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The Role of Monetary and Fiscal Policies in Ensuring Financial Stability

Ayşegül ŞAHİN*

ABSTRACT

This study examines the effects of monetary and fiscal policies on financial stability in the Turkish economy for the period 2005Q1-2024Q1. For this purpose, a comprehensive Macro-Financial Stability Index reflecting the changes in the financial stability of the Turkish economy is calculated. Monetary policy interest rate and tax revenue data were used as monetary and fiscal policy variables, respectively. According to the results of the Autoregressive Distributed-Lag (ARDL) model, it is seen that increases in policy interest rates negatively affect financial stability in the short and long term. It is determined that the increase in tax revenues has negative effects on financial stability in the short term and a positive impact in the long term. Sudden and sharp increases in interest rates can disrupt financial stability in the short term. Increasing tax revenues will help sustain public debt and finance public expenditures. Policymakers can maintain financial stability by carefully managing interest rates and tax policies.

Keywords: Financial stability, Monetary policy, Fiscal policy

JEL Classification: E58, G18, G28

Finansal İstikrarı Sağlamada Para ve Maliye Politikalarının Rolü

ÖZ

Bu çalışmada, Türkiye ekonomisinde para ve maliye politikalarının finansal istikrara etkileri 2005Q1-2024Q1 dönemi için incelenmektedir. Bu amaçla, Türkiye ekonomisinin finansal istikrarındaki değişimleri yansıtan kapsamlı bir Makro-Finansal İstikrar Endeksi hesaplanmıştır. Para ve maliye politikası değişkenleri olarak, sırasıyla, para politikası faiz oranı ve vergi geliri verileri kullanılmıştır. Gecikmesi Dağıtılmış Otoregresif Sınır Testi (ARDL) modelinin sonuçlarına göre, politika faiz oranlarındaki artışların kısa ve uzun vadede finansal istikrarı olumsuz etkilediği görülmektedir. Vergi gelirlerindeki artışın finansal istikrar üzerinde kısa vadede olumsuz, uzun vadede ise olumlu etkileri olduğu belirlenmiştir. Faiz oranlarındaki ani ve keskin artışlar kısa vadede finansal istikrarı bozabilir. Vergi gelirlerinin artırılması kamu borcunun sürdürülmesine ve kamu harcamalarının finanse edilmesine yardımcı olacaktır. Politika yapıcılar faiz oranlarını ve vergi politikalarını dikkatli bir şekilde yöneterek finansal istikrarı koruyabilirler.

Anahtar Kelimeler: Finansal istikrar, Para politikası, Maliye politikası

JEL Sınıflandırması: E58, G18, G28

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1. INTRODUCTION

The recent global financial crisis has shown that financial institutions are insufficient to prevent systemic risk and that traditional monetary policies are ineffective in solving the problems experienced in the real economy. Developments in economies after the crisis have proven that ensuring price stability alone is insufficient and that new policy tools that include the goal of financial stability are needed.

The World Bank defines financial stability as a stable system that can "allocate resources effectively, assess and manage financial risks, keep employment levels close to the natural rate of the economy, and eliminate relative price movements of real or financial assets that would affect monetary stability or employment levels" (WB, 2015; WB, 2019). Financial stability is when all components of the financial system (financial institutions, financial intermediaries, and financial markets) function well (Mishkin, 1992; Schinasi, 2004). Financial stability is critical for macroeconomic growth, especially in the case of general economic recovery after crises (IMF, 2020).

Before the global financial crisis, monetary policies were only adjusted to eliminate inflation imbalances and ensure production balance. On the other hand, fiscal policies were generally concerned with balancing the government budget and financing public expenditures. The global financial crisis encouraged policymakers to review the effectiveness of both monetary and fiscal policies. Central banks and governments have increasingly questioned their roles in maintaining financial stability.

The policy rate, one of the most important tools used within monetary policy, plays a critical role in central banks' strategies to direct economic activity and control inflation targets (Taylor, 1993). However, the policy rate can have significant effects not only on inflation or growth but also on financial stability (Mishkin, 2009). The impact of changes in interest rates on credit demand, asset prices, and borrowing costs can directly affect the financial system's stability (Adrian and Shin, 2010). Expansionary monetary policies lead to an increase in lending in the market. This can increase risk-taking behavior in the market. Expectations about risk also raise concerns about financial instability, and the fragility of the financial system may increase (Hudaya and Firmansyah, 2023).

After the Great Depression, fiscal policy was a very important macroeconomic policy tool until the 1970s. It lagged behind monetary policy in the 1990s. However, today it is understood that fiscal policy should support monetary policy to ensure financial stability (Ma and Lv, 2023). Variables representing the state's revenue and expenditure items can be used as fiscal policy indicators. Tax revenues, one of the fiscal policy tools, are an important indicator of governments' budget balance and expenditure policies. In some of the studies in the literature, the government tax revenue variable has been used as a representative of the fiscal policy indicator (Jha et al., 2014; Kassouri and Altıntaş, 2021; Mawejje and Odhiambo, 2022). Tax policies can have a strong impact on the management of public debt and economic activity and, therefore, can be associated with financial stability (Barro, 1979). In periods when tax revenues increase, the government's borrowing needs decrease, which can increase confidence in financial markets. On the other hand, uncertainties in tax policies may increase uncertainty in the financial system and create instability.

This study aims to investigate the effects of monetary and fiscal policy indicators on the calculated financial stability index for Türkiye between 2005Q1-2024Q1. The effect of the policy interest rate selected as the monetary policy indicator and the tax revenues selected as the fiscal policy indicator on the financial stability index will be analyzed in the short and long term using the Autoregressive Distributed Lag (ARDL) model. The study makes three main contributions to the literature. First, a comprehensive financial stability index has been

calculated for Türkiye. An index has been calculated by carefully selecting and weighing variables reflecting Türkiye's financial institutions, financial market, macroeconomic situation, and external sector shocks. Second, many studies in the literature have examined the effect of monetary policy on financial stability and have not made a comparison with fiscal policy. Third, the study offers the opportunity to compare and analyze the short and long-term effects of monetary and fiscal policies. Monetary policy tools are used to ensure financial stability in the Turkish economy. However, the primary motivation of the study is to investigate whether fiscal policy tools effectively ensure financial stability.

The rest of the article is organized as follows: Section 2 summarizes the relevant literature. Section 3 explains the construction of the financial stability index for Türkiye and the ARDL method. Section 4 presents the effects of monetary and fiscal policy on the financial stability index. Section 5 generally comments on the results of the analysis and makes policy recommendations.

