Research Article

The impact of stock market development on economic growth in Turkey: ARDL analysis

Türkiye'deki hisse senedi piyasası gelişiminin ekonomik büyüme üzerindeki etkisi: ARDL analizi

Emine Aybike AKKUTAY[1]

[1] Dr. Lecturer, Ankara Hacı Bayram Veli University, Ankara, Turkey,
emine.akkutay@hbv.edu.tr

ORCID: 0000-0002-3580-0134

Abstract

The stock market has become more significant due to the globalization of financial markets, and there is a widespread perception that it propels economic growth. Nonetheless, some recent research has found that this effect differs throughout countries based on their financial infrastructures and degrees of development. In nations with established financial infrastructure and economic stability, the stock market aids in economic growth; nevertheless, it has no such effect in economies characterized by macroeconomic instability and uncertainty. Based on this, this study used quarterly data from 2006 to 2023 to examine the effects of Turkey's stock market development on economic growth using an autoregressive distributed lag (ARDL) method. The results show that while there was a negative and considerable short-term effect, stock market development in Turkey did not have a long-term detrimental impact on economic growth. According to the findings, for Turkey's stock market to positively impact economic growth, the country's financial system has to be modernized.

Keywords: Economic growth, Stock market, Turkey

Jel Codes: E44, G10, O40

Öz

Finansal piyasaların uluslararasılaşmasıyla beraber hisse senedi piyasası önem kazanmış ve ekonomik büyüme üzerinde itici bir güç olarak görev aldığına dair genel bir kanı oluşmuştur. Ancak son dönemlerde yapılan bazı çalışmalarda ülkelerin gelişmişlik düzeylerine ve finansal alt yapılarına bağlı olarak bu etkinin farklılık gösterdiği sonucuna ulaşılmıştır. Ekonomik istikrarın sağlandığı ve güçlü finansal alt yapıya sahip ülkelerde hisse senedi piyasası ekonomik büyümeye katkı sağlarken makroekonomik istikrarsızlıkların ve belirsizliklerin olduğu bir ekonomide hisse senedi piyasasının ekonomik büyümeye katkısı bulunmamaktadır. Buradan hareketle bu çalışmada Türkiye'deki hisse senedi piyasası gelişiminin ekonomik büyüme üzerindeki etkileri 2006-2023 yılları arasında üçer aylık veriler kullanılarak otoregresif dağıtılmış gecikme (ARDL) yaklaşımıyla analiz edilmiştir. Elde edilen bulgulara göre Türkiye'deki hisse senedi piyasası gelişiminin uzun vadede ekonomik büyüme üzerinde negatif ama anlamlı bir etkisinin olmadığı; kısa vadede ise negatif ve anlamlı bir etkisi olduğu tespit edilmiştir. Sonuçlar Türkiye'de hisse senedi piyasasının ekonomik büyüme üzerinde pozitif bir etkiye sahip olabilmesi için finansal alt yapının güçlendirilmesi gerektiğini ortaya koymaktadır.

Anahtar Kelimeler: Ekonomik büyüme, Hisse senedi piyasası, Türkiye

JEL Kodları: E44, G10, O40

Introduction

Financial globalization implies incorporating a country's financial system into global financial networks, involving the marketization of the national banking sector and the capital account. As a result, there are more capital transfers between nations. Although industrialized nations actively participate in the financial globalization process, developing nations are also seen to be involved in this phenomenon (Schmukler, 2008). In recent years, the importance of the capital market's expansion and its influence on economic growth have grown. Moreover, theoretical and empirical research within capital markets has shown a discernible increase. (Pradhan, 2018; Antonios, 2010).

The capital market facilitates economic development and growth. Economic development and efficiency can be achieved by directing resources in this area, upgrading the financial sector, and deploying financial intermediation capability. (Donwa & Odia, 2010). Conversely, the evolution of the stock market is greatly impacted by political, economic, and worldwide changes. Consequently, it would seem that investors weigh the state of the market when making decisions. (Demir, 2019). In addition, developing markets have important differences from developed markets. Foreign financing is necessary for emerging markets; thus, fair disclosure, accurate reporting, and transparency are crucial. Furthermore, institutional reporting is required to mitigate agency costs resulting from information asymmetry (Uyar, Kılıç & Gökçe, 2016).

Economists have harboured persistent regarding the link between financial development and economic expansion. In 19th-century economic theory, it was posited that real economic variables and economic growth operated independently of the financial structure. Modern viewpoints, however, show that the expansion of the capital market has a greater impact on economic growth. (Bekaert, Garcia & Harvey, 1995). An increasing amount of empirical research demonstrates the tight connection between long-term economic growth and the financial sector. Both financial and non-financial developments have an impact on the financial system. Changes in computers, telecommunications, non-financial sector regulations, institutions, and economic growth all affect the features of financial services and the configuration of the financial system. Technology advancements reduce transaction costs, influencing fiscal and monetary policy, financial regulations, and the taxation of financial services and intermediaries.

Political and legal developments also impact the financial system (Levine, 1997). Financial markets have become more sensitive and impact all domestic or foreign actors as national and international markets have become more monetary. As a result, since the 20th century, the growth of global capital markets has been noted, impacting political interests and shaping both domestic and global economic development (Obstfeld & Taylor, 2002). Macroeconomic factors have the potential to impact the stock market index. Company profits and alternative investment opportunities influence stock price fluctuations. Sociopolitical and economic issues can affect stock prices and alternative investment options (Alexakis & Petrakis, 1991). However, the stock market is about more than just investors' potential gains. Determining capital accumulation and stock market valuation occur concurrently (Hall, 1999).

