Indonesian Annual Conference Series, Vol. 2, 2023
Halu Oleo International Conference on Economic and Business (IACS-HOICEB 2023)

Cashless Economy and Electronic Money: Concepts, Nexus, Opportunities, and Challenges

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Abstract

The principles of a cashless economy and electronic money have become revolutionary forces in finance and commerce in today's digitally-driven world. These two interrelated notions highlight diverse yet interconnected aspects of the current financial revolution. The purpose of this qualitative study is to provide a fresh grasp on the fundamental tenets of the cashless economy and electronic money, as well as a succinct overview of the two's potential traits and drawbacks. The study endeavors to illustrate how the two are interrelated as well. To the best of my knowledge, no study has ever examined the two concepts together, as both as the opportunities and challenges of e-money and the cashless economy in contemporary society are an area of study that has not been adequately considered as they ought to be. The study uses an exploratory research design and rests its conclusions on a variety of secondary sources of information, including articles, research papers, and journals.

Keywords: *Cashless Economy, Challenges, E-Money, Nexus, Opportunities.*
JEL Classification Codes: E42, O31 & O33

INTRODUCTION

In the fast-paced and interconnected world of today, a profound transformation is unfolding in the way we perceive and comprehend economy and money. As digital technologies continue to redefine each aspect of society, the realm of finance is no exception. The doctrine of the cashless economy and electronic money, an astonishing and multifaceted phenomenon that is transforming the global financial atmosphere, is at the pioneering of this paradigm shift.

The ideas of electronic money and a cashless economy have emerged as a revolutionary force in the constantly changing world of global finance, disrupting how societies conduct transactions and redefining the fundamental essence of money itself. These two interfere with traditional practices, reshape consumer behavior by changing their spending pattern and mediums, as well as offer limitless potential for businesses and governments alike in a world marked by rapid technology breakthroughs, digitization, and interconnection.

At its foundation, the two represent a paradigm shift in how people execute their financial activities. A cashless economy focuses on electronic payment mechanisms to handle the majority, if not all, of retail transactions, in striking contrast to traditional economies where actual currency serves as the principal means of exchange. Going cashless makes life easier while also assisting in the formalization and authentication of transactions. This contributes to curbing corruption and the flow of illicit funds, which boosts economic growth. The cost associated with printing and shipping currency notes has decreased too (Joshi, 2018). Because of the growing popularity of electronic commerce (Becirovic, 2014) and online purchasing (Aggarwal & Kapoor, 2020; Sarangi, 2022), new requirements for easy and secure payment methods have emerged. Since cashless transactions and economic growth are favorably correlated (Tee & Ong, 2016; Ong & Chong, 2022), a cashless society can result in systematic advancement (Goyal, 2021). This is due to the fact that while a cashless economy could facilitate transparent, efficient, and quick transactions, there are numerous practical issues with its widespread adoption, particularly the security concerns that present a significant obstacle (Gaba & Nagpal, 2017). Furthermore, reduced tax evasion, sponsorship of terrorism, money laundering, costs of money printing, and the like, are among the main advantages of a cashless economy (Kaur, 2019). However, eradicating black money is the primary goal of creating a cashless economy. Additionally, the ideal method to transition to a cashless economy is to digitalize all transactions, encourage the usage of plastic money, and encourage individuals to form strong digital transaction habits (Agarwal, 2019). However, to provide people with greater convenience, speed, and efficiency in their day-to-day financial transactions, credit cards, debit

cards, mobile payment apps, and internet transfers have evolved into the backbone of this transformative economic paradigm.

In today's digitally-driven world, the tenets of a cashless economy and electronic money have emerged as revolutionary forces in finance and commerce. These two interconnected concepts reflect distinct yet connected facets of the contemporary financial revolution. However, cyber fraud, high illiteracy, mindset, lack of trust in electronic transactions, lack of knowledge about the advantages of digital banking, a significant cash-dependent informal economy, and the absence of digital infrastructure in remote areas are some of the major obstacles to achieving a cashless economy to a large extent. Any attempt to move the economy towards a cashless system may be unsuccessful unless these structural problems are fully resolved (Sharma, 2019; Goyal, 2021). According to Pertiwi et al., 2021; IvyPanda, the major challenges for e-money are system errors, asymmetric information, default and double pay, card loss, hacking, cyber security, memorization of various pins & passwords, data theft, and user privacy. Jia et al. (2020), using the Technological Acceptance Model, showed that the use of e-wallets is positively correlated with perceived usefulness and ease of use. The main obstacles to the acceptance and use of e-money, however, include digital illiteracy, uncertain income, the desire to hold onto cash, and ignorance (Kumar & Chaubey, 2017). Therefore, to support digital payment services, a robust financial infrastructure is necessary (Lakhwani R., 2022). However, Sova K. (2013) revealed that young people are more willing to use e-money for a variety of purposes and are more excited about doing so even after meeting certain challenges. This clearly indicates the positive future prospects of e-money and a cashless economy in the world.

