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Original Research Article

Redefining the Central Bank's Supportive Policies for Economic Growth with Emphasis on Stability and Banking Technology

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This study investigates the impact of banking stability and banking technology on economic growth in the D8 group, over the period 2003-2022. Using annual data from the World Development Indicators (WDI) and applying the Panel Autoregressive Distributed Lag (Panel ARDL) approach, the results indicate that banking stability, measured by the Z-score, has a positive and significant effect on economic growth in both the short and long run. Similarly, indicators of banking technology - namely ICT development, internet banking, and the number of ATMs - positively contribute to growth. In contrast, the average deposit interest rate shows a negative relationship with economic growth. The Error Correction Model (ECM) confirms a strong speed of adjustment toward long-run equilibrium. These findings highlight the critical role of a stable and technologically advanced banking system in fostering sustainable economic growth. Accordingly, policy recommendations emphasize strengthening banking stability and accelerating the adoption of digital banking technologies across D8 economies.

Keywords: Central Bank, Inflation, Economic Growth, Banking Stability, Technology
JEL Classification*:* K10, O14, O47, E58

1 Introduction

Economic growth is a central concern of modern economies, but its interaction with central bank mandates - particularly banking stability and technological innovation - remains underexplored. While traditional macroeconomic literature emphasizes the benefits of growth, recent scholarship highlights the

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structural trade-offs that central banks face when pursuing both financial stability and innovation. This research is motivated by the question of whether central banks can simultaneously support economic growth through enhanced banking stability and the adoption of banking technologies, or whether these objectives are in tension.

Banking stability is widely recognized as a prerequisite for sustainable growth, especially in emerging economies exposed to recurrent crises. Recent studies show that financial stability enhances growth resilience and mitigates systemic risks (Beck & Keil, 2022; Demirgüç-Kunt et al., 2021). For this reason, stability indicators such as Z-scores, capital adequacy ratios, and non-performing loans remain central to empirical investigations of growth dynamics.

At the same time, banking technology has emerged as a transformative driver of financial inclusion and efficiency. Defined broadly, it encompasses fintech innovations such as digital payments, blockchain-based applications, AI-driven credit scoring, and central bank digital currencies (CBDCs) (Philippon, 2019; Chen et al., 2019; Auer et al., 2020). These technologies are argued to reduce transaction costs, expand access to credit, and improve the quality of financial intermediation. However, their impact on stability and growth remains contested. Some scholars argue that fintech adoption complements stability by enhancing transparency and resilience, while others suggest that rapid innovation may amplify systemic risks (Narayan & Sahminan, 2018).

Despite the growing attention to fintech and banking stability, there remains limited evidence on how the interaction between these two dimensions shapes economic growth, particularly in developing and emerging economies comparable to Iran, such as Turkey, India, and Brazil. The originality of this study lies in positioning banking stability and banking technology not as parallel, independent factors, but as potentially complementary - or conflicting - mechanisms through which central banks indirectly influence growth.

The neglected point here, however, is that supporting economic growth by the central bank does not necessarily and exclusively pass through expansionary monetary policy. Instead, with a different perspective, another strategy can also be considered. This study seeks to redefine the supportive role of the central bank in achieving economic growth by emphasizing banking stability and banking technology. In this way, the central bank can fulfill the legislator’s intention of supporting growth without deviating from its “primary mandate” of inflation control.

Accordingly, this study asks a sharper research question: How do banking stability and banking technology, as mediated by central bank policy, affect economic growth in the short run and the long run? By applying the panel ARDL–PMG approach, the paper contributes empirically to the debate on whether central banks can simultaneously enhance growth by supporting stability and fostering technological innovation. Also, two main hypotheses are proposed in this research:

Hypothesis 1: Banking stability has a positive and significant effect on economic growth.

Hypothesis 2: Banking technology has a positive and significant effect on economic growth.

If these two hypotheses are confirmed, a redefinition of the central bank's supportive role for economic growth, as stipulated in Article 3 of the new law, can be put forward. In this redefinition, instead of relying exclusively on expansionary monetary policy and liquidity creation, the Central Bank of Iran is advised to pursue policies that ensure banking stability and foster banking technologies as alternative and complementary channels for achieving the legislator's objective.

The remainder of this study is structured as follows: Section 2 presents the theoretical foundations and literature review, Section 3 reviews related empirical studies, Sections 4 and 5 provide the methodology and findings, and the final section concludes with policy implications.