The relationship between the development of the stock market and economic growth has been the subject of numerous noteworthy research initiatives. Depending on the countries, these studies may have different methodologies and outcomes. Different results about how the stock market affects economic growth depend on the degree of development in markets and nations. In contrast to Schumputer (1912), who claims that financial markets have a favourable effect on economic expansion, Stiglitz (1992) claims in his research that the capital market is insufficient and attributes this to a lack of information and transaction costs. However, the author also highlights that a bigger issue arises when there is an imperfect capital market. According to Obstfeld (1998), international capital markets can be very beneficial, but they can also limit national choices for monetary and fiscal policy, which could result in overborrowing. Adjasi & Biekpe (2006) examined 14 African countries' economic growth in stock market development using a panel data modelling approach. They discussed how the emergence of stock markets accelerates economic expansion in economies of the upper and middle classes, but low-income African nations must continue to expand their markets in order to reap greater economic rewards.

Additionally, they underlined how poorly Africa's stock market development is currently integrated into the continent's economy and recommended encouraging capital growth through stock market intermediation and education. Seven & Yetkiner (2015) examined the relationships between the capital market, the banking industry, and economic growth during 20 years (1991–2011) in 146 countries with varying income levels. The results demonstrated that, although the expansion of the banking sector

impacted high-income nations negatively, low- and middle-income nations benefited from its favourable impact on economic growth. In contrast, research has shown that the growth of capital markets has a beneficial effect on economic growth in middle-class and high-income countries. Brasoveanu, Dragota, Catarana & Semenecsu (2008) used quarterly data from 2000 to 2006 to analyze the relationship between Romania's stock market and economic development. The results show a clear positive association between capital market trading volume and economic growth, suggesting that the two are influenced by one other. Nordin & Nordin (2016) used the Johansen-Juselius cointegration test on the Malaysian economy to show how the capital and debt markets contribute positively to economic growth. They also discovered a noteworthy impact from the vector error correction model's long-term outcomes. Using the ARDL limits test and the VECM Granger causality test, Choong, Yusop, Law & Liew (2005) investigated the relationship between the stock market's growth and economic growth in Malaysia between 1978 and 2000. The results demonstrate that, over time, stock market expansion contributes to economic growth. Furthermore, the Granger causality test concludes that an increased stock market drives economic expansion.

Boyd & Smith (1997) looked at an open economy model in which loans partially finance capital market investments. They maintained that nations with high capital stocks appeal more to investors because they offer more internal financing than low-income nations. They also asserted that the existence of international financial markets would only make impoverished nations even poorer. Agbloyor, Abor, Adjasi & Yawson (2014) examine the association between economic growth and private capital movements in 14 African nations from 1990 to 2007. Economic growth and total capital flows were found to be negatively correlated. The study emphasized that the main causes are the negative impacts on economic growth caused by private debt flows, foreign direct investment, and foreign capital portfolio investments. However, they added that nations with robust financial systems could benefit from directing foreign capital toward profitable ventures. They underlined that a robust financial system is required for private capital flows to affect economic growth positively. Enisan & Olufisayo (2009) used the ARDL bounds testing technique to examine the long-term relationship between the stock market development and economic expansion in seven sub-Saharan African countries. Their research revealed that the growth of the stock markets in South Africa and Egypt had a long-term beneficial effect on economic expansion. The expansion of the stock market and the advancement of the economies in Zimbabwe, Kenya, Morocco, and the Ivory Coast were correlated.

Nevertheless, they found limited evidence substantiating the notion that Nigeria's growth is affected by the development of the stock market. They made the case that macroeconomic and regulatory policies are necessary to foster the growth of African stock markets. Boubakari & Jin (2010) used the Granger test to investigate the causal association between stock market development and economic growth in Euronext nations between 1995 Q1 and 2008 Q4. The results show that while the stock market's expansion and economic growth positively correlate in nations with developed stock markets, there is no correlation between the two nations with underdeveloped ones.

Since opening its financial markets to international trade in the 1980s, Turkey has implemented liberal economic policies. Capital inflows increased after the founding of the Istanbul Stock Exchange in 1985. However, looking at Turkey's economic past, it becomes clear that the nation has experienced multiple economic crises (Demir, 2019). Although there have been significant correlations between economic growth and financial markets in Turkey since 2002, numerous unfavourable political developments have impacted economic growth and financial stability (Şentürk, Özkan & Akbaş, 2014).

Using the Granger causality test and the Johansen cointegration test, Kaya, Bektaş & Feridun (2011) analyzed 1998Q1 to 2004Q2 to investigate the results of Turkey's stock market and banking sector expansion on the country's economic growth. The results demonstrated little correlation between economic expansion and the development of the stock market. Using monthly data from 1998 to 2010, Kırankabeş & Başarır (2012) used monthly data to examine the causal relationship between Turkey's economic development and the BIST 100 index. The directional relationship was evaluated utilizing the Granger causality test. The outcome indicated that the BIST 100 index and long-term economic growth had a unidirectional link. In a parallel manner, Using quarterly data and the VAR model, Kaplan (2008) investigated the long-run relationship between Turkey's economic growth and the stock market from 1987 to 2006. The research findings established a link between stock prices and economic growth by providing strong proof of the stock market's substantial impact on actual economic activity.

In a study that covered 11 MENA countries, including Turkey, Naceur & Ghazouani (2007) they attempted to evaluate the relationship between economic expansion and stock market development. The impact of the expansion of the capital markets and the banking sector on one another was investigated. They concluded that the MENA region's financial development had little to no impact on

economic growth based on a range of control variables and GMM estimates. They argued that weak financial systems or unsteady growth rates had the biggest effects on the quality of the finance-growth link in the area. Tursoy & Fiasal (2016) used ARDL analysis to examine quarterly data from 1989Q2 to 2014Q2, and the findings of the Granger causality test showed a continuous, bidirectional causal association between stock prices and GDP in Turkey. By using Granger and cointegration tests, Çetintaş & Barışık (2003) examined the relationship between economic growth and the development of the stock market while examining the evolution of the Turkish banking industry from 1989 to 2000. Their results demonstrated a significant correlation between economic growth and the expansion of the banking and stock markets. They proposed that the rise in the stock market had a direct effect on the banking industry, and they also argued that the banking industry, in turn, contributed to economic growth due to its relationship with the stock market. As a result, the study emphasizes the importance of including stock market development when developing the banking industry to attain economic growth.

