

Indicator of financial literacy in the Turkish economy and its effect on financial depth*

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Abstract: Advancing technology and widespread news network are offering new financial gadgets to evaluate their financial investments. In this respect, financial literacy has gained great importance in recent years for benefiting related financial opportunities. From this point of view, in our analysis within the scope of the ARDL bound test approach, to measure the financial literacy indicators for the Turkish economy and the impact of selected macroeconomic variables on financial depth between 2002-2021, the Financial Depth Index (Deep Index), Private Sector Loans/GDP (LOANS) and M3/ GDP variables were analyzed. According to the long-term coefficient estimation results of ARDL analysis, it is understood that while the relationship between M3-GDP and Deep Index is in the same direction in Turkey, the relationship between Loans and Deep Index is in the reverse direction. In this case, it can be stated that the increase in the M3-GDP value in Turkey will increase the financial depth index, and the increase in domestic loans given by the banks will decrease the financial depth index.

Key Words: Financial, Financial Literacy, Financial Knowledge, Financial Education, Financial Behaviour and Attitude, Financial Awareness.

1. INTRODUCTION

Recently, the number of new financial products and financial services in financial markets has been increasing. Financial deep and financial diversity are majorly increased with the advancing technology. The presence of new financial gadgets, increasing financial depth, and financial literacy that lags behind the expected level have brought new difficulties in comprehending the financial system. Hereby responsibilities of economic actors are immensely increased. Financial literacy which is one of the great responsibilities of economic actors has become one of the basic indicators in an economic actor's financial life. The low level of financial literacy in both national and international markets can cause disruptions in the management of financial resources and, together with it, problems in the financial system. Thus economic actors who lack enough financial education make mistakes. Past mistakes influence and damages the whole/entire economy over time. Therefore, for this not to be the case, economic actors must be conscious of financial matters and be able to make reasonable/healthy decisions.

Factors such as the general level of prices and interest rates, which are reflected in the country's

economy in line with the behavior of economic actors, return to the themselves. Briefly, it can be interpreted that the success of a country's economy is highly related to the level of financial literacy of the society living in that country this sense, opportunities for countries to develop are provided. As the level of financial literacy increases, people with this knowledge act more rationally while using the gadgets of the financial world. They turn their saving into investments and make their acceptable budgeting future plans more rational. Otherwise, a low level of financial education destabilizes the markets. Therefore, maximum mistakes come with minimum income.

Since rational decisions affect economic actors in terms of social, economic, and cultural they higher-ups the life quality of economic actors. One must understand the importance and value of financial decisions on the way of welfare. Consequently, in other words, the financial behaviors of economic actors are also affecting the national economic financial structure. A low level of social financial literacy will reduce the effectiveness of monetary and fiscal policies applied in national economies.

Financial literacy first begins with proper financial education. The right financial education policies to be applied based on financial literacy are also one

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of important indicators of the country's development. Apart from educational institutions, cooperation between the private sector and non-governmental organizations with other national and international financial institutions will bring success in this regard. In this direction, in the first part this study, financial literacy and the main determinants of financial literacy, and the effects of financial literacy on the economy are studied. In the second part of the study, literature studies on financial literacy are included. In the third part, the relationship between financial literacy indicators and financial deepening was analyzed by the ARDL bounds test.

2. THE CONCEPT OF FINANCIAL LITERACY

Financial literacy has gained immense significance for the economies of developing countries with the increase in financial depth and global financialization. It is important for underdeveloped and developing countries to get a larger share of global financial investments, to understand the conceptual dimension of financial literacy, and to find application area in these countries. From this point of view, although there is no complete consensus on financial literacy in the relevant literature, different definitions are made in different studies on financial literacy. Financial literacy skills enable economic actors to make predictions about financial problems and to make fast and correct decisions in solving financial problems (Öztürk ve Demir, 2015: 114).

According to the definition of the Organization for Economic Co-operation and Development (OECD), financial literacy is aware of where to apply when problems arise to strengthen the financial capabilities of economic actors to turn opportunities and risks into advantages in the situations they encounter and to make conscious decisions and at the same time provide them with an objective and/or information that increases their well-being (OECD, 2013: 144).

