İnsan ve Toplum Bilimleri Araştırmaları Dergisi
Journal of the Human and Social Science Researches
[2147-1185]
12 th Years

2023, 12 (2), 1069-1094 | Research Article

Türkiye's Export Analysis with Specific Reference to OECD Countries: 1982Q1 and 2021Q

Zelha ALTINKAYA[1] **Kaveh A. ADLİ**[2] **Uğur ŞENER**[3]

Abstract

International economics is a field that primarily examines the liberalization of trade and its impact on a country's gross domestic product (GDP). The trade policies in the World economy, specifically Türkiye as a developing economy, have experienced different cycles since the 1980s, and Türkiye has been following liberal trade policies in an attempt to overcome instabilities in its economy since 24 January 1980. In particular, the long-term, including, the 1994, 2001, 2018 currency crises in Türkiye, the 1997 Asia, the 2007-2009 global financial crisis, and the 2020-2022 Covid 19 global recession, further increases significance of the analysis. This article specifically explores the effects of neo-liberal trade policies on Türkiye and its primary export market, the OECD countries. In particular, the impact of changes in the OECD Countries' GDP on Turkish exports is analyzed in relation to the Terms of Trade (TOT) and foreign exchange (FX) volatility of the Turkish Lira through Auto Regressive Distributed Lag (ARDL) method. The results reveal that Türkiye's exports follow a statistically significant correlation with OECD's GDP and FX volatility but not with the TOT for the period between 1982Q1 to 2021Q1. However, the lagged variables evaluated by the ADRL method indicate that five periods of lagging Turkish exports have a statistically significant relationship with two periods of lagging GDP of OECD, and one period of lagging FX, as well as with one period of lagging TOT. This article also offers valuable insights into the impact of exceptional events like COVID-19 pandemic on national economies, thus findings presented in this paper can help governments and policy makers predict potential implications of other extraordinary circumstances or global disasters and make informed decisions to mitigate their impact on the national economy. This is a long term analysis of neoliberal FX policies applied in Türkiye.

Keywords: Türkiye, OECD; Export, Foreign Exchange, Terms of Trade, ARDL, Neoliberalism

Altınkaya, Z. , Ahmadi Adli, K. & Şener, U. (2023). Türkiye's Export Analysis with Specific Reference to OECD Countries: 1982Q1 and 2021Q1 . Journal of the Human and Social Science Researches , 12 (2) , 1069-1094 . https://doi.org/10.15869/itobiad.1247321

Date of Submission	03.02.2023
Date of Acceptance	25.06.2023
Date of Publication	27.06.2023

[1] Assoc.Prof., Yalova University, F. E.A.S., Yalova, Türkiye, zelha.altinkaya@yalova.edu.tr, ORCID:0000-0002-6964-7182

[2] G. Student, ITU, Graduate School , Business M, Istanbul, Türkiye, adli21@itu.edu.tr, ORCID:0000-0002-5549-3258

[3] Asst. Prof., Istanbul Aydin University, Faculty of.E.A.S.T., Business M, Istanbul, Türkiye, usener@aydin.edu.tr, ORCID:0000-0001-5524-1707

İnsan ve Toplum Bilimleri Araştırmaları Dergisi
Journal of the Human and Social Science Researches
[2147-1185]
12 th Years

2023, 12 (2), 1069-1094 | Araştırma Makalesi

OECD Ülkeleri Örneğinde Türkiye'nin İhracat Analizi: 1982Q1 ve 2021Q1

Zelha ALTINKAYA [4] **Kaveh A. ADLİ**[5] **Uğur ŞENER**[6]

Öz

Uluslararası ekonomi, öncelikle, dış ticaretin serbestleştirilmesine, ve bu serbestleşmenin bir ülkenin gayri safi yurtiçi hasıla (GSYH) üzerindeki etkilerine odaklanır. Özellikle, Türkiye, dünya ekonomisindeki pek çok gelişmekte olan ülke gibi, ekonomisinde yaşanan istikrarsızlıkların etkisiyle, 24 Ocak 1980 tarihinden itibaren, neoliberal dış ticaret politikaları izlemeye başlamıştır. Bu nedenle, neoliberal ticaret politikalarının Türkiye ihracatı üzerindeki etkisini analiz etmek çok daha fazla önem kazanmıştır. Özellikle, Türkiye'de 1994, 2001, 2018 döviz krizleri, 1997 Asya krizi, 2007-2009 küresel finansal krizi ile 2020-2022 Covid 19 küresel durgunluk dönemleri, bu önemi daha da artırmaktadır. Bu çalışmada, ihracatında en büyük paya sahip olan OECD ülkelerinin GSYH' lerindeki değişikliklerin, Türkiye'nin dış ticaretini etkilediği varsayılmaktadır. Bu çalışma, OECD ülkelerinin GSYH^deki değişimlerin, dış ticaret hadleri (TOT) ve döviz (döviz) oynaklığının, Türkiye'nin ihracat talep fonksiyonunu oluşturan önemli değişkenler olduğunu iddia etmektedir. Bu değişkenlerin, Türkiye ihracat modeli üzerindeki etkisi otoregresif Dağıtılmış Gecikme (ARDL) yöntemi ile analiz edilmektedir. Araştırma, 1982Ç1-2021Ç1 arasındaki döneme ait istatistiklere dayanmaktadır. Sonuçlar, Türkiye'nin ihracatının OECD'nin GSYH ve Türk Lirası-ABD doları kurunun değişimi ile istatistiksel olarak anlamlı bir korelasyona sahip olduğunu, ancak ticaret hadleri ile ilişkilendirmediğini ortaya koymaktadır. Ancak, gecikmeli değişkenler ADRL yöntemi ile değerlendirildiğinde, beş dönem gecikmeli Türkiye ihracatının iki dönem gecikmeli OECD GSYH, bir dönem gecikmeli döviz kuru değişimleri ve bir dönem gecikmeli ticaret hadleri ile istatistiksel olarak anlamlı bir ilişkisi vardır. Bu da, ihracat pazarındaki OECD ülkelerinin GSYH'ndeki değişimlerin, Türkiye'nin ihracatını doğrudan etkilendiğini ortaya koyduğu gibi, COVID-19 salgını gibi ekonomik durgunluğa neden olan durumlarda, bu ülke ekonomilerdeki değişimlerin Türkiye ihracatı üzerinde ne kadar etkili olacağı konusunda öngörüde bulunmasını sağlamaktadır.

Anahtar Kelimeler: Türkiye, OECD; İhracat, Döviz Kuru, Ticaret Hadleri, ARDL, Neoliberalizm

Altınkaya, Z. , Ahmadi Adli, K. & Şener, U. (2023). OECD Ülkeleri Örneğinde Türkiye'nin İhracat Analizi: 1982Q1 ve 2021Q1 . İnsan ve Toplum Bilimleri Araştırmaları Dergisi , 12 (2) , 1069-1094 . https://doi.org/10.15869/itobiad.1247321

Geliş Tarihi	03.02.2023
Kabul Tarihi	25.06.2023
Yayın Tarihi	27.06.2023

[4] Doçent, Yalova Üniversitesi, İ.İ.B.F., Yalova, Türkiye, zelha.altinkaya@yalova.edu.tr,ORCID:0000-0002-6964-7182

[5] Doktora Öğrencisi, İTÜ L.E.E., İşletme Yönetimi, İstanbul, Türkiye, adli21@itu.edu.tr,ORCID 0000-0002-5549-3258

[6] Dr. Öğr.Ü., İAU, ,İ.İ.B.F, İşletme Yön.(İng), İstanbul, Türkiye, usener@aydin.edu.tr, ORCID: 0000-0001-5524-1707

Introduction

This study examined Türkiye's exports to OECD countries in the period from 1982Q1 to 2021Q1. The study was designed as a quantitative research based on the model with OECD countries' Gross Domestic Products (GDP) changes, foreign exchange (FX) volatility in the Turkish Lira (TRY/USD exchange rate*, purchasing parity) and the Terms of Trade (TOT). The GDP as a measure of (E.R.) welfare (Kuznet, 1934) has gained significant importance besides the level of employment and consumption in the country. This research examined Turkish exports by considering both conventional and contemporary trade theories, which posit that the removal of trade restrictions such as tariffs and quotas leads to an increase in a country's overall welfare (Smith, 1776; Ricardo, 1817; Hecksher, 1931-Ohlin,1935; Stolper & Samuelson, 1974; Krugman, 1979; Eaton,1987; Markusen & Venables, 1989; Grosman&Helpman, 1991).

