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-RESEARCH ARTICLE-

THE IMPACT OF FINANCIAL INCLUSION ON ECONOMIC GROWTH: THE CASE OF TURKEY

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Abstract

Facilitating the integration of individuals and enterprises into the financial system, financial inclusion promotes wider engagement in economic processes and contributes to economic development. Over the past few years, Turkey has made significant strides in enhancing financial inclusion, largely attributed to advancements in digital technologies. Nevertheless, the precise role of these improvements in driving economic growth remains a topic of ongoing discussion.

Key indicators such as bank account ownership, the utilization of mobile payment platforms, and access to credit are commonly used to measure financial inclusion. These indicators influence economic growth through both direct and indirect channels. Increased access to financial services enables businesses to obtain funding more effectively and supports individuals in managing their savings. However, limited financial literacy can act as a barrier, reducing the potential positive effects of financial inclusion on economic growth.

An in-depth analysis of Turkey's financial inclusion indicators, utilizing data from the IMF's International Financial Index spanning 2009 to 2022 and assessed through the ARDL methodology, indicates a modest influence of financial inclusion on economic growth. Several challenges, such as inadequate access to financial services for low-income populations and ongoing regional disparities, have limited the capacity of financial inclusion to significantly propel economic advancement.

While Turkey's financial inclusion indicators still fall short of those seen in developed countries, the increasing uptake of digital financial services highlights opportunities for future progress. Evidence from other nations underscores that higher levels of financial inclusion can play a transformative role in fostering economic growth.

The findings suggest that Turkey has yet to realize the full economic benefits of financial inclusion. Future studies should aim to optimize policies targeting financial inclusion and develop approaches to enhance their effectiveness. Key initiatives may include promoting financial literacy, expanding the reach of digital financial platforms, and addressing regional disparities in access to financial services.

Keywords: *Financial Inclusion, Economic Growth, Digital Financial Services, ARDL Model, Regional Inequalities.*

JEL Codes: *C22, E44, G21, O16, R58.*
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FİNANSAL KAPSAYICILIĞIN EKONOMİK BÜYÜME ÜZERİNDEKİ ETKİSİ: TÜRKİYE ÖRNEĞİ [2]

Öz

Bireylerin ve işletmelerin finansal sisteme entegrasyonunu kolaylaştıran finansal kapsayıcılık, ekonomik süreçlere daha geniş bir katılım sağlamakta ve ekonomik kalkınmaya katkıda bulunmaktadır. Son birkaç yılda, Türkiye finansal kapsayıcılığı artırma konusunda, büyük ölçüde dijital teknolojideki gelişmelere atfedilen önemli ilerlemeler kaydetmiştir. Ancak, bu ilerlemenin ekonomik büyümeyi ne ölçüde desteklediği hala tartışılmaktadır.

Finansal kapsayıcılığı ölçmek için genellikle banka hesabı sahipliği, mobil ödeme platformlarının kullanımı ve krediye erişim gibi göstergeler kullanılmaktadır. Bu göstergeler, ekonomik büyümeyi hem doğrudan hem de dolaylı yollarla etkiler. Finansal hizmetlere artan erişim, işletmelerin finansmana daha kolay ulaşmasını sağlarken, bireylerin tasarruflarını daha etkili bir şekilde yönetmelerine yardımcı olur. Bununla birlikte, yetersiz finansal okuryazarlık, finansal kapsayıcılığın ekonomik büyümeyi teşvik etme potansiyelini azaltabilir.

IMF'nin Uluslararası Finansal Endeksi'nden 2009-2022 dönemini kapsayan veriler kullanılarak ve ARDL modeliyle yapılan Türkiye'nin finansal kapsayıcılık göstergelerinin ayrıntılı bir değerlendirmesi, finansal kapsayıcılığın ekonomik büyüme üzerindeki etkisinin görece sınırlı olduğunu ortaya koymaktadır. Düşük gelirli grupların finansal hizmetlere sınırlı erişimi ve bölgesel eşitsizliklerin devam etmesi gibi çeşitli zorluklar, finansal kapsayıcılığın ekonomik kalkınmayı etkili bir şekilde yönlendirme potansiyelini kısıtlamaktadır.

Türkiye'nin finansal kapsayıcılık göstergeleri, gelişmiş ülkelerinkinin hala gerisinde kalsa da, dijital finansal hizmetlerin artan kullanım oranı, gelecekteki ilerleme için fırsatlar sunmaktadır. Diğer ülkelerden elde edilen kanıtlar, daha yüksek finansal kapsayıcılık seviyelerinin ekonomik büyümeyi dönüştürücü bir şekilde destekleyebileceğini vurgulamaktadır.

Bulgular, Türkiye'nin finansal kapsayıcılığın ekonomik büyüme üzerindeki tam faydalarını henüz gerçekleştiremediğini göstermektedir. Gelecek araştırmalar, finansal kapsayıcılığa yönelik politikaları optimize etmeyi ve bunların etkisini artıracak yaklaşımlar geliştirmeyi hedeflemelidir. Önemli girişimler arasında finansal okuryazarlığın artırılması, dijital finansal platformların erişiminin genişletilmesi ve finansal hizmetlere erişimdeki bölgesel eşitsizliklerin ele alınması yer alabilir.

Anahtar Kelimeler: *Finansal Kapsayıcılık, Ekonomik Büyüme, Dijital Finansal Hizmetler, ARDL Modeli, Bölgelerarası Eşitsizlikler.*

JEL Kodları: *C22, E44, G21, O16, R58.*

"Bu çalışma Araştırma ve Yayın Etiğine uygun olarak hazırlanmıştır."

[2] Genişletilmiş Türkçe Özet, makalenin sonunda yer almaktadır.

1. INTRODUCTION

Enhancing access to advanced financial services is critically important for promoting economic progress and supporting societal development. Particularly in developing countries, broader access to financial services significantly fosters economic growth while contributing to the improvement of social welfare (Demirgüç-Kunt et al., 2018). The growing prevalence of digital financial technologies accelerates this transformation by offering new methods to integrate individuals and businesses into financial systems (Gomber et al., 2017). Innovations such as digital wallets, blockchain technology and mobile banking expand financial inclusion by reducing transaction costs and increasing service accessibility (Allen et al., 2016).

Financial inclusion emerges as a critical factor supporting economic growth. This concept promotes the integration of individuals and businesses into the financial system, enabling broader economic participation. Advancements in technological innovations have the potential to make this integration more effective and inclusive. Innovations such as mobile payment systems, blockchain reduce the costs of financial services, digital banking, and enhance accessibility. However, the widespread adoption of financial services is proximately linked not only to the development of technical infrastructure but also to addressing regional disparities and improving financial literacy levels. Therefore, reforms in financial inclusion should aim to foster not only social development but also economic growth.