2. LITERATURE REVIEW

After the 2008 Global Financial Crisis, it became clear to everyone involved in the financial system that comprehensive reforms were required to ensure financial stability and prevent future crises. Many developed and developing countries have used monetary and macroprudential policies to ensure financial stability and macroeconomic balance. When considering how to prevent financial crises, it is quite normal to be primarily concerned with monetary policy (Cocriş and Nucu, 2014; Wang et al., 2022; Hudaya and Firmansyah, 2023; Cairó and Sim, 2023). After all, when a central bank affects the cost of financing through changes in the policy rate, its actions affect the economy by changing asset prices, encouraging or discouraging risk-taking, and affecting credit flows. This shows that monetary policy can affect financial stability for better or worse (Lane, 2024). However, it has been proven by studies that it is not possible to solve the problems in the financial markets only with monetary policies and that fiscal policies should also support monetary policy (Oprea et al., 2013; Bikas and Žaltauskaite, 2014; Dumičić, 2019; Hodula and Pfeifer, 2018; Thach et al., 2018; Borio et al., 2023; Borio et al., 2024).

Since the study investigates whether monetary or fiscal policy is more effective in achieving financial stability, a summary of the literature on the subject will be included first. Studies based on monetary and fiscal policy will then be included.

There are two methods used to measure the stability of the financial system. The first uses a single indicator and evaluates the financial system using the changes in this indicator after the financial crisis. However, a single indicator does not provide detailed information about the general economy (Albulescu, 2013). The other method is to create a composite financial stability index. Here, many variables that can define economic stability are weighted using various methods, and an index is calculated (Kalsie and Pandey, 2020).

Although the effect of monetary policy on financial stability is a frequently researched topic, the results in the existing literature are not definitive. Financial stability can affect monetary policy through many channels such as the stock channel, interest rate channel, exchange rate channel, and money supply (Zahner and Groß, 2020). Gameiro et al. (2011) stated that disruptions in the financial system can disrupt monetary policy transmission. Financial instabilities such as disruptions in credit markets can weaken traditional monetary policy transmission channels such as interest rates or credit channels. In addition, according to the study, achieving financial stability does not guarantee price stability. Smets (2018) stated that the main purpose of monetary policy is to ensure financial stability and that policymakers should care about financial stability. Cocriş and Nucu (2014) discussed the effectiveness of monetary

policy in affecting financial stability indicators. In countries such as the Czech Republic, Hungary, Poland, and Romania, the interest rate tool used for inflation targeting encourages financial stability. Billi and Vredin (2014) argue that instead of taking strict measures after the financial crisis, various tightening policies before the financial crisis occurs would be more effective. They stated that especially implementing monetary policy to limit excessive debt would contribute to financial stability.

Friedrich et al. (2019) calculated a financial stability index for 10 advanced economies. The results show that central banks with high financial stability orientation increase policy rates more than central banks with low orientation in response to high financial stability risks. Chukwudi and Henry (2020) investigated the impact of monetary policy on financial stability in Nigeria and found that the impact of monetary policy on banking financial stability was weak. Elsayed et al. (2023) created an extended financial stability indicator for four Gulf Cooperation Countries: Bahrain, Kuwait, Saudi Arabia, and the United Arab Emirates. They investigated the impact of changes in monetary policy. The response of monetary authorities to positive and negative shocks in financial stability differs in the short and long term. According to the results, only the United Arab Emirates, Kuwait, and Bahrain see financial stability as one of the main objectives of monetary policy. Wang et al. (2022) stated in their study for China that monetary policies can support financial stability, especially in the short term. According to Cairó and Sim (2023), when the central bank does not impose any limits on nominal interest rates, it adopts an aggressive inflation-targeting regime. It can achieve both financial stability and price stability. Hudaya and Firmansyah (2023) showed that the increase in interest rates significantly provides financial stability in Indonesia.

Başçı and Kara (2011) explained in their study that the CBRT designed a new policy strategy using different policy tools to limit macro-financial risks. A new policy tool is created using the policy rate, interest rate corridor, and required reserves together. It has been suggested that such policies can be implemented to alleviate the impact of short-term capital movements on macroeconomic imbalances in countries with high current account deficits. Felek and Ceylan (2021) revealed the effects of the CBRT's unconventional monetary policy tools, the interest rate corridor, exception day application, and credit expansion on the financial stability index they calculated using the SVAR method. According to the findings, the exception day application and the interest rate corridor, which are among the unconventional monetary policy tools used by the CBRT, support financial stability. According to Polat and Akın (2020), expansionary monetary policy in Türkiye negatively affects financial stability.

Existing studies examine the interaction mechanism between financial stability and monetary policy in both aspects. Fiscal policy studies, which constitute another dimension of this study, are more limited. While Ubi-Abai and Bosco (2017), Adegoriola (2018), and Thach et al. (2018) examined the relationship between financial stability and fiscal policy, Dumičić (2019) is interested in the financial instability dimension.

Oprea et al. (2013) stated that incompatible monetary and fiscal policies encourage financial instability. According to Thach et al. (2019), macroprudential policies support financial stability despite the negative impact of fiscal policies on financial stability. The combination of expansionary monetary and fiscal policies disrupts financial stability by increasing housing prices through credit costs in the medium term. Borio et al. (2023) argued that financial stability should be considered when designing fiscal policy and stated that all of these are important for macroeconomic stability. Dumičić (2019) is one of the studies that explains in detail how fiscal policy affects financial stability. Accordingly, the impact of many mechanisms on systemic risks, from public debt management to tax policies, from government funding costs to tax incentives, has been addressed. Fiscal policies can provide buffering at a level that can compensate for the consequences of a financial crisis.

The most important conclusion from the studies discussed above is that both monetary policy transmission channels and fiscal policies can impact financial stability. However, especially in Türkiye, research on the impact of monetary and fiscal policies on financial stability after crises is quite limited. This study fills the gap in the literature. The next stage of the study will primarily be shaped by calculating the financial stability index.

3. DATA AND METHODOLOGY

3.1. Estimation of Financial Stability Index

This section will include the variables and econometric method used in the study. Since the study aims to investigate the effect of monetary and fiscal policy on the financial stability index, information will first be provided about the creation of this index.

The 1990s were a period of high inflation and significant fluctuations in growth rates for Türkiye. The main goal of the Central Bank was to ensure price stability. The Turkish economy, which followed a volatile course until the 2000s, experienced the deepest crisis in its history in February 2001. With the great collapse of the banking system, financial stability was also greatly damaged. In this period, to bring the economy back to a sustainable growth environment, many regulations and structural reform studies were initiated to restore the banking system to a healthy structure and make it competitive internationally. In May 2001, "ensuring financial stability" was determined as a supporting goal next to the main goal of the Central Bank. After the 2008 global financial crisis, a flexible monetary policy was implemented that closely monitored financial stability.

There is no consensus on financial stability, how it will be achieved, and what tools will be used. Since it requires taking into account both the internal and external dynamics of each country, there are differences in the measurement of this concept in terms of both the context and the method. The study is based on the definitions of the Macro-Financial Stability Index (MFSI), the International Monetary Fund, the World Bank, and the Bank of International Settlements (IMF, 2006; WB, 2020; BIS, 2023). The main purpose is to create a much more comprehensive index by removing financial stability from the definition of the financial environment in which financial institutions can operate healthily.

Based on this, the MFSI indicator used in the study will be calculated using 4 basic sub-indicators.

