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Causality between Economic Freedom and Its Components in Türkiye

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ABSTRACT

Economic freedom is known to be a significant driver towards achieving economic growth. This study analyzes how the components and the economic freedom index (EFI) are linked. The main objective is to promote per capita gross domestic product and economic growth in Türkiye by producing appropriate policies to improve EFI in line with the findings obtained. Hence, the frequency-domain causality test investigates the link between the components and EFI. Empirical analyses employ time series data covering the years from 2000Q1 to 2021Q4. The estimation results of the frequency-domain causality test confirm a causality running from the size of government, property rights, and freedom to trade to EFI, whereas no causality is confirmed from sound money and regulations to EFI. The VAR-based Granger Causality test also supports the obtained results. Except for the causality from economic freedom to government size in the long run and short run, no causality running from EFI to the components was detected.

Keywords: Economic Freedom; Türkiye; Frequency-Domain Causality; VAR-based Granger Causality

JEL Codes: E02; C01

Türkiye'de Ekonomik Özgürlük ve Bileşenleri Arasındaki Nedensellik

ÖZ

Ekonomik özgürlüğün ekonomik büyümeye ulaşmada önemli bir itici güç olduğu bilinmektedir. Bu çalışma, bileşenlerin ve ekonomik özgürlük endeksinin (EFI) nasıl bağlantılı olduğunu analiz etmektedir. Temel amaç elde edilen bulgular doğrultusunda EFI'ni iyileştirmeye yönelik uygun politikalar üreterek Türkiye'de kişi başına düşen gayri safi yurt içi hasılayı ve ekonomik büyümeyi teşvik etmektir. Bu nedenle, bileşenler ve EFI arasındaki bağlantıyı araştırmak için frekans alanı nedensellik testi kullanılmıştır. Ampirik analizler, 2000Q1'den 2021Q4'e kadar olan yılları kapsayan zaman serisi verileri kullanılarak gerçekleştirilmiştir. Frekans alanı nedensellik testinin tahmin sonuçları, hükümetin büyüklüğü, mülkiyet hakları ve uluslararası ticaret özgürlüğünden EFI'ye doğru bir nedensellik olduğunu doğrularken, sağlam para ve mevzuattan EFI'ye doğru hiçbir nedensellik doğrulanmamıştır. VAR tabanlı Granger Nedensellik testi de elde edilen sonuçları desteklemektedir. Uzun vadede ve kısa vadede ekonomik özgürlükten hükümetin büyüklüğüne doğru giden nedensellik hariç, EFI'den bileşenlere doğru giden hiçbir nedensellik tespit edilmemiştir.

Anahtar Sözcükler: Ekonomik Özgürlük; Türkiye; Frekans Alanı Nedenselliği; VAR Tabanlı Granger Nedenselliği

JEL Sınıflandırması: E02; C01

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1. INTRODUCTION

Achieving sustainable economic growth has been one of the pivotal targets of all countries, regardless of their development levels, receiving significant attention from academics and policymakers. However, the question 'Why can some countries achieve a certain level of economic growth while others can not?' remains unsolved. Recent economic growth theories emphasize the significant stimulating incentive of institutional eminence on economic growth (Barro, 1991; Bencivenga & Smith, 1991; Knack & Keefer, 1995). There have been several studies in related literature confirming the importance of economic freedom to attain a number of desirable socioeconomic improvements, especially persistent, sustainable, long-term economic growth (Lawson et al., 2020; Gwartney, 1999; Berggren, 2003).

Economic freedom, in general, allows each individual to control his/her own labour and property. In other words, economic freedom indicates the free economic activities of the individuals, where the governments allow the free movement of factors of production and goods and services while protecting and maintaining liberty. Several indices have been developed to evaluate the degree of economic freedom (Heritage.org, 2025; Statista, 2025). The Fraser Institute developed the Economic Freedom Index (EFI), which is applied in this study. EFI consists of five main categories: size of government (SG), property rights (PR), sound money (SM), freedom to trade (FT), and regulations (R). Each category of the index includes several sub-categories. In total, there are 26 components of EFI. The first of the five main categories of EFI, namely SG, comprises top marginal tax rate, state ownership of the assets, government enterprises and investment, transfers and subsidies, and government expenditure. As SG increases, economic freedom reduces as a result of the fact that the government and political decisions substitute for personal choices. The second category, PR, consists of the protection of property rights, regulatory costs of the sale of real property, military interference in rule of law and politics, gender disparity adjustment, impartial courts, judicial independence, integrity of the legal system, legal enforcement of contracts, reliability of police, and business costs of crime. As the security of PR improves in a country, it indicates that the performance of the protective functions of the government develops, and EFI increases. The third category of the EFI is SM, involving money growth, freedom to own foreign currency bank accounts, inflation of the most recent year, and standard deviation of inflation. As access to SM increases, EFI improves since SM indicates long-term price stability with a low inflation rate due to consistent monetary policies and/or institutions. The fourth category is FT, which includes regulatory controls of labour and capital movements, trade barriers, tariffs, and black-market exchange rates. As FT internationally reduces, EFI decreases. The last category of the EFI is the regulations, which consist of credit market regulations, labour market regulations, and business regulations. EFI is reduced due to the regulations that restrict the free entry to the market and the voluntary exchange in labour, credit and goods markets.

According to the 2023 records (Worldbank, 2025), as an emerging economy, the per capita GDP of Türkiye accounts for 14,600 USD. She has been the European Union (EU) candidate since 1999 and, since 1961, the Organisation for Economic Cooperation and Development (OECD) member state. Even though the negotiations with the EU are ongoing, Türkiye falls far behind the accounts of both the members individually and the EU averages. Her per capita GDP is significantly below the EU member states' per capita GDP and even less than half of the EU average per capita GDP, which accounts for 34,162.6 USD (Worldbank, 2025). Türkiye has a long road to go before reaching the EU averages. Improving economic freedom in Türkiye might be the correct policy direction to decrease the gap and achieve sustainable economic growth in Türkiye. Comparing the economic freedom index values of Türkiye with EU members for 2021, as the most recent records, Türkiye has the lowest EFI value among the EU member states, which is far below the EU average (Fraser Institute, 2024). Figure 1 below

illustrates the trend of the EFI in Türkiye and the EU average covering the years from 2000 to 2021.