In Turkey, the relationship between economic growth and financial inclusion has become a focal point of research, especially within the context of digitalization and policy reforms. The country has achieved notable advancements in this area, particularly through the widespread adoption of digital banking and mobile payment services. However, while the use of digital financial services is increasing, regional disparities and a lack of financial literacy remain key obstacles to achieving inclusive economic growth (Chibba, 2009). Although numerous studies emphasize the positive effects of digital financial services on economic growth, debates persist regarding the sustainability and extent of these benefits (Park & Mercado, 2018).

This research offers an in-depth examination of how financial inclusion influences economic development within the framework of Turkey. It employs the ARDL model to examine both the short- and long-term effects of financial inclusion on economic development. Covering the 2000-2022 period, this study evaluates Turkey's achievements in financial inclusion within the framework of digitalization and compares them with findings from international research.

Current research consistently emphasizes the critical importance of digital financial services in enhancing financial inclusion and fostering economic growth. Mas and Radcliffe (2010) demonstrated that Kenya’s M-PESA mobile payment system significantly improved financial access in rural areas, thereby encouraging economic activities. Similarly, Ahamed and Mallick (2019) found that the expansion of fintech services in India has substantially boosted financial inclusion and positively impacted

economic growth. These examples underline the importance of prioritizing digitalization in Turkey to enhance the efficiency and impact of its financial inclusion efforts.

Studies indicate that enhancing financial inclusion necessitates not only broadening access to financial services but also tackling the fundamental factors that contribute to economic growth. Issues such as financial literacy and regional inequalities must be resolved as part of this effort. Within this framework, the present study provides crucial insights into how Turkey can optimize its financial inclusion strategies to maximize their economic benefits.

In the subsequent sections of this study, the findings of previous research on the relationship between financial inclusion and economic growth are examined through a literature review. Then, the financial inclusion indicators in the context of Turkey and their effects on economic growth are detailed, with the dataset and analysis methods explained. In the methodology section, the short- and long-term relationships are analyzed using the ARDL model, and the findings are discussed. In the results section, the limited impact of financial inclusion on economic growth is evaluated, and the role of digitalization and policy reforms in shaping this relationship in Turkey is analyzed. Finally, the overall conclusions of the study are discussed, and recommendations for improving Turkey's financial inclusion policies are presented.

1.1. Literature Review

Providing cost-effective, inclusive, and long-lasting financial services to both individuals and enterprises, financial inclusion emerges as a key driver of economic progress and poverty alleviation. Advances in digital finance are pivotal in realizing this objective by offering frameworks to evaluate financial inclusion and examine the impact of the fintech transformation on economic accessibility. A wide range of research in this domain has consistently demonstrated a robust link between financial inclusion and economic growth.

Peng-Lee and Ismail (2023) employed the ARDL approach to investigate the link between public debt and economic growth across 25 European Union countries from 1996 to 2017. Their findings demonstrated a beneficial effect of public debt on economic growth. Furthermore, they analyzed the interplay between economic growth, environmental challenges, and public debt in ASEAN-5 nations using a panel ARDL framework, highlighting the critical importance of aligning economic progress with environmental sustainability.

Findings from the Toronto Center (2022) and the FinEquity Knowledge Guide (2021) highlight the transformative impact of digital financial services in promoting financial inclusion and stimulating economic growth. People with substantial digital finance expertise are more likely to embrace contemporary technologies like mobile payment systems and digital wallets, enhancing both the utilization and effectiveness of these tools.

Gries and Redlin (2020) examined how trade openness influences economic growth across eight Mediterranean countries between 1975 and 2016. Their analysis, employing panel ARDL methods, demonstrates a favorable connection between trade openness and economic growth.

Kousar et al. (2020) examined the linkages between remittances, education spending, and economic growth using the ARDL approach. Their findings highlight that both remittance inflows and investments in education play a crucial role in fostering economic growth.

Lacheheb and Ismail (2020) examined how remittances and the development of the financial sector influence economic growth using panel data analysis combined with the GMM approach. Their study concluded that these factors contribute positively to economic growth over both the long and short term.

Lawanson and Umar (2020) investigated the effect of education spending on Nigeria's economic growth through the application of the ARDL methodology. Their study found that increased investment in education significantly supports economic advancement.

Pazarbaşıoğlu et al. (2020) explored how digital financial services contribute to economic growth and financial inclusion. Through the application of panel data analysis and the GMM technique, their study revealed that digital financial services expand connectivity to financial systems, facilitating greater financial inclusion and supporting economic growth.

Ahamed and Mallick (2019) studied the global relationship between financial inclusion and banking stability using fixed-effects models and the GMM method. They concluded that the adoption of digital financial services in India has significantly enhanced financial inclusion and driven economic growth.

Cabeza-García et al. (2019) emphasized that integrating women into financial systems drives economic growth and lessens income inequality. Their study, utilizing SEM, demonstrates that digital financial services facilitate women's inclusion in the financial sector, advancing development and reducing disparities.

Aluko and Ajayi (2018) analyzed the connection between economic growth and financial inclusion in developing nations by employing panel ARDL techniques. Their findings indicated that financial inclusion positively influences economic growth over both short-term and long-term horizons.

Demirgüç-Kunt et al. (2018) applied logistic regression and panel data techniques to explore financial inclusion. Their study concludes that digital financial services improve connectivity to financial systems for low-income groups, thereby stimulating economic activities.

Ozili (2018) analyzed the link between digital financial services and financial stability using panel data and fixed-effects models. The study demonstrates that these services improve financial stability by expanding access to financial systems.

Park and Mercado (2018) investigated how the expansion of digital financial services impacts economic inclusion and growth in developing economies. Utilizing panel data and fixed-effects models, they found that these services help reduce income inequality by increasing access to financial systems.

Gomber et al. (2017) highlighted the advantages of digital technologies, including mobile banking, digital wallets, and blockchain, in reducing costs and improving accessibility. Employing factor analysis and SEM, their study examined prevailing trends and proposed future research avenues, highlighting the essential role of digital finance in promoting financial inclusion.

Keho (2017) explored the relationship between trade openness and economic growth using the ARDL methodology. The study revealed that increased trade openness significantly enhances economic development.
Mialou et al. (2017) developed a composite index to evaluate financial inclusion across various countries. Through factor analysis and time-series methods, they concluded that digital financial services effectively enhance financial inclusion.

Allen et al. (2016) employed SEM and logistic regression to examine the effect of digital financial knowledge on the adoption of technologies like digital wallets and mobile payment platforms, concluding that greater digital literacy substantially boosts the utilization of financial tools and entry to formal financial systems.

Evans and Adeoye (2016) investigated the factors influencing financial inclusion in African countries using a dynamic panel data approach. Their research concludes that digital financial services play a pivotal role in improving financial inclusion, thereby supporting economic activities throughout the region.

Suri and Jack (2016) explored the long-term impact of mobile money systems on reducing poverty in Kenya using panel data combined with a difference-in-difference approach. Their research highlighted that mobile money systems substantially contribute to alleviating alleviating poverty and advancing gender equality by increasing women's access to economic opportunities.

Anzoategui et al. (2015) examined the contribution of digital financial services to improving financial inclusion by fostering greater competition within the banking industry, with a specific focus on Mexico. Using panel data and a fixed-effects model, they concluded that these services improve financial accessibility by fostering competition within the financial industry.

