


Examining the relationship between exports and economic growth in Türkiye: Fourier Toda-Yamamoto Granger causality test

Türkiye’de ihracat ile ekonomik büyüme ilişkisinin incelenmesi: Fourier Toda-Yamamoto Granger nedensellik testi

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Abstract

This study aims to investigate the causal relationship between exports and economic growth in Türkiye from 2016:1 to 2023:12, focusing on the validity of the export-led growth hypothesis. The Fourier Toda-Yamamoto Granger Causality Test created by Nazlıoğlu, Gormus and Soytaş (2016) was used with variables including total exports and industrial production index derived from monthly data. The data suggest a bidirectional causation between the two variables, indicating that each one is the cause of the other. The export-led growth hypothesis is confirmed in Türkiye for the relevant timeframes. The results of this study align closely with existing research on the topic compared to other studies, further suggesting that decreasing the reliance on imported intermediate items in Turkish export products will enhance the direct connection between exports and economic growth.

Keywords: Economic Growth, Export, Export-Led Growth Strategy, Fourier Toda-Yamamoto Granger Causality Test

Jel Codes: B22, C20, F10

Öz

Çalışmanın amacı, Türkiye’de 2016:1 ile 2023:12 dönemleri arası ihracat ile ekonomik büyüme arasındaki nedensel ilişkiyi ihracata dayalı büyüme hipotezinin geçerliliği bağlamında incelemektir. Aylık verilerden derlenen toplam ihracat ile sanayi üretim endeksinden oluşan değişkenlerle Nazlıoğlu, Gormus ve Soytaş (2016) tarafından geliştirilen Fourier Toda-Yamamoto Granger Nedensellik Testi uygulanmıştır. Elde edilen bulgular, her iki değişkenin de birbirlerinin nedeni olduğu yani aralarında çift yönlü bir nedenselliğin varlığı tespit edilmiştir. Bu bulgu, Türkiye’de belirtilen dönemlerde ihracata dayalı büyüme hipotezinin geçerli olduğunu göstermektedir. Konu hakkında yapılan diğer çalışmalar karşılaştırıldığında bu çalışmanın bulgusu literatürle büyük oranda örtüşmektedir. Türkiye’de ihracat ürünlerinde ithal ara malının kullanım oranlarının düşürülmesi ihracat ile ekonomik büyüme arasındaki nedensel bağın daha sağlıklı bir zemine oturtulmasına katkı sağlayacaktır.

Anahtar Kelimeler: Ekonomik Büyüme, İhracat, İhracata Dayalı Büyüme Stratejisi, Fourier Toda-Yamamoto Granger Nedensellik Testi

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Introduction

The significance of international trade is commonly attributed to the industrial revolution throughout history. During the initial phases of the Industrial Revolution, specific industries profited from large-scale manufacturing, cost advantages due to increased size, and skilled labour progressively became specialized and capable of being exported, contributing to economic growth and development. Initially, these specialized businesses mainly concentrated on iron, coal, and textiles and expanded their global reach. The process of industrialization, which converted the agrarian economies of different nations, is widely recognized as the catalyst for a new socio-economic and cultural paradigm and technological advancements. Consequently, the initial connection between international trade and economic growth emerged during the Industrial Revolution, as numerous industries experienced significant development (Hussain, Haseeb, Kot and Jermisittiparsert, 2020). Following World War II, global trade experienced exceptionally swift expansion. The period that experienced its zenith in the late 1960s and early 1970s also presented specific prospects for developing nations. Developing nations, particularly those in the textile and apparel industry, maximized their utilization of this potential (Schmid and Phillips, 1980). Developing nations have benefited from international trade by formulating export plans centred around specific strategic products they have identified, using their comparative advantages.

An advantage of prioritizing these strategic products is the possibility for the industry to export manufactured goods and earn foreign cash, thus stimulating economic growth, particularly in low-income nations. Furthermore, these sectors make a significant socio-economic impact by boosting employment rates among low-income demographics and offering work prospects for highly trained persons, particularly women. Once again, migrating individuals from rural to urban regions to pursue employment and commercial prospects enhances the flow of capital within the economy and significantly alleviates poverty. This phenomenon enhances the local economy and facilitates the integration of national economies with the global economy (Hussain et al., 2020). The significant achievement of exporting manufactured goods has been closely associated with rapid economic expansion. Manufactured exports have stimulated the generation of foreign currency income to cover the costs of importing capital goods and fostered stronger connections with multinational corporations. Generally, it speeds up economic growth and technological advancement (Radelet, 1999). Chen (2009) contends that the connection between international commerce and economic growth is partially linked to the rise of foreign trade, and its progress has been somewhat synonymous with economic expansion.