Previous research in the literature has been classified into three groups due to its explanatory characterization feature of export. The first group of research deals with the impact of economic policies, level of customs duties, tariff, quota (Leith, 1971; Rodriguez, 1979; Ethier, 1973; Baron, 1976; Tarr and Morkre, 1984; Giovanni, 1988; Franke; 1991, De Grauwe, 1988; Sercu & Van Hulle; 1992; Dellas & Zilberfarb; 1993; Kenen & Rodrik, 1986;Pere & Steinher, 1989; Pozo, 1992, Chowdhury, 1993; Holly,1995; Arize, 1995; Aristotelous & Fountas; 1999; Arize et al, 2000; Leigh et al., 2017;Berthoud & De Dyne, 2018; Thorbecke & Salike, 2018; Amiti et al, 2019; Jiaping & Zhupig , 2020; Ahmet et al., 2021) while the second group examines the capability of supplying to the export market, focusing on supply-oriented factors concerning export and integration capability to global value chains (Morris et al, 1997; Humphrey, 2007; Sturgeon & Biesebroeck, 2011;Morris, & Staritz,2019). However, a third group of more recent studies looks at exports from a demand-focused perspective, with the target country's GDP being the primary demand-related factor (Arize, 2001; Choudry, 2001). This third group of explanatory factors will be the focus of examination in this paper.

In the model analyzed in this paper, the GDP of the OECD countries has been considered as the main determinant in Türkiye's export to OECD countries. Empirical studies show that the increases and decreases in the growth rate of the country's GDP strongly affect the aggregate demand of the country. The World GDP and specifically OECD countries' GDP have been shaped and evaluated in the cycles of the World economy. The economic cycles of the 1980s were a result of prior global economic challenges and the policy decisions made to address these challenges or stimulate growth during periods of recession or depression. Later, technological advancements and shifts in technology combined with neoliberal policies led to imbalances in the world financial, monetary, and commodity markets, resulting in the 2007-2009 global financial crisis. This crisis caused a significant decrease in the exports of both the world and Türkiye in the early 21st century. Most recently, the COVID-19 pandemic has introduced a new threat to the global economy and Türkiye's exports since early 2020. This paper therefore aims to assess the impact of such unforeseen events on Turkish exports, and secondly, to examine the effect of neoliberal policies on Türkiye's foreign exchange (FX) markets. The methodology recognizes that previous studies in the

literature, in addition to classical and new trade policies, often focus on measuring the impact of neoliberal policies on the home country's GDP(Acaravcı & Öztürk, 2002, Öztürk & Acaravcı, 2010) and the influence of the change in the national gross product of the counties where the product is sold (Houthakker & Magee, 1969). However, Houthakker & Magee (1969) express a country's export demand (x) in terms of product prices and income levels of the countries where the product is sold in general.

Xd = (P; Y) (Houthakker & Magee, 1969) where x represents export demand for the home country; P, price level, Y, the income of the host country of exports.

The second and significant explanatory variable for the export function of the country is the FX volatility. The impacts of FX rate movements on export levels, and whether these effects are statistically significant, have been under discussion in the international economics literature since the 1970s. The earliest studies explain the role of uncertainty and argue that FX volatility only affects the forward rate of FX rate and not the export level (Ethier, 1973; Baron, 1976; Giovanni, 1988). The studies by Franke (1991), De Grauwe (1988), Sercu & Vanhulle (1992), Dellas & Zilberfarb (1993) demonstrate that the increase in FX rate volatility increases trade level in the developed economies. However, studies by Kenen & Rodrik (1986), Pere & Steinher (1989), Pozo (1992), Chowdhury (1993), Holly (1995), Arize (1995); Aristotelous & Fountas (1999) Arize et al. (2000) find negative relationship between FX volatility and trade level in developed economies. Leigh et al. (2017) calculated the real FX rate elasticity for 11 European countries from 1986 to 2014. Berthoud & De Dyne (2018) determined the real FX rate and foreign income elasticity for 11 European countries from 2001 to 2011. Ahmet et al. (2015) estimated the elasticity of real exchange rate volatility and foreign income for 46 countries worldwide from 1996 to 2012. Thorbecke & Salike (2018) analyzed the real exchange rate elasticity of 17 major exporting countries from 1992 to 2016.

Other studies on the degree of influence of FX volatility argue that this depends on the firm's knowledge on future FX rate. One of the earliest analysts on the subject, Ethier (1973) presented a novel concept when the Bretton Woods gold standard system was abandoned, arguing that the prevailing trade pattern did not align with the exporter's expectations for the future behavior of the spot exchange rate. The uncertainty in a firm's revenue due to future FX rates would impact the volume of trade and alter the TOT and future profit rate (Ethier, 1973). The impact of FX volatility changes with the effectiveness of exchanging regimes (Obstfeld et al., 2019; Gourinchas, 2017; Rey, 2013; Bahmani - Oskooee & Niroomand, 1998; Edwards,1989; Kenen & Rodrik, 1986; Cushman, 1983; Gupta, 1980).

The literature also distinguishes the effects of FX volatility on developed and developing economies. In developing economies, higher FX rate volatility increases risk for companies and leads to a decrease in both production and international trade volume (Greenaway, 2010; Fang et al., 2006; Calvo et al., 2002; Broll &Echwert, 1999; Franke, 1991). Since FX rate risk is linked to local currency depreciation, which leads to higher prices in the domestic economy denominated in the local currency, the resulting price increase reduces the output level (Berument & Dinçer, 2004). Not long ago, Bussiere et al. (2020) found that real exchange rate elasticity varied among 51 countries

from 1995 to 2012, a period considered to be long-term. The FX volatility rate in developing economies is largely impacted by monetary policies in developed economies. Along with other factors that influence the FX rate, central banks (CB) in open economies adopt policies to minimize trade-off volatility in terms of employment, inflation,GDP growth rates, and FX rate stability (Kalemli-Özcan, 2019).

In policy making, some countries choose depreciation of their national currency to raise competitiveness of their product prices in terms of FX currency and encourage exports of their own products. However, in addition to their own policy choices, the US monetary policy affects other countries' exports, imports, balance of payments, capital flows, and the domestic economies (Miranda-Agrippino & Rey, 2020). Likewise, home currency depreciation has a greater effective rate whenever the US tightens its monetary policy. Appreciation of the home country's currency, as a result of monetary easing, led to an expansion in the GDP and a decrease in home country's exports during the period from 2008 to 2013. In 2013, tightening policies adopted by the US Federal Reserve (FED) resulted in slower growth in emerging economies (World Bank, 2022; Kalemli-Ozcan, 2020; Calvo & Reinhert, 2002). From 2013 to 2019, the world economy entered a new phase of economic development as the largest economy, the US, ended its expansionary monetary policies that were implemented during the 2007-2009 financial crisis (FED, 2013). The world economy underwent a substantial transformation during the period between 2013 and 2019, with the end of the US's expansionary monetary policies in response to the 2007-2009 financial crisis. This slowdown in growth impacted developing countries. On top of that, the outbreak of COVID-19 pandemic in early 2020 posed a new threat to the global economy, resulting in a simultaneous recession in developed economies such as the US, EU, China, and OECD countries, as well as the other economies. This marked the first time in history that the global economy experienced a recession due to a sudden stop in production, consumption, and supply chains. The pandemic caused a decrease in the global GDP by 3.6% in 2020. The US economy experienced a contraction of 10% in its GDP, while the EU saw a greater decrease at 12%. International trade suffered a sharp decline in 2020, with the global manufacturing industry shrinking by 10%, the fuels and mining sectors contracting by 26%. The commercial services sector saw a decline of 20%, and the travel and transport sectors, as well as the world exports, decreased by 61% and 21% respectively (WTO, 2021; Weiwei et al., 2021; Kerr et al., 2021; Hassani & Dost, 2020; Obayelu, 2020; Verschurr et al., 2021). It was the sharpest decline since WWII.

