

The Impact of Economic Growth and External Debt on Turkey's Trade Openness in the Context of Global Accounting Integration

Fatih KOÇ¹
Sinan ÇİNAR²
Banu HAS³

Received: 03.01.2026, Accepted: 31.03.2026
DOI Number: 10.5281/zenodo.20563224

Abstract

In a period where globalization dynamics are becoming more prominent, countries' trade openness is largely shaped by external debt, economic growth, and the financial transparency promoted by international standards. This study examines the effects of external debt and economic growth on Türkiye's trade openness for the 1989–2019 period. The stationarity of the series is tested using the ADF approach, while long-run relationships are analyzed through the ARDL Bounds Test and the error-correction model. The findings show that external debt and economic growth increase trade openness in the long run, and short-run shocks converge to equilibrium at a rate of 21%. The study provides a strong contribution to the literature by offering an original assessment of trade openness dynamics within the context of financial transparency and global accounting integration.

Key words: Trade Openness, ARDL Analysis, Economic Growth, Global Accounting Integration

JEL Code: F43, C22, M41

1. Introduction

In today's global economy, the boundaries between international dynamics and domestic policies have become increasingly blurred. The interactions among key macroeconomic indicators such as economic growth, external debt, and trade openness are shaped not only by national policy choices but also by the broader process of global financial integration. These global mechanisms can play a decisive role in influencing countries' growth performance, debt levels, and their

¹Asst. Prof., Istanbul Okan University, Faculty of Business and Management Sciences, Department of Business Administration, Istanbul, fatih.koc@okan.edu.tr, <http://orcid.org/0000-0002-0333-7456>

² PhD, Independent Researcher, Izmir, sinancinar110@gmail.com, <http://orcid.org/0000-0002-2756-5875>.

³ Asst. Prof., Istanbul Okan University, Faculty of Business and Management Sciences, Department of Economics and Finance, Istanbul, banu.has@okan.edu.tr, <http://orcid.org/0000-0001-7693-8490>.
Corresponding author.

degree of trade openness. For developing economies like Türkiye, understanding these interactions—particularly how external debt and economic growth affect trade openness—requires a comprehensive and detailed examination of their interdependent relationships.

In the empirical literature on the Turkish economy, studies examining the impact of external debt on economic growth have produced mixed results. Gövdeli (2019) investigated the relationship between external debt stock and economic growth and found that external debt has a positive long-term effect on growth. In contrast, a more recent study by Yavuz and Polat (2024) revealed that the impact of external debt on economic growth is significant and negative, while the relationship between trade openness and economic growth is positive and strong. These divergent findings in the literature reflect a heterogeneous pattern, largely influenced by differences in analysis periods, selected variables, and methodological approaches. There are also studies that directly examine the relationship between trade openness and external debt in Türkiye. Bölükbaş (2016), using a cointegration analysis, identified a positive relationship between trade openness and external debt, showing that an increase in trade openness is accompanied by a rise in external debt stock.

Global accounting integration serves as a crucial mechanism for achieving both economic growth and development. This integration process enhances the transparency, consistency, and comparability of macroeconomic indicators, thereby strengthening the alignment of national economies within the global system. Moreover, global accounting integration facilitates more efficient capital flows, which can promote investment by improving the allocation of financial resources. For developing countries such as Türkiye, these factors are of particular importance for understanding the complex relationship among external borrowing, trade openness, and indirectly, economic growth. In today's world, where globalization dynamics are becoming increasingly intense, countries' levels of trade openness are largely evaluated within the framework of their external debt stock and economic growth performance. This process is not limited to the expansion of trade volume; it also encompasses financial harmonization through the adoption of global accounting standards that enhance transparency and comparability. In economies such as Türkiye, which have embraced sustainable development goals, examining the effects of external borrowing and economic growth on trade openness is crucial for ensuring long-term fiscal and economic stability. Overall, the literature indicates that the interactions among external debt, economic growth, and trade openness vary across analysis periods and methodological approaches. However, studies addressing these relationships within the context of global accounting integration remain limited. Therefore, investigating these interactions in the case of the Turkish economy holds significant importance.

The main objective of this study is to analyze the effects of external debt and economic growth on the level of trade openness in the Turkish economy and to identify the key factors shaping trade openness dynamics. The analysis focuses on the period 1989–2019, characterized by financial fluctuations and the process of

global accounting integration facilitated by the adoption of the International Financial Reporting Standards (IFRS), which contributed to greater financial transparency. As the first study in Türkiye to examine the effects of economic growth and external debt on trade openness within the framework of financial transparency under global accounting integration, both on a periodic basis and within the scope of the ARDL approach, this research provides an original and comprehensive contribution to the literature. Within this framework, the study is structured as follows: following the introduction, the second section presents a literature review covering recent research. The third section introduces the econometric methodology, followed by the data and model description. The fourth section discusses empirical findings with both statistical and economic interpretations. Finally, the conclusion and discussion section provides an overall evaluation of the results and offers relevant policy implications.

2. Literature Review

The globalization process has made countries increasingly integrated economically, socially, and politically, while the relationships among foreign trade, external debt, and economic growth have become more complex. For developing countries such as Türkiye, outward-oriented growth strategies are considered one of the fundamental drivers of development. These strategies, while promoting economic growth through trade liberalization and foreign capital inflows, may also lead to vulnerabilities such as an increase in external debt stock. Managing these dynamics within a transparent and comparable financial reporting framework brings the notion of global accounting integration—specifically, compliance with the International Financial Reporting Standards (IFRS)—to the forefront as a crucial component of this equation. This literature review aims to examine the multifaceted relationships among economic growth, external debt, and trade openness in Türkiye within the context of global accounting integration, drawing on insights from existing academic studies.

