T.C.

ISTANBUL AYDIN UNIVERSITY

INSTITUTE OF GRADUATE STUDIES

IMPACT OF EXCHANGE RATE VOLTALITY ON ECONOMIC GROWTH: EVIDENCE FROM TURKEY CASE

MASTER'S THESIS

MOAZ MOHAMEED MONZER KAAKA

Department of Business

Business Administration Program

APRIL, 2023

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Thesis Advisor: Assist. Prof. Dr. MUSTAFA ÖZYEŞİL

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APPROVAL PAGE

DECLARATION

I hereby declare with respect that the study “Impact Of Exchange Rate Voltality On Economic Growth: Evidence From Turkey Case”, which I submitted as a Master thesis, is written without any assistance in violation of scientific ethics and traditions in all the processes from the Project phase to the conclusion of the thesis and that the works I have benefited are from those shown in the Bibliography. (30/04/2023)

MOAZ MOHAMEED MONZER KAAKA

FOREWORD

I would firstly like to thank my parents for their love and support during my journey till my graduation. Honestly speaking, without them, this day would not have seen the light . I would also like to thank my research advisor Assis. Professor Dr. MUSTAFA ÖZYEŞİL who has not lift no stone unturned in order to finish up my thesis successfully. He has been really helpful and available round the clock. My thanks to my colleagues for their encouragement and love.

April, 2023 MOAZ MOHAMEED MONZER KAAKA

IMPACT OF EXCHANGE RATE VOLATILITY ON ECONOMIC GROWTH: EVIDENCE FROM TURKEY CASE

ABSTRACT

A significant macroeconomic aspect that has an impact on both international trade and any nation's economic development is the exchange rate.Gross domestic product (GDP) growth rate is the level of increase that occurs in a country's economic output, and this rate determines exactly how fast a country's economy can grow. Many countries use real GDP to calculate the growth rate. It is very important to study the effect of the exchange rate on the GDP. This thesis looks at the impact of exchange rate fluctuation on Turkey's economic development from 1999 to 2021. We have taken Twenty- three annual observations of two time series data with interval period extend from 1999 to 2021 in Turkey. The Granger causality test and simple regression model were used to examine the causal linkages between foreign exchange rate volatility and economic growth. There is only one conceivable path for the causal relationship between exchange rate volatility and economic growth, and empirical evidence indicates that exchange rate volatility has a negative and statistically significant influence on Turkey's economic growth.

Keywords: Exchange Rate Volatility, GDP, Granger Causality Test, Simple Regression Model, Turkey

DÖVİZ KURU OYNAKLIĞININ EKONOMİK BÜYÜME ÜZERİNDEKİ ETKİSİ: TÜRKİYE ÖRNEĞİNDEN KANITLAR

ÖZET

Hem uluslararası ticaret hem de herhangi bir ülkenin ekonomik gelişimi üzerinde etkisi olan önemli bir makroekonomik yön döviz kurudur. Gayri safi yurtiçi hasıla (GSYİH) büyüme oranı, bir ülkenin ekonomik çıktısında meydana gelen artış düzeyidir ve bu oran tam olarak ne kadar hızlı olduğunu belirler. bir ülke ekonomisi büyüyebilir. Birçok ülke büyüme oranını hesaplamak için reel GSYİH kullanır. Döviz kurunun GSYİH üzerindeki etkisini incelemek çok önemlidir. Bu tez, döviz kuru dalgalanmasının 1999'dan 2021'e kadar Türkiye'nin ekonomik gelişimi üzerindeki etkisini incelemektedir. Türkiye'de 1999'dan 2021'e uzanan aralıklı iki zaman serisi verisinin yirmi üç yıllık gözlemini aldık. Döviz kuru oynaklığı ile ekonomik büyüme arasındaki nedensel ilişkileri incelemek için Granger nedensellik testi ve basit regresyon modelleri kullanılmıştır. Döviz kuru oynaklığı ile ekonomik büyüme arasındaki nedensel ilişki için akla gelebilecek tek bir yol vardır ve ampirik kanıtlar, döviz kuru oynaklığının Türkiye'nin ekonomik büyümesi üzerinde negatif ve istatistiksel olarak anlamlı bir etkiye sahip olduğunu göstermektedir.

Anahtar Kelimeler: Döviz Kuru Oynaklığı, GSYİH, Granger Nedensellik Testi, Basit Regresyon Modeli, Türkiye

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GDP : Gross Domestic Product

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I. INTRODUCTION

Achieving a high rate of economic growth is the ultimate goal of any economic system. This includes implementing the right economic policies, stabilizing economic policies as well as a greater understanding of the factors that influence or affect economic growth. Most economists have come to a consensus that economic stability is a necessary condition for strong economic growth, while economic instability is the opposite, limiting and constraining prospects for economic growth.

Economic growth provides the resources that enable sustainable improvement in human development, and on the other hand, human development and the improvement of the quality of manpower and employment in the economy encourages and enhances economic growth. In other words, more freedom as well as capacity growth/sharing leads to greater economic performance and human development plays a crucial role in economic growth. (Bousari et al., 2008)

The most important factor affecting the global economy is the exchange rate. The currency traded globally around the world is the US dollar. The exchange rate is the mediator between the domestic and international economies. In a world moving towards free trade and the accelerating volume of international exchange, the exchange rate is one of the most important variables that affect the economic fortunes of countries. The exchange rate translates domestic prices into international prices and vice versa. (Dolatabadi & Fard, 2015)

The exchange rate indicates that the selected country's currency is valued in the currency of another nation. If we are interested in the Turkish lira and the US dollar, then this is referred to as a currency pair and is indicated as follows: The Tur/USD currency pair denotes the Tur's exchange rate against the US dollar. Daily fluctuations in supply and demand determine the currency's value. Volatility is the term used to describe the daily swings in currency value. (2021, Heroja A.)

The variability of unanticipated changes in exchange rates is known as exchange rate volatility. Volatility, to put it more formally, is the likelihood that domestic or foreign currency's purchasing power will change from its current value in the future.

Exchange rate volatility has become a major concern for countries as a result of the deployment of the floating exchange rate system and the departure of the fixed exchange rate system following the collapse of the Bretton Woods system. According to Levi (2009), volatility is the standard deviation of an asset's or liability's local currency value as a result of unforeseen fluctuations in exchange rates. (Levi, 2009)

GDP growth rate is the level of increase that occurs in a country's economic output, and this rate determines exactly how fast a country's economy can grow. Many countries use real GDP to calculate the growth rate. (bousari et al., 2008)

The aim of this thesis is to assess and analyze the impact of exchange rate volatility on the GDP of Turkey during the period between 1999-2021, via asymmetric causality test and several statistical analysis methods as correlation coefficient, simple regression model. Several diagnostic statistical analysis methods were used to check the efficiency of the inferred regression model.

The rest of this thesis is organized as follows: in section 1, Finance history briefly presented; in section 2, Exchange Rates is described; in section 3, the relation of exchange rate and economic growth is described; in section 4, Literature review is described; in section 5 data specifications are briefly presented; in section 4, the experimental and statistical results are presented; In the last section, the conclusions are summarized.

A. Finance History:

1. Introduction:

If we go back a few hundred years, trade has always been a part of our existence since it is essential to our food chain and is likely to remain so forever. The three most crucial requirements are, as we shall rapidly see when we examine the three fundamental human needs for survival water, air and food. I'll use food as an example and start a more thorough analysis as air and water may be found in many

places at no cost.

One of the fundamental requirements for human survival has been recognized from ancient times as being food. As a result, we now realize the immense value of food.

It was one of the first ways for humans to exchange money for certain items or services, and like anything else of value, it entered the network of global trade.

Food has historically been one of the best forms of payment because it helps with basic survival. In actuality, a lot of websites continue to employ this strategy today.

Payment systems started to alter as civilization advanced, notably in more established villages and towns.

We didn't have refrigerators or freezers back then, so culinary goods like exotic fruits or any kind of meat would go bad if we paid for them. This led to numerous problems. Hence, a solution to this issue was required. A new payment system that was difficult to corrupt or lose provided the solution. It must, however, be redeemable for food or any other products or services.

B. Valuable Metal:

Shiny metals, such as silver or gold, were brought to society as a brand-new method of exchange. Naturally, the majority of people first opposed the concept. But idea was put into practice, and gradually it gained popularity. It was truly revolutionary since it could be exchanged for food, other things, or services, and it still is today because the price of silver or gold keeps rising. The extraction of gold and silver has grown increasingly challenging, as humans have realized. As a result, the use of precious metal as the primary form of payment had to end.

- **Fiat Currency:**

Given that humans are uncomfortable with change and hesitant to adjust to anything we don't understand - at least at first - the introduction of fiat money appeared absurd. At some time, practically all of the nations in the globe adopted paper money in a centralized fashion. Fiat money, the modern kind of money, has been active and prospering everywhere. Fiat money is fine, but there are innumerable

nations where it has repeatedly failed owing to its long-term devaluation. Paper money's declining value has other causes as well, such how simple and prevalently it is counterfeited. Also, we have discovered that limited supply items have an increase in value over time, just like everything else in the universe.The value of paper money decreases when it is printed more, on the other hand. It's an interesting subject when it comes to fiat currency. Despite the fact that we have repeatedly learned that paper money is a failure, we keep developing new forms of currency.