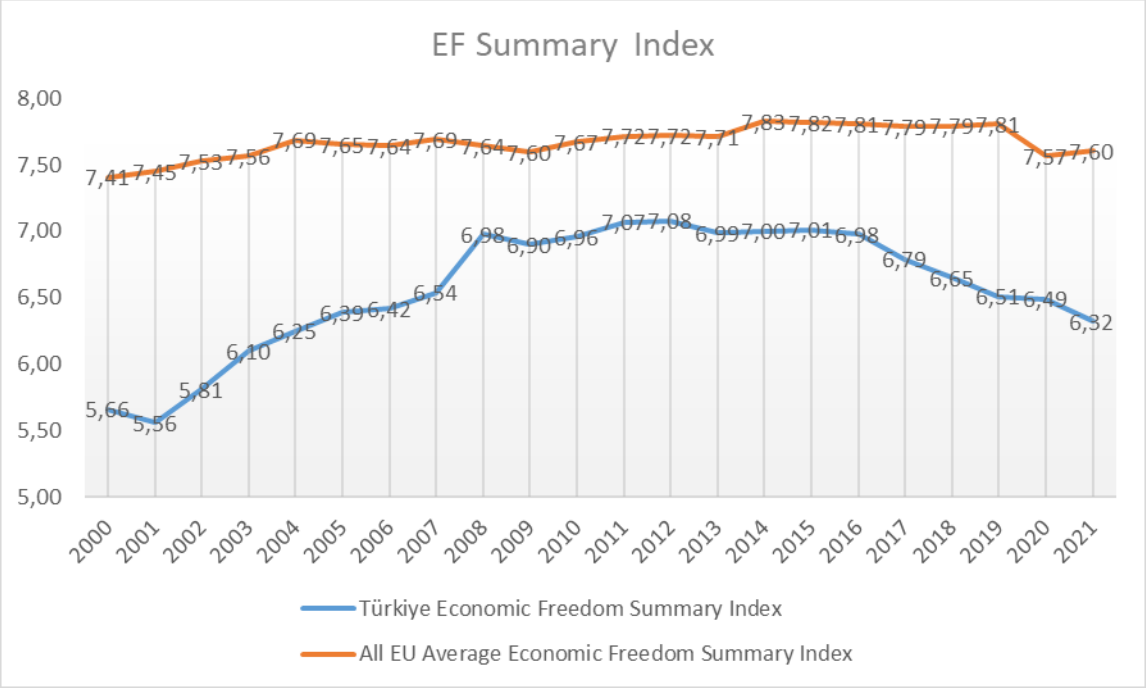


Figure 1. EFI for Türkiye and EU Average
Source: Fraser Institute (2024)

As can be seen from Figure 1, EFI in Türkiye improved from 2000 to 2008, following a stable pattern until the end of 2015; however, the trend continued to decline through the rest of the coverage period of the series (Fraser Institute, 2024). Throughout the study's coverage period, Türkiye's EFI remained far below the EU average. Furthermore, the gap between Türkiye and the EU average has been expanding since 2012. Improvement of the EFI in Türkiye can lead to improvement in per capita GDP and sustainable economic development on the way to catching the EU averages. Thus, this study sheds light on this issue by analysing how the components and the EFI are linked, deserving vital focus in both the academic and social arenas, to plan suitable policies toward improving EFI, therefore promoting GDP per capita and economic growth in Türkiye. Hence, the recently developed frequency-domain (F-D) causality test is utilized to explore the causality relationship between the components and EFI.

This study has been prepared in accordance with research and publication ethics, and consists of five sections. Following the first section, which is the introduction, the second section includes a brief review of the literature related to the study's interest. The third section delivers the data and methodology information that is applied to the empirical analysis. The fourth section provides the findings of the empirical analysis, and the fifth section concludes the study.

2. LITERATURE REVIEW

Several studies in the literature investigate the link between EFI, economic growth and environmental quality, which shows the important role EFI plays in sustainability. Most studies in the literature verify the positive impact of EFI on economic growth (Berggren, 2003; Gwartney, 1999). To promote economic growth, investigating the link between the component and the EFI is crucial to develop appropriate policies for individual countries.

SG is considered to be a significant component of EFI. Several studies confirmed that as the SG increases, economic freedom in a given country declines (Fraser Institute, 2024), and vice versa. However, according to the study conducted by Mahon (2014), including the OECD member countries, the analysis generally can not verify a statistically significant relationship between the SG and economic freedom. Another important component of EFI is PR. PR's protection raises the EFI by encouraging free market activities and increasing incentives for agents to contribute to productive activities (Acemoglu & Verdier, 2000; Pieroni & d'Agostino, 2013). Powell (2002) states that countries with an institutional environment endowed with secure PR achieve high degrees of economic freedom, leading to improved economic well-being. The third component of EFI is SM. In their study, Bjørnskov and Foss (2008) confirmed that SM policy generates stable prices, decreasing uncertainty and fostering entrepreneurship, further improving economic freedom that promotes economic activities. FT is the fourth component of the EFI. In a study conducted by Gwartney et al. (1999), it is confirmed that trade liberty leads to economic freedom, generating a positive relationship between trade liberty and economic growth since trade liberty allows individuals to divert their capital to the countries where profit can be maximized, leading to improved economic growth. Furthermore, Gehring (2013) investigated the relationship between free international trade and economic growth for 86 countries, confirming that trade liberty has a statistically significant positive effect on economic growth arising from the improvement in EFI as a result of the fewer restrictions imposed through fewer or nontariff barriers on import and export of goods and services. R, which is the last component of the EFI, have a negative impact on economic growth through the restrictions generated on the credit market, labour market and business. Mamatzakis (2013) found that strict labour regulation increases bank inefficiency. On the other hand, foreign ownership and competition, which are other examples of credit market regulations, are significantly linked with improved bank efficiency, promoting economic growth.

The impact of each component and EFI overall on economic growth is significant in designing appropriate policies for governments. In each country, the impact and influence of each component might be different as a result of the characteristics of each country. In this study, through the application of innovative econometric techniques, namely the F-D causality test, the causal relationship between the main components and EFI is investigated for appropriate policy development to promote the economic growth of Türkiye further.