Based on this, this study examines the relationship between Turkey's stock market development and economic growth using the ARDL technique to evaluate quarterly data from 2006 to 2023. In the next part of the paper, the data used in the investigation are explained along with the principal component analysis and empirical methods. The results and discussion of the econometric study are then presented in the last section.

Data and methodology

Data description

The relationship between the development of the stock market and economic growth was examined quarterly from 2006 Q1 to 2023 Q2. The gross domestic product, or GDP, measure economic growth. The stock market (STOCK) development is gauged using three metrics: market capitalization, trade stocks, and turnover ratio. The total value of all the listed stocks on a country's stock exchange is represented by its market capitalization. The turnover ratio indicates the relationship between the total traded value and market capitalization. Lastly, trade stocks include elements associated with the volume and openness of stock markets.

The regression model incorporates three control variables that may impact the Turkish economy. The first is investment, or gross fixed capital formation, or GFCF. The exchange rate (REER) comes in second. The trade openness ratio (TRADED) comes in third. The Istanbul Stock Market Index (BIST), the Turkish Statistical Institute (TURKSTAT), and the Central Bank of the Republic of Turkey (CBRT) provided the time series data for these variables. Table 1 displays a few common summary statistics and data sources.

Table 1: Summary Statistics

Variables	Notation	Data Sources	Mean	Minimum	Maximum	Standard Deviation
Gross Domestic Product	GDP	TURKSTAT	19.25190	0.117451	36.61530	5.214384
Market Capitalization	MAC	BIST	28.33415	-39.82805	211.1301	46.28025
Turnover Ratio	TOR	BIST	28.99893	-59.37604	325.8568	57.56211
Trade Stock	TRADESTOCK	BIST	43.92057	-43.83839	346.0036	77.83356
Reel Effective Currency Rate	REER	CBRT	94.23143	47.61000	127.7100	22.30770
Gross Fixed Capital Formation	GFCF	TURKSTAT	40.71992	0.052129	67.53501	12.59704
Trade openness Ratio	TRADED	TURKSTAT	61.18409	0.052094	131.1490	18.66796

The evolution of the stock market lacks a widely accepted definition. According to Kunt-Demirgüç and Levine (1996), the market capitalization ratio, traded value, and turnover ratio affect how the stock market evolves. Principal component analysis is used by Coşkun, Seven, Ertuğrul & Ulussever (2017) to analyze the stock market. They evaluate variables such as stock market capitalization, mutual fund total market value, traded value, and the capitalization of corporate bonds and pension funds. Seven &

Yetkiner (2015) describe the development of the stock market by examining variables such as stock market turnover ratio, total value traded to GDP, and stock market capitalization.

Similarly, Owusu & Odhiambo (2014) developed an index of stock market development based on market capitalization, turnover ratio, and the ratio of total stock value traded to GDP. Based on previous research, principal component analysis was applied in this study to measure the evolution of the stock market. Market capitalization, trade stock, and turnover ratio were considered in this analysis. The greater the relationship, the closer the correlation coefficient is to one. Table 2 demonstrates that Tradestock and Tor have the strongest association, followed by Tradestock and Mac and Tor and Mac.

Furthermore, all of the correlations between the variables are shown to be statistically significant. The correlation matrix shown in Table 2 shows that the three stock market development indicators that were chosen have a high degree of correlation with one another, suggesting that the principal component analysis used as a measure of the Turkish stock market's development is effective. Because of their strong association, all three variables provide unclear results when included simultaneously in the regression. Principal component analysis assists in resolving this problem.

Table 3 displays the principal component analysis results. With an eigenvalue larger than 1, the first principal component explains 74% of the variation in the whole. The eigenvalues of the remaining primary components are all less than 1. Furthermore, their respective basic variances are 2 per cent and 23 per cent. As a result, Table 4's values for the first eigenvector are used to compute the stock market's development.

Table 2: Correlations Between Stock Market Development Variables

	MAC	TOR	TRADESTOCK
MAC	1.000000		
TOR	0.303418	1.000000	
	(0.0107)		
TRADESTOCK	0.679765	0.815831	1.000000
	(0.0000)	(0.0000)	

() represents the probability value

Table 3: Principal Component Analysis

	PCA1	PCA2	PCA3
Eigenvalues % of variance Cumulative %	2.222688	0.702502	0.074810
	0.7409	0.2342	0.0249
	0.7409	0.9751	1.0000

Notes: Using three stock market development variables, the PCA technique derives three principal components (PCA1, PCA2, and PCA3).

Table 4: Eigenvectors

Variable	Vector1	Vector2	Vector3
MAC	0.503994	0.777669	0.375795
TOR	0.562436	-0.625702	0.540521
TRADESTOCK	0.655482	-0.061059	-0.752738

Unit root tests

First, an analysis was conducted on the variables' stationary. Using the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) unit root test, the stationarity of the variables was investigated at both the level and the first difference. Every variable mentioned in Table 5 exhibits stationarity at I(0), except for the effective exchange rate. Furthermore, each variable reaches stationarity at I(1) after taking the first difference. The ARDL bound test, in contrast to other cointegration tests, permits the estimation of both I(1) and I(0) variables. As a result, the estimation takes into account every variable.

