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THE EFFECT OF ECONOMIC FREEDOMS ON PUBLIC DEBT IN TÜRKİYE

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Abstract: *While the fourth industrial revolution is happening at great speed, it is an inevitable fact that without significant economic investments, countries will enter a stagnant economy and lose their international competitiveness. Large amounts of funds are needed to invest in these areas. For this reason, countries that cannot provide sufficient funds through national and international trade need public borrowing to finance investments. Given these explanations, the study focused on analyzing a dataset encompassing the share of public debt in GDP and the sub-criteria of the economic freedom index for the years 1999-2022. The objective was to explore the influence of economic freedoms on the economy. Public debt in Türkiye ARDL (Autoregressive Distributed Lag) method was used to determine the short- and long-term relationship. According to the results of the analysis, business freedom and tax burden, which are the sub-criteria of economic freedom, have a positive effect on public expenditures; Monetary freedom, trade freedom, financial freedom and investment freedom have been found to have a negative impact. It is expected that these borrowings will turn into a burden on the country's economy in the short term and gain in the long term.*

Keywords: *Public Debt, Economic Freedom, ARDL*

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1. Introduction

Public debt is a complex economic concept comprising the borrowings a country undertakes to finance its public expenditures. These debts are typically acquired from the country's bond market or international credit institutions. Public debt functions not solely as a liability for the government but also operates as an indicator of the economic and financial well-being of the country. This debt burden can impact a nation's economic strength and stability. Generally, the magnitude of public debt reflects a country's economic strength and stability. Countries with low levels of public debt often exhibit robust and stable economies, enabling them to attract more investment and stimulate economic growth. Conversely, nations burdened with high levels of public debt often experience economic weakness and instability. This situation may

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lead to difficulties in repaying debts or result in economic problems due to high interest costs. Nevertheless, it is crucial to recognize that the significance of public debt lies not only in its size but also in how it is utilized. Countries can enhance their economic power by investing their high debts in areas that foster economic growth and development, such as infrastructure projects, education, healthcare services, and technological innovation. However, countries that squander low debts on unnecessary expenditures or succumb to corruption, such as bribery, may diminish their economic strength. Moreover, countries with high levels of public debt may find it more challenging to navigate through economic crises, and the repayment of debts during such crises could become even more difficult, potentially leading to long-term economic recovery issues.

Public debts have a complex impact on a country's economic growth, with various approaches offered by economic theories and research to assess this effect. According to classical economic theory, public debts can have a negative impact on economic growth. This theory suggests that public debts may restrict private investments and exert pressure on capital markets by increasing future tax burdens, thereby limiting economic growth. In contrast, Keynesian economists argue that public borrowing stimulates economic growth in the short term. Increasing public expenditures elevates overall demand, promoting employment and growth. However, this stimulative effect may only be sustainable if the debt is managed effectively and its long-term sustainability is ensured. Some economists, such as Ricardo, assert that public debts have a neutral relationship with economic growth, neither positively nor negatively influencing it. This perspective does not focus on the management and use of the debt. Reinhart and Rogoff (2010) propose a more nuanced view, suggesting a complex relationship between public debts and economic growth. They argue that public debts can support growth up to a certain threshold but may have negative effects once that threshold is surpassed. In other words, they posit a "inverted U-shaped" relationship between debt and growth (Augustine & Rafi, 2023).

The influence of public debts on economic growth results from a confluence of factors, encompassing the magnitude, purpose, and administration of the debts, as well as prevailing economic conditions, interest rates, and other contributing elements. Policymakers are tasked with thoughtful consideration of these factors in crafting and overseeing borrowing policies, given their crucial significance for the vitality and expansion of the economy. Economic growth stands as a foundational objective in advancing a country's prosperity and elevating the quality of life for its inhabitants. While it is influenced by numerous factors, economic freedoms serve as one of its key driving forces. Countries aim to achieve increased well-being alongside economic growth, and economic freedoms form the foundation of this objective. Economic freedoms allow individuals, businesses, and investors to freely conduct economic activities. They encompass the respect for property rights, ensuring that individuals and businesses have secure ownership and can freely utilize their properties. Furthermore, economic freedoms involve promoting free-market conditions, where prices are determined by supply and demand, and competition operates freely. This encourages more choices for consumers and contributes to increased productivity.

Economic freedoms also encompass the reduction of regulatory barriers. This can decrease the cost of doing business, encourage entrepreneurship, and accelerate economic growth. Additionally, it involves factors such as engaging in free trade agreements and promoting international trade. Liberalized trade strengthens economic relations between countries and can lead to market expansion. These freedoms are fundamental pillars of market economies and generally stimulate economic growth. Numerous studies in economic literature indicate an increase in economic growth as economic freedoms increase. Therefore, policymakers emphasize promoting and preserving economic freedoms, aiming not only for economic

growth but also for higher living standards and prosperity (De Haan & Sturm, 2000; Piątek et al., 2013).

