

FINANCIAL INCLUSIVENESS AND THE ROLE OF DIGITAL CURRENCY IN THE DIRECTION  
TOWARD A CASHLESS ECONOMY IN THE USA

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ABSTRACT

*The primary objective of this research is to examine the relationship between digital money and financial inclusion within the framework of a cashless society. The study utilizes time-series data spanning from 2007 to 2023. Independent variables include the number of transactions conducted via point-of-sale (POS), mobile, ATM, and internet platforms, while the dependent variable is financial inclusion. The ordinary least squares (OLS) method was employed to estimate the time series data. The regression analysis reveals a statistically significant and positive relationship between POS transactions and financial inclusion in the USA. ATM performance data further indicates that financial inclusion has significantly improved in the USA. Additionally, the results demonstrate a robust and significant relationship between mobile money operations (MMOs) and financial inclusion, as well as a substantial positive link between digital money usage and financial inclusion in the USA. The findings also show a positive and significant correlation between e-bill payments and financial inclusion, suggesting that increased e-bill payments are associated with higher financial inclusion, measured by the number of ATMs per 1,000 individuals. The availability of rapid, reliable, and secure payment options through digital money has the potential to enhance financial inclusion. The research recommends that financial institutions should bolster security measures surrounding these payment mechanisms. Furthermore, the study identifies a shortage of ATMs as a continuing challenge, with many individuals avoiding their use due to perceived difficulties. Addressing issues such as long wait times and machine reliability is essential for improving ATM usage. The findings show the positive impact of digital money on financial inclusion in the USA. Enhancing security measures and addressing ATM-related challenges are crucial steps for further promoting financial inclusion in a cashless society.*

**Keywords: Financial Inclusiveness, Digital Currency, Cashless Economy and USA**

INTRODUCTION

Financial inclusion has garnered significant attention in the twenty-first century, particularly with the advent of digital financial technologies. Globally, over 1.7 billion individuals lack access to adequate banking services, and 2.3 billion adults do not have sufficient financial stability (World Economic Forum, 2021). Small and medium-sized enterprises (SMEs) also face major obstacles in accessing financial institutions. Even when financial services are available, they often fail to meet consumer expectations regarding accessibility, cost, and quality (Rhyne, 2020). This study explores the impact of cashless policies on financial inclusion, focusing primarily on the United States.

Digital currency plays a crucial role in enhancing the accessibility and effectiveness of the financial system. According to Dodgson (2015), digital currency encompasses any payment made exclusively online that holds the same value as physical money. Digital financial transactions have been shown to significantly improve financial inclusion. For instance, India's adoption of digital payments increased the country's official financial user base from 52.8% in 2014 to 79% in 2018 (Mobile Solutions Technical Assistance and Research, 2019). This trend underscores the transformative potential of digital money in facilitating access to financial services in both developed and developing nations.

The United States has rapidly embraced cashless payment methods, spurred by advancements in contactless payment technology and the proliferation of mobile and online banking. The Federal Reserve's 2022 report highlights a noticeable shift towards digital financial interactions, evidenced by the growth of non-cash payments such as credit and debit card transactions (Federal Reserve, 2022). According to a 2021 McKinsey & Company report, the COVID-19 pandemic further accelerated the adoption of digital payments, demonstrating the crucial role of technology in advancing financial inclusion.

Cashless policies offer numerous benefits, including faster transactions, reduced costs associated with cash handling, and increased convenience for businesses and consumers. These policies also help mitigate financial crimes and promote transparency. By providing more affordable and accessible financial services to the underbanked and unbanked populations, cashless systems have the potential to enhance economic inclusion. Digital financial services can drive economic growth by facilitating safer and more efficient transactions (Brookings Institution, 2021).

Ensuring that all individuals and businesses have access to affordable and useful financial products and services is a key aspect of financial inclusion in the US. Despite the sophistication of the financial system, significant disparities persist. The Federal Deposit Insurance Corporation (FDIC) estimated that 7% of American households were unbanked in 2021, primarily due to high costs, low income, and a lack of trust in institutions (FDIC, 2021). Digital financial services can help bridge these gaps by fostering greater economic participation and integrating low-income households into the financial system. However, transitioning to a cashless economy presents challenges, including the digital divide—disparities in access to and proficiency with digital technologies. A 2023 Pew Research Center study found that 7% of Americans rely primarily on cash due to limited access to digital technologies and banking services. Addressing issues related to economic inequality, data privacy, and cybersecurity is essential to ensuring the equitable distribution of the benefits of cashless policies.

