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THE IMPACT OF THE WORLD TRADE UNCERTAINTY ON INTERNATIONAL TRADE: THE CASE OF THE TURKISH ECONOMY

DÜNYA TİCARET BELİRSİZLİĞİNİN ULUSLARARASI TİCARETE ETKİSİ: TÜRKİYE EKONOMİSİ ÖRNEĞİ

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ABSTRACT

International trade can be affected by various economic events, including domestic and global developments, such as economic crises, exchange rate volatilities, natural resource explorations, and globalization. In addition, trade uncertainty is an important factor that affects the trade volume of an economy. Recently, trade uncertainty has increased episodically in the world with trade wars between the US and China, and this uncertainty has spilled over to other countries, thereby affecting trade volumes. This study attempts to understand and explain the role of World Trade Uncertainty (WTU) on both export and import in the Turkish economy for the period from 1998:Q1 to 2021:Q4. Therefore, this study utilizes the Autoregressive Distributed Lag (ARDL) bounds test. The research findings presented here reveal that there is a long-run nexus between the variables in both models. The results also show that an

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increase in WTU negatively affects export, while it has no statistically significant effect on Turkish import for the period examined.

ÖZ

Uluslararası ticaret, ekonomik krizler, döviz kuru oynaklıkları, doğal kaynak keşifleri, küreselleşme vb. gibi yerel ve küresel gelişmeler dahil olmak üzere çeşitli ekonomik olaylardan etkilenebilir. Ayrıca ticaret belirsizliği bir ekonominin ticaret hacmini etkileyen bir diğer önemli faktördür. Son dönemde dünyada ABD-Çin Ticaret Savaşı ile birlikte ticaret belirsizliği dönem dönem artmış ve bu belirsizlik diğer ülkelere de sıçrayarak ticaret hacimlerini etkilemiştir. Bu araştırma, Dünya Ticaret Belirsizliğinin (WTU) 1998:Ç1'den 2021:Ç4'e kadar olan dönem için Türkiye ekonomisinin hem ihracatı hem de ithalatı üzerindeki rolünü anlamaya ve açıklamaya çalışmaktadır. Bu amaç doğrultusunda, bu makale, eşbütünleşme için Gecikmesi Dağıtılmış Otoregresif (ARDL) sınır testi yaklaşımını kullanmaktadır. Çalışmanın ampirik sonuçları her iki model için de değişkenler arasında uzun dönemli bir ilişki olduğunu doğrulamaktadır. Sonuçlar, aynı zamanda, incelenen dönemde, WTU'daki bir artışın Türkiye'nin ihracatını olumsuz etkilediğini, buna karşılık ithalatı üzerinde ise istatistiksel olarak anlamlı bir etkisinin olmadığını göstermiştir.

Keywords: ARDL bounds testing, Export supply function, Import demand function, Türkiye, Trade uncertainty

Anahtar Kelimeler: ARDL sınır testi, İhracat arz fonksiyonu, İthalat talep fonksiyonu, Türkiye, Ticaret belirsizliği

1. INTRODUCTION

In the economic framework, decisions are taken by economic actors, such as households, firms, and public policymakers. During the decision-making process, economic actors encounter uncertain conditions. Recently, understanding the effect of uncertainty on economic actors' decision-making process has been of the utmost concern in the literature (Liu, 2010: 1-79). In the wake of the 2008 Global Financial Crisis (GFC), the growth rate of trade flows across countries slowed down (Boz et al., 2015: 55-70), and this decline was based on rising protectionism and depreciating currencies to increase export (Tam, 2018: 3718-3734). It is further suggested that a substantial share of the collapse in trade in the 2008 GFC depended on uncertainty, and a sharp rise in uncertainty caused a change in firms' inventory policies, and firms cut their foreign inputs and intermediate goods, which caused a more considerable reduction in international trade flows among countries (Novy and Taylor, 2020: 749-765).

The spillover of an unexpected shock in a country's uncertainty to other countries affects trade flow (Han et. al., 2016: 4907-4921; Yin and Han, 2014: 938-944; Osnago et al., 2015). One way to transmit uncertainty about trade performance is through global value chains across borders (Osnago et al., 2015). Unexpected changes in trade uncertainty are transmitted through the supply chain mechanisms. In a globalized economy, the relationships among firms are closely and tightly connected and have become complex over time (Caldara et al., 2020: 38-59). It means that increased input costs due to trade uncertainty cause firms to consider alternative supply chain channels, and thus trade volumes among countries are adversely affected. Another way that policy uncertainty may slow down the growth rate of trade flows is the entrepreneurs' expectations. When uncertainty increases, entrepreneurs are less likely to be optimistic about future export demand, and the likelihood of a wait-and-see option emerges (Nguyen, 2012: 336-344). Until uncertainty is resolved, entrepreneurs do not enter foreign trade markets, and firms delay their investments.

A similar channel can be found in exchange rate expectations, in which an increase in uncertainty leads to a rise in exchange rate volatility. In this regard, trade flows between the host and the home country decrease (Tam, 2018: 3718-3734). Lastly, uncertainty about international trade is transmitted to asset prices and financial markets. As trade uncertainty increases, the prices of financial assets decrease because of worsening credit conditions due to financial frictions (Alessandri and Mumtaz, 2019: 31-46; Gilchrist et al., 2014). Thus, household consumption and firm investment are negatively affected by the wealth effect (Nalban and Smădu, 2021). Nevertheless, notwithstanding the negative effects of trade uncertainty on economic activity, the growth option theory proposed by Oi (1961: 58-64), Hartman (1972: 258-266), and Abel (1983: 228-233) argues that the rise of uncertainty might stimulate investment and hence extend trade performance. Firms recognize higher uncertainty as a profit opportunity, and heightened uncertainty is likely to increase the expected return on capital. In addition, risk-taking firms are stimulated to invest and enter foreign trade markets (Bloom, 2014: 153-176).

