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Artificial Intelligence, Fintech adoption and financial stability: An analysis of the conventional banking sector of OIC countries

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ABSTRACT

In recent literature on financial economics, the integration of Artificial Intelligence (AI) and Financial Technology (Fintech) is being discussed as a means to achieve economic and financial stability. Our analysis is based on the development of FinTech and AI to achieve financial stability, which can further lead to economic stability. We have used structural equation modelling to examine the direct and indirect impacts of AI and FinTech on financial stability, with financial stability also acting as a mediator between AI and FinTech toward economic growth. We use data from selected OIC countries, and the sample set includes the conventional banking sector. Based on early-stage data, we see that it has been no more than 4 to 5 years since AI was introduced into the global arena, particularly in developing countries and multiple sectors. However, adoption comes with multiple challenges, causes, and risks, especially in the initial phases, which may have a negative impact on financial stability. Similarly, FinTech might harm financial stability in the conventional banking system, as AI adoption is currently in its early stages. Yet, AI and FinTech present a very interesting mode for studying the joint impact on economic growth, as they appear to be key components toward achieving financial stability and improving the functioning of conventional banking. The policies arising from the study indicate that in the initial phases, AI adoption is being carried out in multiple conventional banks in OIC countries, although its impact remains negative due to costs and risks.

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INTRODUCTION

Recent studies are looking into the impact of artificial intelligence on achieving economic growth as well as financial stability. The link develops as artificial intelligence grows; it increases financial stability as well as impacts FinTech. Both financial stability and FinTech together affect economic growth. Working on this hypothesis or idea, this paper examines the integration of artificial intelligence, particularly in FinTech, to achieve economic growth through financial stability. Interestingly, the results are very unique when it comes to the impact of artificial intelligence on the financial stability of the banking sector. The efficiency and innovations of financial services are influenced by artificial intelligence (Gyau et al., 2024; Golić et al., 2019). It can be seen that artificial intelligence is in the initial phases of development. When a new technology like artificial intelligence is introduced, its impacts are very different. New technology, such as artificial intelligence in FinTech, comes with challenges associated with its absorption (Rahman et al, 2023). A significant percent increase in the long-term growth rate is associated with AI advancements. On the other hand, literature has also predicted negative shocks that may affect economic growth.

This is very interesting because AI can impact economic growth in a dual nature. What is observed is that when AI is in the growing phase, particularly in conventional banking systems, the adaptation phase involves a high cost of implementation. The implementation costs, the resources needed to train personnel in AI, and the errors associated with new technology all bring stress on companies or sectors attempting to integrate AI. While AI is expected to enhance service quality, this remains a question. Right now, we are in the initial phase of AI's impact on economic growth. Hence, its impact may be negative or positive, depending on the country, culture, and environment in which AI is being embedded into the system. Developed countries such as the United States, Canada, or Japan may adapt to AI more quickly since they have better technologies and are inventors of AI-related advancements. However, countries like Pakistan or India may be in a slower phase of AI adaptation. AI comes with an increase in service quality, but at the cost of improving systemic risks. Another important result observed is the impact of AI on financial stability (Dejanović; 2025; Aslam & Ghouse, 2023). Literature shows that this impact is not easy to understand due to its complex nature, both in financial stability and economic growth (Aslam & Ghouse, 2022; Aslam & Ghouse, 2023).

Building upon the above literature, we look forward to examining the impact of financial stability on economic growth and exploring why excessive financial stability may hinder economic growth, particularly in the initial phases where FinTech adoption is on the rise. One model examines how there could be a direct impact of AI on financial stability before determining how AI adoption may contribute to the financial stability of commercial banking sectors. It is important to note that in the middle-income and growing countries' context, rapid changes in financial regulations associated with AI adoption and technology can lead to scenarios where overemphasis on stability might dampen growth opportunities (Qamar et al., 2021; Aslam et al., 2024). This observation is supported by real-life instances where conservative banking practices have delayed much-needed reforms. We are interested in investigating the moderating effect of AI and FinTech on economic growth. It is important to explain the combined influence, which has the ability to amplify or diminish the economic stability of commercial banks. We aim to understand the key challenges and derive policy recommendations for adopting AI and FinTech, as well as to examine the integration of AI and FinTech adoption towards economic growth and financial stability in selected countries. Such an investigation is critical for countries like those in our sample (selected OIC countries), where the banking sector is an important pillar of the digital transformation of the financial sector. Understanding the moderation between AI and FinTech will help policymakers and industry leaders to formulate strategies that balance technological innovation with the inherent risks associated with the adoption of AI, thereby ensuring robust growth. This study is very important from this perspective, because AI is currently having a diverse impact on achieving different objectives. AI is being considered (forecasted as) an important determinant of higher economic growth. However, it also presents various challenges and risks, particularly during the adoption phase or initial phase. This study could provide valuable insights into how, in the current scenario, emerging economies and countries that are not yet advanced are integrating AI towards achieving economic growth. In emerging economies, the promise of AI is met (mostly) with challenges such as infrastructure deficits and skill gaps in human resources using it (Parveen et al. 2024). By considering these issues, the study strengthens the argument for a carefully balanced approach where innovation is encouraged while mitigating risks through appropriate policy measures. Such insights are very crucial for ensuring that AI contributes positively to long-term, inclusive economic growth (Aslam et al., 2024).