The Relationship Between Trade Openness and Economic Growth

Although the effect of trade openness on economic growth is one of the most extensively examined topics in the literature, there is no clear consensus on the direction or strength of this relationship. A group of studies argue that, in parallel with the liberalization policies implemented after the 1980s, trade openness has positively influenced Türkiye's economic growth. For instance, Yağış (2024) and Tatar et al. (2022) found that trade openness exerts a positive impact on economic growth. Similarly, Kadiroğlu and Ayhan (2025) and Ojaghlou and Tercan (2024) also reported that increased trade openness contributes to higher economic growth. Khalid (2016), on the other hand, noted that this positive effect is statistically significant only in the short run, becoming insignificant in the long run.

Conversely, several studies adopt a more cautious approach or present conflicting evidence. In an alternative analysis, Kadiroğlu and Ayhan (2025)

concluded that while trade openness supports growth, the overall economic globalization index negatively affects economic growth in the long term. This finding suggests that globalization may increase economic vulnerabilities if not accompanied by structural reforms. A clearer contrasting result is provided by Çelik (2025), who identified a negative and statistically insignificant long-term relationship between trade openness and economic growth. These differing outcomes indicate that the impact of trade openness on economic growth may vary depending on other factors such as capital accumulation, employment, and the quality of macroeconomic policies (Çelik, 2025; Yenisu, 2019).

The Effect of External Debt on Economic Growth

For developing countries, external debt serves as an important instrument to bridge the financing gap required for investment and production when domestic savings are insufficient (Arslanhan and Çondur, 2022). However, the impact of external borrowing on economic growth varies depending on several factors, such as the maturity structure of debt, its composition between public and private sectors, and whether the debt level surpasses a certain threshold.

A considerable body of literature suggests that an increase in external debt stock negatively affects economic growth, particularly in the long run. İlder and Günsoy (2024) and İlder (2023) found that both public and private external debt stocks exert a negative influence on economic growth in Türkiye. Yiğitbaş (2025) provided a more dynamic perspective, noting that while external debt may have a positive short-term impact on economic growth, its effect turns negative over time. This finding suggests that beyond a certain threshold, external borrowing begins to harm economic growth. Similarly, Atasert and Utkulu (2025) explored the existence of a threshold level in Türkiye, beyond which external debt accumulation leads to excessive debt and weaker economic growth performance. On the other hand, some studies emphasize the economic growth-enhancing role of external debt. Taş and Ekmekçiler (2022) reported that both short- and long-term external debt positively and significantly influence GDP, consumption, and investment in Türkiye, with the effect of long-term debt being more pronounced. Likewise, Uslu (2021) and Gövdeli (2019) concluded that external debt contributes positively to economic growth.

These differing results highlight that the overall impact of external borrowing largely depends on how the borrowed funds are utilized and how effectively debt is managed. Productive use of external resources, efficient debt management strategies, and maintaining sustainable debt levels are critical in ensuring that external debt supports rather than constrains economic growth.

The Relationship Between Trade Openness and External Debt

The relationship between trade openness and external debt stock is important for understanding how international trade affects financing needs and capital flows. Empirical studies indicate that trade openness in Türkiye has a

positive effect on the external debt stock. Ayvaz Kızılgöl and İpek (2014) found that increased trade openness raises external debt both in the short and long term, which can be explained by the growing need for foreign financing, particularly to cover import expenditures. Similarly, an analysis by Kadiroğlu (2024) confirms that trade openness is one of the key factors contributing to the rise in Türkiye's external debt stock. These findings suggest that outward-oriented policies may increase a country's demand for external financing and, consequently, its overall level of indebtedness.

The Role of Global Accounting Integration

The adoption of the International Financial Reporting Standards (IFRS) has emerged as a necessary step for integration into global capital markets. The primary objective of IFRS is to create a common accounting language by enhancing the comparability, transparency, and reliability of financial statements (Sabuncu, 2017; Tetik and Yelgen, 2014). In Türkiye, the Public Oversight, Accounting, and Auditing Standards Authority (KGK) has issued Turkish Accounting Standards (TMS) aligned with IFRS, and the transition process has been largely completed, particularly for publicly listed companies (Gielen, 2007; Arsoy and Sipahi, 2007).

This integration goes beyond technical accounting regulation and has significant economic implications. IFRS compliance has been shown to improve countries' global competitiveness, corporate quality, and institutional infrastructure (Eryılmaz and Koçak, 2024). In developing economies, adopting IFRS can act as a catalyst for economic growth (Owusu et al., 2022). One of the main mechanisms behind this effect is the reduction of capital costs: enhanced transparency and comparability, lower investment risks, reducing the cost of capital, and thereby positively influence investment and economic growth (Ghouma et al., 2024). Thus, global accounting integration represents a crucial contextual factor that helps Türkiye manage its economic relations with the rest of the world—through trade and borrowing—on a more stable basis, increases its potential to attract foreign capital, and strengthens financial stability.

A review of the literature reveals that the relationships among trade openness, external debt, and economic growth in Türkiye are complex and multidimensional. While the impact of trade openness on economic growth remains ambiguous, studies have shown that it can be positive, negative, or statistically insignificant. Similarly, the effect of external debt on economic growth presents a dilemma: external debt can support economic growth in the short term or when used productively but may hinder economic growth in the long term or beyond certain threshold levels. Strong evidence also indicates that trade openness tends to increase the external debt stock. At the center of this network of relationships lies global accounting integration. Compliance with IFRS enhances transparency and international comparability in financial reporting, lowers capital costs, and increases the country's global competitiveness. This provides a critical framework for Türkiye to manage trade and external borrowing more effectively and to pursue

a sustainable economic growth path. Future research could make significant contributions by directly modeling how IFRS compliance affects the threshold at which external debt influences economic growth or the vulnerabilities introduced by trade openness.