A substantial body of literature has been developed to examine the relationship between exports and economic growth. In this regard, four different techniques have been formulated and analyzed. The neoclassical export-led growth hypothesis posits that the causal relationship between exports and economic growth is such that exports lead to economic growth. The reason for this is that higher levels of exports enhance productivity by offering economies of scale. As exports grow, exporters manufacture products of superior quality, leading to increased productivity and production. The alternative perspective posits that there is a causal relationship in which economic growth influences exports – increased productivity results in reduced unit costs, promoting export expansion. The third perspective posits a causal relationship between the two. According to proponents of this perspective, there is a mutually reinforcing relationship between economic growth and exports. According to Velnampy and Achchuthan (2013), exports and economic growth in the fourth and final perspective are influenced by both the development process and technical progress. Given these methodologies, it is challenging to determine the correlation between international commerce and economic growth definitively.

Indeed, the research findings thus far have yielded varying outcomes. Several studies, including Diks and Panchenko (2006), Korkmaz (2014), Bakari and Mabrouki (2017), and Baktemur (2021), provide support for the Neoclassical export-led growth hypothesis. These studies find evidence of a one-way causal relationship between total exports and economic growth. Çetintaş and Barışık (2009) and Iqbal, Tang and Rasool (2023) observe a one-way causal relationship between economic growth and exports, but Doraisami (1996) and Awokuse (2005) identify a two-way causal relationship between exports and economic growth. The significance of the matter for emerging nations, along with the long-standing implementation of Türkiye's foreign trade strategy, has generated interest in its influence on economic progress. The export-oriented economic growth paradigm, initiated by the decisions made on January 24, 1980, has persisted to the present day. To fully understand the effects of this technique, it is necessary to study the correlation between exports and economic growth carefully. Hence, numerous research works have examined the correlation between exports and economic growth in Türkiye.

In the context of this information, this study aims to examine the causality relationship between exports and economic growth in Türkiye and test the validity of the export-led growth hypothesis. For this purpose, the Fourier Toda-Yamamoto Granger Causality Analysis developed by Nazlioglu et al. (2016)

was applied between total exports compiled from monthly data between 2016 and 2023 and industrial production index variables representing economic growth. Although the number of studies on this subject is very high, it is impossible to define the relationship between them clearly. Assessing the influence of exports on economic growth and development will help reduce uncertainty to some degree.

The study's distinctiveness stems from its analysis of the specific examined period. The analysis of this study in 2016 is based on significant advancements that occurred during that year. The Turkish Exporters Assembly's Economy Foreign Trade Report (2017) highlights the substantial influence of some world events in 2016 and subsequent periods on Türkiye's economy and foreign trade. Specifically, the tightening of the monetary policy implemented by the Federal Reserve (FED) has been observed to harm developing nations like Türkiye. In recent years, the Federal Reserve (FED) has begun raising policy interest rates. The election of Donald Trump as the US president and the subsequent uncertain policies have had the greatest impact on this process. Furthermore, significant factors include the monetary policies the Central Bank of the Republic of Türkiye implemented, the attempted coup against the government, and the geopolitical circumstances in surrounding nations. Thus, 2016 marks a pivotal moment in the progression that resulted in substantial alterations in Türkiye's macroeconomic perspective. Several factors, including the migration of Syrians to Türkiye, the COVID-19 pandemic, military activities, and the earthquake on February 6, 2023, have occurred during the following period. Within the framework of these many advancements, this study addresses whether exports remain significant in Türkiye's economic growth trajectory and whether a causal relationship exists between them.

One distinctive feature of this study is incorporating approaches that include Fourier functions. The omission of structural breaks is one of the factors that hinders the attainment of accurate findings in research investigating the causal link between variables. The Fourier Toda-Yamamoto Granger Causality Test addresses a significant gap in current knowledge. It is crucial because it enables the internal identification of structural fractures while avoiding the loss of long-term information in stationary series at varying degrees. The study consists of 84 observations. Given the sample size, it might be contended that the findings derived from the chosen methodology will provide more insightful policy suggestions. The introduction section of this study outlines the significance, objectives, and methods of the research. Then, the theoretical and empirical literature on the subject is reviewed, and previous approaches and studies are compared. In the methodology section, the findings are analyzed, and these findings are discussed in the economic context in the conclusion section.