This time, we think it will be successful. For instance, the euro has replaced currencies like:

- French franc
- Austrian Schilling
- German Mark
- Spanish peseta
- Italian Lira
- Dutch guilder
- Lira Maltese (Söze, 2017)

C. Exchange Rates:

1. Introduction to Exchange rate:

Money does not simply "turn" into other money, only because of the "banks".No more than a pint of milk can become a liter of juice, or a piece of silver can become a piece of gold, can a pound become a US dollar. To understand foreign exchange, let's think with Ahmet who wants to send GBP from his GBP account so that it is in USD in Bob's USD account? One pound is not 1.3 US dollars, more ever, one pound is not even equal to 1.3 US dollars.

Assets and currencies cannot instantly change from one type to another as the British pound is a completely different asset from the US dollar.

We always require a third party who is prepared to take one kind of payment and give us another.

No, pounds don’t magically become dollars

You have to find someone to exchange it with

Someone is acting as a third party prepared to accept some of our money in return for some other in a two-currency transaction. The role of exchange may be carried out by Ahmet Bank, which will deduct GBP from Ahmet's account, when Ahmet pays GBP to end up as USD in Bob's account. Bob's Bank will accept British Pounds from Ahmet Bank in exchange for US Dollar credits in Bob's account as well as US Dollar credits at Bob's Bank. Or Ahmet might work with a certain third party, like an MTO like TransferWise.

They will receive sterling from Ahmet to their sterling account in London and will direct their New York USD bank to transmit some USD from their USD account to Bob's account. TransferWise and other similar money transfer providers have local currency accounts at banks in many different countries. By maintaining more GBP and less USD, TransferWise has altered the balance of the currency we now hold.

This alters the risk that it faces from changes in the value of those currencies relative to one another, or exchange rate swings. TransferWise then waits for someone to wish to send the money the opposite way, clearing their books, or they

might try to sell that additional sterling to another agency for US dollars in order to retain its original risk profile. (Lewis, 2018)

D. Understanding Exchange Rate:

The exchange rate is only a price, which is the first thing to learn about it. The UK price for this book is the exchange rate between a given good (the book) and the pound sterling. Or, in the alternative, prices as we typically understand the term are the exchange rates themselves. If the book's price is set at £50, it will either sell for that amount or be available for purchase at that price.It trades at the exchange rate of 1 book = £50. This suggests that at £50 per book, "money can buy" in the eyes of the bookseller. From the perspective of a bookstore, £1 is equivalent to one-fiftyth of a copy of this book. If it were £51, only 1/51 of a copy would need to be saved in order for the retailer to make £1. Hence, a rise in a book's price from £50 to £51 corresponds to a fall in the value of money from 1/50 to 1/51 of a book. The price of a euro in UK currency is $1 (1 / 1.50) = £0.66, according to the exchange rate of £1 = €1.50. €1.50 is the price of a pound to an Italian or German. The quantity of units of B required to buy one unit of currency A is generally referred to as the exchange rate of that currency. Sadly, there is no common method to communicate the conversion rate, despite the fact that it is more natural to speak of the (money) price of books rather than the (book) price of money. There are two valid methods to describe the same exchange rate: £1 = €1.50 and €1.00 = £0.66.

Interestingly, the Germans and the Brits both choose the first choice. People from Japan and continental Europe typically see exchange rates as what the market refers to as "straight quotations," or the cost of a foreign currency. The American and British tend to consider in terms of the dollar's or pound's 2 purchasing power, respectively, although this isn't always the case. The currency markets don't seem to be particularly interested in making things easy for textbook readers (or writer). (Copeland, 2008)

Since 1973, the topics of determining exchange rate levels (and adjustments) and evaluating the effects of these changes have drawn more and more attention.

This interest developed as a result of the global transition to flexible exchange rates when exchange rates collapsed. These issues pique the interest of both

academic and professional economists because they are difficult to analyze and because in 1971, when the United States stopped converting dollars into gold, disparities in exchange rates caused the Bretton Woods system of fixed exchange rates to collapse.

When it comes to a foreign exchange element, which is unavoidable in this day of globalization, it influences risk and return on investment as well as market shares.

The fact that foreign exchange risk management has developed into a thriving field since the system transformation in the 1970s and as a result, tools and approaches have been developed to deal with this risk, provides evidence for the significance of the exchange rate element.

A second reason why exchange rates and changes to them are important to policy makers is because they have a big impact on practically all macroeconomic variables, including the four key ones (growth, inflation, unemployment and balance of payments). These and other factors have led to a boom in exchange rate research.

(Moos, 2010) Currency exchange takes place on a common market only when it can be stated in terms of other currencies. An exchange rate is the price of one currency in relation to another.

The currency rate quotation may be **direct or indirect**. The quantity of foreign money that can be obtained for one unit of home currency differs **between direct and indirect** quoting. Direct quotation refers to the amount of domestic currency that can be purchased for a unit of foreign currency (Howells & Bain, 2007).

The exchange rate is known as the nominal exchange rate when there are inflationary pressures; the real exchange rate when there aren't any. The value of each country's currency in reference to the US dollar was fixed prior to 1972, when almost all countries in the world switched to a floating exchange rate system.

The exchange rate is important because it permits the rate to be modified in accordance with the economy's supply and demand for foreign currency.

Market equilibrium is achieved by this self-adjustment, which doesn't alter the amount of reserves. It's crucial to let nations create their own monetary policies

without thinking about how those policies will affect the balance of payments.

In order to control the adjustment process, external shocks and imbalance effects typically manifest as changes in the currency rate rather than changes in reserves or central bank action.

Exchange rates are significantly influenced by market supply and demand. Under flexible exchange rate regimes, the price of currencies is determined by the dynamics of supply and demand for that currency on the forex market. (Njuguna, 2016)

E. Exchange Rate and Volatility

Some countries gave up the fixed exchange rate system and adopted the floating exchange rate system when the Bretton Woods system collapsed. Exchange rate volatility has become a major concern for countries since the adoption of a floating exchange rate regime. Exchange rate volatility refers to any genuine alterations and shifts in a currency's value or depreciation. (Martins, 2015).

The study subject itself cannot be understood without comprehending exchange rate, which is a crucial element in this thesis. Exchange rates just suggest that the chosen nation's currency is expressed in another nation's. If we are interested in the euro and the US dollar, then this is referred to as a currency pair and is symbolized as follows: The value of the euro in US dollars is represented by the currency pair EUR/USD.

Every day, supply and demand determine how much a currency is worth. (Levi 2009)

Every day, supply and demand determine how much a currency is worth. (Levi 2009)

Volatility is described by Adler and Dumas (1984) in terms of the volatility of unforeseen changes in exchange rates. More precisely, volatility is the likelihood that the purchasing power of a local or foreign currency will vary from its current value in the future. Levi (2009) offered a little bit of a different viewpoint. The standard deviation of an asset's or liability's local currency values as a result of unforeseen changes in exchange rates is known as volatility. (Heroja, 2021)

F. Monetary Policy and Exchange Rate:

Because they have the ability to regulate the amount of money in circulation, central banks have a significant impact on the economy. By purchasing (selling) assets in a market where the amount of money in circulation rises (falls), for instance, one might raise (reduce) the money supply. In other words, the major commercial banks' balance sheets are boosted by the size of the central bank's purchase when it buys bonds from them.

As a result, banks are now able to extend more credit to the general population because the number of securities bought has increased the size of the balance sheet. As a result, the money supply grew. The central bank-controlled policy rate has a significant impact on the money supply as well. Commercial banks are permitted to borrow money from the central bank at the policy rate. The bank's loans to the general public mirror the policy's rate level. Because borrowing money is more affordable when the policy rate is low, demand for money will rise; conversely, if the policy rate is high, demand for money will fall. (Goodfriend et. Al, 2007)

As was previously said, supply and demand determine a currency's price, therefore variations in the money supply and interest rates have an impact. The currency's external value, or exchange rate, falls against other currencies as there are more of those in use. In contrast, a steady decline in the money supply results in a rise in prices relative to other currencies. Even though it may not always be the aim, the central bank can affect the exchange rate through controlling the money supply. The level of the exchange rate can also be indirectly impacted by the policy rate.

Investors receive larger returns in a country where interest rates have increased if it has high interest rates relative to other nations. The impact of interest rates also works in the opposite direction, leading to a depreciation of the currency, as a result of a steady increase in the money supply and a decline in interest rates. These two strategies both aim to reduce or increase the amount of money in circulation. The exchange rate is not affected differently even though the rise in money supply is. . (Heroja, 2021)

G. Macroeconomic Policy and The Exchange Rate:

Central banks frequently intervene in the market to "smooth" and "smooth" exchange rate swings in a system of flexible exchange rates. They occasionally intervene in an effort to change an established market tendency, but they absolutely fail at this (In September 1992 and July 1997, the Thai monetary authorities and the Bank of England both had unpleasant experiences.). The justification for central bank intervention rests on the premises that (1) exchange rate volatility might occasionally be excessive and (2) exchange rate fluctuations have a detrimental impact on economic activity.