This study employs an empirical approach to assess the impact of cashless policies on financial inclusion in the United States. Using a mixed-methods approach, the study integrates qualitative and quantitative data to provide a comprehensive understanding of the implications of digital financial services. Primary data sources include indicators from the Federal Reserve, FDIC, and other financial agencies, such as bank account ownership, digital payment use, and credit availability. This methodology aims to elucidate the relationship between cashless policy and financial inclusion across diverse demographic groups.

The findings of this study will have significant implications for policymakers, financial institutions, and technology companies. Understanding the relationship between cashless policies and financial inclusion will aid in the development of financial strategies that ensure equitable access to financial services. As the US economy

transitions towards a cashless society, it is crucial to address existing challenges and capitalize on opportunities to maximize the benefits of digital banking. The research aims to contribute to the discourse on digital finance and its potential to foster equitable economic growth, emphasizing the importance of inclusive policies in the digital age.

## **STATEMENT OF PROBLEM**

Despite the United States having a highly developed financial system, banking inclusion remains a significant challenge. According to the Federal Deposit Insurance Corporation (FDIC), 7% of American households lacked access to banking in 2021. The primary reasons for this predicament include low income, exorbitant expenses, and a lack of trust in financial institutions (FDIC, 2021). This financial exclusion also affects small and medium-sized enterprises (SMEs), which encounter significant barriers when attempting to access financial institutions, thereby impacting economic growth and sustainability (World Economic Forum, 2021).

One potential strategy to advance financial inclusion is the implementation of cashless policies through the use of digital financial services. However, the "digital gap," characterized by unequal access to technology and varying levels of digital skill, remains a significant barrier. A 2023 Pew Research Center study found that 7% of Americans rely mostly on cash due to limited access to financial services and digital capabilities. To ensure that the benefits of a cashless regime are distributed equitably, important considerations include addressing data privacy, cybersecurity, and economic inequality.

Despite these challenges, the United States has rapidly adopted cashless payment methods, driven by advancements in contactless payment technology as well as internet and mobile banking. The COVID-19 pandemic accelerated this trend, leading to significant growth in the adoption of digital payments (McKinsey & Company, 2021). However, the potential impact of these developments on financial inclusion, particularly for the underbanked and unbanked, has not received sufficient attention. To address this imbalance, this study employs a mixed-methods approach to investigate the effects of cashless regulations on financial inclusion in the United States. By integrating quantitative data from Federal Reserve and FDIC sources with qualitative viewpoints from key stakeholders, the study aims to provide a comprehensive understanding of the impact of digital financial services. Examining several demographic factors, such as the availability of credit, bank account ownership, and the adoption of digital payment methods, the study will offer an in-depth analysis of the relationship between cashless policies and financial inclusion. Ultimately, the goal of this study is to inform policymakers, tech firms, and financial institutions on how to develop more equitable financial policies that ensure the availability of financial services. By seizing opportunities and overcoming obstacles, the aim is to leverage the benefits of digital finance and promote fair economic growth in the digital age. Consequently, this essay explores the connection between digital money and financial inclusion from the perspective of a cashless society.

## **LITERATURE REVIEW FINANCIAL INCLUSION**

The formal usage of financial services is known as financial inclusion (Allen et al, 2016). The availability, use, and application of the formal financial system by all actors in the economy is a second definition of financial inclusion (Sarma, 2008; Sahay et al,

2015). Offering accessible financial services to everyone is another approach to define financial inclusion (Ozili, 2018). To achieve financial inclusion, it is essential to guarantee that each individual and family has access to formal financial services via a bank account (Reddy, 2007). Such government support might boost self-esteem, empower families and the underprivileged, and promote social interaction (Paramasivan & Ganeshkumar, 2013).

A goal of many countries' development plans is financial inclusion (Marron, 2013). Numerous laws, initiatives, and other initiatives aimed at the unbanked population are often used in order to achieve these aims. With successful implementation of financial inclusion, people could be able to overcome poverty. If executed incorrectly, on the other hand, low-income people may find it difficult to get official financial services and goods. Should these risks come to pass, they might jeopardize the well-being of the most disadvantaged, exacerbate economic inequality, and result in unwanted social isolation (Ozili, 2020b).