In the present study, the intention is not to provide conclusive clarification, but rather to promote critical discourse and a more comprehensive examination of how economic systems may be infused to accommodate the evolving demands of the twenty-first century. That's why I delve into the concepts, explore their nexus, and then assess the opportunities and challenges they present for individuals, businesses, and economies at large.

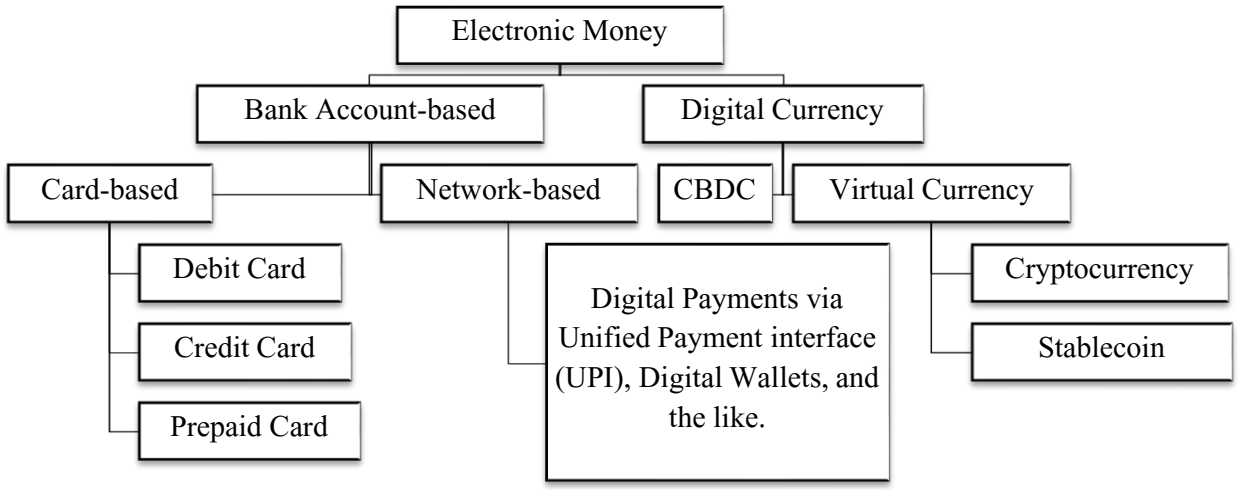
METHODS

The research employs an exploratory research design and relies on an array of secondary sources of data such as journals, articles, and theses, to establish its goals qualitatively. To the best of my knowledge, no study has ever analyzed the two concepts together, and the prospects and challenges of e-money and cashless economy in the modern world are an area of study that hasn't been as well explored as they could be. Thus, the study seeks to deliver a completely new insight into the inner concepts, drivers, and purpose of the cashless economy and electronic money, as well as a concise overview of the two's prospective benefits and challenges. The study makes an effort to demonstrate how they are interconnected as well. Lastly, the paper concludes by making some recommendations for promoting a cashless economy and enhancing e-money transactions worldwide.

RESULTS AND DISCUSSION

Electronic money, also known as e-money or digital money, refers to a form of money that exists only in digital or electronic form. It allows for electronic transactions, purchases, and transfers of funds without the need for physical cash or traditional banking methods. Electronic money is typically stored and transacted through various electronic devices, such as computers, smartphones, or specialized cards. The entire classification of e-money is depicted in Figure 1.