Table 5: Unit Root Test Results

	ADF Unit Root Test				
	Intercept			**Trend and Intercept**	
Variables	**Level I(0)**	**First Difference I(1)**		**Level I(0)**	**First Difference I(1)**
GDP	-4.041144**	-10.32505***		-4.023369**	-10.24839***
STOCK	-3.386571**	-5.995865***		-4.024581**	-6.086770***
GFCF	-5.437429***	-5.503744***		-5.423521***	-5.459270***
REER	-0.652801	-10.53617***		-2.969882	-10.68085***
TRADED	-4.976481***	-6.765260***		-4.945985***	-6.716227***
	PP Unit Root Test				
	Intercept			**Trend and Intercept**	
Variables	**Level I(0)**	**First Difference I(1)**		**Level I(0)**	**First Difference I(1)**
GDP	-4.107668**	-10.40464***		-4.085388**	-10.32561***
STOCK	-3.584815***	-8.465168***		-4.124924***	-8.445411***
GFCF	-3.407263**	-8.117975***		-3.372649	-8.069746***
REER	-0.435356	-10.49629***		-2.869305	-10.82778***
TRADED	-5.012236***	-13.30227***		-4.981158***	-13.20137***

*Significance at 10%, ** Significance at 5%, *** Significance at 1%. The unit root null hypothesis has been rejected, as shown by the asterisks.

Empirical methodology

This research examines the relationship between economic growth and the development of the stock market, accounting for trade openness ratio, effective exchange rate, and gross fixed capital formation. The regression model being considered for estimate is shown in Equation 1.

$$GDP_t = \alpha_0 + \alpha_1 STOCK + \alpha_2 GFCF + \alpha_3 REER + \alpha_4 TRADED + \varepsilon_t \qquad (1)$$

In this case, the quarterly Gross Domestic Product at time t is denoted by GDP_t; the total measure of stock market development, produced by principal component analysis with three stock market development variables, is denoted by STOCK; GFCF denotes gross fixed capital formation, the effective exchange rate by REER, and the trade openness ratio by TRADED.

The ARDL model uses the study to estimate short- and long-term parameters. The ARDL method eliminates the need to identify whether the variables are stationary at level I(0) or first difference I(1), in contrast to other cointegration techniques. It can produce more consistent results in samples with fewer observations. The following is a specification of the ARDL model:

$$GDP_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta GDP_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta STOCK_{t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta GFCF_{t-i} + \sum_{i=0}^{n} \beta_{4i} \Delta REER_{t-i}$$
$$+ \sum_{i=0}^{n} \beta_{5i} \Delta TRADED_{t-i} + \beta_6 GDP_{t-1} + \beta_7 STOCK_{t-1} + \beta_8 GFCF_{t-1} + \beta_9 REEER_{t-1}$$
$$+ \beta_{10} TRADED_{t-1}$$
$$+ \varepsilon_{1t} \qquad (2)$$

The differencing operator in this case is Δ. In addition, the equation's terms with summation symbols indicate short-term relationships, while the terms without symbols indicate long-term relationships.

The ARDL bound testing approach investigates the cointegration connection between the variables. The upper and lower critical values are compared using the F-test that Pesaran, Shin & Smith (2001) suggested. The alternative hypothesis that supports cointegration is accepted, rejecting the null hypothesis that claims no cointegration exists. The following is a representation of the error correction model if the variables are cointegrated:

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta GDP_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta STOCK_{t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta GFCF_{t-i} + \sum_{i=0}^{n} \beta_{4i} \Delta REER_{t-i}$$
$$+ \sum_{i=0}^{n} \beta_{5i} \Delta TRADED_{t-i} + \mu ECT_{t-1} + u_t \tag{3}$$

The term ECT_{t-1} It is less than one and has a negative value, which means that the system is in balance and that any deviations cause it to revert to equilibrium.

Table 6: The ARDL Bounds Test Results

Model: F(GDP | STOCK, GFCF, REER, TRADED)					
Optimal Lag Length:		ARDL(1,3,4,4,2)			
F Statistic:		5.698143			
Critical Values					
10%		5%		1%	
I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
2.32	3.232	2.725	3.718	3.608	4.86

Note: The I(0) and I(1) bounds' critical values are derived from Pesaran et al. (2001). The Akaike Information Criteria (AIC) determines the lag lengths.

A boundary test in Table 6 determines the long-term link between the variables. The Akaike Information Criteria have chosen ARDL (1,3,4,4,2) as the best model. Furthermore, the boundary test F-statistic supported by Pesaran et al. (2001) is higher than the upper critical value at a 1% significance level. Cointegration is evident despite the I(0) and I(1) values, as the null hypothesis is rejected.

Results

Long run and short run estimates:

The ARDL specification's short- and long-term results are shown in Table 7. While statistically negligible, the stock market's characteristics indicate that, in the long run, economic growth is negatively impacted by it. These findings suggest that the capital market in Turkey has no long-term impact on economic growth. A statistically negligible negative correlation is seen with the real effective exchange rate. It has, therefore, very little long-term impact on economic growth. However, the trade openness ratio and gross fixed capital formation show statistical significance and a positive correlation, showing their significant impact on economic growth. For every 1% increase in gross fixed capital formation and the trade openness ratio, respectively, economic expansion gains 0.28% and 0.10%.

Table 7 also contains the error correction model's coefficients. The long-term correction of short-term disequilibrium is indicated by the negative and significant coefficient of ECT_{t-1}. The noticeable short-term adverse influence of Turkey's stock market development on economic growth serves as a vivid indication of the inefficiency of the country's stock market from 2006 to 2023. Furthermore, the findings indicate that a 1% rise in gross fixed investment and the trade openness ratio cause short-term economic growth increases of 0.29% and 0.12%. Even though its numerical effect might be considered negligible, the real effective exchange rate significantly and negatively impacts economic growth in the near term.