1) *Financial Development Indicator – FDI*
2) *Financial Soundness Indicator – FSI*
3) *Financial Vulnerability İndicator – FVI*
4) *World Economic Climate Indicator – WECI*

It is not possible to represent these sub-indicators directly with a variable. They must be created by combining the data sets of the variables that are considered to represent these indicators. The review period was determined as 2005Q1-2024Q1.

The min-max normalization method is used to scale the time series:

$$X_i^n = \frac{X_i - X^{min}}{X^{max} - X^{min}}$$

where, X_i^n represents the normalized X_i time series observations, X^{min} represents the smallest and X^{max} represents the largest observation values of the time series. When the time series is normalized, the observations take variable values between 0 and 1. This normalization process ensures that the indicators can be used in a comparable and suitable form for analysis.

In creating the components of the first sub-indicator, the Financial Development Indicator (FDI), a selection was made among the variables suggested by Svirydzenka (2016). These are: (1) The ratio of loans provided to the private sector to total loans, (2) The ratio of total loans to GDP, (3) The ratio of cash to demand deposits, and (4) the M3 money multiplier. All of them, except the third component, positively affect financial development. The "Cash/Demand Deposit" ratio, included among the components as an indicator of the public's use of the banking system in payments, is expected to decrease in the financial development process. Therefore, it is necessary to accept the existence of an inverse relationship between this ratio and financial development. These components, which have an inverse relationship with financial development, should be included in the formation of the financial development indicator with the inverse $\left(\frac{1}{X_i}\right)$. Figure 1 shows the seasonally adjusted and normalized course of these subcomponents.

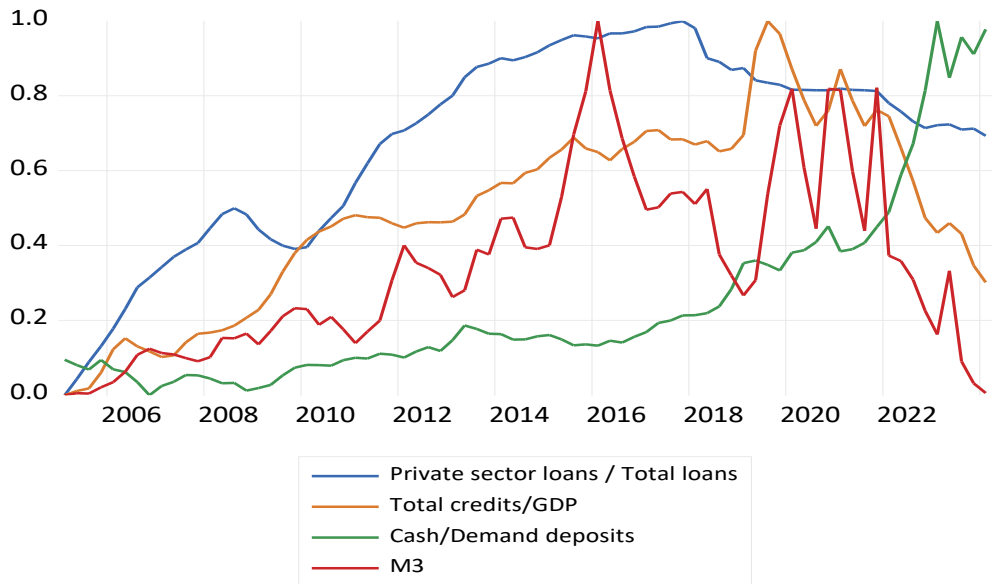

Figure 1. Normalized Components of Financial Development Indicator

Each component needs to be weighted in order to create the financial development indicator by combining the normalized time series of the listed components. Therefore, each component will be included with a weight of 0.25. Accordingly, the financial development indicator during the review period will be in Figure 2.

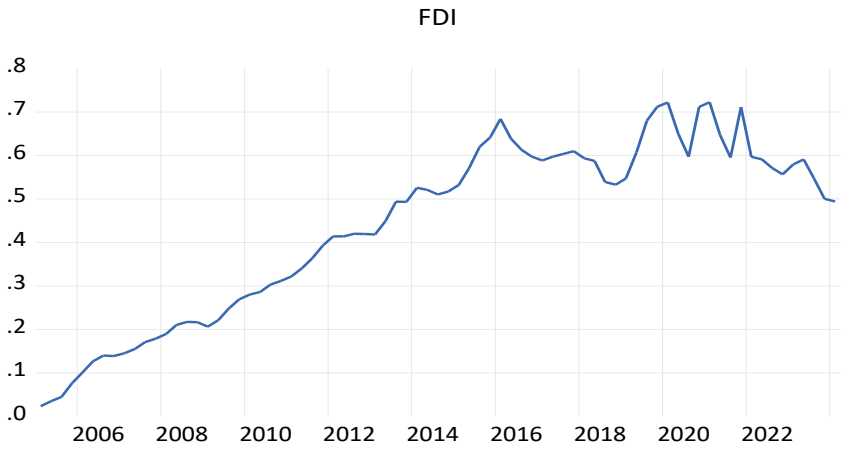

Figure 2. Financial Development Indicator (FDI)

The financial development indicator takes values between 0 and 1. When the indicator value approaches 1, it indicates that the level of financial development is increasing; when it approaches 0, it indicates that the level of financial development is decreasing. It is observed that the financial development indicator followed an increasing trend until 2016. The indicator, which followed a rather fluctuating course after 2016, significantly declined during the Covid19 pandemic. The indicator, which rose to 0.7 before the pandemic, has recently decreased to 0.5. Thus, it can be said that there has been a contraction in the level of financial development.

Another sub-indicator of the macro-financial stability index, financial soundness indicators (FSI), are indicators compiled to monitor the health and soundness of financial institutions and markets and their institutional and household counterparts (Sundararajan et al., 2002). Financial soundness indicators (FSI) are affected by several factors such as macroeconomic, financial, institutional, etc. (Kasselaki and Tagkalakis, 2014). FSI is very important in monitoring the risks and weaknesses of national financial systems. IMF (2006) suggests that the strength indicator should consist of components that provide information about the capital adequacy, asset quality, liquidity, and profitability of financial institutions and markets. Based on this, for the Turkish economy, (1) The ratio of non-performing loans to total loans, (2) the Return on equity ratio, (3) the Return on assets ratio, and (4) the Capital to assets ratio sub-components are used. The ratio of non-performing loans to total loans adversely affects financial soundness, while the other components contribute positively to financial soundness. Increases observed in this ratio will cause deterioration in the asset quality of the financial system and erosion in financial soundness and therefore will be included in the calculation by taking the corresponding amount. The developments exhibited by the normalized time series during the examination period are given in Figure 3.