Figure 1. Classification of E-Money



Source: Author's Own

1. Debit Card: A debit card is a convenient and widely used payment method that is directly linked to a bank account. When making purchases or transactions, the amount is deducted directly from the user's account, making it an efficient way to access funds without carrying physical cash. A line of credit is not offered by debit cards, in contrast to credit cards.
2. Credit Card: Credit cards are financial tools that let customers buy things on credit up to a set spending cap. Credit cards, which are issued by financial institutions, offer a line of credit, and users can decide whether to pay back the borrowed amount in full at the end of the payment cycle or over time with additional interest fees. So, users can buy things even when they don't currently have enough money thanks to this flexibility. However, if it is not used wisely, it also carries the potential to lead to debt accumulation.
3. Prepaid Cards: Prepaid cards are a convenient alternative to traditional payment methods, offering many of the same benefits as debit cards, with the added benefit of allowing users to load a specified amount of money onto the prepaid card before making purchases or conducting transactions. Once the card's balance has been used up, it cannot be used again until it has been replenished. Even though it is issued by banks, it often does not require a checking account. However, the recipient's bank account receives the money paid.
4. Digital Wallets: A digital wallet, also referred to as an e-wallet, is a software-based application or service that allows users to conduct electronic transactions including online purchases, mobile payments, and money transfers while securely storing their payment information. The electronic transactions carried out by digital wallets typically involve two bank accounts.
5. UPI: Unified Payments Interface (UPI) is a real-time payment system, developed by the National Payments Corporation of India (NPCI) in 2016. It enables customers to send funds instantly and without a hitch between banks via a smartphone application. It makes it possible to conduct secure peer-to-peer (P2P), merchant, bill, and other financial transactions. Users of UPI can generate Virtual Payment Addresses (VPAs) or utilize their current bank account number and IFSC code for transactions after linking their bank accounts to a mobile app. Transactions are streamlined and need no sharing of private bank account information thanks to the VPA's role as a unique identifier. Users must enter the recipient's VPA or account information, set the payment amount, and approve the transaction using a unique UPI PIN to start a UPI payment. It is a quick and easy way of payment because the money is promptly sent from the sender's bank account to the recipient's bank account.
6. CBDC: Central bank digital currency (CBDC) refers to a digital form of a country's fiat currency

(legal tender) issued and regulated by the country's central bank. CBDC is a digital representation of the national currency, similar to physical banknotes and coins, but in electronic form. There are two primary CBDC types, which are as follows.

a. Retail CBDC: It is designed for use by the general public and is accessible to individuals and businesses. It allows for peer-to-peer transactions, retail purchases, and other payment activities. Retail CBDC intends to provide a safe and effective digital payment option to supplement already existing forms of money, such as actual cash and commercial bank deposits.
b. Wholesale CBDC: It is designed by financial institutions and other authorized entities for large-scale interbank transactions and settlements. It serves to strengthen the efficiency and security of financial market infrastructures as well as to simplify the clearing and settlement procedures.

7. Virtual Currency: It speaks about currencies that operate independently of a central authority and are regulated by outside parties. There are two different types of it, which are;
   a. Cryptocurrency: Cryptocurrency is a subset of virtual currency that functions on decentralized networks, generally using blockchain technology. To safeguard transactions and regulate the generation of new units, it employs cryptographic algorithms. Bitcoin is the most well-known cryptocurrency, but there are several others as well, including Ethereum, Litecoin, Ripple, Dash, Nano, and Tron. With the use of cryptocurrency, peer-to-peer transactions can be carried out without restrictions or requirements for intermediaries like banks. However, as a result of its decentralized structure, they are vulnerable to price volatility and regulatory complications. Its value normally depends on investors and speculators.
   b. Stablecoins: A specific kind of virtual currency called stablecoin, was created to solve price volatility. It has similar functions like cryptocurrency but is linked to a reserve asset, such as precious commodities (like gold & silver) or fiat currencies (like the USD, EUR, or INR), to keep the value consistent, giving consumers access to a digital currency that is less unpredictable and unstable. Some of its examples are BitUSD, Tether, USD Circle, Binance USD, Shiba Inu, etc.

Purpose of E-Money

Electronic money serves a crucial purpose for various stakeholders, including common people, businesses, and governments. From the perspective of common people, e-money provides unparalleled convenience and accessibility in conducting financial transactions. Individuals can effortlessly make payments, and transfer funds, eliminating the need to carry physical cash. Moreover, the security measures implemented in electronic money systems reduce the risk of theft and fraud compared to carrying physical cash. This added security reinforces the confidence of individuals in digital payment methods.

From a business perspective, electronic money offers numerous advantages, making it an increasingly popular choice for payment processing. Businesses can reduce expenses related to cash management, such as security, transportation, and cash counting, contributing to improved operational efficiency and profitability. Furthermore, embracing e-money as a payment option can attract more customers, especially those who prefer safe and secure transactions. This, in turn, can boost sales and expand the customer base for businesses.