By promoting economic growth, economic freedoms can increase government revenues. This leads to an increase in tax revenues, providing the government with more resources. Simultaneously, economic freedoms encourage more effective management of expenditures. Effective spending ensures the efficient use of public resources and prevents waste. These effects can have a positive impact on public borrowing. Higher tax revenues can reduce the government's need for borrowing. The increased tax revenues associated with economic growth can play a significant role in financing public debts. Additionally, the promotion of free-market conditions by economic freedoms can enhance economic growth, further improving the sustainability of public debts. Ease of doing business under free-market conditions encourages entrepreneurship and assists in the growth of businesses. However, it is crucial to strike a balance in the implementation of economic freedoms to avoid adverse consequences. For instance, excessively low tax rates or minimal regulations may lead to a decrease in public revenues and an increase in government borrowing. Therefore, the balanced implementation of economic freedoms and careful management of public policies are essential.

In conclusion, economic freedoms, by increasing economic growth, can boost government revenues and have a positive impact on public debt. However, it is crucial to manage these effects in a balanced manner. This study includes both long and short-term analyses to understand the impact of economic freedoms on public borrowing, preceded by a literature review to enhance clarity and strengthen the scientific foundation of the subject.

2. Literature Research

Mahmood et al. (2010) sought to assess the impact of economic freedom on growth by employing data from five countries within the SAARC organization. The study subjected the data to testing using the ARDL model. The analyses culminated in the finding that economic freedom exerted a significant influence on the per capita gross domestic product in the respective countries. In a subsequent study, Mahmood and Azid (2011) conducted an analysis encompassing data from 96 countries, utilizing the ARDL method to discern the relationship between economic freedom and economic growth across various economies. The results of the analysis revealed a robust bilateral correlation between economic freedom and economic growth in high, low, and middle-income countries. Conversely, it was observed that there existed a unidirectional relationship between economic freedom and economic growth in upper-middle-income and lower-middle-income countries.

Egbetunde (2012) explored the correlation between public debt and economic growth in Nigeria spanning from 1970 to 2010, employing Vector Autoregressive analysis. The study identified a bidirectional causality between economic growth and public debt in Nigeria, concluding that a long-term relationship exists between the two. It also proposed that a positive relationship prevails when government borrowing is transparent and directed toward economic development rather than personal interests.

Presbitero (2012) delved into the impact of public debt on growth through causality analysis, utilizing data from low and middle-income countries from 1990 to 2007. The findings of this analysis revealed a detrimental effect of public debt on GDP. Essentially, the study concluded that public borrowing had an adverse impact on economic growth during the examined period.

In a separate study, Panizza and Presbitero (2014) endeavored to quantify the causal impact of public debt on economic growth in OECD countries, employing an instrumental variable approach. The analysis outcomes indicated a negative relationship between public debt and

growth. Tunçsiper and Biçen (2014) concentrated on gauging the impact of economic freedom on economic growth in nine developing countries, including Türkiye. They utilized panel regression analysis with data from 2000 to 2012. The results of the analysis suggested that there was no significant relationship between economic growth and the freedom index. These studies collectively contribute to unraveling the intricate connections between public debt, economic freedom, and economic growth, providing valuable insights into the specific contexts of the countries examined.

Lee and Ng (2015) explored the influence of public debt on economic growth in Malaysia, employing correlation and regression analysis with data spanning from 1991 to 2013. The results of the analysis unveiled a negative relationship between borrowing and growth, indicating that public debt exerted an adverse impact on Gross Domestic Product (GDP). Furthermore, the study concluded that budget deficits, public consumption, and external debt were diminishing functions in relation to GDP. Owusu-Nantwi and Erickson (2016) scrutinized the enduring connection between public debt and economic growth in Ghana, utilizing the Johansen cointegration model with data acquired from the World Bank and IMF for the years 1970-2012. The study concluded that there existed a positive and statistically significant long-term relationship between public debt and economic growth in Ghana.

Tanin and Masih (2017) sought to gauge the impact of economic freedom on growth using data from Bangladesh spanning the years 1995-2015. Employing the ARDL method, the results of the analysis indicated a positive effect of economic freedom on economic growth during the specified period. In a different study, Gündüz and Çelikay (2019) investigated the repercussions of public debt on economic growth in 52 selected countries categorized by income groups. They employed error correction models for their analysis, revealing that in low-income countries, the relationship was negative in the long run, whereas in other income groups, it was negative in the short run.

Leite et al. (2019) scrutinized data from 121 countries, utilizing the ARDL method to assess the enduring effects of economic freedom and anti-corruption efforts on economic growth. The outcomes highlighted that economic freedom and corruption control significantly and positively influenced a country's economic growth in the long run. Turan (2019) delved into the relationship between public debts and economic growth in Türkiye, employing both ARDL and NARDL methods. The study concluded that, in the short term, public borrowing had a negative impact on economic growth, but in the long term, it did not exhibit any significant influence on growth.

Asghar et al. (2020) gauged the impact of institutional quality on economic growth in 13 developing countries in Asia, utilizing data from 1990 to 2013 and employing ARDL analysis. The results indicated a positive effect of institutional quality on economic growth. Awan and Naeem (2020) investigated the relationship between economic freedom and economic growth in Pakistan, analyzing 23 years of data from 1995 to 2017 with the ARDL model. The findings suggested that political instability negatively affected economic freedom in Pakistan, while economic growth showed a positive correlation with both the labor force and economic freedom.

