Ekonomik Özgürlüğün Büyüme Üzerindeki Etkisi: Küreselleşme ve İnsani Gelişim Bağlamında Bir Değerlendirme

The Influence of Economıc Freedom on Growth: an Assessment Within the Context of Globalization and Human Development

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Özet

Bu çalışma, ekonomik özgürlüğün ekonomik büyüme üzerindeki etkisini küreselleşme ve insani gelişmişlik çerçevesinde incelemektedir. 1999-2022 dönemi Türkiye verileri kullanılarak Toda-Yamamoto nedensellik testi uygulanmış ve değişkenler arasındaki dinamik ilişkiler analiz edilmiştir. Bulgular, ekonomik özgürlüğün ekonomik büyümeyi ve küreselleşmeyi anlamlı şekilde etkilediğini, ayrıca insani gelişmişliğin bu etkileşimde önemli bir rol oynadığını göstermektedir. Küreselleşmenin ekonomik büyüme üzerindeki etkisinin değişkenlik gösterdiği ve kurumsal yapı ile politika çerçevelerine bağlı olduğu tespit edilmiştir. Sonuçlar, ekonomik özgürlüğün ekonomik genişlemeyi teşvik ettiğini ancak sosyal ve çevresel faktörleri de içeren dengeli politikaların benimsenmesi gerektiğini ortaya koymaktadır. Ayrıca, kurumsal kalitenin artırılması ve sürdürülebilir küreselleşme politikalarının benimsenmesi, uzun vadeli ekonomik istikrar açısından kritik öneme sahiptir.

Anahtar Kelimeler: Ekonomik özgürlük, ekonomik büyüme, küreselleşme, insani gelişmişlik, Toda-Yamamoto nedensellik testi

Abstract

This study examines the impact of economic freedom on economic growth within the framework of globalization and human development. Using data from 1999 to 2022 for Turkey, the Toda-Yamamoto causality test is applied to analyze the dynamic relationships between variables. The findings reveal that economic freedom significantly influences economic growth and globalization, while human development also plays a crucial role in this interaction. Additionally, globalization's effects on economic growth vary, indicating that its benefits depend on institutional and policy frameworks. The results suggest that while economic freedom fosters economic expansion, policymakers should consider balanced strategies that incorporate social and environmental factors. Furthermore, enhancing institutional quality and ensuring sustainable globalization policies are critical for long-term economic stability. This study contributes to the literature by highlighting the multidimensional role of economic freedom in economic development and providing policy insights for emerging economies.

Keywords: Economic freedom, economic growth, globalization, human development, Toda-Yamamoto causality test

1. INTRODUCTION

Economic growth is a crucial metric in the sustainable development processes of nations, influencing not only welfare enhancement but also several elements such as income distribution, employment, and living standards. Nonetheless, assessing economic growth exclusively through output and income augmentation is inadequate in contemporary economic discourse; it is underscored that structural components that improve individuals' economic and social wellbeing are also pivotal in this process. In this environment, economic freedom, globalization, and human development emerge as essential variables affecting economic growth. The interplay among these factors distinguishes the growth performances of nations and significantly influences political decision-making processes.

Economic freedom denotes the extent to which individuals and enterprises can engage in economic activity through market methods, free from governmental interference. The classical economic perspective posits that nations with elevated economic freedom have enhanced market efficiency, foster entrepreneurship, and achieve greater stability in long-term prosperity. Nonetheless, there are objections that the total abrogation of the state's regulatory function in the market may result in market failures and exacerbate wealth disparity. The relationship between economic freedom and growth, along with the mechanisms involved, remains a subject of ongoing theoretical and empirical debate.

Globalization is characterized as a process that enhances interconnectedness across economic systems, facilitates capital movement, amplifies trade volume, and accelerates technological dissemination. The impact of globalization on economic growth has been thoroughly examined in the literature, revealing that this relationship differs among countries and the elements of globalization. Economic globalization can foster prosperity by enhancing openness and expediting international investment flows; yet, it may also introduce hazards, including financial crises and economic volatility. Social and political globalization, although significantly enhancing individual living standards, is posited to potentially exacerbate socio-economic disparities in certain nations. Consequently, the influence of globalization on growth requires thorough examination.

The notion of human development serves as a crucial metric that assesses the extent to which economic growth influences individuals' quality of life, encompassing factors such as income distribution, education, and health. Amartya Sen's human development approach posits that economic growth should not be assessed merely by the rise in national wealth, but rather from a more comprehensive viewpoint that encompasses individuals' access to fundamental necessities. The impact of human development on economic growth and its relationship with economic freedom is becoming increasingly significant for policymakers.

This study seeks to assess the influence of economic freedom on economic growth within the frameworks of globalization and human development. The study will explore the causal relationship between economic freedom and growth, focusing on the factors of globalization and human development. Time series analyses will be performed utilizing the Economic Freedom Index (EFI), Globalization Index (GI), Human Development Index (HDI), and Economic Growth Rate (GDP) variables. The Toda-Yamamoto causality test will be utilized to assess the long-term links among the variables in the context of empirical study. The study seeks to enhance the discourse in the literature concerning the influence of economic freedom on economic growth and to furnish actionable insights for policymakers.

2. THEORETICAL FRAMEWORK

Economic freedom is a concept that refers to the capacity of individuals to carry out economic activities without government intervention. This notion encompasses aspects such as the

safeguarding of property rights, trade liberty, the state's function in the market, and regulatory measures (Gwartney, Holcombe, & Lawson, 2004, p. 208). The notion of economic freedom, discussed by classical economists, was elaborated in Adam Smith's "The Wealth of Nations" (1776) in relation to free market principles. Smith contended that individuals' capacity to make autonomous economic judgments is essential for the effective operation of markets and fosters economic growth (Yay & Ezanoğlu, 2023, p. 1336). The global economic freedom index values for 2024 indicate that Turkey possesses a moderate level of economic freedom.
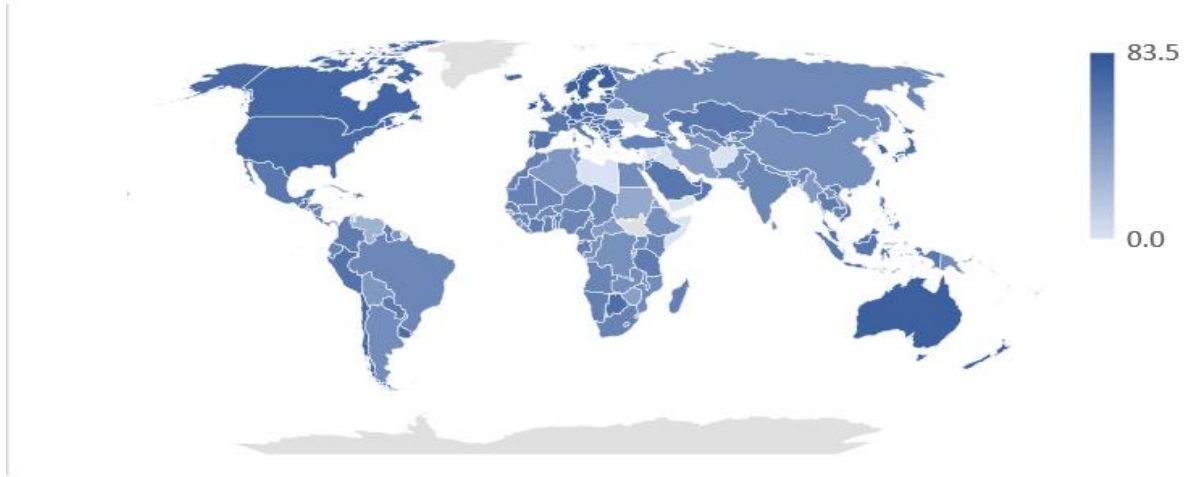
Source: (The Heritage Foundation, 2025)