Theoretical framework

The correlation between foreign trade and economic growth is a key and crucial topic in economic growth and development theories. Chen (2009) states that classical economics posits that foreign trade impacts economic growth by enhancing resource allocation and efficiency and providing essential raw materials and equipment for economic development. Prominent examples of this notion include Adam Smith and David Ricardo's theory of advantage, John Mueller's "interests of trade development," and Robert Morrison's concept that "trade is the engine of economic growth." According to the Marxist perspective, the relationship is viewed in terms of exchange and production. Marx asserts that the organization and advancement of manufacturing influence the extent and scope of trade. Production expansion fosters market growth, whereas market size promotes production expansion. Nevertheless, these hypotheses only elucidate the link to a certain extent. The uncontrolled and intricate global setting has resulted in the development of alternative theories on the subject. The structuralist school posits that in a developing economy, the industrial sector absorbs excess labour from the agricultural sector, leading to economic growth by expanding export products. The new growth school associates international trade with economic growth and technological advancement, while the new trade school links international trade to economies of scale and knowledge-intensive sectors (Chen, 2009).

Aside from theoretical perspectives on how foreign trade affects economic growth, there has been a discussion on the sectors through which traded goods and services should be supplied. Many emerging nations aim to demonstrate economic progress by focusing on manufacturing. Kaldor argues that high economic growth rates are primarily achieved through the advancement of the manufacturing industry sector, asserting that this sector is the primary driver of growth. Kaldor's law states that industrial growth relies on foreign demand, specifically through exports (Kılavuz and Altay Topcu, 2012). Kaldor's law states that foreign demand reallocates surplus labour from the agriculture and service sectors to the industrial sector, leading to an overall production rise and balanced growth across all three sectors. Verdoorn also mentioned that the rise in production within the industrial sector leads to increased labour productivity. Verdoorn's law posits a direct correlation between the industrial sector's growth rate and the labour force's production level within that sector (Abdioğlu and Yamak, 2016).

Developing nations anticipate an export-focused approach with a well-distributed sectoral balance within the manufacturing sector to provide several benefits. Various perspectives exist regarding the benefits of using an export-driven approach for growth and development. Dawson (2005) states that exports result in earning foreign exchange, used to finance imported goods, capital goods, and technology that contribute to growth. Exporting also leads to competition, economies of scale, and technological progress while creating positive externalities like efficient production and management techniques that aid growth. Doraisami (1996) states that exports play a crucial role in generating foreign cash, enabling the trade of intermediate inputs and capital products internationally. These inputs may involve technology unavailable to local companies, hence enhancing productivity. Iqbal et al. (2023) contend that exports lead to an expansion in market size, compelling producers to offer more suitable expertise. Lal and Rajapatirana (1987) argue that competitive pressures hinder the formation of detrimental domestic monopolies and motivate local producers to enhance quality and lower expenses. Whether exports can contribute to a country's economic growth as a strategic choice will rely on their benefits.

Furthermore, the assistance for exports is not fully developed and without conditions, for there are drawbacks to following such a method. Hossain and Karunaratne (2004) argue that the effects of learning by doing may slow down in later stages and eventually stop if not supported by more technical advances; that reliance on exports in an uncertain world market may not lead to long-term sustainable growth in a developing country. In addition, Bakari and Mabrouki (2017) remind us that instability in the destination country due to higher-than-expected competition, the unpopularity of products in the market, internal conflicts or wars can lead to road accidents. Despite the drawbacks, the need for countries to demonstrate economic growth to thrive in the global environment has prompted them to prioritize exporting. By the late 1970s, most developing economies had abandoned import substitution policies favouring an export-oriented approach to growth and development (Doru and Dabakoğlu, 2021).

Over the years, economists have acknowledged the irrefutable reality of how exports support economic growth. The remarkable economic progress of the newly industrialized countries in East Asia is a prime illustration of this phenomenon. African and Latin American countries have experienced low development rates due to their more self-contained approaches, unlike the successful strategies adopted by other nations. Türkiye was a developing nation that changed its growth strategy to focus on exports. After the 1980s, Türkiye saw an export-oriented growth strategy as a more appropriate policy instrument instead of import substitution policies in its growth target. The connection between this favoured choice in Türkiye and economic development has consistently piqued curiosity. In this study, we have tried to look for clues about the existence of this relationship in Türkiye.