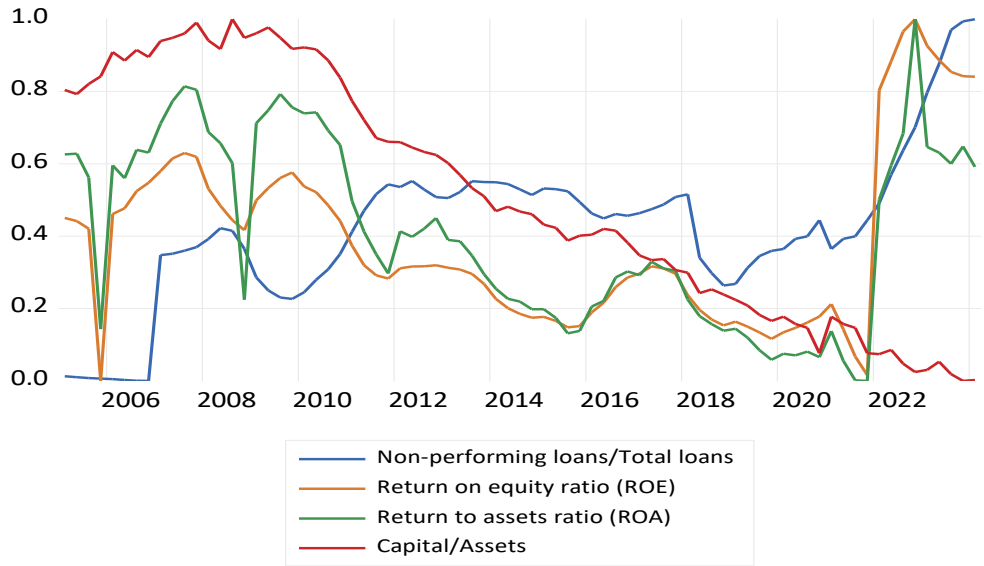

Figure 3. Normalized Components of Financial Soundness Indicator

The previous sub-indicator is also calculated systematically, and the financial soundness indicator obtained by using each component with a weight of 0.25 can be observed in Figure 4 below.

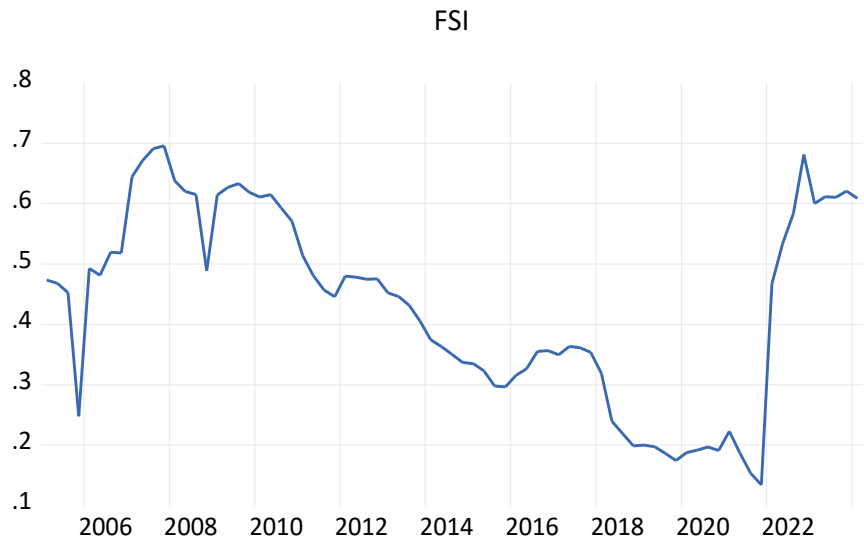

Figure 4. Financial Soundness Indicator

The financial soundness indicator, one sub-indicator that positively affects financial stability, takes values between 0 and 1. When the indicator value approaches 0, it means that financial soundness decreases, while when the value approaches 1, it shows that the financial system's resistance to fragility increases. During the review period, it is observed that the financial soundness indicator has tended to decline for many years, especially after the 2008 Global Financial Crisis. The indicator, which saw its lowest level in the last quarter of 2021, entered a rapid recovery process afterward. The increase in the ROA and ROE indicator values that make up the indicator has positively affected the series.

The third indicator, the financial vulnerability indicator (FVI), can be considered as the financial system's vulnerability to shocks or disruptions. Financial vulnerability resulting from imbalances in the financial system can lead to the risk of unexpected corrections and even reduce its ability to withstand other shocks (Arip et al., 2019). Therefore, monitoring a single indicator of financial fragility cannot be an effective measure. Therefore, combining several indicators into a composite leading indicator serves as a warning system for measuring vulnerabilities in the financial market. When financial vulnerability is considered in this way, it is obvious that many factors can affect it. The variables used to create the financial fragility indicator in this study are as follows: (1) Inflation rate, (2) Current account deficit to GDP ratio, (3) Real exchange rate, and (4) Unemployment rate. All of the components that make up the financial vulnerability indicator, the third sub-indicator of macro-financial stability, affect financial vulnerability in the right direction. Increases in each of these components also cause an increase in financial vulnerability. Since the increase in financial vulnerability will also negatively affect financial stability, this variable will be included with a negative effect (-) when calculating the financial stability index. The course of the normalized time series is given in Figure 5.

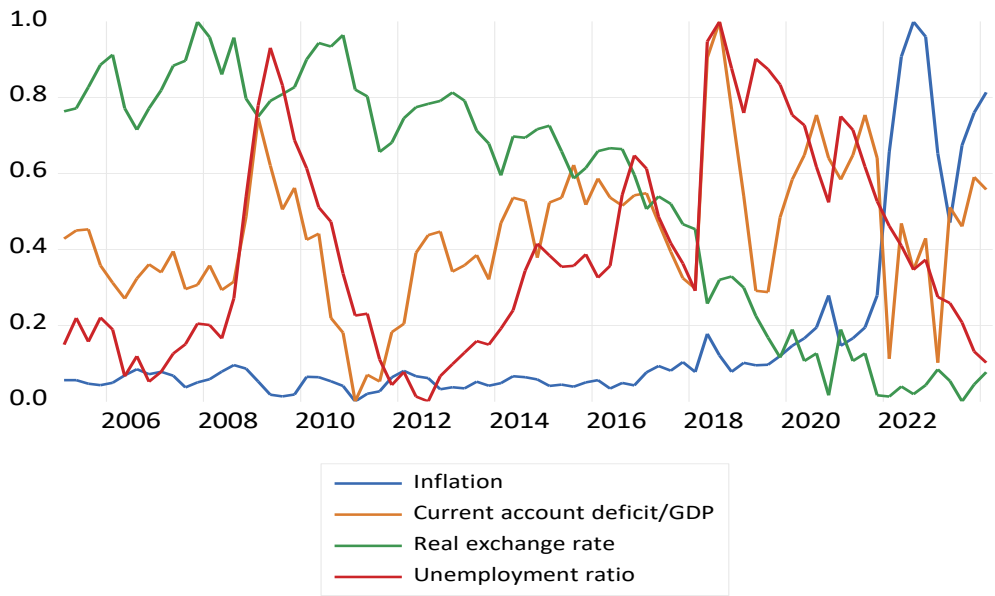

Figure 5. Normalized Components of Financial Vulnerability Indicator

In order to avoid creating systematic differences and adding bias to the analysis, each component will be included in the formation of the financial vulnerability indicator with a weight of 0.25, as was done in the previous indicators. Accordingly, the financial vulnerability indicator created for the review period is given in Figure 6.

