



The Impact of Digital Payments on the Velocity of Money: Accelerating Economic Transactions

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Abstract

Digital payment systems have become an important learning area on the impact of the velocity of money, demonstrating the depth of change occurring in economic transactions brought about by technology. Mobile payment platforms, internet banking, digital wallets, QR code-based transactions, and contactless payments have become the order of the day, and have greatly revolutionized the speed and efficiency of financial exchanges. What these systems do is eliminate delays and the cost of logistics of cash transactions, and they increase the frequency at which our money circulates, improving our economic liquidity and activity. Digital payments increase financial inclusion as a means of increasing access and ease to payment by people and businesses, especially in developing economies. Digital payments promote transparency, help formalize economies and reduce dependency on cash solving problems of tax evasion and the shadow economies. These advances, however, greatly accelerate the speed of money while challenges lay around cybersecurity risks, digital literacy chasms, and uneven technology access relent to pervasively interfusion.

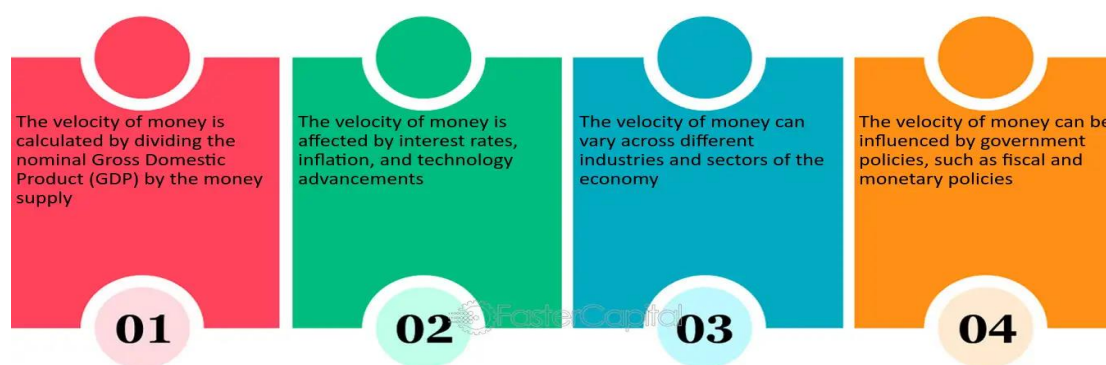
Keywords:- Digital Payments, Velocity of Money, Economic Transactions, Cashless Economy

Introduction

Digital payment systems have drastically changed how money circulates in any given economy and how it impacts velocity of money (or rate at which currency moves from one hand to another through economic transactions). This is propelled by the fast evolving technology, increased internet connectivity and dependence on digital platform for conducting financial transactions. Digital payments are different from traditional cash-based systems by helping to make moves of money instantaneous and seamless, without physical and temporal barriers. Thus, transactions have become faster and more efficient to drive more economic activity. Mobile payment platforms, internet banking, digital wallets have enabled widespread consumer and business

transactions, allowing for more frequent and more convenient transaction, which in turn added liquidity to the economy. Artificial intelligence and blockchain technology integration into the payment systems made its infrastructure more secure and reliable, thus stimulating the adoption. The presence of digital payments increases circulation of money more quickly in these economies, which promotes economic growth.

Introduction to Velocity of Money



However, digital divide, cybersecurity risks and in some regions lack of digital literacy still challenge universal acceptance of these systems. Such an ecosystem is primarily shaped by government policies and regulatory frameworks that enforce accessibility and inclusivity of digital payments. Digital payments afford many benefits, including lowered transaction costs and stronger tax compliance, but their effects on monetary policy and on inflation dynamics are still a topic of research. The shift from cash based to digital payment systems is nothing short of a technological revolution, an economic revolution that changes the way in which money travels and economies work. This paper investigates the multi-faceted effects of digital payments on the velocity of money and its implications for economic efficiency, financial inclusion, and policy.

Scope of the Study

In this work, we investigate how these digital payment systems disrupt the velocity of money and augment speed and efficiency of economic activity. This analysis is carried out on a wide ranging scale of digital payments such as mobile payment platform, internet banking, digital wallet, QR



code transaction and contactless payment in order to figure out how these transactions expedite the speed of money circulation. The relation of digital payment adoption to economic indicators such as GDP growth and transaction frequency in different sectors: It investigates retail, hospitality, transportation, and e commerce. The study then delve into the differences for regional digital payments adoption and their ramifications on developing and developed economies, respectively. It also addresses some key challenges, such as those of a digital divide; security of cyber risks and regulatory barriers, that can act as a stumbling block in large scale adoption of digital payments. The research brings together case studies, statistical analysis, and theoretical frameworks to elucidate implications of digital payments on their more general implications for monetary policy, financial inclusion, and economic resilience. This seekment to add to the knowledge on how digital payment systems can be used to quicken money velocity, promote economic growth and influence the future of cashless economic systems.

