

Financial Technology and Bank Profitability: Ghanaian Evidence

Prince Kofi Ofofu

University of Dundee, UK

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CORRESPONDENSI

Nama : Prince Ofofu

Email : prince.ofosu7@yahoo.com



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ABSTRACT

Fintech is a contemporary phenomenon that is revolutionizing the banking sector by introducing innovations that increase efficiency and streamline financial procedures. This paper explores the relationship between fintech and profitability of selected banks in Ghana from 2014 to 2023. Specifically, the research objectives are to analyze the impact of fintech on bank profitability and liquidity. A quantitative and explanatory study design were adopted. With 150 observations, the study utilized secondary data sourced from the annual financial reports of the selected banks and the World Bank Indicators Database. To assess the impact of fintech on bank profitability and liquidity, the OLS estimation method was utilized. The findings of the study offer a 2-way relationship between the variables. It was revealed that ATM banking has a positive impact on both bank profitability and liquidity. Findings of the study further revealed that Internet banking has a negative impact on profitability, but a positive impact on liquidity. In addition, it was found that mobile banking has a negative and positive impact on profitability and liquidity respectively. The study recommends that banks in Ghana should prioritize financial innovation, reduce transaction costs, and increase their security measures. This study concludes that fintech adoption plays a significant role in enhancing the profitability and liquidity creation of banks.

Introduction

The banking sector plays a pivotal role as intermediary between savers and borrowers, facilitating credit creation, allocating scarce resources, and driving economic growth and development in emerging economies (Abor et al., 2019). The rapid advancement of technological innovation has modified financial services and products, and is having an intense impact on the banking sector (Chhaidar et al., 2023). Financial technology (Fintech), which comprises the fusion of finance and technology, is regarded as a creative innovation that support the spread of financial products (Ferilli et al., 2024), drives bank profitability (Abdelhadi and Bashayreh, 2024), and effectively enhance customer satisfaction as well as the development of new customer segments (Chen et al., 2021). In the era of financial services, technological advancements enable the banking sector to utilize fintech solutions and digital platforms, expanding financial services to isolated regions and meeting the needs of marginalized people (Zheng et al., 2023). Remarkably, a country's financial system becomes more inclusive when fintech is used to increase banking access for the previously unbanked population.

Generally speaking, banks dominate the financial system. Banks as the core of the financial system are always changing how they offer financial services to their clients.

Notably, the emergence of finTech has affected banks in a number of ways, including lending relationships, the form of business, and product designs (Thakor, 2020). In line with the financial intermediation theory, the core function of banks includes the mobilization and reallocation of funds between savers and investors, risk transformation and the creation of liquidity (Allen and Santomero, 1997; Tang et al., 2024), which enhance bank profitability. Thus, the adoption of fintech in the operations of banks has altered the way the banking industry operates, moving from offline banking (involving visiting bank branches) to online banking services, which has increased the operational efficiency of banks and enhance the quality of their services to drive customer satisfaction (Wu et al., 2024; Lee et al., 2021).

Fintech, which provides unprecedented opportunities for transformation is the prevalent trend of the future's financial industry. Existing literature has revealed that the emergence and application of fintech has inevitably had a series of impacts on the banking sector (Le et al., 2021; Wu et al., 2023; Elsaid, 2023; Tang et al., 2024). In particular, banks can utilize fintech to boost operational effectiveness, broaden their service offerings, and create a risk-and cost-matched strategy for providing financial services, which in turn enhance profitability (Wang et al., 2021b). In many developing countries, fintech is constantly recognized as a means of enhancing bank financial stability (Safiullah and Paramati, 2024) and driving the overall performance and profitability of banks (Zheng et al., 2023; Khan et al., 2024).

Moreover, fintech has enhanced product development innovation and broadened the number of services offered by financial institutions. Following Al-Matari et al. (2022), traditional banks frequently struggle to adjust to shifting consumer needs and have small product portfolios. Nevertheless, Nasreen et al. (2020) revealed that innovative financial products and services, which includes digital wallets and crowdfunding platforms have been made possible by fintech startups. The researcher further explained that these innovative financial products and services enhance financial inclusion and promote customer satisfaction within the banking sector. By collaborating with fintech companies, funding their digital transformation, or enhancing their internal fintech capabilities, Ye et al. (2022) revealed that banks have reacted to this innovation, which in turn drives their profitability and liquidity.