The first claim actually emphasizes how crucial it is to comprehend how exchange rates behave. The first claim actually emphasizes how crucial it is to comprehend how exchange rates behave. Changes in exchange rates can have a variety of effects on international trade. The first is that when there is uncertainty, agents tend to reduce the volume of global transactions. The reaction might also entail altering the composition of investment and production in order to reduce risk.

Changes in exchange rates may also have an impact on macroeconomic policy through changing policy swaps (see, for example, International Monetary Fund, 1984). There is some evidence that exchange rate uncertainty has a negative influence on resource allocation and exports.

H. Macroeconomic links through exchange rates:

The exchange rate establishes an essential macroeconomic link between the domestic economy and the rest of the world through commodities and asset markets. The link between domestic and foreign prices in the commodities market is controlled by the exchange rate because domestic prices are a subset of overseas prices whose exchange rates have changed (not exactly but close enough).Workers may request pay rises when increased import costs increase the cost of living, which is one way that international prices have an impact on domestic pricing (and higher import prices may result only from higher foreign exchange rates).

Asset markets are correlated with currency rates, which can generally lead to imported inflation and a loss of competitiveness. Based on a connection between risk and return that can be expressed in terms of unhedged interest parity, the choice of

which assets to employ is made (UIP). The distribution of resources is impacted by microeconomic connections made through exchange rates. Asset markets are correlated with currency rates, which can generally lead to imported inflation and a loss of competitiveness.

Based on a connection between risk and return that can be expressed in terms of unhedged interest parity, the choice of which assets to employ is made (UIP). If a nation has a traditional export industry (such as mining or agriculture), traditional exports will be profitable due to a highly competitive exchange rate and an undervalued local currency. Markets for assets are also affected. There will be less money available for domestic investment when domestic returns are lower than overseas yields.

When capital limits are put in place, individuals who participate in (illegal) capital flight (like those who create fake trade invoices) frequently do so at the expense of others who do not (possibly because they are unable). With their effects on aggregate expenditure (via the demand for money) and on the competitiveness of traded goods, exchange rate rules and regulations have an impact on both the external balance and the internal balance. The external balance should be regarded as achieving a sustainable current account deficit, claim Collier and Joshi (1989). (a deficit that corresponds to a realistic medium-term expectation of an inflow of foreign capital).

Because it includes employment (or output) and inflation, internal equilibrium is a more complicated goal. More employment, production, and lower inflation are what policymakers aim for, but there may be trade-offs between these sub-goals, which complicates things (as suggested by the Phillips curve).

Due to the currency's significant direct impact on the general price level (through links to the commodities market) and significant indirect impact on the amount of macroeconomic activity, exchange rate regimes and policies have an impact on internal equilibrium. Real income maximization depends on the effectiveness of resource allocation at the microeconomic level. The two ways in which exchange rate regimes and policies affect efficiency are I by changing the level of uncertainty around the outcomes of economic transactions, particularly those involving foreign commerce, and (ii) by changing the likelihood that trade barriers

will be put in place.(Moosa, 2010)

İ. Bilateral Exchange Rates vs Trade Weighted Exchange Rates:

Imagine that one day we learn that the value of the US dollar has increased because the pound has decreased in relation to it. Does this indicate a decline in the value of the pound globally? Or would it be more accurate to state that the American dollar has gained value? From a purely binary standpoint, the two are equivalent. But, Baldin's perspective is too constrained for a lot of things.

Let's imagine, for example, that we want to understand why the dollar has been overtaking the pound in the binary exchange rate. Naturally, we should look to occurrences in the US rather than the UK to explain the shift in the exchange rate, and vice versa, if we have reasons to assume that the American currency strengthened and not the pound sterling that weakened. If we believe that the dollar has not changed but the pound has. The issue is the same as when attempting to justify, for instance, the increase in the price of beef. If the relative price of beef has increased, the explanation is likely to be related to changes in the beef market. If, however, the price of goods has increased generally (i.e., inflation), the explanation is likely to be related to macroeconomic factors and would imply a different explanation.

Note that we say the price of beef, meat, or whatever has increased when the price of one commodity or class of commodities increases but the price of all other goods remains unchanged. We claim that the worth of money has decreased when the price of beef increases simultaneously with the price of all other prices. In a similar vein, we can argue that the US currency has strengthened if the dollar's price (in sterling) rises while the prices (in sterling) of all other currencies remain unchanged. On the other hand, the pound depreciates if all currency rates move against it. One would anticipate that the UK economy would experience change if the pound suddenly fell against all other currencies, and the opposite would be true if the dollar rose. All of this should help to explain why, for some purposes, it suffices to look solely at the exchange rate between two countries, while for other reasons, such a narrow approach may be wholly deceiving.

We have only thought about exchange rates in the setting of two countries thus far. We require the following definition to be more specific: The cost of the dollar in terms of the pound, for instance, represents the bilateral exchange rate between the United Kingdom and the United States. As a result, it has been suggested that a shift in the UK-US bilateral exchange rate in favor of the dollar may signal either a drop in the international value of the pound or an increase in the dollar, or both, of course. How can we be certain of which? How can we learn more about what happened to the dollar's or pound's total value? (Copeland, 2008). One approach is to simply observe the movements of the US and UK currencies relative to the euro. To do this, one would need to look at two binary exchange rates for the US (dollars/£) and two for the UK (pounds/dollars). ($/£, $/€). (Copeland, 2008)

J. Cross Exchange Rate

The exchange rate between two currencies, A and B, both of which are not US dollars, is known as a cross exchange rate. It can be calculated as the reciprocal of the ratio between the dollar exchange rates for A and B. A three-weighted average of currency A's exchange rates with B, C, D, and E yields its actual or trade-weighted exchange rate. The weights are often calculated using country A's trade ratio, which includes B, C, D, and E, etc., in that order. Instead of being bilateral, the real exchange rate is multilateral. It also makes no sense to compare it to the absolute level of the effective exchange rate because that is dependent on the base year that we select, much like the retail price index.

As an illustration, the fact that the euro's effective exchange rate was 115.44 on March 19, 2008, indicates that its average value versus the other major international currencies was somewhat higher than its average during the base period, the first quarter of 1999, which was just over 15%. A detailed discussion of whether and when not to use binary exchange rates efficiently has no place here. All that has to be said is that the theoretical literature occasionally examines the interaction between the domestic and foreign economies of two countries, leading to results that are obviously related to the bilateral exchange rate.

In other instances, it makes an effort to explain the relative worth of one currency to others in general, so that the effective exchange rate is the obvious way to evaluate empirical evidence. (Copeland, 2008)

Even in this situation, we may still apply the theory as if it were determining the exchange rate between the home economy and the rest of the world (ROW), an intervening nation. (Copeland, 2008)

K. Bid and Ask Prices:

To trade with anonymous investors, who may be liquidity or informed traders, stock traders must set bids and bids (BS and AS) .The likelihood of a liquidity trader purchasing or selling one unit of stock is assumed to be 1/2, and the ratio of liquidity traders to insider traders is assumed to be NS. Each knowledgeable trader will purchase 1 unit of stock (ST > AS) and sell 1 unit of stock (ST BS)

depending on whether the stock's value is higher than the ask price or lower than the bid price.

Since traders must deal with the issue of reverse selection and are expected to be risk-neutral, they will make bids and seek quotes so that their anticipated gains from liquidity traders balance their anticipated losses from informed traders.(Han K., 1997)

To understand this, let's look at straight quotes for an example of a EUR-USD rate between 1.2310 and 1.2415. The trader's readiness to buy euros from the customer is indicated by the first sentence, whilst his willingness to sell euros to the customer is shown by the second. In order for the trader to continue making money, the price at which he is willing to buy the foreign currency, known as the bid, must be lower than the price at which he is willing to sell it, known as the ask or the bid. Hence, in direct quotations, the bid rate will always be less than the ask rate.

Once more, let's look at a USD-EUR quote of 0.819.5. The trader's readiness to buy euros from the consumer is shown by the first sentence, whilst his willingness to sell euros to a party is indicated by the second. He wants to pay less per euro to acquire a client. When he sells the Euro, he would prefer to get less money per dollar.

So, it is not surprising that the bid is higher than the ask when using the indirect quoting mechanism. When using a direct quotation, the bid and ask represent the price to purchase and sell the base currency, respectively. In contrast, the ask is the variable currency's selling price and the bid is the variable currency's purchase price in indirect quotation. (Parameswaran S., 2011)

L. Rates of Return:

Assume that S0 is the dollar-to-euro exchange rate that was quoted in Frankfurt.

