Araştırma Makalesi

The Effect of Selected Variables on External Debt Stock: The Case of Türkiye

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Abstract

In this study, the long-term relationship between trade openness rate, fixed capital creation, GDP per capita and general government final consumption expenditures on the external debt stock in Türkiye was investigated by using annual data for the period 1994–2021 together with Johansen co-integration analysis. Long-term correlations between variables were determined by analyzing FMOLS and CCR coefficient estimators. According to the findings obtained from the FMOLS and CCR coefficient estimators, the general government final consumption expenditures affected the external debt stock the most among the variables examined in Türkiye in the 1994-2021 period. It was followed by GDP per capita, fixed capital formation, and trade openness. In summary, while fixed capital formation, trade openness, and general government final consumption expenditures increase Türkiye's external debt stock, GDP per capita decreases the external debt stock in the same economy.

Keywords: External debt stock, fixed capital formation, GDP per capita, trade openness ratio.
JEL Classification Codes: F6, F34.

Seçilmiş Değişkenlerin Dış Borç Stoku Üzerine Etkisi: Türkiye Örneği

Öz

Bu çalışmada, 1994–2021 dönemine ait yıllık verileri Johansen eşbütünleşme analiziyle birlikte kullanarak Türkiye'deki dış borç stoku üzerinde ticari açıklık oranı, sabit sermaye yaratımı, kişi başına GSYİH ve genel devlet nihai tüketim harcamaları arasındaki uzun vadeli ilişki araştırılmıştır. Değişkenler arasındaki uzun dönemli korelasyonlar FMOLS ve CCR katsayı tahmin edicileri analiz edilerek tespit edilmiştir. FMOLS ve CCR katsayı tahmincilerinden elde edilen bulgulara göre, Türkiye'de 1994-2021 döneminde incelenen değişkenler arasında dış borç stokunu en çok genel devlet nihai tüketim harcamaları etkilemiştir. Onu kişi başına GSYH, sabit sermaye oluşumu ve ticari açıklık oranı takip etmiştir. Özetle, sabit sermaye oluşumu, ticari açıklık oranı ve genel devlet nihai tüketim harcamaları Türkiye'nin dış borç stokunu arıtırken, kişi başına GSYH aynı ekonomide dış borç stokunu azaltmaktadır.

Anahtar kelimeler: Dış borç stoku, sabit sermaye oluşumu, kişi başına GSYH, ticari açıklık oranı.
Jel Sınıflandırma Kodları: F6, F34.

1. Introduction

The external debt ratio has increased significantly due to problems such as current account deficit and budget balance, especially in underdeveloped and developing countries. The increasing burden of external debt and payment costs remains a constant concern for developing economies (Waheed, 2017, p. 234). Basically, foreign indebtedness is used to finance the gap between a nation's mandatory investments and its national savings. External debt is acknowledged as a key resource for financing countries' economic growth and improving the living standards of society. Foreign indebtedness at a lower interest rate than the local interest rate gives a country a considerable benefit. Obtaining inexpensive additional resources is an important factor in making priority projects and infrastructure investments. In addition, it facilitates economic growth by spreading the maturity of external debt over longer periods (Lau and Lee, 2016, p. 1973; Gokmenoglu and Rafik, 2018, p. 16).

Debt can be obtained from within a country's borders or from outside. External debt, as defined by the World Bank (2023), is debt owed to non-residents in the form of food, services, or foreign currency. Public debt is the name given to the indebtedness of businesses to finance businesses because their own resources are insufficient to meet their needs. Public debt is a global phenomenon maintained within certain controls and limits. However, if external indebtedness goes beyond these controls and exceeds this limit, it can become a serious problem. On the other hand, it can turn into a debt crisis and cause great risks and negative effects for the country's economy and public money. External debt is seen as a significant primary source of finance for countries and governments in order to achieve public objectives and contribute to their development. In this direction, governments resort to external indebtedness, especially in cases of foreign exchange need and national savings (Siddique, Selvanathan and Selvanathan, 2016, p. 874-875).

External indebtedness not only contributes to the growth of a country, but also causes the country to be dragged into a deep debt crisis. Therefore, external indebtedness has always been a controversial issue for researchers and analysts. External debt supports developing country economies suffering from scarce capital stock. However, when these countries do not manage their external finances correctly, external debt causes more debt and creates a vicious circle of external debt. This situation increases the country's debt obligations and hinders its economic growth. Generally, in the early stages of development, developing countries seek financial aid from donor countries in the form of debts and foreign aid due to limited capital stock and current account deficits (Awan, Anjum and Rahim, 2014, p. 382-383). When a country goes into external indebtedness, sometimes it can import goods and services from abroad as much as the value of the loan without having to export anything in exchange for barter. On the other hand, in the repayment of interest and capital, the same country can reduce its costs

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by exporting goods and services. However, these two types of debt must cover the principal and interest payments of the debtor country's term savings. For this reason, external debt investments should be directed to sectors with high added value and should obtain a higher rate of return than the external debt service payment cost (Ajayi, 2012, p. 299).