Empirical studies investigating fintech-profitability nexus have reported mixed findings. Among others, Lv et al. (2022) and Zheng et al. (2023) revealed a positive link between fintech and bank profitability. Other studies however, reported a negative relationship between fintech and bank profitability (Phan et al., 2020). Similarly, it has been reported that the entry of fintech firms into the Chinese credit market erodes the country's banks profitability (Katsiaampa et al., 2022). Findings from these studies clearly depicts that the study of fintech and bank profitability is inconclusive. While prior studies on the phenomenon under investigation have been carried out in UK (Dasilas and Karanovic, 2023), in USA and Canada (Kalai and Toukabri, 2024), in China (Chen et al., 2021; Li et al., 2023; Lv et al., 2022), in UAE (Dwivedi et al., 2021), in Kenya (Oranga

and Ondabu, 2018), and in other emerging economies (Nalluri and Chen, 2024)- there remains dearth of such studies in the Ghanaian context.

This research makes significant contributions to literature in several ways. Firstly, the utmost importance of this research is justified as it addresses the dearth of studies that have empirically assessed, within the context of fintech and bank profitability among universal banks in Ghana. Precisely, it addresses the issues of whether fintech impacts on profitability and liquidity of banks, pioneering in its focus on Ghana as an emerging economy. To the management of the banking sector, a study of this nature will provide useful insights that will inform their strategic decisions to invest in developing their own fintech solutions and meet the demands of customers in the digital age by offering innovative products and services. To the best of the researcher's knowledge, this research represents the first attempt to explore the impact of fintech adoption on bank profitability and liquidity by using 15 banks fully operating after the banking sector clean-up exercise in Ghana over the period of 2014 to 2023.

Banks now face opportunities and challenges as a result of the advent of fintech which has transformed the banking industry. Through a number of models such as increased competition, modification in consumer behavior, and changes in business model, fintech has an impact on bank profitability and liquidity (Tang et al., 2024). Understanding how the advent of fintech impacts on bank profitability and liquidity remains a pressing issue for key stakeholders including regulators, policymakers, and management of banks. In light of this background, this research seeks to answer the following questions:

- (i) What is the impact of fintech on bank profitability?
- (ii) What is the impact of fintech on bank liquidity?

The rest of this paper is structured as follows: Section two presents the literature review. Section three describes the research methodology and data sources. Section four and five present the major findings and conclude the study respectively.

Literature Review and Hypothesis Development

1. Definition of Financial Technology

Fintech has been defined by Li et al. (2023) as the application of innovative technologies based on blockchain, digital currency, big data, cloud computing and artificial intelligence in the financial industry, which are applied in retail banking, financial settlement, management of wealth, business financing, clearing, receipt and payment. From the perspective of Darolles (2016), fintech is the application of distinct forms of advanced technologies within the financial sector. Following the Financial Stability Board (FSB), fintech refers to the application of technologies, operating processes, and products regarded as creative innovation that utilize technical means to enhance financial innovation in a way to have significant effect on financial markets and institutions across the globe (FSB, 2016). According to Stulz (2022) fintech is defined as "financial innovation that is based on the use of big data and digital technologies." The

above definitions on fintech all point to a clear direction on innovative technologies and also have great promise for significantly lowering financial frictions by expanding on the cost-cutting possibilities made possible by digital technologies.