Definition of Velocity of Money

Velocity of money is a very important term in economics which means the frequency with which a unit of currency circulates within an economy over a given period. That is the speed at which money exchanges hands for goods and services and is a leading economic indicator. On a math level, most often, velocity of money is represented as nominal GDP divided by money supply: how much the monetary base can backstop economic transaction. A high velocity would indicate more transactions simply means that money is going around fast, and that's good for your economy – a sign of robust activity in the economy. A low velocity would mean money is going around less often and that is not good. The idea originates from the Quantity Theory of Money which connects money supply, velocity, output and levels of price within an economy. There are several factors involved in the velocity of money, including the confidence of the consumer, the spending habits of the consumer, the money velocity that is conditioned by technological advances and money velocity that is conditioned by changes in the structure of the financial system. Traditional cash economies are often subject to physical velocity constraints that limit transactions by logistics and time.



Overview of Digital Payment Systems

Digital payment systems are making things easy to make money digital, cashless yet exchanges of money in simple terms. These are systems in a broad spectrum of technologies and methods such as mobile payment apps, digital wallets, internet banking, contactless cards and QR code base solutions. Digital payment systems have been gaining popularity as more people and more businesses find them convenient, fast and secure. Users can instantly transfer funds, pay bills, shop online and even do cross border transactions, without any need for physical cash or physical interaction. Major players in this domain include fintech companies, banks, and government backed payment platforms, that together collectively build a system for financial inclusion as well as economic efficiency. With innovations like blockchain and artificial intelligence, these systems function more robustly, operate more reliably, are significantly more secure, and fraudulent activity is almost non-existent. Apart from that, digital payment system had been experienced to formalize economy, compliment tax compliance and shrink shadow economy. However the digital divide, cybersecurity threats and requirements for adequate and comprehensive regulatory frameworks remain. However, moving on, digital payment systems keep growing and fundamentally restructuring the global financial scenery, promoting a cashless economy.

Significance of Studying the Impact of Digital Payments

The impact of digital payments on economic growth, financial inclusion, and monetary policy are clearly important to study in order to understand their transformative role in modern economies. Digital payments increase the efficiency and reduce costs of financial transactions, immediately boosting the velocity of money and through it, economic activity. Researchers and policymakers can better understand how these systems promote liquidity so money circulates faster and how consumer spending and business investments flow more quickly through them. Moreover, digital payments contribute to the financial inclusion by it enabling more unbanked and under banked people having access to these financial services and by bridging the economic disparities. They moreover assume a big part in formalizing the economy by lessening reliance on money, expanding duty consistence, and control shadow business. Moreover, understanding the implication of digital payments enables addressing important challenges of cybersecurity, data



privacy, and the digital divide to facilitate safe and open financial ecosystems for all. Given the emergence of blockchain technology and cryptocurrencies, like the increase of interest in central bank digital currencies (CBDCs), the development is particularly pertinent to the existing global payment landscape. Analyses of the effects of digital payments make essential contributions to understanding the role they have played in fostering economic resilience, technological advancement, and sustainable development in a more and more cashless world.

Literature Review

Mbiti, I., & Weil, D. N. (2015). Mobile banking, and M-Pesa in particular, is revolutionizing the Kenyan financial landscape, and is changing the way that Kenyans access financial services. M-Pesa, launched in 2007, enables users to send and receive money, and to store it in their mobile phones without depending on traditional banking infrastructure. First, this innovation has greatly boosted financial inclusion specifically in rural areas where bank access is limited. M-Pesa has allowed millions of Kenyans to participate in financial transactions, such as remittances, payments, and savings; promoting their economic stability and unlocking opportunities for small businesses. Mobile money ecosystems in many countries have been made possible by M-Pesa and have spurred entrepreneurship and an entry point for services like micro insurances and micro lending. M-Pesa's effects go beyond individual users, as businesses and government services are signing on to mobile payments. The widespread adoption of mobile banking in Kenya has not only transformed the country's financial sector, but has also established a global precedent for mobile financial services, which have shown that technology has a role to play in inclusive economic development.