Capital accumulation, according to Muinga (2018), is essential for economic development. The implications of external debt on macroeconomic parameters divide academics and policymakers. External indebtedness has both positive and negative consequences. Some analysts are of the opinion that external debt contributes positively to economic growth as capital increases accelerate the expansion rate. On the other hand, external debt that exceeds certain measures can reduce economic growth by reducing investment (Khalif, 2022, p. 8).

In the development process, Türkiye did not go to external indebtedness in the first years, as it assumed the responsibility of the external debts remaining from the Ottoman state and due to bad experience. In the 1930s, Türkiye resorted to external indebtedness both to pay the external debts of the Ottoman state and to use it in investment activities, especially in transportation. However, the external indebtedness process started mainly after the 1950s. After the 1950s, the deterioration of the balance of payments in Türkiye led to financial problems in the repayment of external debt. External indebtedness in Türkiye increased by 410 percent in the 1930-1960 period (Adıyaman, 2006, p. 26; Karagöz, 2007, p. 102). The effect of the oil crises in 1973-1974 led to deterioration in the economic structure of Türkiye, and again in this period, external indebtedness was resorted to. When it comes to the 1980s, it has been observed that external indebtedness has increased with the opening up of movements and the participation of new actors in the economy in the 1990s (Peker and Bölükbaşı, 2013, p. 290). The values of Türkiye's external debt over time can be monitored with the help of Graph 1.
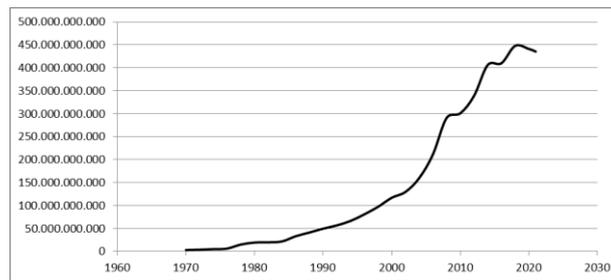
Graph 1: Türkiye's External Debt Stock (Billion Dollars)

In Graph 1, Türkiye's external debt stock is presented over the years. Türkiye's external debt stock, which started to increase in the 1980s, started to decrease partially in the 1994, 2001 and 2008 crises, but increased very rapidly in the post-2002 period. Particularly during the 2004-2007 and 2010-2011 eras, when economic growth accelerated, the pace of increase in external debt increased

significantly (Uslu, 2019, p. 355). The economic downturn induced by the COVID-19 pandemic in the 2020-2021 era resulted in a reduction in the level of external indebtedness. Graph 2 displays the ratio of external debt stock to GDP because it is likely that interpreting merely the amount of external debt is inaccurate.
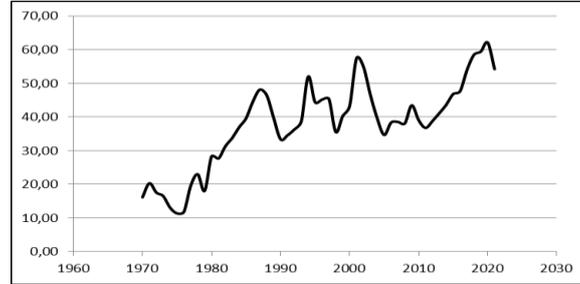
Graph 2: Ratio of Türkiye's External Debt Stock to GDP (%)

The ratio of Türkiye's external debt stock to GDP is shown in Graph 2 over the years. The ratio of Türkiye's external debt to national income started to increase rapidly in the post-1975 period, decreased with the 1980 military coup, but increased rapidly afterwards, reaching up to 58% in 2001. The external debt stock, which seemed low compared to the increasing national income in the 2004-2007 period, started to increase again as of 2011. In the third quarter of 2018, this rate was 48%, which is not a small value. Given that the World Bank and IMF consider nations with an external debt stock/GDP ratio of more than 50% to be extremely indebted, Türkiye has approached this threshold. There is a thought in the public opinion that the total amount of external debt is not very important and that the majority of Türkiye's external debt belongs to the private sector. Whereas, foreign companies give debts to domestic companies and public institutions, mostly relying on the guarantor of the state. In cases where the private sector is in crisis, they act on the assumption that the government will somehow support these companies and that they can get the money they give (Uslu, 2019, p. 355). In 2017 and the following periods, the external debt ratio is above 50%. Türkiye's external debt, which was 19.1 billion US dollars in 1980, rose to 49.4 billion US dollars at the end of 1990. Its external debt was $116.7 billion in 2000 and $300.8 billion in 2010. In 2021, this amount was 435 billion dollars. In the period of 1994-2021 examined by the study, the external debt in Türkiye increased by approximately 557 percent. The current study examines the many causes of external debt in Türkiye by using additional variables such as General government final consumption expenditures and Fixed capital formation. It also investigates the series' long-run and short-run relationships.

