








# Digital Finance on Stability among Philippine Banks

Albie Mae G. Sumaylo , Christine Mae S. Babon , Marivic L. Bayaras , Ella Michelle E. Pedrigal , Aleshia Klyne S. Pening , Mary Joy C. Teodosio\* , and Jesse S. Susada 

School of Business and Management, University of San Jose-Recoletos, Cebu City, Philippines

\*Email Correspondence: [maryjoyteodosio@usjr.edu.ph](mailto:maryjoyteodosio@usjr.edu.ph)

---

## Abstract

*To promote financial inclusivity while being responsive to technology demands, the Philippine government implemented a framework that requires banks to improve and innovate their payment systems. The introduction of the National Retail Payment System raises the question of whether the aim of Bangko Sentral ng Pilipinas in advancing digital financial inclusion significantly impacts the financial stability of universal and commercial banks. This correlational study examines the impact of digital financial inclusion on bank stability utilizing principal component analysis and linear regression analysis from a dataset of 19 universal and commercial banks from 2017 to 2019. Findings showed that a higher level of digital financial inclusion is associated with higher banking stability for Philippine universal and commercial banks. While the results support the study hypothesis of a positive relationship between the two (2) variables, the statistical significance cannot be guaranteed at the outset of this analysis due to the limited number of years examined.*

*Keywords: digital financial inclusion, BSP National Retail Payment System, universal banks, commercial banks, bank stability*

---

## 1.0 Introduction

In the year 2000, the General Banking Law provided that "the State shall promote and maintain a stable and efficient banking and financial system that is globally competitive, dynamic, and responsive to the demands of a developing economy" (The General Banking Law, 2000). With this, the government strengthens its partnerships with banking institutions, highlighting the importance of banks' initiatives to accelerate further financial inclusion by improving the level of digital payments in the country (Villanueva, 2021). To meet one of the objectives of the government towards achieving a stable financial system and to give every Filipino simple access to financial services whenever and wherever

they are needed via any digital device, the Bangko Sentral ng Pilipinas (BSP) adopted the National Retail Payment System (NRPS) Framework (Bangko Sentral ng Pilipinas, 2017).

A large portion of the country's population uses mobile phones, and, according to BSP Reports, 52% is inclined toward smartphone adoption. In the Philippines, the combined number of universal and commercial banks accounts for roughly 70% of the banking system's resources (Morales, 2022) and offers a wide range of accessibility and various digital financial services. Services include mobile wallet transactions and online banking. Such makes the banking sector grow in the country. The challenge is how this broad spectrum of financial inclusion facilitated by technology aids universal

and commercial banks in gaining value, specifically in their financial performance. According to Ahamed and Mallick (2019), banks with more comprehensive inclusions and offer various services help banks attain stability. Hence, this paper aims to investigate the impact of digital financial inclusion on banking stability in Philippine universal and commercial banks.

Banks play an important role in driving digital financial inclusion strategies, given the rapid development of technological innovations in the digital finance sector (Vo et al., 2021). An example of this financial inclusion strategy is the adoption of digital financial services such as mobile banking, internet banking, and mobile wallets (Durai & Jesus, 2019; Kithinji, 2017; Khera et al., 2021). The awareness of digital financial inclusivity benefits digital financial services users in all sectors, increasing access to underserved populations. There is a two-way cause-and-effect relationship between financial inclusion and digital finance. First, financial inclusion can increase digital finance utilization since bank account holders are made aware of the new and established platforms they can use. Such utilization leads to influencing other individuals to engage with the same service, thus, leading to increased digital financial inclusivity (Ozili, 2018). According to former BSP Governor Nestor Espenilla, Jr., digital infrastructure offers the chance to achieve financial inclusion. Although remoteness and high cost are major impediments to financial inclusion, the development of mobile banking opens an opportunity to eliminate these barriers because, with a smartphone, people can easily check their accounts in real-time to access financial services (Ezzahid & Elouaourti, 2021). A study conducted by Ahamed and Mallick (2019) evidenced from 86 countries concludes that the wide accessibility of financial services begets broad financial inclusivity with higher customer deposit funding share. Moreover, banks can make use of these resources to finance their lending activities from which they profit from

the interest income they receive (Vo et al., 2021).