Asteriou et al. (2021) examined the impact of public debt on economic growth in selected Asian countries for the period 1980-2012. The analysis results indicated that an increase in public debts had a negative impact on economic growth, both in the short and long term.Abubakar and Mamman (2021) examined the impact of public debt on the economic growth of OECD countries in their study. The results of the study indicated that public debt had a persistent negative effect and a temporary positive effect on economic growth. Makhoba et al. (2021) used NARDL and STAR methods with data from 1980 to 2018 to analyze the effects of

public debt on economic growth in South Africa. The results demonstrated a significant nonlinear and inverted U-shaped relationship between public debt and economic growth.

In the study conducted by Nutassey et al. (2023), the Generalized Method of Moments was utilized to explore the interplay of political institutions in the link between public debt and economic institutions across 40 Sub-Saharan African countries. The research revealed a notable and negative relationship between economic institutions and public debt. Moreover, the results underscored that political institutions played a consequential and negative role in influencing the connection between economic institutions and public debt.

As a result of the literature review, it is seen that many studies have been conducted on the Turkish economy, economic freedoms and public debt, but the effects of economic freedoms on public debt have not been studied much. In general, the intensity of studies aimed at determining the effects on growth is noteworthy. It is a known fact how important this issue is considered in the world economic literature. In the light of these researches, it was planned to clearly reveal the short and long-term relationships in the study, and the suitability of the ARDL method to the subject was determined by us.

3. Methodology

Among the data to be used in the analysis, the share of public debt in GDP was obtained from the IMF (International Monetary Fund). The sub-criteria of the economic freedom index were obtained from The Heritage Foundation and included in the analysis. All data were converted into an annual time series for the period covering 1999-2022. In this form, ARDL analysis was used to test the data.

ARDL (Autoregressive Distributed Lag) analysis, developed by Pesaran et al. in 2001, is an econometric cointegration analysis that helps determine short- and long-term relationships between variables. The "condition of series being equally stationary", which is generally sought in other cointegration tests, is also valid for ARDL. Unlike other econometric methods, both low and high level lags can be analyzed. Therefore, ARDL analysis allows a more comprehensive and accurate explanation of the relationships between variables in the data set (Pesaran et al., 2001).

In the ARDL analysis, the share of public debt in GDP was used as the dependent variable and the sub-criteria of the economic freedom index were used as independent variables. The following model was then created to perform the analysis:

$$PD = \alpha + \beta_1 BF + \beta_2 FF + \beta_3 IF + \beta_4 MF + \beta_5 TB + \beta_6 TF + \mu_i \quad (1)$$

Explanations of the variable abbreviations used in the model are given in Table 1.

Table 1. Explanations of variables

Variable	Explanation
PD	Public Debt-to-GDP Ratio
BF	Business Freedom
FF	Financial Freedom
IF	Investment Freedom
MF	Monetary Freedom
TB	Tax Burden
TF	Trade Freedom

4. Analyze

Table 2 includes descriptive statistics of dependent and independent variables in the first stage of the analyses. Descriptive statistics are measures that describe general characteristics of a data set. These are statistical data that introduce and summarize numerical data, show the typical values and distribution of units, and provide information about distributions. Descriptive statistics are commonly set apart from inferential statistics. Through descriptive statistics, one can straightforwardly depict the nature of the data or the information it conveys. It is employed to showcase quantitative explanations in a manageable structure and aids us in streamlining extensive data in a coherent manner. Each descriptive statistic condenses a substantial volume of data into a more straightforward summary. In the table, the largest value of the standard deviation is 14.490 and the smallest value is 4.737, which shows that it is not very common in its distribution. The fact that the maximum and minimum values are 86,800 and 27,362 supports that we are in an important range for economic freedoms and public debt figures and that we are on the right track in the analysis.

Table 2. Descriptive Statistics

	PD	**BF**	**FF**	**IF**	**MF**	**TB**	**TF**
Mean	43.130	65.071	55.417	63.750	61.333	71.917	80.179
Median	40.694	67.050	60.000	70.000	70.000	74.700	79.600
Maximum	75.511	70.000	70.000	75.000	73.300	78.200	86.800
Minimum	27.362	55.000	30.000	50.000	31.800	57.000	73.000
Std. Dev.	13.709	5.142	8.330	10.242	14.490	6.128	4.737
Skewness	0.882	-1.122	-0.826	-0.523	-1.039	-0.852	-0.003
Kurtosis	2.987	2.894	4.912	1.506	2.473	2.624	1.533
Jarque-Bera	3.111	5.045	6.385	3.326	4.596	3.042	2.152
Prob.	0.2111	0.0803	0.0411	0.1895	0.1005	0.2185	0.3409
Sum	1035.128	1561.700	1330.000	1530.000	1472.000	1726.000	1924.300
Sum Sq. Dev.	4322.573	608.090	1595.833	2412.500	4828.933	863.713	516.080
Observations	24	24	24	24	24	24	24