2. The Ghanaian Fintech Market

The Ghanaian fintech market, whose stakeholders include banks, financial institutions, as well as telecommunication companies is growing rapidly in Africa. Ghana's fintech ecosystem is composed of payment solution companies (operated by telcos), digital financial services (like the Digital Ghana Agenda introduced by the government to enhance digital payments, and innovative technologies (like blockchain, and cryptocurrencies, among others). Improvements in the number of fintech service providers, mobile money agents, and the proliferation of fintech services are now driving the Ghanaian fintech sector (Coffie and Hongjiang, 2023). The fintech market of Ghana has made it possible not only for clients to enjoy interoperability of mobile financial services, but also improved e-commerce and financial services across the country. Currently, the Government of Ghana's initiatives such as the adoption of the 5G network, deepening financial inclusion, growing demand for digital financial services, and opportunities for innovative technological advancements have boosted the fintech market of Ghana. Besides, the fintech market has enhanced the government's revenue generation as the government was able to generate GH¢1.19 billion in 2023 from the e-levy (Citinewsroom, 2024; Senyo et al., 2024). According to Haruna (2012), Ghana's Fintech was mainly undeveloped prior to 2008. Financial exclusion, particularly in rural areas of Ghana, was exacerbated by this, poverty, illiteracy, and the perceived expense of formal account ownership (Haruna, 2012). Accordingly, this quick turnaround is attributed to the growth of ICT infrastructure in Ghana's financial sector (Adaba and Ayoung, 2017).

3. The Impact of Fintech on Bank Profitability

Many studies investigate the impact of fintech on bank profitability (Singh et al., 2021; Nguyen et al., 2022; Zheng et al., 2023; Khalaf and Al-Shaer, 2023; Chhaidar et al., 2023; Abdelhadi and Bashayreh, 2024; Hodula, 2024; Tarawneh et al., 2024), particularly in Africa (Tshukudu et al., 2022), Asia (Cho and Chen, 2021), America (Wang et al., 2024a), Europe (Chhaidar et al., 2023; Mirza et al., 2023), and cross-country (Nguyen et al., 2022). However, these studies on fintech-profitability nexus have reported mixed findings.

Tong and Yang (2024) analyzed the impact of fintech on profitability of 33 listed banks in China from 2013 to 2020. The study utilized a grouping regression method for the analysis as the different selected banks were categorized into four: state-owned, rural commercial, city commercial and joint-stock banks. Different results on the link between fintech and profitability were reported for the different types of banks. Specifically, the report revealed that fintech impacts positively on the ROA of state-owned, joint stock and rural commercial banks, while its impact on the ROA of city commercial banks is a non-significant positive.

[Lv et al. \(2022\)](#) employed data spanning from 2011 to 2020 from the Industrial and Commercial Bank of China to study how fintech impacts on banks profitability. Based on the available data, the study methodologically combined the error correlational model with Granger Causal Relation tests. The findings of the study revealed that the profitability of banks has a cooperative link with credit risks, bank assets and fintech. It was further revealed that fintech has an effect on banks' operations, which lowers their profitability; meanwhile, as the benefits of fintech grows over time, so does their profitability.

[Mirza et al. \(2023\)](#) sampled 319 European banks with data spanning from 2011 to 2021 to study the role of fintech in enhancing profitability in the euro zone. To eliminate any impact of exchange rate, the study selected samples from banks in the eurozone with homogenous currency. The results of the fixed-effect regression model revealed that investment in fintech positively enhances bank profitability. [Zheng et al. \(2023\)](#) utilized an unbalanced panel dataset from 660 banks across some selected emerging economies to examine whether fintech-driven inclusive finance induces bank profitability.

[Nguyen et al. \(2022\)](#) utilize dataset from 73 countries covering 2013 to 2018 to study the moderating role of bank regulations on the relationship between fintech credit and performance of banks. As a way of tackling potential endogeneity issues and ensuring robustness of results, not only were different proxies of fintech credit introduced by the authors, but also, they perform sub-sample analysis. Based on the results, the study reported that fintech credit reduces the profitability of banks. The study further reported that the presence of stringent banking regulations moderates the relationship between fintech credit and the performance of banks. [Phan et al. \(2020\)](#) in their study of fintech and bank performance utilized 41 banks in Indonesia with panel data covering the period of 1988 to 2017. Using the two-step GMM system dynamic panel estimator, results of the fintech influence bank performance negatively.

[Chhaidar et al. \(2023\)](#) revealed that the maximization of profit, according to the transaction cost theory, requires efforts on reducing the cost of transaction. That is, an optimum organisational structure (such as carrying out forward integration) should be applied by any organisation which aims to economize their transaction cost. Companies can now connect with low-cost suppliers worldwide because of the advent of new technologies, particularly the internet, which eliminates the need for forward integration. Therefore, [Kenneth and Jane \(2009\)](#) concluded that it supports the enhancement of productivity without expanding or even decreasing the organization's size.