While previous studies provide a positive link between digital financial services to financial inclusion, a study conducted by Agufa (2016) in the banking industry of Kenya did not consider financial inclusion as a primary objective for providing digital financial services. They found out that banking institutions adopt digital financial services not merely to foster financial inclusion but to improve profitability and lower the operational costs of opening and operating bank branches. However, previous research has also questioned the positive influence of financial inclusion on bank stability. The study conducted by Cihak et al. (2016) found that allowing extensive use of credit among individuals and firms can impose a threat with unexpected losses to the financial system and possibly lead to bank crises. In addition, Akhisar et al. (2015) concluded that electronic banking services could significantly affect the income statement due to the high cost of infrastructure and advertising expenses.

Various studies have been conducted generally on financial inclusion in the Philippines and other countries. Nonetheless, previous scholars have not paid much attention to digital finance. While the government continues its effort to achieve an inclusive financial system, specific steps have been taken to meet the demands of the digital era to foster bank stability per Republic Act No. 8791. The National Retail Payment System Framework by the Bangko Sentral ng Pilipinas requires financial institutions to improve and innovate their payment systems. However, there were no studies yet assessing the impact of this newly adopted framework on digital financial inclusion and its link to the bank's stability from the year of its adoption in 2017 until 2019. The Bangko Sentral ng Pilipinas provided only surveys that determined the percentage of the population who accessed and used these financial innovations. These surveys did not dwell on how digital financial inclusion affects bank stability. Hence, there is a need for further research.

The researchers raise the question of whether the effort of Bangko Sentral ng Pilipinas in adopting the National Retail Payment System to accelerate digital financial inclusion has a significant impact on the financial stability of universal and commercial banks. The result of this study intends to provide evidence for the BSP's resiliency in the adoption of digital financial services in conformity with Republic Act No. 8791 thus promoting bank stability. Additionally, it intends to encourage policymakers to formulate direct policy implications for improving the current digital financial inclusion associated with banking stability in the Philippine universal and commercial banks.

### **Framework of the Study**

This study is anchored on the theory of Constraint-Induced Financial Innovation developed by Silber (1983), which claims that financial institutions desire to develop and maximize profits to promote financial services innovation through the adoption of digital strategy. The theory acknowledges internal and external management limitations that may either enhance or hinder financial growth, so they are sought to be minimized (Achieng et al., 2015). As the independent variable, digital financial inclusion has evolved into the most modern phase of financial inclusion, with banks providing the vast majority of digital financial services to consumers and businesses. With this relationship, such inclusivity examined the significant impact on the dependent variable, bank stability, as measured by their financial performance. The following are the identified variables with their corresponding definitions:

#### ***Digital Financial Inclusion***

Digital financial inclusion refers to technological advancements to expand access to formal financial services offered by universal and commercial banks to the wide population. Previous studies have shown that digital

financial access and its usage are dimensions of digital financial inclusion (e.g., Banna & Alam, 2021; Ahamed & Mallick, 2019). Although there are threats to the high investment cost, the technology-driven access and usage indicators outweigh its cost by offering significant opportunities for digital financial inclusion (Akhisar et al., 2015). The following is the definition for each dimension identified with its corresponding key indicators:

- **FINANCIAL ACCESS.** It refers to the chance individuals and firms can safely use a wide range of financial services (Demirguc-Kunt et al., 2018) via digital platforms. The researchers identified the number of automated teller machines (ATMs) and the number of mobile money agent outlets as key indicators for financial access. The number of ATMs refers to the ATM available or made available by banks in different areas to make financial services like withdrawals and balance inquiries accessible to the users. The existence of ATMs allows simple banking transactions and interbank transactions without the need to visit bank branches (Vineeth, 2021). The number of mobile money agent outlets refers to the number of locations where mobile money agents, who serve as liaisons between banks and mobile services to perform banking transactions, are contracted. A 2017 Global Findex survey revealed that 22 % of adults without a formal financial account noted physical distance to a financial institution as one of the barriers. Mobile money agent outlets play a significant role in helping banks' financial services extend their reach to a wide population (Caputo, 2019).
- **FINANCIAL USAGE.** This refers to the extent and regularity of digital platforms for financial services and transactions. The key indicators identified are the number

of mobile money accounts and internet users using mobile banking. The number of active mobile money accounts refers to the digital accounts used by clients to manage cash transactions linked to a smartphone. The number of internet users using mobile banking refers to the total number of individuals who conduct banking transactions online via mobile devices.

### **Bank Stability**

Bank stability refers to the resilience and capability of a bank's financial system to adapt to the digital era. This includes carrying out payments through digital finance that promotes sound and efficient financial systems and increases financial performance in the banking sector. A good measure of bank financial stability is the z-score, widely accepted and used by previous studies (Banna & Alam, 2021; Ahamed & Mallick, 2019; Danisman & Tazari, 2020; Vo et al., 2021). Values from the z-score include return on average assets and equity-to-asset ratio, which are derived from the consolidated financial position and income statement of the universal and commercial banks of the Philippines.