Figure 1. 2024 Dünya geneli ekonomik özgürlük endeksi (ülkeler bazında)

The economic freedom index, although a significant metric for assessing the growth and wellbeing of nations, does not independently ensure economic success. Wealthy countries generally have high economic freedom and demonstrate sustainable growth thanks to free market mechanisms and strong institutional structures. Nevertheless, in many nations, challenges like as income disparity and market monopolization may restrict the advantages of economic liberty. On the other hand, in poor countries, low economic freedom, corruption, public intervention, and market restrictions hinder economic development, but in some countries, the state's strategic interventions can yield positive results in development processes. Turkey is at a medium level in terms of economic freedom and is struggling to strengthen its investment environment due to macroeconomic instability, uncertainties regarding the rule of law, and unpredictability in regulations. Although enhancing economic freedom is a crucial component of growth, a comprehensive development strategy must be formulated that does not overlook aspects such as social justice and wealth distribution. The insufficiency of a comprehensive viewpoint in elucidating the components of economic freedom becomes evident.

Table 1. Components of the concept of economic freedom

Factors	Components		
Rule of Law	property rights	government integrity	judicial effectiveness
Government Size	tax burden	government spending	fiscal health
Regulatory Efficiency	business freedom	labor freedom	monetary freedom
Open Markets	trade freedom	investment freedom	financial freedom

Source: (The Heritage Foundation, 2025)

The index is determined by four primary criteria and twelve variables associated with these characteristics. Each of the twelve economic liberties under these categories is evaluated on a scale from 0 to 100. The total score of a country is derived by averaging twelve economic liberties, each assigned equal weight (The Heritage Foundation, 2025).

The elements comprising the Economic Freedom Index do not consistently reinforce one another; in certain nations, specific components are robust while others are deficient. For example, although Germany scores high in terms of the rule of law due to strong property rights and judicial independence, excessive financial regulations limit market efficiency. Conversely, while China has assimilated into the global market through investment and trade liberalization, its inadequate property rights and weak rule of law provide a risk to long-term investment security. Although Sweden is successful in terms of fiscal soundness and budget discipline, it exhibits a structure that contradicts the principle of limited government due to its high tax burden and extensive public spending. Similarly, although France has strong mechanisms for ease of doing business, the rigidity of its labor regulations results in low labor market flexibility. Despite Argentina's provision of a free financial market structure, its monetary flexibility is significantly constrained by elevated inflation rates. These examples illustrate how the components of economic freedom differ between countries and, in some cases, can lead to contradictory outcomes instead of supporting each other. A comparable scenario exists in Turkey, where analogous imbalances are evident in the analysis of the nation's economic freedom dynamics.
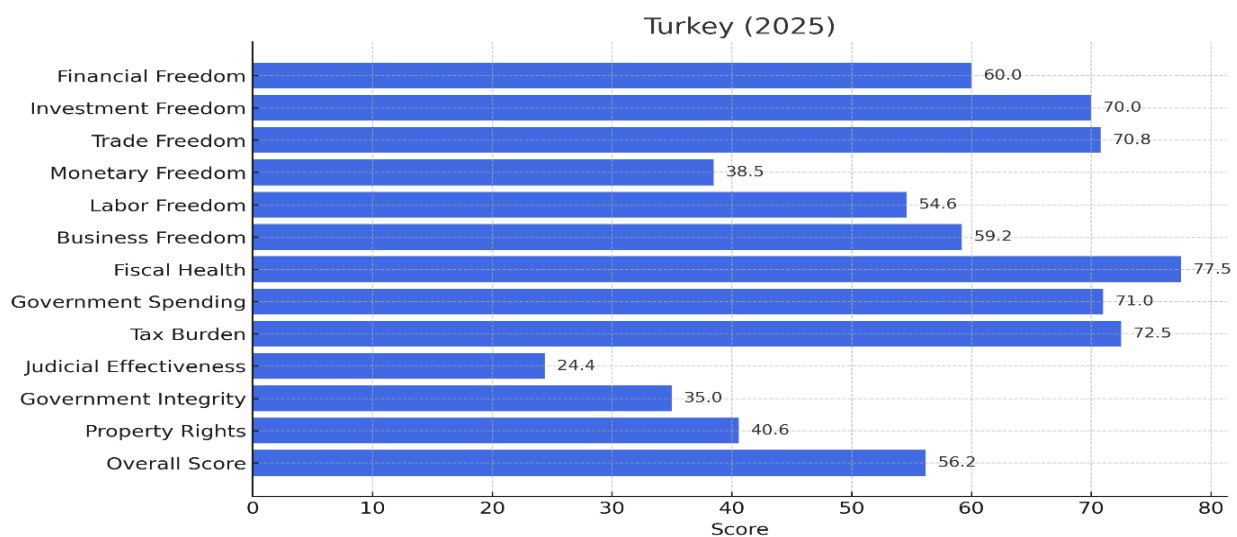
Source: (The Heritage Foundation, 2025)

**Figure 2.** 2024 Türkiye ekonomik özgürlük endeksi bileşenleri

In Turkey, while some components determining economic freedom support each other, others

exhibit a contradictory structure. Although there are mechanisms that encourage entrepreneurship in terms of ease of doing business, high inflation and uncertainties in monetary policies suppress monetary freedom. Uncertainties regarding property rights and judicial independence can negatively affect long-term investment decisions, while despite the relatively low tax burden, concerns about the increase in public spending and fiscal discipline make macroeconomic stability difficult. These examples show that the factors constituting economic freedom do not always support each other and that conflicting economic policies in some countries can hinder the effective functioning of market mechanisms. Therefore, the balanced implementation of economic reforms is of critical importance for sustainable development.

When considering the impact of economic freedom on growth, the functioning of free market mechanisms and the level of government intervention emerge as important determinants. However, economic growth is not solely determined by internal dynamics; elements such as trade between countries, capital mobility, and technology transfer, as part of the global integration process, also play a decisive role. In this context, the relationship between the process of globalization and economic growth, and the outcomes of this relationship in different countries, is an important topic of discussion.

Globalization refers to the process of integration between economies through elements such as the free movement of goods and services, capital mobility, technological diffusion, and the flow of information (Gygli, Haelg, Potrafke, & Sturm, 2019). Globalization, addressed in three fundamental dimensions: economic, social, and political, particularly within the scope of economic globalization, directly impacts economic growth through dynamics such as the liberalization of international trade, the increase in foreign direct investments (FDI), and the deepening of financial integration (Dreher, 2006). With the widespread adoption of free trade policies, countries are optimizing their production by utilizing their comparative advantages and supporting economic growth by accessing new markets. However, the acceleration of technological developments and the proliferation of global supply chains are driving up growth rates by promoting efficiency gains (Ünkaracalar, 2022).