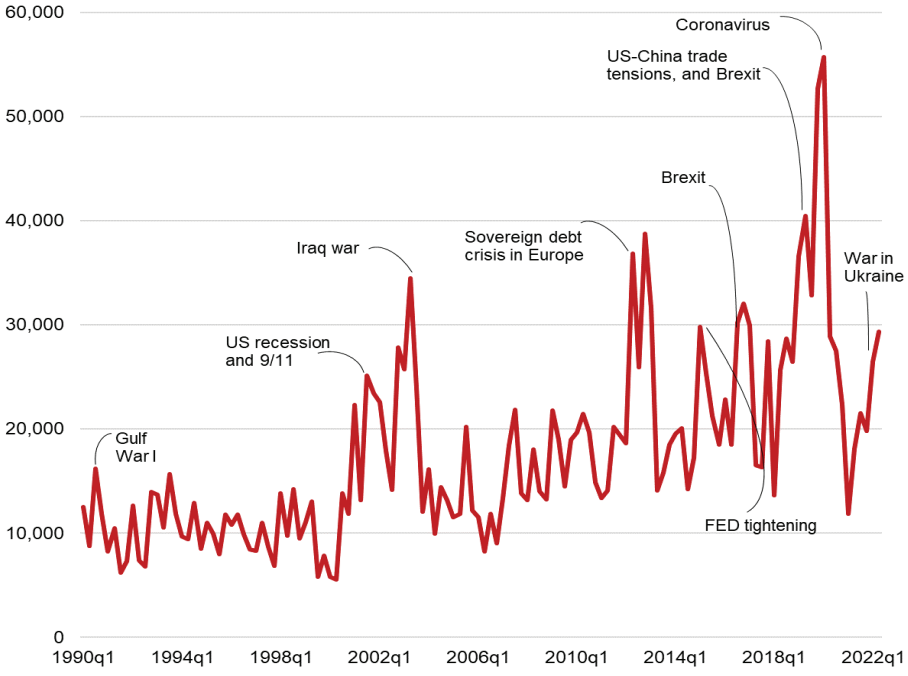
Trade policies have started to be interrogated in the last decade, especially after Donald Trump became the 45th president. In the early days of his presidency, the administration swung into action immediately.

The administration first expedited the suspension of the United States' membership in the World Trade Organization. Then, the Trump government negotiated the North Atlantic Free Trade Agreement reestablishment in favor of the US. Next, the US suspended the negotiations on the Trans-Atlantic Trade and Investment Partnership Agreement, intended to be signed between the US and the European Union (EU), aiming to give a new direction to world trade. Finally, on March 22, 2018, additional tariffs of 50 billion USD were proposed for Chinese import to the US. The increased foreign trade deficit in some industrial sectors and the decreased establishment of new factories due to imported products from abroad led the US to take action against trading partners. Moreover, the rise in the unemployment rate among unskilled labor and the elevation in income inequality among individuals caused the Trump administration to apply rather illiberal trade measures (Liu and Woo, 2018: 319-340; Huang et al., 2018; Rashish, 2017).

After US policy measures toward trade partners, and trade wars in the world economy have arisen, both developed and developing countries have questioned the steps taken to liberalize international trade among countries in the past 40 years. In addition, the number of trade distortions and restrictions has increased recently, while fewer measures for trade liberalization have been carried out. These harmful measures have brought significant uncertainty related to trade policy and led to less output growth through reduced investment and lower business sentiment (Ebeke and Siminitz, 2018). Trade uncertainty has increased episodically with the US-China Trade War. It has also provided us with a better understanding of recent decreases in trade volumes, which traditional models cannot give an adequate explanation (Jaaskela and Mathews, 2015: 39-46). The recent upsurge of the US-China trade war has not only affected firms and households in those economies, but the unintended consequences of this war have also been felt by firms and households in other regions and countries (Chen and Chiang, 2020).

The uncertainty level in the world can be affected by plenty of economic, political, and social factors. As seen in Figure 1, the World Uncertainty (WU) value increased with the 2008 GFC and the EU's sovereign debt crisis. Then, during the Brexit period and the escalation of US-China trade relations, it was heightened again and peaked at the beginning of the Covid-19 pandemic across the globe. The index hit its highest value, 55.685, in the first quarter

of 2020. In the pandemic period, many countries faced economic recessions and depressions. The economic slowdown led to a decrease in output level, many firms fired their workers, and then the unemployment rate increased in many developed and developing countries. After that, it started to decrease subsequent to the economic recovery after the pandemic. However, this economic recovery did not last long; world trade uncertainty increased again because of the Ukraine-Russian war. Since this war has affected both energy and grain prices, especially, the European countries' economies have faced high economic uncertainty.