## **2.0 Methodology**

The study utilized correlational research principles to explore the relationship between variables (Bhandari, 2021) and used data from the BSP's list of universal and commercial banks that engage in retail banking services such as electronic money fund transfers or remittances. Out of the 46 universal and commercial banks enumerated in the BSP statistics, only 19 banks met the criteria considered in this research. Data were gathered from various sources: (1) bank data were taken from the Bangko Sentral ng Pilipinas published statistics for banking financial positions and the individual bank's income statements; and (2) digital

financial inclusion was taken from the International Monetary Fund- Financial Access Survey, and Data Report Philippines. The time frame considered in the analysis was from 2017 to 2019, considering the 2017 adoption of the National Retail Payment System as part of the BSP's financial inclusion strategy to accelerate digital payments ("BSP Digital Payments," n.d.).

As part of geographic and demographic outreach penetration, the indicators for the access dimension considered were the number of ATMs and mobile money agent outlets per 100,000 adults and per 1,000 km<sup>2</sup>. As part of the usage dimension, the indicators were the number of active mobile money accounts and internet users using mobile banking. The researchers followed the studies of Kim et al. (2020), Banna and Alam (2021), and Ahamed and Mallick (2019) that measure bank stability using a z-score which has been widely used as a measure of bank riskiness—taking into account the following indicators: return on average assets (ROAA), the equity-to-assets ratio, and standard deviation of the ROAA. Z-score has been measured in the following way:

$$Z\text{-score}_{xy} = \frac{ROAA_{xy} + ETAR_{xy}}{\sigma(ROAA)_{xy}}$$

where ROAA<sub>xy</sub> is the return on average assets, ETAR<sub>xy</sub> is an equity-to-assets ratio, and  $\sigma(ROAA)_{xy}$  is the standard deviation of the ROAA of bank x in year y. The result can be interpreted as a direct positive relationship between the score and banking stability. To arrive at a single measure for digital financial inclusion, a principal component analysis was used. After arriving at one score to represent digital financial inclusion, linear regression was utilized to assess the strength of the relationship between the variables (Bevans, 2020). Using Minitab, a statistical tool for analyzing complex data sets, all the independent variables were plotted together with the bank stability scores. In this manner, the coefficients of the relationship, their corresponding

p-values, and the R-square (coefficient of variation) of the modeled equation were recorded. Hypothesis testing was performed using a 0.05 level of significance at a 95% confidence interval.

### 3.0 Results and Discussion

Table 1 exhibits Filipinos' digital financial access and usage within the three-year time frame. It can be deduced that there are 70 units of ATMs per 1,000 km<sup>2</sup> in the Philippines. The number of ATMs in the country increased by 2% which means 21,777 in 2019 from 21,278 in 2018. The number has grown since 2011, with an average annual growth rate of 9% as reflected in the BSP Report on the State of Financial Inclusion in 2019. Likewise, there are 28.68 machines all in all available per 100,000 adults. According to the International Monetary Fund-Financial Access Survey, ATMs per 100,000 adult Filipinos were reported to be 28.90 in 2018. This represents an increase above the previous year's figure of 28.14. In 2019, the data reached an all-time high of 28.99.

Furthermore, there were 100.20 mobile money agent outlets per 1,000 km<sup>2</sup>. These outlets serve 40.76 mobile money agent outlets per 100,000 adults. The BSP Circular No. 940, released on January 20, 2017, authorized a bank to hire third-party cash agents. Over 11,000 cash agents provided a wide range of banking services like deposits, withdrawals, fund transfers, and bill

payments in 2018. However, mobile money agent outlets showed a decreasing number from 2017 to 2019 as more people could transfer funds using only their mobile phones without going to physical outlets (BSP Financial Inclusion Survey, 2019). In 2017, there were over 120,000 other financial service access points, including e-money agents, 62,000 in 2018, and 34,000 in 2019. (Bangko Sentral ng Pilipinas, 2019).