In empirical investigations involving time series, there is an assumption that the data exhibits "stationarity." Nevertheless, a notable portion of time series data does not adhere to this stationary characteristic. In order for the relationships between variables to be meaningful, the time series we use must show stationary properties. In the case of non-stationarity, it may appear that there is a relationship between two variables even though there is no significant relationship between them. When we establish a correlation model with these series, a high R2 value can be obtained even if there is no relationship between them. In this case, the spurious connection problem will arise. If both time series exhibit a strong trend, the reason for the high R2 observed between them is not a linear relationship between the two variables in question, but rather a strong trend relationship. Therefore, when analyzed with non-stationary series, traditional t and f tests and the R2 value give misleading results. For this reason, unit root tests were carried out with ADF (Augmented Dickey–Fuller) and PP (Phillips–Perron) methods to measure the stationarity levels of the series in Table 3. It was determined that all series were stationary at the first difference in both ADF and PP methods. In addition, the fact that both methods give consistent and close results with each other ensures the stationarity of the series at the first difference.

Table 3. Unit Root Tests

At Level			**PD**	**FF**	**BF**	**MF**	**TF**	**TB**	**IF**
With Constant	PP	t-Stat.	-13.347	-27.584	-24.426	-23.610	-15.483	-27.458	-14.401
		Prob.	0.5954	0.0799*	0.1419	0.1630	0.4919	0.0819*	0.5450
	ADF	t-Stat.	-14.445	-28.170	-38.930	-29.123	-15.714	-26.894	-13.426
		Prob.	0.5420	0.0714*	0.0084***	0.0600*	0.4805	0.0941*	0.5917
With Constant & Trend	PP	t-Stat.	-12.530	-35.586	-24.559	-0.085	-11.181	-26.527	-22.555
		Prob.	0.8741	0.0565*	0.3443	0.9918	0.9037	0.2628	0.4395
	ADF	t-Stat.	-0.996	-34.372	-35.218	0.1062	-11.181	-0.922	-22.579
		Prob.	0.9250	0.0709*	0.0641*	0.9952	0.9037	0.9318	0.4383
Without Constant & Trend	PP	t-Stat.	-0.520	-0.663	-0.468	0.5897	0.0214	0.8245	-0.209
		Prob.	0.4804	0.4187	0.5014	0.8364	0.6794	0.8829	0.6002
	ADF	t-Stat.	-0.509	-0.663	-0.468	0.0028	-0.001	0.7035	-0.209
		Prob.	0.4844	0.4184	0.5014	0.6728	0.6722	0.8599	0.6002
At First Difference			**d(PD)**	**d(FF)**	**d(BF)**	**d(MF)**	**d(TF)**	**d(TB)**	**d(IF)**
With Constant	PP	t-Stat.	-36.980	-62.776	-46.447	-18.720	-56.409	-69.747	-40.476
		Prob.	0.0117**	0.0000***	0.0014***	0.3384	0.0001***	0.0000***	0.0054***
	ADF	t-Stat.	-36.980	-61.776	-46.447	-18.720	-56.614	-70.588	-40.452
		Prob.	0.0117**	0.0000***	0.0014***	0.3384	0.0001***	0.0000***	0.0054***
With Constant & Trend	PP	t-Stat.	-36.718	-66.264	-45.387	-36.424	-62.774	-68.725	-40.711
		Prob.	0.0464**	0.0001***	0.0082***	0.0491**	0.0002***	0.0001***	0.0212**
	ADF	t-Stat.	-36.873	-64.805	-41.781	-30.214	-43.946	-47.351	-40.701
		Prob.	0.0451**	0.0001***	0.0196**	0.1510	0.0139**	0.0074***	0.0213**
Without Constant & Trend	PP	t-Stat.	-37.883	-64.191	-47.450	-18.444	-57.770	-69.809	-41.471
		Prob.	0.0006***	0.0000***	0.0001***	0.0630*	0.0000***	0.0000***	0.0002***
	ADF	t-Stat.	-37.883	-62.981	-47.450	-18.444	-58.005	-70.993	-41.451
		Prob.	0.0006***	0.0000***	0.0001***	0.0630*	0.0000***	0.0000***	0.0002***

*** 10% significance level**
**** 5% significance level**
***** 1% significance level**

The unit root test with structural breaks also takes into account structural breaks in the time series. Structural breaks are sudden and permanent changes in expected trends or other characteristics of a time series. This test helps to more accurately estimate the stationarity feature of the time series by determining the presence of structural breaks in the time series. Unit root test results with structural breaks for the data used in the study are given in Table 4. According to the results obtained, it is seen that the MF and IF variables are not stationary at the level, but all variables are stationary at the first difference.