Let's say the USD to EUR exchange rate is S1 after a year. The rate of return for a European trader earning dollars is established by:

$$r_d = \frac{(S_1 - S_0)}{S_0}.$$

Consider it from the standpoint of an American trader receiving Euros.

A euro is worth 1/S0 EUR-USD in terms of the dollar.

The merchant's rate of return is as a result:

$$r_f = \frac{(\frac{1}{S_1} - \frac{1}{S_0})}{\frac{1}{S_0}} = \frac{(S_0 - S_1)}{S_1} = \frac{-r_d}{(1 + r_d)}$$

So, the point of view we choose affects the return % change.

The European trader was seen as the local investor, and the American trader as the foreign investor.

We can show that:

$$(1 + r_d) = \frac{1}{(1 + r_f)}$$

Hence, 1 plus a domestic investor's return rate is equivalent to 1 plus a foreign investor's return rate. Example 1 illustrates the return for investors who purchase currency as an investment.

The return to investors who purchase currency as an investment is shown in Example 1.

Example 1:

Let the following rates for US dollars be given on two different dates:

February 1, 21, 2001/;0.900 USD_EUR

December 31, 2001: 0.933 USD_EUR

For a European investor, the rate of return is:

$$r_d = \frac{(0.933 - 0.900)}{0.900} = 0.016615 = 1.6615\%.$$

The rate of return for an investor from Europe is positive as a result of the rise of the dollar against the euro.

For an American trader, the rate of return is:

$$r_f = \frac{-0.016615}{1 + 0.016615} = -0.015412 = -1.53421\%.$$

The euro has weakened versus the dollar, which has caused the yield to be negative. (Parameswaran S., 2011)

M. Economic Growth And Exchange Rate

The exchange rate is the most important rate in any economy since it affects all other rates. The government's monetary policy may therefore be its most important economic policy. This is especially true in an open economy because almost every single economic factor is influenced by the interactions between the domestic and global economies. Currency policy is determined by decision-makers who must respond, either directly or indirectly, to voters, including voters, interest groups, and investors. The options open to currency policymakers entail trade-offs, much like all types of policies. Currency policies include advantages and disadvantages, as well as winners and losers.

The trade-offs, costs and benefits, and winners and losers resulting from a decision on the exchange rate must be considered. Exchange rate policy offers a unique perspective through which to evaluate a nation's political economy. This is especially true for countries whose economies are open to those of other countries, as in those cases, currency policy has a big impact on a lot of different economic and political decisions.

Discussions about exchange rate policy and the decisions made about it can teach us a lot about the economy, society, and its political institutions. Currency policy reflects the significance of the electorate, the significance of elections, the structure of economic groups, the power of vested interests, the time horizons of voters and politicians, and the way political institutions respond to pressure, in addition to nearly all other aspects of national politics and economics.

In some sense, setting exchange rate policy calls on the government to choose between two very straightforward options: fixing the currency or letting it float, and attempting to maintain a strong or weak currency. But, even straightforward choices reveal incredibly intricate structures, drives, and pressures. Since individuals who decide currency policy must take into account how their decisions will affect practically every member of society, it can be said that currency policy summarizes many aspects of the national political economy.

N. Currency Choices:

The first is the requirement for an exchange rate system, especially when comparing one currency with another or with a commodity like gold. The level of the exchange rate is the second element (price). There are two main definitions for exchange rate systems. The first speaks about the current global monetary structures. While the gold standard, Bretton Woods gold dollar standard, and current floatation are all global monetary systems, the European Monetary System (EMS) was a regional monetary system. This way, numerous states must collectively decide on the system to use. An international monetary system cannot be established by a single nation since it only exists to the extent that many nations accept it. A government's management of its currency is the second definition of an exchange rate system.

A country can choose from a number of alternatives in this scenario to influence the connection between its exchange rate and the rates of other currencies. The fixed exchange rate system necessitates the monetary authorities to maintain the value of the national currency when exchanging it for an item like gold or another nation's currency. Although a currency may occasionally be fixed against a basket of other currencies, this is less stable because there is a significant range in the exchange rates of the individual currencies. Furthermore, if the composition of the basket is not made public, the government may adjust the exchange rate by changing the basket (as is typical). A multi-nation currency union, like the euro, or the adoption of another nation's currency, like the US dollar, are only occasionally options available to governments.

With a fixed but flexible or adjustable peg, the government affirms that the exchange rate will remain constant at all times while also making it clear that it may alter as needed. This offers the advantages of short-term currency rate stability while retaining some of national leaders' capacity to influence policy. Yet, such a system might not be totally believable due to the unpredictability of a currency that could see a shift in value at any time.

A floating exchange rate is one that the monetary authorities do not make an effort to maintain at a predetermined level. Because the value of a currency is determined on the foreign exchange markets, national policy makers are not required to support a certain exchange rate. This does not exclude out the interest of

policymakers in the exchange rate. The government might intervene to support the currency or try to prevent it from falling too far below what they consider to be appropriate. It is possible to conduct national monetary policies that take the exchange rate into consideration, such as interest rate policy. But, there isn't any stated public commitment to keep a specific exchange rate. In addition to setting policies that affect the regime of exchange rates, the monetary authorities also have an impact on the value or level of the currency.

As compared to other currencies, a currency might depreciate, rise or revalue, or depreciate, fall or fall. Different currencies can impact exchange rates in different ways. The best summary indicator is the effective exchange rate, which is a country's rate of change relative to other currencies weighted by their importance in that country's commerce. Changes in the nominal exchange rate, which essentially measures a currency's relative worth, are typically less significant than changes in the real exchange rate, which takes regional differences in inflation into consideration.

While exchange rates are held constant, if domestic inflation is zero but global inflation is 20%, the local price of household goods will fall compared to the overseas price of the same commodities, which is the same as a real depreciation of the domestic currency.

It is also analogous to a real appreciation of the foreign currency if the prices of their goods, expressed in their own currency, are higher than those in the home country.

The impact of the exchange rate on a nation's commerce and payments is reflected in the real exchange rate.

Politicians, businesspeople, journalists, and others frequently discuss how the currency affects "competitiveness," lamenting how difficult it is for native industries to compete with imports or exports due to the currency's value. They criticize the real exchange rate in these situations.

The "overvalued" (appreciated or "strong") currency irritates some industries, whereas the "undervalued" (undervalued or "weak") currency annoys others. Every open economy depends on the actual value of a currency since it affects how much domestic goods and services cost in comparison to those supplied abroad. As a result, policymakers, economic players, and others place a great deal of importance on the

real exchange rate, which is frequently referred to as a country's competitiveness.

Because nominal currency swings almost always have a real impact, this makes nominal exchange rate policy essential.

Undoubtedly, the impact can fluctuate between nations, between items, and Over time, this variance can actually have a big impact (more on this below).

Notwithstanding debates over the efficacy of exchange rate control, the majority of scholars agree that nominal currency movements have a significant actual impact, at least in the short and medium terms. The crucial notion is that, for our purposes, governments can influence both the exchange rate regime and the exchange rate level. They can accomplish this in a number of ways, including by meddling in currency markets and changing interest rates. Also, the affluence of important economic actors as well as the general health of national economies are significantly influenced by a currency's value. Currency policy is just as potent as any individual country economic policy. Its choices have an equal impact on policymakers and the general public. (Frieden, 2015)

II. LITERATURE REVIEW

Due to its effects on developing countries, exchange rate volatility—defined as ongoing swings in exchange rates—has received a lot of attention in the literature recently. Due to its negative direct and indirect consequences on economic growth, exchange rate volatility is expensive for the local economy.

The complicated phenomena of economic growth is influenced by a number of factors, including social, economic, political, cultural, etc. Yet, there are some justifications for the existence of a relationship between economic growth and exchange rate regimes that have been offered in the literature on the subject.

In reality, by absorbing and/or damping shocks to the economy, exchange rate volatility can directly affect GDP in the medium run. Because it can indirectly affect economic growth and the key factors that determine it, such as investment, foreign trade, the expansion of the financial sector, and foreign capital flows, it helps to moderate the volatility in economic growth rates.(Guellil et al., 2017) Concerns regarding exchange rate swings have grown in both established and developing economies, mostly as a result of their effects on employment growth, exports, inflation, foreign commerce, and growth and investment. Via a number of different pathways, exchange rate volatility can impact investment and growth.

According to theory, the assumptions could change the relationship's sign. Several researches back up the idea that decreased global trade and economic growth are caused by exchange rate volatility.because the currency of the exporting or importing country is used to pay for the majority of items in international transactions. Due to their effect on earnings, unanticipated changes and swings in exchange rates must harm international trade flows and economic growth.