The study examined the third independent explanatory variable, Terms of Trade (TOT), by using the Harberger Laursen Metzler (HLM) model, among alternative models such as the Marshall-Lerner (Marshall,1923;Lerner,1944), J Curve (Magee,1973; Backus et al., 1992; Bahmani-Oskooee & Kara 2003; Bahmani-Oskooee & Wang, 2006) and S Curve (Bahmani-Oskooee &Xi, 2015). The OECD defines TOT as the ratio of the index of export prices to the index of import prices (OECD, 2022). In the study, the HLM model was used to determine the impact of FX volatility on the export demand of foreign countries (host country) and import demand elasticities in the home country. The HLM suggests that the foreign trade balance is influenced by the current and future

movements of the TOT, and it is positively related to the past movements of the TOT. The HLM approach posits that an increase in the TOT leads to an increase in trade, assuming all other factors remain constant. Research conducted in recent years has explored the relationship between exchange rate or TOT and the foreign trade balance using the framework of J Curve, S Curve and HLM effects, attempting to explain how changes in E.R.s and TOT impact the foreign trade balance and how this relationship could be modeled and predicted (Bahmani-Oskooee,1991; Bahmani-Oskooee & Niroomand, 1998; Bahmani - Oskooee, 2003). In contrast to the model proposed by Dornbusch(1976), monetary shocks influence consumption, output, and the TOT (Obstfeld & Rogoff, 1994). Mendoza (1995) explores whether TOT shocks could be constant for developing and OECD countries or not (Mendoza, 1995). Otto (2003) finds the HLM effect among certain developing countries and OECD countries in terms of trade balance, TOT, and real output from 1960 to 1997. Sudden shocks to TOT increases trade in the analysis period. Akal (2010) shows that a decline in relative TOT leads to an increase in import demand of OECD countries by 5%. Furthermore, a greater decline in relative TOT is believed to result in an even higher increase in export demand in the period between 1993 and 2007. However, it should also be noted that current account imbalances with OECD countries can negatively impact TOT, leading to a deterioration in the trade balance. This highlights the complex relationship between TOT and foreign trade balance and the need for a more in-depth analysis to fully understand the dynamics of this relationship (Akal, 2010).

This article focuses on analyzing Türkiye's exports to OECD countries from the viewpoint of changes in OECD GDP, the FX volatility of Turkish Lira (TL), and Türkiye's TOT from 1982 Q1 to 2021 Q1. The aim of the analysis is to provide a forecast for Türkiye's exports to OECD countries, particularly in light of the exceptional circumstances affecting both the OECD and Turkish economies. The paper is divided into several sections, starting with a review of relevant literature, followed by the methodology for the analysis in the third part, and finally, a conclusion.

Literature Review on Turkish Export to OECD Countries

The Turkish economy was confronted with a severe economic crisis in the late 1970s due to the oil crisis, FX volatility, and gold markets of the world economy. Even though Türkiye had followed liberal policies on trade, FX, capital markets by the 1980 decisions, these decisions were not enough to stabilize the Turkish economy, resulting in new national economic and financial crises in 1994 and 2001. The measures recommended by the IMF and implemented by the Turkish government effectively helped overcome the economic imbalances of 2001-2002 by 2003 and resulted in growth and an increase in Turkish exports until 2008. The 2007-2009 global financial crises (GFC), and following the 2010 Euro crisis in the EU, and OECD partly, decreased Türkiye’s exports to these markets. The recession caused by the COVID-19 pandemic in the EU countries, OECD countries and in the World economy has become an important determinant on Türkiye’s exports in 2020 and the following years. In November of 2021, Türkiye also experienced a new wave of severe currency depreciation. The focus of the studies in the literature is therefore on the exports of OECD countries, taking into

account factors such as GDP, price elasticities, income, the size and trends of intra-industry trade.

Export to OECD

Previous studies argue that the OECD countries have had a positive impact on Turkish exports for the varying analysis period from since 1960 (Konya; 2006; Sen et al, 2009; Akal; 2010; Altıntaş et al., 2011). Berument et al (2014) examine the specific products groups' export sensitivity to the income of the OECD countries. The empirical findings reveal that among the various goods traded, the GDP growth rates of OECD countries had the highest income elasticities for durable goods and raw materials as well as intermediate goods, while food and beverages had the lowest income elasticity during the period from 1996 to 2009. Kabakarlı et al. (2017) discovered that the income of 14 OECD countries impacted the exports of high-technology products between 1989 and 2015. Gül (2018) similarly found a positive correlation between the income of the EU and Türkiye's exports. Çelgin et al (2019) also stated that income had a greater effect on the exports of goods. All of these studies were limited in their examination period, ranging from 1994 to 2001 or from 2008 to 2018. This paper, however, expands the analysis period from 1982Q1 to 2021Q1.

Turkish Export and Foreign Exchange Volatility

The volatility of the FX market has been a significant factor affecting Turkish exports, as Türkiye is a non-oil producing country, a major importer of energy sources, and a middle-income country that has experienced FX crises since the late 1970s. Indeed, the 1979 FX crisis played a role in the shift of the economic system in Türkiye. The impact of the devaluation of the Turkish Lira(TL) on exports from Türkiye to its main trading partners, the OECD countries and the EU, has been studied by several trade-related studies covering different time periods. Rose (1990), Brada et al. (1997), Arize et al. (2005), Yanıkkaya (2001); Vergil (2002), Kasman & Kasman (2005), Şimşek & Kadılar (2005); Saygılı & Saygılı (2011) Erdal et al(2012); Erlat & Erlat (2012); Nazlıoğlu (2013); Özmen & Yolcu-Karadam (2014) suggest a positive correlation between FX volatility and an increase in exports in Türkiye from the period 1960 to 2013. Arize et al. (2000) concludes that a rise in the FX volatility leads to a significant negative effect on export demand in developing economies due to the high risk and uncertainty in financial markets. However, Öztürk & Kalyoncu (2009) argue that increases in the real E.R. volatility caused greater uncertainty and led to a negative impact on trade with some Asian, east European, and South African countries and a positive impact on trade with Hungary in the period between 1987-2008. Çulha & Kalafatçılar (2014) derive similar conclusions to those of Öztürk & Kalyoncu (2009). The study argues that FX rates did not lead to a significant change between 2003 and 2013. This would be interpreted as severe depreciation of TL during the 2001 financial crisis, and the 2007-2009 global crisis caused decline in exports. Gül (2018) extends the analysis period from 2004 to 2016, showing that FX volatility elasticities did not change export level in the analysis period. Bozok et al(2015); Tatlıyer&Yigit (2016); Iossifov & Fei (2019) suggest that price and income elasticities vary across the EU 27, Middle East, North African countries; exports

have higher income elasticities from 2005Q1 to 2013Q4. Kazdal & Gül (2021) argue that real FX rate fluctuations did not influence exports significantly on the export target country and sector base. The study by Kazdal &Gül (2021) contributes to a better understanding of FX's role on Türkiye's export in the period under severe depreciation of TL in 2018 and the first year of COVID-19 pandemic of 2020.

Terms of Trade

In addition to Akal (2010), Özmen & Yolcu-Karadam (2014) discovered that the real E.R. elasticities of Turkish exports were low, and that exports could be determined by global real output. Akbulut & Terzi (2016) found a positive relationship between past FX volatility performance and a negative relationship with current and future movements of the foreign trade balance for industries in Türkiye, where the S-curve effect was valid from 2002 to 2017, and there was a positive correlation with past movements.

Türkiye's Export with Specific Reference to OECD Countries

This article examines the export performance of the Turkish economy between 1982Q1 and 2021Q. The export function was modeled based on the income (gross domestic products) of the countries to which Türkiye exported, FX volatility of TL and the TOT of Türkiye in the analysis period from 1982Q1 to 2021Q1.

Methodology

Originating from this background of the Turkish economy, the model set in this paper is based on the factors on the OECD countries' GDP, FX volatility of TL on the US dollar, and the TOT. For the simplicity of the model, all other variables which have an impact on the import demand of the host country are constant. The model is stated as follows:

Export = f (OECD's GDP, FX rate, TOT).

The quarterly data were obtained from three sources: the Electronic Data Delivery System (EVDS) of the Central Bank of the Republic of Türkiye(CBRT), the OECD database and TURKSTAT. The data cover the period between 1982Q1 to 2021Q1. All series are seasonally adjusted by using Census X-12 quarterly seasonal adjustment method.

Table 1. Descriptive Statistics

	logexport	logcurrency	logGDP	logTOT
Mean	9.172.663	-2.046.146	1.749.606	4.192.694
Median	8.922.164	172.970	1.754.681	4.182.021
Maximum	1.088.470	2.063.794	1.788.889	4.605.170
Minimum	7.090.077	-8.845.697	1.696.471	3.806.662
Std. Dev.	1.162.849	3.404.495	269.861	144.221
Observations	156	156	156	156

All the variables were used in logarithmic form to minimize the variance along the series. The 156 points were used in this range to make a model for interpretation of relationships among the dependent variable (logexport) and independent variables (logcurrency, logGDP and logTOT).

ARDL Model Description

The ARDL model, as described by Pesaran and Shin (1999), is a linear model that examines both the dependent and independent variables in lagged form and reveals the long-term relationship (cointegration) among time series. This model is capable of handling a combination of stationary and non-stationary time series, as demonstrated by the ARDL Bound Testing. Statistical representation of the ARDL model is given by the equation (1).

$$y_t = \beta_0 + {}_1y_{t-1} + \ldots\ldots + {}_py_{t-p} + {}_0x_t + {}_1x_{t-1} + {}_2x_{t-2} + \ldots\ldots\ldots + {}_qx_{t-q} + {}_t$$

y_t represents the dependent variable, Turkish export. The independent variables in the ARDL model consist of lagged values of both the dependent variable and other independent variables. Also, $_t$ is the error term in the ARDL model that should be white noise, meaning it should be serially uncorrelated. The ARDL model not only has an autoregressive feature, as it regresses lags of the dependent variable, but it also has a Distributed Lag (DL) component, as it uses lags of the explanatory variables. In some cases, the current value of the explanatory variable can be excluded from the DL structure. The ARDL model is estimated using Ordinary Least Squares (OLS) with the successive lags of the explanatory variables included in the model. However, this can result in auto-correlated errors and biased coefficient estimates. To avoid this problem, it may be efficient to reduce the number of parameters by imposing restrictions on the values of the coefficients.