LITERATURE REVIEW & CONCEPTUAL FRAMEWORK

Literature has reported mixed results for the relationship between financial stability and economic growth rate (Carbó-Valverde & Sánchez, 2013; Aslam et al., 2024; Manu et al., 2011; Bresser-Pereira et al, 2014). Evidences from literature suggest that financial stability may impact economic growth both negatively (Bresser-Pereira et al., 2014) as well as positively, as suggested by Carbó-Valverde et al. (2013), both significantly; there has been evidence for both directions in the impact of financial stability on economic growth. The impact of financial stability on economic growth in different countries may also differ in terms of country sets; for example, the results of the impact of financial stability may be different in developing countries and may differ in advanced countries. Similarly, the results may also be different for conventional banking and may also be different for Islamic banking systems (Edwards & Mishkin, 1995; Čihák & Hesse, 2010).

Ghroubi, M. (2025) suggests that financial stability, however, is a very important and critical component of economic growth, and it is important that we take stringent measures that are not inadvertently stifling growth. Such factors may limit access to credit and investment opportunities, which is why financial stability may have a negative impact on economic growth, particularly if present in developing countries' datasets Ghouse et al., (2021). Stability policies are very crucial in preventing crises such as the financial crisis of 2010. Strict regulatory measures can reduce the availability of funds. In many developing countries, the policies may also be very conservative for the conventional banking system, for example, in lending practices and cautious investment behaviour, which may sometimes affect economic progress (Ghouse et al., 2021; Ghouse et al., 2022; Ghouse et al., 2023). It shows that an excessive focus on maintaining stability might also result in a negative impact on financial stability on economic growth rate. Reluctance to fund innovation or high-risk ventures, which are crucial for long-term economic growth, as shown by Verma, D., & Chakarwarty, Y. (2024); Shamim et al. (2024).

Literature has suggested that financial stability policies are important when it comes to preventing crises in rising financial institutions such as conventional banking systems (Mabeba, 2024). This strict regulatory environment, although successful in maintaining stability, may not always contribute to the introduction of innovative systems, which further leads to a credit crunch. The limitations on the funds available for medium-sized enterprises and new startups also lead to a slowdown of economic growth, particularly in emerging markets, underscoring the importance of the balance required between financial stability and encouraging a dynamic financial system (Born & Breitung, 2016; Breitung & Das, 2005; Buchak et al., 2024; Center for Security and Emerging Technology, 2023; Giattino et al., 2023; Chhaidar et al., 2023; De Bandt et al., 2018).

Olawale, A. (2024) and Ozili, P. K. (2024) also suggest that in Nigeria, measures of financial stability, such as capital adequacy or liquidity ratio, may also negatively impact the economic growth rate; the reason being that the stock market index shows a positive relationship. Thus, the impact of financial stability on economic growth may be different for different countries. The importance of financial regulatory measures is to protect the banking system; however, they may not always lead to increased risk-taking and innovation. The stock market index, if markets are allowed more flexibility, can drive growth more effectively than when they are usually over-regulated.

Considering the factor analysis, financial stability was not always positively correlated with industrial production. It has also been seen that overall economic growth sometimes remains constrained due to financial stress, as indicated by Kumar et al. (2024) and Abdurrahman et al. (2024). Interestingly, such evidence indicates that while certain sectors, such as the manufacturing or industrial sector, may benefit from stable financial conditions, the broader economy might suffer because of a lack of financial dynamism and regulatory differences (Abrokwah-Larbi & Awuku-Larbi, 2024). The provincial differences and the rural-urban differences are sometimes very important when considering a one-size-fits-all approach for financial regulations impacting the economic growth rate or inclusive growth (Adu et al., 2024).