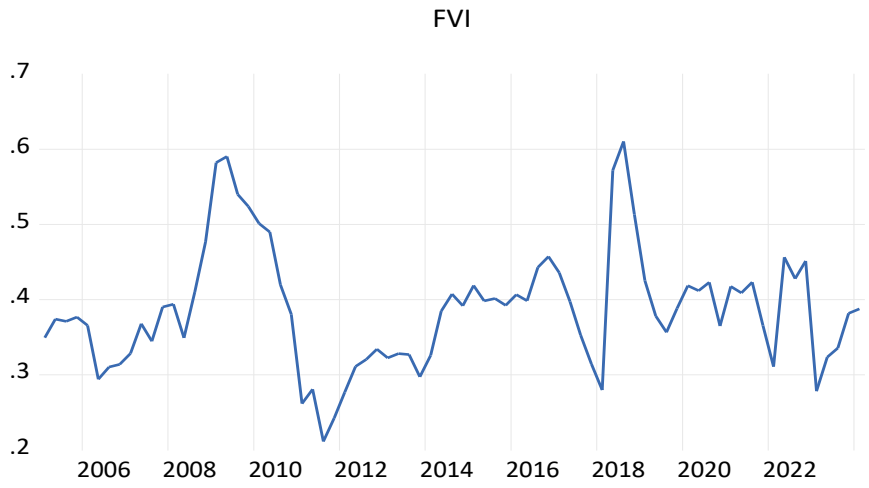

Figure 6. Financial Vulnerability Indicator

The financial vulnerability indicator takes values between 0 and 1. When the indicator value approaches 0, it means that financial fragility has decreased. As the value approaches 1, it shows that the fragility of the financial system has increased. Therefore, financial markets have gained a sensitive structure in the face of financial and economic crises. The sharp increase during the 2008 global financial crisis in particular indicates that financial vulnerability has also increased in Türkiye during that period. Although there have been occasional increases during the Covid19 period, the series' recent re-emergence in an upward trend indicates negative news about financial vulnerability.

The last indicator, the World Economic Climate Indicator (WECI), represents how developments in the world economy are reflected in the financial stability of the country. Many components need to be considered when creating this sub-indicator. However, variables representing developments that may create fluctuations in foreign trade and the financial sector have been selected for the Turkish economy. These are (1) the OECD manufacturing industry production index, (2) the Crude oil price index, (3) the World policy uncertainty index, and finally (4) the Global financial stress index. All of the components listed above, except for the first component, are components that represent developments that will negatively affect macro-financial stability in the country. The developments of the normalized time series of these components, which include developments and expectations in international real and financial markets, during the examination period, can be observed in Figure 7.

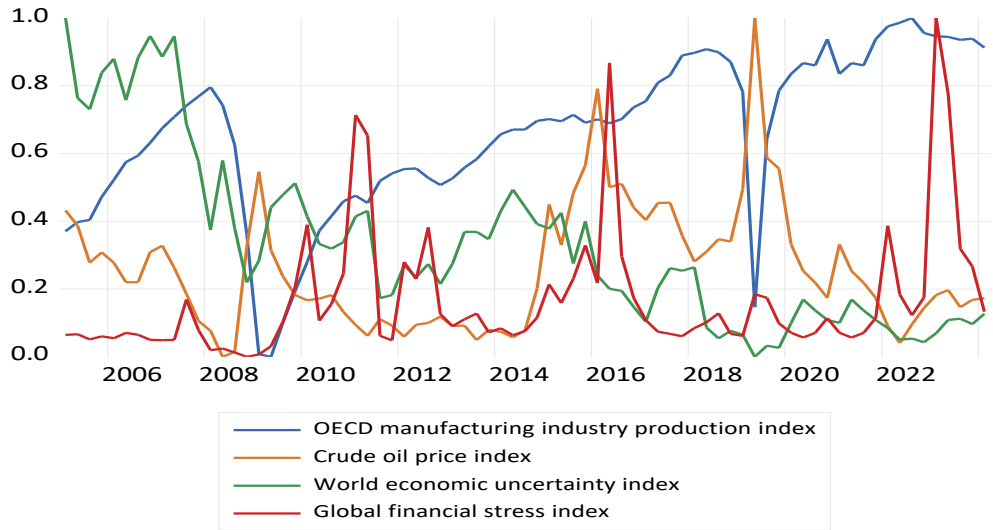

Figure 7. Normalized Components of World Economic Climate Indicator

The system used in calculating the previous sub-indicators was also applied in calculating the world economic trend sub-indicator, and the world economic climate indicator obtained by using each component with a weight of 0.25 can be observed in Figure 8 below.

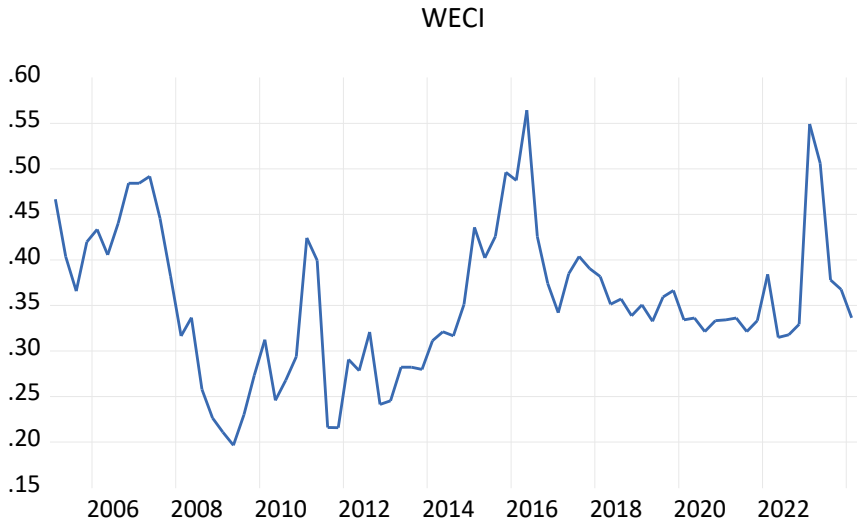

Figure 8. World Economic Climate Indicator

The world economic climate indicator takes values between 0 and 1. When the indicator value approaches 0, it indicates that global economic developments are negative, while when it approaches 1, it indicates optimistic global economic developments. The series experienced the most significant decline in the review period in 2008. Although it began to recover after the crisis, it remained at fluctuating but low levels between 2016 and 2022. Global economic uncertainties will increase the series after 2022, informing us of a negative trend on a global scale.

In this section, 4 macro-financial stability sub-indicators (FDI, FSI, FVI, and WECI), created by using 16 components in the sub-indicators explained above, will be combined to develop the macro-financial stability index to be used in the following sections of the study.