External debt is expected to benefit emerging countries' growth processes. There is a wealth of practical research on the determinants of external debt stock in the literature, particularly for emerging economies. Applied studies on the causes of external debt stock may produce variable-specific results. Due to the decline in

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social welfare and living standards caused by external indebtedness, it is necessary to determine the main determinants of the external indebtedness of countries. Identifying key determinants helps to eliminate such negative consequences. The study aimed to analyze the main macroeconomic factors that cause external indebtedness by using a new model and data set for the Turkish economy. In this context, in the study, firstly, the relevant theoretical background and empirical studies were briefly discussed, and then an application was made on the example of Türkiye. In this study, in which time series analysis was performed, the relationships between the variables were examined with the Johansen cointegration approach. Thus, it has become possible to compare the results of the studies presented in the literature summary section with the results obtained from this study. In addition, based on the results of the application, the relative importance of the macroeconomic variables on external indebtedness can be understood. As a result, various policy inferences were made from the findings obtained.

2. Literature Summary

Researchers employed time series and panel data with various econometric tools to explore the determinants determining external debt in the literature. The findings obtained as a result of the research differ. There is a substantial body of study on the relationship between external debt and macroeconomic factors. In chronological order, examples of countries researched on the drivers of external debt and studies covering Türkiye are summarized.

Koyuncu and Tekeli (2010) examined the macroeconomic variables affecting external indebtedness in Türkiye for the period 1990-2009. They analyzed the effects of domestic debt stock, current account deficit, public expenditures and domestic savings variables on external indebtedness with Johansen cointegration analysis. The research indicates that the stock of external debt is significantly impacted by domestic savings and the current account deficit. Peker and Bölükbaşı (2013) examined the variables that cause external borrowing in Türkiye using quarterly data for the periods 1994-2010 and 2001-2010. The balance of payments, public expenditures, domestic debt, and external debt were all considered independent variables in the study, and their impact on external indebtedness was calculated using causality analysis and EKK. In the study, while domestic borrowing caused external debt in the period of 1994-2010; It has been determined that public expenditures cause external indebtedness in the period 2001-2010.

In their 2015 study, Lau et al. looked at Malaysia's external debt from 1970 to 2013. The results of causality analysis show that there is a causal relationship between variables in the short term in Malaysia. On the other hand, it has been determined that the real interest rate is the variable expected to have the most impact on the external debt stock in the long run.

Yamaçlı (2015), using Relative Sensitivity and Vector Autoregressive analysis, examined the causes of external indebtedness in Türkiye during the period 1991-2010. According to the results, there is a substantial association between external debt and economic development. However, during economic crisis periods with a current account deficit and a high budget, the sensitivity coefficients between all variables that drive external indebtedness rose. Al-Fawwaz (2016) investigated the macroeconomic variables influencing Jordan's external debt. The effects of trade openness, exchange rate, GDP per capita, terms of trade, and budget deficit on external indebtedness were examined using the ARDL approach for the period 1990-2014. The results show that trade openness has a positive impact on foreign debt. Conversely, it is found that the stock of external debt is negatively impacted by GDP per capita.

In their 2016 study, Adamu and Rasiah looked at Nigeria's external debt from 1970 to 2013. The ARDL method analysis yielded substantial conclusions about the impact of oil price, debt service, and gross domestic savings on Nigeria's external debt. Furthermore, it has been established that the budget deficit and exchange rate have a major impact on external indebtedness.

Waheed (2017) investigated the macroeconomic factors of external debt in nations that export and import oil and gas. Panel data analysis was used to examine the effects of GDP, central government income, general government expenditures, current account balance, and fixed capital formation on external indebtedness from 2004 to 2013. According to the findings, rising economic growth, oil prices, foreign exchange reserves, domestic investment, and government revenues are all essential factors in reducing external debt. On the other hand, Adane et al. (2018) analyzed the determinants of external debt in Ethiopia during the 1981-2016 period. They analyzed the effects of inflation rate, GDP, primary budget deficit, exchange rate and current account balance on external indebtedness using the ARDL method. While domestic savings and budget deficits increased external indebtedness in Ethiopia; resource balance and the inflation rate reduced external indebtedness.