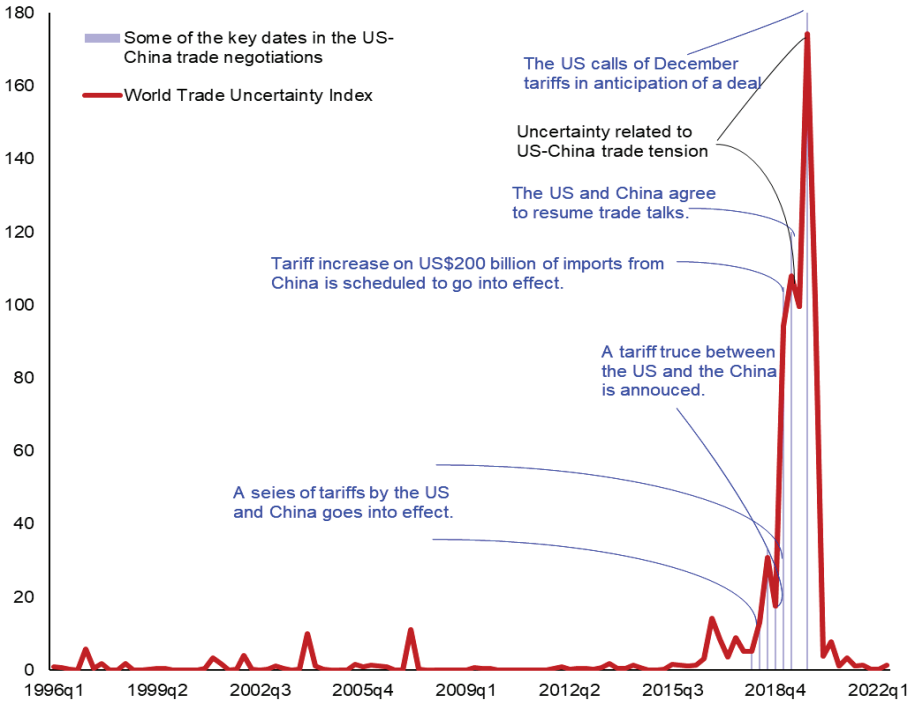


Source: Ahir et al. (2018).

Figure 1: Time Series Plots of World Uncertainty Index (GDP Weighted Average), 1990:Q1-2022:Q2

Considering the trade uncertainty, it is seen that the World Trade Uncertainty (WTU) is less volatile compared to the WU (see Figure 2). The figure shows that especially the trade wars between the US and China caused a sharp increase in the index value. The index hit its highest value, 174.34, in the last quarter of 2019. The high tension between these countries affected

export and import volumes for a considerable number of countries. It had a negative impact on global supply chains. It also damaged competitiveness and increased costs for both firms and consumers. Therefore, demand for goods and services declined because of the relatively higher costs. Then, the economic contraction occurred, and the unemployment rate increased in some countries through the domino effect. In the Biden administration, the aggressive trade relations between the US and China have softened compared to the Trump Administration.



Source: Ahir et al. (2018).

Figure 2: Time Series Plots of World Trade Uncertainty Index (GDP Weighted Average), 1996:Q1-2022:Q2

The cross-border contagion of uncertainty shocks affects countries across the world. With the rise of Türkiye's economic and financial integration into global trade and financial architecture, it is expected that unexpected shocks in world uncertainty will affect export and import markets. Türkiye needs to give special attention to developing countries as it hass one of the biggest economies in the world to analyze. International trade is an important

factor in the Turkish economy, as the share of trade in GDP rose from 5.73% in 1960 to 71.21% in 2021 (World Bank, 2022). In this sense, it is imperative to study the transmission of WTU shocks to the Turkish export and import markets. To the best knowledge of the authors, no previous study has probed the influence of WTU on Türkiye's foreign trade markets.

This study aims to investigate the role of the WTU on both the export and import of the Turkish economy for the period from 1998:Q1 to 2021:Q4. For this reason, this study utilizes the ARDL bounds test. Accordingly, this study makes two contributions to the literature. First, this paper confirms the direct effect of WTU shocks on Türkiye's export and import markets both in the short and long run by using the ARDL bounds test. The advantage of using the ARDL model is that it allows series to be integrated into different orders. Secondly, exploring the effects of WTU shocks on Türkiye's export and import markets enables us to focus on more than one aspect of international trade markets.

The remaining part of this study consists of four main sections. Section 2 summarizes the empirical literature on trade uncertainty. Section 3 covers the paper's data, model, and methods. Section 4 presents the paper's findings. The fifth section wraps up the inquiry.

2. LITERATURE REVIEW

The last decade has witnessed rapidly burgeoning literature on the effect of uncertainty on macro and microeconomic activities. Furthermore, the effect of WTU on economic activities has recently gained more significance in the literature. The objective of this section is to build a literature review on the influence of WTU. Even though there are lots of papers examining the relationship between trade uncertainty and macroeconomic and financial indicators (Bouri et al., 2020; Caldara et al., 2020; Constantinescu et al., 2020; Ebeke and Siminitz, 2018; Gozgor et al., 2019; Handley and Limao, 2015; He et al., 2021; Tian et al., 2020) in the literature, the main focus of this section is to analyze the studies investigating the impact of uncertainty on trade performance.

Aslan and Acikgoz (2021) analyzed the effect of economic policy uncertainty on export flows in 28 emerging economies between January 2006

and December 2019, employing a Panel Vector Autoregressive approach. The empirical results demonstrated that economic policy uncertainty has a negative effect on export flows. Similarly, Han et al. (2016: 4907-4921) concentrated on the impact of economic policy uncertainty on export by using the Global Vector Autoregressive (GVAR) technique. The evidence showed that the growth rate of uncertainty in the US, EU, UK, and Japan has a significant and negative effect on Chinese export. Moreover, positive shocks corresponding to the US's uncertainty, compared with other countries' uncertainties, became the most significant cause of a decline in Chinese export. Contrary to the above studies, Jaaskela and Mathews (2015: 39-46) probed the effect of economic policy uncertainty on real import in a panel of 18 advanced countries. Uncertainty has been shown to negatively affect real import, suggesting that a rise in uncertainty by 1% causes a contraction in real import by 19%.