The rise in banks Mergers and Acquisition (M & A) has increasingly captivated researchers, prompting [Akhtar and Nosheen \(2022\)](#) to research on the impact of fintech on acquirer's performance. The study divided the sample into M & A categories with the data covering the period of 2010 to 2020. Based on GMM analysis and the paired-sampled t-test, the results of their study revealed that the impact of fintech on acquirer's performance is positive and significant. Consequently, this study posits the first hypothesis as follows:

H1: Fintech has a positive impact on bank profitability

4. The Impact of Fintech on Bank Liquidity

Studies on the impact of fintech and bank liquidity are globally abundant (Okoli and Tewari, 2022; Guo and Zhang, 2023; Fan et al., 2024; Liu et al., 2024). Empirical literature has revealed that fintech influences bank liquidity in various ways (Fang et al., 2023; Tang et al., 2024). Some researchers revealed that fintech influences bank liquidity positively. According to Fang et al. (2023), fintech has the ability to alter the credit structure of banks to increase their liquidity. The researchers further revealed that opportunities to transform and innovate banks stems from the development of fintech. Fang et al. (2023) further reported that banks are able to leverage on fintech to change their loan structure and extend lending to long-tail customers, which tend to improve their liquidity creation. Following Liu et al. (2024), fintech policies enhance banks liquidity creation through the ability to convert liquid liabilities into assets in illiquid form.

On the other hand, Wang et al. (2021a) revealed that fintech can lower banks' profits and also weaken their incentives for liquidity creation. The researcher further elaborated that traditional banks are under significant pressure due to high initial investment and maintenance expenses associated with the adaptation of fintech. According to Qui et al. (2018), the cost of debt as well as the asset risk of banks increases as a result of fintech expansion. To stimulate deposit business, Deng et al. (2021) were of the view that banks facing a highly competitive environment may raise their rates of deposit, which has the effect of raising capital pressure on banks. As argued by Zhao et al. (2020), the asset quality of banks can be deteriorated by excessive competition caused by fintech innovation. Based on the above discussions, it can be inferred that fintech can increase bank costs and decrease profitability, eventually decreasing the capital of banks as well as their incentives to generate liquidity.

Moreover, empirical literature has revealed that banks' risk level has increased as a result of fintech adoption (Wang et al., 2021b). It has been argued that the operational risks in the banking sector have increased due to the application of innovative technologies such as AI and big data. Recently, new security challenges for banks continue to increase as a result of issues such as data security and app security (Tang et al., 2024). Fintech firms are more appealing to some clients due to their ability to provide a more efficient and less cost alternative to banks' businesses. Consequently, the credit risks of banks may increase as a result of losing their clients to competitors (Tang et al., 2024). The rise in operational and credit risks then cause liquidity challenges for banks.

A major function of banks, according to the financial intermediation theory, involves the creation of liquidity in the economy. To foster liquidity within the economy, banks do cater for both depositors and clients (Wu et al., 2024). The creation of liquidity by banks involves the activity of financing long-term illiquid assets with liquid liabilities which are short-term in nature. According to Lee et al. (2021), the adoption of fintech by banks has led to a shift from offline branches to online services, resulting in increased efficiency and service quality. Other scholars have revealed that fintech applications by banks foster financial inclusion, which enable them to expand their scope of business and

enhance their liquidity creation ([Maskara et al., 2021](#); [Liu et al., 2024](#)). Based on the above discussion, the second testable hypothesis emerged for the study:

H2: Fintech has a positive impact on bank liquidity.

Data and Research Methodology

1. Research Sample

In this study, annual data were employed from 15 banks currently operating in Ghana. These sampled banks are made up of indigenous banks and foreign banks and include Ghana Commercial Bank, Access Bank, ABSA Bank, Bank of Africa, FBN Bank, Fidelity Bank, First Atlantic Bank, GT Bank, Prudential Bank, Stanbic Bank, CAL Bank, Ecobank, Standard Chartered Bank, Societe Generale Bank, and Zenith Bank. Having operated for more than 15 years in Ghana, these banks survived after the banking sector clean-up exercise conducted by the Bank of Ghana to sanitize the banking system. Besides, these banks suggest a good representation of Ghana's banking sector as they contribute more than half of the total bank assets in Ghana.