Sa'ad et al. (2017) looked at the economic variables that affect Nigeria's external debt stock between 1973 and 2013. The results of the study's application of the Autoregressive Distributed Lag (ARDL) Cointegration Technique show that there is a short- and long-term cointegration between external debt and the consumer price index, interest rate on external debt, gross domestic product, and money supply.

In their 2019 study, Brafu-Insaidoo et al. looked at the macroeconomic variables influencing Ghana's external debt from 1970 to 2012. The analysis's findings demonstrate that a number of factors, such as the easing of regulatory constraints on external indebtedness, the widening of the interest rate differential between domestic and foreign markets, the performance of economic growth, and the

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advancement of domestic financial systems, have contributed to the growth of the stock of short-term external debt, both short- and long-term.

Using the ARDL approach, Beyene and Kotosz (2020) investigated the macroeconomic factors influencing Ethiopia's external debt during the years 1981–2016. The findings demonstrate that the trade deficit, savings-investment gap, fiscal deficit, and debt service have a positive and considerable long-term influence on external indebtedness. On the other hand, the nation's foreign debt is negatively impacted by the pace of trade openness and the rate of inflation increase.

Saxena and Shanker (2020) examined the variables affecting external debt in India for the period 1991-2017. They examined the effects of net domestic savings, gross fiscal deficit, exchange rate, net domestic capital formation, imports, exports, terms of trade, foreign exchange reserves, debt service payments, consumer price index, interest rates, and GDP on external debt. The findings revealed that all of the variables considered in the study had a substantial impact on external debt. Omar and Ibrahim (2021) investigated the factors influencing Somalia's external debt. They analyzed the effects of the exchange rate, exports, GDP per capita, general government final consumption expenditures and domestic investment variables on external debt for the period 1980-2018 using the ARDL method. The findings show that domestic investment and the exchange rate have a positive effect on external debt in the long run, while government final consumption expenditures and GDP per capita have a negative relationship on external debt.

Karaş (2022) investigated the factors influencing Türkiye's external debt stock from 1974 to 2020. The effects of balance of payments, consumer price index, growth rate, deposit interest rate and budget balance on external indebtedness were tested by Johansen cointegration analysis. The result showed that the budget balance, inflation and growth rate have adverse effects on the external debt stock in Türkiye. On the other hand, the interest rate has the same effect on the external debt stock. Khalif (2022) looked at several aspects of Somalia's external debt between 1974 and 2018. The influence on external debt was examined using the ARDL technique, which included final government consumption spending components, GDP, exports, domestic investment, and foreign aid. In the short term, exports and GDP have a negative impact on Somalia's external debt stock, but both foreign and domestic investments have a positive impact.

Danish et al. (2022) aimed to explore the variables affecting external debt in four SAARC countries (India, Bangladesh, Sri Lanka and Pakistan) for the period 1984-2019. Panel data analysis was used to examine the effects of external indebtedness on the balance of payments, budget deficit, corruption, exchange rate, foreign direct investments, financial development, and production value added variables. According to the findings, negative balance of payments, budget deficit, corruption

and devaluation of national currency increase the external debt stock in SAARC countries.

When the literature is evaluated in general, each study reveals different results due to the different economic and geographical conditions of the examined countries. On the other hand, it is observed that each factor affecting external indebtedness has a different degree of impact. In the studies in the national literature, public debt, domestic debt, domestic savings amount, consumer price index, balance of payments, growth rate, interest rate, budget balance and trade openness ratio are discussed. There is little empirical evidence to support the relationship between government consumption expenditures, GDP per capita, fixed capital production, and external debt. Further research is required to close the knowledge gap in the literature regarding the macroeconomic factors that influence external indebtedness within the framework of the Turkish economy throughout the studied period. This research seeks to close this gap in the body of knowledge. When the methods utilized in the studies are analyzed, time series analyses are most prominent. In this study, parallel to the literature, after examining the long-term relationship of trade openness, fixed capital formation, GDP per capita and general government final consumption expenditures on external debt stock in Türkiye with Johansen cointegration analysis, the variables obtained by FMOLS and CCR methods in the long run. It was tried to determine to what extent and in which direction it was affected.