Globalization, a multifaceted process, causes transformations in various fields, but it particularly stands out with its economic, political, and social dimensions. Economic globalization, as shown in Figure 3, illustrates economic growth through the expansion of international trade flows, the integration of financial markets, international labor mobility, and technological innovations:
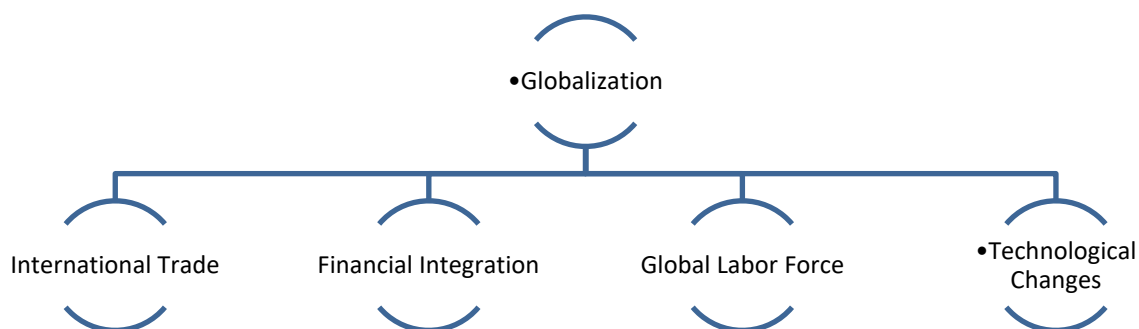

Source:(Husain, 2000)

Figure 3. Components of globalization

For a more comprehensive analysis of the relationship between economic growth and globalization in a Figure, globalization must be made measurable. In this context, various indicators have been developed to assess the levels of economic, political, and social integration of countries. One of

the most widely used among these is the KOF Globalization Index, designed by Axel Dreher in 2002 at the Swiss KOF Institute for Economic Research. This index provides a multidimensional perspective on globalization, enabling comparative analyses (Caselli, 2012). The measurement of globalization is conducted through various indices that capture its different components. These indices help determine the level of global integration among countries by considering the economic, political, and social dimensions of globalization.

Among the most frequently used globalization indices in the literature are the KFP (A.T. Kearney/Foreign Policy Globalization Index) developed in 2001, the KOF Globalization Index (2002), the CSGR (The Centre for the Study of Globalisation and Regionalisation) Globalization Index (2004), the MGI (The Maastricht Globalisation Index) (2008), the NGI (New Globalization Index) (2010), and the PBGI (Person-Based Globalization Index) (2012) (Samimi, Lim, & Buang, 2012, p. 29). These indicators allow for a comparative evaluation of globalization by analyzing its various aspects.

Considering that globalization should be measured not only in economic terms but also in social and political dimensions, the KOF Globalization Index distinguishes itself from other indices. Due to its ability to provide a multidimensional assessment, it is regarded in the literature as one of the most comprehensive and reliable measures of globalization (Topuz, 2017, p. 787). In light of these indices, an examination of Turkey's scores reveals the following insights:
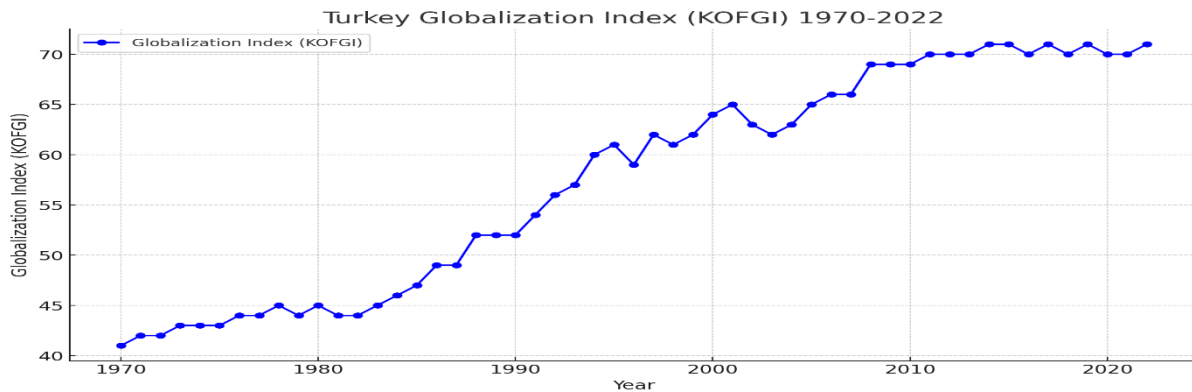

Source: ("KOF Globalisation Index", 2024)

Figure 4. General scores of the Turkey KOF Globalization Index for the period 1970-2022

2024 yılı KOF Küreselleşme Endeksi puan sıralamasına bakıldığında ise Türkiye'nin 215 ülke arasında 54. Sırada yer aldığı görülmektedir("KOF Globalisation Index", 2024). The Turkey Globalization Index (KOFGI) from 1970 to 2022 demonstrates a general upward trend, reflecting the country's increasing integration into the global economy. In the 1970s and 1980s, the index exhibited slow but steady growth, remaining within the 40-50 range. The pace of globalization accelerated in the 1990s, particularly after trade liberalization policies and Turkey's integration into the Customs Union with the European Union (1996). The early 2000s saw a significant rise, with the index surpassing 60, driven by economic reforms and greater international economic participation.

Despite the 2008 Global Financial Crisis, Turkey's globalization index remained stable at around 69. However, in the post-2010 period, the index fluctuated within the 70-71 range, suggesting that globalization reached a saturation point, with no major increases. Political and economic uncertainties in 2016 caused slight instability, but the overall trend remained relatively constant. The data suggests that Turkey's globalization process has experienced periods of rapid expansion,

as well as phases of stagnation influenced by economic crises and geopolitical factors. While the country has become significantly more globalized since the 1970s, the stabilization in the last decade indicates that structural or external factors may be limiting further integration. The Human Development Index (HDI) is an indicator that measures human development across three fundamental dimensions: health, education, and standard of living. It is calculated based on life expectancy at birth, mean and expected years of schooling, and gross national income per capita (GNI per capita). To account for the diminishing marginal utility of income, a logarithmic transformation is applied to GNI calculations. The normalized sub-indices of these three components are aggregated into a single composite index using the geometric mean method (UNDP, 2025). The HDI provides a comparative framework for analyzing the impact of national policies on human development, enabling cross-country comparisons. Moreover, it helps explain why countries with similar income levels may exhibit differing levels of human development, offering valuable insights into the role of policy choices in shaping socio-economic progress.
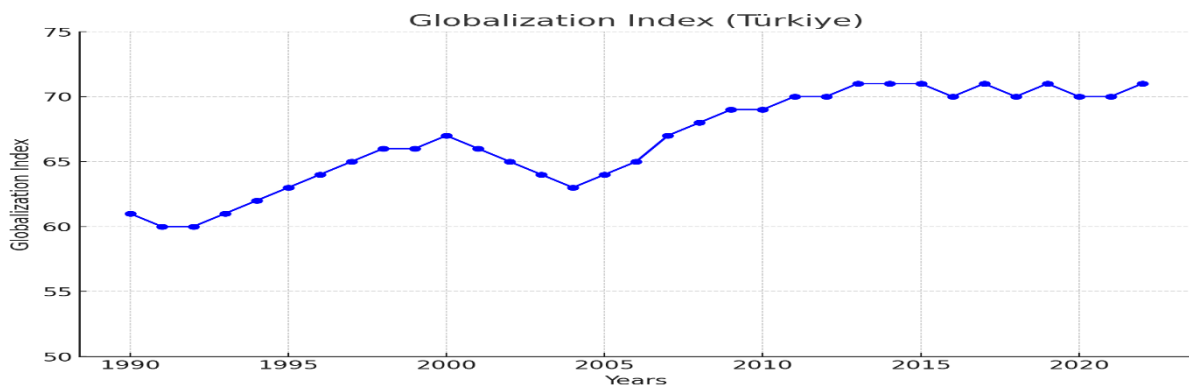
Source: (UNDP, 2025)

Figure 5. Globalization index scores for Türkiye in the 1995-2022 period

The figure (5) shows the change in Turkey's Globalization Index (KOFGI) between 1990 and 2022. Overall, it is observed that the index has been on an upward trend over the years. The index, which fluctuated around the 60 levels in the 1990s, experienced a slight decline at the beginning of the 2000s due to the impact of the 2001 economic crisis, but it began to rise again after 2005. By the time the 2010s arrived, the index reached the 70 levels and began to follow a relatively stable course from this point onward. In the post-2020 period, while there were no major changes in the level of globalization, it is observed that the increase has slowed down due to the impact of the pandemic and global economic uncertainties. Turkey's globalization process has been directly shaped by economic crises, liberalization policies, and global economic dynamics. The stagnation of the globalization level in the post-2010 period may suggest that Turkey has reached a certain saturation point in global integration.