Financial literature has gained importance with the global financial crisis that happened in 2008. In the post-crisis period, which has become economically complex, increasing tendencies have been provided to strengthen the financial literacy of economic actors to make both healthy decisions and to comprehend the system for the financial system (Karataş, 2017: 19-26).

Financial crises have led to a diversification in capital markets and applications of newly introduced investment products, with the further increasing importance of financial literacy. Financial

literacy is the skills and financial knowledge possessed to make healthy financial decisions (Kılıç vd., 2015: 130).

Financial literacy in literature; stated that there is a strong link between financial behavior and financial attitude and financial knowledge level. Thus, it is said that financial literacy consists of qualities such as financial attitude, financial behavior, and financial knowledge (Alkaya ve Yağlı, 2015; Atkinson ve Messy, 2012; Çam vd., 2018; Çömlekçi, 2017).

The concept of attitude, which is an important part of financial literacy, is mostly defined as the set of possible attitudes that economic actors should exhibit toward a random phenomenon, event, or incident. In other words, it expresses the reactions of an object and phenomenon (İnceoğlu, 2010).

Dew and Xiao (2011) defined the trend of financial behavior as consisting of a triple combination of main factors such as credit management, money management, savings and investment. While financial behavior is the actions of economic actors in their financial matters, financial attitude can be defined as the reactions of economic actors to their financial issues. Financial information level is one of the significant factors in indicating of financial literacy. Financial information can be studied at two basic levels. While macroeconomic information is based on the first, microeconomic financial information level is important at the second level (Özdemir, 2011: 9).

The concept of financial responsibility needs to be evaluated in a much more comprehensive way as it affects economic actors who make financial decisions and society when the financial decisions taken in the name of financial responsibility are not researched and acted wisely, it has a negative effect on both economic actors, families, and society. Thus, financially literate economic actors will shape their behavior accordingly without having to make an effort while fulfilling their financial responsibilities (Mason, 2003).

2.1. DEFINING FEATURES OF FINANCIAL LITERACY

Economic actors are required to have knowledge of certain issues related to financial issues. Thanks to the skills and knowledge provided by raising awareness of economic actors, economic actors are much more successful in family and business life by making their financial decisions effectively. Thus, financial education is of great importance in raising the level of financial literacy of economic actors, because the development level of countries with a high level of financial literacy is also high.

In the US, the financial literacy advisory council, in its study for the president of the country, stated the qualifications that require economic actors to be financially literate as follows: (President's Advisory Council on Financial Literacy, 2008: 36-37).

- ✓ To be able to assimilate and control financial hazards,
- ✓ Creating and managing budget
- ✓ To be able to evaluate investment instruments according to the risk and return status,
- ✓ Taking precautions against financial fraud,
- ✓ Managing cash flow,
- ✓ Ability to provide resources against urgent issues that may occur
- ✓ Knowing the financial system and financial institutions,
- ✓ Protecting oneself financially in situations such as disaster, disability, accident, illness, and death,
- ✓ Analyzing alternatives in loan selections and credit provision,
- ✓ Analyzing housing needs according to purchase and rental conditions.

2.2. IMPORTANCE AND BENEFITS OF FINANCIAL LITERACY

The contribution of financial literacy level to one's himself/herself, family, and society is too important to be underestimated. Economic actors that get financial education contribute themselves to act financially reasonably and reach welfare consciously. At the same time, the financial education received will change the perspective of financial events and will allow the level of welfare to increase.

According to Bianco and Bosco, the importance of financial literacy: "It is necessary to accept the importance of knowing English, which is considered as the world language, and the importance of being a good financial literate. For this reason, it is time to teach financial literacy as a course in the Faculties of Economics and Administrative Sciences.

2.2.1. THE IMPORTANCE OF FINANCIAL LITERACY

Today, new products and services are constantly being introduced to the market. As these changes are constantly shown, many options are created for savings and investments. Factors such as prices, inflation, and interest rates, which are reflected in the country's economy in line with the behaviors of economic actors, return to the economic actor again.