Literature review

Most research accounts examining the influence of total exports on economic growth have shown a correlation between the two. The outcomes from the causality analysis indicate either a unidirectional or bidirectional causality relationship between them. Simply put, exports are seen as the driving force behind economic growth, based on the thesis derived from the findings. Doraisami (1996) examined the correlation between total exports and economic growth in Malaysia from 1963 to 1993. The Durbin-Watson Cointegration Test (CIDW) and Error Correction Model (ECM) results indicate a positive long-term relationship between total exports and economic growth. The Granger Causality Test shows bidirectional causality between these variables. The results confirm the prevailing belief in Malaysia that exports drive economic growth and that an increase in exports will boost the economy of underdeveloped nations.

Awokuse (2005) analyzed the correlation between total exports and economic growth in South Korea from 1963 to 2001. The Granger Causality Test results indicate a reciprocal causal relationship between total exports and economic growth. The results provide evidence in favour of the export-led growth (ELG) theory for South Korea. Iqbal et al. (2023) studied how exports influenced economic growth in BRICS countries from 2000 to 2018. The panel data analysis using lagged autoregressive frontier test (ARDL), pooled mean group (PMG), and mean group (MG) methods revealed a long-term positive relationship between total exports and economic growth. The Dumitrescu Hurlin panel causality results also indicated a one-way causality from economic growth to total exports.

Vohra (2001) examined the correlation between total exports and economic growth in India, Pakistan, Philippines, Malaysia, and Thailand from 1973 to 1993. The findings of the least squares technique indicate a positive and robust link between total exports and economic growth in nations that have reached a specific degree of economic development. The results suggest that Malaysia, the Philippines,

and Thailand should focus on liberal and free market policies to promote export expansion and attract foreign investment. In contrast, India and Pakistan should refrain from implementing restrictive and regulatory policy measures. A few studies discuss the adverse correlation between exports and economic growth. Nelson, Gladice, Rivel and Yirong (2020) studied the influence of non-oil exports on economic growth in the Republic of Congo from 1985 to 2015. The vector autoregression model (VAR) findings indicate that non-oil exports harm economic growth. The results suggest that heavy reliance on the oil industry impedes other sectors' growth and obstructs the economy's diversification.

Çetintaş and Barişik (2009) investigated the correlation among total exports, total imports, and economic growth in 13 transition nations (Armenia, Belarus, Bulgaria, Czech Republic, Estonia, Hungary, Kazakhstan, Latvia, Lithuania) from 1995 to 2006. The Pedroni and Kao panel cointegration test results indicate a long-term association between the variables. In contrast, the Panel Granger Causality Test shows a one-way causality from economic growth to total exports. Enhanced productivity in manufacturing results in heightened competitiveness in terms of price and quality for countries, ultimately leading to a surge in exports over time. This outcome supports these countries' growth-led export premise. There is a bidirectional causality link between total imports and economic growth. Imports of commodities and technologies are crucial for the rapid economic expansion of newly market-oriented countries. The prevailing consensus in the research is that the absence of critical foreign inputs for industrialization in these nations has adverse consequences on economic growth. As output rises in certain countries, their incomes also increase, resulting in increased imports relative to industrialized nations. Bakari and Mabrouki (2017) analyzed the correlation among total exports, total imports, and economic growth in Panama from 1980 to 2015. The Johanson cointegration test results indicated no link between the variables. The Granger Causality Test indicates a bidirectional connection between total exports and economic growth, as well as between imports and economic growth. The causality results indicate that exports and imports drive economic growth in Panama.

Korkmaz (2014) examined the correlation between overall exports and economic development in Türkiye from 1998 to 2013. Granger Causality research revealed a unidirectional connection between total exports and economic growth. This outcome corroborates the export-oriented growth hypothesis. The significant reliance on imported raw materials and semi-finished products in Türkiye's exports contributes to a rise in imports, current account imbalance, and export growth. It is crucial to decrease reliance on imported raw materials and intermediary goods. Temiz (2010) presents an alternative perspective on the causal relationship between total exports and economic development. Between 1965 and 2009, the Johansen cointegration test indicated a long-term and positive correlation between the two variables. The Granger Causality Analysis revealed that overall exports do not drive economic development in the short term. Baktemur (2021) examined the correlation between overall exports and economic development using a non-linear approach. The results of the non-linear causality test by Diks and Panchenko (2006) for the years 2003-2020 indicate that total exports cause economic growth. A non-linear approach supports the concept that exports drive economic growth.