Table 4. Unit Root Test with Structural Breaks

Variable(s)		**t-Statistic**	**Probability**
PD	At Level	-5.6583	0.0129
	At First Difference	-9.0726	< 0.01
FF	At Level	-17.3327	< 0.01
	At First Difference	-14.1524	< 0.01
BF	At Level	-5.5663	0.0172
	At First Difference	-7.5585	< 0.01

MF	At Level	-4.6283	0.182
	At First Difference	-5.2328	0.0432
TF	At Level	-5.6636	0.0126
	At First Difference	-7.3514	< 0.01
TB	At Level	-9.9318	< 0.01
	At First Difference	-8.4431	< 0.01
IF	At Level	-2.8089	0.982
	At First Difference	-8.5363	< 0.01

Graphs of unit root tests with structural breaks are given in Figure 1. Points where structural breaks occur can be seen in the graphs.

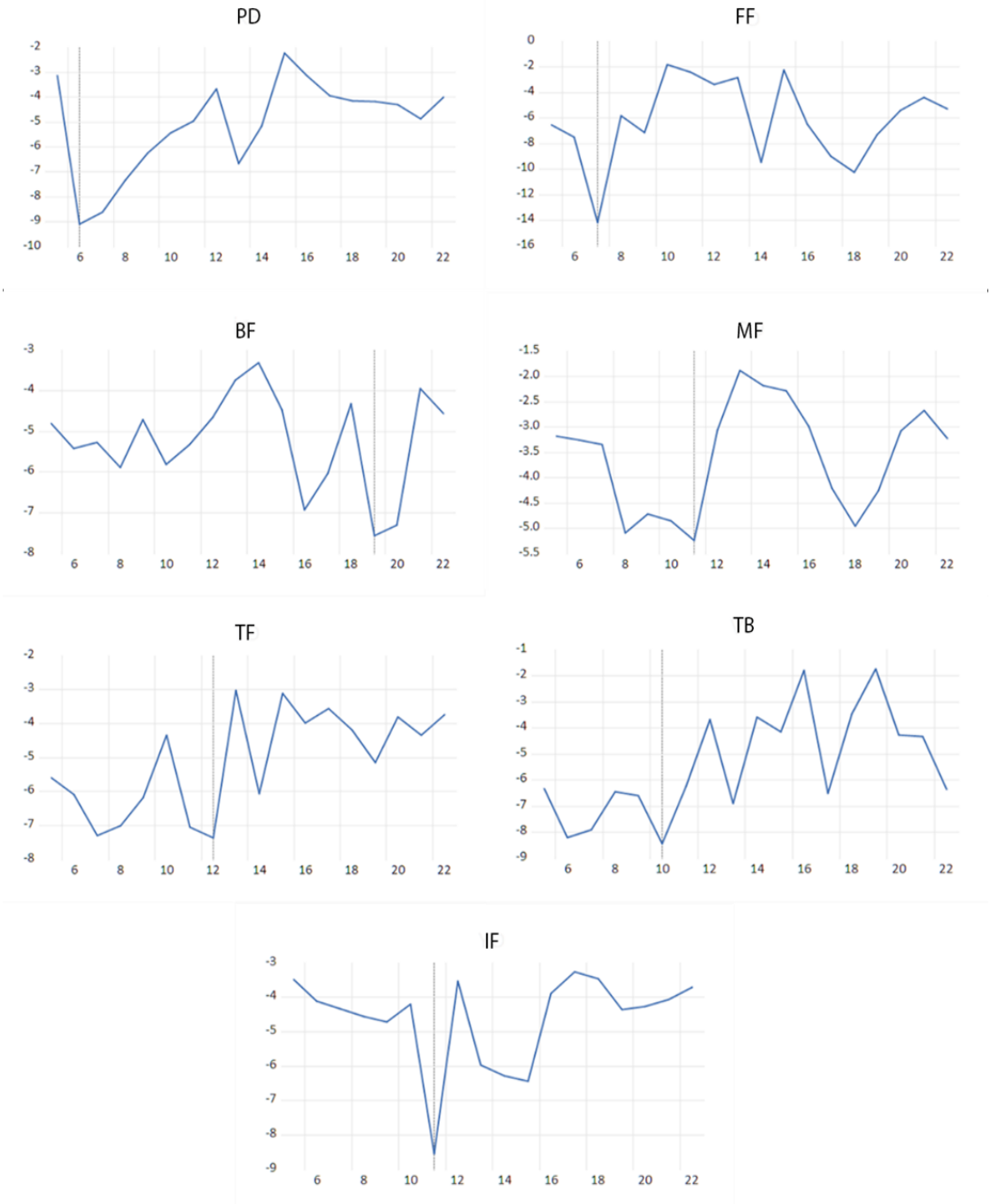

Figure 1. Unit Root Test Graphs with Structural Breaks

ARDL Boundary Test or Autoregressive Distributed Lag Bound Test was developed by M. Hashem Pesaran, Yongcheol Shin and Richard J. Smith in 1995. ARDL is a model used to test the concept of cointegration, which states that there is a stationary combination of at least two series that are not stationary at their levels. In summary, it is known as an econometric model that helps capture long and short term causality relationships. In this cointegration test, as in other cointegration tests, there is no requirement for the series whose cointegration relationship is examined to be stationary to the same degree. ARDL test was performed to detect short- and long-term causal relationships between the data. Short-term ARDL test results are given in Table 5.