On the other hand, there were 5.45 million active mobile money accounts and 25.93 million internet users using mobile banking in the country for three years. The number of active mobile money accounts increases further as people explore convenience and easy payment access. An attractive feature of PESONet and InstaPay is that the recipients are not charged for receiving payments electronically. Instead, senders pay low-cost fees set by the participating banks (Diokno, 2020). As of 2018, it increased from 2.14 in 2017 to more than double for at least five million Filipinos who continuously expanded to own active mobile money accounts in 2019 (Massally & Ricart, 2019). Meanwhile, the number of internet users using mobile banking has expanded dramatically as mobile phones have become viable channels for mobile banking and electronic payments. According to Kemp (2019), 54% of internet users utilized mobile banking up from 28% in 2018 and 2017 due to the early growth of digital payments.

**Table 1.** National Digital Financial Access and Usage Data

Year	Digital Financial Access			Digital Financial Usage		
	Number of ATMs per 1,000 km <sup>2</sup>	Number of ATMs per 100,000 adults	Mobile money agent outlets per 1,000 km <sup>2</sup>	Mobile money agent outlets: active per 100,000 adults	Number of active mobile money accounts (in millions)	Number of internet users using mobile banking (in millions)
2017	68.01	28.14	134.82	55.77	2.14	18.00
2018	71.36	28.90	88.72	35.93	5.04	18.76
2019	73.05	28.99	77.05	30.57	9.17	41.04
<b>Average</b>	<b>70.81</b>	<b>28.68</b>	<b>100.20</b>	<b>40.76</b>	<b>5.45</b>	<b>25.93</b>

Table 2 shows the bank stability scores for the universal and commercial banks (UKBs). In this study, bank stability refers to the financial stability of banks on the adoption of digital retail payment services. The year 2017 yielded the highest stability (z) score of the universal and commercial banks at 0.5664. PESONet was launched in November 2017 under the National Retail Payment System Framework, followed by InstaPay, a real-time low-value transfer credit in April 2018. This year, the late-year adoption of the framework shows no discernible effect on bank stability scores.

However, 2018 achieved negative stability scores for universal and commercial banks. Inflation in 2018 was at 5.21%, the highest inflation rate in the last ten (10) years (“Philippines: Inflation Rate,” n.d.). Inflation and interest rate increases may have made deposit alternatives and consumer spending more appealing than bank savings (Philippine Deposit Insurance Corporation, 2018). Consequently, lesser deposits translate into reduced cash available to support the bank’s lending activities, which translates into lower revenues (Vo et al., 2021).

Moreover, the 2018 BSP Report on Economic and Financial Developments reported total UKBs revenues at 32% which is lower than the previous year while the total expenses increased by 38.6%. This increase was attributable to high-interest expenses on government deposits, higher costs of printing new currencies, and increased taxes and licenses.

**Table 2.***The Bank Stability thru z-score*

Year	Bank Stability
	z-score UKBs
2017	0.5664
2018	-1.1546
2019	0.5882

**Development of Digital Financial Inclusion Index**

Due to the numerous subfactors that each domain consists of, a singular scoring system was desired, known as an index. This index was needed to arrive at one score to represent digital financial inclusion, which we then linked to the bank stability score.

**Table 3.***Principal Component Analysis: Eigenanalysis of the Correlation Matrix*

Eigenvalue	5.4354	0.5646	0.0000	0.0000	-0.0000	-0.0000
Proportion	0.906	0.094	0.000	0.000	-0.000	-0.000
Cumulative	0.906	1.000	1.000	1.000	1.000	1.000

In expressing the digital financial inclusion index, the six factors include: the number of ATMs per 1,000 km<sup>2</sup>, the number of ATMs per 100,000 adults, the number of mobile money agent outlets per 1,000 km<sup>2</sup>, the number of mobile money agent outlets: active per 100,000 adults, number

of active mobile money accounts, and number of internet users using mobile banking, were utilized. Results reveal that the first eigenvector or principal component represents 0.906 or 90.60% of the total variance. This finding is sufficient to represent the six (6) factors of digital financial inclusion.

**Table 4. Eigenvectors**

Variable	PC1	PC2	PC3	PC4	PC5	PC6
Number of ATMs per 1,000 km <sup>2</sup>	0.428	-0.069	-0.415	-0.152	-0.597	-0.510
Number of ATMs per 100,000 adults	0.410	-0.394	0.128	0.799	-0.064	0.131
Mobile money agent outlets per 1,000 km <sup>2</sup>	-0.421	0.258	-0.460	0.513	0.255	-0.466
Mobile money agent outlets: active per 100,000 adults	-0.422	0.243	0.527	0.219	-0.651	-0.119
Number of active mobile money accounts (in millions)	0.417	0.312	0.533	-0.024	0.371	-0.553
Number of internet users using mobile banking (in millions)	0.346	0.785	-0.196	0.161	-0.114	0.431