A review of the literature reveals that the relationships among trade openness, external debt, and economic growth have been extensively examined. However, no study has addressed these relationships in Türkiye on a periodic basis within the context of global accounting integration. Therefore, this study fills a significant gap by evaluating the relevant variables in parallel with Türkiye's IFRS transition process and provides a comprehensive contribution to the literature.

3. Methodology

The Autoregressive Distributed Lag (ARDL) method applied in this study is a widely used and effective econometric technique for examining cointegration relationships in time series analysis. Developed by Pesaran, Shin, and Smith (2001), the ARDL model has the capacity to estimate the long-run dynamics among variables. This approach is particularly preferred for testing the existence of cointegration and reliably estimating long-run coefficients. Compared to traditional time series models, the ARDL approach offers several advantages, which have contributed to its widespread use in modern econometric analyses. The model incorporates lagged values of both dependent and independent variables. Including past values allows for the estimation of long-term relationships between variables. One of the main strengths of the ARDL model is its ability to optimize lag lengths separately for the dependent and independent variables. This flexibility enables the model to adapt to different time series structures, enhancing its applicability across a wide range of economic analyses. Overall, the ARDL method provides a robust framework for investigating both short- and long-term dynamics within economic time series data.

Mathematically, an ARDL (p, q) model can be expressed as in Equation (1):

$$Y_t = \alpha_0 + \sum_{i=1}^p \beta_i Y_{t-i} + \sum_{j=0}^q \delta_j X_{t-j} + \varepsilon_t \quad (1)$$

In the equation:

- Y_t : Dependent variable,
- X_{t-j} : Lagged values of the independent variable,
- p : The lag length of the dependent variable,
- q : The lag length of the independent variable,
- ε_t : Error term.

This notation can be extended to allow separate lag lengths for each independent variable (q_1, q_2, q_k) depending on the number of variables. This structure enables the ARDL model to include lagged values of both dependent and

independent variables in the analysis, thereby allowing for the estimation of long-run equilibrium relationships.

One of the main advantages of the ARDL model is its flexibility regarding the stationarity properties of the series. The ARDL approach can be applied when the series are either $I(0)$ (stationary) or $I(1)$ (stationary after first differencing). This feature allows for testing cointegration even among series with different levels of integration. In contrast, traditional cointegration tests such as Johansen or Engle-Granger require all series to be integrated of the same order. Another significant advantage of the ARDL model is its ability to produce reliable results with small sample sizes. While traditional cointegration tests generally perform better with larger datasets, the ARDL model can provide consistent estimates even with limited data, offering practical benefits for researchers working with small samples. Additionally, the ARDL approach allows for the simultaneous estimation of short-run and long-run coefficients. This enables the model to capture not only long-term equilibrium relationships but also short-term dynamics, providing a more comprehensive analysis. Modeling both effects at the same time offers important insights into how an independent variable influences the dependent variable in both the short and long term.

One of the main applications of the ARDL model is the bounds testing approach. This test is used to determine whether a cointegration relationship exists between variables by comparing the F-statistics obtained from the ARDL model with the critical values provided by Pesaran et al. (2001). The critical values consist of two bounds: the lower bound for $I(0)$ series and the upper bound for $I(1)$ series. If the calculated F-statistics exceeds the upper bound, a cointegration relationship is confirmed. If the F-statistics falls below the lower bound, no cointegration exists. When the F-statistic lies between the two bounds, the result is inconclusive, and additional testing is required. The bounds test thus determines whether a long-run equilibrium relationship exists among the variables. If cointegration is detected, the ARDL model is used to estimate the long-run coefficients of this relationship. If no cointegration is found, the analysis focuses on short-run dynamics.

Once a long-run relationship is confirmed using the ARDL model, an Error Correction Model (ECM) can be applied to examine short-run dynamics (Engle and Granger, 1987). The ECM based on the ARDL framework reveals the speed at which deviations from the long-run equilibrium are corrected over time. In this context, the error correction coefficient must be negative and statistically significant. This coefficient indicates the system's responsiveness to shocks and the rate at which it returns to equilibrium. Accordingly, the short-term impacts of shocks on the long-run balance can be quantitatively assessed, allowing for a deeper understanding of adjustment mechanisms within the economy.

In line with this approach, the study employed the ARDL Bounds Testing method to determine the long-run relationships among the variables. Within this framework, cointegration relationships were analyzed, and long-run interactions

were examined through the corresponding coefficients. Short-run dynamics, on the other hand, were assessed using the Error Correction Model (ECM) (Engle and Granger, 1987).

In the period 1989–2019, global integration and financial fluctuations were the main determinants of the Turkish economy, whereas during the COVID-19 period, shocks primarily stemmed from the global health crisis and supply chain disruptions. In the context of this study, only the pre-COVID period is considered, with global integration and financial volatility forming the underlying framework. Therefore, health-related shocks and supply-side shocks during the COVID period are not the focus. This study examines the 1989–2019 period, in which global accounting integration—strengthened through the adoption of International Financial Reporting Standards (IFRS) to enhance financial transparency—and financial fluctuations were the primary determinants.