2 Theoretical Foundations and Literature Review

Recent studies have highlighted the dual role of banking stability and banking technology in supporting economic growth, particularly in emerging economies. Recent empirical evidence emphasizes the importance of fintech adoption, mobile payments, blockchain integration, and AI-driven credit scoring in improving banking efficiency and economic outcomes. For example, studies in Turkey, India, and Brazil demonstrate that digital payment systems and banking innovations can enhance financial intermediation while posing new risks that require central bank oversight (Beck et al., 2016; Andrianaivo & Kpodar, 2012; Ijaz et al., 2020).

Furthermore, some studies point to potential trade-offs: rapid adoption of digital banking technologies may initially increase operational and systemic risks, which require effective regulatory frameworks. Empirical findings suggest that, when combined with robust banking stability, technology adoption leads to sustainable economic growth, reinforcing the argument for

a coordinated strategy by central banks. The following examines the role of the central bank in supporting economic growth.

2.1 The Role of the Central Bank in Supporting Economic Growth under the New Central Bank Law

As mentioned earlier, some economists do not recognize a fundamental role for central banks in fostering economic growth, restricting their mandate primarily to controlling inflation and safeguarding the value of the national currency. However, the Central Bank Law of Iran (ratified on June 20, 2023) explicitly includes economic growth among its objectives. According to Paragraph (b), Article 3 of Chapter II of this law, the Central Bank must achieve the following objectives in line with the general policies of the system defined under Article 110 of the Constitution of the Islamic Republic of Iran (1979):

1) Controlling (restraining) inflation
2) Ensuring the stability and soundness of the banking system and other supervised entities
3) Supporting economic growth and employment
4) Preserving and enhancing the value of the national currency
5) Contributing to the realization of social justice

It is clear that the third item of this paragraph explicitly designates supporting economic growth and employment as one of the Central Bank's objectives.

Furthermore, Paragraph (b), Article 10 of the Central Bank Law stipulates that the Governor of the Central Bank is obliged to submit a performance report of the Central Bank and the country's banking network at least three days before the scheduled Monetary and Foreign Exchange Policy Meeting (excluding extraordinary sessions). This report must include several items, among which, according to Clause 4, is an account of the Central Bank's performance and that of the banking system as a whole — as well as each credit institution separately — in the areas of supporting economic growth and employment, expanding infrastructure, promoting technology, and increasing exports.

In addition, Paragraph (a), Article 53 of the law requires the Governor of the Central Bank to present to the Parliament (Majlis) in May and November each year a comprehensive report on the performance and plans of the Central Bank. This report must include monetary, exchange rate, and credit policies, banking supervision, economic developments, explanations for any deviations of inflation and other target variables from prior forecasts, as well as the

performance of the Central Bank and the banking network in supporting production, employment, and economic growth, and in ensuring the health and stability of the banking system. The non-confidential parts of this report must also be published for public access[1].

Taken together, these provisions clearly demonstrate that the legislator, through the new law, explicitly emphasizes the Central Bank's role in supporting the country's economic growth and obligates the Governor to submit periodic reports on the extent of fulfilling this role to relevant authorities. However, the law does not specify the exact path by which this role should be carried out. This legal gap opens the door for rethinking non-inflationary policies and redefining the Central Bank's supportive role in fostering economic growth.

2.2 Redefining the Central Bank's Supportive Policies for Economic Growth

At first glance, it may be assumed that the Central Bank's support for economic growth is only achievable through expansionary monetary policy, credit creation, liquidity growth, and ultimately, higher inflation. However, a redefinition of the Central Bank's supportive policies allows for consideration of alternative approaches that do not necessarily involve increasing liquidity or fueling inflation.

Within this redefinition, the Central Bank can positively and significantly influence economic growth through two channels:

1) Banking Stability
2) Banking Technology

In this way, the legislator's intention as outlined in Article 3, Paragraph (b) of the Central Bank Law can be fulfilled without compromising price stability. The following subsections elaborate on these two channels.

2.2.1 Banking Stability and Its Effects on Economic Growth

In recent decades, economic stability has become one of the primary objectives of economic systems. Within the banking literature, banking stability is regarded both as a crucial component of overall economic stability and as a key prerequisite for the functioning of the banking sector itself. Banking stability refers to the resilience and endurance of the banking system

[1] It should be noted that in paragraph b of Article 10 of the Monetary and Banking Law (approved in 1972), the goal of the Central Bank was stated to be to maintain the value of the currency and the balance of payments, facilitate trade exchanges, and contribute to the country's economic growth.

against macroeconomic fluctuations—such as changes in GDP and inflation—as well as in relation to drivers of economic development and the degree of banking sector concentration.