3. LITERATURE REVIEW

The impact of economic freedom on economic growth is a widely studied topic in the literature, with various studies conducted across different countries and periods indicating that economic freedom serves as a catalyst for growth. Yay and Ezanoğlu (2023) found that economic freedom has a unidirectional causal effect on economic growth in Turkey, while Tunçsiper and Biçen (2015, 2014) examined the effects of different components of economic freedom on growth in emerging market economies. Their findings suggest that business freedom and trade freedom positively influence economic growth, whereas property rights and investment freedom may have negative effects under certain conditions. Similarly, Gwartney, Holcombe, and Lawson (2004) emphasized the role of economic freedom in supporting long-term growth through institutional structures and

investment levels. Bucak and Gacener Atış (2021) analyzed BRICS-T countries and concluded that social globalization has a positive impact on economic growth, whereas political globalization may have detrimental effects.

Parallel to its impact on growth, economic freedom's relationship with human development has also been widely explored in the literature. Güney (2017) found that economic freedom enhances human development by improving education, health, and overall quality of life in OECD countries. Similarly, İmre (2022) demonstrated a long-term positive relationship between economic freedom and human development in the Fragile Five countries, indicating that increased economic freedom significantly raises human development levels. Bucak (2022) examined E7 countries and concluded that economic freedom promotes human development, though balanced policies are necessary to ensure environmental sustainability. These findings suggest that while economic freedom contributes to individual well-being, policymakers should also consider its environmental implications when designing policies.

The relationship between globalization and economic growth is particularly significant for developing economies. Studies suggest that globalization's effects on economic growth vary depending on the country and the specific components of globalization. Ausianikava (2023) found that globalization generally contributes positively to economic growth, though social globalization may produce adverse effects in certain countries. Radulović and Kostić (2020) analyzed Eurozone countries and observed that economic globalization positively affects growth, whereas political globalization has long-term restrictive effects on economic expansion. Çeştepe, Ergün Tatar, and Erdoğan (2023) investigated the Turkish case and found that economic globalization supports economic growth through investment and trade channels, yet overall globalization levels may be linked to macroeconomic vulnerabilities. In a broader context, Ünkaracalar (2022) identified a bidirectional causality between globalization and economic growth but noted that financial and political globalization may exert varying effects on growth over time.

Beyond its implications for growth, globalization is also a crucial determinant of income inequality and human development. Faustino and Vali (2013) found that trade openness reduces income inequality, while the effect of foreign direct investment on inequality is contingent on model specifications. Ahmad (2017) concluded that economic freedom exacerbates income inequality; however, democratic regimes can mitigate this adverse effect. Similarly, Hasan and Waheed (2020) demonstrated that foreign direct investment enhances human development in South Asian countries, whereas trade openness negatively affects the Human Development Index (HDI). Aigheyisi (2013) examined Nigeria's case and found that trade openness and financial liberalization negatively affect economic growth and human development, while migration flows exert a positive influence on economic growth. Ay (2025) examined the relationship between social expenditures, which are generally positively related to growth in the literature, and the human development index. It concluded that there is a positive relationship between social expenditures and human development index in Türkiye in the period 1990-2019.

Another critical factor influencing growth is foreign aid. Empirical studies indicate that the effectiveness of foreign aid in fostering economic growth largely depends on a country's institutional framework and level of economic freedom. Abate (2022) identified an inverted U-shaped relationship between foreign aid and economic growth, implying that aid promotes growth up to a certain threshold but becomes detrimental beyond that level. The study further highlighted that institutional reforms and enhanced economic freedom are essential for maximizing the positive effects of foreign aid on growth.

Taken together, these findings suggest that economic freedom generally exerts a positive influence

on economic growth and human development, although its impact may vary based on the institutional and economic structures of different countries. While globalization is generally associated with higher economic growth, financial and political globalization may sometimes yield negative consequences. Moreover, the effectiveness of foreign aid in promoting growth is contingent upon economic freedom and institutional quality. Considering these dynamics, policies aimed at strengthening economic freedom, managing globalization sustainably, and reinforcing institutional reforms play a crucial role in ensuring long-term economic growth and stability.

4. DATA SET AND METHODOLOGY

4.1 Data Set

In this study, the impact of the economic freedom index on other important variables in the Turkish economy was tried to be measured by using annual data for the sample period 1999-2022. In the econometric model, the economic freedom index is taken as the dependent variable and its interactions with the human development index (HDI), globalization index (GI) and economic growth (gross domestic product annual growth rate) (GDP), which is added as a control variable, are tried to be measured. Considering the availability of the series used in the study, the study period is accepted as 1999-2022. The definitions and sources of the series used in the study are presented in Table 2;

Table 2. Table of variables

Variable	Notation	Source
The Economic Freedom Index	EFI	Herritage.org
Human Development Index	HDI	United Nations Development Program (UNDP)
Globalization Index	GI	Swiss Institute for Development Research (KOF)
Economic Growth rate	GDP	World Bank (WDI)

The Economic Freedom Index is an index that measures the extent to which countries ensure economic freedom and assess their economic policies. This index evaluates the degree to which individuals and businesses can engage in economic activities freely and is generally calculated based on key indicators such as property rights, government intervention, regulatory efficiency, and market openness. It is measured across four main areas: rule of law (property rights, control of corruption), size of government (public expenditures, tax burden, fiscal health), regulatory efficiency (business freedom, labor market flexibility, monetary freedom), and market openness (trade freedom, investment freedom, financial freedom) (The Heritage Foundation, 2025). The Human Development Index (HDI), on the other hand, is an index developed by the United Nations Development Programme (UNDP) to measure a country's socio-economic development level. Rather than focusing solely on economic growth, HDI aims to evaluate well-being more comprehensively by considering the quality of life of individuals. It is calculated by taking the geometric mean of values scaled between 0 and 1 for each component, where the highest level of development is considered 1 and the lowest is 0 (UNDP, 2025).

The Globalization Index measures the level of global integration of countries. This index evaluates how advanced a country's economic, social, political, and technological connections are. Published by the KOF Swiss Economic Policy Institute, it consists of three main dimensions. Economic globalization includes international trade and investments (trade volume, foreign direct investments - FDI) and financial flows and capital movements. Social globalization encompasses

information flow (internet, media, cultural dissemination), personal contact (migration, tourism, foreign-born population rates), and cultural proximity (the presence of international brands such as McDonald's and IKEA). Political globalization involves diplomatic relations between countries, membership in international organizations (UN, IMF, World Bank, WTO, etc.), international agreements, and participation in peacekeeping missions. The KOF Globalization Index is measured on a scale from 0 to 100, where higher values indicate greater globalization (Gygli et al., 2019).