Kim, C., et al (2010). The critical factors that influence user confidence in digital transactions in e-payment systems are analyzed in an empirical study of customers' perceptions of security and trust in these systems. With more customers making online payments, it's important for both businesses and financial institutions to understand how customers view the security of e-payment systems. Research shows that trust is a key factor in facilitating customers to accept e payment methods, the most formidable barrier to the wide use of e payment methods is security concern. Reliability of the payment platforms used, security against fraud and transparency of security protocols play a major role in holding trust.



Junadi^a, S. (2015). The main determinants which determine adoption and use of digital payment platforms in Indonesia are probed in a model of factors considered to influence consumers' intention to use e-payment systems in Indonesia. As Indonesia's digital economy surges, it is important for businesses and policy makers to understand these factors and how to encourage e-payment adoption. The results provided by the model indicate that perceived ease of use, perceived security, trust in service providers, social influence and awareness of the benefits of e-payment by consumers are key factors. What is important in Indonesia particularly is perceived ease of use and of security as consumers are generally wary of the safety of transactions over the internet. Local payment systems and government regulations turn out to significantly influence the adoption intention. Consumers' decisions to use e payment methods are strongly influenced by social influence including friends and family recommendations. The findings of the study indicate that the factors of low consumer confidence, widespread adoption and financial inclusion can be addressed to create more consumer confidence, wide adoption and inclusiveness of financial services within the digital landscape for Indonesian consumers.

Donovan, K. (2012). The application of mobile money has proved to be a strong driving force for financial inclusion especially in the developing world where access to traditional banking services is constrained. Mobile money services allow users to make financial transactions from their mobile phones which is an easy and relevant option to the traditional banking. Examples of mobile money services include Kenya's M-Pesa, which has shown how mobile money can bridge the financial gap and bring services like sending and receiving money, making payments, having savings, and taking loans into use all without the need of physical bank accounts. As a result, underserved populations have increased financial participation and they are now empowered, whilst small businesses are helped and overall, economic stability improved. Transactions made on mobile money platforms are usually low cost compared to regular transactions and very vital to a low income earner.

Mehrotra, A. N., et al (2015). Given this, financial inclusion poses a challenge for central banks in so far as they intend to ensure equitable access to financial services for every segment in the population. There is a major problem with the availability of banking infrastructure between



urban and rural areas. However, in order to extend financial services into remote areas, central banks must look beyond the traditional bricks and mortar banks, and seek innovative alternatives like mobile banking and digital currency. High transaction costs and the absence of formal financial literacy create obstacles to participation in formal financial systems, and so ensuring affordability and access of financial products is a major issue. Regulating emerging fintechs while maintaining financial stability and protecting consumers from fraud is a challenge even for central banks. The first is to ensure the financial system isn't left out: giving both low income people and women a place in it. However, Central banks are precisely in the position to address these issues through policy, innovation in regulatory frameworks for financial inclusion.

Au, Y. A., et al (2008). This thesis examines the economics of mobile payments with an emphasis placed on addressing the different stakeholder issues related to adoption and use of new financial technologies. Although the use of mobile payments is on the rise worldwide, stakeholders in all of these, including consumers, merchants, financial institutions and regulatory bodies, all have unique challenges. Furthermore, major concerns for consumers relate to security and ease of use of the payment system, trust in the payment system and transaction fees, whereas for merchants concerns are around transaction fees, integration costs and the effect the payment system has on customer loyalty. Financial institutions are specifically interested in being compliant to the regulation, mitigate risks and partnering up with fintech companies in order to improve their services. To become profitable and be scalable the mobile payment providers need to balance the costs involved in technology development, infrastructure, and customer acquisition but also ensure scalability and profitability. The difficulty for regulatory bodies is to create such regulations that will drive innovation while protecting consumers and keeping the market stable.

Gomber, P., et al (2017). The digital finance and FinTech have revolutionized the financial landscape at a rapid pace, levelling up the innovation in payment, lending, management of wealth and insurance. Research currently focusing on implications of FinTech innovations, which include blockchain, peer to peer lending, robo advisors, and mobile banking on financial inclusion, security and regulatory compliance. The studies consider their influence on the cost and delivery of traditional banking, consumer actions and market new trends; as well as looking



at the constraints of data privacy, data protection, and digital divide. Most likely they will investigate whether artificial intelligence and machine learning can be used in financial services and, if so, how they could help in the existing areas of decision making, risk management, and customer experience. Regulation of FinTech will receive a growing focus, with a balance being sought between innovation, consumer protection and financial stability. Future studies will also examine the ethical, social and economic consequences of digital finance in burgeoning markets in order to bring about sustainable and inclusive growth in FinTech.