In this study, the degree of trade openness (RATIO) serves as the dependent variable, while real gross domestic product growth (GROWTH) and the external debt ratio (EXT) function as the independent variables. The trade openness ratio is defined as $(\text{Exports} + \text{Imports}) / \text{GDP} \times 100$. Within the econometric framework, real economic growth and the external debt ratio are identified as the primary determinants of trade openness in the context of Türkiye's macroeconomic dynamics for the period 1989–2019. Real economic growth supports trade openness by stimulating both exports and imports, whereas the external debt ratio enhances trade openness through import financing and external debt sustainability mechanisms. Given that the study covers a 31-year period, only these two core explanatory variables are included to avoid overparameterization and to ensure statistical reliability and interpretability. This parsimonious modeling strategy provides a focused representation of the fundamental drivers of Türkiye's trade openness while preserving explanatory strength. All data were extracted from the World Bank database, and the econometric analysis was conducted using the EViews 12 statistical software package. The dataset contains no missing observations; therefore, a balanced time series analysis is applied.

The econometric model used in this study is presented in Equation (2):

$$\text{RATIO}_t = \beta_0 + \beta_1 \text{GROWTH}_t + \beta_2 \text{EXT}_t + \varepsilon_t \quad (2)$$

In the econometric model, β_0 represents the intercept term, while β_1 ve β_2 are the slope coefficients t denotes the time dimension, and ε_t represents the error term.

4. Findings

Unit root tests hold critical importance in econometric analyses. By conducting these tests, a general assessment of the variables is made, and the appropriate econometric techniques are selected based on their stationarity properties. This process helps prevent spurious regression and ensures that the results are consistent and reliable. Accordingly, the unit root test results for the

variables, based on the Augmented Dickey-Fuller (ADF) test (Said and Dickey, 1984), are presented in Table 1.

Table 1. Augmented Dickey-Fuller (ADF) Unit Root Test Results

Variables	I(0)		I(1)	
	t-statistic	probability	t-statistic	probability
RATIO	-1.421604	0.5585	-3.824137	0.0008***
GROWTH	-5.920637	0.0000***		
EXT	-1.667023	0.4371	-5.264340	0.0002***

Note: *** denotes significance at the 1% level, ** at 5%, and * at 10%.

According to Table 1, the trade openness variable (RATIO) becomes stationary at the first difference at the 1% significance level. The real economic growth variable (GROWTH) is stationary at level at the 1% significance level, whereas the external debt variable (EXT) becomes stationary at the first difference at the 1% significance level. These findings show that the variables exhibit different stationarity properties. Therefore, the study employs the ARDL method, which is appropriate for models that include variables achieving stationarity at different levels (Pesaran et al., 2001).

This study determines the appropriate lag length as a critical step in the ARDL model. Different lag combinations are tested, and the model in Table 2 is selected because it shows significant coefficients and the lowest Hannan-Quinn Information Criterion (HQ) value (Hannan and Quinn, 1979).

Table 2. Lag Length Selection and Model Choice Based on Information Criteria

Dependent Variable : RATIO				
Method: ARDL				
Maximum dependent lags: 4 (Automatic selection)				
Model selection method: Hannan-Quinn Info Criteria (HQ)				
Dynamic regressors (4 lags, automatic): EXT GROWTH				
Fixed regressors: C				
Number of models evaluated: 100				
Selected Model: ARDL(1, 1, 0)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RATIO(-1)	0.786929	0.090129	8.731118	0.0000***
EXT	0.008416	0.001894	4.442570	0.0002***
EXT(-1)	-0.005408	0.001812	-2.985363	0.0063***
GROWTH	0.006749	0.002025	3.332951	0.0027***
C	-0.059029	0.040829	-1.445740	0.1607
R-squared	0.860713	Mean dependent var		0.465082
Adjusted R-squared	0.838427	S.D. dependent var		0.082464
S.E. of regression	0.033147	Akaike info criterion		-3.824698
Sum squared resid	0.027469	Schwarz criterion		-3.591165
Log likelihood	62.37047	Hannan-Quinn criter.		-3.749989
F-statistic	38.62143	Durbin-Watson stat		1.831878
Prob(F-statistic)	0.000000			

Note: Note: *** denotes significance at the 1% level, ** at 5%, and * at 10%. On the other hand, the intercept term in the model is statistically insignificant. This result arises because trade openness is primarily explained by variables such as real economic growth and external debt. The insignificance of the intercept suggests that, during the period under study, trade openness in Türkiye was largely shaped by economic growth dynamics and borrowing activities. An independent constant term does not produce a statistically meaningful effect. In this context, the econometric model highlights the key determinants of trade openness and, with its parsimonious structure, reflects a hypothesis-driven approach.

Following this step, Table 3 analyzes and confirms the existence of a cointegration relationship.

Table 3. ARDL Long Run Form and Bounds Test

Dependent Variable: D(RATIO)				
Selected Model: ARDL(1, 1, 0)				
Case 2: Restricted Constant and No Trend				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.059029	0.046655	-1.265223	0.2175
RATIO(-1)*	-0.213071	0.089433	-2.382456	0.0251**
EXT(-1)	0.003007	0.001081	2.782315	0.0101***
GROWTH**	0.006749	0.001719	3.925627	0.0006***
D(EXT)	0.008416	0.001465	5.743476	0.0000***
** Variable interpreted as $Z = Z(-1) + D(Z)$.				
Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXT	0.014114	0.004636	3.044335	0.0054***
GROWTH	0.031677	0.013334	2.375737	0.0255**
C	-0.277039	0.227568	-1.217390	0.2348
EC = RATIO - (0.0141*EXT + 0.0317*GROWTH - 0.2770)				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	6.251679	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Finite Sample: n=30				
Actual Sample Size	30			
		10%	2.915	3.695
		5%	3.538	4.428
		1%	5.155	6.265

Note: *** denotes significance at the 1% level, ** at 5%, and * at 10%. According to the test results, there is a cointegration relationship among the variables at the 5% significance level. The bounds test indicates the presence of a long-term relationship between the variables. The long-run coefficients are

presented in the Levels Equation section. As shown in the table, the long-run coefficients are statistically significant. A one-unit increase in the external debt ratio leads to a 0.0141-unit rise in the trade openness ratio. This finding suggests that external debt not only provides short-term financing but also promotes trade openness in Türkiye by supporting global accounting integration and foreign trade activities. On the other hand, a one-unit increase in the real economic growth rate results in a 0.0316-unit increase in the trade openness ratio. This result implies that real economic growth facilitates Türkiye's access to international markets within the framework of global accounting integration through sustainable trade and investment. The signs of the coefficients are consistent with economic expectations.