Kirchner (2019: 178-199) and Krol (2018) not only examined the influence of economic policy uncertainty on export but also questioned the impact on import. Kirchner (2019: 178-199) sought to address whether uncertainty affects international trade, industrial production, and investment for Australia and the US. The Vector Autoregressive (VAR) results demonstrated a negative link between uncertainty and trade volumes. An increase in Australian uncertainty by one standard deviation causes a decline in trade volume by 0.4%. There is a similar nexus between uncertainty and trade volume in the US, referring to the fact that an unexpected shock in uncertainty results in a 1.2% drop in trade volumes. Krol (2018) aimed to examine the impact of economic and trade policy uncertainties on US international trade. The findings confirmed a negative relationship between uncertainties and trade volumes. Beyond this existing research, Tam (2018: 3718-3734) empirically investigated the effects of economic policy uncertainty on trade flows for 45 countries spanning the period of 1998:Q1-2016:Q4. One standard deviation increase in US uncertainty leads to a reduction in the US and Chinese export (import) by 3.2% (3.3%) and 6% (3.6%), respectively. In the same way, the response of Chinese export and import to a one standard deviation increase in Chinese uncertainty causes a drop of 2.6% and 1.5%, respectively. Additionally, Wei (2019: 20-31) quantified the effect of oil price shocks and economic policy uncertainty on Chinese trade performance. A negative association is found between uncertainty and trade performance for China, suggesting that increased uncertainty provokes a rapid drop in real export. However, an increase in uncertainty has an insignificant and

adverse influence on real import. Moreover, unexpected shocks in uncertainty do not worsen terms of trade.

In another critical study, Sharma and Paramati (2021: 139-149) explored the impact of economic and financial uncertainties on import. An analysis of India covers a panel of 97 imported commodities over the period 2011:M11-2019:M01 by using novel panel data techniques. According to the estimation results, the US and Global uncertainties will have an impact on India's import in the long run. Contrary to the findings for the long-run relationship, the uncertainties have a positive impact on import in the short run, meaning that heightened economic uncertainty causes a surge in India's import.

Crowley et al. (2018: 96-115) revealed a negative association between trade uncertainty and the trade performance of nations. Crowley et al. (2018: 96-115) examined the effect of trade uncertainty on Chinese export to the US and proposed that an increase in the customs tariffs set by the foreign country causes domestic firms to be less likely to penetrate export markets and more likely to exit from export destinations. In addition, Novy and Taylor (2020: 749-765) examined the impact of trade policy uncertainty on US import. The findings denote that the Great Trade Collapse experienced during the 2008 GFC can be linked to the unanticipated rise in uncertainty shocks. Unexpected changes in uncertainty lead to a reduction of foreign input orders by firms due to increased fixed costs and thereby a contraction in international trade flows. In addition, the effect of world, US, and Chinese trade uncertainties on trade openness in Sub-Saharan African countries was investigated by Bandura (2022: 49-59). The findings proved that openness to international trade in sub-Saharan African countries is negatively associated with world, US, and Chinese trade uncertainties, suggesting that increased uncertainty adversely affects openness to international trade. Moreover, the magnitude of the effect of the world and China trade uncertainties is greater than the US trade uncertainty on openness to international trade.

For the Turkish economy, the impact of trade uncertainty on stock markets (Akdag et al., 2023: 60-77; Çekin and Nuroğlu, 2020: 73-90; Yıldırım, 2021: 11-33), country risk (Eryılmaz and Yılmaz, 2020: 91-112), and exchange rate (Ozkan, 2020) were studied. In addition, the nexus between trade protectionism and credit default spreads (CDS) was explored in another study (Yılmaz and Eryılmaz, 2020: 616-635). Based on the results of these studies for Türkiye, it can be concluded that trade uncertainty is detrimental

to different economic activities, which triggers a reduction in investment and decreases in financial transactions. According to the literature review, it can be suggested that no study has examined the impact of trade uncertainty on Türkiye's export and import markets. To fill this gap in the literature, we attempted to scrutinize the relationship between the world WTU and Türkiye's foreign trade market during 1998: Q1-2021: Q4.

3. DATA, MODEL AND METHODOLOGY

In this paper, we utilize quarterly data to examine the cointegration relationship between export (import) (% GDP) (hereafter, *EX* and *IM* in order), the World Trade Uncertainty (WTU), the real effective exchange rate index (*ER*), the Global Real Economic Activity (*GREA*), and per capita real GDP (after, *GDPpc*) from 1998: Q1 to 2021: Q4. The series are taken from the IMF, the World Uncertainty Index of Ahir et al. (2018), the CBRT, the Bank of Dallas, and the IMF databases, respectively. This paper uses the WTU index constructed by Ahir et al. (2018). This index measures WTU starting from 1996. The WTU was constructed with a total of 143 countries on a quarterly basis by counting the occurrence of trade-related keywords in the Economist Intelligence Unit country reports. Even though the Global Economic Policy Uncertainty (GEPU) set up by Baker et al. (2016) is used to measure economic policy uncertainty, we used the WTU index. The GEPU Index is a GDP-weighted average of 21 national economic policy uncertainty indices and these national indices measure the relative frequency of own-country newspaper articles including a triad of economic (E), policy (P), and uncertainty (U) words. That is to say, the GEPU index reflects the uncertainty of 21 nations and is based on their newspapers. Thus, we preferred to use the WTU index, which reflects trade uncertainty globally and is based on country reports. All the series are seasonally adjusted through the Census X-12 method before the analyses. Besides, they are transformed into natural logarithm forms except for the WTU index and the GREA index since they include zero and/or negative values.