Table 7: The Estimation Results in the Long-Term and Short-Term

Dependent Variable: GDP			
Long-Run Results			
Regressors	**Coefficients**	**t-statistic**	**Probability**
STOCK	-0.231740	-0.541685	0.5893
GFCF	0.282639	5.844789	0.0000
REER	-0.032624	-1.663245	0.1029
TRADED	0.109843	3.554846	0.0009
Constant	3.871353	1.446373	0.1508
Short-Run Error Correction Results			
Regressors	**Coefficients**	**t-statistic**	**Probability**
Δ STOCK	-0.649683	-6.048314	0.0000
Δ STOCK (-1)	-0.003548	-0.029023	0.9971
Δ STOCK (-2)	-0.35894	-3.020696	0.0041
Δ GFCF	0.296983	14.15899	0.0000
Δ GFCF (-1)	-0.006252	-0.319419	0.7572
Δ GFCF (-2)	-0.053449	-3.441663	0.0013
Δ GFCF (-3)	-0.037865	2.221770	0.0343
Δ REER	-0.049552	-2.141265	0.0372
Δ REER (-1)	-0.031988	-1.371303	0.2158
Δ REER (-2)	-0.045388	-2.045128	0.0371
Δ REER (-3)	-0.073939	-3.403239	0.0021
Δ TRADED	0.126400	14.40156	0.0000
Δ TRADED (-1)	0.014984	1.659988	0.0980
Δ ECT(-1)	-0.529434	-6.150282	0.0000

Table 8: Diagnostic Tests

R^2	0.966866
Adjusted R^2	0.957770
Durbin-Watson stat	2.234390
F-statistic	106.2995(0.000000)
Breusch-Godfrey Serial Correlation Test (X^2)	3.409935(0.1818)
Heteroskedasticity (X^2)	11.34905(0.8790)
Jarque-Bera(X^2)	1.057785(0.589257)
Ramsey RESET	0.002726(0.9586)

Together with the long-term and short-term coefficients, the results of the diagnostic tests are also shown in Table 7 and Table 8. The error correction model's coefficient in Table 7 was determined to be -0.539434. A significant probability value at a critical value of 1% suggests statistical importance, whereas this value, between 0 and -1, implies economic significance. The study's appropriateness tests are provided in Table 8. First, the Breusch-Godfrey Serial Correlation Test indicates no autocorrelation issue because the probability value is greater than 5%. Next, the Heteroskedasticity test was used to see if there was a heteroscedasticity issue. The probability value being higher than 5% suggests that there is no heteroscedasticity issue. An analysis of the errors' normal distribution was done using the Jarque-Bera test. It can be seen from the results that the residuals in the model have a normal distribution when the probability value is more than five per cent. It can be concluded that the model has no specification issues if the probability value of the Ramsey Reset test is higher than 5%. The findings show that the

ARDL(1,3,4,4,2) model's error terms have a normal distribution and are free of misspecification or heteroscedasticity. Furthermore, stability is shown by the cumulative sum of squares of recursive residuals and the cumulative sum of recursive residuals, both of which fall within the critical values of the estimated parameters.
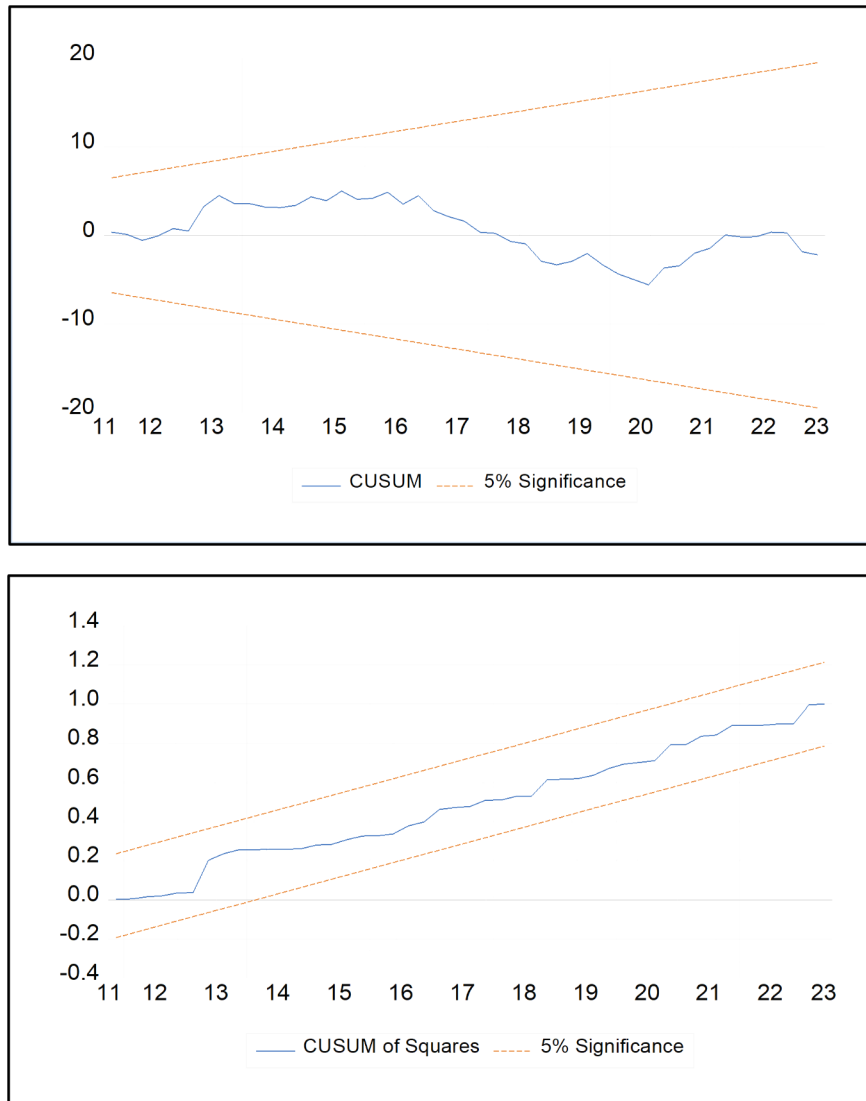

Figure 1. CUSUM and CUSUMQ

In Figure 1, the Cusum and CusumQ tests are used to determine whether the stability requirements of the series' parameter estimates are satisfied. According to the figure, stability requirements are satisfied when parameter estimates in the Cusum and CusumQ tests fall within the confidence intervals.