Bound Testing for ARDL Model

The ARDL Bound Test approach developed by Pesaran, et al. (2001) investigates the long-term connection, also known as Cointegration, between variables of varying orders of integration (I(0) and I(1) through the use of the ARDL model. It tests the importance of the level variables with F and t-statistics. This Bound testing process does not necessitate any prior stationary or cointegration tests, as the ARDL Bound Test can handle various integration orders lower than I(2) and non-stationarity. The statistical representation of the ARDL Bound Test is shown in Equation (2).

$$\Delta y_t = \beta_0 + i\Delta y_{t-i} + Yj\Delta x_{1t-j} + k\Delta x_{2t-k} + 0y_{t-1} + 1\ x1_{t-1} + {}_2\ x_{2t-1} + e_t$$

The null hypothesis for Bound testing is to prove that $0=1=2=0$ which rejection of the null hypothesis shows the possibility of the underlying cointegration. If the F statistics is below the lower bound of the confidence, it can be determined that there is no cointegration. If the F statistics is above the upper bound, it can be concluded that there is cointegration. If the F statistics is between the two bounds, the result is inconclusive.

Empirical Results

Correlation

The Pearson correlation results demonstrate a strong correlation between logexport and other variables, with the exception of logTOT, which has a moderate correlation. Pearson can be used as an initial tool to analyze the relationship between variables. To acquire reliable results, further investigation is necessary, such as modeling the data and conducting t-tests.

Table 2. The Pearson Correlation Among Variables

Variables	logexport	logcurrency	logGDP	logTOT
(logexport)	1.000.000			
(logcurrency)	*0.928746	1.000.000		
(logGDP)	*0.979129	*0.973398	1.000.000	
(logTOT)	*0.192838	*0.078982	*0.157916	1.000.000

Notes: * 5% significance level

Stationarity Check

The Augmented Dickey-Fuller (ADF) test, developed by Dickey and Fuller (1979), is used to test for the stationarity of variables, which is a crucial factor in the model selection process.

Table 3a. ADF Test Results

Variables	t-Stat.	Prob.	Δ Variables	t-Stat	Prob.
logexport	-1.623.741	7.792	Δ logexport	-5.821.116	0.000
logcurrency	-656.540	9.738	Δ logcurrency)	-8.620.780	0.000
logGDP	-1.565.638	8.021	Δ logGDP	-1.501.761	0.000
logTOT	-6.199.455	0	Δ logTOT	-	-

Notes: Δ = first difference

The ADF test is a robust tool for testing the stationarity of a time-series without structural breaks, but it is not suitable for detecting structural breaks in the time-series. To detect such breaks, the Perron test can be used.

Table 3b. ADF Breakpoint Test Results

Variables	t	p	Break Date	ΔVariables	t	p	Break Date
logexport	-3.02	0.68	2002Q3	Δ logexport	-16.57	<0.01	1984Q4
logcurrency	-4.75	0.02	1990Q4	Δ logcurrency	-10.83	<0.01	2001Q2
logGDP	-3.66	0.30	2020Q2	Δ logGDP	-15.36	<0.01	2009Q1
logTOT	-7.05	<0.01	2015Q1	Δ logTOT	-15.71	<0.01	1984Q1

This test is used to determine the stationarity of a time-series in the presence of structural breaks. The results of the Perron test are given in Table 4 and can be used to identify any existing breakpoints in the time-series.

Table 4: Perron Test Results for Variables

Variables	t-stat.	Prob.	Δ Variables	t-stat	Prob.
logexport	-3.974.564	5.394	Δ logexport	-1.683.063	< 0.01
(logcurrency)	-4.524.540	2.265	Δ logcurrency	-1.120.758	< 0.01
logGDP	-4.717.615	1.517	Δ logGDP	-1.888.694	< 0.01
logTOT	-7.700.337	0	Δ logTOT	-	-

Notes: Δ = first difference, tested without intercept and trend

While logexport, logcurrency and, logGDP variables are stationary on the first order I(1), the logTOT presents a stationary behavior on its level as I(0). Thus, there is no sign of I(2) in the data and variables are combined as I(1) and I(0). As Pesaran, Shin, and Smith (2001) describes, the ARDL model can handle combinations of variables with different order of integration unless none of them are second order of integration I(2).

ARDL Model Forming

The first step in the process was to choose the maximum lag length for the dependent and independent variables as five and three respectively, based on prior studies and the requirement of serial independence in the model residuals. After setting maximum lags, the next step is to determine the optimal lags for both dependent and independent variables. This can be achieved by employing information criteria, including Akaike, Bayesian and Hannan-Quinn. The most common criteria are AIC and BIC, thus AIC was used to select optimum lag length. The AIC is defined by the residual sum of squares of the regression which is corrected to sample size and number of parameters in the equation. The mathematical representation of the AIC shown as the Equation (3).

$$AIC = \ln RSS n-k+2nk$$

Where the RSS is the residual sum of squares of the regression, the n and k show the sample size and number of parameters consequently.

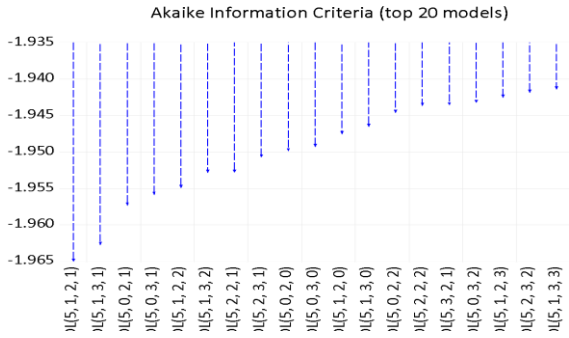

Figure 1

As shown in Figure1 the ARDL (5,1,2,1) was matched with the lowest value for AIC. Thus, it satisfies the aim to minimize the AIC value to lag selection procedure. Based on lag selection by minimization of the AIC, the ARDL model has been formed using an OLS estimator. The results are presented in Table 5.

Table 5. ARDL (5,1,2,1) Estimation Results

Variable	Coefficient	t-statistics	Prob.
logexport(-1)	700.659	9.953.808	0
logexport(-2)	42.315	596.546	5.518
logexport(-3)	-53.015	-758.050	4.497
logexport(-4)	605.617	8.542.927	0
logexport(-5)	-407.023	-5.908.405	0
logcurrency	-167.705	-1.823.715	704
LogCurrency(-1)	155.783	1.707.420	900
logGDP	418.477	701.697	4.841
logGDP (-1)	2.942.603	3.996.600	1
logGDP (-2)	-2.750.077	-4.587.874	0
logTOT	112.114	1.691.106	931
logTOT (-1)	-139.384	-2.075.151	398
C	-9.560.669	-2.009.269	465
R-squared	0.994506	Akaike info criterion	-1.964783

AdjustedR-squared	0.994028	Schwarz criterion	-1.705018
Sum squared resid	1.043347	Hannan-Quinn criterion	-1.859253
F-statistic	2081.776	Durbin-Watson stat	2.056116
Prob.(F-statistic)	0.000000		

As shown in the results, five lags of logexport are involved in the model in which only lag1, lag 4 and lag 5 were significant at 95% of confidence intervals. As an explanatory variable, logcurrency showed no significant relationship with logexport both in current and lag1 values. For the logGDP, while surprisingly the current value showed no significant relationship with the dependent variable logexport, lag 1 and lag2 of the logGDP were significant. As logTOT current value had no significant relationship, after one lag, it represented a significant relationship with logexport. The R-Squared and adjusted R-Squared both showed a relationship above 99%, which besides relatively high value for significant F-statistics proves an adequate model. Also, the Durbin-Watson (DW) value can be used for interpreting the serial correlation in error terms. DW value between 1.5 to 2.0 shows the absence of the serial correlation problem in the model, while for further investigation the authors run an LM test to ensure the absence of serial correlation problem in the model.