3. DATA AND METHODOLOGY

The information regarding the data and methods employed for the main purpose of the study is provided in this section. The dependent variable is Economic Freedom, while the independent variables utilized are SG, PR, SM, FT, and R. Data regarding all variables used in this study were gathered from the Fraser Institute (2024). The study covers the years from 2000 to 2021 for Türkiye. The source of data and variable information is given in Table 1 below.

Table 1. Data and Variable Information

Variable Name	Indicator	Source
EFI	Economic Freedom Index	Fraser Institute (2024)
SG	Size of Government	Fraser Institute (2024)
PR	Property Rights	Fraser Institute (2024)
SM	Sound Money	Fraser Institute (2024)
FT	Freedom to Trade Internationally	Fraser Institute (2024)
R	Regulation	Fraser Institute (2024)

The functional form of the EFI is given below by Equation 1.

$$EFI = f\,(SG, PR, SM, FT, R) \tag{1}$$

Since Granger initiated it in 1969, investigating the causal link between economic indicators is widely accepted as one of the most significant developments in econometric analysis. Causality running from one economic indicator to the other implies that one's actual values can help forecast another indicator's future values (Granger, 1969). The direction of the causal link might be unidirectional, running from one indicator to the other but not from the other to the one, or bidirectional, indicating causality running from one to the other and from the other to the one, or there might not be any causal link existing between the indicators. This study aims to investigate the causal link between EFI and its main indicators by applying the VAR-based Granger Causality (GC) test and the F-D causality test developed by Breitung-Candelon (2006). The economic series has to be integrated in the same order to be able to apply the VAR-based GC test. Thus, the Augmented Dickey-Fuller (ADF) unit root test with break-point is applied to test for the series' integration level. The ADF unit root test with a breakpoint provides the opportunity to detect structural breaks in the series that the standard unit root tests, such as ADF and Kwiatkowski-Phillips-Schmidt-Shin (KPSS), cannot. Therefore, the ADF test with a breakpoint provides a more reliable assessment of stationarity, particularly in the context of significant economic or policy shifts that could influence the underlying dynamics of the time series. Furthermore, to identify the optimum lag length of the variables, the VAR-based GC test is required, which is determined by the application of the VAR lag order selection criteria based on the Akaike information criterion (AIC) and the final prediction error (FPE), since they are superior than the other criteria providing the opportunity to maximize the chance to establish the true lag length, through minimizing the chance of under estimation in case of small sample size.

In addition to the VAR-based GC test, the F-D causality test developed by Breitung-Candelon (2006) is applied since it allows the capture of the asymmetric causal link between the variables at varying frequencies, as long-run, medium-run, and short-run, that conventional causality tests can not provide (Akcay, 2023). The long-run, medium-run, and short-run frequencies fall in the 3.14 to 2.5 band, the 2.5 to 1.5 band, and the 1.5 to 0 band, respectively. Furthermore, the F-D test to detect causal links between the indicators provides the advantage of controlling seasonality-induced fluctuations in the series (Xie et al., 2022). In addition, the F-D causality test can be applied not only when there is a linear connection between the indicators but also when the indicators are connected non-linearly. Moreover, the F-D causality test provides the benefit of testing if the independent variable at the frequency *w* can predict the component of the dependent variable. The F-D causality test was developed by Breitung-Candelon (2006) based on the approach proposed previously by Geweke (1982) and Hosoya (1991). The null hypothesis states that there is no GC running from the independent indicator to the dependent indicator. The F-statistic is used to decide the rejection or non-rejection of the null hypothesis. For the detailed derivation of the F-D causality test, please see Breitung-Candelon (2006). The application of the VAR-based GC and F-D causality tests together provides a

comprehensive analysis of the dynamic relationships between the indicators. The VAR-based test provides an overall view of predictive causality in the time domain. In contrast, the F-D test breaks down this causality into various frequency bands, uncovering the time horizons over which causal effects take place. This integrated approach fosters a deeper understanding of the underlying economic mechanisms, revealing how different components interact over both short and long-term periods. By employing these methodologies simultaneously, researchers can better comprehend the complexities of economic relationships and tailor more effective policy interventions.

Figure 2, given below, provides the research methodology flow.

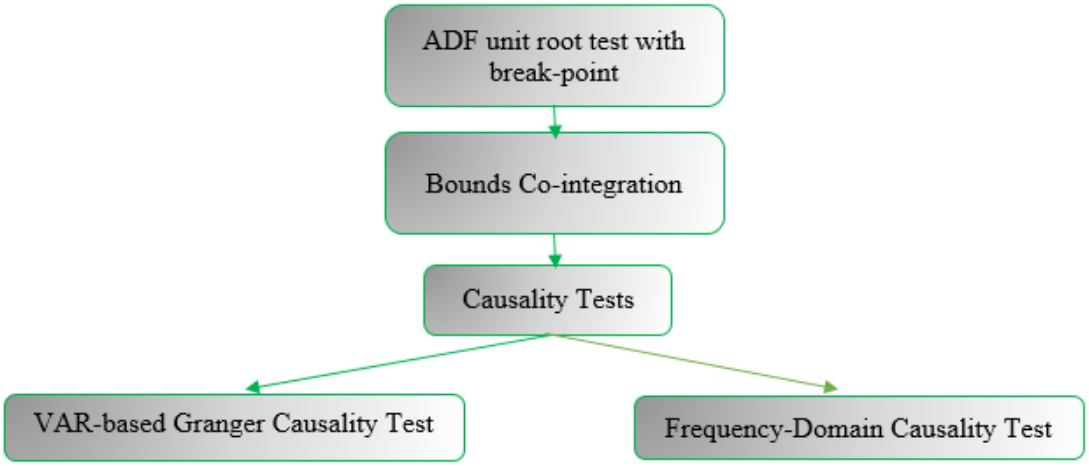
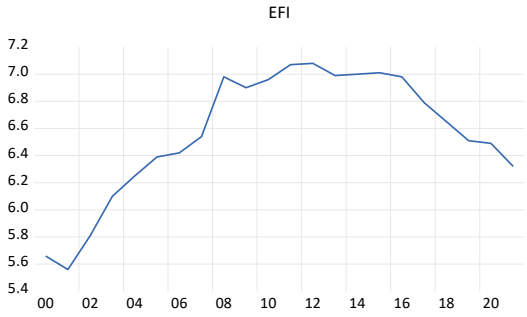


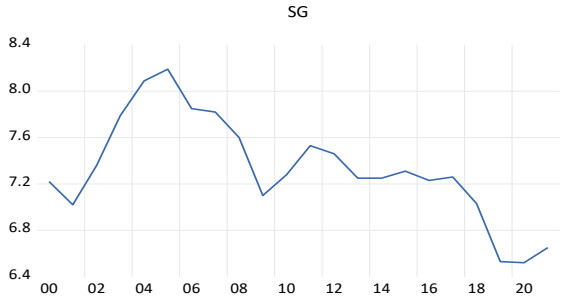
Figure 2: The Research Methodology Flow

Figure 3 below illustrates the trends of the variables considered for this study covering the years from 2000 to 2021.