Beck and Brown (2015) investigated how digital financial services contribute to improving access to financial systems, highlighting their transformative impact.

Employing factor analysis and structural equation modeling (SEM), their research demonstrates that digital tools improve accessibility for individuals and businesses, strengthening financial inclusion and serving as a vital measure of its success.

Klapper and Singer (2015) studied the role of informal financial services in increasing accessibility while also evaluating how digital financial services support formal financial systems. Using panel data and SEM, they analyzed the interaction between informal and digital services, concluding that digital financial services expand access to formal systems, reduce reliance on informal alternatives, and improve overall financial inclusion.

Kumar and Stauvermann (2014) analyzed the influence of human capital on economic growth in East Asian nations through the application of the panel ARDL method. Their findings identified human capital as a crucial factor driving economic growth.

Pradhan et al. (2014) investigated the role of information and communication technologies (ICT) in fostering economic growth within OECD nations, employing the panel ARDL technique. Their research identified a favorable correlation between economic growth and ICT.

Rojas-Suarez and Amado (2014) evaluated the gap in financial inclusion across Latin America by applying fixed-effects models and panel data analysis. Their research highlighted the crucial role of digital financial services in enhancing financial inclusion and driving economic activity.

Samargandi et al. (2014) investigated the link between financial development and economic growth in Egypt through the ARDL bounds testing approach. Their findings showed that financial development has a positive impact on economic growth.

Shahbaz et al. (2013) examined the relationship between economic growth and financial development in South Asia using a panel ARDL framework. Their results underscored that financial development serves as a key catalyst for economic growth in the region.

Sarma and Pais (2011) created a composite index and used panel data analysis to examine how financial inclusion impacts development. Their research concludes that digital financial services improve financial inclusion, foster economic growth, and help narrow income inequalities.

Mas and Radcliffe (2010) examined how digital financial services influence financial inclusion via mobile payment systems, using time series analysis and a fixed-effects model to study the growth of M-PESA in Kenya. Their findings indicate that M-PESA significantly improved availability of financial services, especially in rural regions, while also promoting economic activity.

Chibba (2009) highlighted the vital importance of digital finance in incorporating low-income individuals and small businesses into the formal financial system. These services enhance financial stability and resilience. Using panel data analysis and logistic regression, the study concludes that digital financial services broaden access for low-income individuals and positively impact economic activities.

Fedderke et al. (2006) analyzed the connection between economic growth and infrastructure development in South Africa using the ARDL approach. Their research showed that improvements in infrastructure significantly enhance economic growth.

Musila and Belassi (2004) explored the relationship between economic growth and financial development in Uganda using the ARDL methodology. Their results showed that financial development positively impacts economic growth.

The transition to digital financial services has facilitated broader access to formal financial systems and enhanced financial stability in many countries. Kenya's M-PESA example demonstrates how mobile payment platforms increase financial inclusion and economic activities, with econometric analyses affirming the critical role of digital finance in promoting growth and inclusion.

Some studies suggest that financial inclusion, digital finance, and financial literacy do not always have positive effects on economic growth. These factors can occasionally lead to unexpected adverse outcomes, emphasizing the need for careful evaluation of policies aimed at expanding financial services.

Peng-Lee and Ismail (2023) analyzed the impact of public debt on economic growth in Turkey through the ARDL approach. Their study revealed that public debt has a detrimental effect on economic growth in the short term, while its influence in the long term is insignificant.

Demirgüç-Kunt, Klapper, and Singer (2018) explored the global implications of the role of financial inclusion in fostering economic growth using SEM and panel data techniques. Their findings emphasized that while financial inclusion promotes growth, excessive levels can disrupt economic stability and impede progress.

Feng et al. (2017) examined the interplay between interest rates, exchange rates, and stock market performance in India using the ARDL framework. Their research demonstrated that both interest rates and exchange rates negatively affect stock market indices.

Giri and Sehrawat (2017) analyzed the relationships among financial development, economic growth, and income inequality through the ARDL bounds testing method. Their findings suggest that, in low-income countries, financial inclusion and digital finance may occasionally intensify income inequality and hinder economic efficiency.

Sarma (2010) evaluated the effect of financial inclusion on economic growth using composite index construction and factor analysis. The study concluded that while financial inclusion can enhance economic outcomes, excessive access to financial services may reduce economic efficiency, and broader access does not always yield positive results.

Honohan (2008) noted that the expansion of financial inclusion does not always provide the anticipated economic benefits. Through panel data and fixed-effects analysis, the study highlighted that an overextension of financial services may result in economic imbalances and impede growth.

Beck, Demirgüç-Kunt, and Levine (2007) explored the relationship among financial inclusion, financial development, and income inequality using panel data analysis with the GMM method. Their findings indicated that while financial inclusion can enhance economic growth, excessive access to financial services may destabilize economies and have adverse effects on growth.

Research in this field presents varied outcomes across different periods. Some studies highlight the detrimental effects of imports on economic growth, whereas others emphasize the positive contributions of exports and trade openness.

Bulut and Çizmeci Akyüz (2020) explored how digital banking influences Turkey's economic growth by analyzing quarterly data spanning 2011 to 2019. Using the ARDL cointegration technique, they uncovered a strong positive correlation between digital banking and long-term economic growth, while short-term effects were minimal. Their research highlighted that digital banking enhances financial inclusion and supports sustained economic development.

Mamun et al. (2015) evaluated the role of remittances in supporting economic growth in African nations through the ARDL framework. Their results indicated that remittances boost economic growth in the short term, but their impact becomes negligible over the long term.

Tafa (2015) analyzed the roles of exports, imports, and trade liberalization in driving Namibia’s economic growth through the ARDL cointegration methodology. The findings showed that while imports exert a detrimental impact on growth, both exports and trade openness contribute positively to economic development.
Idun and Aboagye (2014) investigated the relationship between economic growth and financial innovation in Ghana, utilizing both linear and nonlinear ARDL models. Their study concluded that financial innovation negatively affects growth in the short term but yields beneficial effects in the long term.
Fayissa and Nsiah (2008) assessed how remittances impact economic growth in MENA countries using the ARDL approach. The study revealed that remittances significantly promote short-term economic growth, though their long-term effect lacks statistical importance.

Soytas and Sari (2003) investigated the relationship between energy use and economic growth in Turkey using the ARDL framework. Their research demonstrated that energy consumption positively impacts growth in the short run but has no notable long-term influence.

2. METHODOLOGY

The ARDL (Autoregressive Distributed Lag) model is a versatile econometric technique frequently utilized in time-series analysis. The flexibility of this approach enables its application regardless of the stationarity properties of the variables. It is particularly valued for its ability to examine short-term dynamics alongside long-term equilibrium relationships (Pesaran, Shin & Smith, 2001).