This study investigates the effect of the WTU on export and import in the Turkish economy through the following two main models:

$$\textbf{Model 1.}\ LNEX = f(WTU, LNER, GREA, LNGDPpc)$$

$$\textbf{Model 2.}\ LNIM = f(WTU, LNER, GREA, LNGDPpc)$$

We set up these two models based on the export supply function and the import demand function. There can be additional control variables included in these models; however, we chose four common variables that affect the dependent variables together. It is widely known that one of the main problems of the Turkish economy is the trade deficit; it exists when imports exceed export in a country (*Trade Deficit = Export < Import*). Thus, it can be rational to investigate the factors affecting these two trade variables for the economic well-being of Türkiye.

The ARDL bounds test is a seminal work introduced by Pesaran et al. (2001: 289-326). The main advantage of this methodology is that it allows one to examine the cointegration relationship between variables where regressors can be I(0) or I(1). This methodology can be examined through the following models:

$$\Delta LNEX_t = a_0 + a_1 t + \sum_{i=1}^{p_1} b_i \, \Delta LNEX_{t-i} + \sum_{i=0}^{p_2} c_i \, \Delta WTU_{t-i} + \sum_{i=0}^{p_3} d_i \, \Delta LNER_{t-i} + \sum_{i=0}^{p_4} e_i \, \Delta GREA_{t-i} + \sum_{i=0}^{p_5} f_i \, \Delta LNGDPpc_{t-i} + \delta_1 LNEX_{t-1} + \delta_2 WTU_{t-1} + \delta_3 LNER_{t-1} + \delta_4 GREA_{t-1} + \delta_5 LNGDPpc_{t-1} + u_t$$

where Δ is the first difference operator, while p_1,p_2,p_3,p_4, and p_5 are the lag lengths. In addition, a_0 is the unrestricted intercept, t is the unrestricted trend, and u_t is the error term.

$$\Delta LNIM_t = \alpha_0 + \sum_{i=1}^{r_1} k_i \, \Delta LNIM_{t-i} + \sum_{i=0}^{r_2} l_i \, \Delta WTU_{t-i} + \sum_{i=0}^{r_3} m_i \, \Delta LNER_{t-i} + \sum_{i=0}^{r_4} n_i \, \Delta GREA_{t-i} + \sum_{i=0}^{r_5} o_i \, \Delta LNGDPpc_{t-i} + \theta_1 LNIM_{t-1} + \theta_2 WTU_{t-1} + \theta_3 LNER_{t-1} + \theta_4 GREA_{t-1} + \theta_5 LNGDPpc_{t-1} + \epsilon_t$$

where Δ is the first difference operator, while r_1,r_2,r_3,r_4, and r_5 are the lag lengths. Besides, α_0 is the unrestricted intercept and ϵ_t is the error term.

The cointegration relationship between variables can be tested by comparing the null of no cointegration against the alternative one (Bahmani-Oskooee and Nasir, 2004: 483-488; Nazlioglu et al., 2014: 315-324). The *F statistics* are compared with the lower and upper critical values of Narayan's (2005: 1979-1990) work. The null is rejected if the *F statistics* is higher than

the upper bound. It means that these variables move together in the long run. In this study, we use Narayan's (2005: 1979-1990) critical values instead of Pesaran et al.'s (2001: 289-326) because his critical values are generated primarily for small sample sizes like ours.

4. EMPIRICAL RESULTS AND DISCUSSION

This paper aims to investigate the effects of the WTU on export and import in the Turkish economy from 1998:Q1 to 2021:Q4. For this purpose, this paper utilized the ARDL bounds test and the error-correction model. Before these analyses, it is required to determine the unit root properties of the variables.

Table 1 presents the empirical findings of the ADF and PP test results for 'with constant and trend model' in addition to 'with constant model'. The empirical results suggest that the stationarity properties of the series differ across the unit root tests utilized and/or the models chosen; however, the common results support that there is not any I(2) data in our analysis. In detail, the dependent variable is I(1), while the independent variables are a mixture of I(0) and I(1). Thus, these series satisfy the requirements for applying the ARDL bounds test.

Table 1: Unit Root Tests Results

Variables	ADF Test		PP Test	
	CM	CTM	CM	CTM
LNEX	-1.433	-2.843	-1.477	-2.843
LNIM	-0.938	-3.562**	-0.976	-3.377**
WTU	-3.324**	-3.530**	-2.885*	-3.251*
LNER	-0.304	-1.378	1.495	0.239
GREA	-2.360	-2.417	-2.221	-2.269
LNGDPpc	0.399	-3.657**	0.270	-3.609**
ΔLNEX	-9.674***	-9.699***	-9.518***	-9.524***
ΔLNIM	-9.845***	-9.816***	-9.781***	-9.759***
ΔWTU	—	—	—	—
ΔLNER	-11.082***	-12.905***	-11.054***	-7.505***
ΔGREA	-9.249***	-9.198***	-9.248***	-9.197***
ΔLNGDPpc	-11.313***	-11.344***	-11.326***	-11.358***

Note: *** is 1%, ** is 5%, and * is 10% significance level. CM refers to the constant model, while CTM denotes the constant & trend model.

Table 2 exhibits the ARDL bounds test results for both Model 1 and Model 2. The cointegration test results indicate that these series have a long-run relationship for both models. So, their F statistics exceed the critical values of the upper bound of Narayan (2005: 1979-1990). Besides, these estimated models pass the autocorrelation, heteroskedasticity, and normality tests. Models also pass the CUSUM and the CUSUMQ tests (see Figure 3). Therefore, the long-run coefficients of the models can be estimated in the next step.