On the other hand, several tests are applied to examine the validity of the model. In econometric analysis, the error terms are expected to be free from serial correlation (autocorrelation). If autocorrelation is present, the reliability of the estimated coefficients decreases, leading to misleading statistical inferences. The Breusch–Godfrey Serial Correlation LM Test, which has the ability to detect autocorrelation even at higher orders (Breusch, 1978; Godfrey, 1978), is therefore employed in this study. Accordingly, the results of the BG autocorrelation test are presented in Table 4.

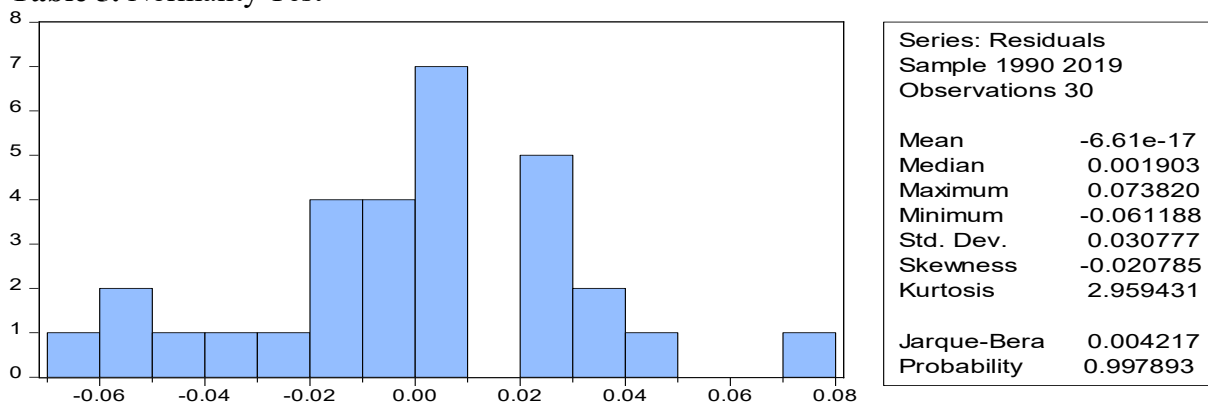
Table 4. Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.192207	Prob. F(2,23)	0.8264
Obs*R-squared	0.493167	Prob. Chi-Square(2)	0.7815

Note: *** denotes significance at the 1% level, ** at 5%, and * at 10%.

According to Table 4, the null hypothesis indicating no autocorrelation in the model cannot be rejected. Therefore, there is no evidence of serial dependence among the error terms. In addition, the normality of residuals is important for obtaining reliable coefficient estimates, especially in models covering relatively short time periods such as 31 years. When the residuals are not normally distributed, hypothesis tests and confidence intervals may yield unreliable results (Jarque and Bera, 1980). For this reason, the Jarque–Bera (JB) test is employed, and the results assessing the normality of the residuals are presented in Table 5.

Table 5. Normality Test



Examining the p-value of the JB test, the null hypothesis that the residuals are normally distributed cannot be rejected. This indicates that the model's error terms exhibit normality, in line with statistical assumptions. In addition, testing for heteroscedasticity is crucial, as the error terms may not have constant variance. If heteroscedasticity is present, the standard errors of the estimated coefficients and related statistics may be misleading. To detect heteroscedasticity, Breusch and Pagan (1979) developed a specific test, which is applied in this study. The results of the Breusch–Pagan (BP) heteroscedasticity test are presented in Table 6.

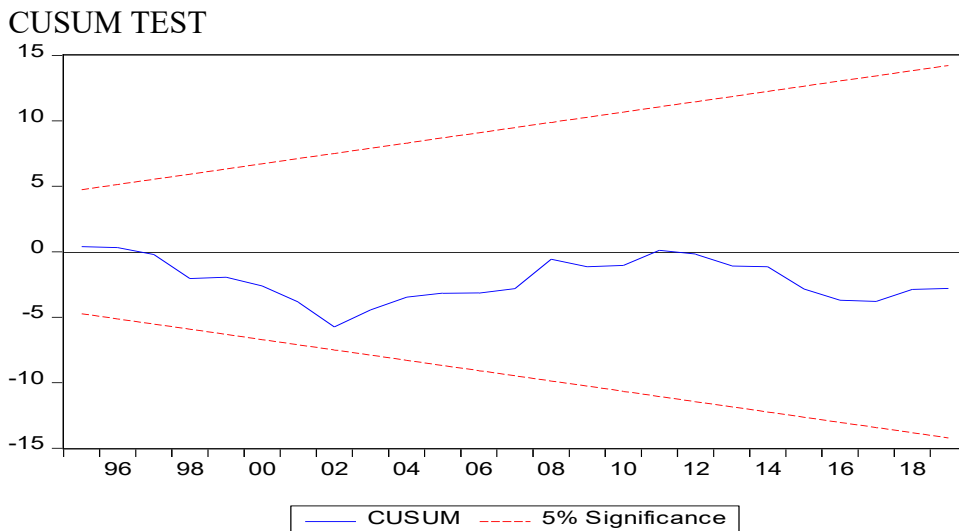
Table 6. Breusch Pagan Heteroscedasticity Test