The results offer that the rise of the Turkish stock market has little bearing on the long-term expansion of the national economy. Uncertainty is one of the main factors contributing to the stock market's negative effects on economic growth. Economic uncertainties arise due to trade wars, pandemics, rising international disputes, and global economic crises. Investment decisions are delayed and have a detrimental impact on economic growth during times of high uncertainty (Usta & Mete, 2022). Although risk and uncertainty play a significant role in all markets where transactions occur, these factors' impact is particularly noticeable on the stock exchanges, which are the busiest financial markets. Economic, financial and political uncertainty induces return loss in stock markets (Gürsoy & Zeren, 2022). Turkey's economic performance has been impacted by the numerous internal and external uncertainties it has encountered since 2006. Financial crises, worldwide pandemics, and the war between Russia and Ukraine are among these concerns.

When examining Turkey's economic past, numerous financial and economic crises can be found. These crises bring about drastic economic policy changes and significantly affect the economy, finances, society, and politics (Arı & Cergibozan, 2014). The 2008 financial crisis caused a reduction in

international capital flows and the outflow of foreign capital from the nation, which had a detrimental impact on the economy (Koçak, Kısakürek & Babacan, 2023). The coronavirus outbreak has caused another dilemma for Turkey. States started enacting prohibitions in response to the coronavirus, which first surfaced in China at the end of 2019. These prohibitions impacted the afflicted nations' economies by triggering the contraction of numerous sectors. Like global markets, this circumstance resulted in index reductions at Borsa Istanbul (Kılıç, 2020). The crisis between Russia and Ukraine is another factor influencing Turkey's economic circumstances. The Turkish stock market suffered greatly and adversely following the Russia-Ukraine conflict (Yousaf, Patel & Yarovaya, 2022).

Economic growth and the evolution of a nation's financial systems are correlated linearly. While the banking industry is the foundation of most nations' financial systems, it is evident that certain nations have market-based financial systems. Nonetheless, an ideal financial system is required to support economic growth in financial systems with a market foundation and a banking sector. A well-developed legal system is necessary for an ideal financial system. Effective resource allocation is ensured, and financial decision-making is made easier with a robust legal framework. (Contuk & Güngör, 2016).

Conclusion

Several theoretical and empirical research studies have been conducted on financial development, economic growth, and the evolution of the stock market. Due to the liberalization of capital flows, nations are increasingly involved in the financial markets; the significance of the stock market's impact on economic growth has increased. The Auto-Regressive Distributed Lag (ARDL) approach is used in this study to empirically examine how Turkey's stock market development has affected the country's economic growth. The analysis is based on quarterly data from 2006 Q1 to 2023 Q2. A set of fewer artificial variables that produced the most variety was constructed during the stock market's inception by grouping variables with high correlations using principal component analysis. The indexes of market capitalization, turnover ratio, and trade stocks are used to measure the development of the stock market (STOCK). Market capitalization is the total worth of all equities traded on a nation's stock exchange. The turnover ratio provides the market capitalization rate of the entire value transacted. Lastly, trade stock comprises elements of stock market size and liquidity. The regression model also contained three control variables that might impact the Turkish economy. First is an investment, or Gross Fixed Capital Formation (GFCF). The effective exchange rate (REER) comes in second. The trade openness rate comes in third.

The outcomes of the model's long-term forecasts: The probability value of the STOCK series is not statistically significant, but it is evident that the stock market development series, represented by STOCK, hurts the economic growth series, represented by GDP, with a coefficient of -0.231740. The research concludes that the effective exchange rate series, represented by the symbol REER, has a statistically negligible probability value. The results indicate a negative effect on economic growth, corroborated by the -0.003548 coefficient. The analysis also reveals that gross fixed capital formation, or GFCF, has a statistically significant and positive correlation with economic growth (coefficient of 0.282639). An error correction model (ECM) result of -0.529434, which is statistically significant, was obtained. The error correction model's negative and statistically significant output at the 1% significance level indicates that the model was correctly constructed.

Interestingly, more investigation reveals that most of the short-term coefficients are statistically significant. According to autocorrelation and normality tests of the error terms applied after the model is estimated, the model is sufficiently strong. The CUSUM and CUSUMQ tests stand out as additional statistics that demonstrate the stability of the model.

The significance of stock markets in national economies is growing due to the growing influence of globalization. Research on how the development of the stock market affects economic growth has produced a range of findings. Stock markets need a strong financial infrastructure before contributing positively to economic growth. Research indicates that the financial and stock markets may not invariably contribute to economic expansion. According to research conducted by Adjasi & Biekpe (2006), Seven & Yetkiner (2015), Boyd & Smith (1997), Agbloyor et al. (2014), and Enisan & Olufisayo (2009), financial development and capital markets do not positively impact economic growth in developing nations or nations with insufficient financial infrastructure. Studies have suggested that macroeconomic policies should be established and used to regulate the financial sector and stock market. Numerous studies emphasize how important it was for non-financial sector policies, institutions, and shifts in economic growth to influence how the financial system developed.

Additionally, legal and political developments also have important effects. As the financial system develops, the importance of the stock market further increases. Economic and socio-political variables

are observed to influence stock returns. Thus, a robust financial system is not only achieved with an advanced economy but also with an advanced legal system, political system, and technologies. Numerous studies also emphasize that developing countries can contribute to economic growth by strengthening their financial infrastructures. The macroeconomic stability index, political stability index, or economic freedom index can all be used in later research to investigate the impact of the stock market on economic growth in further depth.