2. Data Source

The data to measure fintech adoption, profitability and liquidity of banks were sourced from the annual reports of the sampled banks. Macro-economic variables employed as control variables were sourced from the World Bank Indicators Database (WBID). The 150 observations include 15 banks with a sample period from 2014 to 2023.

3. Variable Definition and Measurement

Independent Variables

Studies have employed different proxies to measure fintech. [Tang et al. \(2024\)](#) in their study utilised data from 7 dimensions to measure fintech. These dimensions include network transmission, payment system, resource allocation, risk management, big data, AI and distributed technology. Similarly, [Tong and Wang \(2024\)](#) employed five dimensions which include technological innovation, payment and settlement, financial information, risk control, as well as lending and financing, to measure fintech in their study. [Wu et al. \(2024\)](#) in their study measured fintech adoption using various online news sources and new article titles on fintech. Generally, prior studies have measured fintech adoption using AI, blockchain, big data, cloud and internet ([Wang et al., 2021b](#); [Zhang et al., 2024](#)). Based on data availability, this study followed the proxies (which include ATM services, internet banking services and mobile banking services) employed by [Bashayreh and Wadi \(2021\)](#) to measure fintech.

Dependent Variables

The indicators employed to measure the profitability of banks showcase the ability of the banks to utilize the funds to obtain profits, while keeping cost and expenses under control ([Wang et al., 2024c](#)). Following [Lv et al. \(2022\)](#), this study measured bank profitability with return on equity (ROE). Mainly, the ROE is employed by analysts and researchers to measure how effective banks are in utilizing their own capital. In addition, liquidity as another dependent variable, which measures how a company might be able to meet their short-term debt obligations, was measured using the current ratio of the

selected banks. It was computed by dividing the banks’ total assets by current liabilities within a specified time frame (Akhtar and Nosheen, 2022; Fang et al., 2023).

Control Variables

In this study, some bank variables and macro-economic variables were employed as control variables. The bank-specific control variables employed include non-performing loans (Tang et al., 2024), bank size (Akhtar and Nosheen, 2022), and firm age (Talavera et al., 2018). According to Tang et al. (2024), these bank-specific control variables may influence fintech-profitability nexus. The macro-economic variable employed as a control variable is GDP. These variables will enable the researcher to capture the macro-environmental impacts on bank profitability and liquidity (Tang et al., 2024). Table 3.1 presents the description of the study variables.

Table 1. Variable Descriptions

| Variable | Measurement | Source |
|---------------|---|--------------------------|
| Fintech | value of ATM transactions per year | Bashayreh and Wadi, 2021 |
| | value of internet banking transactions per year | Bashayreh and Wadi, 2021 |
| | value of mobile banking transactions per year | Bashayreh and Wadi, 2021 |
| Profitability | ROE | Lv et al., 2022 |
| Liquidity | Current ratio | Fang et al., 2023 |
| NPL | NPL ratio | Tang et al., 2024 |
| Bank Size | Natural logarithm of total assets | Akhtar and Nosheen, 2022 |
| Firm Age | Natural logarithm of bank age | Talavera et al., 2018 |
| GDP | Annual GDP growth rate | Tang et al., 2024 |

Source: Author’s Computation (2025)

Model Specification

The following relevant studies (such as Zheng et al., 2023; Fang et al., 2023; Tang et al., 2024) were considered in the development of the research models. Hence, to assess the relationship between fintech and ban profitability, the following baseline econometric models were developed:

$$ROE_{it} = \beta_0 + \beta_1FINTECH_{it} + \beta_2NPL_{it} + \beta_3BSIZE_{it} + \beta_4AGE_{it} + \beta_5GDP_{it} + \epsilon_{it} \dots \dots \dots (1)$$

$$CR_{it} = \beta_0 + \beta_1FINTECH_{it} + \beta_2NPL_{it} + \beta_3BSIZE_{it} + \beta_4AGE_{it} + \beta_5GDP_{it} + \epsilon_{it} \dots \dots \dots (2)$$

Where, subscript i and t denotes the number of banks and time period (2014-2023) respectively; ROE and CR are the proxies of bank profitability and liquidity respectively; fintech represents financial technology; NPL BSIZE, and AGE refers to the bank-specific control variables; GDP represents a macro-economic variable; constant is denoted by β_0 ; β_1 to β_5 denote the coefficient of the variables; and the error term is represented by ϵ_{it} .