In calculating this index, methods such as equal weight weighting (1/4), using the correlation coefficients between them and real GDP, or inverse variance can be used. However, the inverse variance weighting method suggested in the study of Ma and Zhang (2016) is used in this study. Here, each variable is weighted inversely proportional to its volatility. This means that the weight assigned to each variable reflects its relative stability throughout the sample period, i.e., a higher weight is assigned to a relatively more stable variable and is calculated with the following formula:

$$w_i = \frac{1}{\sigma_i^2} \Big/ \sum_i \frac{1}{\sigma_i^2}$$

where w_i is the weight of the variable, σ_i is the standard deviation of variable. Based on this, the variables and calculated weights for each indicator are given in Table 1.

Table 1. Weight of the Indicator

Sub-indicators	Variables	Weight	Indicator weight
Financial Development Indicator (FDI)	Private sector loans / Total loans	0.25	0.547
	Total credits/GDP	0.25	
	Cash/Demand deposits (-)	0.25	
	M3	0.25	
Financial Soundness Indicator (FSI)	Non-performing loans/Total loans (-)	0.25	0.267
	Return on equity ratio (ROE)	0.25	
	Return to assets ratio (ROA)	0.25	
	Capital/Assets	0.25	
Financial Vulnerability Indicator (FVI) (-)	Inflation	0.25	-0.269
	Current account deficit/GDP	0.25	
	Real exchange rate	0.25	
	Unemployment ratio	0.25	
World Economic Climate Indicator (WECI)	OECD Manufacturing Industry Production Index	0.25	0.455
	Crude oil price index (-)	0.25	
	World Economic Uncertainty Index (-)	0.25	
	Global financial stress index (-)	0.25	
		Total	1.000

Among the coefficient estimates for the FDI, FSI, FVI, and WECI indicators that constitute the sub-indicators of the Macro-Financial Stability Indicator (M-FSI), the highest coefficient belongs to the Financial Development Indicator (FDI). This situation is important for Türkiye because it emphasizes the importance of financial development in supporting and stabilizing economic growth. The second largest effect is seen in the World Economic Climate Indicator (WECI). This indicator proves that the effects of openness to the world are quite high in the Turkish economy. Fluctuations in oil prices are very important for a country like Türkiye,

which depends on foreign sources regarding raw materials. The increase in uncertainties in world economic policies will cause fluctuations in the exchange rate, making this index important for Türkiye. According to theoretical expectations and the way the series are created, while financial fragility affects financial stability in the opposite direction, financial soundness and developments in the world economy have a positive effect. The effects of financial soundness and financial fragility indicators on real economic activities are close to each other in absolute values. The M-FSI graph calculated for Türkiye for the period 2005Q1 – 2024Q1 is shown in Figure 9.

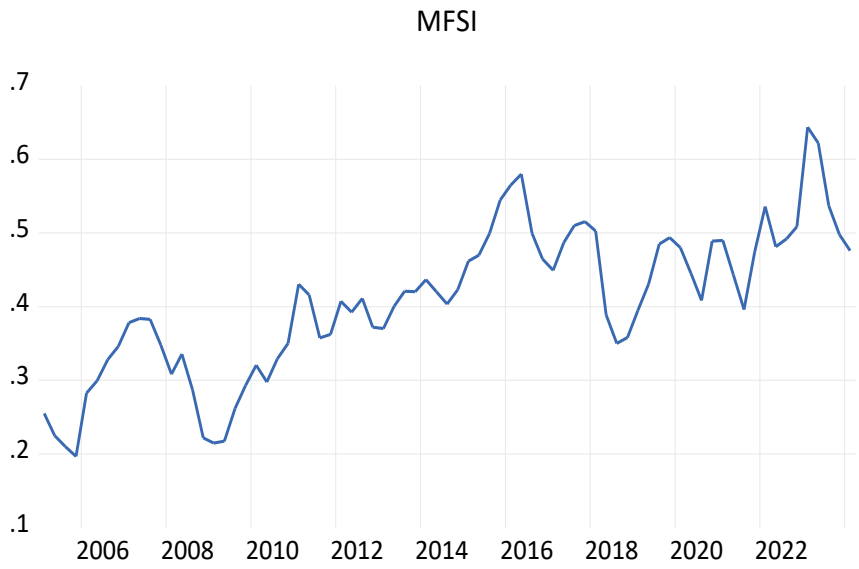

Figure 9. Macro-Financial Stability Index

The M-FSI graph generally shows a fluctuating trend. The indicator, which takes values between 0 and 1, approaches 1, indicating an increase in financial stability, while approaches 0 indicates an increase in financial instability. In other words, increases in the graph show a positive impression of financial stability, while decreases reveal that financial stability is deteriorating. The financial stability index, which saw its lowest level between 2008-2009, later entered a serious recovery process. It is proven that financial stability was negatively affected by the process that started with the increasing exchange rate in 2018, following the negative developments in the global economy in 2017. The transformation of the health crisis into a financial crisis during the Covid19 period also prevented the positive course of financial stability. The index has entered a downward trend after 2023.

After the Macro-Financial Stability Index is created, the variables selected as monetary policy and fiscal policy indicators need to be explained. In monetary policy analyses, the policy interest rate applied by central banks is the basic research used to direct economic activities. Policy interest rates are the main tools used to manage inflation targets and economic expectations (Reis, 2022). Especially low policy interest rates can create difficulties for financial stability by increasing investors' risk-taking tendencies due to the ease of access to credit (Lian et al., 2019). The monetary policy interest rate is selected as an explanatory variable in the study because it contains important information about the general course of the economy and future expectations.

The size of public revenues, both in absolute terms and as a ratio to GDP, affects many variables from the production capacity of the economy to the level of social welfare (Akıncı, 2019). Thanks to tax revenues, the state provides financing for public goods and services and

uses them as a fiscal policy tool (Öztürk, 2016). Tax revenues serve many purposes such as economic growth, financial and economic stability, and ensuring justice in income distribution. Tax revenues, one of the most basic tools in directing fiscal policy, are another explanatory variable in this study. Figure 10 shows the course of the monetary policy interest rate (INT) and tax revenues (TAXR) during the review period.