Governments also recognize the significance of electronic money in advancing economic and financial objectives. Promoting financial inclusion is a crucial aspect for governments, and e-money can play a pivotal role in achieving this goal. By encouraging the adoption of electronic payment methods, governments can extend financial services to populations that may lack easy access to traditional banking infrastructure. This inclusion can stimulate economic progress by bringing more people into the formal financial system. As more economic activities become traceable and transparent through digital transactions, the widespread use of e-money can help reduce the size of the informal economy. It thus, provides Governments the ability to monitor financial activities which contributes to the fight against money laundering, tax evasion, and other financial crimes, promoting a more transparent and accountable financial ecosystem. Even during economic downturns, governments can leverage electronic payment systems to efficiently distribute financial aid and stimulus packages to citizens,

ensuring swift relief and supporting overall economic recovery.

Simply put, e-money serves a multifaceted purpose that aligns with the needs and aspirations of common people, businesses, and governments. The continued evolution and adoption of e-money are likely to play a pivotal role in shaping the future of global finance and commerce.

Drivers of E-Money

The widespread adoption of e-money has been driven by several major factors that have reshaped the financial landscape. Technological advancements, particularly in the fields of information technology and telecommunications, have paved the way for the development of fast and secure e-payment systems. The rise of smartphones and internet connectivity has empowered individuals to access financial services on the go, making e-money a convenient and accessible option for conducting transactions. Additionally, the growing demand for contactless payment methods, due to the Covid-19 pandemic, is driven by the need for e-money. Financial inclusion efforts by governments and financial institutions have also played a significant role in promoting e-money usage, as digital payment platforms provide a gateway to formal financial services for the unbanked and underbanked populations. Moreover, the expansion of e-commerce has created a conducive environment for the adoption of e-payment methods, facilitating seamless transactions in the digital marketplace.

Opportunities and Benefits of E-Money

The following are some of the potential applications or opportunities for e-money.

1. Digital Payment Solutions: E-money shortly can develop and offer innovative digital payment solutions that cater to specific market needs. This could include mobile wallets, peer-to-peer payment apps, and contactless payment systems.
2. Cross-Border Payments: Electronic money in the coming era could facilitate seamless and cost-effective cross-border transactions via electronic modes, targeting individuals and businesses with international operations.
3. Improve Financial Inclusion: Digital money focuses on providing e-money services to unbanked and underbanked populations, expanding financial inclusion in regions with limited access to traditional banking services.
4. E-Commerce Integration: The collaboration with e-commerce platforms to provide integrated e-money payment options, may enhance the convenience and security of online transactions in the fourth coming times.
5. Internet of Things (IoT) Payments: E-money in the future may explore the opportunities to enable IoT devices (smartphones, smart security systems, digital personal assistants, smart home devices, and connected vehicles, etc.) to make payments secure & efficient.
6. Efficient Financial Management: In the upcoming future, e-money may concentrate on developing digital programs and platforms that enable users to manage their finances effectively, including budgeting, savings, and investment features.
7. Security and Fraud Prevention: Invest in robust security measures to protect against fraud and data breaches, building trust among users and businesses, soon.
8. Partnerships and Integration: The collaboration of fintech companies, financial institutions, and technology providers, could expand the overall e-money ecosystem.
9. Regulatory Compliance Solutions: In the future, there may be development in solutions to assist e-money providers in meeting their regulatory requirements and ensuring compliance with evolving financial regulations, with the help of the government.
10. Blockchain and Cryptocurrency Integration: Explore opportunities to integrate e-money platforms with blockchain technology and cryptocurrencies, catering to the growing interest in decentralized finance (DeFi) and digital assets.
11. Government Policies: Shortly, all the financial grants & subsidies of the governments may be provided directly to the beneficiaries electronically.

Overall, the advantages of e-money are rooted in its capacity to facilitate transactions, increase financial accessibility, improve security, and foster economic growth, making it an essential component in the development of the digital economy.

Challenges for E-Money

While e-money has many benefits, there are also several issues that must be resolved if it is to be adopted widely and continue to be successful. The

following are a few of the primary challenges with e-money.

