 11. Heteroskedasticity Test Results

Breusch–Pagan–Godfrey Heteroskedasticity Test			
F–statistic	1.2083	Prob. F(16,12)	0.3430
Observed R–squared	11.6756	Prob. Chi–Square(16)	0.3074

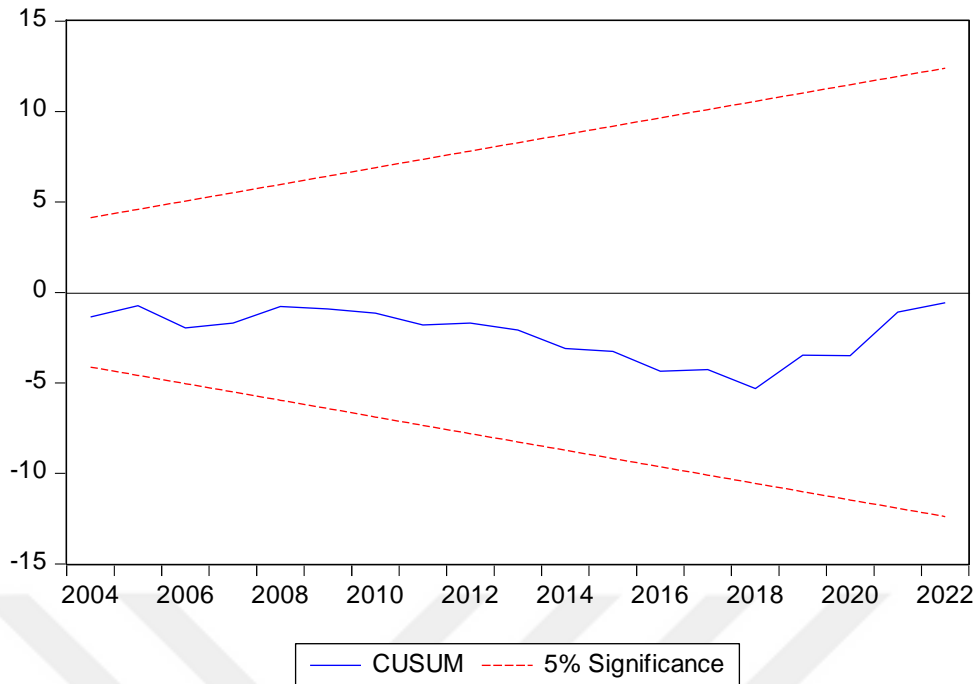
Source: Generated by the author using EViews

Null Hypothesis: No evidence of heteroscedasticity

Once again, the decision is to be based on the p–value of the observed R–squared. Since the p–value is not significant, as it is greater than 5%, it is advised to accept the null hypothesis. Therefore, no evidence of heteroscedasticity in the model is found.