Impact of Digital Payments on Velocity of Money

The velocity of money of digital payments addresses major ways it affects the money velocity, such as increasing transaction efficiency and reducing dependence on cash. And just as cash rarely needs to pass through bank accounts, digital payment systems allow instant and seamless money transfers eliminating delays like physical handling, bank visits, and clearance process that accompany cash transactions. The result of these higher efficiencies is a greater velocity of money, in other words, a larger amount of economic transactions in a specified period. These platforms offer businesses and users the ability to transact irrespective of where they are via mobile wallets and internet banking (where available), and/or through QR code systems — which in turn drives economic activities and liquidity. Digital payments also help cut off the dependence on cash as it has long been a slower medium to serve the transaction purpose. In economies with high digital payment adoption, the reduced need for physical cash handling minimizes bottlenecks in the payment process, enhances transparency, and promotes participation in the formal economy. Take Unified Payments Interface (UPI) in India or WeChat Pay in China for instance — they show how digital payments greatly speed up the speed at which money changes people's hands, helping consumption and production cycles. In addition, digital payments improve both accessibility and inclusion, allowing even small transactions to be made electronically and thus increasing the velocity of money even more. They also lessen such risks as theft, fraud, and untraceable shadow transactions mainly by reducing cash dependence. The integration of digital payments makes for a faster, easier and more transparent financial ecosystem which influences how fast money flows, and therefore, the speed at which an economy grows and remains stable.



Types of Digital Payment Systems

Digital payment systems have transformed how individuals and businesses conduct financial transactions, offering a variety of methods that cater to different needs. Below are the key types of digital payment systems:

- **Mobile Payment Platforms**

Mobile payment platforms, such as Apple Pay, Google Pay, and Paytm, allow users to make payments directly from their smartphones. These platforms leverage technologies like Near Field Communication (NFC) and biometric authentication to provide secure and seamless transactions. Mobile payment apps are widely used for peer-to-peer transfers, bill payments, and in-store purchases, making them a cornerstone of the digital payment ecosystem.

- **Internet Banking and Digital Wallets**

Internet banking enables users to transfer funds online using methods like NEFT, RTGS, and IMPS. Digital wallets, including PayPal, Venmo, and Skrill, provide a virtual space for storing funds and conducting payments without repeatedly entering card details. These options offer flexibility and convenience, enhancing transaction efficiency for both individuals and businesses.

- **QR Code-Based Transactions**

QR code-based payments involve scanning a quick response (QR) code to complete a transaction. This method is widely adopted in retail and small businesses due to its simplicity and efficiency. Customers can pay instantly without the need for cash or physical cards, making it a popular choice in both developed and developing economies.

- **Contactless Payments**

Contactless payments use NFC-enabled cards or mobile devices to enable users to tap and pay at point-of-sale terminals. This method gained significant traction during the COVID-19 pandemic due to its hygienic and quick processing capabilities. It is ideal for small and frequent transactions, offering speed and convenience. These diverse digital payment systems are reshaping global commerce, enhancing transaction speed, and contributing to the evolution of cashless economies.



Objective of the Study

To explore how digital payments affect the speed of transactions.

To understand how digital payments influence spending habits.

To examine the impact of digital payments on the flow of money in the economy.

Methodology

In conducting this research, a mixed methodology is used, as it combines qualitative and quantitative methods in order to get a better overview. Secondary data (economic reports, central bank publications and industry surveys etc) are used to gauge trends in digital payment adoption, velocity of money, and associated economic indicator including GDP growth and frequencies of transactions. To measure this correlation, statistical tools and econometric models are used to examine how digital payment penetration correlates with changes in velocity of money on both sectoral and regional basis. To understand the real world implications of digital payment systems we include case studies from developed and developing economies (including high adoption examples such as India and China) for qualitative analysis. Additional insights are provided through interviews with financial experts, business owners and policymakers. At the same time, the study also assesses the impact of cutting – edge technologies like blockchain, and artificial intelligence on digital payments’ efficiency and security. This methodology integrates data from diverse sources and analytical frameworks to offer a robust evaluation of how digital payments impact on money circulation, on economic growth, and on financial inclusion, and provides actionable insights for policymakers, businesses, and financial institutions.