1. Security Concerns: E-money platforms are susceptible to cyberattacks, data breaches, and fraud, which raises questions about the safety of financial transactions and personal information.
2. Regulatory Compliance: E-money services often operate across national borders, leading to complex regulatory landscapes. Adhering to different financial regulations in various jurisdictions set by different governments can be challenging for the providers and thus, may hamper cross-border operations.
3. Digital Division: Despite the progress in digital connectivity, the digital divide still exists, especially in rural and underdeveloped regions. Lack of access to stable internet and technological infrastructure can hinder the adoption of e-money in such areas.
4. Consumer Protection: Ensuring consumer protection is crucial in the e-money space. Issues like unauthorized transactions, disputes, and resolution mechanisms need to be well-defined and implemented to safeguard users' interests.
5. Interoperability: The lack of interoperability between different e-money platforms and payment systems can create inconvenience for users and limit the seamless transfer of funds between different accounts.
6. Financial Literacy: Many individuals, particularly in developing countries, may lack the necessary financial literacy to use e-money effectively. Education and awareness programs are needed to help users understand the benefits and risks of digital payments.
7. Payment Infrastructure: In some regions, the payment infrastructure may not be fully developed to support the seamless adoption of e-money, leading to limited acceptance points and usability challenges.
8. Fraud and Scams: E-money platforms can attract scammers and fraudulent activities, taking advantage of unsuspecting users, particularly in the absence of strong security measures.
9. Trust and Perception: Building trust among users, especially those who are skeptical of digital payment systems, is a significant challenge. Overcoming concerns related to security and reliability is essential for broad adoption.
10. Privacy Concerns: E-money transactions generate valuable user data, raising concerns about how this data is collected, used, and protected. Balancing data privacy with the need for customer insights can be complex.
11. Connectivity Issues: Reliable internet connectivity and network stability are essential for e-money transactions, but in some areas, both network and internet connectivity may be inconsistent or unavailable, hindering the seamless use of e-payment systems.
12. Regulatory Innovation: As technology evolves rapidly, existing regulations may struggle to keep pace with the dynamic e-money landscape. Regulatory frameworks need to adapt and innovate to address emerging challenges and risks.

To overcome these obstacles and establish a safe, inclusive, and strongly regulated e-money ecosystem, governments, businesses, and financial institutions must work together.

Caseless Economy

A cashless economy is one in which the majority, if not all, of retail transactions are made through electronic means rather than physical cash. In such an economic system, individuals use a variety of electronic payment resources, including credit cards, debit cards, mobile payments, and digital wallets, to make purchases of products and services. The transition to a cashless economy has been fuelled by technological advancements, growing digital infrastructure, and changing consumer preferences.

1. Purpose of Cashless Economy

The purpose of a cashless economy is to eliminate or significantly reduce the usage of physical cash in financial transactions and replace it with electronic payment methods as a whole. However, the purpose of a cashless economy serves an entirely distinct function for common people, corporations, and governments.

The idea of a cashless economy is appealing because it makes financial transactions more convenient, quick, and efficient. With electronic payment methods, individuals no longer need to carry cash or deal with change while making purchases, paying payments or bills, or transferring money. This lessens the need to manage change or carry physical currency for common people. For business organizations, electronic transactions provide simplified payment processes, improved record-keeping, and the possibility for cost reductions in cash

handling and security. Thus, improved transactional transparency provides for better tracking and analysis of spending patterns, allowing individuals and corporations to make more informed financial decisions. For Governments, reduced reliance on cash can lead to a more transparent and accountable economic environment. Because a cashless economy is frequently linked to increased financial transparency and financial inclusion. Governments can more easily detect and monitor financial activities because of the digital trails that electronic transactions leave behind. This increased visibility could assist with tax collection, prevent illegal financial activity, and encourage more accountability in economic transactions. Furthermore, since electronic payment systems provide unbanked and underbanked populations with access to digital financial services, the democratization of finance has the potential to empower disadvantaged communities by providing them with tools to participate diligently in economic activities and bridge the socioeconomic divide.

2. Prime Drivers of Cashless Economy

Numerous variables have come together to contribute to the growth of the cashless economy. Near-field communication (NFC) technology (Wikipedia, Near-field Communication), QR codes, and other technological advancements have made electronic transactions effortless and safe, reducing the perceived necessity for actual cash. Along with credit or debit cards, consumers can now carry their virtual wallets with them everywhere they go because of the increasing use of smartphones and internet access, which has further accelerated the acceptance of cashless payment options. The expansion of cashless infrastructure, such as point-of-sale (POS) terminals, ATMs, and online payment gateways, will make it easier for merchants and companies to accept digital payments. Moreover, the popularity of e-banking and peer-to-peer payment platforms are all set to accelerate cashless transactions.

3. Opportunities and Benefits of Cashless Economy

Transitioning to a cashless economy presents several advantageous prospects for various stakeholders, including individuals, businesses, governments, and financial institutions. Some key opportunities in a cashless economy include the following.