1. Handling Stationarity: The ARDL model can incorporate variables with varying stationarity levels, including those that are stationary at level (I(0)) or integrated at first order (I(1)), within the same analytical framework.
2. Analyzing Temporal Relationships: By employing the Error Correction Model (ECM), the ARDL method effectively explores short-term variations alongside long-term relationships.
3. Lag Optimization: The model's structure includes an automatic selection mechanism for lag lengths, enhancing its reliability and precision.

Essentially, the ARDL model formulates a regression equation that connects a dependent variable (y) to an independent variable (x) using both present and lagged data points. This capability allows for the simultaneous examination of immediate and delayed interactions between variables, offering a detailed perspective on their interconnected dynamics. Furthermore, the ARDL framework offers valuable insights into the influence of both past and current values of the independent variable on the dependent variable, providing a comprehensive perspective on their interconnections.

2.1. Mathematical Formulation of the ARDL Model

The general form of an ARDL (p, q) model is as follows:

$$y_t = \alpha_0 + \Sigma\beta_i \, . \, y_{t-i} + \Sigma\gamma_j \, . \, x_{t-j} + \epsilon_t \qquad (1)$$

Here :
y_t : The present value of the dependent variable
α_0 : Constant term
β_i : The coefficients linked to the lagged values of the dependent variable
γ_j : The coefficients corresponding to the lagged values of the independent variable
ϵ_t : Error term
represents.

2.2. Error Correction Model (ECM)

The ARDL model's error correction representation allows for the distinct examination of short-term variations and long-term equilibrium connections. The equation for the error correction model is expressed as follows:

$$\Delta y_t = \alpha_0 + \Sigma \beta_i \Delta y_{t-i} + \Sigma \gamma_j \Delta x_{t-j} + \lambda (y_{t-1} - \theta_0 - \theta 1 \, . \, x_{t-1}) + \varepsilon_t \quad (2)$$

Here :
Δy_t : The change in the dependent variable
λ : Error correction coefficient (represents the rate at which adjustments occur toward long-term equilibrium)
θ_0 , θ_1 : Long-term coefficients
represents.

2.3. Steps of ARDL Model Application

1. Lag Length Selection**:** Choosing suitable lag lengths is crucial for improving the model's efficiency and predictive accuracy. This step relies on criteria such as the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC).
2. Bound Testing**:** The existence of a long-term relationship, or cointegration, is assessed using the bound test. This method involves evaluating the F-statistic against specific critical values, which vary depending on the data and model characteristics.
3. Model Estimation: The ARDL model is estimated after determining the lag lengths and completing the bound test. This step entails estimating the parameters for short-term and long-term relationships simultaneously.
4. Error Correction Analysis: When the bound test confirms a long-term relationship, the Error Correction Model (ECM) is applied. This model evaluates the adjustments of short-term disequilibria towards the long-term equilibrium state.
5. Model Diagnostics: A range of diagnostic evaluations ensures the statistical robustness and reliability of the model. These include tests for autocorrelation to detect autoregressive errors, heteroscedasticity tests for assessing variance stability, and normality tests for residuals. These diagnostic outcomes are essential for confirming the model's credibility and consistency.

2.4. Data

The data utilized in this study, including Real GDP growth (Annual percent change) and the Financial Institutions Access Index, were sourced from the International Monetary Fund (IMF) database (https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b&sid=139003034154). In the model, the Financial Institutions Access Index represents the independent variable (x), while Real GDP growth serves as the dependent variable (y). The study covers a 15-year period from 2009 to 2024, using annual data for both variables.

3. FINDINGS

The variables used in this study to analyze the relationship between financial inclusion and economic growth in Turkey are as follows:

FIATR (Independent Variable) : Turkey's Financial Inclusion Index
GDPTR (Dependent Variable) : Turkey's Real Economic Growth Rate
d(FIATR) : The first difference of the independent variable
d(GDPTR) : The first difference of the dependent variable

The Augmented Dickey-Fuller (ADF) test was utilized to determine the stationarity properties of the data. Stationarity is a critical requirement for time series modeling, and the test outcomes were assessed under three scenarios: with a constant, with both constant and trend, and without either constant or trend. The findings of the ADF test are summarized in Table 1.

Table 1: Unit Root Test Results

Variable	Test	t-Statistic	Prob.
FIATR	With Constant	-5,0754	0.0003
	With Constant & Trend	-4,9879	0.0019
	Without Constant & Trend	-4,7699	0.0000
d(FIATR)	With Constant	-6,4579	0.0000
	With Constant & Trend	-6,3346	0.0001
	Without Constant & Trend	-6,5811	0.0000
GDPTR	With Constant	-5,5342	0.0001
	With Constant & Trend	-4,2316	0.0136
	Without Constant & Trend	-1,7526	0.0757
d(GDPTR)	With Constant	-3,6852	0.0116
	With Constant & Trend	-8,4392	0.0000
	Without Constant & Trend	-4,3992	0.0001

As shown in Table 1, the variables FIATR and GDPTR are stationary at the level (%1 significance level). In other cases, stationarity is achieved when the first difference is taken. These results indicate that the dataset is suitable for constructing an ARDL model. However, further analysis is required to confirm the long-term relationship.

The ARDL model results for the dependent variable (GDPTR) and the independent variable (FIATR) are presented in Table 2**.**

Table 2: ARDL Model Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPTR(-1)	-0.146358	0.197376	-0.741520	0.4650
FIATR	0.054995	0.037092	1.482.661	0.1502
C	3.920.461	1.907.702	2.055.070	0.0500
@TREND	0.068121	0.099178	0.686861	0.4983

R-squared : 0.0943
Adjusted R-squared :-0.0102
F-statistic : 0.9024 (p = 0.4533)

As seen in Table 2, the explanatory power of the model is low ($R^2 = 0.0943$), and the impact of FIATR on GDPTR is not statistically significant ($p > 0.05$). This result indicates that the effect of financial inclusion on economic growth in Turkey is weak. The scope of the financial inclusion index and the specific characteristics of Turkey's economic structure may explain this insufficiency. To improve the model's performance, additional variables may need to be included.

The Error Correction Model (ECM) was employed to examine the short-term dynamics and long-term equilibrium relationship. The variables used in the ECM are as follows:

CointEq(-1) : Long-term equilibrium relationship
C ve @TREND : Constant and trend effects
represents.

The results obtained from the Error Correction Model are summarized in Table 3:

Table 3: Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3,9205	1,8428	2,1275	0,0430
@TREND	0,0681	0,0973	0,7004	0,4899
CointEq(-1)	-1,1464	0,1936	-5,9214	0,0000

R-squared : 0,5653
Adjusted R-squared : 0,5331
F-statistic :17,5557 (p < 0.0001)

When the results of the ARDL model are evaluated, it is observed that the coefficient of the constant term (C) is 3.9205 and statistically significant at the 5% level (p = 0.0430). The coefficient of the variable representing the time trend (@TREND) is calculated as 0.0681; however, this coefficient is not statistically significant (p =

0.4899). The coefficient of CointEq (-1), which represents the speed of adjustment to the long-term equilibrium, is found to be negative and significant (-1.146, $p < 0.01$). This indicates a rapid return to equilibrium in the long term. However, no significant relationship is found in the short term. This result suggests that the impact of financial inclusion on short-term economic growth in Turkey is limited. It also demonstrates that the model effectively corrects short-term disequilibria.