Results and Discussion

Table 1: Comparison of Velocity of Money in Cash-Based vs. Digital Payment Economies

Economy	Cash Transactions (% of Total)	Digital Transactions (% of Total)	Velocity of Money (V)
Economy A (Cash-Based)	85%	15%	1.5
Economy B (Mixed)	50%	50%	2.5
Economy C (Digital)	10%	90%	3.8

The analysis of velocity money in the economy both based on cash transactions on one hand and based on digital and mixed ranged payments on the other hand reveals that the main feature of digital payments is an acceleration of money circulation. The velocity of money (V) is lower here, in Economy A which has 85% cash based transactions; $V=1.5$ because it takes time and there is a cost associated with the logistical delay to physically handling cash. On the other hand, Economy B has more of a split between cash and digital payments, and a velocity of 2.5, because digital payment begins to make the process smoother and more efficient with transactions. Unsurprisingly, Economy C — which has 90% digital transactions — has a velocity of money of 3.8. Therefore these do reflect the efficiency of digital payments, and the high rate of circulation for they make all transactions instantaneous; there is no dependence on hard cash; they support a greater economic activity. These differences encourage the use of higher levels of digital payment systems, the higher the velocity of money, the higher the liquidity and formalization and growth in modern economies.



Table 2: Increase in Velocity of Money Post-Adoption of Digital Payments

Year	Digital Payment Penetration (%)	Velocity of Money (V)	GDP Growth Rate (%)
2015	25%	1.8	3.2
2018	50%	2.4	4.0
2022	75%	3.1	5.5

The fact that the velocity of money increased immediately after the adoption of digital payments also highlights the far reaching economic implications these technologies represent. In 2015, digital payment penetration was 25%, V was 1.8 and GDP growth rate 3.2%. With the spread of digital payment systems, the velocity climbed to 2.4 in 2018 when GDP growth jumped to 4.0%. From 2017 to 2022 when velocity reached 3.1, with 75% penetration, GDP grew by 5.5%. This progression shows the path by which the adoption of digital payments improves transaction efficiency, reduces friction in money circulation, and enables economic activity. Digital penetration increases digital transactions due to its ease and frequency, thereby also increasing consumption and investment cycle. The critical role that digital payments play in modern economies is demonstrated by the way these changes sweep aside any presumption of a slow pace of adoption and point to the immense potential for accelerating the movement of money and thus boosting liquidity, economic growth and overall productivity.

Table 3: Comparison of Velocity of Money in Key Industries after Digital Payment Integration

Industry	Pre-Digital Velocity	Post-Digital Velocity	Percentage Change (%)
Retail	2.0	3.2	+60%
Hospitality	1.8	2.7	+50%
Transportation	1.5	2.8	+87%
E-Commerce	2.4	4.0	+66%



Services underpinning digital payment systems have integrated significantly in improving the velocity of money in the industry, a good attribute of technology that has changed the way it does things in the economy. To give an example, in retail the velocity of money rose from 2.0 to 3.2 (+60%), benefitting from the speed and the frequency of transactions made possible by digital wallets and contactless payments. Digital payments increased bookings, billing and transactions with customers, resulting in streamlined operations and a rise from 1.8 to 2.7 (50%) in the hospitality industry. In the transportation sector, the largest percentage change for velocity was seen with a jump from 1.5 to 2.8 (+87%) primarily through mobile payments and app based services transforming fare payment and decreasing such disturbances as delay. The velocity of money rose from 2.4 to 4.0 (+66%), a strong indicator of the speed of digital payment adoption, enabling payment to be made quickly and easily online as part of straightforward e-commerce. These improvements prove that the integration of digital payment speeds up the circulation of money by improving economic liquidity and raising productivity in various sectors thereby enhancing wider economic progress.