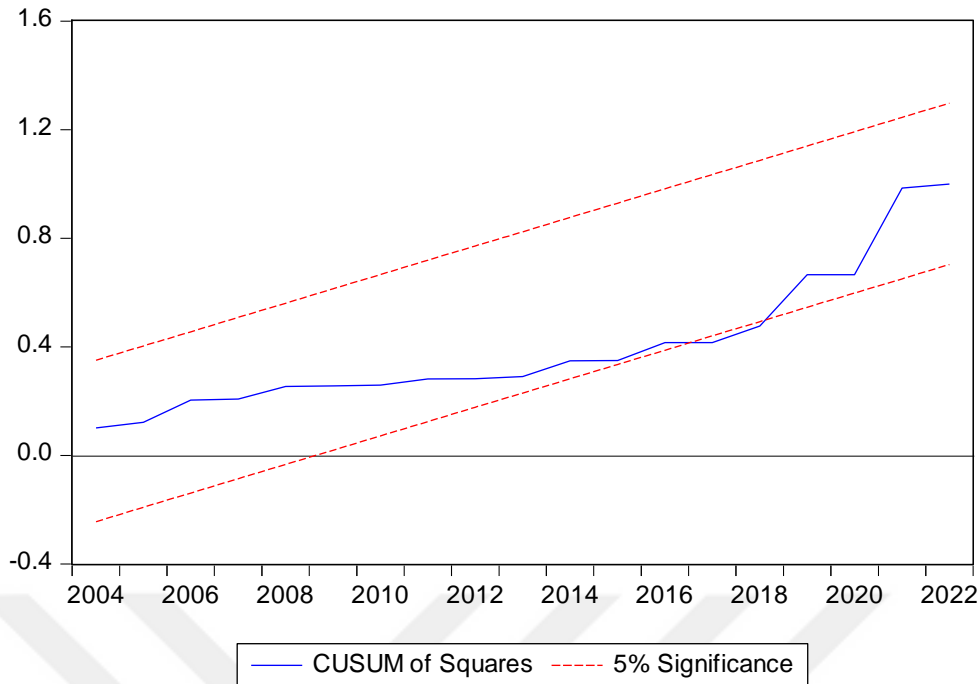
4.5.7. CUSUM and CUSUMSQ Charts

Cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) charts are utilized to assess the stability of the model and identify any potential structural breaks. Both charts are presented below.



Graphic 7. CUSUM Chart

The CUSUM chart above demonstrates that the blue line remains within the upper and lower critical bounds (red lines) at a significance level of 5%. This confirms the stability of the model and indicates the absence of any structural breaks.



Graphic 8. CUSUMSQ Chart

The CUSUMSQ chart is displayed in the figure above. Once again, the blue line stays within the red lines, indicating a 5% level of significance. However, there is a slight structural break in the years 2017 and 2018. This test may indicate a temporary disruption in the stability of the coefficients. Turner (2010) suggests that when a structural change occurs at the end of the sample period, the CUSUM of Square test tends to provide more robust results. In contrast, for cases where the structural change happens at other points, the standard/basic CUSUM test yields stronger outcomes.

In the context of a short-term disturbance in the model coefficients' stability, the structural change takes place at the end of a period for which data has been collected. Hence, using the CUSUMSQ test is a good choice because it is known to provide reliable and trustworthy results in such cases. It can be concluded that the parameters fall within the critical limits, indicating stability. Therefore, the model is deemed structurally stable. Based on both charts, it can be concluded that the current model has performed better.

CHAPTER FIVE

CONCLUSION

The primary purpose of this research was to investigate the role that inflation has in determining the rate of economic expansion in Turkey. Annual time-series data for the period 1990–2022 to conduct the analysis has been used. The purpose of the study was to assess the level of representativeness of Turkish economic development as well as to investigate the influence inflation has on economic growth overall. The study also helped determine whether the inverted U-shaped relationship between inflation and growth exists.

This research is vital for macroeconomists, financial analysts, academics, policymakers, and central bank officials because it illuminates the sensitivity of GDP to changes in the general price level, allowing them to better set prices at a level that encourages production. Policymakers must eliminate confusion, yet several studies have found little correlation between inflation and economic expansion. Depending on the study, a positive or negative correlation between these two macroeconomic factors has been found to exist.

Based on the analysis using the Autoregressive Distributed Lag (ARDL) model, several conclusions can be drawn regarding the long-term and short-term relationships between the variables studied. The ARDL bounds test was conducted to determine the presence of long-term relationships among the variables. The results indicated that there is evidence of a long-run relationship, as the F-statistic value exceeded the upper bounds at critical levels of 1%, 2.5%, 5%, and 10%. Therefore, the null hypothesis of no long-run relationship was rejected.

In the long run, the consumer price index (CPI) is statistically meaningful, and it affects long-term economic growth positively while the square of CPI (CPISQ) has a deteriorating impact on the economic progress of Turkey. This reveals an inverted U-shaped relation between inflation and economic expansion. The control factors also have a noticeable effect on growth. An increase in the world uncertainty index (WUI) leads to a reduction in long-term economic growth. The labour force (LABOR) has a

favorable but statistically unacceptable impact on growth. CAPITAL has a highly significant impact on economic progress.

The findings from the error correction model (ECM) indicated that the ECM component is both negative and statistically significant, which confirms the presence of a long-term relationship and a tendency to move towards a long-term equilibrium. In other words, about 80% of the necessary adjustment took place in the preceding period. Additionally, the factor "LABOR" has a positive influence on growth, supported by a 1% level of statistical significance, but its past values (first lag) don't seem to have a substantial short-term impact. As for inflation, in the short term, it appears to be beneficial for the Turkish economy.

The Breusch–Godfrey serial correlation test indicated no evidence of serial correlation in the model. The Breusch–Pagan–Godfrey heteroscedasticity test also showed no evidence of heteroscedasticity. The CUSUM charts shows no structural breaks in the model. The CUSUM of square (CUSUMSQ) chart demonstrates a statistical significance level of 5% and identifies a small structural change occurring between 2017 and 2018. This finding suggests that the CUSUM of Square test is robust in detecting changes in the structure of the data towards the end of the sample period. As a result, it provides reliable results in identifying short-term disturbances in the stability of model coefficients.