Data and methodology

This study uses time series analysis to examine the causal relationship between total exports and economic development in Türkiye from January 2016 to December 2023. The industrial production index was utilized as a representation of economic growth data in the analysis. The logarithms of these series were computed and examined. Details regarding the variables can be found in Table 1.

Table 1: Variables and Features

Country/Period	Variables	Abbreviation	Source
Türkiye 2016:1-2023:12	Industrial Production Index	EPI	TCMB
	Total Amount of Exports	EXP	TİM

Unit root test and findings: Fourier KPSS unit test

Becker, Enders and Lee (2006) created the Fourier KPSS Unit Root Test. This test considers both abrupt and gradual shocks, suggesting that shocks are not temporary. The model has been redesigned and is now exhibited.

$$y_t = X_t' \beta + Z_t' + r_t + \varepsilon_t$$

$$r_t = r_{t-1} + u_t$$

The equation in which the error term (not inclusive of a unit root) is denoted by ε_t presents u_t , showing the residuals of u that are uncorrelated with the variance but have a similar distribution.

This test is a vector where a trigonometric function, $Z_t = \left[\sin\left(\frac{2\pi kt}{T}\right), \cos\left(\frac{2\pi kt}{T}\right) \right]$, is included. Here, T refers to time, t to trend and k to frequency. To test the null hypothesis of stationarity, residuals are obtained, and test statistics for level stationarity and trend stationarity are calculated.

$$y_t = a_0 + \gamma_1 \sin\left(\frac{2\pi kt}{T}\right) + \gamma_2 \cos\left(\frac{2\pi kt}{T}\right) + e_t$$

$$y_t = a_0 + \beta_t + \gamma_1 \sin\left(\frac{2\pi kt}{T}\right) + \gamma_2 \cos\left(\frac{2\pi kt}{T}\right) + e_t$$

Error terms are derived, and the hypothesis is tested by implementing one of these models. The test statistics is calculated by

$$\tau_\mu(k) = \frac{1}{T^2} \frac{\sum_{t=1}^T \check{s}_t(k)^2}{\check{\sigma}^2}. \text{ Here, this conclusion is obtained:}$$

$$\check{s}_t(k) = \sum_{j=1}^T \check{e}_j$$

The absence of a non-linear trend in the data-generating process necessitates using the standard KPSS Unit Root Test. Becker et al. (2006) argue the null hypothesis of no linear trend using the F test statistic.

$$F_i(k) = \frac{(SSR_0 - SSR_1)/2}{SSR_1/(T - q)}$$

SSR_0 and SSR_1 denote the sum of residual squares, and q refers to the number of independent variables. The F test's strength demonstrates the importance of trigonometric variables in the model. If the F test statistic value exceeds the critical values, use the Fourier Kwiatkowski-Phillips-Schmidt-Shin (FKPSS) stationarity test. If the F test statistic value is below the critical values, use the standard Kwiatkowski-Phillips-Schmidt-Shin (KPSS) stationarity test (Naimoğlu and Özbek, 2022; Bayar, 2023). The Fourier KPSS and KPSS stationarity test outcomes for the variables are displayed in Table 2.

Table 2: Variables and Features

Variables	Level				
	Frequency	MINSSR	FKPSS	KPSS	F-Test
EPI	1	1.5068	0.443	1.234	25.933
EXP	1	2.831	0.435	1.109	30.47
Variables	First difference				
	Frequency	MINSSR	FKPSS	KPSS	F-Test
EPI	5	1.444	0.079	0.1074*	0.147
EXP	3	1.851	0.178	0.1365*	0.194

Note: For the F test, critical values are %1=6.730, %5=4.929, %10=4.133. For Fourier KPSS test, the critical values are %1=0.2700, %5=0.1735, %10=0.1323, for KPSS test, the critical values are %1=0.739, %5=0.463, %10=0.347.

When analyzing Table 2, if the F test statistic exceeds the critical levels, indicating the significance of the trigonometric functions, the results of the Fourier KPSS test will be interpreted. The Fourier KPSS test results indicate that the test statistics for the industrial production index (EPI) and total exports (EXP) exceed the critical values at the 1% significance level. Therefore, the null hypothesis suggesting the stationarity of the series is rejected, and it is concluded that the series are unit-rooted. According to Fourier KPSS Unit Root Tests, the series are non-stationary at their level values.