Table 5. Short-Term ARDL Test

ARDL Model: (2, 1, 1, 0, 0, 1, 0)				
Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
PD(-1)	0.165310	0.155510	1.063016	0.3128
PD(-2)	-0.148771	0.085793	-1.734062	0.1136
FF	-0.228225	0.094705	-2.409840	0.0367
FF(-1)	-0.236488	0.130204	-1.816285	0.0994
BF	0.496605	0.149982	3.311102	0.0079
BF(-1)	0.253134	0.175199	1.444839	0.1791
MF	-1.212638	0.147023	-8.247958	0.0000
TF	-0.656962	0.195648	-3.357884	0.0073
TB	0.313577	0.229115	1.368644	0.2011
TB(-1)	0.591307	0.207797	2.845604	0.0174
IF	-0.300964	0.094249	-3.193299	0.0096
R-squared	0.992717			
Adjusted R-squared	0.984706			
Durbin-Watson Statistic	2.429347			
Probability (F-statistic)	0.000000			

When short-term ARDL test results are examined; Financial freedom (FF), business freedom (BF), monetary freedom, trade freedom (TF), tax burden (TB) and investment freedom (IF) appear to be effective on public debt. When the table is examined in more detail, financial freedom has a negative impact on public debt both in the same period and with a period delay. Business freedom has a positive effect in the same period. Monetary freedom, trade freedom and investment freedom have a negative impact in the same period; The tax burden has a positive effect only with a one-period delay.

The error correction model, created by including a period lag of the variables in the analysis, shows the rate at which independent variables that lose their relationship with the dependent variable can re-establish a relationship in a period in the event of an economic shock (crisis, disaster, etc.). The error correction model test performed for the analyzes is given in Table 6.

Table 6. Error Correction Model

Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(PD(-1))	0.148771	0.061981	2.400261	0.0373
D(FF)	-0.228225	0.044446	-5.134835	0.0004
D(IO)	0.496605	0.090400	5.493385	0.0003
D(TB)	0.313577	0.112667	2.783232	0.0193
CointEq(-1)*	-0.983461	0.055936	-17.58177	0.0000

When the error correction model is examined, it is seen that the coefficient of the error correction model is negative (-0.98) as expected, and the probability value is found to be significant. The conclusion to be drawn here is that the rate of independent variables re-establishing a relationship with the dependent variable in any shock situation is 98% in a period.

After the short-term ARDL analysis, the results of the long-term relationship are presented in Table 7.

Table 7. Long-Term ARDL Test

Variables	Coefficient	Std. Error	t-Statistic	Prob.
FF	-0.472528	0.138689	-3.407102	0.0067
BF	0.762347	0.194200	3.925571	0.0028
MF	-1.233031	0.103086	-11.96119	0.0000
TF	-0.668010	0.186655	-3.578846	0.0050
TB	0.920102	0.308973	2.977941	0.0139
IF	-0.306025	0.083777	-3.652864	0.0044

It has been determined that all variables have a significant effect on public debt in the long term, as in the short term. Negative and positive relationships of variables are the same as short-term effects. However, the fact that the coefficients of the variables in the long term are much higher than in the short term shows that public debts are much more affected by the freedom indices in the long term.

In the next stage, a bounds test was performed to prove the existence of long-term relationships. The results of the test are given in Table 8.

Table 8. ARDL Bounds Test

F-statistic	Significance	I(0)	I(1)
	10%	2.457	3.797
15.96486	5%	2.97	4.499
	1%	4.27	6.211

According to the bounds test results, the f-statistic value is higher than the I(1) upper critical value with 10%, 5% and 1% significance levels. In other words, the model created has cointegration at a 1% significance level in the long run.

A normality test was performed to understand whether the residuals were normally distributed in the created model and the results obtained are presented in Figure 2.

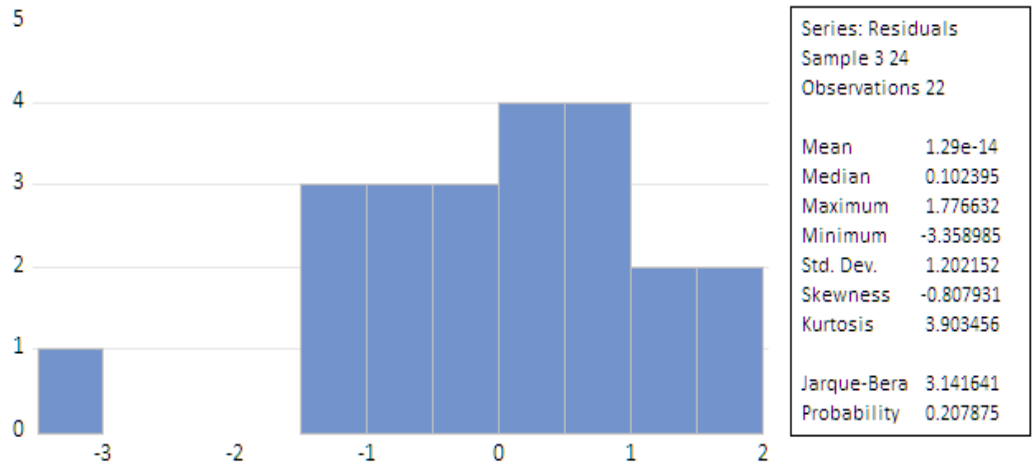

Figure 2. Statistics and Normality Value of the ARDL Model

In Figure 2, it was determined that the Jarque-Bera normality test probability value was 0.208 (>0.05) and the residues were not normally distributed.