Applying the first principal component with 0.906 or 90.60% amount of the total variance, the index of Digital Financial Inclusion can be modeled by the equation given:

$$\text{Digital Financial Inclusion Index (DFII)} = 0.428 * \text{Number of ATMs per 1,000 km}^2 + 0.410 * \text{Number of ATMs per 100,000 adults} - 0.421 * \text{Mobile money agent outlets per 1,000 km}^2 - 0.422 * \text{Mobile money agent outlets: active per 100,000 adults} + 0.417 * \text{Number of active mobile money accounts (in millions)} + 0.346 * \text{Number of internet users using mobile banking (in millions)}$$

The model suggests that of the six (6) indicators of digital financial inclusion, four (4) are positively correlated while two (2) are negatively correlated with digital financial inclusion. The number of ATMs per 1,000 km<sup>2</sup>, the number of ATMs per 100,000 adults, the number of active mobile money accounts, and the number of internet users using mobile banking positively correlated with digital financial inclusion. On the other hand, the number of mobile money agent outlets per 1,000 km<sup>2</sup> and the number of mobile money agent outlets: active

per 100,000 adults negatively correlated with digital financial inclusion.

The number of ATMs per 1,000 km<sup>2</sup> and the number of ATMs per 100,000 adults positively correlated with the digital financial inclusion index. As these figures increased or were made available to both locations and the people, greater digital financial inclusion was observed. The BSP reported that 90% of Filipino adults remain most aware of ATMs for cash-based transactions. ATMs are still the most utilized access point by individuals since Filipinos find them more accessible and convenient than banks.

The number of active mobile money accounts (in millions) positively impacts the digital financial inclusion index. As these figures increased in the country, more access to financial services was manifested. Consumers could conduct fund transfers and remittances, pay bills, and purchase goods using only their mobile phones. As noted in the 2019 Financial Inclusion Survey mobile money was a significant driver of account ownership growth, growing from 7% to 8% in 2019 from 1% in 2017 (Bangko Sentral ng Pilipinas, 2019).

Likewise, the number of internet users using mobile banking (in millions) is positively correlated



with digital financial inclusion. As these figures increased, better financial access was observed in the country. According to Visa Inc. (2017), over three-quarters of Filipinos own a banking app on their mobile phones, and 80 % preferred to transact via the app rather than visit a branch. As a result, financial usage increased from around 30% in 2017 to 54% in 2019 as the BSP promoted the availability of financial transactions through NRPS to increase financial usage (Bangko Sentral ng Pilipinas, 2019).

With an important milestone in 2017, the BSP continued to advocate the growth of the country's backbone for payments and settlements via digital means. The prevalence of e-money accounts had the most significant increase, rising from 1.3 % to 8% in 2019. This part of financial inclusion that entails digital methods has a beneficial effect as the country gradually transitions away from physical and digital banking. Mobile banking users have a favorable response to this usage since mobile banking encourages accessibility, convenience, and time savings by utilizing mobile applications

to execute payments or even receive monies (Financial Inclusion Survey, 2019).

However, interestingly, the number of mobile money agent outlets per 1,000 km<sup>2</sup> and the number of mobile money agent outlets: active per 100,000 adults negatively correlated with digital financial inclusion. As these figures increased or were made available to both locations and the people, lesser digital financial inclusion was observed. Results showed a decrease in mobile money agent outlets from 2017 to 2019. The adoption of the NRPS introduced PESONet and InstaPay, which were launched in 2017 and 2018, respectively. This allowed greater participation in the retail payment system (Bangko Sentral ng Pilipinas, 2017). In 2019, mobile money agents started linking a user's bank account as one way to cash-in funds in their mobile wallet allowing users to transfer and cash-in funds using only their mobile phones (GCashResource, 2020). Such a system significantly decreases physical interaction with remittance and bayad centers but it increases digital financial inclusion.

**Table 5.** *Relationship between the Digital Financial Inclusion Index and Bank Stability*

Term	Coef	SE Coef	T-Value	P-Value
Constant	-3.85	5.49	-0.70	0.610
DFI index	0.0292	0.0413	0.71	0.608
S 1.15061	Rq 33.34%			

**Regression Equation**

Equation:  $z\text{-score} = -3.85 + 0.0292 \text{ DFI index}$

The regression analysis revealed that digital financial inclusion, represented by an index score, is positively correlated with bank stability as represented by its z-score. As the country's financial inclusion became more inclusive, better stability was recorded for the universal and commercial banks. The regression equation suggests that for every unit change in digital financial inclusion, the bank's stability increases by 0.0292.