1. Enhancing Financial Inclusion: Embracing a cashless economy can extend access to financial services to previously unbanked individuals, fostering financial inclusion and empowerment through digital payment platforms and mobile banking.
2. Boosting E-commerce & Startups: A cashless economy encourages the growth of e-commerce by enabling secure and convenient digital payment methods, driving increased activity and revenue in online businesses. Additionally, a cashless economy provides an environment beneficial to innovation and entrepreneurship, so that startups and small businesses can develop innovative payment solutions and financial services to cater to specific market needs.
3. Promoting Fintech Innovation: The shift to a cashless economy encourages the development of innovative financial technologies and fintech solutions, catering to evolving consumer needs with new payment platforms, digital wallets, and financial services.
4. Adopting Contactless Payments: A cashless economy promotes the use of contactless payment methods like NFC and QR codes, offering businesses the opportunities to implement seamless payment experiences, especially in retail and hospitality.
5. Leveraging Data Insights: Digital transactions generate vast data that provides valuable insights into consumer behavior and spending patterns. Businesses and governments can utilize this data to make informed decisions and enhance their services and policies.
6. Streamlining Government Services: Governments benefit from cashless transactions by offering digital payment options for taxes, fees, and other services, streamlining payment processes, and reducing administrative burdens.
7. Reducing Cash-Related Crime: A cashless economy helps combat cash-related crimes such as theft and counterfeiting, as digital transactions leave digital trails, aiding in tracing and investigating such illicit activities.
8. Improving Business Efficiency: Cashless transactions streamline payment processes for businesses and keep the entire record of transactions, leading to enhanced efficiency and cost savings by reducing manual cash handling and accounting.

9. Advancing Financial Literacy: Wider adoption of digital payment methods offers an opportunity to promote financial literacy and education, empowering individuals to make informed decisions about managing their finances.
10. Remote and Cross-border Work Opportunities: As payment transfers become more streamlined and effective, a cashless economy can provide remote work arrangements and cross-border job opportunities.
11. Encouraging Economic Formalization: A cashless economy contributes to economic growth by formalizing informal economic activities, leading to better economic data, improved tax collection, and greater overall economic stability.
12. Facilitating Global Financial Integration: Cashless transactions facilitate cross-border payments, promoting global financial integration and enabling businesses to engage in international trade more efficiently.
13. Environmental Benefits: A cashless economy contributes to positive environmental impacts by reducing paper usage, carbon emissions from cash transportation, and deforestation associated with paper currency production.
14. Secure Government Benefit Distribution: Embracing digital payment methods ensures the secure and efficient distribution of government benefits, minimizing leakages and enhancing service delivery for social welfare payments.
15. Enabling Digital Healthcare Payments: Cashless economies can integrate with digital healthcare systems, ensuring secure and efficient payment for medical services and prescriptions.
16. Expanding Global Market Access: Cashless economies offer business organizations the opportunity to access global markets and broaden their customer base beyond geographic boundaries.
17. Facilitating Emergency Response and Philanthropic Contributions: In times of disasters and emergencies, cashless payment methods enable swift and efficient aid distribution and disaster relief efforts. It too allows people a safe and convenient option to donate to charity organizations, encouraging the expansion of philanthropy.

Overall, the transition to a cashless economy offers diverse opportunities to create a more inclusive, efficient, and technologically advanced financial landscape. By capitalizing on these opportunities, stakeholders can harness the full potential of digital payment solutions to drive economic growth and enhance the overall quality of financial services.

4. Challenges in Achieving Cashless Economy

The path towards a cashless economy is not without its difficulties. The following are some of the major challenges:

1. Digital Divide: Bridging the digital divide is a significant challenge as not everyone has equal access to technology and digital infrastructure. Illiterates, people in rural areas, and economically disadvantaged communities may struggle to participate in cashless transactions.
2. Static Consumer Behavior: Changing deeply ingrained consumer behavior is quite difficult. Because it can be difficult to convince some people to use cashless payment options, particularly older generations or people used to using cash. Many people may be hesitant to adopt digital payment methods due to habit or trust concerns.
3. Cybersecurity Vulnerabilities: Transitioning to a cashless economy exposes individuals and businesses to heightened cybersecurity risks as well. Cyberattacks, data breaches, and identity theft can undermine confidence in digital transactions.
4. Privacy Issues: The shift to a cashless economy raises concerns about data privacy. The collection of vast amounts of personal data in digital transactions requires robust measures to protect user information.
5. Technological Reliability & Systematic Risks: A cashless economy relies heavily on technology. System glitches, outages, disruptions, and network volatility could hinder the smooth functioning of the economy. Additionally, the risk of a large-scale system failure or cyberattack could have severe consequences.
6. Unbanked and underbanked individuals: While a cashless economy aims to improve financial inclusion, unbanked and underbanked individuals may face barriers to accessing digital payment services.
7. The trade-off between Regulatory Framework & Transaction Costs: Implementing a robust and coherent regulatory framework to govern cashless transactions presents a challenge for governments and financial institutions. The regulatory format