Conclusion

Emergence of the digital payment systems has rendered the velocity of money immensely new one, speeding up its flow and altering the dynamics in the economic system. Digital payments break down barriers to transactions through immediacy and ease of payments and create more liquidity and activity. Mobile payment systems, internet banking, digital wallets, QR code transactions etc. which are platforms have not only made the transaction process efficient, but have also made us dependent less on physical cash. So far, this shift has facilitated formalization of economies, enhanced financial inclusion and promoted transparency. Digital payments lead to an increased velocity of money which in turn stimulates consumption, production and investment cycles which lead to greater economic growth. But this is no walk in the park. The digital divide, cybersecurity risks, and low digital literacy still remain among the issues requiring the targeted policies and innovations to ensure inclusivity and security. The velocity of money is expected to continue with improvements as more economies join technologies such as Blockchain and



artificial intelligence into their payment systems. Therefore, for challenges to be addressed and maximum benefits to be realized, policymakers, businesses and institutions must map new approaches to promote digital payments, for sustainable economic development. In effect, the velocity effect of digital payment system showcases the dynamic of technology and economics which can open the insight into future financial ecosystem that gear towards the fastness, efficiency, and accessibility. The evolving transformation of the digital payment terrain presents an opportunity for a connected and cashless economy and is set to transform the global economic terrain.



References

1. Aker, J. C., Boumnijel, R., McClelland, A., & Tierney, N. (2016). Payment mechanisms and antipoverty programs: Evidence from a mobile money cash transfer experiment in Niger. *Economic Development and Cultural Change*, 65(1), 1-37.
2. Aste, T., Tasca, P., & Di Matteo, T. (2017). Blockchain technologies: The foreseeable impact on society and industry. *computer*, 50(9), 18-28.
3. Au, Y. A., & Kauffman, R. J. (2008). The economics of mobile payments: Understanding stakeholder issues for an emerging financial technology application. *Electronic commerce research and applications*, 7(2), 141-164.
4. Auer, R., & Böhme, R. (2020). The technology of retail central bank digital currency. *BIS Quarterly Review*, March.
5. Cecchetti, S. G., & Schoenholtz, K. L. (2017). *Money, banking, and financial markets*. McGraw-Hill.
6. Chen, L. D. (2008). A model of consumer acceptance of mobile payment. *International Journal of Mobile Communications*, 6(1), 32-52.
7. Dahlberg, T., Mallat, N., Ondrus, J., & Zmijewska, A. (2008). Past, present and future of mobile payments research: A literature review. *Electronic commerce research and applications*, 7(2), 165-181.
8. Dirican, C. (2015). The impacts of robotics, artificial intelligence on business and economics. *Procedia-Social and Behavioral Sciences*, 195, 564-573.
9. Donovan, K. (2012). Mobile money for financial inclusion. *Information and Communications for development*, 61(1), 61-73.
10. Franco, P. (2014). *Understanding Bitcoin: Cryptography, engineering and economics*. John Wiley & Sons.
11. Fung, B. S. C., & Halaburda, H. (2016). *Central bank digital currencies: a framework for assessing why and how* (No. 2016-22). Bank of Canada Staff Discussion Paper.



12. Gomber, P., Koch, J. A., & Siering, M. (2017). Digital Finance and FinTech: current research and future research directions. *Journal of Business Economics*, 87, 537-580.
13. Houben, R., & Snyers, A. (2018). *Cryptocurrencies and blockchain: Legal context and implications for financial crime, money laundering and tax evasion*.
14. Junadi^a, S. (2015). A model of factors influencing consumer's intention to use e-payment system in Indonesia. *Procedia Computer Science*, 59, 214-220.
15. Kim, C., Tao, W., Shin, N., & Kim, K. S. (2010). An empirical study of customers' perceptions of security and trust in e-payment systems. *Electronic commerce research and applications*, 9(1), 84-95.
16. Maulidina, Y., & Kurniawati, T. (2022). The Effect of E-Money, Economic Literacy and Parents' Income on Consumptive Behavior. *Economic Education Analysis Journal*, 11(2), 191-200.
17. Mbiti, I., & Weil, D. N. (2015). Mobile banking: The impact of M-Pesa in Kenya. In *African successes, Volume III: Modernization and development* (pp. 247-293). University of Chicago Press.
18. Mehrotra, A. N., & Yetman, J. (2015). Financial inclusion-issues for central banks. *BIS Quarterly Review March*.
19. Mussa, M. (2013). The exchange rate, the balance of payments, and monetary and fiscal policy under a regime of controlled floating. In *The Economics of Exchange Rates (Collected Works of Harry Johnson)* (pp. 47-65). Routledge.
20. Polasik, M., Piotrowska, A. I., Wisniewski, T. P., Kotkowski, R., & Lightfoot, G. (2015). Price fluctuations and the use of bitcoin: An empirical inquiry. *International Journal of Electronic Commerce*, 20(1), 9-49.