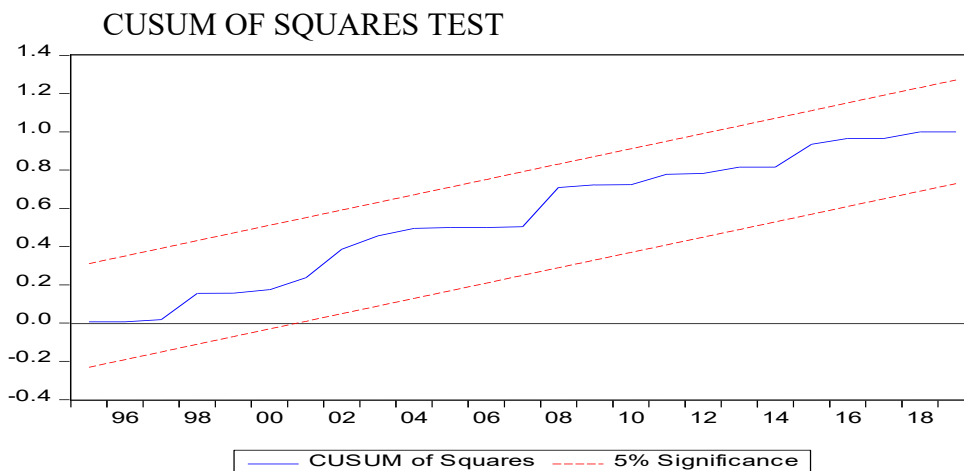
F-statistic	0.898001	Prob. F(4,25)	0.4799
Obs*R-squared	3.768891	Prob. Chi-Square(4)	0.4382
Scaled explained SS	2.564196	Prob. Chi-Square(4)	0.6332

Note: *** denotes significance at the 1% level, ** at 5%, and * at 10%.

Examining the p-value of the Breusch–Pagan (BP) test, the null hypothesis of homoscedasticity cannot be rejected, indicating that the model's error terms have constant variance. Furthermore, it is necessary to investigate whether the model's parameters remain stable over time, particularly whether the regression coefficients exhibit structural breaks. To assess structural stability, the study applies the CUSUM and CUSUM of squares (CUSUMSQ) tests developed by Brown, Durbin, and Evans (1975). The graphs for these tests are presented in Graph 1.

Graph 1. CUSUM Test Graphs





The model-related graphs remain within the critical boundaries, indicating no structural breaks in the regression coefficients. Accordingly, the parameters exhibit stability over time. In addition, Ramsey (1969) developed the RESET test to examine model specifications. The results of the test, assessing the validity of the model's assumed structure, are presented in Table 7.

Table 7. Model Specification Test

Ramsey RESET Test			
Specification: RATIO RATIO(-1) EXT EXT(-1) GROWTH C			
	Value	df	Probability
t-statistic	0.578466	24	0.5683
F-statistic	0.334623	(1, 24)	0.5683
F-test summary:			
	Sum of Sq.	df	Mean Squares
Test SSR	0.000378	1	0.000378
Restricted SSR	0.027469	25	0.001099
Unrestricted SSR	0.027091	24	0.001129

Note: *** denotes significance at the 1% level, ** at 5%, and * at 10%.

The results of the Ramsey RESET test indicate that the null hypothesis of correct model specification cannot be rejected. This suggests that there are no functional form errors, the model is structurally valid, and the included independent variables adequately explain the dependent variable. Following the examination of long-term relationships, short-term shock effects are analyzed using the Error Correction Model (ECM). The ECM-related indicators are presented in Table 8.

Table 8. Error Correction Model

ARDL Error Correction Regression				
Dependent Variable: D(RATIO)				
Selected Model: ARDL(1, 1, 0)				
Case 2: Restricted Constant and No Trend				
Sample: 1989 2019				
Included observations: 30				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
D(EXT)	0.008416	0.001268	6.638798	0.0000***
CointEq(-1)*	-0.213071	0.040261	-5.292213	0.0000***
R-squared	0.614542	Mean dependent var		0.009331
Adjusted R-squared	0.600776	S.D. dependent var		0.049571
S.E. of regression	0.031321	Akaike info criterion		-4.024698
Sum squared resid	0.027469	Schwarz criterion		-3.931285
Log likelihood	62.37047	Hannan-Quinn criter.		-3.994814
Durbin-Watson stat	1.831878			
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.251679	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Note: *** denotes significance at the 1% level, ** at 5%, and * at 10%. The absence of the GROWTH variable in this model suggests that, in the short run, real economic growth does not have a significant effect on trade openness. Consequently, it is assumed that most short-term shocks to trade openness originate from external debt or other temporary factors. In contrast, the long-run equation obtained from the ARDL Bounds Test indicates that both real economic growth and external debt are key determinants of the equilibrium level of trade openness. Accordingly, while short-term fluctuations in trade openness are largely temporary and driven by external debt, in the long run, both real economic growth and external debt jointly shape the trajectory of trade openness.

According to the short-term dynamics within the Error Correction Model (ECM), the error correction coefficient is statistically significant. As expected, the coefficient carries a negative sign and is significant at the 1% level. This indicates that short-term shocks converge toward equilibrium at a speed of 21%. The result also reflects Türkiye's flexibility in responding to short-term fluctuations and its capacity for recovery. Consequently, short-term deviations in trade openness are largely absorbable, indicating that sudden shocks temporarily affect the trade openness ratio without causing permanent structural disruptions.