requires high capex. Thus, digital payment methods involve transaction fees, impacting both consumers and businesses. High fees could deter cashless adoption, particularly for small transactions. The economy will therefore have to choose between incurring a loss by eliminating transaction costs and creating an inexpensive regulatory framework, or charging a transaction cost to create a sophisticated regulatory framework at the expense of a lower adoption of cashless transactions.

8. Infrastructure Readiness: Building and maintaining the necessary cashless payment infrastructure and technology can be costly and may be challenging in certain regions with limited resources.
9. Cash-dependent Informal Economy: In developing economies where a significant portion of transactions occurs in the informal sector, encouraging digital payments may prove difficult and time-taking.
10. Cultural and Social Factors: Cash usage may be deeply ingrained in certain societies like India, due to cultural practices and traditions, making it challenging to transition to a cashless economy.
11. Resistance from Cash-dependent Industries: Industries that heavily rely on cash transactions may resist the shift towards a cashless economy due to existing business models and practices.
12. Education and Awareness: Raising awareness about the benefits and safety of cashless transactions is essential to overcome misconceptions and encourage adoption.
13. Interoperability: Ensuring seamless interoperability between various digital payment platforms and systems is vital to prevent fragmentation and increase user convenience.
14. Legal and Regulatory Challenges: Addressing legal and regulatory challenges related to taxation, money laundering, consumer protection, and cross-border transactions requires careful consideration and coordination.

Overcoming these obstacles would necessitate coordination among governments, financial institutions, technology providers, and other stakeholders. To enable a smooth transition to a cashless economy, it is crucial to create inclusive and sustainable initiatives that address these challenges.

Nexus Between Caseless Economy and E-Money

The nexus between e-money and a cashless economy is inseparable, as e-money serves as a fundamental catalyst for the transition toward a cashless financial ecosystem. E-money, represented by digital currencies and electronic payment methods, has revolutionized the way financial transactions occur, offering convenience, speed, and accessibility. In a cashless economy, physical cash usage is significantly reduced, if not fully eliminated, in favor of digital payment solutions facilitated by e-money. By providing a fast, safe, and secure platform for transactions, e-money fosters financial inclusion, empowers underbanked populations, and encourages innovations in the financial technology sector. As more individuals and businesses embrace e-money, the foundation for a cashless economy solidifies, ushering in a new era of digital financial interactions that are efficient, data-driven, and aligned with the demands of an increasingly interconnected world.

Since both are interconnected, the following points may assist in describing each's contribution to the advancement of the other.

1. Role of E-Money in a Cashless Economy

a. Facilitating Transactions: E-money provides a convenient and efficient means of conducting financial transactions without the need for physical cash. It allows individuals and businesses to make payments for goods and services electronically, either online or through mobile devices, reducing the reliance on physical cash.
b. Digital Payments Infrastructure: E-money systems contribute to the establishment of a robust digital payments infrastructure necessary for a cashless economy. This infrastructure involves payment gateways, secure networks, and digital wallets that facilitate seamless electronic transactions.
c. Financial Inclusion: E-money can enhance financial inclusion by providing access to financial services for people in remote or underbanked areas. With e-money systems, individuals can access financial services using their mobile phones, even without a traditional bank account.
d. Reduced Cash Usage: As more people and businesses adopt e-money and digital payment solutions, the use of physical cash decreases. This reduction in cash usage can lead to cost savings, increased transparency, and decreased risks associated with handling cash.

e. Data-Driven Insights: E-money transactions generate valuable data that can be analyzed to gain insights into consumer behavior and spending patterns. This data can be used by businesses and policymakers to make informed decisions and formulate targeted economic policies.
f. Encouraging Innovation: The rise of e-money and the cashless economy have spurred innovations in the financial technology sector. This has led to the development of new payment solutions, peer-to-peer payment platforms, and other digital financial services.