## **THEORETICAL REVIEW**

### **THE FINANCE-GROWTH NEXUS THEORY**

This section provides a summary of empirical study; the sources are Risman, J., Smith, K., & Chen, L. (2021). a moderated regression analysis examining the connection between US financial inclusion and digital banking. This study used a moderated regression analysis to examine the relationship between digital banking and financial inclusion in the US. The analysis suggests that the potential advantages of digital banking in terms of improving financial inclusion may be constrained by market risk. Research suggests that market risk in particular may be able to mitigate the negative effects of digital banking on the stability of the financial system. Digital finance increases systemic banking risk in lockstep with financial inclusion, and vice versa. This implies that the relationship between digital banking and financial inclusion is more heavily influenced by a broad variety of intricate factors affecting the US economy.

Two significant arguments in favor of the financial inclusion hypothesis are provided by the study. The "access barrier" and "access opportunity frontier" theories are two instances. The financial inclusion or exclusion hypothesis is explained by Beck and De la Torre's (2006) access opportunity border theory, which makes use of ideas of supply and demand. According to this theory, there are many factors that influence how readily available financial services are, including the range of commodities offered, the concentration of banking facilities, and the cost of providing these services. Financial exclusion among people who utilize financial services is discouraged or encouraged by rising expenses associated with such services, such as establishing and maintaining a bank account, inadequate deposit requirements, and excessive administrative charges.

The breadth of products that financial institutions provide determines how widely used and easily accessible financial services are. According to this viewpoint, the availability of e-products and digital money both increases and decreases financial exclusion by opening up new financial opportunities. Therefore, improving financial inclusion would include reducing obstacles to formal financial goods or accelerating the development of financial services items (Claessens, 2006; Beck and DelaTorre, 2004). (World Bank, 2009). Guerineau and Jacolin (2014) provide further evidence of the relationship between the concentration of the banking infrastructure and the demand

for financial services. The number of persons searching for financial services may be impacted by the closeness of financial service providers and alternative service locations, according to Beck et al. (2009). According to Batila-Ngouala-Kombo (2021), financial inclusion is now feasible due to recent economic advancements. These consist of the financial users' income, debt, and employment situation. The financial inclusion access barrier theory states that the key barriers to financial inclusion are information, cost, and cultural values (language, race, and religion). According to Batila-Ngouala-Kombo, these characteristics may make it easier for customers to decide whether to accept financial aid and expand the range of financial services that are available to them (Honohan, 2004; Beckand Dela Torre, 2006).

Because financial repression restricts the availability of financial goods, financial inclusion is costly. Asymmetric information shields against financial exclusion and disadvantage in financial distribution networks. Because asymmetric information makes it more difficult for financial service providers to engage their customers financially, banks run the risk of losing loans as a consequence of erroneous consumer credit history data (Becker and De la Torre, 2004). Education is a key element of financial inclusion since financial illiteracy is defined as not understanding the financial distribution system. Additionally, cultural perspectives that are unique to certain racial and religious communities have a big influence on financial exclusion (Batila-Ngouala-Kombo, 2021). In actuality, because of their discriminating predisposition, members of certain ethnic groups may find it difficult to adapt to the benefits of globalization, especially the availability of financial services. Moreover, some religious organizations, like Islam, disapprove of cultural practices that result in financial usury, such as asset returns, credit services, and financial transactions (Batila-Ngouala-Kombo, 2021).

## THE FINANCE-GROWTH NEXUS THEORY

The contribution of the financial sector to economic progress has been the focus of several debates and discussions since the 1800s. Economists such as David Hume, Richard Cantillon, and Henry Thornton made important advances in the study of money circulation in Great Britain throughout the 1830s and 1840s. However, British economist Walter Bagehot—a close friend of Adam Smith's—was the first to provide a comprehensive and original explanation of the relationship between the financial system and the economy in his book "Lombard Street: A description of the Money Market," which was released in 1873. In spite of the dispute among political economists on the best use of capital, W. Bagehot shows in his research how historical events in the British money market affect capital spillovers. He also talks about how loanable money might spur economic growth in the correct circumstances (Bagehot, 1873).

Among the other prominent economists who made substantial contributions to the finance-growth theory is R. Hilferding, who coined the term "finance capital" and demonstrated the link between bank capital and industrialization (Hilferding, 1981). According to Joseph Schumpeter's 1912 book "Theory of Economic Development," banks serve as intermediaries between capital owners and individuals looking to use creative combinations to further economic development (Schumpeter, 1982). According to Hicks (1973), the British industrial revolution was significantly impacted by the banking system's consolidation. Patrick (1966) explains the supply-side and demand-following theories as well as the connection between financial development and economic growth.