Autocorrelation is a statistical problem that occurs when the relationship between observations in a time series data set depends on previous observations. In this case, an observation value may be determined by one or more of the previous observation values. To test whether there is an autocorrelation problem among the data used in the study, serial correlation LM test was performed and the results are given in Table 9.

Table 9. Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.498282	Prob. F(2,6)	0.6252
Obs.*R-squared	2.436978	Prob. Ki-sq(2)	0.2957

When the probability value is examined in Table 9; It is seen that 0.6252>0.05, meaning that the existence of autocorrelation between the series is rejected. Therefore, it was concluded that there was no autocorrelation problem in the data used in the analysis.

Heteroskedasticity problem is a statistical problem that occurs when the variability (variance) in the data set is not constant. That is, the variability of data in different parts of the data set is different from each other. This may result in the assumptions required for many statistical analyzes not being met, resulting in misleading results. In the next stage, a heteroskedasticity test was performed to detect the existence of a heteroscedasticity problem in the model and the results are given in Table 10.

Table 10. Heteroscedasticity Test

Breusch-Pagan-Godfrey			
F-statistic	0.286473	Prob. F(11,10)	0.9741
Obs.*R-squared	5.271492	Prob. chi-sq (11)	0.9173
Scaled explained SS	1.581152	Prob. chi-sq (11)	0.9995

The fact that the heteroscedasticity probability value is 0.9741 (>0.05) in Table 10 shows that constant variance cannot be rejected in the model, that is, there is no heteroscedasticity problem.

Finally, CUSUM and CUSUM Square tests were performed to see whether the series met the stability condition of parameter estimation and the results are given in Figure 3 and Figure 4.

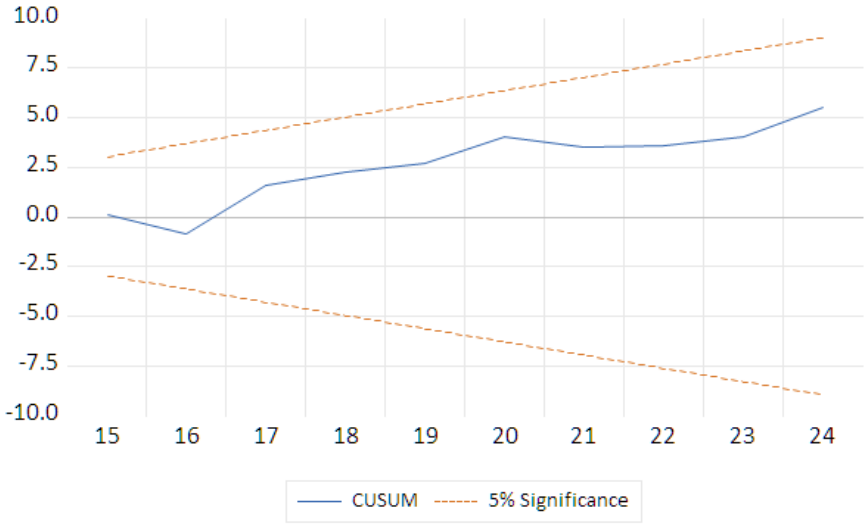

Figure 3. CUSUM Test

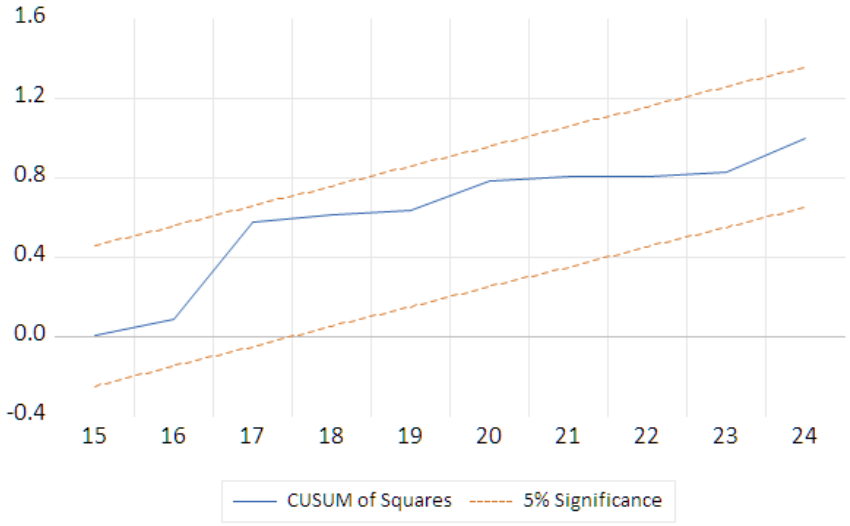

Figure 4. CUSUM Square Test

Dashed lines in the figures represent the 95% confidence limit. It is seen that the parameter estimates for both variables are within the confidence limit.