Methodological Description

To purify the data for robust analysis, Bartlett's sphericity tests and KMO were conducted using SPSS, and the results of the KMO were found to be 0.801. To test for data stationarity using EViews, the Augmented Dickey-Fuller test was employed and the results concluded that the panel data for the study contained no unit root since the p-values obtained at level, 1st and 2nd difference were < 0.05 . Besides, the Breusch-Godfrey test was employed to test for autocorrelation. Since their respective p-values obtained were more than 0.05, we accept the null, hence, the researcher concluded that there is no autocorrelation. Similarly, the results of the p-values above 0.05 obtained from the Breusch-Pagan-Godfrey test indicate the existence of no heteroscedasticity. Afterwards, the OLS estimation of the variables was performed. The next section of this paper presents the results and discussion.

Results and Discussion

1. Descriptive Statistics and Correlation

Table 2 presents the descriptive statistics of the variables employed. The explanatory variable, fintech, proxied by ATM banking, internet banking and mobile banking recorded a mean and standard deviation of 3.733 and 0.223, 3.479 and 0.182, 3.795 and 0.095, respectively. The mean values of the dependent variables ROE and CR, are 0.110, 1.147 respectively. In addition, NPL, firm size, firm age and GDP as the control variables of the study recorded averages of 13.995, 6.668, 1.412, and 5.784 respectively, as shown in Table 2.

To avoid the issue of multicollinearity, the researcher further carried out Pearson correlation tests for each of the variables. As indicated in Table 3, multicollinearity is not an issue in this study as the correlation coefficient between the variables employed are relatively low..

Table 2. Descriptive Statistics

| Variable | N | Mean | SD | Min | Max |
|------------------|-----|--------|-------|--------|--------|
| ATM Banking | 150 | 3.744 | 0.223 | 3.300 | 4.290 |
| Internet Banking | 150 | 3.479 | 0.182 | 2.980 | 4.040 |
| Mobile Banking | 150 | 3.795 | 0.095 | 3.510 | 3.980 |
| ROE | 150 | 0.110 | 0.522 | -4.083 | 0.521 |
| CR | 150 | 1.147 | 0.158 | 0.676 | 1.929 |
| NPL | 150 | 13.996 | 9.094 | 0.980 | 64.440 |
| Firm Size | 150 | 6.668 | 0.393 | 5.560 | 7.530 |
| Firm Age | 150 | 1.412 | 0.352 | 0.480 | 2.100 |
| GDP | 150 | 5.784 | 2.874 | 0.514 | 14.046 |

Note: this Table reports the descriptive statistics of the study variables. Table 3.1 presents the description of these variables

Source: Author's Computation (2025)

Table 3. Pearson Correlation Matrix

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---------------------|---------|----------|---------|----------|---------|---------|---------|--------|---|
| 1. ATM Banking | 1 | | | | | | | | |
| 2. Internet Banking | 0.647** | 1 | | | | | | | |
| 3. Mobile Banking | 0.236** | 1 | | | | | | | |
| 4. ROE | 0.037 | -0.067 | -0.038 | 1 | | | | | |
| 5. CR | -0.027 | 0.173* | -0.011 | 0.236** | 1 | | | | |
| 6. NPL | -0.025 | 0.035 | 0.066 | -0.445** | -0.100 | 1 | | | |
| 7. Firm Size | 0.670** | 0.212** | 0.205* | -0.039 | 0.337** | 0.097 | 1 | | |
| 8. Firm Age | 0.216** | -0.253** | 0.238** | 0.078 | -0.141 | 0.215** | 0.359** | 1 | |
| 9. GDP | 0.270 | 0.199 | -0.359 | -0.245 | -0.101 | -0.310 | 0.081 | -0.128 | 1 |

*, **, represents significance at 0.05 and 0.01 level, respectively

Source: Author's Computation (2025)

2. Regression Model

Table 4 shows the results of the OLS estimation performed initially to assess the impact of fintech on bank profitability. The results, as shown in Table 4, report the coefficient, p-values, and r-squared, among others.