Panel A



Panel B



Panel C

Panel D

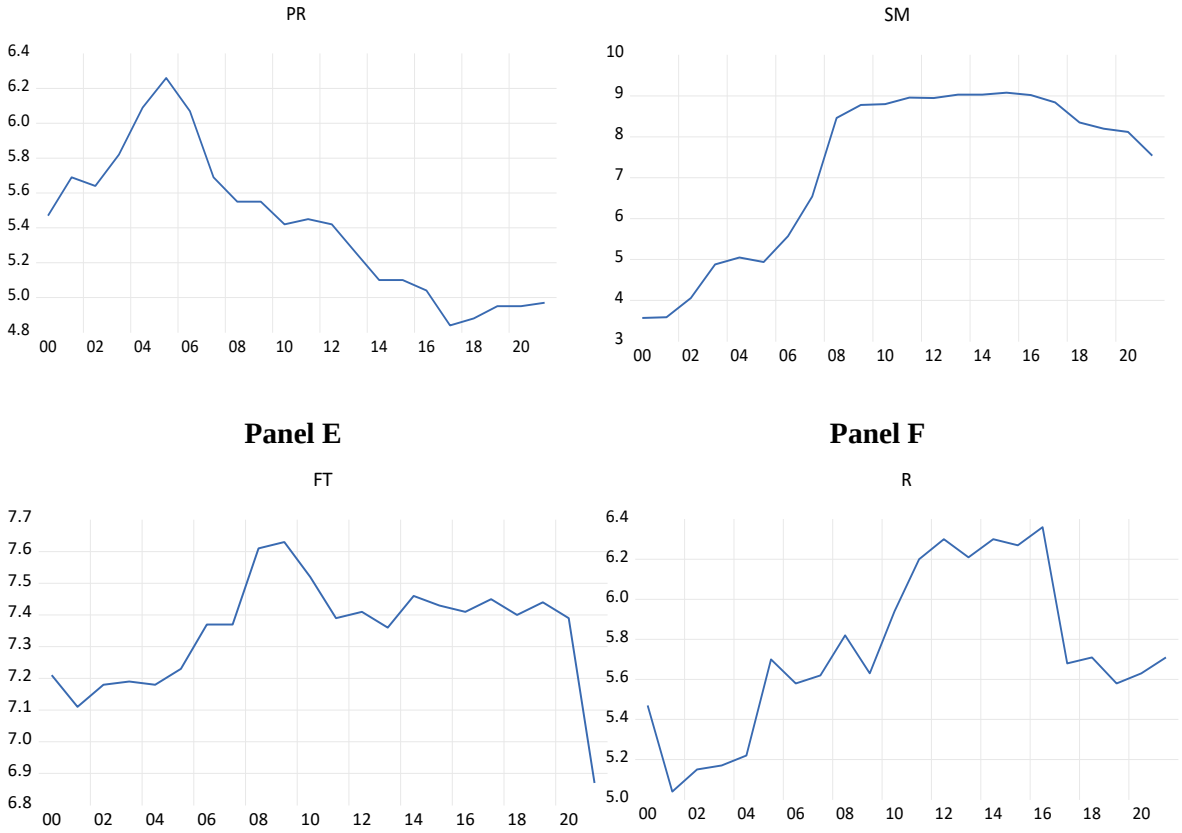


Figure 3. Trends of the indicators over the years 2000 and 2021

Panel A in Figure 3 illustrates the trend of EFI in Türkiye over the coverage period of the study. As can be seen from the trend, EFI in Türkiye improved over the years from 2000 to 2011; however, it showed a continuous decline after 2012 till the end of the coverage period of the study. Panel B in Figure 3 represents the government's size trend from 2000 to 2021. As can be seen from the trend, the size of the government has been decreasing since 2005, which raises the expectation that EFI will improve. On the contrary, as mentioned earlier, EFI has been continuously declining, raising the question of how effective the size of the government is in improving EFI in Türkiye. Panel C in Figure 3 represents the trend of property rights in Türkiye over the entire period of the study. As can be seen from Panel C, property rights improved till 2005 and worsened afterwords till the end of the coverage period of the study, which has a negative impact on EFI. Panel D in Figure 3 presents the trend of sound money over the years from 2000 to 2021. There was an increase in the amount of sound money from 2000 till 2008. From 2008 till 2016, the trend has been stable; however, from 2016 till the end of the coverage period, it has turned out to be declining, which is expected to have a worsening impact on EFI. Panel E in Figure 3 shows the trend of freedom to trade internationally in Türkiye. As can be seen from Panel E, there has been an increase in freedom to trade from 2000 until 2009, when a peak is reached. From 2009 until 2011, the trend of freedom to trade remained stable; however, there has been a sharp decrease from 2020 till the end of the period. The decrease in the freedom to trade is expected to worsen EFI. The last panel, Panel F, illustrates the trend in regulations over the years from 2000 to 2021. Regulations in Türkiye increased from 2001 to 2016; however, they show a sharp decrease at the end of 2016 and continue to decline, which is expected to improve EFI and, thus, the economic well-being of the country.

The annual data collected for empirical analysis is converted into the quarterly match-sum form, allowing for the adjustment of the data for seasonal deviations (Haseeb et al., 2020). Moreover, transforming the data into quarterly form allows for the attainment of the required frequency length for the econometric techniques used for the main purpose of this study (Sharif et al., 2019). Furthermore, the natural logarithmic form of the variables is applied for empirical analysis to smooth the data, affirming their stationarity to achieve more reliable and accurate outcomes. "L" is included to the variable abbreviations to indicate the natural logarithmic form. Next section of the study follows with the empirical findings.