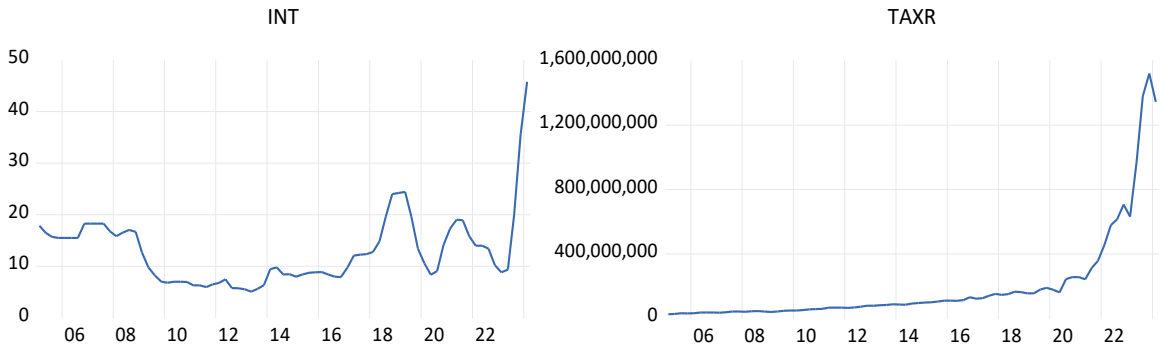

Figure 10. Monetary Policy Interest Rate and Tax Revenues

Based on Figure 10, the policy interest rate, approximately 17% in 2005, decreased until 2014. The increase in growth rates and the decrease in inflation rates caused interest rates to decrease gradually. Türkiye was also affected by the global recession 2008, and interest rates were significantly reduced to stimulate economic activity. In 2018, the Turkish economy entered a serious foreign exchange crisis, the Turkish lira lost value rapidly, and massive capital outflows began. Interest rates began to be increased significantly in mid-2018. With the Covid19 pandemic bringing the global economy to a standstill in 2020, the CBRT, like many other central banks, tried to support economic activity by reducing policy rates. However, towards the end of 2020, pressures on the Turkish lira and increases in inflation rates led the CBRT to increase interest rates. As of 2021, policy interest rates have increased to 50% to control high inflation. Global economic developments, inflationary pressures, exchange rate volatility, and the effects of local economic policies have generally shaped policy interest rates in Türkiye. Interest rates have been increased, particularly during currency crises and inflationary periods, and growth has been supported by reducing interest rates during economic recession periods.

When tax revenues are examined, the data fluctuates depending on economic growth, changes in exchange rates, and crisis periods. Tax revenues in the Turkish economy increased until 2018 but did not experience major jumps. Inflationary pressures that increased with the foreign exchange crisis in 2018 also slowed down economic activity and caused tax revenues to decrease. In 2020, the Covid19 pandemic put the economy in a serious bottleneck, businesses were closed and significant decreases were recorded in tax revenues. In 2022, the economy entered a recovery process, and a significant increase in tax revenues was observed. The increases in prices due to inflation and the expansion of the tax base have also caused tax revenues to grow recently.

3.2. The Autoregressive Distributed-Lag (ARDL) Model

This study uses the Autoregressive Distributed Lag (ARDL) model. The ARDL (Autoregressive Distributed Lag) model is a regression model used especially in analyzing long-term relationships and short-term dynamics. This test, applied in cases where independent and dependent variables may have different unit root properties, provides easier application to larger

data sets. In the ARDL model developed by Pesaran et al. (2001), the dependent variable must be stationary at the first difference. However, the explanatory variables can be stationary at the level or first difference. If the series are stationary at the second difference, the ARDL test cannot be applied.

In order to apply the ARDL test after the unit root tests, the series in the model must be normally distributed, there must be no heteroscedasticity problem, and there must be no autocorrelation problem (Pesaran et al., 2001). Assuming that it satisfies all these conditions, the ARDL model is represented as follows:

$$y_t = \alpha + \sum_{j=1}^{p} \delta_j y_{t-j} + \sum_{i=0}^{q} \gamma_i x_{t-i} + \varepsilon_t \qquad (1)$$

where y_t is the dependent variable, x_{t-i} are the independent variables of the model. p and q represent the maximum lag numbers of the dependent and independent variables, respectively.

In the ARDL model, the null hypothesis states that there is no cointegration between the variables, while the alternative hypothesis states that there is cointegration. Since the study investigates the effects of the policy interest rate (INT), which is a monetary policy indicator, and tax revenues (TAXR), which is a fiscal policy indicator, on financial stability, the basic ARDL model can be expressed as follows:

$$MFSI_t = \alpha + \sum_{j=1}^{p} \delta_j MFSI_{t-j} + \sum_{i=0}^{q} \gamma_{1i} INT_{t-i} + \sum_{i=0}^{q} \gamma_{1i} TAXR_{t-i} + \varepsilon_t \qquad (2)$$

The difference between each lag in the dependent and independent variables indicates the short-term dynamics, which indicate the changes that may occur in the dependent variable. Long-term dynamics are found by dividing each lag value coefficient by the coefficient of the dependent variable. If the variables have a long-term cointegration relationship, the error correction model formulation can also be used. The most important point to consider when interpreting the results is that long-term coefficients indicate permanent relationships between the variables, while short-term coefficients reflect temporary effects.

4. EMPIRICAL FINDINGS

In the ARDL model developed by Peseran et al. (2001), the dependent variable must be stationary at the first difference, while the independent variables can be stationary at the level or first difference. Thus, the ARDL model examines the cointegration relationship between stationary series at both different and the same degrees. Table 2 shows the results of Augmented Dickey-Fuller (ADF), Phillips Perron (PP), and Breakpoint ADF unit root tests.

Table 2. Unitroot Tests Results

	ADF Test	***PP Test***	***Breakpoint ADF Test***	
Variables	*t-stat* *(prob.)*	*t-stat* *(prob.)*	*t-stat* *(prob.)*	*Break date*
Level				
M-FSI	-2.7776* (0.0663)	-1.9625 (0.3026)	-3.9410 (0.4085)	*2018Q1*

INT	-1.5213 (0.5174)	-0.9692 (0.7604)	-2.9880 (0.6929)	*2023Q2*
TAXR	2.7530 (1.0000)	7.0366 (1.0000)	-1.4954 (>0.99)	*2023Q1*
1st Difference				
ΔM-FSI	-	-8.9459*** (0.0000)	-7.9387*** (<0.01)	*2023Q1*
ΔINT	-4.6717*** (0.0003)	-3.0661** (0.0335)	-7.7967*** (<0.01)	*2023Q2*
ΔTAXR	1.5620 (0.9993)	-4.8095*** (0.0002)	-5.0474*** (<0.01)	*2008Q2*
******, **, and * refer to statistically significance at 1%, 5% and 10% respectively. Δ is the difference operator.***				

According to the unit root test results, all variables are stationary in the first difference I(1). This condition is compatible with the ARDL model stationarity conditions. Next, the ARDL bounds test results will be discussed.

Table 3. Bounds Test Results for Cointegration in the Specified ARDL Model

F-statistics	**Significance Level**	**Critical Value**	
		Lower limit I(0)	Upper limit I(1)
	%10	2.725	3.455
9.521***	%5	3.253	4.065
k=2	%1	4.458	5.41
**** (%1), ** (%5), * (%10) indicates rejection of H_0 hypothesis at significance level. For the cointegration test, H_0: There is no cointegration.*			

The null hypothesis (H_0) of the F-statistic obtained from the ARDL bounds test is that there is no cointegration between the series. Therefore, the null hypothesis must be rejected for cointegration between the series. If the value of the F-statistic is less than the lower limit value at the given significance level, the null hypothesis cannot be rejected. If the value of the F-statistic falls between the lower and upper limit values, a definitive decision cannot be made about the null hypothesis at that significance value. If the value of the F-statistic is greater than the upper limit value, the null hypothesis is rejected at that significance level. In other words, it is decided that the series has a long-term relationship. As can be seen from the table, the value of the F statistic (9.521) is greater than the upper limit value of 5.41, which is the 1% significance level. Therefore, the H_0hypothesis is rejected; there is a long-term relationship between the series.