The results are similar to the findings in the previous studies conducted by Banna and Alam in 2021 and Ahamed and Mallick in 2019. If there is an increase in digital financial services, there is also an increase in financial inclusion. Increased digital financial inclusion raises customer deposits, which contribute to the stability of the bank's financial system. These results provide evidence of the effectiveness of the adoption of the



National Retail Payment System, BSP Circular No. 980, in agreement with the General Banking Law of 2000 to keep a sound banking system that is responsive to the needs of a developing economy, competitive on a global scale, and dynamic (The General Banking Law, 2000). The finding implies a direct positive relationship between digital financial inclusion (DFI) and banking stability for Philippine universal and commercial banks. However, statistical results in this study ( $p$ -value  $> 0.05$ ) show that evidence may not be enough to prove the positive relationship between DFI for both universal and commercial bank stability. Though the study hypothesis is supported that "Digital financial inclusion positively impacts the Philippine universal and commercial bank stability, the statistical significance cannot be warranted at the onset of this analysis due to the limited number of years investigated. Furthermore, incorporating digital financial inclusion is not the only aspect involved in ensuring bank stability. Other factors influence bank stability such as bank-specific characteristics and macroeconomic components (Banna & Alam, 2021).

The conduct of this study provided a few limitations. Out of the 46 BSP-listed universal and commercial banks in the Philippines, only 19 met the retail banking services criteria. Additionally, the researchers cannot apply all the variables used by previous studies for the digital financial inclusion index due to a lack of data in the Philippines. It could only cover data until 2019 as data for digital financial inclusion in the Philippines were unavailable in the later years. However, the findings of this study are still valid and relevant despite the limits imposed by data constraints. They can aid future researchers in doing analogous studies on various types of banks or the entire country's financial industry. Therefore, future studies should examine other factors and ratios pertinent to bank stability and digital financial inclusion indicators whenever data is available in the Philippines.

#### 4.0 Conclusion

This paper examines the framework implemented by the Philippine government that requires banks to improve and innovate their payment system. The National Retail Payment System helps realize the BSP's goals of digital financial inclusion. This study provides empirical evidence of the efficiency of the Bangko Sentral ng Pilipinas in providing digital financial services that likewise promotes a stable financial system. Based on the results and discussion, higher digital financial inclusion is tantamount to higher bank stability. With more people engaging in digital financial services, banks have access to greater cash flows to support their lending activities that generates revenue through interest. In this context, expanding financial inclusion through digital means is a key step toward building a more stable financial system.

Although the limited number of years investigated may have provided insignificant statistical results between DFI and bank stability, the BSP can view digital financial inclusion as a catalyst for developing the banking industry's wider financial sector. Future researchers, therefore, can cover more years from the date of a new framework's implementation to measure the long-run effect of financial digitization on a bank's stability. In addition to the digital financial inclusion variables, researchers can also include other factors that influence bank stability. To achieve a consistent positive relationship between digital financial inclusion and bank stability, the government, legislators, and regulatory agencies can also take prompt actions and ensure that innovative, technologically-friendly, and regulatory-based policies are implemented effectively.

It is hoped that this study rekindle interest in conducting further research on digital financial inclusion and other aspects of financial inclusion as both are related to the banking sector and can significantly improve or innovate the BSP's efforts in accelerating financial inclusion in the future.