Model Diagnosis

A serial correlation LM test and heteroscedasticity test for residuals have been used to validate the model shown in Table (6). The null hypothesis for the LM test is in favor of no serial correlation, which in this case with 0.79 p-value, the authors are unable to reject the null hypothesis. The results show no serial correlation in residuals. To investigate the heteroscedasticity problem along residuals, the authors run a heteroscedasticity test where the null hypothesis for the test is not heteroscedasticity. The p-value of 0.14 shows that the null hypothesis cannot be rejected and there is no heteroscedasticity problem in the residuals.

Table 6. Diagnosis Tests Results

Test	**P-VAlues**
Serial Correlation Test	0,7914
Heteroscedasticity	1.400
Notes* = 5%, **= 1% significant.	

Bound Testing and Cointegration

To perform a bound test, the model forms an unrestricted Error Correction Model (ECM) and checks F-statistics to see whether the coefficients of the EC term are significant or not. The result of the ECM is presented in Table (7).

Table 7.F-Bound Test Results for Level Relationship

Variable	**Coefficient**	**t-Statistics**	**Probability**	
Logcurrency	-106.973	-1.171.441	0.2434	
LogGDP	5.482.507	4.639.430	0	
LogTOT	-24.700	-448.331	6.546	
F- BounTest				
Test Statistics	Value	Sİgnificance	I(0)	I(1)
F Statistics	2.050.059	10%	2.72	3.77
k	3	5%	3.23	4.35

As explanatory variables, the logcurrency and logTOT variables are not useful in the Error Correction Model (ECM). The logGDP variable is significant, but the F-statistics value of 2.05 is not high enough to reject the null hypothesis that there is no cointegration relationship between the variables. Thus, the results show that there is no underlying long-term relationship between logexport and explanatory variables.

Table 8. ARDL (5,1,2,1) Estimation Results

Variable	Coefficient	t-Statistics	Prob.
logexport (-1)	0.700659	9.953808	0.0000
logexport (-2)	0.042315	0.596546	0.5518
logexport (-3)	-0.053015	-0.758050	0.4497
logexport (-4)	0.605617	8.542927	0.0000
logexport (-5)	-0.407023	-5.908405	0.0000
logcurrency	-0.167705	-1.823715	0.0704
logcurrency (-1)	0.155783	1.707420	0.0900
logGDP	0.418477	0.701697	0.4841
logGDP (-1)	2.942603	3.996600	0.0001
logGDP (-2)	-2.750077	-4.587874	0.0000
logTOT	0.112114	1.691106	0.0931
logTOT (-1)	-0.139384	-2.075151	0.0398
C	-9.560669	-2.009269	0.0465

R-squared	0.994506		
Adjusted R-squared	0.994028	Akaike info criterion	-1.964783
Sum squared resid	1.043347	Schwarz criterion	-1.705018
F-statistic	2081.776	Hannan-Quinn criterion	-1.859253
Prob.(F-statistic)	0.000000	Durbin-Watson stat	2.056116

Table 9. Diagnosis Tests Results

Test	P-Values
Serial Correlation LM Test	0.7914
Heteroscedasticity	0.1400

Notes* = 5%, **= 1% significant.

Table 10. F-Bound Test Result for a Level Relationship

Variable	Coefficient	T-Statistics	Probability	
Logcurrency	-106.973	-1.171.441	2.434	
LogGDP	5.482.507	4.639.430	0	
logTOT	-24.700	-448.331	6.546	
F-Bound Test Statistics				
Test Statistics	Value	Significance	I(0)	I(1)
F-Statistics	2.050.059	10%	2.72	3.77
k	3	5	3.23	4.35
	2.5	3.69	4.89	
	1%	4.29	5.61	

EC=logexport - (-0.1070*logcurrency + 5.4825*logGDP -0.2447*logTOT)

The F-statistics was conducted to determine if the coefficients of the error correction term in the unrestricted EC model were significant by performing a bound test. Although the coefficient for logGDP is significant but as F-statistics with 2.05 value which is less than all values in different confidence intervals in I(0) order, the null hypothesis of no cointegration relationship cannot be rejected.

The result indicated no underlying long-term relationship that existed among the model's variables of GDP of OECD Countries, FX rate and ToT in the specified period. This result is similar to the result of an earlier study by Sukar (1998), which explains the

negative effect of host country income and real FX rate on the US' exports in the early 1990s and a recent one by Çulha&Kalafatçılar (2014) which argue that the main determinant of Turkish exports to the EU is foreign income from 2003 to 2013. The analysis in this paper revealed similar results with Çulha &Kalafatçcılar (2014) for a longer period of analysis from 1982Q1 to 2021Q1. However, in contrast to EU countries' income, GDPs of M.East and N. African countries were found to have no influence on Turkish exports. The foreign income elasticity of exports to the region is statistically insignificant, while the real E.R. has a significant and negative effect on exports to the region (Bozok et al., 2015).

The study finds out that the foreign income elasticity of exports is higher in the EU and other developed countries than in developing countries from 2005 and 2013. Bozok et al. (2014) reported that Turkish exports were highly sensitive to the changes in the GDPs of foreign countries. This study implies that the GDP fluctuations in OECD countries play a significant role in Turkish export patterns. Unlike the previous analysis that demonstrates that a change in FX rate does not have an impact on Turkish export in a relatively shorter analysis period, this study shows FX volatility has a significant effect on Turkish export from 1982Q1 to 2021Q1 (including 156 quarters). Furthermore, the TOT does not have a significant impact on Türkiye's exports for the analysis period.

Gül (2018) uses nonlinear ARDL and Panel ARDL methods for the period 2004-2016 and reveals that the real FX rate elasticities of exports vary considerably by country. Regarding the asymmetric effects of the real FX rate on exports, the reports suggest that the impact of the appreciation and depreciation of the Turkish lira on exports excluding gold differ at the country level, and in most of the countries where asymmetry is observed, the appreciation of the value is more effective on exports. In summary, recent studies reveal that Türkiye's exports to the EU are mainly affected by income, while exports to MENA are susceptible to price or rate elasticities. In addition, it has been discovered that recent E.R. movements may influence exports asymmetrically.

The results of the study by Kazdal & Gül (2021) provide evidence that the foreign income has affected Turkish exports. In addition, E.R. movements result in different effects at the sectoral level, and that exports in some sectors do not react to real exchange rate changes at significant levels. The results presented in the paper seem to confirm earlier research that showed that the GDP of OECD countries and its fluctuations are the primary factors affecting exports from Türkiye to the OECD countries. This confirms that the economic health of the OECD countries is an important factor in determining the amount of exports from Türkiye. The real exchange rate elasticity of exports has increased over recent years. However, in previous analysis, it was recognized that the FX volatility did not encourage Turkish exports. The analysis period includes the 1994, 2001, 2008, 2020 national and GFC.

In August 2018, the TRY/USD exchange rate deteriorated significantly rising from 4.91 TL to 8.50 TL/US dollar, with the Turkish Lira depreciating by 173% in a short time due

to foreign policy-related issues called the '*Pastor Brunson crisis*', but Türkiye's exports increased in the following September-December period. However, the expected increase did not occur; the main significant increase was on December 20, 2021, but the TRY/USD E.R. had depreciated even further (from 8.58 TL to 17.50 TL), and the improvement in export figures was not at the expected rate (100%). In addition, while the current account deficit was expected to decrease, it reached from 4 billion US dollars in November 2021 to the level of 41 billion US dollars in December, 2022. First put forward by Magee (1973), the hypothesis called the J Curve effect measures the depreciation of TRY against foreign currencies in the short run, and it has been examined in the empirical studies by Bahmani Oskooee(1991); Bahmani-Oskooee &Kara(2003); Bahmani -Oskooee & Harvey(2006); Bahmani-Oskooee & Xi (2015) for many countries separately. Using this effect, the investigations on the extent to which the depreciation of TRY against foreign currencies increased Türkiye's exports will be discussed in another article.

Conclusion

This article examines the impact of changes in OECD countries' GDP on Türkiye's exports from 1982Q1 to 2021Q1. The proportion of Türkiye's exports to OECD countries has ranged from 54 to 56 percent in recent decades and has been the primary contributor to total exports since 1980. The Terms of Trade (TOT), composition of commodities and services Türkiye exported and their weight in total export have changed. Under these conditions, the analysis of Türkiye to OECD countries has been modeled by using the GDP; TRY/USD FX rate, the TOT of Türkiye. GDP is the major determinant of export demand-oriented analysis. The results show that the model's variables of GDP of OECD Countries, FX rate and TOT are not cointegrated for the period between 1982 to 2021. However, Türkiye's export to OECD countries has a statistically significant correlation with OECD's GDP and foreign currency but not in the TOT. Türkiye's export has a statistically significant relationship with two periods lagged to OECD GDP and one period lagged with the foreign currency volatility, and one period lagged TOT in the ARDL analysis. This outcome is different from the findings of Kazdal and Gül's study on the short-term effect of foreign exchange (FX) on Türkiye's exports, which focused on the 2006 and 2016 periods. By including the impact of the 2018 devaluation of the Turkish lira and the COVID-19 pandemic recession on the global economy, this research enhances our understanding of FX's role in Türkiye's exports. The article provides a comprehensive analysis of the impact of changes in the GDP of OECD countries on Türkiye's export performance from 1982Q1 to 2021Q1. Furthermore, the model offers new insights into the influence of foreign exchange volatility of the Turkish lira and total exports on Türkiye's exports. Finally, the model can also be used to predict Türkiye's export volume during unexpected events such as the COVID-19 pandemic.