In evaluating the model's performance metrics, the R-squared value is determined to be 0.5653, showing that approximately 56.53% of the variance in the dependent variable is accounted for by the independent variables. The adjusted R-squared value, calculated as 0.53, reflects the model's robust explanatory power while accounting for the number of predictors included. Additionally, the F-statistic, which assesses the overall validity of the model, is computed as 17.56, with a p-value below 0.0001, confirming the statistical significance of the model.

The F-Bounds test is employed to investigate the existence of a long-term relationship between FIATR and GDPTR, with the results summarized in Table 4:

Table 4: F-Bounds Test Results

Test Statistic	Value	Significance Level	I(0)	I(1)
F-statistic	16,8821	1%	8,74	9,63
t-statistic	-5,9214	1%	-3,96	-4.26

The F-Bounds test results in the table reveal that the F-statistic value (16.8821) surpasses the I(1) upper bound critical value (9.63), indicating the existence of a long-term cointegration relationship between the dependent variable (GDPTR) and the independent variable (FIATR). This finding underscores a significant long-term association between economic growth (GDPTR) and the financial inclusion index (FIATR). Moreover, the t-statistic value (-5.9214) shown in the table is lower than the I(1) upper critical value (-4.26), providing additional evidence of a long-term relationship. The significance of the t-statistic further validates the presence of long-term equilibrium in the error correction model. A negative and statistically significant t-statistic implies a rapid adjustment back to equilibrium in the long term, confirming the proper functioning of the error correction mechanism. These results strongly support a meaningful and robust long-term link between financial inclusion and economic growth, while the short-term dynamics merit further detailed investigation.

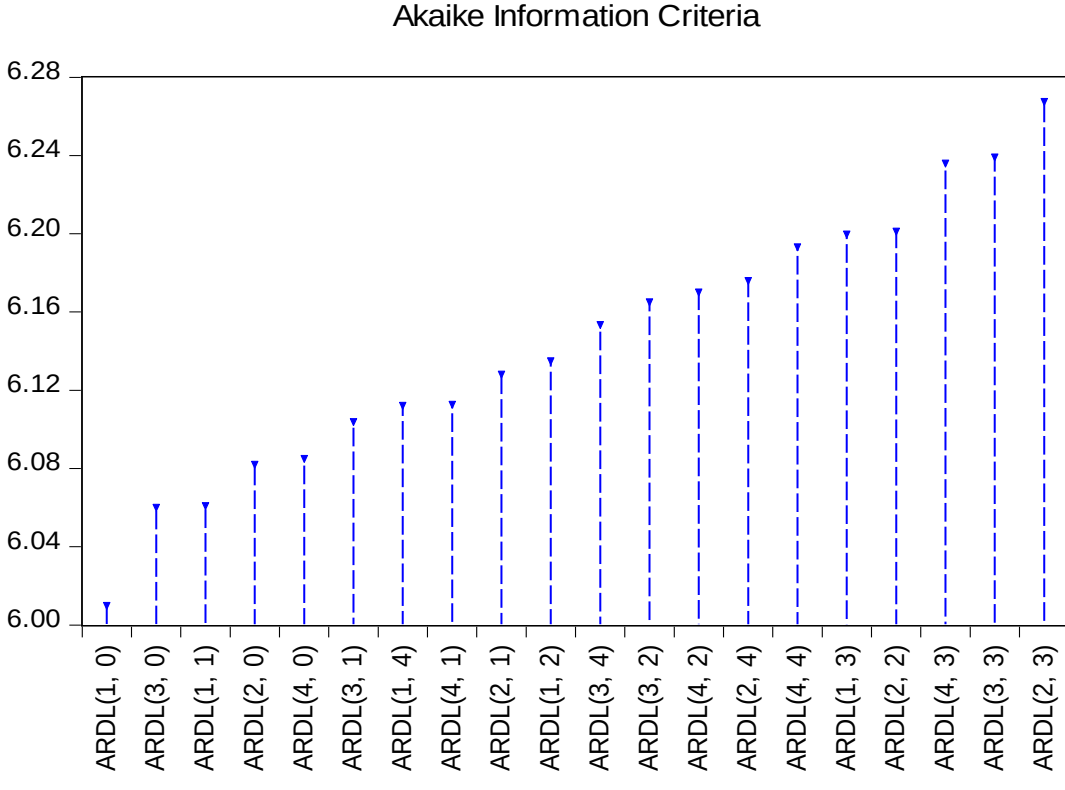
Akaike Information Criterion (AIC)

AIC plays a crucial role in determining the optimal lag lengths of the ARDL model. It selects the model that provides the best balance among models estimated with different lag lengths. AIC aims to strike a balance between model complexity (number of independent variables) and explanatory power (maximum likelihood).

$$AIC = 2k - 2\ln(L) \quad (3)$$

Here:
k : The total number of parameters included in the model,
L : the maximum likelihood value of the model.
represents.
A lower AIC value indicates a better balance achieved by the model. Consequently, in the ARDL framework, various lag lengths are tested, and the model with the smallest AIC value is chosen as the optimal one.

Figure 1: Lag Length Selection (ARDL)



According to the Akaike Information Criterion (AIC), an output generated by the ARDL model, the ARDL(1,0) specification yields the lowest AIC value. This suggests that the optimal model for analyzing the relationship between financial inclusion and economic growth in Turkey incorporates a one-year lag.

CUSUM and CUSUMQ Tests

The CUSUM (Cumulative Sum) and CUSUMQ (Cumulative Sum of Squares) tests are stability tests used to check whether the estimated coefficients and the overall structure of a model remain stable over time. These tests are critically important for the ARDL model, as they indicate whether the estimated model has undergone structural changes.

The **CUSUM Test** evaluates whether the estimated regression coefficients remain stable over time. In time series data, the model is expected to have a stable structure. If the CUSUM graph remains within the critical boundaries, the model is considered stable. However, if it crosses the critical boundaries, it indicates a structural break or change in the model.

The **CUSUMQ Test** examines whether the variances remain constant over time. This test is particularly useful for detecting issues of heteroscedasticity (variance instability). If the CUSUMQ graph remains within the critical boundaries, it suggests that the variance is stable and the model is reliable. Conversely, if the graph crosses the critical boundaries, it indicates that variance changes over time, and the model's stability is compromised. The critical boundaries for the CUSUM and CUSUMQ tests are typically drawn at a 5% significance level. Any values outside these boundaries signal instability or structural breaks in the model.