According to Eker (2017), consumers with low financial literacy have the thought of leaving the financial system when they make wrong and incorrect financial decisions. For these reasons, the real sector may be adversely affected and may cause the financial system to shrink. As a result of this, the resulting economic contraction may lead to the dismissal of economic actors. However, economic actors with an increased level of financial literacy will be able to direct their investments to the markets and participate in the financial system by giving priority to financial products. Thus, they will contribute to the growth of the economy and have a positive effect on the decrease in the unemployment rate. As a result, the reactions of households and economic actors' choices in the normal time frame are poorly understood, but when economic crises do occur, they have a huge impact.

When the recent global crises are examined, it is seen that banks and other financial institutions take high risks. If consumers had more information about financial matters, they could consider alternatives and take precautions against risky situations. As a result, banks could be protected from taking high risks. In other words, financial literacy will affect the mechanism of the state and the financial institution and will facilitate the more regular operation of the markets.

In Türkiye, especially in the last thirty years, the impact of financial crises has attracted a lot of attention. A large proportion of households have been exposed to financial crises and have had to live financially on a "knife edge". These crises, which occur because households cannot protect existing assets and provide new assets and at the same time leave assets as an inheritance to children, have begun to appear and spread in the vast majority of society. The erroneous attitudes of economic decision-makers in their financial decisions may cause volatility in macroeconomic variables and reduce the level of prosperity in the economy. Therefore, it should be ensured that the welfare level of society increases by increasing the financial literacy levels and providing financial training to economic actors (Altıntaş, 2008: 36).

One of the important economic factors of financial literacy is that it prevents informality. Thanks to the financial literacy equipment they provide to themselves, economic actors prefer to stay away from unregistered transactions by being aware of the damage that informal transactions will bring to the economy. This situation will reflect positively on the unity and stability of the society (Satoğlu, 2014: 37).

3. LITERATURE REVIVAL

In this part of the study, as explained in the previous sections, financial literacy, which is a very important concept in the economy, and studies investigating the effects of financial literacy on economic indicators will be included.

Dawson's (2003) study showed that there is a positive relationship between financial development and economic growth, which supports the empirical literature. This relationship is generated from annual data for 13 Central and Eastern European countries using panel data covering the period 1994-1999. Growth rate calculations with a total number of observations of 78 65 were used. In the study, it was stated that, within the evidence from the panel data, financial development, as measured by liquid liabilities as a proportion of GDP, has an insignificant effect on economic growth.

Demetriades and Law (2006) examined the importance of the interaction between financial development and institutional quality in terms of economic development. The study consists of an observation panel including 72 countries covering the period 1978-2000. In the study, countries were examined into three groups as high, middle, and low income according to the World Bank classification. Annual data on real GDP per capita, gross fixed capital formation, and three alternative financial development indicators are based on World Development indicators. In conclusion, these findings indicate that both finance and institutional quality have major direct and indirect effects on economic development in middle-income countries.

Shan and Jianhong (2006) investigated the causality problem between financial development and economic growth both theoretically and empirically. In the study, the effect of financial development on economic growth in China was examined with the Vector Autoregression (VAR) approach. The variability of the var model's forecast error is disaggregated according to the 3-year forecast horizon. In the study, it is stated that financial development comes as the second force (after the contribution of labor input) to economic growth in China.

Rousseau and Yilmazkuday (2009) studied the relationship between financial development and economic growth. In the study, the triple relationship between inflation, finance, and growth is shown by using three-dimensional graphics. In the study, the data were organized as a panel including country observations from the 2007 edition of the

World Bank's World Development Indicators database and 84 countries. The study concludes that higher levels of financial development combined with lower inflation are associated with higher rates of economic growth, especially in low-income countries.

Jappelli (2010) used international panel data on economic literacy with a wide range of macroeconomic and institutional variables in a sample of 55 countries covering the period 1995-2008. The purpose of this analysis is to examine factors that are more likely to explain literacy differences using cross-country and time-dependent indicators. According to the results expressed in the research, financial literacy is that other macroeconomic and institutional variables are robust against the existence of fixed effects by country, and regression analysis, PISA test scores, and success in education are positively related to economic literacy.