Peer-Review	Double anonymized - Two External
Ethical Statement	* It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited. Secondary data is used so ethical permission is not required.
Plagiarism Checks	Yes - Ithenticate
Conflicts of Interest	The author(s) has no conflict of interest to declare.
Complaints	itobiad@itobiad.com
Grant Support	The author(s) acknowledge that they received no external funding in support of this research.
Author Contributions	Design of Study: 1. Author (%40), 2. Author (%30), 3. Author (%30) Data Acquisition: 1. Author (%40), 2. Author (%30), 3. Author (%30) Data Analysis: 1. Author (%40), 2. Author (%30), 3. Author (%30) Writing up: 1. Author (%40), 2. Author (%30), 3. Author (%30) Submission and Revision: 1. Author (%40), 2. Author (%30), 3. Author (%30)

Değerlendirme	İki Dış Hakem / Çift Taraflı Körleme
Etik Beyan	** Bu çalışmanın hazırlanma sürecinde bilimsel ve etik ilkelere uyulduğu ve yararlanılan tüm çalışmaların kaynakçada belirtildiği beyan olunur.*
Benzerlik Taraması	Yapıldı – Ithenticate
Etik Bildirim	itobiad@itobiad.com
Çıkar Çatışması	Çıkar çatışması beyan edilmemiştir.
Finansman	Bu araştırmayı desteklemek için dış fon kullanılmamıştır.
Yazar Katkıları	Çalışmanın Tasarlanması: 1. Yazar (%40), 2. Yazar (%30), 3. Yazar (%30) Veri Toplanması: 1. Yazar (%40), 2. Yazar (%30), 3. Yazar (%30) Veri Analizi: 1. Yazar (%40), 2. Yazar (%30), 3. Yazar (%30) Makalenin Yazımı: 1. Yazar (%40), 2. Yazar (%30), 3. Yazar (%30) Makale Gönderimi ve Revizyonu: 1. Yazar (%40), 2. Yazar (%30), 3. Yazar (%30)

References / Kaynakça

Acaravcı, A.&İ. Öztürk (2002). Döviz Kurundaki Değişkenliğin Türkiye İhracatı Üzerine Etkisi: Ampirik Bir Çalışma. *Review of Social, Economic and Business Studies*.2, 197-206.

Akal, M. (2010). Estimating Trade Elasticities of Turkey with OECD Countries: A Panel Approach.*European Journal of Social Sciences*, 15(3) 371

Akbulut,B. S.(2014). Dış Ticaret Dengesi-Dış Ticaret Haddi İlişkisi: Türkiye Örneği (2002-2012) *Yayınlanmamış Doktora tezi*.K.T.U. S B. E., Trabzon.

Akbulut,S. & H.Terzi (2016). The Effect of Terms of Foreign Trade on The Balance of Foreign Trade: The Validity of "S-Curve Approach" for the Industries in Turkey. *D.E Ü. İ.İ.B.F. Dergisi 31(2)*

Akcay, U. & Gungen, A. R. (2019). The making of Turkey's 2018-2019 economic crisis. Berlin Institute for IPE. Berlin S.E.L./W. P..120./2019

Akkay, R.C.(2012).Reel Kur Değişimlerinin Dış Ticaret Dengesine Olan Etkisini Değerlendirmede Güncel Bir Yaklaşım: S Eğrisi Hipotezi.*I. U.İ. F. M.*, 62(19), 173 -190

Akıncı, Ö., Çulha, O.Y., Özlale, Ü.& G.Şahinbeyoğlu(2006) The effectiveness of foreign exchange interventions under a floating exchange rate regime for the Turkish economy: a post-crisis period analysis, *Applied Economics*, 38, 12, 1371-1388

Alessandria, G., Kaboski, J.P. &V. Midriga(2010) The Great Collapse of 2008-09 An Inventory Adjustment? NBER W.P, 16059.

Amiti, M., Redding, J.S. & Weinstein, D.E.(2019). The Impact of the 2018 Tariffs on Prices and Welfare.T*he Journal of Economic Perspectives*, 33, (4) 187-210 http://www.jstor.com/stable/26796842

Aristotelous, K. & Fountas, S (2000). The Impact of the Exchange Rate Regime on Exports: Evidence from Bilateral Exports in the European Monetary System.*J. of Economic Integration*,15, 506 -526. https://www.jstor.org/stable/23000390

Arslan, İ. & S. Van Winnergen(1993). Export Incentives, Exchange Rate Policy and Export Growth in Turkey. *The Review of Economics and Statistics*,75,(1),128-133. https://www.jstor.org/stable/2109635

Backus, D.K., Kehoe,P. J. and F. E. Kydland(1992)Dynamics of the trade balance and the terms of trade:the J-curve revisited.D.P.Institute for Empirical Macroeconomics 65,FED Bank of Minneapolis

Bailey,M.J.,Tavlas,G.S. & M. Ulan (1986). Exchange-Rate Variability and Trade Performance: Evidence for the Big Seven Industrial Countries. Weltwirtschaftliches Archiv. Bd., 3, 466-477

Bahmani-Oskooee, M.& Dan Xi (2015). A Note on the S-Curve Dynamics of Commodity Trade Between Brazil and The United States. *Latin American Journal of Economics*, 52, (1) 79-94.

Bahmani-Oskooee, M & Y. Wang (2006) The J Curve: China Versus Her Trading Partners. Bulletin of Economic Research, 58 (4), 323-343.

Bahmani-Oskooee, M.& O. Kara (2003) Relative Responsiveness of Trade Flows to a Change in Prices and E.R.. *International Review of Applied Economics*. 17, 293-308.

Bahmani-Oskooee, M. & F., Niroomand (1998) Long-Run Price Elasticities and the Marshall Lerner condition revisited . *Economics Letters*.61(1) 101-109.

Bahmani-Oskooee, M.(1991). Exchange Rate Uncertainty and Trade Flows of Developing Countries. *The J. of Developing Area*s, 25, (4)497-508. https://www.jstor.org/stable/4192021

Balassa ,B. (1978). Exports and Economic Growth: Further Evidence, *J. of Development Economics*. 5(2) 181 -189.https://www.sciencedirect.com/journal/journal-of-develop ment -economics/vol/5/issue/2

Balwin, R.(2012) Global Supply Chains: Why They Emerged, Why They Matter, and Where They are Going. CEPR D.P. DP9103

Baron,D.(1976).Fluctuating Exchange Rates and the Pricing of Exports, *Economic Inquiry,*14, 425-438.

Berthou,A.& E. Dhyne (2018). Exchange Rate Movements, Firm Level Exports and Heterogeneity. W. P. 660, Banque de France

Berument, H. &N. Dinçer(2004). The Effects of Exchange Rate Risk on Economic Performance the Turkish Experience. Applied *Economics, .36..2429–2441*

Berument, H.M., Dincer, N.N. & Z. Mustafaoglu (2014). External Income Shocks and Turkish Exports: A Sectoral Analysis. *Economic Modelling*. 37,476-484.

Bussière, M., Gaulier, G. & W. Steingress.(2020). Global Trade Flows: Revisiting the Exchange Rate Elasticities. *Open Economies Review*, 31,.1,.25-78.

Bozok, İ., Doğan, B.Ş. & Yunculr, C. (2015). Estimating Income and Price Elasticity of Turkish Exports with Heterogeneous Panel Time-Series Methods. C.B.R.T Working P..

Brada, J., Kutan, A..M.& Zhou, S. (1997). The Exchange Rate and The Balance of Trade Turkish Experience. *The J. of Development Studies*, 33 (5)6 75-692 .https://doi.org/10.1080/00220389708422489

Broll, U. & B.Echwert (1999). Exchange Rate Volatility and International Trade. *Southern Economic J.*, 66 (1) 178 -185

Calvo, G.A. & C.M. Reinhart (2002). Fear of Floating. *The Quarterly Journal of Economics,*.117(2),379.