The model's stability was assessed through the CUSUM and CUSUMQ tests. The results indicate that the model has a stable structure, with no deviations at the 5% significance level. The corresponding graphs are presented below:

Figure 2: Stability Test (CUSUM)

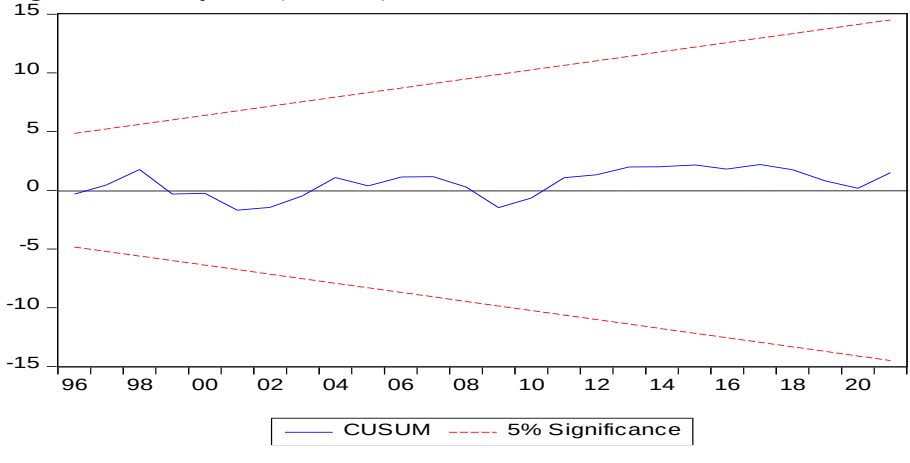
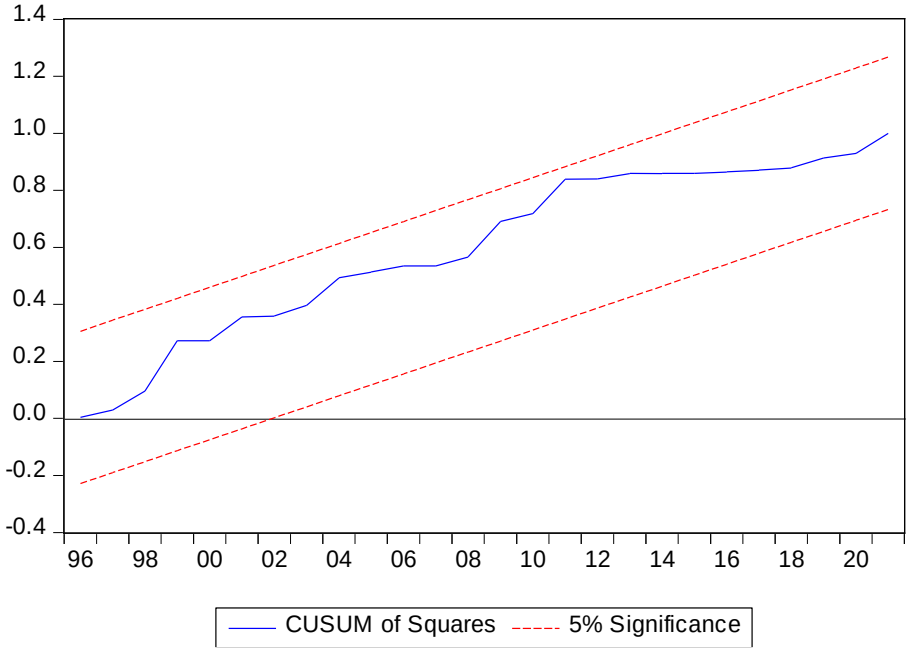


Figure 3: Stability Test (CUSUMQ)



4. DISCUSSION

The findings of this research reveal that financial inclusion in Turkey has a limited direct influence on economic growth. This outcome is consistent with earlier studies in comparable emerging markets, underscoring the intricate nature of the connection between financial access and broader economic performance. The restricted impact observed may stem from structural issues such as insufficient financial literacy, regional disparities, and limited availability of financial services in rural areas. Furthermore, the digital divide continues to pose a significant barrier to equitable access to financial services, impeding the full potential of financial inclusion to drive economic development.

4.1. Financial Literacy and Behavioral Factors

One of the critical barriers identified in the findings is the limited financial literacy among segments of the population. Financial literacy enables individuals to make informed decisions about savings, investments, and credit, all of which contribute to economic dynamism. However, the lack of adequate education and awareness limits the ability of individuals to leverage financial services effectively. Programs aimed at improving financial literacy should be a cornerstone of policies designed to enhance the effectiveness of financial inclusion.

4.2. Regional Disparities

The stark differences in financial access between urban and rural regions further exacerbate the issue. While urban centers benefit from a dense network of financial institutions and digital services, rural areas often lack even basic infrastructure. The concentration of financial resources in urban areas creates an uneven playing field, limiting the overall impact of financial inclusion on national economic growth. Addressing these regional disparities through targeted policies and investments in financial infrastructure can significantly enhance the inclusiveness of economic growth.

4.3. The Role of Digital Financial Services

The findings further underscore the crucial role of digital financial services in narrowing the financial access gap. The swift adoption of mobile banking, digital wallets, and fintech solutions demonstrates significant potential in advancing financial inclusion. However, the study's results indicate that these services have not yet reached their full potential in Turkey. Expanding the reach of digital services and ensuring their accessibility across all income groups and regions is essential for maximizing their impact on economic growth.

4.4. Comparative Analysis

A comparative analysis with other emerging markets, such as Kenya and India, provides valuable insights. In Kenya, mobile payment systems like M-PESA have significantly boosted financial inclusion, particularly in rural areas, leading to measurable improvements in economic activity. Similarly, India's focus on fintech and digital payment systems has demonstrated the potential of technology-driven financial inclusion to foster sustainable economic growth. These examples suggest that Turkey could benefit from adopting similar models while tailoring them to its unique socio-economic context.

4.5. Policy Implications

The results call for a comprehensive policy framework that addresses the multi-faceted challenges identified. Key policy recommendations include:

1. Financial Literacy Programs: Introducing nationwide campaigns and integrating financial education into school curricula.
2. Targeted Rural Investments: Allocating resources to build financial infrastructure in underserved regions.
3. Promoting Digital Innovation: Encouraging public-private partnerships to expand the reach and usability of digital financial services.

Monitoring and Evaluation: Developing robust mechanisms to assess the effectiveness of financial inclusion initiatives and refine strategies as needed.

4.6. Limitations and Future Research

Although the study offers valuable insights, it is not devoid of limitations. The reliance on aggregate data may obscure micro-level dynamics, and the use of ARDL modeling, while robust, may not fully capture the non-linear relationships between variables. Future studies could adopt alternative methodologies and integrate micro-level data to yield a more detailed understanding of the relationship between financial inclusion and economic growth.
In conclusion, while financial inclusion in Turkey shows promise, its impact on economic growth is contingent on addressing underlying structural issues and leveraging the potential of digital innovations. With targeted interventions and sustained efforts, financial inclusion can evolve into a more potent driver of economic progress.

CONCLUSION

Although the model demonstrates stability and provides a dependable framework, its limited explanatory capacity and significance indicate the necessity of incorporating additional variables. The current influence of financial inclusion in Turkey appears to be minimal, emphasizing the need for more extensive and well-structured reforms. These results reveal both similarities and differences when compared to prior studies examining the impact of digital finance and financial inclusion on economic growth. The minimal short-term effects observed align with findings from many studies, but they differ from research predicting more pronounced long-term benefits. This highlights the necessity for additional investigation into the link between financial inclusion and economic growth, incorporating a broader set of variables and considering specific factors like financial literacy in developing countries such as Turkey.