References

Adjasi, C. K.D., & Biekpe, N. B. (2006). Stock Market Development and Economic Growth: The Case of Selected African Countries, African Development Review, 18(1), 144-161. https://doi.org/10.1111/j.1467-8268.2006.00136.x

Agbloyor, E. K., Abor, J. Y., Adjasi, C. K. D., & Yawson, A. (2014). Private Capital Flows and Economic Growth in Africa: The Role of Domestic Financial Markets, Journal of International Financial Markets, Institutions and Money, 30(C), 137-152. https://doi.org/10.1016/j.intfin.2014.02.003

Alexakis, P., & Petrakis P. (1991). Analyzing stock market behaviour in a small capital market, Journal of Banking and Finance, 15(3), 471-483. https://doi.org/10.1016/0378-4266(91)90081-V

Antonios, A. (2010). Stock Market and Economic Growth: An Empirical Analysis for Germany, Business and Economic Journal, 1(1), 1-12. https://www.hilarispublisher.com/open-access/stock-market-and-economic-growth-an-empirical-analysis-for-germany-2151-6219-1-001.pdf

Arı, A., & Cergibozan, R. (2014). The Recent History of Financial Crises in Turkey, The Journal of European Theoretical and Applied Studies, 2(1), 31-46. https://www.researchgate.net/publication/316716887_The_Recent_History_of_Financial_Crises_in_Turkey

Bekaert, G., Garcia, M. G.P., & Harvey, C. R. (1995). The Role of Capital Markets in Economic Growth, Textos para discussão 342, Department of Economics PUC-Rio (Brazil). 1-53. https://www.econ.puc-rio.br/uploads/adm/trabalhos/files/td342.pdf

BIST (2023) https://www.borsaistanbul.com/tr/sayfa/180/konsolide-veriler

Boubakari, A., & Jin, D. (2010). The Role of Stock Market Development in Economic Growth: Evidence from Some Euronext Countries, International Journal of Financial Research, 1(1), 14-20. https://www.researchgate.net/publication/49595830_The_Role_of_Stock_Market_Development_in_Economic_Growth_Evidence_from_Some_Euronext_Countries

Boyd, J. H., & Smith, B. D. (1997). Capital Market Imperfections, International Credit Markets, and NonCovergence, Journal of Economic Theory, 73(2), 335-364. https://doi.org/10.1006/jeth.1996.2237

Brasoveanu, L. O., Dragota, V., Catarama, D., & Semenecsu, A. (2008). Correlations Between Capital Market Development and Economic Growth: The Case of Romania, Journal of Applied Quantitative Methods, 3(1), 64-75. http://www.jaqm.ro/issues/volume-3,issue-1/pdfs/obreja-brasoveanu_dragota_catarama_semenescu.pdf

CBRT (2023). https://evds2.tcmb.gov.tr

Choong, C. K., Yusop, Z., Law, S. H., & Liew V.K. (2005). Financial Development And Economic Growth In Malaysia: The Stock Market Perspective, Investment Management and Financial Innovations,2(4), 178-183.

https://www.researchgate.net/publication/23747353_Financial_Development_and_Economic_Growth_in_Malaysia_The_Stock_Market_Perspective

Contuk, F. Y., & Güngör, B. (2016). Asimetrik Nedensellik Testi ile Finansal Gelişme Ekonomik Büyüme İlişkisinin Analizi [An Analysis of Relationship between Financial Development and Economic Growthwith Asymmetric Causality Test], Muhasebe ve Finansman Dergisi, 71(3), 89-108. https://doi.org/10.25095/mufad.396700

Coşkun, Y., Seven, Ü., Ertuğrul, H. M., & Ulussever, T. (2017). Capital market and economic growth nexus: Evidence from Turkey, Central Bank Review, 19-29. https://doi.org/10.1016/j.cbrev.2017.02.003

Çetintaş, H., & Barışık, S. (2003). Bank, Stock Market and Economic Growth: Cointegration and Causality Analysis Case of Turkey (1989-2000), The ISE Review, 7(25-26), 1-18. https://www.borsaistanbul.com/datum/imkbdergi/EN/ISE_Review_25-26.pdf

Demir, C. (2019). Macroeconomic Determinants of Stock Market Fluctuations: The Case of Bist-100, Economies, 7(1),1-14. https://doi.org/10.3390/economies7010008

Donwa, P., & Odia, J. (2010). An Empirical Analysis of the Impact of the Nigerian Capital Market and Her Socio-Economic Development, Journal of Social Sciences, 24(2), 135-142. https://doi.org/10.1080/09718923.2010.11892845

Enisan, A. A.,& Olufisayo, A. O. (2009) Stock market development and economic growth: Evidence from sub-Sahara African countries, Journal of Economics and Business, 61(2), 162-171. https://doi.org/10.1016/j.jeconbus.2008.05.001

Gürsoy, S., & Zeren, F. (2022). Ekonomik Politika Belirsizliği ve Borsa Belirsizliği İlişkisi: G7 ve BRIC Ülkeleri Örneği [Economic Political Uncertainty And Stock Market Relationship: Evidence From G7 AND BRIC Countries] , Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 61(1), 353-368. https://doi.org/10.18070/erciyesiibd.986321

Hall, R. E. (1999). The Stock Market and Capital Accumulation, NBER Working Papers 7180, National Bureau of Economic Research, Inc. 1-32, https://www.nber.org/system/files/working_papers/w7180/w7180.pdf

Kaplan, M. (2008). The Impact of Stock Market on Real Economic Activity: Evidence from Turkey, Journal Applied Sciences, 8(2), 374-378. OI: 10.3923/jas.2008.374.378