5. Conclusions

In today's era of pronounced globalization dynamics, the interactions among external debt, economic growth, and trade openness are of critical

importance, particularly for developing countries striving to achieve sustainable development goals. This study examines the effects of external debt and economic growth on trade openness in the Turkish economy over the period 1989–2019. The period is selected to capture the impact of financial fluctuations and the accelerated process of global accounting integration, driven by the adoption of International Financial Reporting Standards (IFRS), which contributed to increased financial transparency. External shocks arising from the COVID-19 pandemic, including the global health crisis and supply chain disruptions, are deliberately excluded from the scope of the study.

In the empirical analysis, the stationarity of the series was examined using the Augmented Dickey-Fuller (ADF) unit root test, followed by the application of the ARDL Bounds Test to identify long-term relationships among the variables. The findings indicate that, in the long run, both external debt and economic growth increase Türkiye's trade openness. In contrast, in the short run, only external debt has a significant effect, with shocks converging toward equilibrium at a speed of 21%. These results suggest that while long-term structural dynamics are shaped jointly by external debt and economic growth, short-term fluctuations in trade openness are largely driven by external debt.

Compared with the literature, the findings appear to vary depending on the period analyzed and the methods employed. Gövdeli (2019) suggests that external debt positively affects economic growth in the long run, whereas Yavuz and Polat (2024) find that external debt has a negative impact on economic growth, while the relationship between trade openness and economic growth remains positive. Bölükbaş (2016) reports a positive relationship between trade openness and external debt. These discrepancies indicate that the choice of methodology, the set of variables, and the analysis period can significantly influence the results.

Based on the findings of this study, several key considerations emerge for policymakers regarding Türkiye's trade openness strategies. First, to ensure that external borrowing does not adversely affect long-term economic growth potential, it is critical to direct borrowing toward financing productive investments. In particular, the use of external financing to support technology, innovation, and export capacity can enhance the efficiency and competitiveness dimensions of trade openness. Second, to maintain macroeconomic stability, regular sustainability analyses of the external debt stock should be conducted, and measures aimed at reducing rollover risks of short-term debt should be strengthened. In this context, enhancing transparency standards in both public and private sector borrowing will improve market predictability and, in particular, support financial stability. Third, strengthening institutional capacity is essential for deepening trade openness. Full and effective implementation of international standards, within the framework of corporate governance principles, will further Türkiye's global accounting integration and increase investor confidence. Finally, aligning external debt management and trade openness policies with sustainable development goals is crucial. Allocating external debt resources to education, health, and green transition

strategies will not only improve economic growth performance but also enhance social welfare. Such an approach plays a decisive role in achieving long-term macroeconomic objectives. Overall, the empirical evidence for Türkiye indicates that external debt and economic growth significantly influence trade openness, highlighting the importance of examining this relationship within the context of global integration. The findings underscore the necessity of a holistic evaluation of the dynamics among external debt, economic growth, and trade openness for Türkiye's long-term fiscal and economic stability. By analyzing the effects of external debt and economic growth on trade openness within Türkiye's evolving financial reporting environment, this study provides a novel contribution to the literature.

REFERENCES

- Alper, F. Ö. (2019). Determinants of Economic Growth: The Case of Turkey under Structural Breaks. *Fiscaoeconomia*, 3(1), 202–227.
- Arslanhan, D., & Çondur, F. (2022). Türkiye'de Dış Borç ve Ekonomik Büyüme İlişkisi. *Adnan Menderes Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 9(2), 92–102.
- Arsoy, A. P., & Sipahi, B. (2007). Küçük ve Orta Büyüklükteki İşletmeler İçin Uluslararası Finansal Raporlama Standartları ve Türkiye Örneği. *Ankara Üniversitesi SBF Dergisi*, 62(4), 31–48.
- Atasert, G., & Utkulu, U. (2025). *Dış Borçların Ekonomik Büyüme Üzerindeki Etkileri: Türkiye'de Dış Borç Fazlasına Yol Açan Bir Eşik Değer Var mı?* Efe Akademi Yayınları.
- Ayvaz Kızılgöl, Ö., & İpek, E. (2014). An Empirical Evaluation of the Relationship between Trade Openness and External Debt: Turkish Case. *International Econometric Review*, 6(1), 42–58. doi:10.33818/ier.278030
- Bölükbaş, M. (2016). The Relationship Between Trade Openness and External Debt in Turkey: A Cointegration Analysis. *Journal of Balkan and Near Eastern Studies*, 2(4), 43–48.
- Breusch, T. S. (1978). Testing for Autocorrelation in Dynamic Linear Models. *Australian Economic Papers*, 17(31), 334–355. doi:10.1111/j.1467-8454.1978.tb00635.x
- Breusch, T. S., & Pagan, A. R. (1979). A Simple Test for Heteroskedasticity and Random Coefficient Variation. *Econometrica*, 47(5), 1287–1294.
- Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for Testing the Constancy of Regression Relationships Over Time. *Journal of the Royal Statistical Society: Series B (Methodological)*, 37(2), 149–163. doi:10.1111/j.2517-6161.1975.tb01532.x
- Çelik, H. (2025). Türkiye'de Ticari Dış Açıklık ve Ekonomik Büyüme İlişkisi Üzerine Ampirik Bir Analiz. In Ş. Nas (Ed.), *Dış Ticaret ve Makro Ekonomik Göstergeler: Güncel Tartışmalar*.
- Engle, R. F., & Granger, C. W. J. (1987). Co-Integration and Error Correction: Representation, Estimation, and Testing. *Econometrica*, 55(2), 251–276. doi:10.2307/1913236