Both variables in the model were re-tested for stationarity by calculating their initial differences. The F-test statistic value for the variables using trigonometric functions was below the critical values for both variables, indicating insignificance. Thus, the outcomes of the conventional KPSS test will be analyzed. Results of the KPSS test indicate that the test statistic values for both variables are below the critical values. This suggests that the null hypothesis stating that the series is stationary cannot be disproved. Thus, both variables achieve stationarity after the initial difference is taken.

Causality analysis and findings: Fourier Toda-Yamamoto Granger causality test

The Granger (1969) Causality Method relies on the VAR model to establish causal relationships between variables. To utilize this test, the series must be stationary. Causality is tested on non-stationary data following differencing. This results in long-term information loss. For the Granger Causality Test, the series must be stationary in the same order (Yurtkuran, 2021). The Toda-Yamamoto (1995) causality technique addressed the shortcomings of the Granger Causality Test. The Toda-Yamamoto (1995) Causality Test is applicable when the time series exhibit varying levels of stationarity. Toda-Yamamoto's (1995) Causality Test does not consider structural discontinuities, according to Akardeniz (2023).

The Fourier Toda-Yamamoto Granger Causality Test, created by Nazlıoğlu et al. in 2016, enables the internal detection of structural changes by incorporating Fourier terms into the VAR model. Fourier terms are incorporated into the VAR model instead of a constant term to account for variations in the dependent variable, as stated by Konat (2021). The equation derived from a single Fourier frequency is as follows:

$$y_t = \alpha_0 + \sum_{k=1}^n \alpha_k \sin\left(\frac{2\pi kt}{T}\right) + \sum_{k=1}^n b_{2k} \cos\left(\frac{2\pi kt}{T}\right) + \beta_1 y_{t-1} + \dots + \beta_{p+d} y_{t-(p+d)} + \varepsilon_t$$

In the equation for the single frequency Fourier Toda-Yamamoto Causality Test, the variable *k* represents the number of frequencies. The null hypothesis states that there is no causal relationship between the series. The Fourier Toda-Yamamoto Test results for the variables are displayed in Table 3.

Table 3: Fourier Bootstrap Toda-Yamamoto Causality Test Results

Variables	WALD Test Statistics	Asymptotic Value	Bootstrap p Value	k	p
EXP→ EPI	20.321	0.000	0.000*	1	3
EPI→ EXP	14.624	0.002	0.003*	1	3

Note: * indicates the presence of a causality relationship from the first variable to the second variable at the 1% significance level. Schwarz Information Criterion was used in deciding the *k* and *p* values, and the Bootstrap *p*-value was obtained with 2,000 cycles.

Table 3 displays the results of the Fourier Toda-Yamamoto Causality Test, indicating a bidirectional causation link at the 1% significant level between EPI (industrial production index) and EXP (total amount of exports).

Conclusion

Support for liberalization policies worldwide was reflected in Türkiye after the 1980s with the implementation of the decisions on January 24, 1980. These choices, still subject to discussion, involved a series of structural changes aimed at liberalization. One crucial decision was transitioning from an import substitution growth plan to an export-oriented growth strategy. In Türkiye, domestic goods and firms, previously shielded by high taxes on imported products, transitioned to an export-focused strategy to enhance their competitiveness and boost economic growth through increased exports. Decisions like liberalizing foreign exchange controls and imports, scrapping subsidies except for strategic industries, promoting foreign capital, and exempting imported inputs from taxes should have supported Türkiye's export-focused growth plan. The theory discusses the advantages of international trade and suggests implementing it with either an export-oriented or import-oriented strategy, each with its pros and downsides.

In this context, the relationship between the export strategy implemented in Türkiye and economic growth has been extensively studied. This study aimed to investigate the causal relationship between total exports and economic growth in Türkiye. Fourier Toda-Yamamoto Granger Causality Analysis, a variation of the Toda-Yamamoto Granger Causality Test created by Nazlıoğlu et al. (2016), revealed a bidirectional causality relationship between total export volume and economic growth in Türkiye from 2016 to 2023. This discovery corroborates the export-driven growth theory in Türkiye. The findings align with the bidirectional causality studies by Doraisami (1996), Awokuse (2005), Çetintaş and Barışık (2009) and the unidirectional causality studies by Korkmaz (2014), Bakari and Mabrouki (2017), Baktemur (2021) regarding total exports and economic growth, as well as Iqbal et al. (2023) regarding economic growth and exports. In the theoretical literature, alongside the Neoclassical approach, which posits a causal link between exports and economic growth, Doraisami (1996) suggests the possibility of a reverse causation relationship that might result in an expansion of exports. Therefore, the results of this study provide evidence for both the Neoclassical perspective that exports impact economic growth

and the notion that there is a cause-and-effect relationship between economic growth and exports, as Doraisami (1996) proposed.