## References

- Achieng, O. C., Karani, K. P., & Tabitha, N. (2015). Financial innovation and the future of financial intermediation. *International Journal of Education and Research*, 3(5), 386-396. <https://www.ijern.com/journal/2015/May-2015/33.pdf>
- Agufa, M. M. (2016). *The effect of digital finance on financial inclusion in the banking industry in Kenya*. University of Nairobi Research Archive. <http://erepository.uonbi.ac.ke/handle/11295/98616>
- Ahamed, M. M., & Mallick, S.K. (2019). Is financial inclusion good for bank stability? International evidence. *Journal of Economic Behavior & Organization*, 157, 403-427. <https://doi.org/10.1016/j.jebo.2017.07.027>
- Akhisar, I., & Tunay, K.B., & Tunay, N. (2015). The effects of innovations on bank performance: The case of electronic banking services. *Procedia - Social and Behavioral Sciences*, 195, 369-375. <https://doi.org/10.1016/j.sbspro.2015.06.336>
- Bangko Sentral ng Pilipinas. (2017). *Adoption of national retail payment center (NRPS) framework* [Circular No.980 Series of 2017]. <https://www.bsp.gov.ph/Regulations/Issuances/2017/c980.pdf?fbclid=IwAR1dZTmcGyD61DoLUdgzZ4fJoVUQrQ83bruxWkFpTp88C-8-QY8eez5BveU>
- Bangko Sentral ng Pilipinas (2019). *2019 Financial inclusion survey*. <https://www.bsp.gov.ph/Inclusive%20Finance/Financial%20Inclusion%20Reports%20and%20Publications/2019/2019FISToplineReport.pdf?fbclid=IwAR1WtFAGab0aTLDjYJ2aONhEfMLoP8yShblzAawfHOW8-8L6UfAtbjVdZE>
- Banna, H., & Alam, M. R. (2021). *Is digital financial inclusion good for bank stability and sustainable economic development? Evidence from emerging Asia*. Asian Development Bank. <https://www.adb.org/publications/digital-financial-inclusion-good-bank-stability-sustainable-economic-development-asia>
- Bevans, R. (2020, February 20). *Multiple linear regression | A quick guide (examples)*. Scribbr. Retrieved November 15, 2021, from <https://www.scribbr.com/statistics/multiple-linear-regression/>
- Bhandari, P. (2021, July 7). *Correlational research. When & how to use it*. Scribbr. Retrieved November 13, 2021, from <https://www.scribbr.com/methodology/correlational-research/>
- BSP digital payments transformation roadmap 2020-2023. (n.d.). Retrieved November 13, 2021, from [https://www.bsp.gov.ph/Media\\_And\\_Research/Primers%20Faqs/Digital%20Payments%20Transformation%20Roadmap%20Report.pdf](https://www.bsp.gov.ph/Media_And_Research/Primers%20Faqs/Digital%20Payments%20Transformation%20Roadmap%20Report.pdf)
- Caputo, S. (2019, August 20). *The pivotal role of mobile money agents in driving financial inclusion*. GSMA. Retrieved November 13, 2021, from [https://www.gsma.com/mobilefordevelopment/blog/the-pivotal-role-of-mobile-money-agents-in-driving-financial-inclusion/?fbclid=IwAR0snkdvpHvSBE48Qkimi8NjCdAdw\\_b\\_65rXiXvpTEs727e3wzYcpSgEDqs](https://www.gsma.com/mobilefordevelopment/blog/the-pivotal-role-of-mobile-money-agents-in-driving-financial-inclusion/?fbclid=IwAR0snkdvpHvSBE48Qkimi8NjCdAdw_b_65rXiXvpTEs727e3wzYcpSgEDqs)
- Čihák, M., Mare, D.S., & Melecký, M. (2016). *The nexus of financial inclusion and financial stability: A study of trade-offs and synergies* [Policy Working Paper No. 7722]. Open Knowledge Repository. <https://openknowledge.worldbank.org/handle/10986/24639?locale-attribute=fr>
- Danisman, G.O., & Tarazi, A. (2020). Financial inclusion and bank stability: Evidence from Europe. *The European Journal of Finance*, 26(18), 1842-1855. <https://doi.org/10.1080/1351847X.2020.1782958>
- Demircuc-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. R. (2018). *The global finindex database 2017: Measuring financial inclusion and the fintech revolution*. The World Bank. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/332881525873182837/the-global-finindex-database-2017-measuring-financial-inclusion-and-the-fintech-revolution>
- Diokno, B. (2020, November 11). *Accelerating digital transformation in the COVID-19 era digital transformation in the financial services and navigating through the pandemic*. Bangko Sentral ng Pilipinas. <https://www.bsp.gov.ph/SitePages/MediaAndResearch/SpeechesDisp.aspx?ItemID=76>
- Durai, T., & Jesus, S.G. (2019). *Digital finance and its impact on financial inclusion*. Researchgate. <https://>