Table 2: ARDL Bounds Test and Diagnostic Test Results

Model 1			**Model 2**		
F statistics: 8.778	**I(0)**	**I(1)**	***F statistics:*** 6.608	**I(0)**	**I(1)**
10%	3.160	4.230	10%	2.548	3.644
5%	3.678	4.840	5%	3.010	4.216
1%	4.890	6.164	1%	4.096	5.512
Diagnostic Test Results			**Diagnostic Test Results**		
Tests	**Test statistics**	**p value**	**Tests**	**Test statistics**	**p value**
BG Test	1.397	0.844	**BG Test**	7.102	0.130
WH Test	69.271	0.304	**WH**	66.845	0.152
Normality Test	1.623	0.444	**Normality Test**	0.0345	0.982

Note: BG refers to the Breusch-Godfrey Serial Correlation LM Test, while WH denotes the White Heteroskedasticity Test.

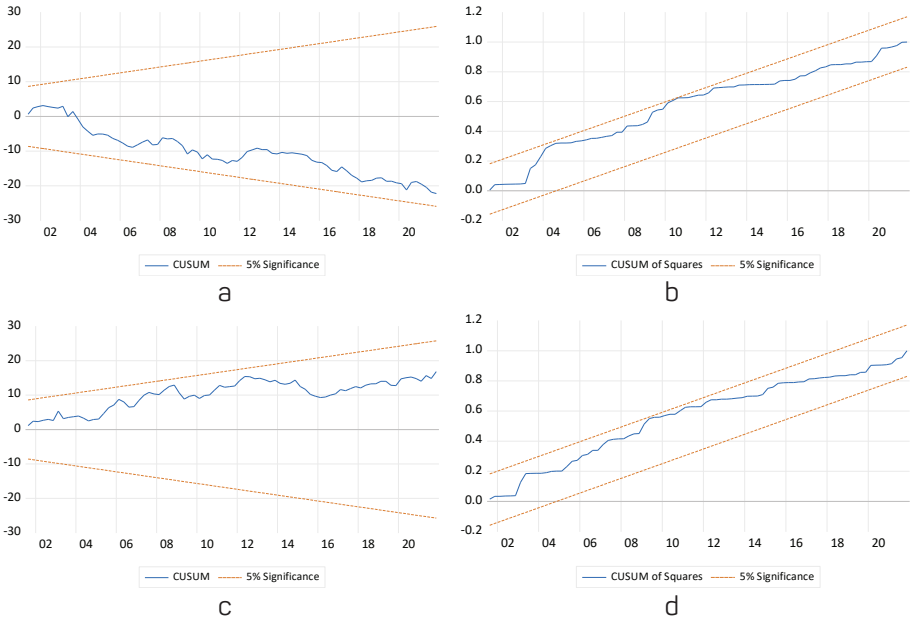


Figure 3: CUSUM and CUSUMQ Graphs for Model 1 (a, b) and Model 2 (c, d)

The long-run estimation results for both the export and import models are displayed in Table 3. The empirical findings show that, in Model 1, a one-unit increase in the WTU causes a 0.145% (-0.00145*100) decline in export in the long run. Besides, a one-unit rise in the GREA increases export by 0.053% (0.00053*100) in the long run. The estimated coefficients of these two variables have to be multiplied by 100 to get a percentage change because they are log-linear models. The signs of these parameters are consistent with the prior expectations. It is expected that a rise in trade uncertainty will cause a decline in export because the trade volume in the world can be negatively affected by these uncertainties, and foreign consumers follow a cautious consumption behavior. Besides, an increase in real global activity refers to a rise in foreign consumers' income; therefore, they can demand more goods and services from Türkiye. The export of the Turkish economy increases slightly with this new demand. Moreover, we find that the appreciation of the domestic currency leads to a decrease in export because Turkish goods and services become more expensive to foreigners. In technical terms, a 1% increase in the real effective exchange rate decreases Turkish export by 0.632%. Lastly, it is found that an increase in per capita GDP does not increase export in the long run.

In Model 2, a one-unit rise in the GREA increases imports by 0.061% (0.00061*100) in the long run. We can assume a positive relationship between global and domestic economic activity, excluding domestic shocks. Therefore, one can say that this finding is consistent with expectations. In addition, a 1% increase in the per capita GDP in Türkiye increases imports by 0.370%. This finding can be attributed to the fact that the demand for imported goods rises when the income level of the citizens advances. Besides, we could not find any statistically significant effect of the WTU and the real effective exchange rate index on imports in the long run for the Turkish economy. Indeed, it was expected that an appreciation of the Turkish Lira would increase the import of foreign goods and services.

Table 3: Long-Run Coefficients of the Models

	Variables	*Coefficient*	*Std. Error*	*t-statistics*
Model 1	**WTU**	-0.0014**	0.0007	-2.0226
	LNER	-0.6324***	0.0959	-6.5916
	GREA	0.0005***	0.0001	2.7091
	LNGDPpc	-0.2865	0.2960	-0.9680
Model 2	**WTU**	0.0007	0.0006	1.1925
	LNER	-0.0807	0.0983	-0.8212
	GREA	0.0006***	0.0002	2.8305
	LNGDPpc	0.3703***	0.0756	4.8925

Note: *** is 1% and ** is 5% significance level.

After that, the error-correction forms of the models are set up, and their results are introduced in Table 4. The error-correction terms of the models are estimated at -0.379 for Model 1 and -0.317 for Model 2, respectively. These findings reveal that any deviation from the long-run equilibrium between export (import), the WTU, the real effective exchange rate, the GREA, and per capita GDP is corrected about the next three quarters, approximately. So, we can say that the error-correction mechanism works for both models. It is also confirmed that the coefficients of the parameters are in line with expectations only for the real effective exchange rate for Model 1 and per capita GDP for Model 2 in the short run.