5.1. Policy Recommendations

Based on the empirical findings of this thesis, the following policy recommendations have been devised.

According to the study's findings, it is recommended that the government should take initiatives to control inflation, as higher levels of inflation may deteriorate the economic progress of the country. However, the existing level of inflation, according to the findings, poses no threat to the economy.

The world uncertainty index has a harmful long-run impact on the Turkish economy. Reducing exposure to world uncertainty may be achieved by minimizing the country's dependency on the world market. Additionally, the country's cooperation with other nations to address economic challenges may also be helpful. Lastly, a

country's preparation of strategies to survive external shocks may prevent it from experiencing a decline in economic growth.

Capital acts like fuel for the economy. The findings reveal that capital has a positive effect on Turkish economic expansion. The government can increase capital by promoting savings and investment in the country. Investment can be raised through lower levels of investment, while household savings may increase if the government provides tax relaxations, improves minimum wages, and controls inflation.

Lastly, results suggest that labor has a favorable impact on short-term economic growth. So, if the government reduces worker shortages in the long run by generating more employment, it can achieve sustainable economic development. Moreover, enhanced economic freedom and a favorable business environment also promote employment, ultimately enhancing economic progress.

REFERENCES

- Adaramola, A. O., & Dada, O. (2020). Impact of inflation on economic growth: evidence from Nigeria. *Investment Management and Financial Innovations*, 17(2), 1–13.
- Adeleye, N., & Eboagu, C. (2019). Evaluation of ICT development and economic growth in Africa. *NETNOMICS: Economic research and electronic networking*, 20, 31–53.
- Ahmad, T. (2022). A Case of Pakistan Investigating the Relationship between Inflation and Economic Growth: A Case of Pakistan. *Acta Pedagogica Asiana*, 1(1), 1–8.
- Aydın, C., Esen, Ö., & Bayrak, M. (2016). Inflation and economic growth: A dynamic panel threshold analysis for Turkish Republics in transition process. *Procedia–Social and Behavioral Sciences*, 229, 196–205.
- Ayyoub, M., Chaudhry, I. S., & Farooq, F. (2011). Does Inflation Affect Economic Growth? The case of Pakistan. *Pakistan Journal of Social Sciences (PJSS)*, 31(1).
- Azam, M., & Khan, S. (2022). Threshold effects in the relationship between inflation and economic growth: Further empirical evidence from the developed and developing world. *International Journal of Finance & Economics*, 27(4), 4224–4243.
- Azam, M., Khan, A. Q., & Ozturk, I. (2019). The effects of energy on investment, human health, environment and economic growth: empirical evidence from China. *Environmental Science and Pollution Research*, 26, 10816–10825.
- Bahrini, R., & Qaffas, A. A. (2019). Impact of information and communication technology on economic growth: Evidence from developing countries. *Economies*, 7(1), 21.
- Bick, A. (2010). Threshold effects of inflation on economic growth in developing countries. *Economics Letters*, 108(2), 126–129.
- Chindengwike, J. (2023). The Nexus between Inflation and Economic Growth in Sub-Saharan Africa Countries.: An Empirical Study using VECM. *Journal of Global Economy*, 19(2), 109–136.
- Eggoh, J.C., & Khan, M. (2014). On the nonlinear relationship between inflation and economic growth. *Research in Economics*, 68(2), 133–143.
- Ehigiamusoe, K. U., Lean, H. H., & Lee, C. C. (2019). Moderating effect of inflation on the finance–growth nexus: insights from West African countries. *Empirical Economics*, 57, 399–422.