Furthermore, it is essential to consider the influence of many global and local events while analyzing these data. The monetary tightening strategy implemented by the US Federal Reserve (FED) in 2016 has significantly impacted developing countries like Türkiye. The FED's decision to raise interest rates adversely affected the countries facing foreign exchange shortages. As a result, currency rates have experienced significant surges. Despite the devaluation of the domestic currency, which resulted in lower prices for export commodities in global trade, the high proportion of imported intermediate goods used to produce these items prevented the country from fully capitalizing on this advantage. Various global factors, including economic contractions worldwide, China's influence on global trade, Donald Trump's presidency and its impact on international trade, the COVID-19 pandemic, geopolitical developments in neighbouring countries, and domestic events such as the attempted coup in Türkiye in 2016, the influx of Syrian migrants, military operations, and the February 6 earthquake, have significantly influenced Türkiye's macroeconomic structure. These factors have collectively resulted in significant price hikes due to rising input costs. The production and export industries have played a crucial role in this chain of influence.

Notwithstanding these difficult circumstances, Türkiye's export volume has increased. Exports are crucial in reducing the current account deficit, which is the underlying cause of Türkiye's persistent economic issues. Consequently, measures have been implemented to enhance the resilience of exports over an extended period. The primary policies enacted include various incentives and assistance provided to export sectors as well as tax reductions and exemptions. Furthermore, ongoing efforts are to enhance competitiveness in international trade through technical investments and the development of regulatory laws. Furthermore, Türkiye is a vibrant nation that has consistently expanded its economy across all periods. The findings indicate that exports significantly impact economic growth and development; conversely, economic growth leads to increased exports. The literature and our study demonstrate a high correlation between economic growth and an export-oriented growth strategy. The discussion on Türkiye's path towards liberalization post-1980s and its resulting impacts is still ongoing and inconclusive. Türkiye's export growth heavily relies on imported intermediate products, resulting in trade imbalances as exports rise. Decreasing reliance on imported intermediate goods in export products will strengthen the connection between exports and economic growth and support the implementation of a suitable growth strategy.

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References

- Abdioğlu, Z., & Yamak, R. (2016). The Relationship between Productivity and Output in the Turkish Manufacturing Industry:Verdoorn Law. *International Journal of Economic Studies*, 2(2), 81-91.
- Akardeniz, E. (2023). Evidence from Fourier Toda-Yamamoto causality test for exchange rate determinants in Türkiye. *Business & Management Studies: An International Journal*, 11(3), 772-787.
- Awokuse, T. O. (2005). Exports, economic growth and causality in Korea. *Applied Economics Letters*, 12(11), 693-696.
- Bakari, S., & Mabrouki, M. (2017). Impact of Exports And Imports on Economic Growth: New Evidence from Panama. *Journal of Smart Economic Growth*, 2(1), 67-79.