Table 4: Error-Correction Forms

Model 1				Model 2			
Variables	*Coefficient*	*Std. Error*	*t-statistics*	*Variables*	*Coefficient*	*Std. Error*	*t-statistics*
ECT	-0.3790***	0.0558	-6.7829	**ECT**	-0.3178***	0.0540	-5.8866
CONSTANT	1.388***	0.2029	6.844	**CONSTANT**	-1.3006***	0.2201	-5.9072
ΔWTU	0.0007***	0.0002	2.8110	**ΔLNER**	-0.3498***	0.0564	-6.2018
ΔWTU(-1)	0.0016***	0.0002	5.4575	**ΔLNER(-1)**	-0.2554***	0.0648	-3.9390
ΔLNER	-0.5722***	0.0633	-9.0450	**ΔLNER(-2)**	-0.1502**	0.0661	-2.2728
ΔLNER(-1)	-0.2727***	0.0695	-3.9230	**ΔLNGDPpc**	0.9100***	0.1501	6.0614
				ΔLNGDPpc(-1)	0.5627***	0.1534	3.6665

Note: *** is 1% significance level. The ECT refers to the error-correction term.

Our empirical evidence demonstrates a statistically significant and negative relationship between WTU and export, whereas a statistically insignificant and positive association exists between WTU and imports in the long run. Our findings for the relationship between WTU and export are consistent with the studies of Aslan and Acikgoz (2021), Han et al. (2016: 4907-4921), Tam (2018: 3718-3734), and Wei (2019: 20-31), meaning that increased WTU leads to a reduction Türkiye's export. Moreover, our results for the association between WTU and import align with the findings of Constantinescu et al. (2020: 285-308), who found a statistically insignificant relationship between uncertainty and global value chains. Beyond that, Sharma and Paramati (2021: 139-149) found that an increase in economic uncertainty causes an increase in imports in the short run. In addition, Wei (2019: 20-31) provided results for the negative but statistically insignificant relationship between uncertainty and real imports. Our finding for the statistically insignificant relationship between WTU and imports is in line with the findings of Wei (2019: 20-31). However, our results for imports contradict the findings of Jaaskela and Mathews (2015: 39-46) and Tam (2018: 3718-3734), who found that the impact of uncertainty is negative on imports.

Overall, shocks related to global trade uncertainty appear to be crucial in explaining variations in Türkiye's real export during the analyzed period. These findings suggest that the rapid decline in Türkiye's export volume between 1998: Q1 and 2021: Q4 is closely tied to shocks to the level of trade uncertainty throughout the world. This study provided results showing that WTU has a statistically significant and negative effect on export, while WTU does not have a significant impact on imports, even though there is a cointegration relationship between imports, WTU, LNER, GREA, and LNGDPpc.

Additionally, considering the control variables, an appreciation of the domestic currency in the Turkish economy causes a rise in export in the long run because Turkish goods and services become relatively cheaper for foreign consumers. Besides, the empirical results demonstrate that an increase in the GREA affects Turkish export positively. Since the rise in the economic well-being of foreign countries, they demanded more goods and services from Türkiye. Similarly, an advance in the per capita income in Türkiye causes an increase in the demand for foreign goods and services in the long run. In addition, an increase in the GREA affects Turkish import positively but slightly.

This result can be attributed to the fact that an increase in real economic activity in the world leads to an increase in goods and services produced in the world (through a shift in the supply curve to the right). This causes a decline in the price of some goods and services, and then the Turkish people can buy more goods and services from abroad.

In the short run, we can say that the estimated parameters are in line with the expectations for the real effective exchange rate for the export model and per capita GDP for the import model. The inconsistencies with the long-run results can emerge from the fact that the short-term reactions of the trade variables can be affected by binding long-term trade contracts. Therefore, a shock in the macroeconomic variables may not affect export or import in the short run, immediately. The spillover effects of macroeconomic shocks may take time.

5. CONCLUSION

This study was set out to explore the effect of the WTU on both Turkish export and import for the periods 1998: Q1 and 2021: Q4. In addition, the real effective exchange rate, the GREA, and the per capita real GDP were utilized as control variables. To find out the long-run relationship between variables, we conducted the ARDL bounds test. In addition, the error-correction forms of the models were constructed to examine the short-term dynamics. The empirical results of this study revealed that there are cointegration linkages between the constructed models. Moreover, our results stated that the error-correction mechanism works for both models.

Taken together, the empirical results show that Turkish export is negatively affected by an increase in the WTU, especially in the long run. In the case of high uncertainty, economic agents, especially risk-averse ones, may prefer cautious consumption behavior. In this case, they tend to save more than compared to the good times. Because of this, the demand for Turkish goods and services from abroad decreases, and then, the country then exports less abroad due to the low demand. Besides, the empirical results suggest that Turkish import is not affected by the WTU significantly. Since the Turkish economy is dependent on imported goods, especially for energy sources (natural gas and oil), high-tech goods, and goods that have high value addition, it is necessary to buy these goods from abroad even in times of high uncertainty.

The empirical findings of this study may direct policymakers to produce and implement more efficient foreign trade policies, considering both the export and import sides. First, they need to increase the number of trade partners since some regions were harshly affected by the trade wars between the US and China, such as Western Hemisphere, Asia and the Pacific, and Europe. Contrarily, the effects of these trade developments remained low in the Middle Eastern and Central Asian countries, in addition to the African countries. Therefore, developing mutual trade ties between these countries may mitigate the detrimental effects of WTU on Turkish export.

Future studies on the current topic at a disaggregated level are recommended. Researchers may be interested in the effects of WTU on the sectoral export and import volumes of emerging economies. In addition, panel data techniques can be utilized to study the relationship between the aforementioned indicators at a regional level.