Sound management and alignment of banking resources and uses can lay the foundation for economic growth and prosperity. Banking stability, much like health, is typically defined in contrast to its absence - instability and fragility. Various studies have associated instability with economic shocks and crises, fluctuations and distortions in economic variables, lack of economic security, and similar phenomena (Khalili Araghi & Ramezanpour, 2001).

Banking instability may therefore be described as persistent fluctuations in most or all banking indicators, weaknesses in risk management, inability to withstand internal and external shocks, and failure to meet minimum standards of banking soundness such as CAMELS indicators. Instances of banking instability include sudden capital outflows leading to currency depreciation, reduced banking profitability, weakened public confidence, bank runs, inability of banks to honor obligations, declining bank stock values, accumulation of non-performing loans, and contagion of crises across banks, eventually spilling over from the monetary and financial sector into the real economy.

Given the strong interconnectedness between the banking system and the broader economy, any instability within banks is likely to disrupt macroeconomic variables, especially growth and production. Ensuring banking stability and soundness is therefore essential to supporting economic growth.

Banking stability is often measured through indicators of financial soundness. It reflects the adequacy of bank funding structures and the quality of financing methods. Bank capital, for instance, enables banks to absorb financial losses and acts as a buffer that mitigates the transmission of shocks and reduces the risks inherent in credit intermediation. On the other hand, rising costs may reduce bank profitability, erode capital, and lead banks to increase interest rates to preserve their equity in the future (Van den Heuvel, 2002). Likewise, Aghion et al. (2010) confirmed that banking sector stability ultimately contributes to overall economic stability, which is a prerequisite for sustainable growth and development.

How, then, does banking stability influence economic growth? A stable banking system creates a favorable environment for mobilizing deposits from surplus funds and channeling them toward productive investments. In other words, banking stability enhances the efficiency of financial intermediation,

enabling banks to better attract resources and allocate them more effectively to productive activities, thereby promoting growth and employment. Additionally, stability improves the effectiveness of monetary policy transmission by the central bank in controlling inflation and strengthening investor confidence in the economic outlook. Indeed, implementing monetary and macroeconomic policies in an unstable banking environment is virtually impossible; banking stability provides the necessary foundation for sound policy execution and interest rate management.

Another channel through which banking stability affects growth is its broader social and security implications. While banking stability is fundamentally an economic matter, instability and banking crises inevitably carry social and political consequences, often more costly than the economic impacts themselves. In extreme cases, severe banking and financial crises are treated as national security concerns. Thus, a stable and resilient banking sector not only fosters economic growth but also ensures societal stability, whereas its absence can become a major barrier to development.

2.2.2 Banking Technology and Its Effects on Economic Growth

From the perspective of some economists, technology represents the body of knowledge applied in the production and commercialization of goods and services. It serves as both a tool for enhancing human physical and intellectual capacities and a mechanism for transforming simple resources into complex goods and services. In other words, technology is considered applied knowledge and a system for converting technical expertise into marketable products (Rastegaran, 2018).

Some studies conceptualize technology within endogenous growth models, where long-term growth is seen as a function of technological progress. Lucas (1988) highlighted the central role of human capital in fostering growth. Subsequently, numerous economists conducted empirical studies to quantify and test growth theories. In Solow's growth model, technology is treated as an exogenous factor. However, by the mid-1980s, Romer (1990) advanced endogenous growth models that placed technology at the core of economic dynamics.

Lucas (1988) developed an endogenous growth model emphasizing human capital within the neoclassical framework. Similarly, Aghion and Howitt (1992), inspired by Schumpeterian insights, stressed the role of technological innovation in enhancing production quality and displacing outdated technologies. In this regard, Grossman and Helpman (1991) offered their own version of the endogenous growth model, while Romer (1990) explicitly incorporated new technology into growth dynamics. Collectively, these

studies highlight the incorporation of technology into production functions as a driver of economic growth.

Theoretically, three primary channels explain the positive impact of technology on growth:

1) Accelerating innovation and diffusion of new technologies,
2) Improving efficiency in resource allocation, and
3) Reducing product prices, thereby boosting demand and investment.