4. EMPIRICAL FINDINGS

Since the VAR-based GC test requires the series to be integrated in the same order, before investigating the causality link between EFI and its main determinants in Türkiye, the ADF unit root test with the breakpoint is employed. ADF unit root test results are represented in Table 3 below, following Table 2, which summarises the descriptive statistics of the variables and the probability values for the Jarque-Bera (J-Bera) normality test results.

Table 2. Descriptive Statistics

Variable Name	Mean	Max	Min	Std.Dev.	Skewness	Kurtosis	p(J-B)
LEFI	1.8794	1.9589	1.7119	0.0725	-0.8731	2.7694	0.0033
LSG	1.9906	2.1067	1.8640	0.0608	-0.1565	2.6766	0.6897
LPR	1.6870	1.8361	1.5722	0.0749	0.2558	2.0784	0.1303
LSM	1.9335	2.2065	1.2548	0.3239	-0.9127	2.3113	0.0009
LFT	1.9938	2.0349	1.8828	0.0246	-1.3798	7.0427	0.0000
LR	1.7451	1.8635	1.6088	0.0696	-0.1053	2.1225	0.2247

Table 3: Unit Root Tests

		At Level					
		LEFI	LSG	LPR	LSM	LFT	LR
ADF	Test-Stat.	-2.1662	-4.3419	-3.9854	-2.7474	-1.2709	-2.7678
	Break Point	2007Q2	2017Q1	2011Q1	2005Q1	2020Q2	2009Q1
		At First Difference					
		LEFI	LSG	LPR	LSM	LFT	LR
ADF	Test-Stat.	-6.0577***	-4.9945**	-5.1277**	-6.2485***	-4.6817*	-5.5278***
	Break Point	2008Q1	2009Q1	2005Q1	2008Q1	2020Q3	2001Q1

Note: ***, **, and * denote 1%, 5%, and 10% levels of statistical significance, respectively.

The probability values of the J-B test provided in Table 2 verify that LEFI, LSM and LFT are not normally distributed, while LSG, LPR and LR follow normal distribution. The unit root test results of the ADF with the breakpoint verify that the series are integrated at the same order of first difference, I(1), confirming that the VAR-based GC test is appropriate to be applied. The breakpoints of LEFI, LSG, LPR, LSM, LFT, and LR are statistically approved to be at 2008Q1, 2009Q1, 2005Q1, 2008Q1, 2020Q3, and 2001Q1, respectively.

Before investigating the causal link between the indicators, the Bounds co-integration test is used to test whether there is a link among the variables in the long-run. Rejection of the null hypothesis of co-integration confirms that there is a long-run equilibrium relationship between LEFI and considered indicators. Thus, a bound between LEFI and the main components

are verified indicating that they are moving towards a shared equilibrium. Therefore, a long-run relationship model between LEFi and the considered variables can be developed.

The ARDL bound co-integration test outcome represented by Table 4 below verifies the long-run link among the indicators.

Table 4: ARDL bound cointegration test

ARDL Bounds test	
Null Hypothesis: No levels relationship	
Model estimation	LEFI = f(LSG, LPR, LSM, LFT, LR)
F-statistics	-5.4400***

Note: *** denotes 1% significance level

After confirming the long-run link among the variables, the causal relationship is examined through the application of the VAR-based GC test. The lag length is determined by the VAR lag order selection criteria based on the AIC and FPE as 6. After determining the VAR lag order, the VAR-based GC test is employed, and the results are represented by Table 5 below.

Table 5. VAR-based GC test

	χ^2	p-value
LSG→ LEFI	1.9137	0.9275
LPR → LEFI	9.3379	0.1554
LSM → LEFI	1.8588	0.9322
LFT → LEFI	5.0497	0.5375
LR → LEFI	1.0108	0.9852
ALL → LEFI	48.6477**	0.0171
LEFI → LSG	10.1778	0.1174
LEFI → LPR	2.5714	0.8604
LEFI → LSM	2.2815	0.8921
LEFI → LFT	4.8147	0.5678
LEFI → LR	5.1658	0.4236

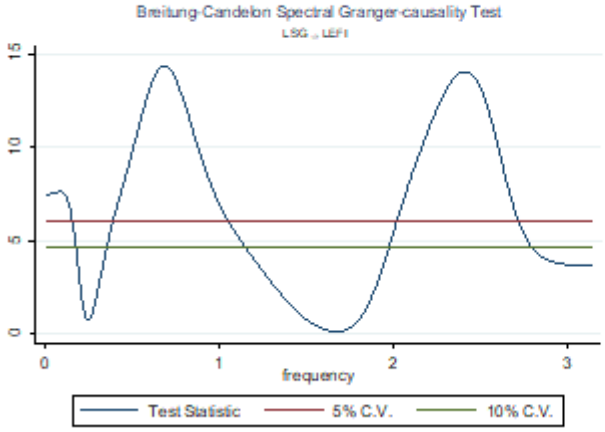
Note: The 5% statistical significance level is denoted by **, while → stands for the direction of causality.

According to the output obtained from the VAR-based GC test, all the independent variables jointly cause LEFI at a 5% statistical significance level. Nevertheless, when the individual causality running from independent variables to the dependent variable is tested, there is no causality confirmed running from any of the indicators to the LEFI. Furthermore, there is no statistically significant evidence to confirm that there is causality running from LEFI to any of the indicators, except from LEFI to LSG in short- and long-run.

After confirming with the VAR-based causality test that a causality link runs from jointly independent variables to LEFI, the F-D causality test is investigated, where the causality link between the indicators is examined at varying frequencies, the range from 0 to 1.5 determines the long-run, while from 1.5 to 2.5 indicates medium–run, and the range from 2.5 to 3.14 stands for the short-run causality running from the explanatory indicators to the explained indicator (Ayad et al., 2023). Table 6 below presents the causality running from LSG, LPR, LSM, LFT, and LR to LEFI, represented by 'a' to panel 'e', respectively.