- Erbaykal, E., & Okuyan, H. A. (2008). Does inflation depress economic growth? Evidence from Turkey. *International Journal of Finance and Economics*, 13(17).
- Girdzijauskas, S., Streimikiene, D., Griesiene, I., Mikalauskiene, A., & Kyriakopoulos, G. L. (2022). New approach to inflation phenomena to ensure sustainable economic growth. *Sustainability*, 14(1), 518.
- Hakim, S., & Seraj, M. (2021). Analyzing the Influence of Inflation on Economic Growth: Empirical Evidence from Iraq. *Information Technology in Industry*, 9(3), 805–815.
- Hossin, M. S. (2015). The relationship between inflation and economic growth of Bangladesh: An empirical analysis from 1961 to 2013. *International Journal of Economics, Finance and Management Sciences*, 3(5), 426–434.
- Kankpeyeng, J. G., Maham, I., & Abubakar, M. (2021). Impact of inflation on gross domestic product growth in Ghana. *Ghana Journal of Development Studies*, 18(2), 117–137.
- Karahan, Ö., & Çolak, O. (2020). Inflation and economic growth in Turkey: evidence from a nonlinear ARDL approach. In *Economic and Financial Challenges for Balkan and Eastern European Countries: Proceedings of the 10th International Conference on the Economies of the Balkan and Eastern European Countries in the Changing World (EBEEC) in Warsaw, Poland 2018* (pp. 33–45). Springer International Publishing.
- Liaqat, M., Ashraf, A., Nisar, S., & Khursheed, A. (2022). The Impact of oil price Inflation on economic growth of oil Importing economies: Empirical evidence from Pakistan. *The Journal of Asian Finance, Economics and Business*, 9(1), 167–176.
- López-Villavicencio, A., & Mignon, V. (2011). On the impact of inflation on output growth: Does the level of inflation matter?. *Journal of macroeconomics*, 33(3), 455–464.
- Mishchenko, V., Naumenkova, S., Mishchenko, S., & Ivanov, V. (2018). Inflation and economic growth: The search for a compromise for the Central Bank's monetary policy. *Banks & bank systems*, 13(2), 153–163.
- Ngouhouo, I., & Nkemgha, G. Z. (2018). Inflation and economic growth: a comparative empirical analysis between Cameroon and the Ivory Coast. *International Journal of Economics and Finance*, 10(12), 87–95.
- Olson, M. (2022). *The rise and decline of nations: Economic growth, stagflation, and social rigidities*. Yale University Press.

- Ozpençe, A.I. (2016). Analysis of the relationship between inflation and economic growth in Turkey. *Journal of Economics Finance and Accounting*, 3(3), 180–191.
- Parker, M. (2018). The impact of disasters on inflation. *Economics of Disasters and Climate Change*, 2(1), 21–48.
- Pesaran, M. H., & Shin, Y. (1995). *An autoregressive distributed lag modeling approach to cointegration analysis (Vol. 9514)*. Cambridge, UK: Department of Applied Economics, University of Cambridge.
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3), 289–326.
- Pollin, R., & Zhu, A. (2006). Inflation and economic growth: A cross-country nonlinear analysis. *Journal of post Keynesian economics*, 28(4), 593–614.
- Runganga, R. (2020). Inflation and economic growth in Zimbabwe is there any inflation threshold level. *International Journal of Applied Economics, Finance and Accounting*, 8(1), 1–10.
- Sanga, G. J., Kongolo, M., & Mnongya, R. (2022). The Effect of Inflation on Economic Growth in Tanzania for the Period from 1970 to 2020. *International Research Journal of MMC (IRJMMC)*, 3(5), 12–27.
- Sarel, M. (1996). Nonlinear effects of inflation on economic growth. *Staff Papers*, 43(1), 199–215.
- Sekwati, D., & Dagume, M. A. (2023). Effect of Unemployment and Inflation on Economic Growth in South Africa. *International Journal of Economics and Financial Issues*, 13(1), 35.
- Tien, N.H. (2021). Relationship between inflation and economic growth in Vietnam. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(14), 5134–5139.
- Turner, P. (2010). Power properties of the CUSUM and CUSUMSQ tests for parameter instability. *Applied Economics Letters*, 17(11), 1049–1053.
- Uddin, I., & Rahman, K. U. (2023). Impact of corruption, unemployment and inflation on economic growth evidence from developing countries. *Quality & Quantity*, 57(3), 2759–2779.
- Valdovinos, C. G. F. (2003). Inflation and economic growth in the long run. *Economics letters*, 80(2), 167–173.
- Vasylijeva, T. A., Lieonov, S. V., Liulov, O. V., & Kyrychenko, K. I. (2018). Macroeconomic stability and its impact on the economic growth of the country. *Montenegrin Journal of Economics*, 14(1), 159–170.

World Bank. (2023). *The World Bank in Turkey*.
<https://www.worldbank.org/en/country/turkey/overview>

Živkov, D., Kovačević, J., & Papić–Blagojević, N. (2020). Measuring the effects of inflation and inflation uncertainty on output growth in the central and eastern European countries. *Baltic Journal of Economics*, 20(2), 218–242.