Beyond these general considerations, the advent of banking technology has not only advanced the banking industry itself but also improved financial intermediation, facilitated economic and commercial transactions, and contributed to broader economic dynamism. Today, banking technologies - by lowering transaction costs, enhancing security, saving time, and streamlining administrative and financial processes — inject vitality into the economy, with tangible positive effects on growth and development.

A key question that remains is whether banking technology and banking/financial stability interact in a complementary and synergistic manner, or whether they may be in conflict. In other words, if the central bank's efforts to promote "banking technology" and ensure "banking stability" are claimed to foster economic growth and fulfill the legislator's objectives under Clause 3, Article 3 of the Central Bank Law, then these two channels should not act in a mutually destructive or conflicting way.

Most studies emphasize the positive impact of financial technologies, such as mobile payments, blockchain, and central bank digital currencies (CBDCs), on financial stability and economic growth. For example, Hemmati and Jamali (2024) demonstrate that CBDCs, by enhancing financial inclusion and providing the central bank with new data sources, contribute to both financial stability and the central bank's operational effectiveness. Similarly, Karami and Esmaeilpour (2024), in their study "The Impact of Banking Financial Technology on Financial Stability in Iran's Banking Industry," using panel data from 2007 to 2021, identify a U-shaped relationship between financial technology and banking sector stability. Initially, financial technology reduces stability, but as technological adoption expands across the banking industry, stability improves.

Accordingly, initiatives such as developing robust technical infrastructure, strengthening regulatory oversight, enforcing appropriate rules and regulations, defining clear strategies and policies, and leveraging advanced security technologies can significantly enhance banking stability.

3 Literature Review

Ukonu (2024), in his study, uses electronic transactions as a proxy for fintech adoption to examine the relationships between financial development and several variables, including inflation, money supply (M2) as a percentage of GDP, GDP growth rate, foreign direct investment, and population growth, focusing on the impact of fintech innovation on financial development in Hong Kong. The results indicate that higher levels of foreign direct investment and GDP growth are positively associated with fintech advancement, contributing to a stronger financial sector. These insights highlight the potential of fintech to transform financial services in Hong Kong and provide policy implications for enhancing the digital financial landscape.

Emami et al. (2024) investigated the long-term impact of Brainard uncertainty and banking stability on Iran's economic growth. They designed a dynamic stochastic general equilibrium (DSGE) model considering the long-term conditions of Brainard uncertainty, monetary policy, and the main research objectives.

Hashemi Dizaji et al. (2023) examined the impact of selected ICT indicators on economic growth and unemployment in MENA countries. Using panel data econometrics within a fixed effects (FE) framework and an FGLS model for the period 2000-2019, their findings revealed that ICT variables exert a significantly positive effect on economic growth and real per capita income, while having a significantly negative impact on unemployment in the region.

Kaviani and Ashraf Telikani (2023) analyzed the effect of profitability and banking sector stability in Iran, taking into account the role of competition, on economic growth. Their findings indicated that bank profitability does not have a significant effect on economic growth, while banking stability does. Moreover, they showed that bank profitability, through the channel of banking competition, does not exert a significant impact on economic growth.

AlHares et al. (2022), using a sample of 480 bank-year observations from an emerging Gulf Cooperation Council (GCC) market over the period 2006–2021, examined the impact of fintech on banks' financial stability. Their results indicate that the development of fintech firms over time enhances banks' financial stability.

Boachie et al. (2023) show that economic growth drives banking stability, rather than the reverse, confirming a unidirectional causal relationship from GDP to banking stability. Their study also finds that financial inclusion has a positive and significant effect on both banking stability and economic growth,

while bank capital regulation negatively affects banking stability in Sub-Saharan African countries.

Amali et al. (2022) highlighted that financial stability is one of the key variables influencing economic growth.

Klein and Weill (2022) demonstrated that, in the long run, bank profitability exerts a positive effect on economic growth, while in the short run, it may have a significant negative impact. In other words, the short-term return on bank assets tends to be low, which undermines the banking system since these banks lack sufficient resilience against external economic shocks.

Bayar et al. (2021) found a reverse causal relationship between banking sector stability indicators and economic growth, characterizing banking sector stability as a multidimensional and hierarchical structure.

Ijaz et al. (2020) concluded that in European countries, banking stability has a significant impact on economic growth. Their empirical results indicated that lower banking competition provides less support for economic growth but enhances financial stability.