3. Dataset and Method

In this section, the model created for the research, the variables used, the empirical analysis and the findings obtained are included. In the study, the long-term relationship between annual data for the years 1994-2021 was analyzed with FMOLS and CCR methods. The model variables were derived from the EDS (2022) Electronic Data Distribution System and the World Bank World Development Indicators. In this direction, the value of the series in each period should be regressed with its value in the preceding period to determine what kind of process the series goes through. For this, the stationarity levels of the series can be determined by the method known as unit root analysis. The stationarity levels of the series can be determined using the Augmented Dickey-Fuller (ADF) and PhillipsPerron (PP) unit root tests (Dickey and Fuller, 1979, p. 427; Phillips and Perron, 1988, p. 337; Tarı, Koç and Abasız, 2019, p. 387). The Perron test, which relies on an exogenously determined structural break date, was modified into an unconditional unit root test by Zivot and Andrews (1993), wherein the break date is approximated. Consequently, the Zivot Andrews test relies on the intersection of time series data and a single trend break. Based on the most significant t-test of an intersection, the break date is determined at the location where the ADF unit root test is the smallest (Perron, 1989, p. 1361; Zivot and Andrews, 1992, p. 253; Mert and Çağlar, 2019, p. 135). The stationarity levels of the variables used in the study

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were tested and it was determined that they were stationary at the first difference level values. Whether there was cointegration between the variables was investigated with the Johansen cointegration test. Cointegration is a technique used to model and estimate the long-term relationship between time series by ensuring that linear combinations of non-stationary variables are stationary over the long term. Indicating a genuine long-term relationship between variables is cointegration (Johansen, 1988, p. 232; Johansen ve Juselius, 1990, p.169-210).

FMOLS, recommended by Phillips and Hansen (1990), and CCR methods, developed by Park (1992), are preferred due to the endogeneity problem that occurs in the estimation phase and the inability to interpret the long-term coefficients obtained. In order to use the mentioned methods, the condition that they are stationary in difference must be met. The study aims to both verify the results obtained and increase the reliability of the findings by using FMOLS and CCR methods. On the other hand, FMOLS and CCR methods can produce reliable findings in small samples. Related methods can solve the endogeneity problem with kernel estimators. Additionally, FMOLS uses the co-variance matrix of error terms to solve problems arising from long-term correlations between stochastic processes and cointegration equations. On the other hand, CCR, allows the Chi-Square test to be performed asymptotically (Erdoğan et al., 2018, p.47).

While the explanatory variables were trade openness, fixed capital formation, GDP per capita and general government final consumption expenditures, the model was created by using external debt stock as the dependent variable. The functional equation below shows the variables used.

Mathematically;

$$EDS = f (TA, GCF, GDP, GGFC) \tag{1}$$

In order to make the mathematical expression predictable, the dependent variable EDS and the logarithmic transformations of the independent variables TA, GCF, GDP and GGFC were taken and converted to the following equation (2):

$$logEDS = \alpha + \beta_1 logTA + \beta_2 logGGFC + \beta_3 logGCF + \beta_4 logGDP + \mu_i \tag{2}$$

Where:

logEDS= External Debt Stock,

logTA= Trade Openness Ratio,

logGGFC= General Government Final Consumption Expenditures,

logGCF= Fixed Capital Formation,

logGDP= GDP per capita.

Fixed capital formation as a percentage of GDP is also known as gross domestic fixed investment. Gross Fixed Capital Formation, land improvements, machinery, equipment, and plant purchases; includes highway, railway, and other infrastructure projects. An increase in gross fixed capital creation is projected to improve the nation's overall livelihoods by creating opportunities for temporary or permanent absorption of the unemployed in a country's workforce. This situation will indirectly increase the welfare of the nation by increasing the income, as well as the improvement in the facilities will lead to an improvement in social welfare (Oageng and Boitumelo, 2017, p. 75). While trying to revive the economy by doing fixed capital formation activities in order to maintain the economic growth of a country, it affects the country's external debt stock in various dimensions (Swamy, 2015, p. 9). The trade openness ratio can increase the volatility of external debt shocks by improving resource allocation at the national and international levels. In addition, since the increase in foreign direct investment and net exports increases foreign exchange reserves, it also positively affects the debt repayment capacity of countries, as it is a cheaper source of foreign capital than external indebtedness (Zakaria, 2012, p. 162). GDP per capita is related to both fixed capital formation and the amount of external debt. GDP per capita reflects social welfare and investment social reflections (Ekren, Fındıkçı and Bildik, 2020, p. 494). The total government's final consumption expenditure includes all current government expenditure on goods and services. It also includes the majority of national security and defense budget at current prices (Omar and Ibrahim, 2021, p. 38).