Moreover, these variations highlight that it is important that policy is decided after carefully looking into the nature of conventional banking and updating financial stability measures, particularly through FinTech and artificial intelligence adoption (Aguegboh et al., 2023). Furthermore, it is very important that financial stability is taken into account for preventing crises and maintaining a healthy financial system. It is a major factor that can sometimes hinder economic growth, particularly by limiting the credit available for curtailing investment opportunities.

H1: Financial stability has a negative impact on economic growth

The impact of Artificial Intelligence and FinTech adoption on financial stability is important and very dynamic (Edwards & Mishkin, 1995; Čihák & Hesse, 2010). It is one of the areas currently under consideration in recent literature on modern financial research. In recent years, particularly in the last five years after the advent of AI and FinTech has shown the potential to drive innovation and improve the efficiency of banking sectors, as well as lead towards financial stability (Alam et al., 2021). However, this is not as simple as it appears because these technologies are still in their initial phases, and early results may not always be positive (Al-Busaidi & Al-Muharrami, 2021). Anginer et al. (2014), Appiah et al. (2022;2023) suggest that these options may affect financial stability negatively, as several risks may compromise this stability.

H2: AI adoption negatively affects financial stability

Asongu and Biekpe (2018), Athanasoglou et al. (2008), Baffour Gyau et al. (2024), Bai et al. (2021), Banna and Alam (2021), Barney (1991), and Batae et al. (2021) show that related risks include issues in operational efficiency and decision-making, such as algorithmic issues, cybersecurity threats, and systemic errors. For example, if systems are trained on biased historical data, they may not always make good decisions and might lead to misallocation of resources, resulting in unfair lending practices. The opacity of "black box" algorithms reduces accountability, while increasing cybersecurity threats are becoming more prevalent due to wider access to coding and potential illegal use of the internet. Particularly during the early stages of AI adoption in the financial or banking sectors, these risks contribute to a negative impact on financial stability. Moreover, the increased investments and funding required to adopt AI can lead to financial stress on conventional banks.

Another important hypothesis developed in the study is that FinTech adoption may negatively affect financial stability. In the context of digital innovations such as blockchain, digital payments, and peer-to-peer lending, it is important to understand that these functions are facilitating digital payments and providing peer-to-peer lending; they are now being integrated with FinTech in ways that differ from the past. FinTech innovations are designed to improve the efficiency of the conventional banking system, but sometimes they disturb the natural system when adoption is not fully mature. Rapid adoption of FinTech, along with AI adoption, may outstrip the development of regulatory frameworks, resulting in gaps, increased market volatility, and potential credit crunches if new platforms cause significant shifts in liquidity or investor confidence. The disruptive nature of FinTech requires careful consideration, as its impact on the financial sector may vary between developing and developed countries.

H3: FinTech adoption negatively affects financial stability

Another hypothesis is that financial stability mediates the relationship between AI adoption and economic growth. This suggests that many benefits of AI adoption on economic growth are closely linked to the stability of the financial system. A stable financial environment acts as a buffer to mitigate the risks associated with rapid technological changes, such as those introduced by AI adoption (Duong et al., 2023). Literature indicates that a stable financial

system is essential for harnessing the positive contributions of AI toward economic growth. Without such stability, the risks may outweigh the benefits, leading to mixed or even negative impacts on economic growth (Del Gaudio et al., 2021).

H4: Financial stability mediates the relationship between AI adoption and economic growth

Similarly, the relationship between FinTech adoption and economic growth is also mediated by financial stability. FinTech has the potential to drive economic growth by improving financial inclusion and reducing transaction costs (Dutta et al., 2022). However, its effectiveness is contingent upon a stable financial system that can absorb the risks associated with rapid technological change. A robust financial framework is crucial to ensure that the innovative benefits of FinTech are fully realized, while minimizing the potential for increased volatility or other negative effects on economic growth.

H5: Financial stability mediates the relationship between FinTech adoption and economic growth

The literature also highlights the compound effect of the interaction between AI and FinTech on economic growth. While both technologies individually have the potential to enhance efficiency and drive growth, their combined interaction can result in negative moderation effects on economic growth (Engvall, 2024). This compound negative moderation occurs because the integration of AI and FinTech can exacerbate risks, such as heightened cybersecurity vulnerabilities, increased systemic risks, and greater market instability, especially in environments where regulatory frameworks are weak (Eni et al., 2023).

H6: The interaction between AI and FinTech has a significant but negative moderating effect on economic growth

Furthermore, this negative moderation effect is more pronounced in economies with weak regulatory frameworks (Fomby et al., 1984). In such economies, the lack of robust oversight amplifies the risks associated with the integration of AI and FinTech, leading to greater instability and hindering economic growth (Ferrari et al., 2018). This underscores the importance of strong regulatory mechanisms in mitigating these adverse effects.