According to the results in Table 4, the model has no heteroscedasticity problem (prob. 0.5575>0.05), no autocorrelation between the error terms (prob. 0.3592>0.05), the model is established correctly (prob. 0.5457>0.05), and the error terms are normally distributed (prob. 0.7201>0.05). All test results show that the basic statistical assumptions in the model are not omitted.

Table 4. The ARDL Test Results

Dependent Variable: MFSI				
Long-run coefficients				
Variable	*Coefficient*	*Std. error*	*t-statistic*	*Prob.*
INT	-0.006020	0.003111	-1.934991	0.0570*
TAXR	0.107626	0.021678	4.964802	0.0000***
C	-1.472236	0.387344	-3.800848	0.0003***
Error correction model coefficients				
Variable	*Coefficient*	*Std. error*	*t-statistic*	*Prob.*
D(INT)	-0.004437	0.001443	-3.074833	0.0030**
D(TAXR)	-0.068614	0.038821	-1.767426	0.0815*
ECT(-1)	-0.260207	0.065857	-3.951085	0.0002***
Diagnostic Tests			*t-statistic*	*Prob.*
Breusch-Pagan-Godfrey heteroskedasticity test			0.794171	0.5575
Breusch -Godfrey serial correlation test			1.040839	0.3592
Ramsey Reset test			0.368725	0.5457
Jarque-Bera normality test			0.656583	0.7201

****, **, and * refer to statistically significance at 1%, 5% and 10% respectiely.*

Table 4 shows both long-term and short-term results. When we look at the long-term results, it is observed that a one-unit increase in the policy interest rate has a negative effect on the M-FSI at the 5% significance level. An increase in the interest rate can reduce the M-FSI, but this effect is not very strong. Since a decrease in the M-FSI (approaching 0) indicates an increase in financial instability, the results prove that sudden and sharp increases in interest rates negatively affect financial stability. Similarly, in the short term, changes in interest rates have a negative effect on the MFSI. These effects indicate that changes in interest rates tend to reduce the M-FSI in the short term. The limited impact of the interest rate increase on M-FSI can be attributed to market expectations of interest rate increases. If consumers and investors anticipate interest rate increases, interest rate increases will have a limited impact on financial stability. Furthermore, monetary policies and communication strategies implemented by central banks can reduce the negative effects by guiding market expectations. The findings are similar to the studies of Chukwudi and Henry (2020), Friedrich et al. (2019), and Hudaya and Firmansyah (2023).

Tax revenues positively and significantly affect M-FSI in the long run. This shows that increasing tax revenues have a financial stability-enhancing effect. Increasing tax revenues increases the government's capacity to finance public expenditures and close the budget deficit. This helps to reduce public debt or keep it at a sustainable level. Keeping debt levels at manageable levels increases the confidence of both domestic and foreign investors, thus ensuring stability in financial markets. It also reduces the government's borrowing need to finance the budget deficit. This eases interest rate pressures in financial markets because the government borrows less from the market, which lowers interest rates. Low interest rates encourage private-sector investment and support economic growth, strengthening financial stability in the long run.

Increasing tax revenues contributes to financial stability in many areas, from ensuring the sustainability of public finances to social and economic welfare. A stronger fiscal structure creates a financial system that is more resilient to economic crises and increases the effectiveness of monetary policies. The effect of changes in tax revenues on MFSI in the short run is negative, but the significance level is around 10%. This suggests that tax revenues may not significantly impact MFSI in the short term, or their impact may change over time. Higher tax rates can reduce the spending power of households and businesses. This can slow down economic activity and create financial instability in the short term. However, in the short term, tax rate increases can help close budget deficits and increase fiscal discipline, which can ensure fiscal sustainability in the long term. In addition, tax revenues can be used to invest in infrastructure and public services. In the long term, these investments can support economic growth and strengthen financial stability. These findings are similar to the results of Hodula and Pfeifer (2018).

When the results are generally examined, the central bank should adjust interest rates more carefully in the short term. Sudden and large changes in interest rates can disrupt financial stability in the short term. Therefore, a soft and careful policy should be followed in interest rates. The central bank can encourage economic growth and support financial stability by keeping interest rates low in the long term. However, this policy should be implemented carefully, also considering the risk of inflation. Rapid changes in fiscal policies should be avoided in the short term. Short-term tax changes should be made carefully, especially during economic fluctuations. A more stable approach should be adopted in tax policies by considering long-term targets. It would not be wrong to say that expanding the tax base can effectively support financial stability. The government can strengthen fiscal policies by reforming the tax system to make it more effective.

The variable indicated by ECT(-1) is the error correction term; the coefficient is expected to be negative and significant, and it shows how much of an imbalance that occurs in the short term will be corrected in the long term.

5. CONCLUSION

This study examines the effects of monetary and fiscal policies on financial stability in the Turkish economy during the period 2005Q1-2024Q1. For this purpose, firstly, the Financial Development Indicator (FDI), Financial Soundness Indicator (FSI), Financial Vulnerability Indicator (FVI), and World Economic Climate Indicator (WECI) sub-indicators are calculated. Then, these sub-indicators are weighted with the inverse variance method, and a Macro-Financial Stability Index (M-FSI) is calculated. Monetary policy interest rate and tax revenue variables represent monetary and fiscal policy.

The analyses conducted using the Autoregressive Distributed Lag (ARDL) model have shown that increases in policy interest rates negatively affect financial stability in the short and long term. High interest rates can increase credit costs, reduce investors' risk appetite, and slow down economic growth. This can increase volatility in financial markets and negatively affect financial stability, especially in the short term. On the other hand, it has been determined that increases in tax revenues have negative effects on financial stability in the short term and positive effects in the long term. While tax increases in the short term can threaten financial stability by slowing down economic activity, they can provide a more sustainable economic structure by strengthening public finances in the long term and positively affecting financial stability. Increases in tax revenues help finance public expenditures, reduce public debt, and increase economic confidence. This provides stability by increasing confidence in the markets for both local and international investors.

The CBRT should also take financial stability into account when determining interest rates. Sudden and sharp increases in interest rates can disrupt financial stability in the short term. Therefore, adjusting interest rates slowly and in a controlled manner can be more effective in both combating inflation and maintaining financial stability. The government can support financial stability by using tax policies more effectively. Increasing tax revenues will help keep public debt sustainable and finance public expenditures. Tax revenues can be increased by expanding the tax base and developing more effective methods to combat tax evasion. In addition, making the tax system more equitable can improve social welfare and strengthen economic and financial stability in the long term.

Consistent implementation of fiscal and monetary policies will play a critical role in ensuring financial stability. It may be difficult to achieve financial stability through monetary policy alone. Therefore, when implementing expansionary or tightening fiscal policies, these policies should be addressed together with monetary policies. In light of these findings, policymakers can ensure Türkiye's financial stability is sustainable by managing interest rates and tax policies more carefully.

Statement of Research and Publication Ethics

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

Contribution Rates of Authors to the Article

The entire study was created by the author.

Declaration of Interest

There is no conflict of interest for the author or third parties arising from the study.

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