Celasun, M. (1994).Trade and Industrialization In Turkey Initial conditions, policy and performance in the 1980s. Trade Policy and Industrialization in Turbulent Times

C.B.R.T.(2022)Foreign Exchange Parity Statistics(https://www.tcmb.gov.tr/wps/wcm /connect/EN/TCMB+EN/Main+Menu/Statistics/Balance+of+Payments+and+Related+Statistics/International+Reserves+and+Foreign+Currncy+Liquidity/)

Clark, P. B.(1973).Uncertainty, Exchange risk, and the Level of International Trade. *Economic Inquiry*, 11, 302–313.

Cohen, M.A.& S.Mallik(1997). Global Supply Chains : Research and Applications. Production and Operation Management, 6(3),1-18.

Çulha,O.Y.& Kalafatçılar, M. K. (2014). Türkiye'de İhracatın Gelir ve Fiyat Esnekliklerine Bir Bakış: Bölgesel Farklılıkların Önemi. *TCMB Ekonomi Notları*, *5*.

Cushman,D.(1983).The Effects of Real Exchange Rate Risk on International Trade. *Journal of International Economics*,15,45-63.

Chowdhury, A.R (1993). Does Exchange Rate Volatility Depress Trade Flows? Evidence from Error-Correction Models. *The Review of Economics and Statistics*.75(4(700) https://www.jstor.org/stable/2110025

Çağlayan, O., Dahi, S., & Fırat Demir (2013). Trade Flows, Exchange Rate Uncertainty, and Financial Depth:Evidence from 28 Emerging Countries. *Southern Economic Journal.* 79., 4, 905 -927.

Çelgin, A.,Gökcü,M.& Özel,Ö. (2019)İhracat ve İthalatta Gelir ve Göreli Fiyat Etkilerinin Ayrıştırılması, Ekonomi Notu, 1905. TCMB.

De-Grauwe,P.(1988). Exchange Rate Variability and the Slowdown in Growth of International Trade. IMF S. P, 35(1) 63-84

Dellas, H. & B.Z.Zilberfarb (1993). Real Exchange Rate Volatility and International Trade: A Reexamination of the Theory. *Southern Economic J.*, 59(4) .641-647 .https://www.jstor.org/stable /1059729

Dixit, A.(1987). International Trade Policy for Oligopolistic Industries, International Trade, ed. J. Bhagwati. MIT Press

Dornbusch, R., Werner, A., Calvo, G. & S. Fischer (1994). Mexico: Stabilization, Reform, and No Growth. *Brookings Papers on Economic Activity*.1,.253-270

Edwards, S. (1989). Exchange Rate Misalignment in Developing Countries. The World Bank Research Observer . 4. 1,3-21. https://www.jstor.org/stable/3986346

Eaton, J. (1987) A Dynamic Specific Factors Model of International Trade. NBER W.P.1419. https://www.jstor.org/stable/3986346

Eaton, J.,Kortum, S. Neiman, B. & J. Romalis (2016) Trade and the Global Recession. NBER W. P., 16666. https://www.nber.org/papers/w16666

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

Erdal, G., Erdal, H. & K. Esengün (2012) The effects of exchange rate volatility on trade: evidence from Turkish Agricultural Trade. *Applied Economics Letters*, 19,3,297-303.

Ethier, W.(1973). International Trade and the Forward Exchange Market. *The American Economic R.* 63, 3, 494-503 https://www.jstor.org/stable/1914383

Erlat, G.& H.Erlat (2012)Comparative Advantage Of Turkish Exports Vis-À-Vis The EU & OECD Countries, 1990-2000. *Ekonomik Yaklaşım*, 23, 77-106.

Fanelli, S. & L.Straub (2020). Theory of Foreign Exchange Interventions. NBER Working P. 27872 http://www.nber.org/papers/w27872.

Fang, W.,Lai, Y. & S.M.Miller(2006). Export Promotion through Exchange Rate Changes: Exchange Rate Depreciation or Stabilization? S*outhern Economic J.*72,3,611-626. https://www.jstor.org/stable/20111836

FED (2013) https://www.federalreserve.gov/newsevents/speech/powell20131011a.htm.

Franke, G.(1991). Exchange rate volatility and international trading strategy. *Journal of International Money & Finance* 10:292-307.

Greenaway, D., Kneller R.& X. Zhang (2010). Exchange Rate Uncertainty and Export Decisions in the UK. *J. Economic I.,*. 25, 4,.734-753.

Gourinchas,P.O.(2017).Monetary Policy Transmission in Emerging Markets: An Application to Chile. Monetary Policy and Global Spillovers: Mechanisms, Effects and Policy Measures 1, 279–324.

Göçer, İ & B.Elmas (2013).Genişletilmiş Marshall Lerner Koşulu Çerçevesinde Reel Döviz Kuru Değişimlerinin Türkiye'nin Dış Ticaret Performansına Etkileri: Çoklu Yapısal Kırılmalı Zaman Serisi Analizi.*BDDK Bankacılık ve Finansal Piyasalar D.*,7, 1,137-157.

Grossman, G. .& E.Helpman(1991.) Trade, Knowledge Spillovers, and Growth.*European Economic R.*, 35(2). 517- 526

Gupta, S. (1980) Exchange Risk in International Trade Under Alternative Exchange Systems: The Developing Countries' Experience. Ph.D. D. Michigan S. U.

Gül, S.(2018).Türkiye'de Reel Kur Hareketlerinin İhracat Üzerindeki Asimetrik Etkileri. Ç. T., 1812, TCMB.

Hassani,K.& S.Dost (2021). Impact of COVID-19 on international trade and China's trade. *Turkish Economic R.*,. 7, 2 www.kspjournals.org

Harberger, A.C.(1950).Currency Depreciation, Income and the Balance of Trade. *J. of Political Economy*. 58(1).47-60.

Hepaktan, E.& S.Çınar (2011).Mali Krizler ve Son mali Krizin Reel Sektöre Etkisi Dumlupınar Ü. *Sosyal B. D.*. 30, 37.-382.

Holly,S.(1995).Exchange Rate Uncertainty and Export Performance: Supply and Demand Effects *Scottish J.*P.E.42,381-391.https://ideas.repec.org/a/bla/scotjp/v42y1995i4p381 -91.html

Hoque, A.(1995). Co-integrating relationship between terms of trade and current account deficit: the Australian evidence. *Applied Economics Letters*,2,.4,130-133,

Houthakker, H.S .& Stephen P. Magee (1969) Income and Price Elasticities in World Trade. *The R. of Economics and Statistics*.51,2,111-125. https://www.jstor.org/stable/1926720

Humphrey, J.. (2007).Upgrading in Global Value Chains. Humphrey, John, Upgrading in Global Value Chains (May, 2004). Available at SSRN: https://ssrn.com/abstract=908214 or http://dx.doi.org/10.2139/ssrn.908214

Iossifov, P. & X. Fei. (2019) Real Effective Exchange Rate and Trade Balance Adjustment: The Case of Turkey, IMF W. P., 19,131.

Jianping, Z. and L.Huan, Feifei, J., H. Zhuping(2020)South-South Integration and the SDGs:. Enhancing Structural Transformation in Key Partner. Countries of the Belt and Road Initiative. UNCTAD/BRI PROJECT/RP12

Kabaklarlı,, E., Duran, M.S. & Y.T.Üçler (2017)The Determinants Of High-Technology Exports: A Panel Data Approach For Selected OECD Countries.Dubrovnik International Economic Meeting, 3,1. DIEM : Dubrovnik International Economic Meeting,

Kalemli-Ozcan, Ş.(2020).Emerging and Frontier Markets: Capital Flows, Risks, and Growth. NBER W.P.https://www.nber.org/conferences/emerging-and-frontier -markets-capital-flows-risks-andgrowth -fall-2020

Kalemli-Ozcan,Ş. (2019).U.S. Monetary Policy And International Risk Spillovers. NBER W. P. 26297 http://www.nber.org/papers/w26297

Kasman, A.& S. Kasman (2005).Exchange rate uncertainty in Turkey and its impact on Export Volume. *M.E.Technical U. J.,*32,.41-58

Kazdal, A.& S. Gül (2021). Türkiye'de İhracat ve Reel Kur Arasında Zamana Göre Değişen İlişki Sektörel Düzeyde Güncel Bir İnceleme. *C.B. R.T. W. P.* 21, 38.

Kenen, P.B. & Rodrik, D. (1986). Measuring and Analyzing the Effects of Short-Term Volatility in Real Exchange Rates.*The R.. of Economics and Statistics* ,68,.2,311-315

Kerr, W.A. (2021). Agriculture after a year with COVID-19: Any long-term implications for international trade policy? *Canadian J. of Agricultural E..* S Issue. doi10.1111/cjag.12274

Konya, L. (2006) Exports and growth: Granger causality analysis on OECD countries. *Economic M.*, 23, 978–992.

Kuznet, S. (1934) National Income. Chapter in National Income, 1929-1932, NBER, W.P.1 -12.