Table 1: Descriptive Statistics

Features of the Series	logEDS	logGCF	logGDP	logGGFC	logTA
Mean	11.32683	11.09550	3.827566	10.79967	1.620819
Median	11.43018	11.24811	3.943132	10.98365	1.685326
Maximum	11.66018	11.45284	4.097174	11.12797	2.160383
Minimum	10.82118	10.44504	3.350498	10.18284	0.837303
Std. Dev.	0.286352	0.330874	0.235788	0.317434	0.391617
Observations	28	28	28	28	28

Descriptive statistics of the variables subject to the study are presented in Table 1. Accordingly, the mean of the external debt stock data is 11.32 and the standard deviation is 0.28; mean of trade openness ratio, 1.62 and standard deviation 0.39;

mean of fixed capital formation 11.09 and standard deviation 0.33; mean of per capita GDP was 3.82 and standard deviation 0.23; mean of the general government final consumption expenditures variable was determined as 10.79 and the standard deviation value was determined as 0.31.

3.1. Analysis of Data

The stationarity levels of the variables used in the study were tested and the analysis results for the unit root tests are presented in Table 2.

Table 2: Stationarity Levels of Variables

Variables	ADF Test		Phillips-Perron Test	
	Level	First difference	Level	Firs difference
logEds	t-Statistic 0.1998	t- Statistic -4.5527	t- Statistic 0.1998	t- Statistic -4.5527
	(0.9967)	(0.0064**)	(0.9967)	(0.0064**)
lnGcf	t- Statistic -1.8687	t- Statistic -5.7340	t- Statistic -1.8724	t- Statistic -5.7340
	(0.6426)	(0.0004**)	(0.6408)	(0.0004**)
lnGdp	t- Statistic -1.1788	t- Statistic -5.0087	t- Statistic -1.2066	t- Statistic -5.0099
	(0.8949)	(0.0023**)	(0.8889)	(0.0023**)
lnGfc	t- Statistic -0.1477	t- Statistic -3.8818	t- Statistic -0.3418	t- Statistic -3.8932
	(0.9910)	(0.0278**)	(0.9848)	(0.0272**)
lnTa	t- Statistic -0.4122	t- Statistic -5.7648	t- Statistic -2.1482	t- Statistic -3.9391
	(0.9805)	(0.0006**)	(0.4975)	(0.0023**)

Note: The expressions *, ** and *** indicate their significance at the 1%, 5% and 10% significance level, respectively. It also states that all variables are stationary at the I(1) level.

The result of the unit root test is presented as shown in Table 2 above. According to the results obtained, when all the variables used in the model are considered in their level forms, it shows that it has a unit root problem, but becomes stationary after the first difference. This was determined by prob. values corresponding to Phillips-Perron (PP) and Augmented Dickey Fuller (ADF) statistics for each variable. For all variables used, prob. values were greater at 5% and 10% significance levels compared to ADF and PP unit root tests ($p>0.05$; $p>0.10$). On the other hand, when the prob. values of ADF and PP statistics in the first differences of the variables were compared, they were found to be lower than the rates of 5% and 10%.

Table 3: Zivot-Andrews Unit Root Test Results

Variables	Model A	Model A Time Break	Model C	Model C Time Break
Eds	-1.3061	2006	-3.0647	2006
Ta	-3.8779	2002	-3.5947	2004
Gcf	-4.1137	2004	-4.0272	2004
Gdp	-3.1870	2004	-3.2460	2004
Ggfc	-2.3733	2003	-2.5354	2007

Note: Model A critical values for the Zivot and Andrews test are -5.34, -4.93, and -4.58 at the 1%, 5%, and 10% levels, respectively. Model C critical values are -5.57, -5.08 and -4.82 at the 1%, 5% and 10% levels, respectively.

Zivot-Andrews unit root test results are presented in Table 3. In this section, the stability levels of the external debt stock (Eds), trade openness ratio (Ta), fixed capital formation (Gcf), GDP per capita (GDP) and general government final consumption expenditures (Ggfc) series are tested by considering structural breaks. According to the findings, nonstationarity was determined as the critical values remained below the Zivot-Andrews unit root test critical values despite the structural break at 1%, 5% and 10% significance levels.

The Johansen Cointegration Test was used to assess the variables' long-term connection. Table 4 displays the variables' optimal lag length.

Table 4: VAR Model Optimal Lag Length

k	FPE	SC	HQ
0	5.80e-13	-13.74415	-13.91642
1	**5.58e-16***	**-19.52397***	**-20.55759***
2	6.84e-16	-18.35163	-20.24661

Note: * indicates the most appropriate lag length for the model.

The optimal lag length was established using the VAR model after determining the eligibility of the data set for cointegration using the stationarity test. Final Prediction Error (FPE), Schwarz Information Criteria (SC), and Hannan-Quin Information Criteria (HQ), which are frequently utilized in the literature, were employed to identify the optimum lag time in the research. The examination of the Lag-length Criteria revealed that the first lag length was the most optimal lag length. On the other hand, the problems of autocorrelation and varying variance in the VAR model disappeared at the third lag (k=3). Accordingly, the analysis was applied considering the second lag length.