On the other hand, several research indicate that exchange rate volatility benefits global trade and economic expansion. (Ozata, 2020) Advocates of this theory contend that flexible and fluctuating exchange rates give nations the ability to react to asymmetries in shocks, promoting economic growth. Additionally, they

believe that volatility lessens the likelihood of speculative attacks and avoids financial disasters. Given these discrepancies, there is ongoing debate regarding how exchange rate volatility affects global trade and economic expansion. (Ozata, 2020)

The literature has numerous empirical studies that have examined the relationship between exchange rates and economic growth. Most empirical studies have demonstrated a strong causal relationship between the level of the exchange rate and economic development. In fact, it appears that a sizable majority of people concur that there is a direct relationship between the exchange rate and economic growth. Yet, there is debate about whether there is a causal relationship between the exchange rate and economic growth that is positive or negative. In other words, it is debatable whether the exchange rate has an impact on economic growth in the positive or negative direction.

The structuralist viewpoint contends that a high exchange rate causes the economy to contract, while the traditional perspective claims that a high exchange rate favorably influences economic growth. (Karahan, 2020) The literature review on the effect of exchange rate volatility on economic growth yields contradictory findings. The effects differ between industrialized and developing nations. Studies have discovered considerable detrimental impacts on growth. Additional research has revealed that growth is benefited by exchange rate volatility. For the period from 1960 to 1990, Domaç (1997) looked at the relationship between Turkey's exchange rate and economic growth.

Regression analysis was used to determine whether unanticipated cuts had a favorable impact on production. (Domaç, 1997) As a result, the author came to the conclusion that Turkey did not support the deflationary devaluation hypothesis. (Domaç, 1997) The consequences of currency devaluation on the Fijian economy between 1970 and 2000 were studied by Narayan and Narayan in 2007. They used the cointegration method and discovered that both in the short and long runs, devaluation causes the level of output to increase. More specifically, it was shown that a production rise of 3.3% following a 10% devaluation. (Narayan & Narayan, 2007)

The relationship between the real exchange rate and economic growth was explored by Ribeiro et al. (2019) by taking into account 26 structural traits of

emerging countries. The sample covered 54 developing countries and spanned the years 1990 to 2010. The empirical results showed that underestimating impacted economic growth in emerging countries negatively. Aman et al. (2013) investigated the relationship between the exchange rate and economic development in Pakistan from 1976 to 2010 using three-dimensional squares methodologies. She suggested that the exchange rate has a positive impact on economic growth by promoting alternative export and import industries. 2019 (Ribeiro et al.)

Kasman and Kasman (2005) analyze the effects of real exchange rate variation on Turkey's exports to its most important trading partners using quarterly data for the years 1982 to 2001. Their research demonstrates that exchange rate fluctuation greatly raises the nation's export volume over time. (Kasman & Kasman, 2005)

This finding would suggest that companies operating in a small economy, like Turkey, are limited in their options for managing elevated exchange rate risks. (Kasman & Kasman, 2005)

Schnabl (2008) conducted research and analysis on the relationship between growth and exchange rate volatility in East Asia and Emerging Europe.

They used an unbalanced plate model across countries for 17 rising European countries and 9 East Asian countries to assess the effect of exchange rate volatility on growth. Estimates for the volatility of the euro against emerging Europe's currencies are consistent with a negative relationship between exchange rate volatility and growth. (Schnabl, 2008) According to the specification for the complete sample with all the control variables, growth is clearly negatively impacted by exchange rate volatility against the euro.(Schnabl, 2008)

Demir (2013) uses a firm-level dataset to compare the growth performances of domestic private manufacturing firms in Turkey to those of foreign firms as well as between publicly traded and non-traded private manufacturing organizations.

The ability of manufacturing businesses to grow is strongly constrained by exchange rate volatility, according to empirical results using dynamic panel data estimation techniques.

Having access to both domestic and foreign stock markets, however, has been found to greatly mitigate these negative effects. (Demir, 2013)

Yldz, Ide, and Malik (2016) examined the relationship between Turkey's economic growth and exchange rate variations using quarterly data for the years 1998:1–2014:4 using the Engle-Granger cointegration approach. The findings show that economic growth and the real effective exchange rate have both a short- and long-term relationship. On the other hand, several research have discovered a link between growth and exchange rate volatility. (Yıldız and Malik, 2016)

Between 1980 and 2021, Turkey saw numerous currency rate regimes. The volatility of the currency rate in Turkey has also increased as a result of the use of the exchange rate as a political instrument to battle inflation or the current account deficit. **(**Ozata, 2020)

Turkey's economy began to alter significantly and fundamentally as a result of the 1980s' policies. The introduction of the floating exchange rate system and modern economic policy tools, particularly monetary policies, were made possible by these fundamental changes. (Aldalou & Sarsour, 2022) (Karahan, 2020) used the Granger causality test and the Johansen cointegration test to examine the relationship between the exchange rate and economic growth using quarterly data from 2002-Q1 to 2019-Q1.

Empirical data show no causal link between exchange rates and economic growth.

(Karahan Ö, 2020) In order to investigate the long- and short-term connections between Turkish exports, exchange rate volatility, foreign income, and relative prices for the period 1993Q3-2009Q4, (Altintaş, et al., 2009) used multivariate cointegration and error correction model (ECM) techniques. (Altintaş, et al., 2009)

According to the findings, relative prices have a negative and considerable impact on Turkish exports, foreign income has no significant impact and exchange rate volatility has a positive and large impact. (Altintaş, et al., 2009)

The effects of exchange rate volatility on Turkey's economic growth during the first quarter of 1998 and the third quarter of 2019 were examined (Ozata, 2020).

Using an autoregressive distributed model, the effect of exchange rate volatility on economic growth in Turkey was investigated (ARDL).

Using the GARCH(1,1) model, exchange rate volatility is determined from the real effective exchange rate. The findings of the estimation using the ARDL model show that the volatility of the real effective exchange rate has a negative and very statistically significant influence on Turkey's economic growth. (Ozata, 2020)

Real GDP is significantly impacted positively by long-term export and investment activities and negatively by import variations and exchange rate changes. (Ozata, 2020) The relationship between the real exchange rate and growth was examined by (UURLU S., 2009) using quarterly data for Turkey from 1989's first quarter to 2005's second quarter. **(**Uğurlu, 2009) He discovered proof that a single cointegration vector depends on two sets of variables using the Johansen cointegration test. In the initial three periods of the base model, a positive exchange rate shock improves GDP; however, later periods see a decline, followed by another decrease. He discovered through variance analysis that the sources of variance in production are exceptional shocks. He also noted that over the long term, the exchange rate's explanatory ratio over GDP does not vanish. **(**Uğurlu, 2009)

The aforementioned review's main conclusion is that people's views on the relationship between exchange rate imbalances and economic growth vary. Nonetheless, the majority of studies supported a contrarian relationship between fluctuating currency rates and economic growth. It is clear that theories about how exchange rate volatility affects economic growth are characterized by contradictory and evasive results. Also, the discrepancy can be seen in the varying currency rates that have an impact on other countries' economic development.

A. Emırıcal Analysıs And Results

1. Abstract

First, it is important to refer to that we studied Impact of Exchange Rate Volatility on Economic Growth in Turkey. We take two-time series data include (Exchange Rates) and (price level ratio of GDP) in Turkey. Many of statistical analysis Methods were used to investigate the relations between financial assets such as Correlation Coefficient, Granger causality test and simple linear regression. The aim of this study is to examine the causality relationships between foreign Exchange Rates and Economic Growth via asymmetric causality test, correlation coefficient,

Simple Regression model and several statistical analysis Methods. Several diagnostic statistical analysis methods were used to check the efficiency of the inferred regression model. The remaining portion of this chapter is organized as follows: Brief descriptions of the data specifications, experimental results, and conclusions are described in sections 1 and 2, respectively.

B. Data Description:

The data has been studied over the past twenty-three years, time interval period extend from (1999) to (2021), our data include a total of (23) annual observations.

The data employed in this study is based on the historical annual observations, the first variable is **real effective exchange rat**e, the base year of the variables is 2003=100, the required data were obtained from the Central Bank of the Republic of Turkey *(www. tcmb.gov.tr)*. The second variable is **(price level ratio of GDP to market exchange rate)** in Turkey extracted from the site of DataBank | The World Bank *(www. databank.worldbank.org)*.

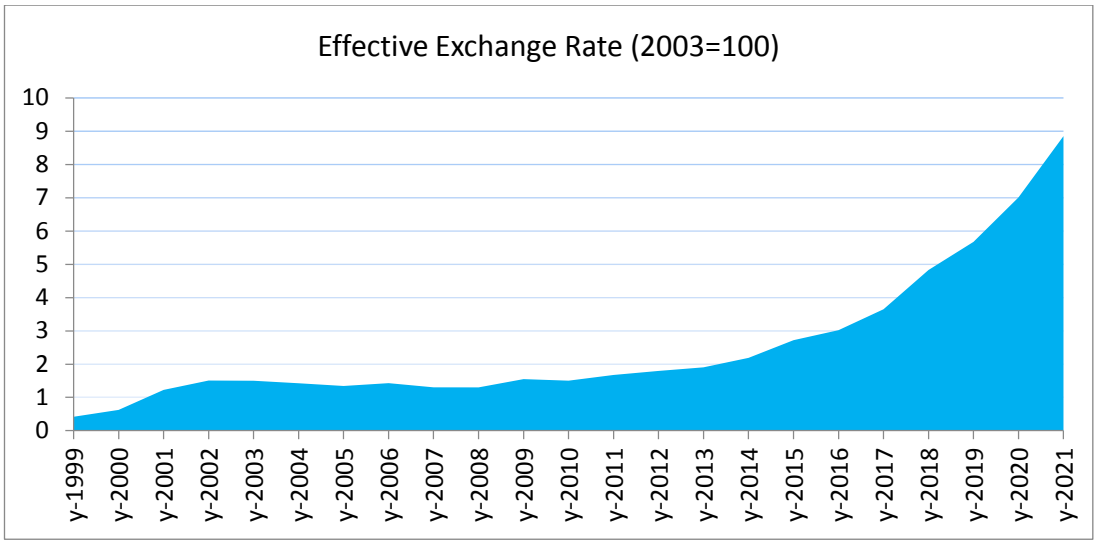
Before creating the simple regression model, some steps must be taken.