Eisazadeh Roshan and Aghaei (2019) investigated the effects of ICT access and infrastructure on economic growth, considering income inequality. Using data from 14 high-inequality and 14 low-inequality countries, they found that the impact of ICT access and infrastructure on economic growth is weaker in high-inequality countries.

In summary, some studies have investigated the link between banking stability and economic performance. For instance, Demirgüç-Kunt and Levine (2001) highlight that stable financial systems promote long-term investment and growth. Recent works, such as Čihák et al. (2016), employ stability indicators like the Z-score to measure systemic soundness. On the other hand, research on banking technology emphasizes the role of ICT, digitalization, and financial innovation in boosting financial inclusion and efficiency (Beck et al., 2016; Andrianaivo & Kpodar, 2012). However, the literature lacks comprehensive studies that simultaneously assess the effects of banking stability and banking technology on growth. This study fills this gap by focusing on the D8 group during 2003–2022.

4 Research Methodology

This study is applied research in terms of its objectives. The statistical population consists of the D-8 countries[1].

[1] Iran, Turkey, Pakistan, Bangladesh, Indonesia, Malaysia, Egypt, and Nigeria.

For the theoretical framework and literature review, the study employed a library-based approach, utilizing specialized Persian and English books, journal articles, and dissertations. Data for the model variables were extracted from the World Bank's WDI database for the period 2003-2022.

The study employs EViews software and the panel autoregressive distributed lag (ARDL) model to analyze the data across the selected countries. Dynamic panel data models can be estimated through several approaches, including Fixed Effects (FE), Random Effects (RE), and the Generalized Method of Moments (GMM). In cases where the time dimension of the panel is small and the cross-sectional dimension is relatively large, the GMM estimator developed by Arellano and Bond (1991) is typically employed. Conversely, when the time dimension is sufficiently large, the Pooled Mean Group (PMG) estimator proposed by Pesaran et al., (1999) is more appropriate. An alternative to PMG is the Mean Group (MG) estimator, which involves estimating separate regressions for each cross-sectional unit and then averaging the coefficients across groups to obtain the panel estimates. The choice between MG and PMG can be guided by statistical tests such as the Hausman test or the likelihood ratio test. Failure to reject the null hypothesis in the Hausman test suggests that the PMG estimator is more efficient than the MG estimator, whereas rejection favors the use of MG.

To test the research hypotheses, following the approach of Jayakumar et al. (2018), the regression model is specified as follows:

$$\mathrm{growth}_{it} = \beta_0 + \beta_1 \mathrm{fd}_{it} + \beta_2 \mathrm{ict}_{it} + \beta_3 \mathrm{ib}_{it} + \beta_4 \mathrm{atm}_{it} + \beta_5 \mathrm{index}_{it} + \beta_6 \mathrm{k}_{it} + \beta_7 \mathrm{l}_{it} + \beta_8 \mathrm{Int}_{it} + \varepsilon_{it} \quad (1)$$

The explanatory variables include banking stability (fd), the ICT development index (ict), the internet banking index (ib), the number of automated teller machines (atm), the capital market development index (index), gross fixed capital formation (k), employment of individuals aged 15 and above (l), and the average bank deposit interest rate (Int).

In previous studies, banking stability (fd) is often measured using the Z-score, calculated as follows:

$$\mathrm{Z} = \frac{\mathrm{ka}+\mu}{\delta} \quad (2)$$

Where:

– ka is the ratio of equity capital to total bank assets, calculated by dividing a bank's equity by its total financial assets.

- μ is the return on assets of the bank.
- δ is the standard deviation of asset returns, serving as an approximation of return volatility (risk). The standard deviation is computed based on both interest-bearing and non-interest-bearing income.

The ICT index (ict) is published by the International Telecommunication Union (ITU) and includes three components: access, usage, and skills, scored on a scale from 0 to 10. A higher score indicates a more developed ICT infrastructure, while a lower score indicates a less developed system.

The internet banking index (ib) and the number of ATMs (atm) represent the banking technology dimension.

Additionally, the capital market development index (index), gross fixed capital formation (k), employment (l), and average deposit interest rate (Int) are included to better explain the model. The capital market development index is measured by the ratio of stock market capitalization to GDP. Gross fixed capital formation and employment are treated as production inputs in a Cobb-Douglas production function.