As an economic growth variable, the annual percentage growth rate of Gross Domestic Product (GDP) at market prices, expressed in constant local currency, is a fundamental indicator that measures changes in the total level of production in an economy over time. GDP is calculated by summing the gross value added created by all resident producers in an economy, adding product taxes, and subtracting subsidies. This calculation is based on nominal values without considering the depreciation of produced assets, the depletion of natural resources, or environmental degradation. To allow for international comparisons, total growth rates are expressed in US dollars based on constant 2015 prices (World Bank, 2025).

4.2 Method

First, stationarity is examined in order to remove the issue of spurious regression from the analysis. In the study, ERS Point Optimal test, one of the traditional unit root tests, was applied to determine the stationarity levels of the series. Then, for the series that were found stationary at different orders as a result of the unit root test, the Figurede Toda-Yamamoto (1995) causality test, which is appropriate to the econometric literature, was applied to investigate causality. This method is based on the Vector Autoregressive (VAR) model over the level values of the variables. An important advantage over the Granger (1969) causality test, which is frequently used in the literature, is that the presence of a unit root or cointegration relationship in the series does not affect the analysis results (Gazel, 2017). In other words, the Toda-Yamamoto (1995)(TY) method provides valid statistical tests and inferences to detect Granger causality in the level VAR model regardless of the level of integration or cointegration of the variables (Elian & Suliman, 2015, p. 9). The graphs of the series are given in Figure 6:
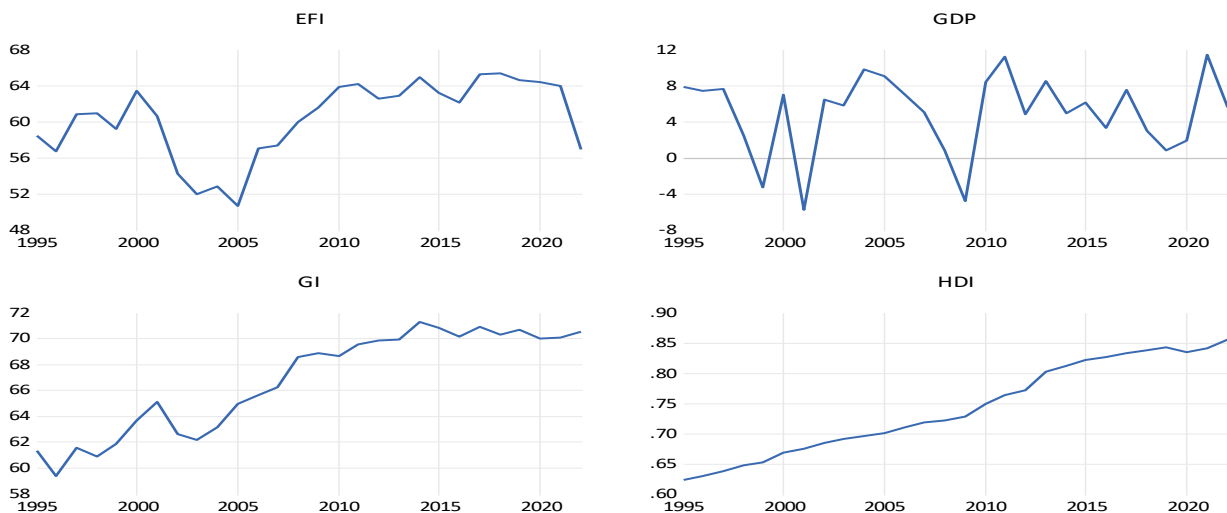
Figure 6. The series' time path graphs

The model under examination is provided in Equation (1). In the econometric model given in Equation (1), the notations β_0 and ε_t represent the constant and error term, respectively. The parameters from β_0 to β_2 are the coefficients of the explanatory variables included in the function:

$$EFI_t = \beta_0 + \beta_1 GDP_t + \beta_2 GI_t + \beta_2 HDI_t + \varepsilon_t \tag{1}$$

t = 1,......,T represents time.

4.2.1 Elliot, Rothenberg, Stock Point Optimum (ERS,1996) Test

Elliot, Rothenberg, and Stock proposed this test, which is an enhanced Dickey-Fuller test with the primary goal of improving statistical reliability. The ERS test is based on removing trend components from the series prior to analysis. In particular, it is argued to be more accurate than alternative unit root tests when the mean of the time series is uncertain or contains a linear trend.

The ERS Point Optimal Test compares the alternative hypothesis that a time series y_t is stationary (I(0)) with the null hypothesis that it is I(1). This test tests stationarity at the asymptotically optimal point under the assumption that the data has an ARMA (Autocorrelated Moving Average) structure. The ERS test is a modified version of the ADF (Extended Dickey-Fuller) test and provides more reliable results by detrending the data before running the test regression. The general ADF regression equation is defined as follows (Boachie et al., 2014, p. 37):

$$\Delta y_t = \alpha y_{t-1} + x_t'\delta + \sum_{j=1}^{p} \Psi j \Delta y_{t-j} + \varepsilon_t \tag{2}$$

The null hypothesis states that y_t is I(1) and α =1 in this equation. In this test, ERS tests how the data behaves against the null hypothesis by identifying the quasi-difference transformation of y_t at a given point. This process is expressed in the following Figure:

$$\partial(y_t|a) = \begin{cases} y_t, & if\, t = 1 \\ y_t - \alpha y_{t-1}, & if\, t > 1 \end{cases} \tag{3}$$

Here a is a specific point to test the null hypothesis against a given alternative hypothesis. The ERS test determines the stationary behavior of the series through quasi-difference regression:

$$\partial_t y_t = \delta\partial_t x_t + \eta_t \tag{4}$$

In the ERS test, the existence of a unit root is the null hypothesis. The test statistic is compared with the critical values suggested by Elliott, Rothenberg, & Stock (1996).

4.2.2 Toda-Yamamoto (1995) Causality Test

The Toda-Yamamoto (1995) methodology employs the Wald test to identify causal links among variables. The test distribution adheres to a χ2 distribution, determined by the cumulative lag length employed in the VAR model and the integration levels of the series. This approach offers a more resilient framework for identifying potential flaws in the cointegration relationship by implementing a typical VAR model using the level values of the series (Duasa, 2007, p. 87; Zapata & Rambaldi, 1997, p. 289). The formulated VAR models are presented in equations (5) and (6):

$$lnX_t = \sum_{i=1}^{k+d_{max}} \alpha_{1i} lnX_{ti} + \sum_{i=1}^{k+d_{max}} \beta_{1i} lnY_{ti} + \varepsilon_{1t}$$
(5)

$$lnY_t = \sum_{i=1}^{k+d_{max}} \alpha_{2i} lnY_{ti} + \sum_{i=1}^{k+d_{max}} \beta_{2i} lnX_{ti} + \varepsilon_{2t} \tag{6}$$

The Toda-Yamamoto approach, as delineated in equations (5) and (6), k signifies the duration of the delay, d_{max} whereas denotes the maximum integration level of the variables pertinent to the examined system. This method assumes that the error terms are distributed with a mean of zero ε_{1t} and ε_{2t} a constant covariance matrix. The Toda-Yamamoto test, which consists of a two-step process, begins with an estimated VAR model to determine the optimal lag length. The optimal (k) and maximum integration order of the series (d_{max}) is established using the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SIC). In the second stage, the augmented VAR model $k + d_{max}$ is expanded in scale and evaluated utilizing the seemingly

unrelated regression (SUR) method. The causal relationship is assessed by testing the hypotheses $H_0 : \alpha_{1i} = 0$ and $H_0 : \alpha_{2i} = 0$ using the modified Wald test (MWALD) in accordance with the X^2 distribution. When the test statistic surpasses the critical value, the null hypothesis is rejected, indicating a significant causal relationship between the variables (Yavuz, 2006, p. 169).