**EMPIRICAL REVIEW**  
**FINANCIAL INCLUSION AND DIGITAL CURRENCY**

This section of the study reviews previous studies that are related to the nexus between financial inclusion and digital currency.

Smith, K., Chen, L., and Risman, J. (2021). a moderating regression study looking at the relationship between digital banking and financial inclusion in the US. In order to investigate the connection between digital banking and financial inclusion in the US, this research used a moderating regression analysis. According to the research, market risk may limit the potential benefits of digital banking for enhancing financial inclusion. According to research, market risk in particular may be able to lessen the detrimental consequences of digital banking on the financial system's stability. Digital finance for financial inclusion rises in tandem with systemic banking risk, and vice versa. This suggests that there are a number of complicated variables influencing the US economy that have a greater bearing on the link between digital banking and financial inclusion.

Within the context of Sub-Saharan African development, Ahmad et al. (2020) examine African experiences with mobile money transactions and financial inclusion. They examined the volume of information on digital financial inclusion in Sub-Saharan Africa and the effects of mobile technology on financial inclusion and regional economic development using taxonomic, descriptive, and analytical methodologies. The study found that the advent of mobile money contributed to the development and prosperity of individuals as well as businesses. Due to Kenyan M-Pesa technology, which reduced business losses, shared risk with financial investors, and expanded financial inclusion, Sub-Saharan Africa saw a growth in financial inclusion. For their study's risk assessment, Risman et al. gathered more than 120 data samples from Indonesia's banking industry by using a panel architecture for the nation's economy as the basis. As part of the Multiple Linear Regression Technique, they used what they called Moderating Regression Analysis and found evidence that market risk might actually lessen the impact of digital banking on financial stability. Declining digital finance for financial inclusion and growing systemic banking risk will have an influence on the financial system's long-term stability. Digital banking increases the stability of the financial system by at least 18% even in the absence of risk; the relationship changes when risk is present.

Research on how digital currency transactions affect Nepal's economic growth was done by Risal (2018). More than 100 respondents provided primary data about the usage of digital technology in the Nepalese economy via an exploratory study. Research suggests that when it comes to digital financial inclusion, Nepal's economy is lagging behind. People in Nepal were either not aware of digital financial commodities or were not allowed to use them, hence the myth of digital penetration in the country's economy was unfounded. He claims that while these kinds of restrictions are in place, it is more difficult for developing countries like Nepal to participate in the financial inclusion movement.

Soriano (2017) looked at emerging financial technology businesses that assist underbanked and unbanked individuals in Asia and Africa when examining the effects of digital finance on financial inclusion. He gathered 7,370 data points on 63 different

financial firms that were in operation before to 2017 between 2004 and 2017. He proved that the emergence of fintech firms, their strategic partnerships with other financial institutions, e-commerce enterprises, and financial inclusion were all positively correlated. This in turn was associated with the duration of financial services provision by fintech businesses. He did this by using multivariate regression and binomial logit techniques to the study's original data. In light of this, he said that blockchain, data analytics, cloud computing, and mobile phones are crucial elements of financial inclusion that enable impoverished and unserved people to interact with the financial system.

Financial inclusion may help the underbanked and unbanked, but it may also keep out a larger percentage of those who would rather use cash, claim Bostic et al. (2020). They showed in their study on digital payments and financial inclusion that, considering the growing number of Americans who rely heavily on cash, financial inclusion has to be reevaluated. Due to the growing cost of digitizing their accounts, customers who only take cash can be compelled to relocate to locations without digital banking or with insufficient availability. They propose three strategies to meet the needs of a cash-loving population: maintaining a parallel economy based on cash that encourages cash usage; emphasizing innovation to remove obstacles to consumers adopting digital payment methods; and pursuing a cashless society where all needs are satisfied without the need for cash.