The results of this study, which underscore the limited influence of financial inclusion on economic growth, are consistent with research conducted in low-income countries. For instance, Demirgüç-Kunt et al. (2018) argued that an excessive expansion of financial services does not always lead to anticipated economic benefits and may, in some cases, jeopardize economic stability. The observation of limited short-term impacts in this study aligns with their conclusions. In a similar vein, Bulut and Çizmeci Akyüz (2020), through their examination of digital banking and economic growth in Turkey, identified modest effects in the short term, aligning with the long-term cointegration findings of this study using the ARDL model. Additionally, the strong long-term association between financial inclusion and economic growth observed here parallels the findings of Mas and Radcliffe (2010), who analyzed the M-PESA system in Kenya. Their research emphasized the significant long-term advantages of digital financial services, while acknowledging short-term constraints. Likewise, Pazarbaşıoğlu et al. (2020) emphasized the pivotal role of digital financial services in enhancing access to financial systems and fostering economic growth, echoing the positive long-term impacts of digitalization highlighted in this study. Finally, Suri and Jack (2016) documented the beneficial long-term effects of mobile

money systems in rural Kenya, further supporting the long-term advantages of digital finance observed in this research.

Conversely, this study's findings, which emphasize the limited contribution of financial inclusion to Turkey's economic growth, contrast with results from high-income nations. For instance, Allen et al. (2016) reported that the extensive use of digital financial services among wealthier populations significantly boosts economic growth, a sharp difference from the limited impact identified in this research. Similarly, Cabeza-García et al. (2019) found a strong positive link between women's engagement in financial systems and economic growth, contrasting with Turkey's ongoing inequalities in access to financial services. Limited financial service availability in rural Turkey further explains the divergence from regions like Asia, where studies by Park and Mercado (2018) highlight the role of digital financial services in reducing poverty and fostering economic development. Lastly, Aluko and Ajayi (2018) concluded that financial inclusion positively impacts economic growth in both the short and long run, differing from this study's observation of modest short-term effects within the Turkish context.

The findings of this study are highly valuable for understanding the impact of financial inclusion on economic growth. The analysis based on the case of Turkey reveals that the effects of financial inclusion on economic growth are limited in the short term but become more pronounced in the long term. The increasing use of digital financial services presents a significant opportunity to support financial inclusion. However, structural issues such as insufficient financial literacy and regional disparities hinder the full realization of this impact. The study emphasizes the importance of not only increasing financial access but also ensuring that individuals can effectively utilize these services in an informed manner. Addressing the lack of financial infrastructure in rural areas and improving the level of financial literacy should be prioritized in policy development. Furthermore, experiences from other developing countries support Turkey's potential to make digital financial services more inclusive. In this context, accelerating the digitization processes and making them accessible to a broader segment of society are of great importance. The analysis provided by the study offers a solid foundation for future research and serves as a valuable guide for policymakers. By addressing the shortcomings in this area, Turkey can transform financial inclusion into a more effective tool for driving economic growth.

FİNANSAL KAPSAYICILIĞIN EKONOMİK BÜYÜME ÜZERİNDEKİ ETKİSİ: TÜRKİYE ÖRNEĞİ

1. GİRİŞ

Bu çalışma, Türkiye özelinde finansal kapsayıcılığın ekonomik büyümeye olan etkilerini analiz etmektedir. Finansal kapsayıcılık, bireylerin ve işletmelerin finansal hizmetlere erişimini artırmayı ve ekonomik faaliyetlere katılımlarını teşvik etmeyi amaçlayan bir kavramdır. Çalışmanın merkezinde, bu erişim seviyesinin ekonomik gelişme üzerindeki doğrudan ve dolaylı etkileri yer almaktadır. Bu etkilerin daha iyi anlaşılabilmesi için finansal okuryazarlık, dijital hizmetlerin yaygınlaşması ve bölgesel farklılıklar gibi faktörlerin ele alınması gerekmektedir.

Banka hesabı sahipliği, mobil ödeme sistemlerinin kullanımı ve krediye erişim gibi finansal kapsayıcılık göstergeleri, bireylerin tasarruflarını daha etkin bir şekilde yönetmelerine ve işletmelerin finansman bulmalarını kolaylaştırmalarına olanak sağlar. Finansal erişimin artması, ekonomik faaliyetlerin genişlemesine katkı sağlasa da bu, pozitif etkilerin maksimum düzeyde hissedilmesi durumu finansal okuryazarlık düzeyine bağlıdır. Finansal okuryazarlık eksik olduğunda, bireyler kredi ve tasarruf yönetiminde zorluk yaşayabilir ve finansal sistemlerin avantajlarından tam anlamıyla faydalanamayabilir.

2. YÖNTEM

2009-2022 dönemini kapsayan çalışma, IMF'nin International Financial Index verilerini kullanarak ARDL modeliyle finansal kapsayıcılığın ekonomik büyümeye etkisini analiz etmektedir. ARDL (Autoregressive Distributed Lag) modeli, zaman serisi analizlerinde kısa ve uzun dönem ilişkilerini eşanlı olarak incelemek için kullanılan bir ekonometrik yöntemdir. Pesaran, Shin ve Smith (2001) tarafından geliştirilen bu model, değişkenlerin aynı düzeyde durağan olma şartını gerektirmemesi nedeniyle diğer geleneksel yöntemlere göre avantaj sağlar. ARDL, hem I(0) hem de I(1) durağanlık seviyesindeki değişkenlerle çalışabilir ancak I(2) seviyesindeki değişkenlerle uygulanamaz. Model, uzun dönem ilişkisinin varlığını test etmek için sınır testi (bounds test) yaklaşımını kullanır. ARDL modeli, her bir bağımsız değişkenin gecikmeli değerlerini bağımlı değişkene dahil ederek kısa dönem dinamiklerini de analiz eder. Bu özelliği sayesinde, politika etkilerinin zaman içindeki geçiş yollarını ve uzun dönem denge ilişkisini ayrıntılı bir şekilde ortaya koyabilir. Özellikle küçük örneklemlerde etkili sonuçlar sunması, modelin uygulamada geniş bir kullanım alanı bulmasını sağlamaktadır.
Elde edilen bulgular, finansal kapsayıcılığın ekonomik büyümeye etkisinin sınırlı olduğunu göstermektedir. Düşük gelir gruplarının finansal hizmetlere erişimindeki zorluklar ve bölgesel eşitsizlikler, bu etkilerin kısıtlanmasında önemli rol oynamaktadır.