Before analysis, the natural logarithm of the two variables from the time series data was taken in the first step with the intention of removing the scale effect between the time series that were used in the application and liberating them from their unit values (bringing them at the same level).

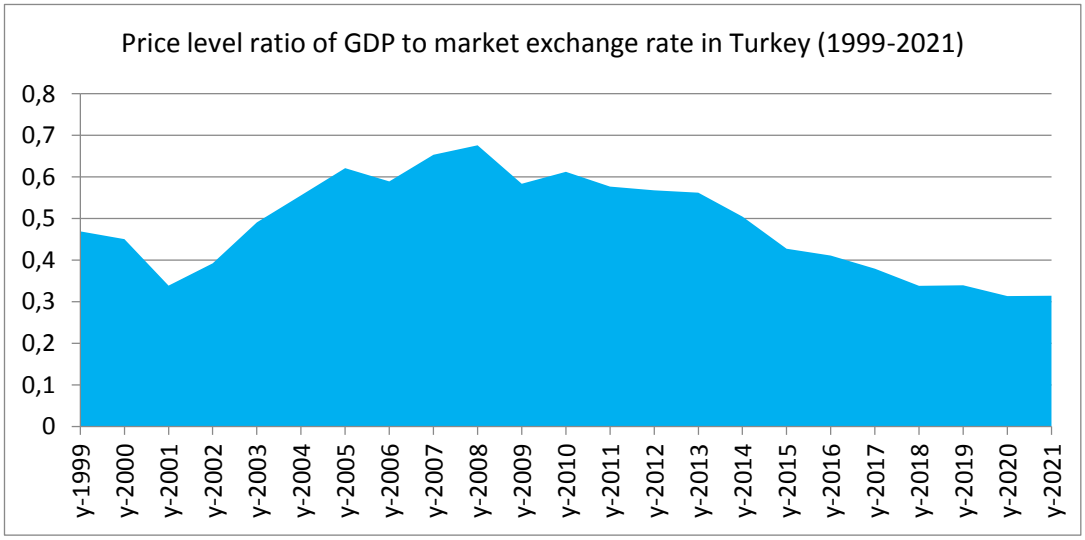
We used Both (Minitab 16.2), (SPSS v.25) and (EVIEWS V.12) packages to perform statistical analysis of data. We would like to point out that in all statistical tests we took the value of the significance level equal to 0.05.

Our analysis focuses on two variables:1- Real effective exchange rate in Turkey, 2- **price level ratio of GDP to market exchange rate** in Turkey.

Figure 1 shows two-time series that described above.



foreign Exchange Rates (1999-2021), Source: own figure.



Price level ratio of GDP to market exchange rate in Turkey (1999-2021), Source: own figure.

Figure 1. Graphical line of time series data.

C. Empirical Analysis and Results:

1. Descriptive statistics:

First it is useful to display descriptive statistics like measures of central tendency and measures of dispersion for raw data before we take natural logarithm transformation for the two variables. Descriptive statistics provide an initial and simplified description of the studied data before any transformation is carried out in order to understand the average values and their dispersion from the mean.

Table 1 Shows Descriptive statistics for two studied variables.

Table 1. Descriptive statistics for two studied variables

	Exchange Rate	**GDP Rate**
Mean	0.485549	2.541099
Median	0.490736	1.549960
Maximum	0.676112	8.850408
Minimum	0.313494	0.418783
Std. Dev.	0.116703	2.123860
Skewness	-0.055723	1.705991
Kurtosis	1.656912	5.045392
Jarque-Bera	1.740626	15.16586
Probability	0.418820	0.50912
Observations	23	23

Source: Author's Computation.

2. Test of Normality:

Before we create the regression model between two variables, it should study the normality of the variables.

We accept the null hypothesis, according to which the data distribution in two-time series data follows a normal distribution, using the Rayan Joiner test to investigate the normality for the two examined variables. Because the P-value was greater than 0.05 in this case.

Table 2 Shows **Rayan Joiner** test to study the normality for two studied variables.

Table 2. Results of Rayan Joiner test.

Tests of Normality: Rayan Joiner test			
	Statistic	df	P-value
Exchange Rate	0.962	23	0.096
GDP Rate	0.975	23	0.236

Source: Author's Computation.

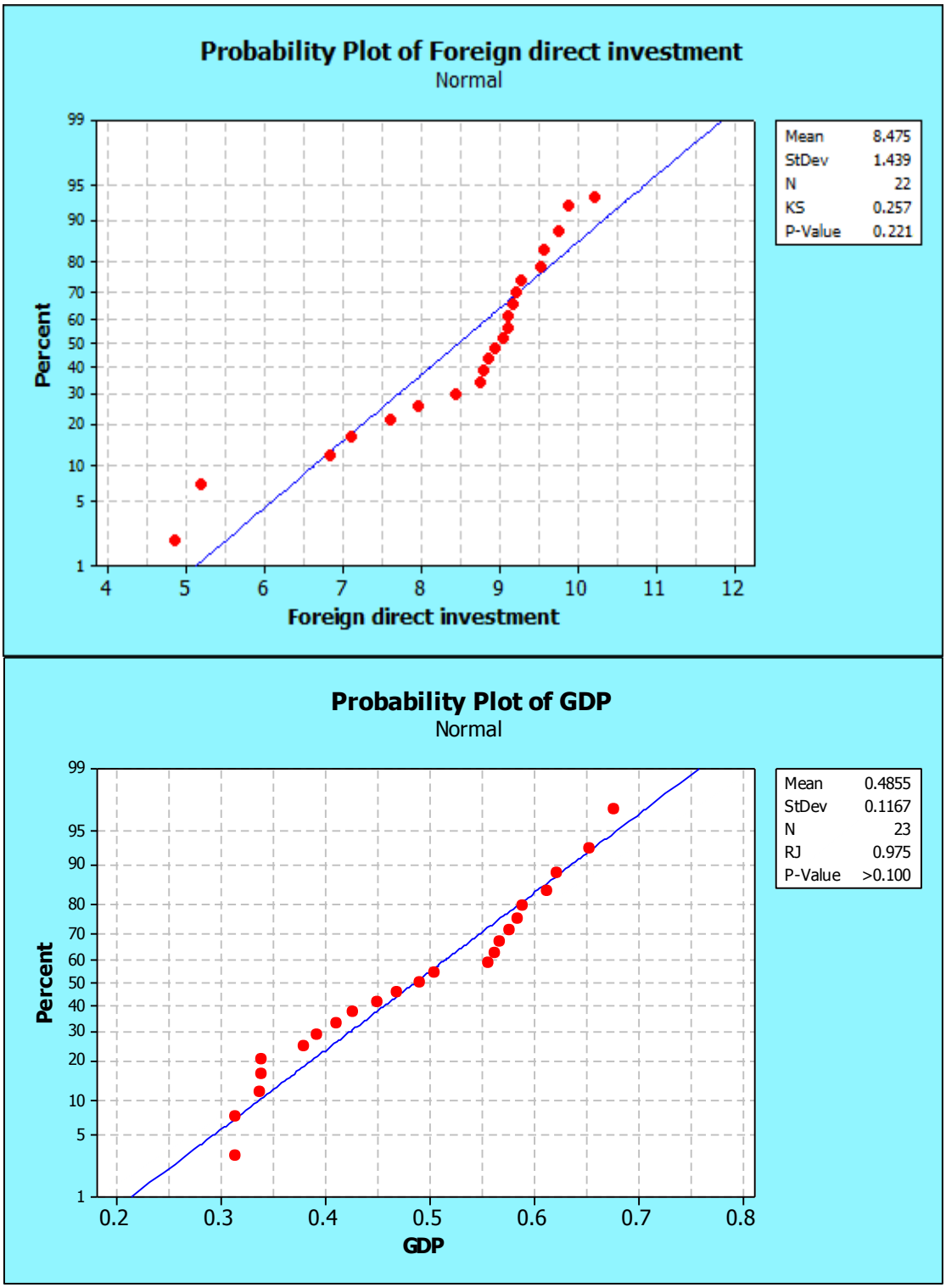


Figure 2. Probability plot for two-time series.