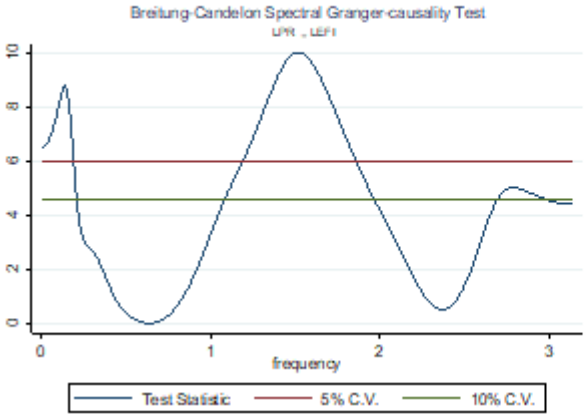
Table 6: F-D Causality results from independent variables to LEFI

a. F-D Causality results from LSG to LEFI



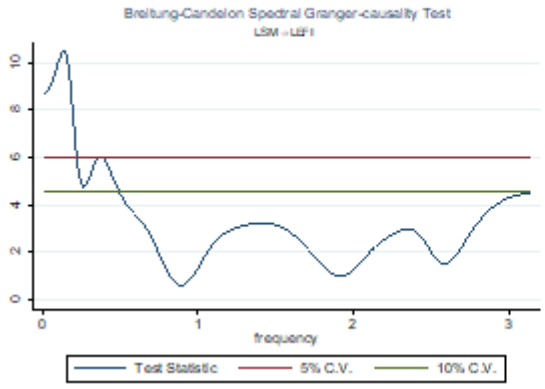
LSG → LEFI	
Frequencies	Wald test statistic
ω = 0.5	9.7307 (0.0077)***
ω = 1.0	6.9461 (0.0310)**
ω = 1.5	0.7656 (0.6820)
ω = 2.0	5.3997 (0.0672)*
ω = 2.5	13.1827 (0.0014)***
ω = 3.0	3.6814 (0.1587)

b. F-D Causality results from LPR to LEFI



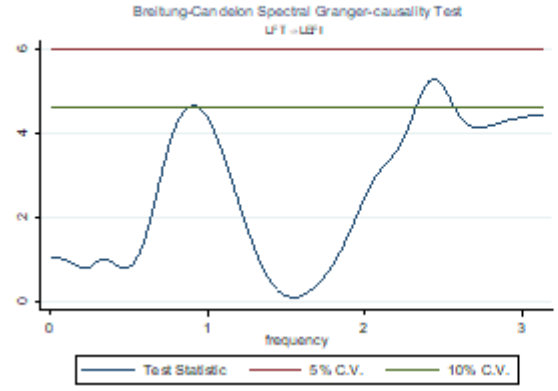
LPR → LSDI	
Frequencies	Wald test statistic
ω = 0.5	0.3977 (0.8197)
ω = 1.0	3.2856 (0.1934)
ω = 1.5	10.0144 (0.0067)***
ω = 2.0	4.1928 (0.1229)
ω = 2.5	1.3808 (0.5014)
ω = 3.0	4.5500 (0.1028)

c. F-D Causality results from LSM to LEFI



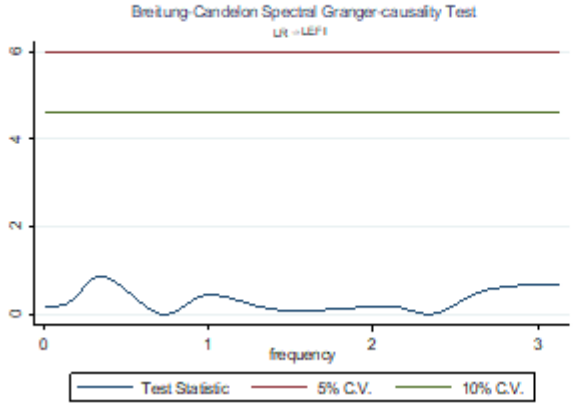
LSM → LEFI	
Frequencies	Wald test statistic
ω = 0.5	4.4764 (0.1066)
ω = 1.0	1.3629 (0.5059)
ω = 1.5	3.1720 (0.2047)
ω = 2.0	1.2712 (0.5296)
ω = 2.5	2.0111 (0.3658)
ω = 3.0	4.3270 (0.1149)

d. F-D Causality results from LFT to LEFI



LFT → LEFI	
Frequencies	Wald test statistic
ω = 0.5	0.8085 (0.6684)
ω = 1.0	4.3830 (0.1117)
ω = 1.5	0.1292 (0.9375)
ω = 2.0	2.4631 (0.2918)
ω = 2.5	5.1163 (0.0774)*
ω = 3.0	4.3849 (0.1116)

e. F-D Causality results from LR to LEFI



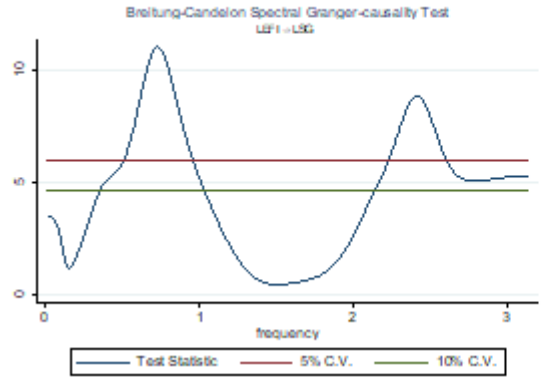
LR→ LEFI	
Frequencies	Wald test statistic
ω = 0.5	0.5632 (0.7546)
ω = 1.0	0.4604 (0.7944)
ω = 1.5	0.0998 (0.9513)
ω = 2.0	0.1905 (0.9091)
ω = 2.5	0.2482 (0.8833)
ω = 3.0	0.6928 (0.7072)

Panel 'a' in Table 6 presents the F-D causality running from LSG to LEFI, statistically confirming causality running from LSG to LEFI both in the long-run and the short-run, at varying significance levels, while panel 'b' shows the F-D causality running from LPR to LEFI, statistically verifying causality running from LPR to LEFI in the medium-run with a 1% statistical significance level. Panel 'c' and panel 'e' represent F-D causality results running from LSM and LR to LEFI, respectively, showing no statistically significant evidence of causality running from LSM and LR to LEFI. Lastly, panel 'd' represents the causality test result of F-D running from LFT to LEFI, verifying the existence of a causal link in the short run at a 10% significance level.

After investigating the F-D running from the main indicators to LEFI, the causality running from LEFI to the main indicators is estimated, which is illustrated in Table 7 below running from LEFI to LSG, LPR, LSM, LFT, and represented by 'a' to panel 'e', respectively.