3. BULGULAR

ARDL modelinden elde edilen sonuçlar, finansal kapsayıcılığın kısa vadede ekonomik büyümeyi sınırlı düzeyde etkilediğini ancak uzun vadede daha anlamlı bir ilişki olduğunu ortaya koymaktadır. Dijital finansal hizmetlerin yaygınlaşması, finansal kapsayıcılığı geliştirerek ekonomik faaliyetleri destekleme potansiyeline sahiptir. Ancak bu etkilerin tam anlamıyla gerçekleşebilmesi için dijital hizmetlerin toplumun her kesimine ulaşması gerekmektedir.

Dünyanın farklı bölgelerinde yapılan çalışmalar, finansal kapsayıcılığın ekonomik büyümeye olan etkilerinin ülkelerin ekonomik yapısına, dijitalleşme seviyesine ve finansal okuryazarlık oranlarına göre değiştiğini göstermektedir. Örneğin, Kenya'daki M-PESA mobil ödeme sistemi, kırsal bölgelerde finansal erişimi artırarak ekonomik faaliyetlere katkıda bulunmuştur. Hindistan'daki dijital ödeme sistemleri ise, özellikle küçük ve orta ölçekli işletmelerin (KOBİ) finansmana erişimini kolaylaştırıp ekonomik faaliyetleri desteklemiştir.

Ancak, finansal hizmetlerin aşırı genişlemesinin ekonomik istikrarı tehdit edebileceği ve büyümeyi olumsuz etkileyebileceği de literatürde belirtilmektedir. Bu durum, finansal kapsayıcılığı artırıcı politikalar önerilirken dıkkatli bir yaklaşım benimsenmesi gerekliliğini ortaya koymaktadır. Aşırı kapsayıcılık, bazen finansal kaynakların etkin olmayan şekilde kullanılmasına ve ekonomik dengesizliklere yol açabilir.

Türkiye'de finansal kapsayıcılık seviyesi, gelişmiş ülkelere kıyasla daha düşüktür. Bununla birlikte, dijital finansal hizmetlerin artan kullanımı olumlu bir dönüşüm potansiyeline işaret etmektedir. Dijital bankacılık, mobil ödemeler ve fintech çözümleri gibi yenilikler, finansal erişimde önemli ilerlemeler kaydetmiştir. Ancak, bu hizmetlerin tam anlamıyla ekonomik büyümeye katkı sağlayabilmesi için bölgesel eşitsizliklerin giderilmesi ve finansal okuryazarlık seviyesinin yükseltilmesi gerekmektedir.

Bölgesel eşitsizlikler, kırsal alanlarda temel finansal altyapı eksiklikleri ve dijital hizmetlerin erişilebilirliğindeki dengesizlikler nedeniyle derinleşmektedir. Şehirlerde yoğunlaşan finansal kaynaklar, kırsal alanlarda ekonomik faaliyetlerin desteklenmesini zorlaştırmaktadır. Türkiye'de bölgesel farklılıkları azaltmaya yönelik daha fazla yatırım ve strateji gereklidir.

4. TARTIŞMA

Bu çalışma, Türkiye'de finansal kapsayıcılığın ekonomik büyümeye olan etkisini artırmak için bir dizi politika önerisi sunmaktadır:

1. **Finansal Okuryazarlık Programları**: Finansal eğitim kampanyaları ve okul müfredatlarına dahil edilen programlar sayesinde bireylerin finansal bilgileri

artırılabilir. Bu programlar, bireylerin tasarruf ve yatırım kararlarında daha bilinçli hareket etmelerini sağlayabilir.
2. **Kırsal Yatırımlar**: Finansal altyapı eksikliklerinin giderilmesi için kırsal alanlara yönelik özel yatırım politikaları geliştirilmelidir. Banka şubeleri ve dijital hizmetlerin bu bölgelerde yaygınlaşması sağlanmalıdır.
3. **Dijital Hizmetlerin Teşviki**: Kamu-özel işbirlikleri aracılığıyla dijital finansal hizmetlerin erişilebilirliği ve kullanılabilirliği artırılabilir. Fintech firmalarına verilecek destekler, yenilikçi çözümler sunabilir.
Bölgesel Eşitsizliklerin Azaltılması: Finansal kaynakların daha dengeli bir şekilde dağıtılması sağlanarak bölgeler arası eşitsizlikler minimize edilebilir. Bu kapsamda, mikro kredi ve kırsal gelişim projeleri desteklenebilir.

SONUÇ

Finansal kapsayıcılık, ekonomik büyümeyi destekleme potansiyeline sahip olmakla birlikte, Türkiye'deki mevcut durum yapısal sorunlar nedeniyle bu potansiyelin tam olarak gerçekleşmesini engellemektedir. Özellikle dijitalleşme süreci ve finansal okuryazarlık seviyelerinin yükseltilmesi gibi önlemler, finansal kapsayıcılığın ekonomik etkisini maksimize etmek için kritik önem arz etmektedir.

Bu bağlamda, finansal kapsayıcılığın artırılmasında dijitalleşmenin rolü oldukça kritik bir önem taşımaktadır. Dijital bankacılık, mobil ödeme sistemleri ve blockchain teknolojileri, finansal hizmetlere erişimi kolaylaştırarak ekonomik büyümeyi destekleme potansiyeline sahiptir. Ancak, bu teknolojilerin etkili bir şekilde uygulanabilmesi için altyapı yatırımları ve düzenleyici çerçeveler kadar bireylerin bu hizmetleri kullanma becerileri de göz önünde bulundurulmalıdır. Türkiye'de özellikle kırsal bölgelerde temel dijital altyapının eksikliği, finansal kapsayıcılık hedeflerine ulaşmayı zorlaştıran faktörlerden biridir. Ayrıca, dijitalleşmenin kapsayıcılığı artırmada önemli bir araç olmasına rağmen, bireylerin finansal hizmetleri doğru bir şekilde anlayıp kullanabilmesi için finansal okuryazarlığın geliştirilmesi gereklidir. Bu nedenle, Türkiye'nin ekonomik büyümesini desteklemek amacıyla finansal okuryazarlık seviyelerinin artırılması ve dijital hizmetlerin daha geniş bir kitleye erişimini sağlayacak politikalar uygulanması gerekmektedir. Gelecekte yapılacak çalışmalar, finansal kapsayıcılığın dijitalleşme ile nasıl daha etkin bir hale getirilebileceğini ve bu etkinin bölgesel eşitsizlikler üzerindeki etkilerini daha detaylı bir şekilde incelemelidir.

Gelecek araştırmalar, finansal kapsayıcılık politikalarının mikro düzeydeki etkilerini daha ayrıntılı inceleyerek bu alandaki bilgi eksikliklerini gidermeye odaklanmalıdır. Özellikle, dijital finansal hizmetlerin uzun vadeli ekonomik etkileri ve bu hizmetlerin bölgesel eşitsizlikleri azaltma potansiyeli kapsamlı bir şekilde analiz edilmelidir. Bu tür çalışmalar, Türkiye gibi gelişmekte olan ülkelerde dijitalleşme yoluyla finansal kapsayıcılığı daha etkin bir hale getirerek ekonomik büyümeye anlamlı katkılar sağlanması için önemli bir temel oluşturacaktır.

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