- Eryılmaz, Ü., & Koçak, D. (2024). The Impact of IFRS Adoption on Global Competitiveness. *Sayıştay Dergisi*, 133, 179–210. doi:10.52836/sayıstay.1500046
- Ghouma, G., Becha, H., Kalai, M., & Helali, K. (2024). Impact of Cost of Capital on European Economic Growth: The Role of IFRS Mandatory Adoption. *Scientific Annals of Economics and Business*, 71(2), 193–219. doi:10.47743/saeb-2024-0012
- Gielen, F. (2007). Türkiye - Standartlara ve Kanunlara Uyum Raporu (ROSC): Muhasebe ve Denetim. World Bank.
- Godfrey, L. G. (1978). Testing for Higher Order Serial Correlation in Regression Equations when the Regressors Include Lagged Dependent Variables. *Econometrica*, 46(6), 1303–1310.
- Gövdeli, T. (2019). External Debt and Economic Growth in Turkey: An Empirical Analysis. *Sosyoekonomi*, 27(40), 119–130.
- Hannan, E. J., & Quinn, B. G. (1979). The Determination of the Order of an Autoregression. *Journal of the Royal Statistical Society: Series B (Methodological)*, 41(2), 190–195. doi:10.1111/j.2517-6161.1979.tb01072.x
- İlter, Ş. (2023). *Türkiye’de Kamu ve Özel Sektör Dış Borçları: Teori, Politika ve Uygulama*. Gazi Kitabevi.
- İlter, Ş., & Günsoy, B. (2024). Türkiye’de Kamu ve Özel Sektör Dış Borçları ile Ekonomik Büyüme Arasındaki İlişki. *Anadolu Üniversitesi Sosyal Bilimler Dergisi*, 24(1), 227–246. doi:10.18037/ausbd.1271595
- Jarque, C. M., & Bera, A. K. (1980). Efficient Tests for Normality, Homoscedasticity and Serial Independence of Regression Residuals. *Economics Letters*, 6(3), 255–259.
- Kadiroğlu, A. (2024). The Effect of Selected Variables on External Debt Stock: The Case of Türkiye. *Çankırı Karatekin Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 14(1), 176–196. doi:10.18074/ckuiibfd.1362338
- Kadiroğlu, A., & Ayhan, S. (2025). Türkiye’de Küreselleşme Sürecinin Ekonomik Büyüme Üzerine Etkileri: ARDL Sınır Testi Yaklaşımı. *Üçüncü Sektör Sosyal Ekonomi Dergisi*, 60(3), 2276–2294. doi:10.63556/tisej.2025.1500
- Khalid, M. A. (2016). The Impact of Trade Openness on Economic Growth in the Case of Turkey. *Research Journal of Finance and Accounting*, 7(10), 51–61.
- Ojaghlou, M., & Tercan, C. (2024). Impact of Liberalization and Globalization on Economic Growth: Empirical Evidence from Türkiye. *Journal of International Studies*, 17(1), 35–51. doi:10.14254/2071-8330.2024/17-1/3
- Owusu, G. M. Y., Suppiah, S. D. K., Saat, N. A. M., & Law, S. H. (2022). IFRS Adoption and Economic Growth in Developing Economies. *International Journal of Economics and Accounting*, 11(1), 73–98. doi:10.1504/IJEA.2022.119613
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16(3), 289–326.

- Ramsey, J. B. (1969). Tests for Specification Errors in Classical Linear Least Squares Regression Analysis. *Journal of the Royal Statistical Society: Series B (Methodological)*, 31(2), 350–371.
- Sabuncu, B. (2017). Degree of Adaptation to International Financial Reporting Standards: The Case of Turkey. *European Scientific Journal*, 13(28), 248–356.
- Said, S. E., & Dickey, D. A. (1984). Testing for Unit Roots in Autoregressive-Moving Average Models of Unknown Order. *Biometrika*, 71(3), 599–607. doi:10.1093/biomet/71.3.599
- Taş, T., & Ekmekçiler, Ç. C. (2022). The Relationship between External Debt and Growth under the Structural Breaks in Turkey. *Business & Management Studies: An International Journal*, 10(4), 1441–1453. doi:10.15295/bmij.v10i4.2118
- Tatar, H. E., Konat, G., & Temiz, M. (2022). The Relationship between Financial Development, Trade Openness and Economic Growth in Turkey: Evidence from Fourier Tests. *Statistika: Statistics and Economy Journal*, 102(2), 153–167.
- Tetik, N., & Yelgen, E. (2014). The Development of Accounting in Turkey and Analysis of the Accounting Culture in Terms of International Accounting and Financial Reporting Standards (IFRS). *Proceedings of International Academic Conferences 0702371*, International Institute of Social and Economic Sciences.
- Uslu, H. (2021). Relationship Between Economic Growth External Debt: Application to Turkey. *Manas Sosyal Araştırmalar Dergisi*, 10(1), 272–294.
- Yağış, O. (2024). Ticari Dışa Açıklığın Ekonomik Büyüme Üzerindeki Etkisi: Türkiye İçin Kesirli Frekanslı Fourier ARDL Yaklaşımı. *Maliye ve Finans Yazıları*, 121, 129–146.
- Yavuz, Y., & Polat, M. (2024). Relationship between External Debt and Economic Growth: An Econometric Analysis of the Turkish Economy. *Journal of Economic Policy Researches*, 11(2), 334–354. doi:10.26650/JEPR1429732
- Yenisu, E. (2019). Türkiye’de İhracat, İthalat ve Ekonomik Büyüme İlişkisi: ARDL Sınır Testi Yaklaşımı. *Gaziantep Üniversitesi Sosyal Bilimler Dergisi*, 18(3), 1175–1193.
- Yiğitbaş, Ş. B. (2025). The Effect of Private Sector Fixed Capital Investment, External Openness and External Debt on Economic Growth: Empirical Evidence from Turkey. *İşletme Araştırmaları Dergisi*, 17(1), 123–138. doi:10.20491/isarder.2025.1961