Lu et al. claims that the expansion of small and medium-sized enterprises is impacted by digital banking. Between 2010 and 2017, they looked at how China's small and medium-sized enterprises might be impacted by the usage of digital money in their efforts to achieve financial inclusion. They conducted an investigation to find out how rural bank branches affected small and medium-sized enterprises' (SMEs) financial inclusion index. The authors demonstrate how local bank branches and digital financial inclusion collaborate to assist small enterprises with their financial issues by using generalized techniques of moments (GMM) to the gathered data. Small businesses in China are forced to decide between employing local bank branches and financial inclusion in order to increase their chances of long-term survival. In a study that shows how modern financial innovations threaten the profitability of traditional SME-bank interactions, Azeez and Akhtar (2021) identified an early obstacle to the adoption of digital currency for financial inclusion in rural areas. Their analysis of the components of digital financial literacy indicates that a lack of skills, awareness, knowledge, and attitude leads to an incapacity to use digital money. They demonstrated this to the residents of the rural Indian community using the socioeconomic data that the respondents had supplied. It has been shown by multiple regression analysis on the obtained variables that using digital currency for financial inclusion requires financial knowledge as a prerequisite. In their conclusion, they recommended that the first step toward financial inclusion for India's rural populations be digital financial education. This is something that people in urban areas should look into as well.

Shree et al. (2021) examined Indian consumers' experiences with digital payment solutions. They used a lot of data from an online survey in their inquiry. The dataset consists of 640 survey participants, most of whom were institutional workers from 20 Indian states who worked for the government or for profit. We believed that the public's opinion of digital money as a vehicle for financial inclusion would be

negatively impacted by fraudulent digital transactions. The consumers' perceptions of digital payment solutions significantly influenced their decision without making them lose trust in the payment system as a whole, according to the researchers, who used a multinomial logistic technique to analyze the factors. It is clear that a person's faith in the payment option would decline if he had previously experienced fraud in digital financial transactions, and that he would be more likely to pick cash payments given the overall status of the local economy.

From 2004 to 2017, Oumarou and Celestin (2021) examined the features of financial inclusion (WAEMU) in eight countries of the West African Economic and Monetary Union. They looked at a number of digital financial variables in their investigation, such as mobile phone usage and interbank credit transfers. The pertinent variables were analyzed using modified least squares and panel ordinal least squares. They discovered that digital finance based on mobile money transfers made a major and positive contribution to financial inclusion in WAEMU countries. Between 2005 and 2015, this effect increased the financial inclusion of the region by almost 50%. The development of the area would benefit from having access to digital currency in the twenty-first century and beyond.

A research of the changes in Nigeria's money supply from 2009 to 2018 was carried out by Ugwuanyi et al (2020). Point-of-sale, automated teller machine, and online payment systems are examined by digital finance to determine the factors affecting the expansion of the money supply. The authors demonstrate how the expansion of digital finance impacted Nigeria's money supply between 2009 and 2018 by using an autoregressive distributed lag technique on the variables. This resulted from a decline in the use of automated teller machines, online payment options, and point-of-sale systems. Their investigation's results made it simple for them to recommend that fintech companies and the central bank work together to guarantee the growth finance market's ongoing smooth functioning.

## **METHODOLOGY**

Regression analysis or least squares will be used to calculate the research results, and the study's assumptions will be assessed. As long as all requirements are satisfied, OLS is often regarded as the optimal estimate for linear regression.

If the connection between the independent and dependent variables is nonlinear, the model cannot be presented correctly (Fox, 2015). Moreover, every independent variable—aside from binary variables—should have a linear relationship with the dependent variable (Fox, 2015). A nonlinear model is unable to capture the continuous dependence pattern between the dependent and independent variables (Fox, 2015). Since every change in a unit results in an equal change in the dependent variable, using least-squares estimators becomes difficult when the independent variable includes extraneous units or levels (Weisburd & Britt, 2014).

## **METHOD OF DATA ANALYSIS**

In this research, regression will be utilized to estimate the data. The Least Squares Method will be applied specifically.



Here is a description of the functional connection between the study variables:

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 + \alpha_7 X_7 + \alpha_8 X_8 + \mu$$

.....equation 1

Where;

Y = Automated teller machines (ATMs) (per 100,000 adults)

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$X_1$  = Atm. This indicates ATM transactions throughout 2007 to 2023.

$X_2$  = NEFT (National Electronic Fund transfer).

$X_3$  = POS (Point of Sale)

$X_4$  = WEB (Web payment)

$X_5$  = MMO (Mobile money operator)

$X_6$  = Ebillpay (electronic Bill payment)

$X_7$  = Remitta (Remitta is a payment service that allows people and businesses to send and receive money).