- www.researchgate.net/publication/330933079\_DIGITAL\_FINANCE\_AND\_ITS\_IMPACT\_ON\_FINANCIAL\_INCLUSION
- Ezzahid, E., & Elouaourti, Z. (2021). Financial inclusion, mobile banking, informal finance and financial exclusion: micro-level evidence from Morocco. *International Journal of Social Economics*, 48(7), 1060-1086. <https://doi.org/10.1108/IJSE-11-2020-0747>
- GCash Resource. (2020, July 27). *How to cash-in from your bank account (and unlock higher wallet limits)*. <https://gcashresource.com/how-to-cash-in-from-your-bank-account/>
- The General Banking Law of 2000, 11th Congress, 2nd Regular Session (2000). [https://lawphil.net/statutes/repacts/ra2000/ra\\_8791\\_2000.html](https://lawphil.net/statutes/repacts/ra2000/ra_8791_2000.html)
- Kemp, S. (2019, January 31). *Digital 2019: The Philippines*. DataReportal. [https://datareportal.com/digital-in-the-philippines?rq=philippines&fbclid=IwAR3meQG1OTAfMnK\\_qU7PK-uzN-Jy5iaysBVWL6OQpPzrKlJnbEppKSogR8](https://datareportal.com/digital-in-the-philippines?rq=philippines&fbclid=IwAR3meQG1OTAfMnK_qU7PK-uzN-Jy5iaysBVWL6OQpPzrKlJnbEppKSogR8)
- Khera, P., Ng, S.Y., Ogawa, S., & Sahay, R. (2021). *Is digital financial inclusion unlocking growth?* [Working Paper No. 2021/167]. [https://www.elibrary.imf.org/configurable/content/journals/\\$002f001\\$002f2021\\$002f167\\$002farticle-A001-en.xml?t%3Aac=journals%24002f001%24002f2021%24002f167%24002farticle-A001-en.xml](https://www.elibrary.imf.org/configurable/content/journals/$002f001$002f2021$002f167$002farticle-A001-en.xml?t%3Aac=journals%24002f001%24002f2021%24002f167%24002farticle-A001-en.xml)
- Kim, H., Batten, J. A., & Ryu, D. (2020). Financial crisis, bank diversification, and financial stability: OECD countries. *International Review of Economics & Finance*, 65, 94-104. <https://doi.org/10.1016/j.iref.2019.08.009>
- Kithinji, E. (2017). *Effects of digital banking strategy on financial inclusion among commercial banks in Kenya*. University of Nairobi Research Archive. <http://erepository.uonbi.ac.ke/handle/11295/102435#:~:text=The%20digital%20banking%20strategies%20had,over%20the%205%2Dyear%20period>
- Massally, K.N., & Ricart, R.M. (2019). The state of digital payments in the Philippines. [https://btca-production-site.s3.amazonaws.com/documents/436/english\\_attachments/The\\_State\\_of\\_Digital\\_Payments\\_in\\_the\\_Philippines.pdf?1577119102](https://btca-production-site.s3.amazonaws.com/documents/436/english_attachments/The_State_of_Digital_Payments_in_the_Philippines.pdf?1577119102)
- Morales, R. A. (2022, May 11). *The Banking regulation review: Philippines*. The Law Reviews. <https://thelawreviews.co.uk/title/the-banking-regulation-review/philippines>
- Ozili, P.K. (2018). *Impact of digital finance on financial inclusion and stability*. *Borsa Istanbul Review*, 18(4), 329-340. <https://doi.org/10.1016/j.bir.2017.12.003>
- Philippine Deposit Insurance Corporation. (2018). *A new horizon: 2018 annual report*. <https://bit.ly/3WUSzLe>
- Philippines: Inflation rate from 1987-2027. (n.d.). Statista. Retrieved April 26, 2022, from <https://www.statista.com/statistics/578717/inflation-rate-in-philippines/>
- Silber, W. L. (1983). The process of financial innovation. *The American Economic Review*, 73(2), 89-95. <https://www.jstor.org/stable/pdf/1816820.pdf>
- Villanueva, J. (2021, October 12). *Gov't boosts digital payments adoption in PH*. Philippine News Agency. <https://www.pna.gov.ph/articles/1156422?fbclid=IwAR19IHGHRERSiNh2G61zpg6lxMpzipPkZju7oPW3WO1-UJVDVhycn6vLtU>
- Vineeth. (2021). *ATM - Automated Teller Machine*. ClearTax. <https://cleartax.in/g/terms/automated-teller-machine-atm>
- Visa Inc. (2017). *More Filipinos using their smartphones for mobile banking and payments – Visa Study*. <https://www.visa.com.ph/about-visa/newsroom/press-releases/more-filipinos-using-their-smartphones-for-mobile-banking-and-payments-visa-study.html>
- Vo, D.H., Nguyen, N.T., & Van, L.T.H. (2021). Financial inclusion and stability in the Asian region using bank-level data. *Borsa Istanbul Review*, 21(1), 36-43. <https://doi.org/10.1016/j.bir.2020.06.003>