Bittencourt (2011) examined the effect of inflation on financial development in Brazil. The current data set in the study was created from a panel of 10 regions covering the 1985-2002 period. In the study, it is stated that inflation clearly reduces financial development in Brazil according to different datasets and a number of estimators.

Rooij vd, (2011) used a panel dataset that provides information on savings and portfolio selection, covering a representative sample of the Dutch population, to measure financial literacy and evaluate its relationship with financial decision-making. The dataset in the study represents the Dutch population and includes more than 2,000 households. In the research, a comprehensive list of questions was designed to measure and differentiate different literacy and financial knowledge levels. In the study, all of the different measures of financial information used stated that the lack of literacy prevented households from participating in the stock market.

Wahid vd. (2011) studied the relationship between inflation and financial development in the Bangladesh economy. In the study, selected data for the 1985-2005 period were analyzed annually with the ARDL model. As a result, it is stated in the study that a high inflation tendency negatively affects the performance of financial markets and there is an inverse relationship between inflation and financial development in the Bangladesh economy.

Sevim vd. (2012) used both qualitative and quantitative research methods to measure the effects of Turkish financial consumers' financial literacy on their borrowing behavior. The

questionnaire created in the study was administered to a sample of 550 people in the city of Eskişehir. Cluster analysis was used to categorize the financial literacy level of the survey participants. To determine whether the financial literacy levels of the participants differ according to demographic characteristics, the chi-squared test was applied. The survey was made up of three parts. As a result, it has been stated in the study that there are differences in the borrowing behaviors of consumers with different levels of financial literacy, that attempts to increase the financial literacy of financial consumers may have important consequences in preventing excessive borrowing, and that people with low financial knowledge are more likely to have debt problems.

Behrman vd. (2012) investigated the links between financial accumulation and financial literacy. Using the Chilean Social Protection Questionnaire (Encuesta de Protección Social, EPS), a microeconomic dataset, the study examined the effects of financial literacy for a wider range of schools and ages. In the study, it was stated that the development of financial literacy makes a significant difference in financial behavior beyond regular education.

Beckmann (2013), on the other hand, analyzed how financial literacy is related to household savings. The analysis is based on data from the Euro Survey of the Central Bank of Austria on the level of financial literacy in Romania. In the study, it was stated that there is a strong regional disparity in financial literacy levels in Romania, which cannot be fully explained by sociodemographic differences between regions, financial literacy has a positive effect on saving behavior in Romania, and financial literacy is positively related to financial behavior.

Jonubi and Abad (2013), on the other hand, examined the impact of financial literacy on economic actor's savings in the context of Malaysia, an emerging market. In the study, a survey was conducted on approximately 200 people in the Klang Valley of Malaysia to examine the relationship. Other indicators of economic actor's savings were also examined in terms of regular savings, risk-taking behavior, and socio-demographic characteristics. As a result of the study, it was stated that saving is important for the long-term development and economic growth of a nation, financial literacy is an important determinant in economic actor's savings, and their knowledge about financial issues is effective in increasing savings.

In the analysis made by Fedorova (2015), the effect of financial literacy on the stock market was

examined. The study used data from 1,006 participants. In the study, structural equation modeling was used to analyze data collected from 345 Greek investors. The findings of the research are that the trading behavior and performance of Greek investors are influenced by their personality traits and that the trading volume has a positive effect on trading frequency.

In the study conducted by Abdeldayem (2016), the relationship between financial information and financial investment decisions in the Kingdom of Bahrain was examined. In the research, the investor survey in Bahrain was used. Data were analyzed using Pearson Correlation, t-test, and Chi-square test. In the study, it was stated that the financial literacy level of investors is low (38.6%) and far from the required level, women are less financially literate than men, participants between the ages of 41-50 are more knowledgeable than all other age groups, and financial literacy is highly related to education.

Xiao (2016) used data collected from the US 2012 National Financial Talent study (NFCS) to test the assumption that financial education is positively associated with financial competence. The study used multiple measures of financial competence, including four economic actor's literacy/behavior variables and an index. Related variables were determined as objective financial literacy, subjective financial literacy, desired financial behavior, and perceived financial ability. In the study, the index was calculated by summing the Z scores of the variables in question. In the study in which the regression analysis was carried out, the relationship between financial education and financial capacity was examined by using the USA data set. In the study, it was stated that financial education can have multiple positive effects on consumer financial competence by improving financial knowledge, encouraging positive financial behaviors, and increasing confidence in financial competence.