Table 4. Impact of Fintech on Bank Profitability

| Variable | Coefficient | Std. Error | T-Statistic | Prob. |
|-------------------|-------------|-------------------|-------------|--------|
| Constant | 2.871529 | 0.924644 | 3.105550 | 0.0023 |
| ATM Banking | 0.302011 | 0.145006 | 2.082752 | 0.0391 |
| Internet Banking | -0.203683 | 0.139590 | -1.459149 | 0.1467 |
| Mobile Banking | -0.056358 | 0.180678 | -0.311927 | 0.7556 |
| NPL | -0.027530 | 0.004378 | -6.288887 | 0.0000 |
| Firm Size | -0.171115 | 0.063515 | -2.694101 | 0.0079 |
| Firm Age | 0.069076 | 0.058619 | 1.178402 | 0.2406 |
| GDP | -0.006191 | 0.013872 | -0.446321 | 0.6560 |
| R-square | 0.248978 | Observations | 150 | |
| Adjusted R-square | 0.211956 | Prob(F-statistic) | 0.000001 | |

Source: Author's Computation (2025)

Secondly, OLS estimation was carried out to assess the impact of fintech on bank liquidity. Table 4.4 reports the results of the regression estimation under the second model.

Table 5: Impact of Fintech on Bank Liquidity

| Variable | Coefficient | Std. Error | T-Statistic | Prob. |
|-------------------|-------------|-------------------|-------------|--------|
| Constant | 2.466528 | 0.254928 | 9.675375 | 0.0000 |
| ATM Banking | 0.004499 | 0.005448 | 0.825796 | 0.4103 |
| Internet Banking | 0.020203 | 0.008977 | 2.250504 | 0.0260 |
| Mobile Banking | 0.006421 | 0.009134 | 0.702993 | 0.4832 |
| NPL | -0.003183 | 0.001350 | -2.357043 | 0.0198 |
| Firm Size | -0.098279 | 0.018004 | -5.458855 | 0.0000 |
| Firm Age | 0.015982 | 0.017316 | 0.922954 | 0.3576 |
| GDP | -0.001498 | 0.004297 | -0.348592 | 0.7279 |
| R-square | 0.218287 | Observation | 150 | |
| Adjusted R-square | 0.179752 | Prob(F-statistic) | 0.000009 | |

Source: Author's Computation (2025)

3. Main Findings, Implications and Recommendations

The Impact of Fintech on Bank Profitability

Using EViews software, the study first analyzed the impact of fintech on bank profitability. The explanatory variable, ATM banking, recorded a coefficient of 0.302, which is statistically significant at 0.05 level (p-value=0.0391). This might be due to the fact that ATM banking introduced in Ghanaian society has received substantial acceptance and many bank customers are using them more frequently. According to [Wang et al. \(2021b\)](#), banks can employ fintech tools to enhance their profitability by boosting their operational effectiveness and broadening their service offerings. It is therefore recommended that banks should frequently install ATMs at many advantageous points to become easily accessible by their clients. Internet banking recorded a parameter estimate of -0.203, with p-value of 0.146, indicating a negative and insignificant relationship between internet banking and ROE. This might be due to the risky nature of internet banking which might prevent many people from patronizing the service.