Finally, i denotes the cross-sectional units (the D8 countries) and t represents the time periods of the study.

5 Research Findings

Before estimating the model, the statistical properties of each variable were examined to gain an accurate understanding. Table 1 presents the descriptive statistics of the variables.

Table 1
Descriptive Statistics of Variables

Variable / Statistic	Mean	Median	Max	Min	Std. Dev	Observations
GROWTH	3.65258	3.75452	15.32656	-5.32656	0.853236	160
FD	0.65006	0.66715	0.87563	0.1356	0.27133	160
ATM	0.48563	0.47563	0.87452	0.125896	0.04523	160
IB	0.60146	0.59215	0.9684	0.1458	0. 5315	160
ICT	78.2856	77.6235	85.6523	65.8556	8.26586	160
INDEX	0.25893	0.26875	0.48563	0.15236	0.05256	160
INT	4.05632	4.09856	18	1.5	۰.۸۷٤۲٥	160
K	0.64258	0.65814	0.81257	0.38416	0.02598	160
L	78.2569	79.2589	87.6582	74.25694	8.25698	160

Source: Research findings

This study examines the short-term and long-term impacts of banking stability and banking technology on economic growth in D8 countries using dynamic panel models. Prior to hypothesis testing, unit root tests were applied to ensure the stationarity of all variables. The results of the Levin et al. (2002) unit root test are presented in Table 2, indicating that all variables are stationary.

Table 2
Unit Root Test Results for Variables

Variable	Test Statistic	Probability	Result
ATM	-3.10624	0.0009	I(0) Stationary
FD	-2.19073	0.0142	I(0) Stationary
GROWTH	-7.11172	0.0000	I(0) Stationary
IB	-7.86909	0.0000	I(0) Stationary
ICT	-9.41292	0.0000	I(0) Stationary
INDEX	-7.33581	0.0000	I(0) Stationary
K	-10.7978	0.0000	I(0) Stationary
L	-6.98185	0.0002	I(0) Stationary
INT	-3.48539	0.0002	I(0) Stationary

Source: Research findings

Economic theories often describe long-term relationships among variables in level form. To ensure the existence of a long-term relationship among the model variables, it is necessary that the variables are stationary or share the same order of integration. Therefore, cointegration tests were applied using the Kao Residual Cointegration Test, which yielded a test statistic of -8.18, significant at conventional levels, confirming the presence of long-term cointegration among the variables.

The Hausman test is conducted with the null hypothesis that there are no systematic differences between the coefficients of the PMG and MG estimators. In this framework, the test compares a more efficient estimator (PMG) against a less efficient but consistent one (MG) to verify whether the efficient estimator produces consistent results. The test statistic is 5.72 with a probability value of 0.12, which is greater than the 0.05 significance level. Therefore, the null hypothesis cannot be rejected, indicating that the PMG estimator is preferred over the MG estimator.

Table 3 shows the results estimated using the Panel ARDL PMG estimator, with economic growth as the dependent variable. The long-run estimation results indicate that banking stability, measured by the Z-score, exerts a positive and statistically significant effect on economic growth ($\beta = 2.26$, $p <$

0.05). This suggests that greater resilience and soundness in the banking sector foster an environment conducive to investment, financial intermediation, and ultimately sustainable economic growth among the D8 countries. Similarly, the indicators of banking technology including ICT development and the number of ATMs, show positive long-run effects on growth, reflecting the role of technological modernization in enhancing banking efficiency and expanding access to financial services. Conversely, the deposit interest rate exhibits a negative long-run relationship with economic growth, implying that higher deposit rates may discourage investment and crowd out productive economic activities.

In the short run, ICT development and the number of ATMs have positive and significant impacts on economic growth, highlighting the importance of technology adoption and improved financial infrastructure in driving short-term economic performance. However, the results show that internet banking does not have a significant short-term effect, suggesting that its positive contributions materialize only over a longer horizon as adoption rates and trust in digital banking deepen. Moreover, banking stability demonstrates a robust positive role in the short run, consistent with the long-run findings.

The Error Correction Model (ECM) coefficient (−0.2999, $p < 0.01$) is negative and highly significant, confirming the validity of the model. This coefficient indicates that approximately 30% of any short-term disequilibrium is corrected within a single year, ensuring convergence toward the long-run equilibrium. The strong speed of adjustment underlines the stability of the estimated system and validates the use of the Panel ARDL framework.