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DÜNYA TİCARET BELİRSİZLİĞİNİN ULUSLARARASI TİCARETE ETKİSİ: TÜRKİYE EKONOMİSİ ÖRNEĞİ

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Mert AKYÜZ

GENİŞLETİLMİŞ ÖZET

Uluslararası ticaret hareketleri, ekonomik krizler, döviz kuru oynaklıkları, doğal kaynak keşifleri, küreselleşme vb. gibi yerel ve küresel gelişmeler dahil olmak üzere birçok ekonomik olaydan etkilenebilmektedir. Bununla birlikte, ticaret belirsizliği bir ekonominin ticaret hacmini etkileyen bir diğer önemli faktördür. Dünyada son dönemde ABD-Çin Ticaret Savaşı ile birlikte ticaret belirsizliği artmış ve bu belirsizlik diğer gelişmiş ülkelere de sıçrayarak ticaret hacimlerini önemli bir biçimde etkilemiştir. İki ülke arasındaki ticari anlaşmazlıkların neticesinde oluşan olumsuz ekonomik hava, domino etkisiyle tüm dünyaya yayılmış ve Türkiye gibi ekonomisi dış ticarete bağımlı gelişmekte olan bir ekonomiyi de etkilemiştir.

Türkiye ekonomisi hem ihracata hem de ithalata önemli derecede bağlı bir ülkedir. Dünya bankası verilerine göre 1960'lı yılların başında ticaretin Türkiye ekonomisi içindeki ağırlığı (mal ve hizmet ithalatının ve ihracatının toplamının gayri safi yurt içi hasılaya oranı) %6 civarında iken, 2021 yılının sonuna gelindiğinde bu oran %70'lere çıkmıştır. Ticaret belirsizliği hakkındaki sınırlı ampirik yazın incelendiğinde, Türkiye ile ilgili çalışmaların daha çok borsa, ülke riski ve döviz kuru gibi alanlarda olduğu, ihracat ve ithalat üzerindeki etkisinin incelenmediği tespit edilmiştir. Bu sebeple Türkiye'nin dış ticaretinin dünyadaki ticari belirsizliklerden etkilenip etkilenmediği, etkileniyorsa bunun ne ölçüde olduğu araştırılması gereken önemli konulardan biridir.

Bu araştırma, Dünya Ticaret Belirsizliğinin 1998 yılının 1. çeyreğinden 2021 yılının 4. çeyreğine kadar olan dönem için Türkiye ekonomisinin hem ihracatı hem de ithalatı üzerindeki rolünü anlamaya ve açıklamaya çalışmaktadır. Bu amaç doğrultusunda, bu makale, değişkenler arasındaki uzun dönemli ilişkinin tespiti için ARDL sınır testi yaklaşımını kullanmaktadır. Çalışmanın ampirik sonuçları her iki model için de değişkenler arasında uzun dönemli bir ilişki olduğunu doğrulamaktadır. Diğer bir ifadeyle değişkenler uzun dönemde birlikte hareket etmektedirler.

Tahmin edilen uzun dönemli katsayılar incelendiğinde, Dünya Ticaret Belirsizliğindeki bir artışın Türkiye'nin ihracatını olumsuz yönde etkilediği tespit edilmiştir. Bu sonuç beklentilerle uyumluluk göstermektedir. Dünyadaki ticaret hacminin belirsizliklerden olumsuz etkilenmesi ve yabancı tüketicilerin ihtiyatlı bir tüketim davranışı izlemesi nedeniyle, ticaret belirsizliğindeki artışın Türkiye'nin ihracatında gerilemeye neden olduğu söylenebilmektedir. Diğer yandan, Dünya Ticaret Belirsizliğindeki bir değişimin Türkiye'nin ithalatı üzerinde istatistiksel olarak anlamlı bir etkisinin olmadığı sonucuna ulaşılmıştır. Bununla birlikte, Türkiye'nin ithalatının hem yurt içindeki hem de yurtdışındaki ekonomik gelişmelerden olumlu yönde etkilendiği tespit edilmiştir. Çalışmada uzun dönem katsayılarının tespit edilmesinden sonra her iki model için de hata düzeltme modeli kurulmuştur. Modellerin hata düzeltme terimleri ihracat modeli için -0.379, ithalat modeli için ise -0.317 olarak tahmin edilmiştir. Bu bulgular, değişkenler arasındaki uzun dönemli dengeden herhangi bir sapmanın, yaklaşık üç çeyrek sonra düzeldiğini ortaya koymaktadır.

Bu araştırmanın ampirik bulguları, politika yapıcıları dış ticaretin hem ihracat tarafını hem de ithalat tarafını dikkate alacak şekilde daha etkin ticaret politikaları üretmeye ve uygulamaya yönlendirebilir. Karar alıcıların, bu doğrultuda, ABD ve Çin arasındaki ticaret savaşının etkileri özellikle Batı Yarımkürede, Asya-Pasifik'te ve Avrupa'da daha sert bir şekilde hissedildiği için, dış ticaret ortaklarının sayısını artırması gerekmektedir. Diğer yandan, bu iki ülke arasındaki ekonomik ve siyasi gerilimin etkileri Afrika ülkelerinin yanı sıra Orta Doğu ve Orta Asya ülkelerinde nispeten düşük düzeyde kalmıştır. Bu nedenle, Türkiye'nin bu ülkelerle arasındaki karşılıklı ticaret bağlarını geliştirmesi, gelecekte meydana gelebilecek ticari belirsizlik ortamlarında, dış ticaretinin daha az etkilenmesine neden olabilir.