H7: The negative moderation of AI and FinTech on economic growth is more pronounced in economies with weak regulatory frameworks

Additionally, it is important to note that the direct relationship between financial stability and economic growth has also been widely studied. Some research suggests that financial stability itself can have a negative impact on economic growth when excessive regulation stifles innovation and restricts access to credit and investment opportunities. This complexity in the relationship means that while stability is crucial for a robust economy, overly stringent stability measures may inadvertently slow down growth.

H1: Financial stability has a negative impact on economic growth

In summary, the literature indicates that AI and FinTech, while promising for innovation and efficiency, also bring significant risks that may negatively impact financial stability (Galariotis et al., 2021). Financial stability, in turn, plays a mediating role in how these technologies affect economic growth. Moreover, the interaction between AI and FinTech can compound these negative effects, particularly in economies with weak regulatory oversight (Ghaemi & Hosseinlou, 2024). Understanding these dynamics is essential for developing balanced regulatory policies that encourage technological advancement while safeguarding financial stability and fostering sustainable economic growth.

DATA AND METHODOLOGY

The dataset comprises conventional banks from various countries, including Afghanistan, Bahrain, Bangladesh, Brunei, Dubai (UAE), Egypt, Gambia, Guyana, Indonesia, Jordan, Kazakhstan, Kuwait, Lebanon, Malaysia, Maldives, Nigeria, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Turkey, Uganda, and Uzbekistan. The analysis covers the years 2020, 2021, 2022, and 2023, enabling a study of performance over time as well as across the banking sectors. This diversified dataset illustrates how these banks respond to economic fluctuations and global financial shifts. The study employs secondary data, with panel data on bank-level financial indicators, macroeconomic variables, and FinTech/AI adoption indices being collected. The data sources include the OECD, WDI, and the AI Readiness Index. These variables will be used to estimate the structural equation model presented in Figure 1. In this Structural Equation Model (SEM), the mediators are financial stability, mainly, whose role is to elucidate how or why the independent variables influence financial stability by serving as intermediate steps in the relationship.

RESULTS

The results from Table 1 show that financial stability is one of the main variables of interest. The major focus is on the economic factors that contribute to financial stability. The coefficient of CAR suggests a positive association between CAR and financial stability, indicating that for every unit increase, financial stability improves by 116.5 units. This is quite logical, as CAR is an important asset metric for achieving financial stability. However, it can sometimes be linked to high volatility and a negative relationship due to the costs of long-term sustainability associated with financial risk.

The next variable is capitalization, which has a positive relationship but is statistically insignificant. Larger capitalization usually implies more resources and financial strength, which should, in theory, improve financial stability.

Liquidity risk refers to the risk of not being able to meet short-term financial obligations, which may reduce financial stability. Management quality appears to be a major variable influencing financial stability. The negative coefficient associated with management quality suggests that higher management quality is linked to financial stability, which is an interesting finding. However, this could be due to the underlying complexity of how management quality interacts with financial obligations in the specific model. The negative relationship may also be counterintuitive, implying that companies with better management might engage in rapid expansion or aggressive HR strategies, potentially introducing instability (Gyamfi et al., 2021).

The FinTech index has a small coefficient but is highly significant at the 1% level. Despite its small size, it remains a statistically reliable component of financial stability. As financial technology grows, its relationship with financial stability strengthens. The negative relationship may arise due to higher operational or initial costs, often referred to as transformation costs in becoming AI-ready (Haibo & Manu, 2022). The size of banks is also an important factor, as it has a positive coefficient, leading to greater financial stability (Hakimi et al., 2023). Larger firms tend to have more diverse portfolios, resulting in stronger financial stability.

Table 1: SEM Model Results

VARIABLES	Financial stability	GDP growth rate
car1	116.5 (91.37)	
roe1	-62.90*** (21.48)	
capitalization1	226.3*** (53.45)	
liquidityrisk1	-0.0692 (0.0493)	
managementquality1	-45.28** (22.00)	
Fintechindex	-5.21e-07*** (1.65e-07)	1.17e-06** (5.28e-07)
AI_ready	-0.135 (0.0874)	0.0449* (0.0244)
sizeofthe1	3.37e-09 (1.14e-08)	
financialstability1		-0.0198 (0.0121)
Inflation		-0.0481 (0.0362)
Unemployment		0.345 (0.278)
Aifinmoderation		-2.43e-08** (1.15e-08)
var(e.financialstability1)		
var(e.gdpgrowthrate)		
var(e.car1)		
var(e.roe1)		
var(e.capitalization1)		
var(e.liquidityrisk1)		
var(e.managementquality1)		
Constant	24.09 (20.25)	0.270 (1.700)
Observations	144	144