5. FINDINGS

The stationarity characteristic of time series is a crucial need for the dependability of outcomes derived from econometric analysis. A stationary time series is defined by a constant mean and variance over time, with the joint variation between two periods depending entirely on the interval between them, rather than on specific time points. Analyses performed on non-stationary series may yield erroneous conclusions; therefore, it is essential to initially assess the stationarity characteristics of the series during the modeling process.

This study analyzed the stationarity characteristics of time series with the Elliot, Rothenberg, and Stock (ERS, 1996) Point Optimal Test. According to the unit root test results, it has been determined that the Efi, Gi, and Hdi variables in the fixed-term model contain a unit root and are therefore non-stationary. Conversely, the GDP variable was determined to be stationary and classified as an I(0) process. Upon calculating the first differences of the variables, it was seen that the Efi, Gi, and Hdi variables exhibited no unit roots and achieved stationarity. This scenario suggests that the specified variables are I(1) processes. Nonetheless, for the Hdi variable, the existence of a unit root persisted in the model incorporating a constant and trend, and it was ascertained that it became stationary upon taking the second difference. Consequently, it has been determined that the Hdi variable is an I(2) process. The GDP variable is stationary in both its level values and initial difference, classified as I(0). Based on these observations, the maximum degree of integration of the variables has been established as dmax = 2:

Table 3. Elliot, Rothenberg, and Stock (ERS, 1996) Point Optimal unit root test

Constant			
Variable	**P_t**	**Critical Value (%5)**	**Result**
Efi (6)	495.771	2.97	There is a unit root.
Gdp(6)	1.954	2.97	There is no unit root.
Gi(2)	70.311	2.97	There is a unit root.
Hdi	495.771	2.97	There is a unit root.
dEfi (6)	1.958	2.97	There is no unit root.
dGdp(6)	2.471	2.97	There is no unit root.
dGi(2)	2.216	2.97	There is no unit root.
dHdi(6)	1.958	2.97	There is no unit root.
Constant +Trend			
Variable	**P_t**	**Critical Value (%5)**	**Result**
Efi (6)	13.011	5.72	There is a unit root.
Gdp(3)	1.994	5.72	There is no unit root.
Gi(2)	14.862	5.72	There is a unit root.
Hdi*	14.771	5.72	There is a unit root.
dEfi (6)	5.611	5.72	There is no unit root.
dGdp(3)	1.120	5.72	There is no unit root.
dGi(2)	2.765	5.72	There is no unit root.
dHdi	6.888	5.72	There is a unit root.

Note: The values in parentheses represent the optimal lag lengths determined by the AIC and SC information criteria.

*It has been determined that the Hdı Variable is stationary in the second difference (I(2)) form

with constant and trend (Pt=2.793 I(2), critical value (5%)=5.72). The maximum integration order (dmax) of the variables was determined to be 2. Note: The values in parentheses represent the optimal lag lengths determined by the AIC and SC information criteria.

*It has been determined that the Hdı Variable is stationary in the second difference (I(2)) form with constant and trend (Pt=2.793 I(2), critical value (5%)=5.72). The maximum degree of integration (dmax) of the variables has been determined to be 2.

Due to the differing stationarity levels of the variables, meaning some series are I(0), while others are I(1) and I(2) processes, the Toda-Yamamoto method has been used in the causality analysis. This method effectively operates independently of the cointegration levels of the series, preventing erroneous causality detections. After determining the maximum number of lags, the second step is to identify the optimal lag length for the VAR model. However, the lag lengths suggested by information criteria may not always be sufficient to ensure the stability of the VAR model, eliminate autocorrelation, and address the issue of changing variance. Therefore, the optimal lag length that will satisfy the model's stability conditions and improve forecast performance should be determined in Figure 4.

Table 4. Var lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-138.476	NA	1.684	11.873	12.069	11.925
1	-53.320	134.829*	0.005*	6.110	7.091*	6.370*
2	-48.076	6.554	0.015128	7.006	8.773	7.475
3	-24.736	21.396	0.011	6.394	8.947	7.071
4	-3.410	12.440	0.018377	5.950872*	9.288691	6.836397

Note: The optimal lag length estimation results obtained using the Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Information Criterion (HQ) are specified in the table. * indicates the optimal lag length.

In the model, the number of lags is determined as 1 according to the SC (Schwarz Information Criterion) and HQ (Hannan-Quinn Information Criterion), LR (Sequential Modified LR Test Statistic), and FPE (Final Prediction Error) criteria, and as 4 according to the ACI (Akaike Information Criterion) criteria. In practice, when the information criteria indicate different lag lengths, the commonly used method is to consider the LR result. Since the LR criterion also indicates 1 lag, the number of lags (k) has been determined as 1. As a result of the stationarity analysis, since the highest degree of integration of the identified series is dmax = 2, it has been concluded that the required level of k + dmax for the Toda-Yamamoto causality analysis is 3. In the next stage, since the condition is that the roots must lie within the inner region of the unit circle and all be less than 1, it is necessary to examine the roots of the AR characteristic polynomials:

Inverse Roots of AR Characteristic Polynomial
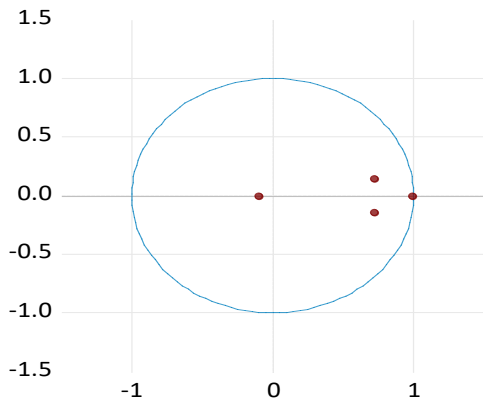
Figure 4. Inverse Root Values of AR Characteristic Polynomials

The numerical expression of the inverse root values of the AR characteristic polynomials is given in Table 5;

Table 5. Inverse Root Values of AR Characteristic Polynomials

Root	Modulus
0.989428	0.9894282392071188
0.720494 - 0.146456i	0.7352289680628686
0.720494 + 0.146456i	0.7352289680628686
-0.103545	0.1035448118592112

The inverse root modulus values of the AR characteristic polynomials presented in Table 5 and Figure 4 being less than 1 signifies that the series satisfies the stationarity requirement. Consequently, the VAR(1) model adheres to the stability criterion. Simultaneously, the issues of autocorrelation and heteroscedasticity have not been identified in the model.

Table 6. LM and White Test results

Lm Test For Serial Autocorrelation		
Lags	LM Stat.	Prob.
1	10.345	0.851
White Test		
Lags	t-Stat.	Prob
1	155.129	0.180

In the autocorrelation test, the null hypothesis H_0 posits "There is no autocorrelation," but in the changing variance test, the null hypothesis H_0 asserts "There is no changing variance."