- Baktemur, F. İ. (2021). Analysis of the Non-linear Causal Relationship between Exports and Economic Growth in Turkey. *Osmaniye Korkut Ata University Journal of Economics and Administrative Sciences*, 5(1), 80-90.
- Bayar, İ. (2023). The Impact of Health Expenditures on Turkey's Economic Growth: Evidence from Fourier Unit Root and Cointegration Test. *Journal of Management and Economics*, 30(100. Yıl Özel Sayısı), 127-146.
- Becker, R., Enders, W., & Lee, J. (2006). A Stationarity Test in the Presence of an Unknown Number of Smooth Breaks. *Journal of Time Series Analysis*, 27(3), 381-409.
- Chen, H. (2009). A Literature Review on the Relationship between Foreign Trade and Economic Growth. *International Journal of Economics and Finance*, 1(1), 127-130.
- Çetintaş, H., & Barişik, S. (2009). Export, Import and Economic Growth: The Case of Transition Economies. *Transition Studies Review*, 15, 636-649.
- Dawson, P. J. (2005). Agricultural exports and economic growth in less developed countries. *Agricultural Economics*, 33(2), 145-152.
- Diks, C., & Panchenko, V. (2006). A new statistic and practical guidelines for nonparametric Granger causality testing. *Journal of Economic Dynamics and Control*, 30(9-10), 1647-1669.
- Doraisami, A. (1996). Export Growth and Economic Growth: A Reexamination of Some Time-Series Evidence. *The Journal of Developing Areas*, 30(2), 223-230.
- Doru, Ö., & Dabakoğlu, M. (2021). The Relationship between High-Technology Product Export and Economic Growth in Selected Countries. *Journal of Economics and Administrative Sciences*, 5(2), 295-313.
- Granger, C. W. (1969). Investigating Causal Relations by Econometric Models and Cross-spectral Methods. *Econometrica*, 37(3), 424-438.
- Hossain, M., & Karunaratne, N. (2004). Exports and Economic Growth in Bangladesh: Has Manufacturing Exports Become a New Engine of Export-Led Growth? *The International Trade Journal*, 18(4), 303-334.
- Hussain, H. I., Haseeb, M., Kot, S., & Jermisittiparsert, K. (2020). Non-Linear Impact of Textile and Clothing Manufacturing on Economic Growth: The Case of Top-Asian Economies. *Fibres & Textiles in Eastern Europe*, 5(143), 27-36.
- Iqbal, A., Tang, X., & Rasool, S. F. (2023). Investigating the Nexus between CO2 Emissions, Renewable Energy Consumption, FDI, Exports and Economic Growth: Evidence From BRICS Countries. *Environment, Development and Sustainability*, 25, 2234-2263.
- Kilavuz, E., & Altay Topcu, B. (2012). Export and Economic Growth in the Case of the Manufacturing Industry: Panel Data Analysis of Developing Countries. *International Journal of Economics and Financial Issues*, 2(2), 201-215.
- Konat, G. (2021). Public Expenditure and Foreign Trade Relationship in Turkey: Fourier Causality Approach. *International Journal of Management Economics and Business*, 17(3), 900-917.
- Korkmaz, S. (2014). Causality Relationship between Export and Economic Growth in Turkish Economy. *Business and Economics Research Journal*, 5(4), 119-128.
- Lal, D., & Rajapatirana, S. (1987). *Foreign Trade Regimes and Economic Growth in Developing Countries*. Oxford University Press, 2(2), 189-217.
- Naimoğlu, M., & Özbek, S. (2022). Revisiting of The Relationship Between Defense Expenditures and Economic Growth in Turkey: A Fourier Approach. *İzmir Journal of Economics*, 37(1), 174-188.
- Nazlioglu, S., Gormus, N., & Soytas, U. (2016). Oil prices and real estate investment trusts (REITs): Gradual-shift causality and volatility transmission analysis. *Energy Economics*, 60, 168-175.
- Nelson, O. N., Gladice, O., Rivel, B., & Yirong, Y. (2020). Impact of Exports on Economic Growth in the Non Oil Sector in the Republic of Congo. *International Journal of Economics and Finance*, 12(3), 46-54.
- Radelet, S. (1999). *Manufactured Exports, Export Platforms, and Economic Growth*. Cambridge: Harvard Institute for International Development Consulting Assistance on Economic Reform II.

- Schmid, G., & Phillips, O. (1980). Textile trade and the pattern of economic growth. *Weltwirtschaftliches Archiv*, 116, 294-306.
- Temiz, D. (2010). The Relationship Between Real Export and Real GDP in Turkey: The Period of 1965-2009. *Hitit Journal of Social Sciences*, 3(1-2), 71-82.
- Toda, H. Y., & Yamamoto, T. (1995). Statistical Inference in Vector Autoregressions with Possibly Integrated Processes. *Journal of Econometrics*, 66(1-2), 225-250.
- Türkiye İhracatçılar Meclisi. (2018). Economy Foreign Trade Report 2017 . İstanbul: Türkiye İhracatçılar Meclisi.
- Velnampy, T., & Achchuthan, S. (2013). Export, Import and Economic Growth: Evidence from Sri Lanka. *Journal of Economics and Sustainable Development*, 4(9), 147-155.
- Vohra, R. (2001). Export and Economic Growth: Further Time Series Evidence from Less-Developed Countries. *International Advances in Economic Research*, 7, 345-350.
- Yurtkuran, S. (2021). Is the Pollution Haven Hypothesis Valid for Turkey? Evidence from Fourier Cointegration and Causality Methods. *Journal of Academic Researches and Studies*, 13(24), 61-77.