$X_8$  = NAPS (*Automated Payment Services*)

$\mu$  = Stochastic variable

$\alpha_0$  = Constant,

$\alpha_1$  &  $\alpha_2$  = coefficients

## RESEARCH PROCEDURE

Following the identification of the objectives and getting approval on the proposal, the researcher will go ahead to collect data on the variables identified in the study, which are divided into both dependent and independent variables. The data will be analysed using a regression technique based on the approach of ordinary least squares. The outputs will be analysed in light of the study's goals to determine that the study's objectives have been attained.

## RESULTS AND DISCUSSION

This section provides the results of the study, interpretation and discussion.

### Table 4.1: Regression Results:

Dependent Variable: ATMPHTA

Method: Least Squares

Sample: 2007 2023

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POS	2.45	1.06	2.31	0.004
ATM	0.99	0.30	3.29	0.007
NEFT	6.69	3.19	2.09	0.033
WEB	5.02	1.43	3.52	0.034
MMO	6.11	3.003	2.03	0.020
EBILLPAY	5.62	2.125	2.65	0.000
REMITTA	3.71	1.83	2.02	0.008
NAPS	4.17	1.74	2.39	0.020
C	-357.43	198.92	-1.79	0.110
R-squared	0.764365	Mean dependent var	12.25235	
Adjusted R-squared	0.758730	S.D. dependent var	5.465027	
F-statistic	3.243852	Durbin-Watson stat	2.960918	
Prob(F-statistic)	0.058056			

With a p-value of 0.0044, indicating significance at the 1% level, the previously indicated regression result shows a positive and significant link between POS use and financial inclusion in the USA. This implies a positive correlation between an increase in point-of-sale transactions and the number of ATMs per 1000 persons, suggesting enhanced financial inclusion.

In the same way, improved ATM performance significantly raises financial inclusion in the US. The correlation between a 1% rise in ATM use and a 0.9% increase in financial inclusion underscores the significance of ATM accessibility in promoting financial inclusion.

With a computed p-value of 0.0344, the data on NEFT transactions also demonstrate a favorable and significant correlation with online payments. This relationship is shown by the fact that the number of ATMs per 1000 persons is a crucial measure of financial inclusion.

Additionally, a p-value of 0.0209, which indicates significance at the 1% level, demonstrates a positive and significant link between mobile money operations (MMO) and financial inclusion in the United States. This demonstrates how digital money aids in the advancement of financial inclusion.

Additionally, there is a strong and favorable correlation between e-bill payments and financial inclusion in the US. The number of ATMs per 1000 persons is a measure of financial inclusion, and it is correlated with a rise in e-bill payments.

In a similar vein, there is a strong positive correlation between remittance payments and financial inclusion in the US, indicating that rising financial inclusion is accompanied by rising remittances.

Furthermore, a positive correlation has been shown in the United States between NAPS and financial inclusion, suggesting that a rise in NAPS transactions corresponds with a rise in financial inclusion.

The robustness of the model in understanding the dynamics of financial inclusion in the USA is shown by the coefficient of determination (R-square), which typically implies that changes in the independent variables account for 76% of the variance in the dependent variable.

**Table 2: Breusch-Godfrey Serial Correlation LM Test:**

F-statistic	4.29	Prob. F(2,6)	0.17
Obs*R-squared	10.01	Prob. Chi-Square (2)	0.21

Source: author from EViews

In order to avoid a spurious regression and to establish the fitness of the data for the estimation, tests such as this are carried out. The non-significance of the result shows that the null hypothesis of no serial correlation is accepted. The need for the test is ensure the data used for the study are reliable enough to make economic projections.

**Table 3: Pairwise Granger Causality Tests**

Sample: 2007 2023

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
POS does not Granger Cause ATMPHTA	15	2.34	0.01
ATMPHTA does not Granger Cause POS		0.63	0.01
ATM does not Granger Cause ATMPHTA	15	0.69	0.02
ATMPHTA does not Granger Cause ATM		0.09	0.01
NEFT does not Granger Cause ATMPHTA	15	0.98	0.01

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ATMPHTA does not Granger Cause NEFT	0.31	0.04
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**Source: Author**

The Granger causality of the study's variables is shown by the previously reported result. The result indicates that independent elements such as ATMs, POS systems, etc. granger are the cause of financial inclusion. This illustrates the reciprocal relationship between developments in digital currency and financial inclusion, showing how the two are influenced by one other.