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This model, created by choosing the optimal lag length, may still not be a suitable model. To understand this, it is necessary to look at other conditions in the later stages. The first of these is the condition of stability, in other words, the "test of stability" (Hendry and Juselius, 2001, p. 88).
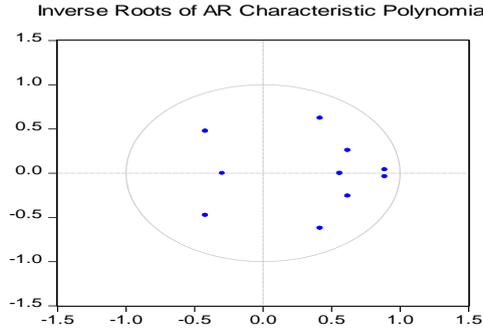
Graph 3: Inverse Roots Plot of AR Characteristic Polynomial

In this direction, the developed VAR model's stability was investigated, and the outcomes are displayed in Graph 3. This demonstrates that the VAR model satisfies the stability criteria since the Inverse Roots of the AR Characteristic Polynomial are distributed within the unit circle and do not lie outside the reference range (-1 to +1).

Table 5: Diagnostic Tests for VAR (3)

Test	Autocorrelation (LM-İst.)	Heteroscedasticity (χ^2-İst.)	Normality (JB-İst.)
Statistic	0.7711	302.6661	3.6336
Prob.	**0.7384****	**0.4460****	**0.9624****

Note: The expressions *, ** and *** indicate their significance at the 1%, 5% and 10% significance level, respectively.

Diagnostic tests were performed for the VAR(3) of the variables and the findings are presented in Table 5. Significance values show that the variables do not have autocorrelation and varying variance problems and exhibit normal distribution ($p > 0.05$).

Table 6: Johansen Co-Integration Test

Eigen Value	Trace Statistic	5% Critical Value	Prob.
0.971429	188.1039	69.81889	0.0000
0.894199	99.22006	47.85613	0.0000
0.624869	43.06509	29.79707	0.0009
0.518943	18.55308	15.49471	0.0167
0.010300	0.258837	3.841466	0.6109

Table 6 (continued): Johansen Co-Integration Test

Eigen Value	Max. Eigen Statistic	5% Critical Value	Prob.
0.971429	88.88384	33.87687	0.0000
0.894199	56.15498	27.58434	0.0000
0.624869	24.51201	21.13162	0.0161
0.518943	18.29424	14.26460	0.0109
0.010300	0.258837	3.841466	0.6109

Table 6 displays the variables' findings of the Johansen cointegration test. In comparison to the critical values, the co-integrated vector was present at the 5% significance level, as indicated by the computed maximum trace and eigenvalue statistics. As a result of the Johansen cointegration analysis, the trace statistics were found to be 188.1039 and the eigenvalue statistics to be 88.8838. These values are higher than the critical values of 69.8188 for the trace test and 33.8768 for the eigenvalue test at the 5% significance level. Therefore, the null hypothesis of "there are no cointegrated vectors between the variables" was rejected by both trace and self-test statistics. This indicates that there is at least 1 cointegration.

Following the analysis that showed a long-term association between the variables, the focus shifted to figuring out how and to what extent Ta, Gcf, GDP, and Ggfc affect Eds. Here, the long-term associations between the variables were ascertained through the application of FMOLS and CCR techniques. According to FMOLS and CCR analysis, significant findings were observed between the variables, as shown in Table 7.

Table 7: Coefficient Estimations for FMOLS and CCR Method

Variable	Coefficient	Standard error	t-Statistic	Prob.
FMOLS				
logGcf	0.275635	0.111174	2.479312	0.0213
logGdp	-1.176816	0.229237	-5.133619	0.0000
logGgfc	1.178398	0.155210	7.592266	0.0000
logTa	0.239406	0.058854	4.067782	0.0005
C	-0.339872	1.496667	-0.227086	0.8225
CCR				
logGcf	0.274480	0.128584	2.134629	0.0442
logGdp	-1.175187	0.255830	-4.593630	0.0001
logGgfc	1.176320	0.181788	6.470836	0.0000
logTa	0.242403	0.063402	3.823251	0.0009
C	-0.316007	1.655107	-0.190929	0.8503

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Note: The expressions *, ** and *** indicate their significance at the 1%, 5% and 10% significance level, respectively.