Adoko vd. (2016) investigated the importance of the relationship between access to finance and firm growth in terms of economic growth. The study was empirically tested using survey data from 201 small and medium enterprises in Ghana. The study aims to lay the foundations of financial literacy to achieve the knowledge and skills to manage financial information and skills, use financial services, and effectively plan the consumer market to achieve a firm's financial goals. As a result, it is stated in the study that financial literacy has a positive effect on access to finance company growth links in Ghana.

In the study by Ćumurović and Hyll (2019), the relationship between financial literacy and employment was examined. In the content of the study, the survey study was limited to economic actors between the ages of 18 and 65. In the study, it was stated that the level of financial development has an effect on the domestic financial decision-making mechanisms, the level of financial development is effective on the behavior of economic actors, and there is a positive relationship between financial literacy and self-employment.

Selvarajan and Ab-Rahim (2020) used dynamic panel model data including 33 Asian countries covering the period 1980-2015 to estimate the effect of financial integration on economic growth in their study. In the study, the dynamic relationship between financial integration and growth in Asian regions was tried to be examined, and the effects of financial integration and economic growth were examined using three different time intervals. These periods were 1980-1995 before the nexus crisis, 1998-2015 after the crisis, and 1980-2015. In the study, it has been stated that there is no relationship between the post-crisis and empirical results of the general examples, financial integration, and economic growth.

Khan (2020) examined whether financial literacy is related to investment in financial markets in the USA. Probit regression models were used to examine whether financial literacy is related to investment in financial markets. The dependent variable in the study is an investment in financial markets. In the study, it was stated that improving financial literacy positively affects the mobilization of household funds and contributes to capital formation, and financial literacy is positively associated with financial market participation.

Waheed vd. (2020) conducted a survey on a large number of investors who invested in Pakistan. In the research, it is aimed to determine the mediating role of risk perception between investors' investment decisions and financial literacy. In the study, it was stated that financial literacy has a positive effect on investment decisions.

4. DATA SET AND METHODOLOGY

4.1 DATA SET

The study examines the Turkish economy by considering the main determinants of financial literacy and its relationship with financial depth. The study examines the Turkish economy by considering the main indicators of financial literacy and its relationship with financial depth. In the study, Financial Depth Index (Deep Index)

dependent Private Sector Loans/GDP (LOANS) and M3/ GDP independent variables were used. The series analyzed in the study were prepared annually for the 2002-2021 period. In order to examine the relationships between the series, the stationarity tests of the series were initially performed. Philip Perron root test was used in this study. As a result of the test, it was observed that the related series were not stationary at the level. As mentioned, the PP unit root test results provided by models consisting of fixed, trendy, and fixed models, the Deep Index, M3-GDP, and Credits variables are not static at the levels. Time series; It consists of a set of values observed at different times of the variables we have considered. Time series analyses have become the subject of multiple studies (Gujarati, 1999: 23).

In the analysis carried out on the time series, the main theme of the series is not stationary and it has become a problem that is often encountered. In time-series analyses, a prediction is made when there is no general information about causality relationships for the future behaviors of the variables considered (Tari, 1999: 366).

In analyses involving time series, analysis is performed in line with the assumption that the series is stationary. The fact that data that is a time series has a unit root can change the mediation and variance of the related series (Kutlar, 2000:15).

4.1.2. DEFINITIONS OF DATA ANALYSIS

In the study, which examines the indicators of financial literacy in the Turkish economy and its effect on financial depth, the variables indicated to be used in the dependent independent analysis are as follows:

1- (M3/GDP) The variability represent money supply is shown with MS.

GDP: Gross domestic product, which means measuring the goods and services produced by an economy in terms of price in a year, is measured annually and quarterly.

(M3/GDP) Money Supply MS: Definitions of money supply in Turkey is formulated as:

M1 = M1 is composed of currency in circulation and demand deposits.