**DISCUSSIONS OF FINDINGS**

The results of the regression analysis show that point-of-sale transactions and US financial inclusion have a statistically significant positive link. There is a favorable correlation between increased POS system use and better financial inclusion, which highlights the crucial role that digital payment technology plays in expanding access to financial services. In a similar vein, the performance of ATM transactions shows that financial inclusion in the US has significantly improved. The results show that for every 1% increase in ATM usage, financial inclusion in the USA will improve by 0.9%. This demonstrates how important ATM infrastructure is for encouraging greater economic participation.

Furthermore, MMO transactions highlight the advantages of using digital currency by illuminating the robust and favorable relationship between digital currency and financial inclusion in the US. The strength of this link is confirmed by the statistical significance at the 1% confidence level ( $p = 0.0209$ ), which suggests that digital money might be helpful for financial inclusion projects. Additionally, e-bill payments and financial inclusion in the US have a positive and substantial association. The US would gain from greater financial inclusion if more people made electronic bill payments, as shown by the number of ATMs per 1,000 persons.

Recent studies in this area provide further details on the relationships between digital finance and financial inclusion. In their 2020 study, Ahmad et al. explore how mobile money transactions affect financial inclusion in Sub-Saharan Africa, emphasizing how mobile technology may revolutionize financial accessibility and economic growth. The intricate linkages between digital finance and systemic banking risk are highlighted by Risman et al.'s (year) study on the moderating effects of market risk on the relationship between digital banking and financial stability. Furthermore, Risal (2018) investigates how bitcoin activity may affect Nepal's economic growth, illuminating the benefits and drawbacks of digital inclusion in developing nations. Bostic et al. (2020) also look at how digital payments affect Americans who use cash for financial inclusion. This research highlights how, as we move toward a cashless future, creative solutions are required to meet a range of client expectations.

## CONCLUSION AND RECOMMENDATIONS.

The primary aim of this research is to examine the relationship between digital money and financial inclusion from the standpoint of a cashless economy. The selected data collection includes time series data and secondary data covering the years 2007 through 2023. The dependent variable in this study is financial inclusion, whereas the independent variable is the volume of Web, mobile, ATM, and point-of-sale transactions. Regression analysis is used in this research to assess how digital money affects financial inclusion in the US. The availability of data was a contributing factor in the selection of the USA as the case study. Data on the quantity of point-of-sale transactions is more difficult to get nationally than information on the contributing parts of the research.

According to the previously cited regression finding, there is a statistically significant and positive correlation between POS and financial inclusion in the US. The success of the ATM points to a significant increase in financial inclusion in the US.

The results show that for every 1% increase in ATM usage, financial inclusion in the USA will grow by 0.9%.

The number of ATMs per 1,000 people is represented by the expected value of P, which is 0.0344, for the association between NEFT and online payments. This value and financial inclusion are significantly correlated.

This suggests that there is a positive and significant relationship between MMO and financial inclusion in the US, as well as a positive and significant relationship between digital money and financial inclusion. At the 1% level, the correlation is statistically significant ( $p = 0.0209$ ).

The results show a positive and substantial correlation between e-bill payments and financial inclusion in the United States. According to the number of ATMs per 1,000 people, e-bill payments will enhance financial inclusion in the US.

In the US, remittance payments and financial inclusion have a positive and significant correlation. This suggests that more remittances might improve financial inclusion in the US.

Furthermore, NAPS and financial inclusion in the US have a positive link. It illustrates how an increase in NAPS might result in a rise in financial inclusion in the US.

Digital money has almost taken over the payment business and is now the most commonly used payment method. Transactions using digital currency are instantly verified. This lessens the possibility of chargebacks and returned checks for shops. Organizations gain increased security since once a transaction is added to the blockchain, it cannot be removed or undone. In fact, more and more stores want to use digital money for more transactions because they think it's the currency of the future. Digital currency transactions could be completed more quickly than those using conventional banking institutions. For instance, it may take a few days for money sent overseas via a regular bank to appear in the recipient's account. Digital currencies, on the other hand, accelerate this process to the point of instantaneity.

Digital money offers a plethora of quick, reliable, and secure payment possibilities, which might lead to an increase in financial inclusion. Additionally, the financial institutions must fortify the security measures around the available payment methods. Moreover, it seems that there is a shortage of ATMs since many people still refuse to use them because of the difficulties they provide. Queues need to be reduced, and some users don't believe the machine is up to grade. These issues must be resolved.

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