The study's conclusions indicate that the trade openness ratio, fixed capital creation, and overall government final consumption expenditures have positive coefficients and are significant at the 5% significance level. When the results are evaluated together, when the fixed capital formation increases by 1%, the external debt stock, FMOLS and CCR coefficients increase by 0.27% on average. The external debt stock rises by 1.17% on average when general government final consumption expenditures increase by 1%. Furthermore, a 1% increase in the trade openness ratio is accompanied by an average 0.24% increase in the external debt stock. These findings are consistent with the findings in (Mahdavi, 2004; Kızılgöl and Evren, 2014; Saheed, Sani and Idakwoji, 2015; Ogunbiyi and Okunlola, 2015; Bölükbaş, 2016; Chaudhry, Iffat and Farooq, 2017; Kocha, Iwedi and Sarakiri, 2021; Omar and Ibrahim, 2021; Çolak and Özkaya, 2021) reporting the positive effects of trade openness, fixed capital formation and general government final consumption expenditures on external debt stock. The FMOLS and CCR coefficients show that the external debt stock falls by an average of -1.17% for every 1% growth in GDP per capita. These results are consistent with those of Presbitero (2006) and Fida, Khan, and Sohail (2012), which found a negative relationship between GDP per capita and the stock of external debt.

According to these results, Among the examined variables during 1994-2021, general government final consumption expenditures had the most significant impact on Türkiye's external debt stock. It was followed by GDP per capita, fixed capital formation and trade openness. In summary, while fixed capital formation, trade openness and general government final consumption expenditures increase Türkiye's external debt stock, GDP per capita decreases the external debt stock in the same economy.

4. Conclusion and Recommendations

For developing countries like Türkiye, external indebtedness is an important tool to ensure sustainable economic development. Countries use external debt as a tool to finance capital formation. It also serves as a policy tool to address budget deficits and bridge the investment-savings gap (Umaru, Hamidu and Musa, 2013, p. 71). External debt is important for this study, as the global debt crisis exists and is a popular topic of discussion. Today, especially developing countries' economies are faced with the problem of indebtedness due to budget deficits, low savings and investments, an increasing population and the inadequacy of infrastructure. This study was examined the long-term relationship between trade openness, fixed capital formation, GDP per capita and general government final consumption expenditures on external debt stock, using annual data for the period 1994-2021 in Türkiye. In addition, it has been tried to determine to what extent and in which

direction the variables obtained by FMOLS and CCR methods affect in the long term.

The results show that the trade openness ratio, fixed capital formation, GDP per capita and general government final consumption expenditures are statistically significant factors in the amount of external debt stock. The specific findings are summarized as follows: Firstly, the fixed capital formation affects the external debt stock in the same direction in Türkiye. It can be concluded that the fixed capital investments created in order to contribute to Türkiye's economic growth are financed by foreign indebtedness, and therefore, each increase in fixed capital formation affects external indebtedness positively. Secondly, the trade openness ratio positively affects the external debt stock in Türkiye. The increase in the external debt stock is expected to be positively related to the trade openness ratio. As a factor in improving productivity and resource allocation, trade liberalization can have a positive impact on the solvency of economies, as it can lead to increased foreign exchange resources such as net exports and foreign direct investment (Zafar and Butt, 2008, p. 3). Third, general government final consumption expenditures have a statistically positive effect on the external debt stock. Most developing countries are characterized by the inadequacy of capital resources to meet the increasing public expenditures (Saheed et al., 2015, p. 51). In Türkiye, indebtedness can be used to close the capital deficit and support domestic savings. On the other hand, external indebtedness in Türkiye as an additional resource tool for investment activities can be considered another factor. Reducing the government's consumption expenditures and increasing tax revenues will facilitate access to sustainable debt. Finally, per capita GDP has a negative effect on external indebtedness in Türkiye. Especially in developing countries, due to the low GDP per capita, the savings-investment gap is quite high. Due to the low savings problem, developing countries resort to external indebtedness to finance their investment activities.

In light of these estimated results, Türkiye should direct its external debt to sectors with high returns in order to minimize both government expenditures and foreign dependency. The primary goal of governments is to ensure fiscal discipline by minimizing external debt costs. In this context, the Ministry of Finance and the central bank should be in close coordination. On the other hand, in order to reduce external indebtedness, Türkiye needs to increase its capital investments and increase its domestic savings to sufficient levels. The government should develop a simple tax base system and increase its non-tax revenues by encouraging voluntary taxes to ensure fiscal discipline by controlling budget deficits. In addition, by eliminating the dependence of public expenditures on financial stability, a fiscal balance can be achieved in terms of external debt.

This study is limited to the Turkish economy. The model of this study can be applied to economic and political group countries and developing countries. Finally, this

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study is limited to certain macroeconomic variables. Furthermore, only the long-term link between macroeconomic factors was explored in this study, eliminating causality. In this direction, future studies can improve the study by taking the mentioned factors into account.

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