Source: own figure.

3. Dickey-Fuller test to study stationary of time series:

Before applying the Granger causality test, stationarity levels of the variables were analyzed. In order to study time series data based on the unit roots test, Dickey-Fuller analysis is required. Before applying the Granger causality test, the first difference should be taken into consideration if the Dickey-Fuller test results show that any of the variables is non-stationary.

In addition, if the unit roots test results for the first difference show that the data is non-stationary, the second difference of time series data must be taken into consideration. In the two variables, the differences were taken from the first order of both series, and it was found using the Dickie Fuller test that the two series are unstable. After that, the differences were taken from the second order for both series and both series became stable, and therefore the differences must be taken from the second order for the two series to become stable.

The results of using the Dickey-Fuller unit root test are shown in **Table 3**.

Table 3 Shows the Dickey-Fuller test results.

Variables	ADF lags	statistics	p-value
Exchange Rate	2	1.70369	0.7900
GDP Rate	2	2.38655	0.9915

Source: Author's Computation.

The results for unit roots shown in Table 1 show acceptance of the null hypothesis that the two-time series are stationary because the p-values of the two-time series data are greater than the significant level of 0.05. However, the data for the two series are stationary when second-order differences are taken into account.

4. Pearson Correlation test:

We used Pearson coefficient to examine the relationship between Exchange Rates and **GDP Rate**, from table 5 it is possible to see that Exchange Rates is significantly correlation with **GDP Rate** where p-value<0.05.

The Pearson correlation coefficient was -0.668, and the significance level was 0.05. As a result, we agree with the alternative hypothesis that there is a meaningful association between the two variables. As a result, the relationship between the exchange rate and the GDP rate is intermediate and inverse.

Table 4. Pearson coefficient test.

Correlations			
		Effective Exchange Rate (2003=100)	GDP Rate
Effective Exchange Rate (2003=100)	Pearson Correlation	1	-0.6687-**
	P-value		.000
	N	23	23
GDP Rate	Pearson Correlation	-0.6687-**	1
	P-value	.000	
	N	23	23
**. At the 0.01 level, the association is statistically significant..			

Source: Author's Computation.

5. Test of causality (Granger):

A statistical hypothesis test called the Granger causality test is used to determine whether one time series may be used to predict another. By removing asymmetric information from financial time series, it is intended to distinguish between the effects of positive and negative shocks. By removing asymmetry in financial time series, Granger causality Analysis is able to identify the effects of both positive and negative shocks independently. After all time series data became stationary, the Granger causality test was used to determine the causal connections between exchange rates and the GDP rate. The findings of the Granger causality test are presented in Table 4. In this instance, Turkey's analysis time frame, There is a one-way causal relationship between exchange rates and GDP rates.

Table 5. Results of causality test (Granger):

Null Hypothesis:	Fisher-Statistic	Prob.
GDP Rate does not Granger Cause Exchange Rate	0.98767	0.4290
Exchange Rate does not Granger Cause GDP Rate	2.86659	**0.0073**

Source: Author's Computation.

Table 5 shows that there is a one-way causal relationship between GDP Rate and Exchange Rates with a p-value of less than 0.05, rejecting the null hypothesis.

Nonetheless, the null hypothesis has been accepted because there was no causal relationship between the GDP Rate and Exchange Rates with a p-value greater than 0.05. The Granger test results show that the GDP rate can be predicted by

exchange rates, but the reverse is not true. The direction of causality is from exchange rates to GDP rate.Also, this result shows that GDP Rate is affected by *Exchange Rates*.

6. Simple linear regression model:

By using causal Granger model, we found a One-Way relationship from ***Exchange Rates*** to **GDP Rate**. To predict *GDP Rate* (dependent variable) based on *Exchange Rates* variable (independent variable), we applied **simple linear regression model**.

Table 5. reports the results of applying simple linear regression:

Table 5. Straightforward linear regression findings.

Variable	Regression Coefficient	standard Error	t-Statistic	P-value
EXCHANGE_RATE	-0.036741	0.008916	-4.120786	**0.0005**
C	0.578912	0.029263	19.78311	**0.0000**
Person Correlation	-0.668647	Mean		0.485549
F-statistic	16.98088	Durbin-Watson stat		0.332296
S.E. of regression	0.088820	Akaike info criterion		-1.921471
R-squared	0.447090	S.D.		0.116703
Log likelihood	24.09692	Hannan-Quinn criter.		-1.896639
Sum squared resid	0.165668	Schwarz criterion		-1.822733
(F-statistic) Probability	**0.000487**			

Source: Author's Computation.

According to the results from **table 5.** the regression equation of Exchange Rates:

$$\textbf{GDP Rate} = 0.578912 - 0.036741 \times (\textbf{Exchange Rates})$$

P-value<0.05 for all coefficients of equation; Thus, coefficients values are statistically significance. The value of the slope of the regression equation was negative, so the percentage of GDP increases with the decrease in the percentage of the exchange rate, and vice versa. Coefficient of determination (R^2) is 0.447090;

The coefficient of determination is the percentage of the dependent variable's variance that the independent variable contributes to explaining. Thus, 44% of the *GDP Rate* series is explained by *Exchange Rates* series. To check the significant in the equation of regression model **One Way ANOVA** for regression model was applied to examine the significant in the equation of regression model, and P-value

=0.009 < 0.05 which indicate that the equation is statistically significant.

Therefore, the predictions resulting from the significant regression model can be accepted. To check the efficacy of regression model we must examine the normality of residuals, Testing Autocorrelation.

Table 6. Results of One Way ANOVA for regression model.

ANOVA [a] Model	Sum of Squares	Degree of freedom	Mean Square	Fisher test	Probability-value
Regression	.134	1	.134	16.981	.009
Residual	.166	21	.008		
Total	.300	22			

a. Dependent Variable: GDP
b. Predictors: (Constant), Exchange Rate

Source: Author's Computation using SPSS.

To check the efficacy of regression model we must examine the normality of residuals, and testing Autocorrelation.

7. Normality test for residuals:

We used **Jarque Bera Test** to investigation of the normality of residuals, p-value=0.5861 ugreater than 0.05, and hence we accept null hypothesis and that mean the residuals are distributed normally.

Figure 3 reflects graph of normality test (Jarque-Bera) for residuals.

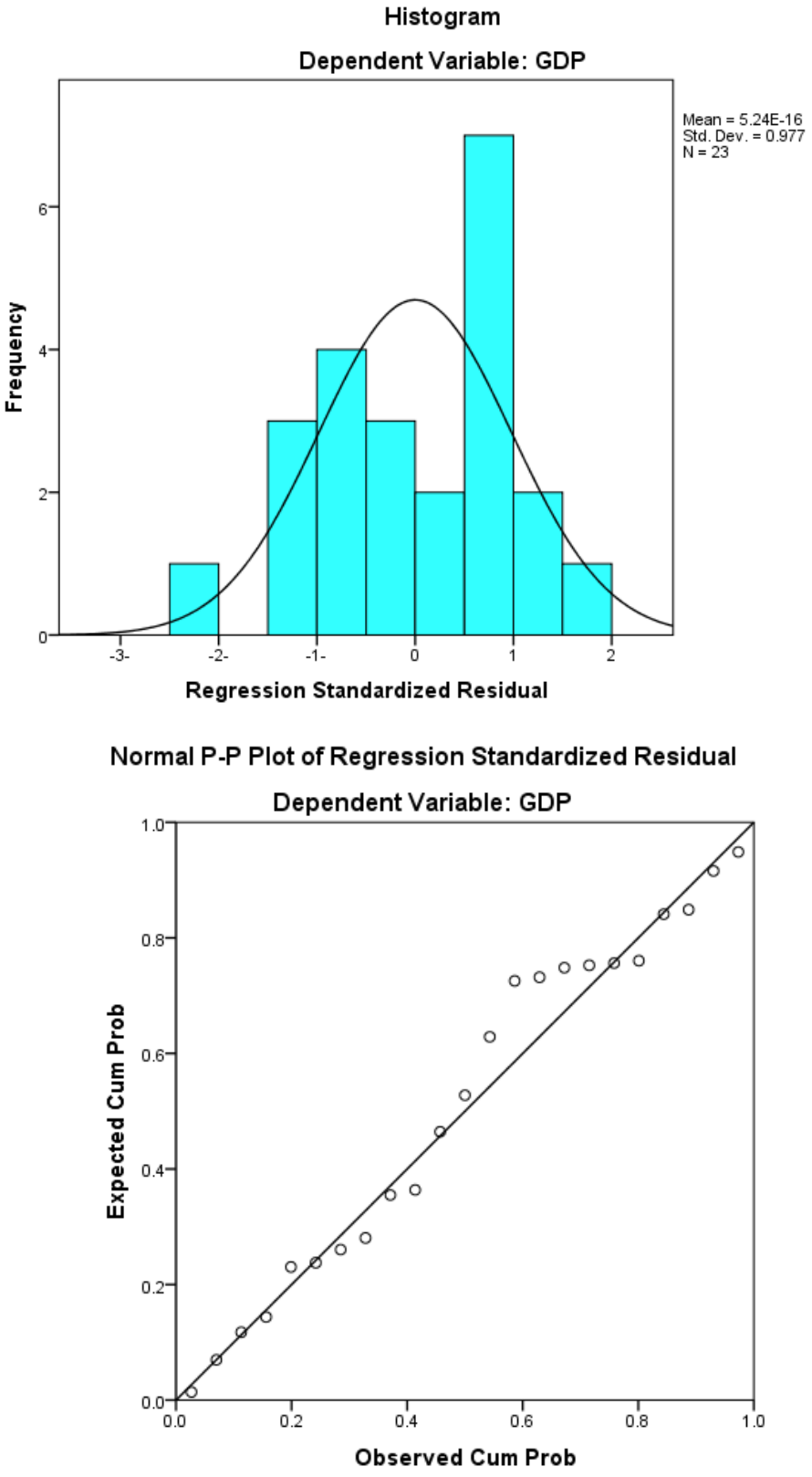


Figure 3. Graph of Normality test for residuals.