Kaya, E., Bektaş, E., & Feridun, M. (2011). Stock Market And Banking Sector Development in Turkey: Do They Have The Same Impact on Economic Growth? Economic Research, 24(4), 65-74. https://doi.org/10.1080/1331677X.2011.11517481

Kılıç, Y. (2020). Borsa İstanbul'da COVID-19 (Koronavirüs) Etkisi, [The Effect of COVID-19 (Coronavirus) in Borsa Istanbul], Journal of Emerging Economies and Policy, 5(1), 66-77. https://dergipark.org.tr/tr/download/article-file/1132865

Kırankabeş, M. C., & Başarır, Ç. (2012). Stock Market Development and Economic Growth in Developing Countries: An Empirical Analysis of Turkey, International Research Journal of Finance and Economics, 87,134-146. https://dspace.balikesir.edu.tr/xmlui/bitstream/handle/20.500.12462/9390/kırankabeş.pdf?sequence=2&isAllowed=y

Koçak, H., Kısakürek, M. M., & Babacan, A. (2023). Ekonomik Kriz Dönemlerinde İşletmelerin Performans Etkinlik İncelemesi: BİST'te Bir Araştırma [Performance Efficiency Review Of Businesses In Period Of Economic Crisis: A Research On Istanbul Stock Exchange (BIST)], Erzincan Binali Yıldırım Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 5(1), 40-60. https://doi.org/10.46482/ebyuiibfdergi.1300289

Kunt-Demirgüç, A., & Levine, R. (1996). Stock Markets, Corporate Finance and Economic Growth: An Overview, The World Bank Economic Review, 10(2), 223-239. https://documents1.worldbank.org/curated/en/395201468150596848/pdf/771210JRN0WBER0Box0377291B00PUBLIC0.pdf

Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda, Journal of Economic Literature, 35(2), 668-726. https://www.jstor.org/stable/2729790

Naceur, S. B., & Ghazounai, S. (2007). Stock markets, banks and economic growth: Empirical evidence from the MENA region, Research in International Business and Finance, 21(2), 297-315. https://doi.org/10.1016/j.ribaf.2006.05.002

Nordin, S., & Nordin, N. (2016). The Impact of Capital Market on Economic Growth: A Malaysian Outlook, International Journal of Economics and Financial Issues, 6(7), 259-265. https://dergipark.org.tr/en/download/article-file/364049

Obstfeld, M. (1998). The Global Capital Market: Benefactor or Menace?, Journal of Economic Perspectives, 12(4), 9-30. DOI: 10.1257/jep.12.4.9

Obstfeld M., & Taylor, A. M. (2002). Globalization and Capital Markets, NBER Working Papers, 8846, National Bureau of Economic Research, Inc. https://www.nber.org/system/files/working_papers/w8846/w8846.pdf

Owusu, E. L., & Odhiambo, N. M. (2014). Stock market development and economic growth in Ghana: an Ardl bounds testing approach, Applied Economics Letters, 21(4), 229-234. https://doi.org/10.1080/13504851.2013.844315

Pesaran, M. H., Shin, Y., & Smith, R., (2001). Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics 16(3) 289–326. https://www.jstor.org/stable/2678547

Pradhan, R. P. (2018). Development of stock market and economic growth: the G-20 evidence, Eurasian Economic Review, 8(2), 161-181. https://link.springer.com/article/10.1007/s40822-018-0094-4

Schmukler, S. L. (2008). The Benefits and Risks of Financial Globalization, in Capital Market Liberalization and Development, J. S. Ocampo & J. E. Stiglitz, Capital Market Liberalization and Development, 48-75, New York, Oxford University Press,

Schumputer, J. A. (1912). The Theory of Economic Development. Cambridge, Massachusetts, Harvard University Press.

Stiglitz, J. E. (1992). Alfred Marshall Lecture Capital markets and economic fluctuations in capitalist economies, European Economic Review 36, 269-306. https://doi.org/10.1016/0014-2921(92)90084-A

Seven, Ü., & Yetkiner, H. (2015). Financial İntermediation and economic growth: Does income matter? Economic Systems, 40(1), 39-58. https://doi.org/10.1016/j.ecosys.2015.09.004

Şentürk, M., Özkan ,S. G., & Akbaş, Y. E. (2014). The Relationship Between Economic Growth and Stock Returns: An Example From Turkey, Doğuş Üniversitesi Dergisi, 15(2), 155-164. https://dergipark.org.tr/en/download/article-file/2152063

TURKSTAT (2023) https://data.tuik.gov.tr/Kategori/GetKategori?p=ulusal-hesaplar-113&dil=1

Tursoy, T., & Faisal, F. (2016). Causality between stock price and GDP in Turkey: An ARDL Bounds Testing Approach, Romanian Statistical Review, 64(4),3-19. https://www.revistadestatistica.ro/wp-content/uploads/2016/12/RRS4_2016_A1.pdf

Usta, C., & Mete, E. (2022). Ekonomik Politika Belirsizliğinin Makro Ekonomik Göstergeler Üzerine Etkisi: Avrupa Birliği Ülkeleri Örneği [The Effect of Economic Policy Uncertainty on Macroeconomic Indicators: The Case of European Union Countries], Karadeniz Sosyal Bilimler Dergisi, 14(27), 644-659. https://dergipark.org.tr/en/download/article-file/2754261

Uyar, A., Kılıç, M., & Gökçe B. A. (2016). Compliance with IAS/IFRS and firm characteristics: evidence from the emerging capital market of Turkey, Economic Research, 29(1), 148-161. https://doi.org/10.1080/1331677X.2016.1163949

Yousaf, I., Patel, R., & Yarovaya, L. (2022). The reaction of G20+ stock markets to the Russia–Ukraine conflict ''black-swan'' event: Evidence from event study approach, Journal of Behavioral and Experimental Finance, 35(C), 1-6. https://doi.org/10.1016/j.jbef.2022.100723