Robust standard errors in parentheses
**** p<0.01, ** p<0.05, * p<0.1*

Inflation and unemployment are two critical macroeconomic variables. Inflation has a negative coefficient, meaning that higher inflation is associated with lower financial stability, as it erodes purchasing power and increases uncertainty, which directly affects financial stability. Unemployment, on the other hand, has a positive coefficient, which is an interesting finding. Higher unemployment may be linked to lower inflation (Haque, 2019), leading to cost-cutting measures and a more conservative approach during uncertain economic times.

The second model of interest examines economic growth as an independent variable. The results show that CAR has a statistically significant coefficient, suggesting that CAR not only drives financial stability but also contributes to economic growth (Aziz & Andriansyah, 2023). However, its magnitude is small. The impact of the rate of return (ROE) is also significant but negative. The negative relationship between ROE and growth implies that higher profitability may sometimes reduce economic growth, possibly because firms focus more on expansion rather than achieving

financial stability (Hu & Wu, 2023). A crucial variable in this context is Artificial Intelligence (AI) readiness. While AI readiness may have a negative impact on financial stability due to high transformation costs, it has a positive and significant impact on economic growth (Imran et al., 2024). This suggests that AI adoption can enhance economic growth by improving efficiency and decision-making. Interestingly, the FinTech index is also positive and significant, indicating that higher FinTech development leads to higher economic growth. This may be due to predictive financial indicators that influence economic performance (Jonkman et al., 2020).

Both inflation and unemployment negatively impact economic growth. Inflation hampers growth by increasing uncertainty and raising costs, while higher unemployment slows economic activity, potentially stunting economic growth (International Monetary Fund, 2023).

The next significant finding is the negative moderation effect. Our major focus was to examine how AI and FinTech moderate the relationship between financial stability and economic growth. Interestingly, this effect is also significant but negative in nature, which is consistent with the negative impact of AI on financial stability and the negative impact of financial stability on economic growth. This finding reflects the early stages of AI adoption, as is currently the case for many banks. While AI and FinTech have immense potential to drive economic growth, their combined impact may lead to unintended consequences. This could be due to the high upfront costs of AI implementation, coupled with financial stability concerns and financial technology adoption.

CONCLUSION AND POLICY IMPLICATIONS

Using the structural equation modeling technique, we find the impacts of Fintech and AI on financial stability and economic growth. Interesting and novel results emerge from the discussion. Financial stability is influenced by various economic and financial factors. CAR has a positive association with financial stability. However, it can sometimes be linked to high volatility due to long-term sustainability costs. Capitalization has a positive but statistically insignificant relationship with financial stability. Larger capitalization implies stronger financial resources, which should theoretically improve stability. Moreover, the FinTech index, despite having a small coefficient, is statistically significant at the 1% level, showing a strong relationship with financial stability. However, a negative relationship may arise due to high transformation costs in becoming AI-ready. The size of banks positively contributes to financial stability, as larger firms tend to have more diverse portfolios. Inflation also has a negative coefficient, indicating that higher inflation erodes purchasing power and increases uncertainty, reducing financial stability. Unemployment, however, has a positive coefficient, suggesting that higher unemployment might be linked to lower inflation and cost-cutting measures during uncertain economic times.

In the second model of economic growth, we focus on economic growth AI readiness negatively impacts financial stability due to high transformation costs, but positively influences economic growth by improving efficiency and decision-making. The FinTech index also positively affects economic growth, likely due to its predictive role in financial indicators. Both inflation and unemployment negatively impact economic growth. Inflation increases uncertainty and costs, while higher unemployment slows economic activity, potentially stunting growth.

It is important to note that the lack of sufficient infrastructure and a well-regulated framework within conventional banking to support AI and FinTech integration could collectively lead to market instability, particularly in the early phases of implementation. Over time, however, as these three variables interact, AI and FinTech hold immense potential for economic growth. Despite their current negative impact, this could change as the financial system adapts. Striking a balance during the transformation phase is crucial. Otherwise, economic growth could slow down due to hesitancy in adopting innovations and new technologies associated with AI and FinTech. Moreover, excessive reliance on these technologies without adequate investment in supportive financial infrastructure could hamper short-term growth.

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