Overall, these findings underscore the crucial role of a stable and technologically advanced banking sector in promoting both short-term and long-term economic growth.

Table 3
Model estimation results

Selected Model: ARDL(1, 1, 1, 1, 1, 1, 1, 1, 1) Model Selection Method: Schwarz Information Criterion (SIC)				
Long Run Equation				
Prob.	**t-Statistic**	**Std. Error**	**Coefficient**	**Variables**
0.0346	2.124697	1.065157	2.263136	FD
0.0088	2.845729	0.532616	1.515692	ICT
0.0007	3.491492	0.561812	1.961562	IB
0.0102	2.728860	0.986315	2.691516	ATM
0.0127	2.501876	1.261516	3.156157	INDEX
0.0116	2.665298	1.111156	2.961562	K
0.0217	2.168174	0.745151	1.615617	L
0.2336	-1.164130	0.562322	-0.654616	INT
Short Run Equation				
Prob.	**t-Statistic**	**Std. Error**	**Coefficient**	**Variables**
0.0000	-4.219777	0.071072	-0.299908	ECM
0.0454	1.998844	1.081231	2.161212	D(FD)
0.0842	1.756460	0.846313	1.486515	D(ICT)
0.1964	1.475879	1.251129	1.846515	D(IB)
0.0083	2.847899	0.963221	2.743156	D(ATM)
0.0120	2.595514	1.256615	3.261562	D(INDEX)
0.0221	2.307062	1.152616	2.659156	D(K)
0.0219	2.163914	0.853322	1.846515	D(L)
0.2016	-1.438489	0.485615	-0.698552	D(INT)
0.0401	2.077809	1.523312	3.165152	C

Source: Research findings

6 Conclusion and Policy Recommendations

This paper investigated the impact of banking stability and banking technology on economic growth in D8 countries over the period 2003–2022, using the Panel ARDL approach. The empirical results demonstrate that banking stability, measured by the Z-score, significantly contributes to growth in both the short and long run. Similarly, technological indicators – including ICT development, internet banking, and ATM availability - exert a positive influence on growth, while the deposit interest rate negatively affects economic performance. The Error Correction Model further confirms a rapid adjustment toward long-run equilibrium, ensuring the robustness of the findings.

These results lead to several important implications. First, strengthening banking stability is essential. Policymakers should enhance capital adequacy, improve risk management, and tighten supervisory mechanisms to minimize

systemic risks. A stable banking system not only resists external shocks but also fosters investor confidence and promotes long-term growth.

Second, accelerating digital transformation in the banking sector is a strategic necessity. Expanding ICT infrastructure, encouraging internet banking adoption, and increasing ATM coverage enhance financial inclusion and efficiency. Governments and regulators can play a pivotal role by supporting fintech innovation, ensuring cybersecurity, and promoting digital financial literacy through targeted programs and incentives.

Third, balancing interest rate policies is crucial. Since higher deposit rates were found to negatively influence growth, monetary authorities should adopt interest rate strategies that stimulate productive investment while safeguarding financial sector soundness.

In other words, the main finding of this research is that, given that the legislator, according to Article 3 of the Central Bank Law, has assigned the central bank the objective of supporting economic growth, the central bank can pursue this goal and mandate through the channels of promoting and enhancing banking stability and banking technology, rather than solely relying on expansionary monetary policies that may generate inflation.

Beyond the economic dimension, these findings underscore that banking stability is closely linked to social and security considerations. Banking crises can quickly spill over into political and social instability, whereas a resilient and technologically advanced banking system lays the foundation for sustainable growth, employment creation, and social cohesion in D8 economies.

For future research, extending the analysis to include non-banking financial institutions, exploring cross-country heterogeneity, and applying advanced dynamic econometric models could provide further insights into the complex interaction between financial stability, technology, and economic growth. Table 4 presents the hypotheses, results, and policy recommendations.

Table 4
Hypotheses and Policy Recommendations

Hypothesis	Statement	Result
H1	Banking stability has a positive and significant effect on economic growth.	Accepted
H2	Banking technology has a positive and significant effect on economic growth.	Accepted
Policy Recommendation	Based on the acceptance of both hypotheses, the Central Bank's role in supporting economic growth (Article 3 of the new Central Bank Law) should be redefined. Instead of focusing solely on expansionary monetary policy and liquidity creation, the bank should prioritize banking stability and promotion of banking technology to achieve legislative objectives.	

Source: Research Findings

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