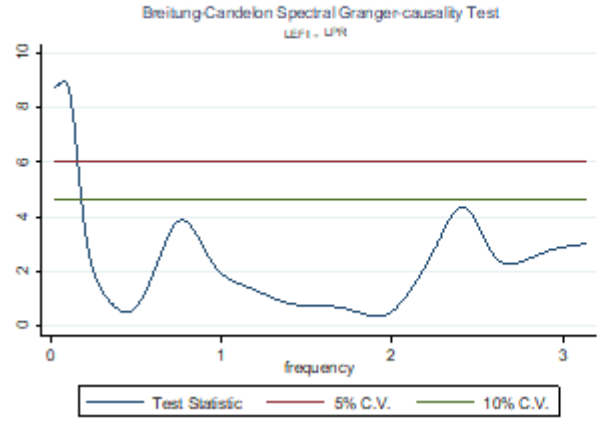
Table 7: F-D Causality results from LEFI to independent variables

a. F-D Causality results from LEFI to LSG



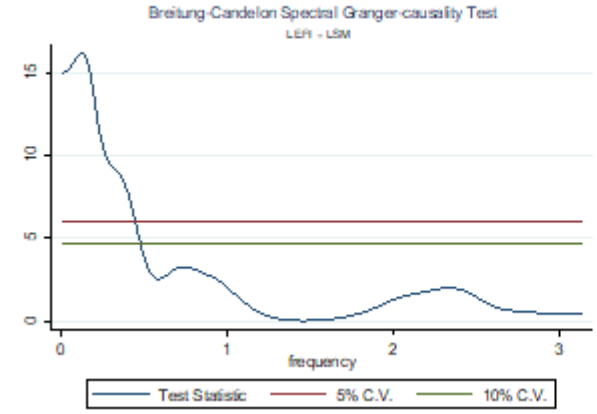
LEFI → LSG	
Frequencies	Wald test statistic
ω = 0.5	5.8913 (0.0526)***
ω = 1.0	5.1497 (0.0762)***
ω = 1.5	0.4299 (0.8066)
ω = 2.0	2.6821 (0.2616)
ω = 2.5	7.8549 (0.0197)**
ω = 3.0	5.2243 (0.0734)***

b. Frequency-Domain Causality results from LEFI to LPR



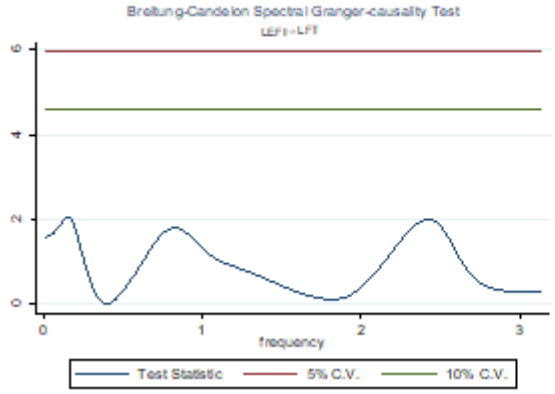
LEFI → LPR	
Frequencies	Wald test statistic
ω = 0.5	0.7436 (0.6895)
ω = 1.0	1.9092 (0.3850)
ω = 1.5	0.7490 (0.6876)
ω = 2.0	0.5541 (0.7580)
ω = 2.5	3.7098 (0.1565)
ω = 3.0	2.8980 (0.2348)

c. F-D Causality results from LEFI to LSM



LEFI → LSM	
Frequencies	Wald test statistic
ω = 0.5	3.9638 (0.1380)
ω = 1.0	2.0398 (0.3606)
ω = 1.5	0.0078 (0.9961)
ω = 2.0	1.2621 (0.5320)
ω = 2.5	1.4054 (0.4953)
ω = 3.0	0.4496 (0.7987)

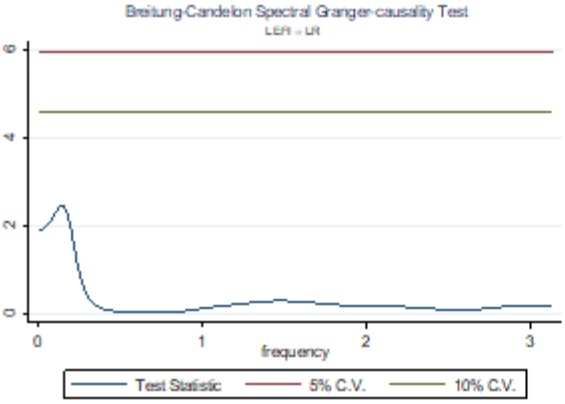
d. F-D Causality results from LEFI to LFT



LEFFI → LFT

Frequencies	Wald test statistic
ω = 0.5	0.3365 (0.8451)
ω = 1.0	1.3220 (0.5163)
ω = 1.5	0.4326 (0.8055)
ω = 2.0	0.3981 (0.8195)
ω = 2.5	1.8491 (0.3967)
ω = 3.0	0.2902 (0.8649)

e. F-D Causality results from LEFI to LR



LEFI → LR

Frequencies	Wald test statistic
ω = 0.5	0.0262 (0.9870)
ω = 1.0	0.0994 (0.9515)
ω = 1.5	0.2742 (0.8719)
ω = 2.0	0.1751 (0.9162)
ω = 2.5	0.0679 (0.9666)
ω = 3.0	0.1599 (0.9232)

The estimation results show evidence only running from LEFI to LSG in the long-run and short-run with 1% significance level, which is represented by panel 'a' in Table 7. No evidence for causality running from LEFI to LPR, LSM, LFT, and LR could be detected to show statistically significant causality running from LEFI.