M2 = M1 + term deposits.

M3 = Broad money supply M3 is derived by adding time deposits, funds received from repo transactions, money market funds and debt securities issued with a maturity up to 2 years to the M1.

2- Financial dept ratio is symbolized as FINDEP.

Financial Depth Ratio (FINDEP): It is a term that describes the wider use of financial service options by all segments of society. In this case, also called financial depth, there is a transfer of funds to the real sector. Within this framework, it is possible to distribute the funds within the supply-demand balance. The increase in the number of financial instruments in an economy is also considered within the scope of deepening.

Loans: It is the division of the ratio of the total loans used by the private sector to the Gross Domestic Product (GDP).

4.1.3 METHODOLOGY

Determining the indicating factors of financial literacy and analyzing the variables determined to investigate their effects on financial deepening were analyzed with the ARDL boundary test approach.

Cointegration tests are applied to determine the long-term relationship between variables. Classical cointegration tests require variables to be equally integrated. This is a constraint for cointegration tests. In the investigation of the cointegration relationship between variables, ARDL analysis provides a serious advantage because it does not take into account the degree of integration of variables. Pesaran vd. (1996) proposed the ARDL approach, which allows the testing of the relationship between variables of different degrees of integration between variables of different degrees (Hüsnüoğlu, 2018: 32). Later developed by Pesaran and Pesaran (1997), Pesaran and Smith (1998), Pesaran and Shin (1999), and Pesaran et al. (2001), this approach has become frequently used in cointegration analyses. The ARDL model cannot be applied in cases where the variables are integrated from the 2nd degree and greater degree (Çağlayan, 2006: 427).

Another advantage of the fact that the ARDL model can be applied in small samples is that it can be mentioned. (Kamaruddin ve Jusoff, 2009: 100). Tests are used to indicate that at least two series are stationary at their level. Stationary is a concept that refers to the fact that series approach a certain value over time, in other words, series have a fixed average, a constant variance, and a covariance depending on the level of delay.

The advantages of the boundary testing approach include:

It is possible to apply the boundary test regardless of whether the variables to be used in the model are

$I(0)$ or $I(1)$. For this reason, there is no need to determine the stationary levels of the variables before applying the limit test. However, since the critical values in Pesaran vd. (2001) are tabulated according to whether their variables are $I(0)$ or $I(1)$, the variables must be tested against the possibility of them being $I(2)$.

Since the ARDL approach uses an unconstrained error correction model, it has better statistical properties than the Engle-Granger test and gives more reliable results than the Johansen and Engle-Granger tests in small samples (Narayan, 2005: 429).

The ARDL boundary test, which makes it possible for the analyzed variables to have different degrees of delay length, can be applied when the series to be used in the analysis are not static in their second difference. ARDL analysis, a single-equation cointegration analysis, eliminates the problem of possible internality between data. In order to perform the ARDL boundary test analysis, first of all, the model related to the error correction coefficient that is not restricted is established, and then the delay length is found, which is ideal for the model to be executed through Schwarz and Akaike, which are among the information criteria. Afterward, comparisons between the obtained F statistic value and the critical values will be made and it is concluded that there is a relationship between the series and the fact that the statistical value in question is higher than the critical values. In the later stages of the analysis, short-term relationships, autocorrelation, specification, normality, cusum test, and changing variance are examined.

4.1.4. EMPIRICAL ANALYSIS

In order to perform ARDL analysis, the series in the created model should not be second-order stationary. Therefore, before the ARDL analysis, the Phillips-Perron (PP) unit root test, which is one of the unit root tests for the series, was applied. The zero hypothesis of the Phillips-Perron (PP) unit root test for the analyzed series is that the series in question has a unit root, while the other hypothesis is that the series in question do not have a unit root, in other words, they are stationary. Table 1.1 shows the results of the PP unit root test.