Krugman,P.(1979). Increasing Returns, Monopolistic Competition, and International Trade. *J.I.l Economics*, 469-479.

Krugman,P.(1987).Pricing to Market When the Exchange Rate Changes.' In Real-Financial Linkages among Open Economies, ed. by S. W. Arndt & J. D. Richardson. MIT Press.

Laursen,S.L. &Metzler,A(1950). Flexible Exchange Rates and the Theory of Employment, *The R. of Economics and Statistics,* 32 (4)281-299

Leigh,D.,Lian,W.,Poplawski-Ribeiro,M.,Szymanski,R.,Tsyrennikov,V.and H.Yang (2017) Exchange rates and trade:A disconnect? IMF W.P.17/58 https://www.jstor.or/stable /1925511

Leith, C.J. (1971)The Effects of Tariffs on Production, Consumption, and Trade: A Revised Analysis. The American Economic Review, 61, (1)74-81. http://www.jstor.com/stable/1910542

Lerner, A. (1944) The Economics of Control, New York

Magee, S.P.(1973).Currency Contracts, Pass-Through and Devaluation,*Brookings Papers on Economic Activity*, 1,303-325.

Markusen, J.& Venables,A.(1996). The Theory of Endowment, Intra industry trade and Multinational Trade. NBER W. P..5529.

Marshall, A. (1923) Money, Credit and Commerce, London: Macmillan and Co.

Mendoza,E.G.(1995) The terms of trade, the real exchange rate and economic fluctuations,*International Economic R.*,36.1,.101-137.https://www.jstor.org /stable/2527429.

Miranda,-Agrippino, S. & H. Rey (2019). US Monetary Policy and the Global Financial Cycle. NBER W.P. 21722 http://www.nber.org/papers/w21722

Morris, M. & C. Staritz (2019) Industrialization paths and industrial policy for developing countries in global value chainsHandbook Chapters./DOI: https://doi.org/10.4337/9781788113779.00041

Nazlıoğlu, S.(2013) Exchange rate volatility and Turkish industry-level export: Panel cointegration analysis. *The J. T. & E.Development*, 22,7,1088

Obstfeld, M., Ostry J.,Mahvash, D.& S. Qureshi(2019). A Tie That Binds: Revisiting the Trilemma in Emerging Market Economies. *The Review of Economics and Statistics*, 101 (2), 279–293. https://doi.org/10.1162/rest_a_00740

Obstfeld,M.& K. Rogoff(1994).Exchange Rate Dynamics Redux. NBER W. P..4693.

Ohlin, B. (1935). Interregional and International Trade. Cambridge: Harvard U. Press

Obayelu,A.E.Edewor, S.E. and A.O.Ogbe(2020).Trade Effects, Policy Responses and Opportunities of COVID-19 Outbreak in Africa. *Journal of Economic and Foreign Trade Studies, 1, 1-3 .*

OECD(2022). Definition of Terms of Trade and TOT Statistics.https://data.oecd.org /trade/terms-of-trade.htmtext=Terms%20of%20trade%20are%20defined,it%20can%20purchase%20more%20imports.

OECD (2021).GDP Statistics. https://data.oecd.org/gdp/gross-domestic-product-gdp.htm

Orhangazi, Ö. & A.E.Yeldan (2021) The Re-making of the Turkish Crisis The Re-making of the Turkish Crisis.Development and Change, 52: 460-503. https://doi.org/10.1111/dech.12644.

Öztürk, İ. & A. Acaravcı (2010). Testing The Export-Led Growth Hypothesis: Empirical Evidence From Turkey. *The J. of Developing Areas,* 44,1 245-254

Öztürk, İ. &A.Acaravcı (2009). Exchange Rate Volatility and Exports in Türkiye. Int. *J. of Economic Research*, 6(2)285-293.

Özmen, E. & D.Yolcu Karadam (2014). Structural Change in Turkish External Trade: Evidence from BEC Sectors ERC W. P. in Economics 14/13.

Pesaran, H.M., Shin, Y. and Richard J. Smith (2001). Bound Tests of Applied Econometrics. *J. of Applied Econometrics,* 16, 289-326.

Pere,E.&A.Steinherr(1989).Exchange Rate Uncertainty and Foreign Trade. *European Economic R.*,33,1241–64

Pozo,S.(1992). Conditional Exchange Rate Volatility and the Volume of International Trade: Evidence from the Early 1990s. *R. of Economics and Statistics*,74, 325–29.

Rose,A.(2000). One Money, One Market: Estimating the Effect of Common Currency on Trade. *Economic Policy* 30, 7–45.

Reinhart, C.(1995).Devaluations, relative prices, and international trade. IMF S P., 42, 290 -312

Rey ,H. (2013). Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence. Proceedings, Jackson Hole Conference Procedia.

Rodriguez, C. A.(1979) The Quality of Imports and the Differential Welfare Effects of Tariffs, Quotas, and Quality Controls as Protective Devices. *The Canadian J. of Economics.* 12(3) 439-449. https://www.jstor.org/stable/134732

Rogoff, K.(1992). Traded Goods Consumption Smoothing and the Random Walk Behavior of the Real Exchange Rate. *B.J. Monetary & Economic S.*,10, l, 1-29.

Ricardo, D. (1817). The Principles of Political Economy and Taxation. The U.K.

Sachs, J. D. (1981). The Current Account and Macroeconomic Adjustment in the 1970s. Brookings P. on Economic Activity,1, 201-68.

Samuelson, P.(1953).Prices of Factors and Goods in General Equilibrium. *R. of Economic Studies,* 21(1) 1-20.

Saygılı,H. & M.Saygılı (2011). Structural Changes in Exports of An Emerging Economy: Case of Türkiye. Structural Change and Economic Dynamics,22, 342-60.

Sen, A.,Saray, O.M. & M. Karagoz (2009) Intra-Industry Trade between Türkiye and OECD Countries: A Panel Data Analysis. *Zagreb International Review of Economics & Business,* 12, (2) 73-86

Sercue, P. & C. Vanhulle (1992). Exchange rate volatility, international trade, and the value of exporting firms. *J. of Banking and Finance*,16(1),155-182.

Stolper,W.F. & P.A.Samuelson(1941).Protection and Real Wages. *R. of Economic Studie*s, 9, 58-73

Smith,A.(1776). An Inquiry to Nature and Source of Wealth of Nations.

Sturgeon, T.J. & Van Biesebroeck, J.(2011).Global value chains in the automotive industry: An enhanced role for developing countries? Int. J. Technological Learning, Innovation and Development, 4,(1)2/3,

Sukar, A. (1998). Real Effective Exchange Rates and Export Adjustment in the U. S. *Q. J. of B. & Economics,* 3,1,.3-12. https://www.jstor.org/stable/40473231

Şimşek, M. & C. Kadılar(2005).The Cointegration Analysis of Türkiye's Export Demand Function By Bounds Test. *Doğuş Ü. D.*,6,144-152

Tatlıyer, M.&F.Yiğit (2016). Does Exchange Rate Volatility Really Influence Foreign Trade? Evidence from Türkiye. I*nternational J. of Economics and Finance*,.8.,2 .E-ISSN 1916 -9728

Tarr, D.G.& M. E. Morkre(1984). Aggregate Costs to the United States of Tariffs and Quotas on Imports: General Tariff Cuts and Removal of Quotas on Automobiles, Steel, Sugar, and Textiles : an Economic Policy Analysis

Türkcan,K.(2005). Determinants of Intra-Industry Trade in Final Goods and Intermediate Goods between Türkiye and Selected OECD Countries.*İ.Ü.İ.F.Ekonometri ve İstatistik D.*, .1,21-40

Vergil, H. (2002). Exchange Rate Volatility in Turkey and Its Effect on Trade Flows. *J. of Economic & Social Research, 4(1).*

Verschuur,J., Koks, E. & J.W.Hall (2020)*Observed impacts of the COVID-19 pandemic on global trade Nature Human Behavior* https://www.nature.com/articles/s41562-021-01060-5.pdf

Yanıkkaya, H. (2001). The Influence of Real Exchange Rates on Turkish Agricultural Exports. *Gazi Ü.İ.İ.B F. D.*, 3,1.https://dergipark.org.tr/tr/pub/gaziuiibfd /issue/28351 /301393#article-authors-list

Wang ,K .& C. Barret (2007). Estimating the Effects of Exchange Rate Volatility on Export Volumes.*J. of Agricultural and Resource Economics*, .32(2) 225-255. https://www.jstor.org/stable/40987362

Weiwei, Z., Wang, D.,Muhammad T. M.& S.Sohail (2021) COVID-19 and international trade: insights and policy challenges in China and US, Economic Research.10.1080/1331677X.2021.193009