The VAR analysis, using one lag, concluded that there is no variance change or autocorrelation. Consequently, essential tests were administered, and the model's validity was assessed to guarantee that the causality analysis could be performed effectively. A VAR(3) model comprising four variables was estimated, given that k+dmax=3 was established.

Table 7. Toda-Yamamoto Causality Test Results

The direction of causality			Lag(k+dmax) p=1 dmax=2 (p+dmax=3)	Chi-sq	Prob.
EFI	→	GDP	3	13.213***	0.000
EFI	→	GI	3	7.7881***	0.005
EFI	→	HDI	3	3.328*	0.068
GDP	→	EFI	3	5.940**	0.0147
GDP	→	GI	3	3.029*	0.081
GDP	→	HDI	3	1.209	0.271
GI	→	EFI	3	6.593**	0.010
GI	→	GDP	3	1.083	0.297
GI	→	HDI	3	1.838	0.175
HDI	→	EFI	3	7.212***	0.007
HDI	→	GDP	3	6.642***	0.009
HDI	→	GI	3	18.960	1.334

Notes: The (k+dmax) denotes VAR order. The lag length selection was based on LR:sequential modified LR test statistic (each test at 5% level), FPE: Final predictionerror, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ:Hannan-Quinn information criterion. ***, ** and * denotes 1% and 5% , 10%significance level, respectively.

The results of the Toda-Yamamoto causality test indicate a substantial causal association between the Economic Freedom Index and the Economic Growth Rate, Globalization Index, and Human Development Index. The Economic Freedom Index significantly influences the Economic Growth Rate, evidenced by a Wald statistic of 13.213 and a p-value of 0.000. This scenario demonstrates a robust correlation at the 1% significance threshold. The influence of the Economic Freedom Index on the Globalization Index is statistically significant at the 1% level (Wald = 7.7881, p = 0.005). The influence of the Economic Freedom Index on the Human Development Index, approaching significance at the 10% level (Wald = 3.328, p = 0.068), suggests a potential causal relationship.

Analysis of the correlation between the Economic Growth Rate and other variables reveals that the Economic Growth Rate has a substantial impact on the Economic Freedom Index (Wald = 5.940, p = 0.0147), demonstrating a robust causal association at the 5% significance threshold. The impact of the Economic Growth Rate on the Globalization Index has been marginal at the 10% significance level (Wald = 3.029, p = 0.081), and a convincing causal relationship cannot be established. The Economic Growth Rate does not significantly impact the Human Development Index (Wald = 1.209, p = 0.271).

A causal association has been established at the 5% significance level between the Globalization Index and the Economic Freedom Index (Wald = 6.593, p = 0.010). The Globalization Index did not have statistically significant effects on the Economic Growth Rate and the Human Development Index, with p-values of 0.297 and 0.175, respectively.

The impact of the Human Development Index on other factors is significant. The Human Development Index has a significant impact on the Economic Freedom Index at the 1% significance level, indicating a robust causal association (Wald = 7.212, p = 0.007). The Human Development Index significantly affects the Economic Growth Rate at the 1% significance level (Wald = 6.642, p = 0.009). However, the effect of the Human Development Index on the Globalization Index (Wald = 18.960, p = 1.334) was not statistically significant.

Upon comprehensive evaluation of these results, it is evident that the Economic Freedom Index and the Human Development Index exhibit robust causal linkages with other factors. The Economic Freedom Index significantly influences both the Economic Growth Rate and the Globalization Index. Nonetheless, the impact of the Human Development Index on both the Economic Freedom Index and the Economic Growth Rate has been proven in a robust manner. Conversely, although the Globalization Index's impact on the Economic Growth Rate and the Human Development Index was deemed statistically insignificant, the influence of the Economic Growth Rate on the Human Development Index was noted to be poor. These findings offer significant insights into the enduring linkages among economic freedom, globalization, growth, and human development.

6. CONCLUSION

This study investigates the influence of economic freedom on economic growth within the frameworks of globalization and human development, employing econometric methods to explore the correlations among the variables. The Toda-Yamamoto causality test employed in the study was favored due to its consideration of variables potentially being stationary at varying levels and its sensitivity to long-term correlations. The conventional Granger causality test necessitates that the variables be stationary at the same level, while the Toda-Yamamoto approach yields valid and trustworthy outcomes even when the series are integrated at varying levels. This method has proven to be a suitable analytical methodology for the variables employed in the study, as it can assess causal links regardless of the integration levels of the time series.

The analysis results show that economic freedom has significant effects on economic growth, globalization, and human development. The impact of economic freedom on economic growth has been found to be statistically significant at the 1% level, and it is understood that it contributes significantly to the growth process through the more effective functioning of market mechanisms, the improvement of the investment environment, and the encouragement of entrepreneurship. In addition, it has been determined that economic freedom has a positive effect on globalization at the 1% significance level. This finding indicates that the strengthening of the free market economy accelerates the globalization process by increasing international capital movements and foreign trade.

The study also found that economic growth causally affects economic freedom. This relationship was found to be significant at the 5% level, and it was concluded that as growth increases, the need for market reforms also rises, and policies that enhance economic freedom can support the growth process. This bidirectional causality relationship indicates that not only is economic freedom a determinant of growth, but economic growth can also enhance economic freedom. From the perspective of policymakers, it is understood that growth-oriented policies should include elements that enhance economic freedom.

The effect of the globalization process on economic growth is not found to be statistically significant. This result indicates that globalization may not always directly affect economic growth and the benefits of globalization may vary across countries. The effect of globalization on economic freedom is found at the 5 percent significance level and it is concluded that openness policies and international trade can support the development of market economy.

The study's most significant finding is the robust correlation between human development and economic progress. Human development significantly influences economic growth at the 1 percent significance level. This outcome indicates that advancements in education, health, and living conditions facilitate long-term economic growth. Nevertheless, no robust causal association was identified indicating that economic growth directly enhances human development. This indicates that economic progress may not yield uniform advantages for all individuals, highlighting the

significance of income distribution policy.

The correlation between economic freedom and human growth is reciprocal. Economic independence significantly influences human development at the 10 percent threshold. This discovery demonstrates that free market circumstances enhance quality of life by augmenting individuals' access to education and healthcare services. Conversely, human development significantly influences economic freedom at the 1 percent significance level. This conclusion indicates that elements enhancing human development, such as education and health, may facilitate the establishment of institutional frameworks that promote economic freedom.

Based on the study's findings, significant consequences might be inferred for policymakers. Turkey ought to implement measures to improve economic freedom. These changes should focus not just on enhancing market liberalization but also on establishing the rule of law, safeguarding property rights, ensuring transparency in the investment climate, and fortifying the regulatory framework. Foreign trade policy must be enhanced to amplify the influence of globalization on economic growth. Simultaneously, considering that policies fostering human development contribute to long-term economic success, investments in sectors such as education and health should be augmented.

This study possesses certain drawbacks. The investigation is only centered on Turkey and does not encompass a comparative examination of other nations. Subsequent research may employ a more extensive sample of nations to comparatively analyze the impacts of economic freedom and globalization on economic growth. Furthermore, the examined factors rely on aggregate indices, and the impacts of economic freedom subcomponents (such as property rights, tax policies, and regulatory levels) on growth are not assessed individually. In this setting, a more comprehensive microanalysis in future studies may yield more specific recommendations for policymakers.