Source: own figure.

8. Durbin-Watson Examining the autocorrelation:

Autoregressive models, which capture dynamic impacts over time-varying processes, have been employed in the stock market throughout history. The claim that "previous values of the dependent variable have an effect on current values of dependent variable" is supported by this. If this premise is proven to be true, a lagged dependent variable must be included in the model to account for dynamic effect. One can wonder if the market and price movements for Bitcoin follow a similar pattern. (Chan et al., 2017)

The residuals from a statistical model or regression analysis are tested for autocorrelation using the Durbin-Watson statistic. A number between 0 and 4 will always be assigned to the Durbin-Watson statistic.

If the value of Durbin-Watson statistic is 2.0, that means there is no autocorrelation in the sample was found. Positive autocorrelation is shown by values between 0 and less than 2 whereas negative autocorrelation is indicated by values between 2 and 4.(Ozyesil & Saqbani, 2022)

Autoregressive models that detect dynamic impacts over time-varying processes have been employed in the stock market. This is based on the idea that the dependent variable's present values are influenced by its previous values.

If this hypothesis is shown to be correct, a lagged dependent variable must be included in the model in order to detect dynamic effects.

To decide whether to include the lagged dependent variable in the basic regression model, the autocorrelation test was run on the overall model.

The Durbin-Watson test is one method for determining whether autocorrelation exists or not.

If a stock price exhibits positive autocorrelation, it means that the price yesterday and the price today have a positive connection, and if the stock fell yesterday, it is likely to fall today as well. (Ozyesil & Saqbani, 2022). On the other hand, a stock price with a negative autocorrelation has a negative influence on itself over time, increasing the likelihood that it would climb today if it fell yesterday.

The P-value for the D.W. statistic in our model (table 7) is 0.000.05, indicating that the test is statistically significant.

Also, the Durbin-Watson test resulted in a test statistic of 0.332296, ruling out the possibility of positive autocorrelation for the GDP Rate in the dataset used for this study. The first-order autocorrelation hypothesis H1, which states that "the autocorrelation exists," can be ruled out by the interpretation of this number in the Durbin-Watson test. Hence, it is impossible to reject H0, which states that there is no autocorrelation among residuals. As a result, the residuals are not systematic and the model does not require an autocorrelation adjustment. The lagged dependent variable is excluded from the model in this instance. As there is no autocorrelation among the residuals, we accept alternative hypothesis.

Table 7. Results of Durbin-Watson test.

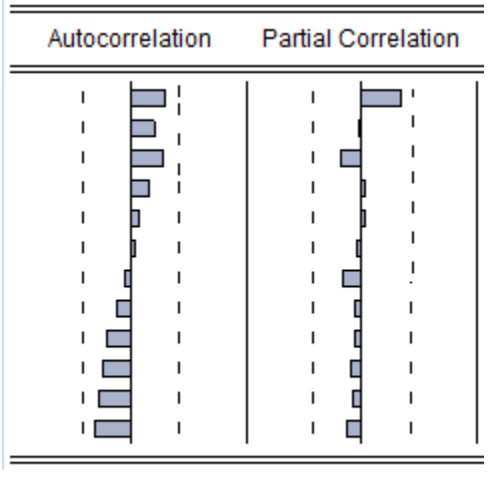
Model Summary [b]

Model	R	R Square	Std. Error of the Estimate	Adjusted R Square	Durbin-Watson
1	.669[a]	.447	.08882	.421	.332

a. Predictors: (Constant), Exchange Rate
b. Dependent Variable: GDP

Source: Author's Computation using SPSS.

The scatter plot of residuals in figure 4 below, over time (time series data of residual terms), in addition to the DW-test, further demonstrates that there is no autocorrelation. As can be observed, there are values dispersed around the 0 line that are either too low or too high, which supports randomization.



	AC	PAC	Q-Stat	P-value
1	0.745	0.365	12.236	0.000
2	0.645	-0.324	19.645	0.000
3	0.290	-0.181	23.344	0.000
4	0.157	0.251	23.722	0.000
5	0.079	0.131	23.917	0.000
6	0.033	-0.121	23.953	0. 000
7	-0.345	-0.159	24.654	0. 000
8	-0.135	-0.058	24.764	0. 000
9	-0.206	-0.151	26.491	0. 000
10	-0.256	-0.183	29.376	0. 000
11	-0.285	-0.172	43.276	0.000
12	-0.455	-0.230	44.112	0.000

Figure 4. Graph of residuals for predicted value over time.

Source: own figure.

The previous regression model provides us the reality that the exchange rate is related in many financial factor, and we may consider the impact of the exchange rate on the GDP rate.

III. CONCLUSION

This study aims to investigate how exchange rate volatility affects Turkey's economic growth. The findings revealed that exchange rate volatility has a statistically significant impact on economic growth.

Empirical analysis concluded that exchange rates have causality negative relationship with GDP rate, and the direction of causality is from Exchange rates to GDP rate, then we can predict the GDP rate by exchange rate variable, but the opposite is not true.

Empirical analysis showed a negative intermediate relationship (inverse relationship) between exchange rates and GDP rate, that means if the value of exchange rate increase, the GDP rate would be decreased. Also, the value of the slope of the regression equation was negative, so the percentage of GDP increases with the decrease in the percentage of the exchange rate, and vice versa.

This indicated that the change in exchange rates statistically significantly affects GDP rat, in other words, the value of GDP rat is determined by the changes of exchange rates and many of the economic and financial factor They are not included in this study.The coefficient of determination in our data claim that 44% of GDP rat is explained by exchange rate. The findings show that the effects of GDP growth on the exchange rate would differ in the short- and long-terms.The analysis of this paper concludes by showing that the Turkish economy is negatively impacted by exchange rate volatility.

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RESUME

Moaz Kaaka

Objective

To obtain a challenging position in Marketing and Sales and apply my academic and professional experience through unique art of dealing with customers and add value to my job by fulfilling all assigned responsibilities.

Education

2019-2022 (Expected)

MBA from Istanbul Aydin University, Turkey

2012-2017

BBA from City University College of Ajman, United Arab Emirates

Work Experience

(2020-Present) Trip Organizer & Tour Guide, Freelancer

- Communicating with clients and plan trips according to their requirements.
- Organizing trips in Istanbul and other cities in Turkey.

(2016-2018) Student Placement Officer, City University College of Ajman, Ajman, United Arab emirates

- Create relationships with both government and private sectors to sign MoU for mutual collaboration which leads to provide internship program and placement opportunities for students.

- Organize workshops for students which can help in preparing them to the real work life.
- Assist the management in making sstrategies which help in achieving goals and objectives of Student Placement Office.

(2010-2014) Sales representative, Al Fujairah National Insurance Company, Dubai, United Arab Emiraes

- Issuing insurance policies for customers by providing fast and accurate service.
- Renewing registration cards by connecting with RTA system.

(2008-2010) Teacher, Bilal Bin Rabah Center, Dubai, United Arab Emirates

- Teaching Arabic language to non-Arab students.
- Create different activities that can help students to learn and practice the language easily.

(2007-2008) Sales Officer, Widiyan Rent a Car, Dubai, United Arab Emirates

- Issuing rental agreements in minimum time and provide superb customer service.
- Solving customer complaints and other problems in a friendly, professional manner.
- Prepare and deliver required reports to the management before deadlines.

(2003-2006) Salesman, Al Iman Supermarket, Syria

- Increasing sales by creating strong relationships with customers
- Fulfilled customer requests as soon as possible.

Personal Skills

- Self Motivation
- Problem Solving
- Flexible & Dependable
- Interpersonal Skills

Computer Skills

- ICDL Certificate
- A+ Certificate

Languages

- Arabic (Native Language)
- English (Excellent reading, writing, listening, and speaking skills)
- Turkish (Good reading, writing, listening, and speaking skills)

Other Skills

- Turkish Driver License
- UAE Driver License

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- Available upon request