5. Conclusion

In this study, ARDL analysis was conducted for the period covering the years 1999-2022 in order to examine the impact of economic freedoms on public debt in Türkiye. As a result of the analysis, it was understood that all economic freedom sub-criteria (business freedom, financial freedom, investment freedom, monetary freedom, tax burden and trade freedom) are effective on public debt both in the long term and in the short term.

Business freedom is an indicator that reflects the ability of individuals to easily establish and operate a business without being burdened with legal processes. In other words, it reflects the free conduct of entrepreneurial activity without burdensome and unnecessary regulations. In addition, grants and supports provided for established businesses also support business freedom. The increase in the number of enterprises and businesses means an increasing need for funding for these grants and supports. At this point, the state will need to provide the fund in question largely through public borrowing. Therefore, the positive effect of business freedom on public debt obtained from the analysis is thus significant.

Increased financial freedom has a reducing effect on public debt in both the short and long term. This shows that liberalized financial markets and reduced regulations support public finance by reducing borrowing costs. In addition, increased financial freedom can indirectly increase public revenues and ease the debt burden by stimulating investments and economic growth.

Increasing trade freedom reduces public debt in the short and long term. At this point, it shows that free trade policies contribute to public finance by encouraging economic growth and improving the foreign trade balance. Additionally, trade liberalization can help increase tax revenues and thus reduce the public debt burden.

Increased investment freedom reduces public debt in both the short and long term; It shows that improving the investment environment will make positive contributions to public finance by supporting economic growth and creating new job opportunities. On the other hand, increased investment freedom can stimulate economic activity by attracting foreign direct investment and encouraging local investment, which in turn can increase public revenues.

Monetary freedoms represent a stable and reliable currency for countries as a medium of exchange, unit of account and store of value. In countries with high monetary freedom, the rate of long-term value creation and capital accumulation is equally high. Therefore, the strengthening capital environment makes public borrowing unnecessary. As a result of the analysis, the negative impact of monetary freedoms on public debt in the long term can be understood more clearly. In the short term, a significant negative effect was detected for both the same period and one period later.

Finally, the tax burden criterion shows how much the tax collected by the state restricts the income of individuals and businesses. However, a positive increase in the tax burden criterion means less tax is collected. That is, as the criterion value increases, the tax burden decreases. At this point, it would be appropriate to interpret the positive significant effect of the tax burden on public debt revealed in the analysis as actually increasing public debt as taxes decrease. In other words, in the long run, tax rates and public debts in the country have a negative relationship. In order to raise funds for public expenditures, countries can increase taxes or resort to public borrowing. From this perspective, the trade-off between tax burden and public debt seems consistent with the results emerging from the analysis.

Although many studies in the literature show that public debt does not have a significant effect on economic growth in the long term, it has been proven that it has negative effects in the short term. This study, in which it has been determined that the economic freedom index sub-criteria in Türkiye are effective on public debt, shows that long and short-term activities to be carried out to improve these indices will also have an impact on public debt policies. In this context, long-term activities to increase economic freedoms include, in particular, structural reforms and policy changes. By increasing business, investment and trade freedoms, such reforms stimulate economic growth and can thus contribute to the reduction of public debt. Short-term activities may include adjustments to be made, especially in financial and monetary policies. Regulations in financial markets can have a positive impact on public finances by reducing borrowing costs. In addition, it is important to review tax policies and create a more

effective tax collection system in this process. A more effective tax system can reduce debt needs by increasing public revenues. Such short- and long-term activities not only improve economic freedoms but also ensure that public debt policies are more sustainable and effective. Therefore, activities to improve economic freedom indices should be considered not only in terms of economic growth and freedoms, but also in terms of healthy public finance and debt management. This study emphasizes the importance of such activities and encourages policy makers to take steps in this direction.

The results obtained from this study, which examined the effects of economic freedoms on public debt in Türkiye using the ARDL analysis method in the period between 1999 and 2022, show that economic freedom sub-criteria such as business freedom, financial freedom, investment freedom, monetary freedom, tax burden and trade freedom, both It shows that it has an impact on public debt in both the long and short term. These findings reveal that increasing economic freedoms has significant effects on public finances and that increasing these freedoms reduces public debt. In particular, policies such as liberalization of financial markets, liberalization of trade and improvement of the investment environment appear to reduce public debt. However, the results of the analysis also show that some economic freedoms have potential public debt-increasing effects, especially in terms of business freedom and tax burden. With the increase in business freedom, the pressure on public finance increases due to the grants and supports provided by the state, and the decrease in the tax burden reduces public revenues and increases the need for borrowing.

Therefore, when assessing the effects of economic freedoms on public debt, it is important to consider the potential negative effects as well as the positive aspects of increasing these freedoms. Future studies can comparatively examine the effects of economic freedoms on public debt in different countries and analyze in more detail the micro-level effects of the increase of these freedoms and their role on socioeconomic inequalities. As a result, this study not only reveals the effects of economic freedoms on public debt, but also provides a basis for larger and more comprehensive research in this field.

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