The interplay among economic freedom, globalization, and human development is essential for the sustainability of economic progress. In formulating Turkey's long-term growth plan, it is essential for the nation to contemplate policies that promote economic freedom, encompassing both market liberalization and the reinforcement of the rule of law and institutional frameworks. The long-term consequences of policies aimed at promoting human development, which bolster economic growth, must be considered, and expenditures in critical sectors such as education and health should be prioritized. The equitable execution of these policies will enable economic growth to be more inclusive and sustainable.

REFERENCES

Abate, G. D. (2022). Foreign aid and economic growth: An inverted U-shaped relationship. *Journal of International Development*, 34(3), 456–472. https://doi.org/10.1002/jid.3590

Ahmad, M. (2017). Economic freedom and income inequality: Does political regime matter? *Economic Research-Ekonomska Istraživanja*, 30(1), 1781–1791. https://doi.org/10.1080/1331677X.2017.1392884

Aigheyisi, O. S. (2013). The effect of trade openness and financial liberalization on economic growth and human development in Nigeria. *International Journal of Economics, Commerce and Management*, 1(5), 1–17.

Altintaş, F. F. (2021). Ekonomik özgürlük performansı faktörleri arasındaki ilişki: Doğrulayıcı faktör analizi ile bir uygulama. *Journal of Institute of Economic Development and Social Researches*, 7(27), 1-13. https://doi.org/10.31623/iksad072701

Ausianikava, O. (2023). Globalization and economic growth: A cross-country analysis. *Economic Modelling*, 115, 105967. https://doi.org/10.1016/j.econmod.2022.105967

Ay, Ş. (2025). Relationship Between Human Development Index And Social Expenditures: Türkiye Example. *Vergi Sorunları Dergisi*, 437, 66-75.

Boachie, M., Mensah, I., Sobiesuo, P., Immurana, M., Iddrisu, A.-A., & Kyei-Brobbey, I. (2014). Determinants of public health expenditure in Ghana: A cointegration analysis. *Journal of Behavioural Economics, Finance, Entrepreneurship, Accounting and Transport*, 2(2), 35-40. https://doi.org/10.12691/jbe-2-2-1

Bucak, T. (2022). Economic freedom and human development: Evidence from E7 countries. *Journal of Economics and Political Economy*, 9(1), 1–15.

Bucak, T., & Gacener Atış, A. (2021). The impact of social and political globalization on economic growth: Evidence from BRICS-T countries. *Journal of International Trade and Economic Development*, 30(2), 273–290. https://doi.org/10.1080/09638199.2020.1827213

Caselli, M. (2012). *Trying to measure globalization: Experiences, critical issues and perspectives* (C. 4). Springer Science & Business Media.

Çeştepe, H., Ergün Tatar, A., & Erdoğan, S. (2023). Economic globalization and economic growth: The case of Turkey. *Journal of Economics, Finance and Accounting*, 10(1), 1–15.

Dreher, A. (2006). Does globalization affect growth? Evidence from a new index of globalization. *Applied Economics*, 38(10), 1091-1110.

Duasa, J. (2007). Malaysian foreign direct investment and growth: Does stability matter? *Journal of Economic Cooperation Among Islamic Countries*, 28(2), 83-98.

Elian, M. I., & Suliman, A. H. (2015). Capital flows and the openness-growth nexus: Toda-Yamamoto causality modeling. *The Journal of Developing Areas*, 83-105.

Elliott, G., Rothenberg, T. J., & Stock, J. H. (1996). Efficient tests for an autoregressive unit root. *Econometrica*, 64(4), 813-836.

Faustino, H. C., & Vali, C. (2013). The effects of globalization on OECD income inequality: A static and dynamic analysis. *Economic Modelling*, 30, 602–608. https://doi.org/10.1016/j.econmod.2012.10.016

Gazel, S. (2017). BİST Sınai Endeksi ile çeşitli metaller arasındaki ilişki: Toda-Yamamoto nedensellik testi. *Akademik Sosyal Araştırmalar Dergisi*, 5(52), 287-299. https://doi.org/10.

Güney, T. (2017). Economic freedom and human development: Evidence from BRICS-T countries. *International Journal of Economics and Financial Issues*, 7(4), 389–397.

Gwartney, J. D., Holcombe, R. G., & Lawson, R. A. (2004). Economic freedom, institutional quality, and cross-country differences in income and growth. *Cato Journal*, 24(3), 205–233.

Gygli, S., Haelg, F., Potrafke, N., & Sturm, J.-E. (2019). The KOF globalization index – revisited. *The Review of International Organizations*, 14(3), 543-574. https://doi.org/10.1007/s11558-019-09344-2

Hasan, M., & Waheed, A. (2020). Foreign direct investment and human development in South Asian countries. *Transnational Corporations Review*, 12(1), 1–12. https://doi.org/10.1080/19186444.2020.1715816

Husain, I. (2000). Making globalization work for the poor case study of Pakistan, EMP-CIDA globalization project. *Lahore University of Management Sciences*, 1-28.

KOF Globalisation Index. (2024, Aralık 12). Retrieved February 3, 2025, from KOF Swiss Economic Institute website: https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-

globalisation-index.html

Radulović, B., & Kostić, M. (2020). Globalization and economic growth: Evidence from Eurozone countries. *Economic Research-Ekonomska Istraživanja*, 33(1), 1822–1841. https://doi.org/10.1080/1331677X.2020.1761415

Samimi, P., Lim, G., & Buang, A. (2012). A critical review on synthetic globalization indexes. *International Journal of Fundamental Psychology and Social Sciences*, 2(1), 28-31.

The Heritage Foundation. (2025). Index of economic freedom: About the index. Retrieved February 2, 2025, from https://www.heritage.org/index

Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics*, 66(1-2), 225-250. https://doi.org/10.1016/0304-4076(94)01616-8

Topuz, S. K. (2017). Ülkelerin küreselleşme, demokrasi ve ekonomik büyüklük göstergeleri ile cinsiyet temelli gelişme endeksi arasındaki ilişkinin incelenmesi. *Gazi Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 18(3), 779-799.

Tunçsiper, B., & Biçen, Ö. F. (2014). Economic freedoms and economic growth: An investigation on emerging market economies. *International Journal of Economics and Financial Issues*, 4(3), 509–519.

Tunçsiper, B., & Biçen, Ö. F. (2015). The relationship between economic freedom and economic growth: An application on emerging market economies. *Procedia - Social and Behavioral Sciences*, 195, 835–842. https://doi.org/10.1016/j.sbspro.2015.06.322

Ünkaracalar, E. (2022). The causality relationship between globalization and economic growth: Evidence from developing countries. *Journal of Applied Economics and Business Research*, 12(1), 1–15.

World Bank. (2025). World development indicators. Retrieved January 29, 2025, from https://databank.worldbank.org/source/world-development-indicators

Yavuz, N. Ç. (2006). Türkiye'de turizm gelirlerinin ekonomik büyümeye etkisinin testi: Yapısal kırılma ve nedensellik analizi. *Doğuş Üniversitesi Dergisi*, 7(2), 162-171.

Yay, S., & Ezanoğlu, Z. (2023). Ekonomik özgürlükler ve ekonomik büyüme birbiriyle ilişkili midir? Genel değerlendirme ve Türkiye üzerine bir analiz. *Fiscaoeconomia*, 7(2), 1334-1360. https://doi.org/10.25295/fsecon.1261507

Zapata, H. O., & Rambaldi, A. N. (1997). Monte Carlo evidence on cointegration and causation. *Oxford Bulletin of Economics and Statistics, 59*(2), 285-293. https://doi.org/10.1111/1468-0084.00065