5. CONCLUSION

Achieving sustainable economic growth is one of the crucial targets of the governments of both developing and developed countries since it is an essential instrument for improving economic well-being and decreasing poverty. Several studies in related literature verified the importance of economic freedom in attaining a number of desirable macroeconomic developments and sustainable economic growth (Lawson et al., 2020; Gwartney, 1999; Berggren, 2003). Thus, the drivers of economic freedom started to receive growing attention from both policymakers and academics. Therefore, investigating the causality relationship between the main components and economic freedom in Türkiye as an emerging economy is fundamental to designing appropriate policies to stimulate economic freedom that will lead to long-term sustainable economic growth. Thus, with this framework, the VAR-based causality test that a causality link runs from jointly from independent variables to LEFI, and the F-D causality test developed by Breitung-Candelon (2006) are investigated, where the causality link between the indicators is examined at varying frequencies. Before running the causality tests, the

co-integration among the variables is investigated through the application of the ARDL-based bounds test. The VAR-based GC test results confirm that all the independent variables jointly cause LEFI at a 5% statistical significance level. However, considering the individual causality running from independent variables to the dependent variable, the existence of causality from any of the components to the LEFI or from LEFI to any of the indicators in Türkiye could not be verified. The estimation results of the F-D causality test confirm that there is a causality running from LSG, LPR, and LFT to LEFI, whereas there is no causality confirmed from LSM and LR to LEFI. Confirming the results of the VAR-based GC test, no causality was detected running from LEFI to the components. While the VAR-based GC test results confirm that the components cause LEFI only when they are considered jointly, the F-D causality test verifies the individual causality running from LSG, LPR, and LFT to LEFI at varying time frequencies. For example, LSG causes LEFI in the long run and short run but only in the medium run, while LPR causes LEFI in the medium run only, and LFT causes LEFI in the short run only.

The impact of SG on EFI is complex and debated, however there is a general acceptance that larger SG is associated with lower EFI, often due to high tax rates and government expenditure, accompanied by the increased govenrment-controlled enterprises. A larger government normally requires more resources, which necessitates higher taxes on individuals and businesses. This reduces individuals' control over their earnings and businesses' ability to invest and grow, thus diminishing economic freedom. Furthermore, when there is large control of government in the share of the economy through government expenditure, it might generate a substitution of political decision-making for individual and market-based choices, indicating resource allocation by the government instead of voluntary exchange. Consequently, individuals' freedom to make their economic decisions might decrease, leading to suppressed innovation and reduced overall economic efficiency. Moreover, the larger size of government-controlled enterprises might limit competition, decreasing the opportunities for the private sector and individual freedom to start and operate businesses in those sectors.

Forming the foundation upon which individuals and businesses can make choices, engage in economic activity with confidence and take risks, it is accepted that well-defined and secure PR are fundamental to economic freedom.. Clearly defined and legally protected PR lets individuals safely invest in their skills and assets, providing a favourable environment for entrepreneurship and innovation, thus contributing to economic growth. In contrast, if the PR are not well defined and weakly supported by legal authorities, uncertainty increases, discouraging investment and thus economic growth.

FT is an essential component of EFI, which has a positive and profound impact on it. FT indicates the degree of the individuals' and businesses' ability to voluntarily engage in the voluntary exchange of goods and services across borders. FT promotes innovation, efficiency, and economic growth, leading to higher living standards. FT provides an environment for individuals and businesses to make their own economic choices with greater autonomy and prosperity, promoting economic growth.

6. POLICY RECOMMENDATIONS

Based on the results of the study's empirical analysis, the government's focus should be on improving economic freedom and promoting economic well-being in Türkiye. However, while designing policies to decrease the size of the government, the policies should be designed according to the long-run and short-run since the size of the government is verified to cause economic freedom at both frequencies. In addition, it is confirmed that improvements in the protection of property rights cause economic freedom in the medium run only. Thus, the policies to promote the protection of property rights have to be designed considering the medium run.

The government's size includes the top marginal tax rate, state ownership of the assets, government enterprises and investment, transfers and subsidies, and government expenditure. Improving economic freedom by reducing the size of government can be achieved by reducing the top marginal tax rates that might improve the motivation to work, save and invest. The inefficiencies and outdated governmental programs can be identified throug comprehensive reviews and redesigned to increase the efficiency of the implemented programs thus decreasing SG. A framework for fiscal discipline can be achieved through strict budget caps and fiscal rules to achive control over teh government expenditure. Efficiency can also be improved through privatization of the inefficient state-owened enterprices. Moreover, utilizing technology that would automate government processes, enhance service delivery, and streamline operations, thereby reducing the need for extensive bureaucracies can reduce SG. Furthermore, decreasing the state ownership of assets, controlling government enterprises and investment, reducing transfers and subsidies, and decreasing government expenditure. However, the government budget might be hampered or in a country like Türkiye, where agricultural production as a sector is very important, a decrease in subsidies might worsen the sector. Thus, all those actions has to be taken cautiously.

Property rights include the protection of property rights, regulatory costs of the sale of real property, military interference in rule of law and politics, gender disparity adjustment, impartial courts, judicial independence, integrity of the legal system, legal enforcement of contracts, reliability of police, and business costs of crime adjustment that has to be considered to be improved to progress economic freedom that might promote economic growth. For example, PR including ownership governing laws regarding transfer and use of land, intellectual property and financial assets, need to be designed in a way that is clear, comprehensive, and easily accessible to all citizens and businesses. Moreover, the transparency and predictability of the government actions should be ensured, providing equal application for all individuals and businesses. Furthermore, the land registry system should be modernized and digitalized to provide clear and secure titles, reducing property registration costs and time. In addition, the awareness of individuals and businesses regarding property rights and protecting them can be improved.

The freedom to trade internationally includes tariffs, regulatory trade barriers, black-market exchange rates, and controls of labour and capital movements that need to be eased to promote economic freedom. Reducing tariffs, especially for intermediate goods and raw materials used in domestic production, would decrease the cost, increase competition, and lead to greater integration into the global economy. Moreover, the restrictions limiting trade can be reduced through the removal or phase-out of import and export quotas. Furthermore, modernized digital technologies can automate the submission of all necessary documentation and data to government agencies involved in the import and export process, which can reduce paperwork and processing time.

It is vital to promote a decrease in the government's size, improvements in the protection of property rights, and freeing international trade to accelerate economic freedom, thus, sustainable economic growth in Türkiye. This study is limited, considering only the main components of EFI, however, the sub-components of the size of the government, property rights and free trade have also been considered. Therefore, those factors have to be considered individually in a future study. Furthermore, this study concentrates only on the investigation of the causal link between the EFI and its main components. The short and long-run impact of the components on EFI can be examined in future studies. Another limitation is that the study does not fully investigate the impact of significant economic shocks that Turkey has experienced.Thus, future work could involve a more comprehensive analysis of the relationship between economic freedom and these shocks, such as the 2008 financial crisis and other global shocks.

Ethic Statement Acknowledgement

This study has been prepared in accordance with the rules of scientific research and publication ethics.

Authors' Contribution

There is only one author of this study.

Conflict of Interest

I confirmed that I have no conflicts of interest to disclose.

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