Table 1.1. Phillips-Perron Unit Root Test Results

Variables	Model	Test Statistic (P-value)
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Loans	Intercept	-3.586963 (0.0125)
	Trend and Intercept	-3.887397 (0.0258)
	None	-2.817364 (0.0065)
M3-GDP	Intercept	-11.46630 (0.0000)
	Trend and Intercept	-13.52428 (0.0000)
	None	-6.398447 (0.0000)
Deep İndeks	Intercept	-10.65527 (0.0000)
	Trend and Intercept	-10.87243 (0.0000)
	None	-7.495892 (0.0000)

As presented by the PP unit root test results from the fixed, trendy, and non-fixed models in Table 1.1, the Deep Index, M3-GDP, and Credits variables are not stationary at the levels. So they have unit roots at levels. On the other hand, when the Deep Index, M3-GDP, and Credits variables are taken as their first differences, they are stationary in their first difference since they do not have a unit root. The unit root test results reveal that the variables Deep Index, M3-GDP, and Credits are first-order integrated (i.e., I(1)) that conform to the integration level requirement of the ARDL boundary test. Therefore, the ARDL boundary test can be performed to analyze the cointegration relationship between the Deep Index, M3-GDP, and Credits variables.

Table 1.2. below shows the results of the optimum delay selection for the model. ARDL (2, 0, 0) was selected as the optimal model among the twenty models and the analyses will be carried out according to the result of the optimum delay selection.

Table 1.2. Optimal Latency Length Selection for the Model

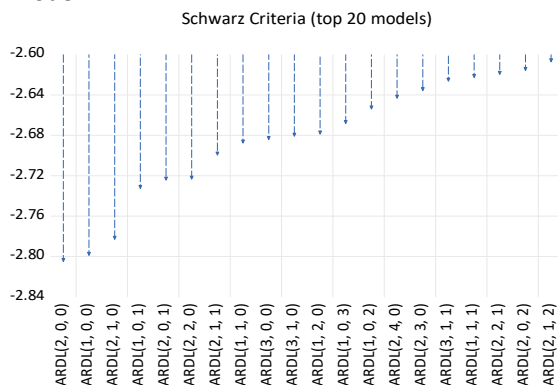


Table 1.3. Presents the ARDL boundary test results for the model given in Equation 1. In Table 5.3, the F-statistical value of 7.782380 exceeds the upper limit critical value at the 10% and 5% significance levels. As can be seen from the explanations, the Deep Index, M3-GDP, and Credits variables are cointegrated.

Table 1.3. ARDL Boundary Test Results

F-Statistic	Critical Values	
	I (0)	I (1)
7.782380		
Significance	Bound	Bound
10%	4.517	5.48
5%	5.457	6.57
1%	7.643	9.063

The long-term coefficient estimation results of the ARDL analysis performed are given in Table 1.4. According to the values in Table 1.4., it is understood that while the relationship between M3-GDP and Deep Index is the same in Turkey, the relationship between Loans and Deep Index is reverse direction. In this case, it can be stated that the increase in the M3-GDP value in Turkey will increase the financial depth index, while the increase in domestic loans given by banks will reduce the financial depth index. This is similar to the cointegration test results in Table 1.4.

Table 1.4. Long-Term ARDL Coefficients (2, 0, 0) Model

Variables	Coefficient	t-statistic	Prob
M3-GDP	0.004488	2.819852	0.0097
Loans	-0.003076	-4.247615	0.0003

Table 1.5. contains both the estimation results of the short-term coefficients and the diagnostic test results. According to the estimation results obtained from Table 1.5, the short-term coefficients of the DEEPİNDEKS variable in the ARDL (2,0,0) model are statistically significant and receive a negative mark. The short-term coefficients of the DEEPİNDEKS variable in the ARDL (2, 0, 0) model at all delays are statistically significant and only take a negative sign at the first delay. The ECM term coefficient is negatively marked as expected and is statistically significant at the 1% significance level. In addition, various diagnostic tests were performed to check for autocorrelation, heteroskedasticity, abnormality, and pattern misidentification. According to the diagnostic test findings, the ARDL