As one of banks' core duties is to protect depositors' funds from risks ([Allen and Santomero, 1997](#)), it is recommended that banks put in place proper security measures and also educate their clients on security-conscious measures to protect their funds. Mobile banking also obtained a coefficient of -0.056, with a p-value of 0.755. The significant negative impact between mobile banking and ROE might be due to the high

transaction costs mainly due to the introduction of e-levy by the government of Ghana which is preventing a lot of people from carrying bulk transactions using mobile banking. According to the transaction cost theory, [Chhaidar et al. \(2023\)](#) revealed banks that aim to enhance profitability are required to reduce their cost of transaction. Based on this, it is recommended to the banks and government to reduce the charges on mobile banking to enhance financial inclusivity. The model obtained an R-square value of 0.245, depicting it can explain around 24.5% of the changes in the dependent variable. Findings of the study contradicts extant literature that reported a positive impact of fintech on bank profitability ([Mirza et al., 2023](#); [Tong and Yang, 2024](#)). Based on the results, the first hypothesis is not supported.

The Impact of Fintech on Bank Liquidity

The second model assessed the impact of fintech on bank liquidity. [Tang et al. \(2024\)](#) revealed that liquidity creation is one of banks' core duties. Referring to Table 4.3, ATM banking achieved a coefficient of 0.004, with P-value of 0.410, indicating a positive but insignificant relationship. As bank risks continue to rise, [Tang et al. \(2024\)](#) revealed that the rise in operational and credit risks cause liquidity challenges for banks. The OLS estimation output further revealed a positive and significant relationship between internet banking and bank liquidity (Coefficient=0.020; P-value=0.026). Empirical literature revealed that fintech can lower banks' profits and also weaken their incentives for liquidity creation ([Wang et al. \(2021a\)](#)). As revealed by [Lee et al. \(2021\)](#), this might mean that the adoption of fintech by banks has led to a shift from offline branches to online services, resulting in increased efficiency and liquidity creation. In addition, a positive but insignificant relationship was found between mobile banking and bank liquidity (Coefficient=0.006; P-value=0.483). This might indicate that the deepening of financial inclusion in Ghana through the mobile money ecosystem has triggered Ghanaians to deposit more of their funds in banks as they have the ability to link their bank account to their mobile money account to transact businesses anytime. The R-square of 0.218 reported is an indication that the model could explain up to 21.8% of the changes in the dependent variable. Results of the study confirmed a positive relationship between fintech and bank liquidity. Extant literature backs this finding ([Maskara et al., 2021](#); [Liu et al., 2024](#)). Based on the results, the second hypothesis is supported.

Conclusion

This study investigated the link between fintech and bank profitability, analyzing 15 universal banks in Ghana over the period from 2014 to 2023. Diverse set of methodologies, including data stationarity test, autocorrelation test, heteroscedasticity test, and OLS estimation to analyze the relationship under study. The findings of the study established a clear relationship between fintech, bank profitability and liquidity. Specifically, the findings showcase that fintech has a negative impact on bank profitability (ROE) among the banks in Ghana sampled for the study. Additionally, the

study found that fintech has a positive impact on liquidity (current ratio) of the selected banks. The robust link between fintech and bank profitability is apparent in countries across the sub-region advancing fintech to drive financial inclusivity.

Theoretically, the adoption of fintech on bank profitability and liquidity manifests in diverse advantages. These perspectives include offering enhanced range of services, enhancing customer satisfaction, deepening the customer base, enhancing loan portfolio, offering effective risk management strategies, moving from online banking to offline banking services, reducing queues at banking halls as well as the usage of physical monies to transact businesses, and enhancing the revenue-based on the government, among others. While there are numerous advantages, there are also issues to consider. Banks may face startup expenses, decreased profitability, and strict regulations. Moreover, maximizing fintech's potential requires a complete approach. This calls for the deepening of financial literacy among individuals to strengthen the fintech ecosystem.

Limitation and Direction for Future Research

This study was carried out using selected banks in Ghana. Specifically, 15 out of the 23 banks were utilized. Though the scrutiny yielded the requisite results, future studies should expand the scope to cover more countries. Future studies should also be carried out in advanced countries to ascertain the findings for comparison purposes.

While this study offers significant insights, it however, does not account for other indicators of fintech, such as AI, blockchain, and risk management, as a result of the study's scope and data availability. Subsequent studies should incorporate the other indicators of fintech. Besides, future studies should incorporate other macro-economic variables such as inflation rate, unemployment rate, interest rates as additional control variables. Nonlinear relationship between fintech and bank profitability should be carried out by upcoming studies.

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