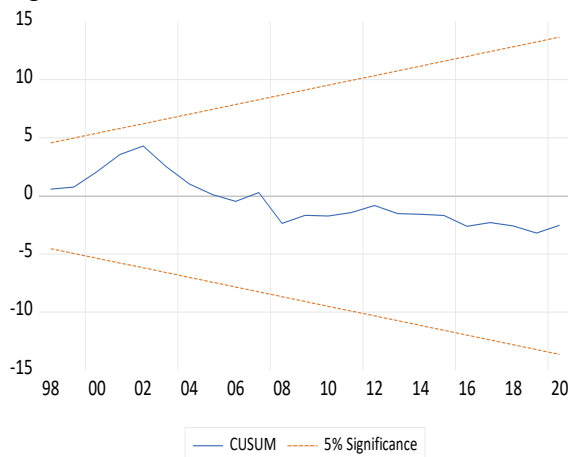
(2,0,0) model does not contain any problems in terms of autocorrelation, varying variance, abnormality, and pattern determination.

Table 1.5. Diagnostic Results of Short-Term & ARDL (2, 0, 0)

Variables	Coefficient	t-Statistic	Prob
C	0.010751	0.607192	0.5497
@TREND	0.015113	4.746527	0.0001
D(DEEPINDEKS(-1))	0.363985	1.827281	0.0807
CointEq(-1)*	-1.467219	-5.037591	0.0000
EC = DEEPINDEKS - (0.0045*M3_GDP -0.0031*LOANS)			
Diagnostic Tests			
Tests	Test Value (Prob.)		
Breusch-Godfrey Serial Correlation LM Test	2.175029 (0.1385)		
Breusch-Pagan Godfrey Heteroskedasticity Test	0.977857 (0.4522)		
Ramsey RESET Test	0.702190 (0.4899)		
Jarque-Bera Test	25.29064 (0.000003)		

The cusum test in Figure 1.1 supports the stability of the ARDL (2 0, 0) model.

Figure 1.1. Cusum Test



CONCLUSION

With the developing technology, a large part of the decision units uses the gadgets of the financial system. The rapid realization of technological developments causes rapid changes in the financial system. These rapid changes provide convenience

such as reducing transaction costs to the economic decision units using the system, but with its complex and diversifying structure, it brings several difficulties by causing erroneous transactions due to incomplete information. It is very important to eliminate the missing information by increasing the level of financial literacy in order to minimize the problems experienced by the decision units in the financial system. With the elimination of this missing information economic actors' recognition of the financial system and increasing their transactions will make great contributions to increasing financial depth.

Financial literacy is a concept that affects the macroeconomic indicators and financial depth of the Turkish economy. Financially literate financial actors contribute to both their financial well-being and the sustainable development and economic growth of countries. It is defined as a combination of financial depth (size and liquidity of markets), access (the ability of economic actors to access financial services), efficiency (the ability of institutions to provide financial services at low cost and with sustainable revenues), and financial services level.

The aim of the study is to use the Phillips-Perron (PP) unit root test, which is one of the unit root tests to understand the stability of the data and the degree to which they are integrated. When the Deep Index, M3-GDP, and Credits variables are taken as their first difference, they are stationary in their first difference because they do not have a unit root. The null hypothesis of the Phillips-Perron (PP) unit root test for the analyzed series is that the series mentioned have a unit root, while the alternative hypothesis is that the series does not have a unit root, in other words, they are stationary. As the PP unit root test results present, the Deep Index, M3-GDP, and Credits variables are not static at the levels. So they have unit roots at levels. On the other hand, when the Deep Index, M3-GDP, and Credits variables are taken as their first differences, they are static in their first difference since they do not have a unit root. This shows that the ARDL boundary test is integrated. Therefore, the ARDL boundary test can be performed to analyze the cointegration relationship between the Deep Index, M3-GDP, and Credits variables. As a result of the f statistical test, the F-statistical value is at the level of 10% and 5% significance and exceeds the upper limit critical value, indicating that the Deep Index, M3-GDP, and Credits variables are cointegrated.

According to the long-term coefficient estimation results of the ARDL analysis, it is understood that the relationship between M3-GDP and Deep Index

in Turkey is in the same direction, while the relationship between Credits and Deep Index is in the opposite direction. In this case, it can be stated that the increase in the M3-GDP value in Turkey will increase the financial depth index, while the increase in domestic loans given by banks will reduce the financial depth index.

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