2. Role of Cashless Economy in Promoting E-money

a. Changing Consumer Behavior: In a cashless economy, people become more accustomed to making digital transactions and using electronic payment methods. As consumers become comfortable with cashless transactions, they are more likely to embrace e-money as a convenient and viable alternative to physical cash.
b. Infrastructure Development: To support a cashless economy, governments and financial institutions invest in building robust digital payment infrastructures. This includes the development of secure online payment gateways, mobile banking apps, and electronic wallets. These infrastructure developments create an environment conducive to the adoption of e-money platforms.
c. Enhanced Accessibility: A cashless economy provides greater accessibility to financial services for a broader population. E-money systems enable individuals without traditional bank accounts to participate in the digital financial ecosystem, making financial inclusion more achievable.
d. Security and Trust: A well-established cashless economy addresses security concerns related to electronic transactions. As consumers gain trust in the security measures of digital payment systems, they are more willing to embrace e-money as a safe and reliable option for their financial transactions.
e. Government Policies and Regulations: Governments may implement policies and regulations that promote the growth of e-money systems. These policies can range from promoting interoperability among different e-money providers to creating a favourable regulatory environment for digital financial services.
f. Technological Advancements: As the cashless economy continues to evolve, it drives technological advancements in the FinTech industry. These advancements lead to the development of innovative e-money platforms with enhanced features & functionalities, making e-money more appealing to a broader audience.

Shortly, as e-payment methods gain popularity and become more prevalent, they contribute to the realization of a cashless economy. Conversely, a cashless economy creates an environment conducive to the adoption and acceptance of e-money, paving the way for the integration of cryptocurrencies, digital wallets, and potentially CBDCs into mainstream financial systems.

CONCLUSION

As the world ventures into an era of unprecedented digital transformation, the concepts of a cashless economy and electronic money are shaping the future of finance, trade, and commerce. The interplay between electronic payment methods, cryptocurrencies, and CBDCs offers a glimpse into a financial landscape that is dynamic, inclusive, and responsive to the needs of a rapidly evolving global society. However, realizing the full potential of a cashless economy and electronic money requires a holistic approach that addresses the challenges while maximizing the opportunities. Governments, financial institutions, technology developers, and consumers must collaborate to build secure, inclusive, and efficient financial ecosystems that empower individuals, businesses, and economies to thrive in this digital era.

The adoption of e-money and the promotion of a cashless economy requires a diverse strategy. Governments should invest in digital payment infrastructure, including financial incentives and subsidies to encourage adoption. Along with public awareness campaigns to inform people of the advantages of digital transactions, a supportive regulatory framework is crucial. Adoption may be boosted through cooperation with financial institutions and the introduction of cashless transactions in governmental and commercial transactions. Additionally, maintaining data security and fraud prevention is essential for fostering trust in e-money systems. A successful and progressive shift towards a cashless economy can be achieved, benefiting both

people and businesses, by encouraging financial literacy, enabling interoperability, and technological advancement. Additionally, governments, regulatory bodies, financial institutions, and business organizations must collaborate to create a secure, stable, inclusive, and strictly regulated cashless ecosystem.

REFERENCES

Agarwal, R. K. (2019). Challenges and Prospects of Cashless Economy in India. *International Journal of Advanced Research In Commerce, Management & Social Science, 2(*3), 103 – 108.

Aggarwal, B., & Kapoor, D. (2020). A Study on Influence of Covid-19 Pandemic on Customer's Online Buying Behaviour. *MDIM Business Review, 1*(2), 41 – 47.

Auer, R., Cornelli, G., & Frost, J. (2020). Covid-19, Cash, and the Future of Payments. *FSI Briefs,* Bank for International Settlements, No.3.

Becirovic, S. (2014). Challenges Facing E-Money *University Journal of Information Technology and Economics, 1 (*1), 28 – 36.

Dowsett, C. (2023). What are Stablecoins? Retrieved from: https://builtin.com/cryptocurrency/stablecoins.

Frankenfield, J. (2023). Digital Currency Types, Characteristics, Pros & Cons, Future Uses. *Investopedia*. Retrieved from: https://www.investopedia.com/terms/d/digital-currency.asp.

Gaba, M., & Nagpal, M. (2017). Cashless Economy: Problems and Prospects. *International Journal of Engineering Research & Technology, Special Issue – 2017*, NCIETM - 2017 Conference Proceedings.

Goyal, K. (2021). Cashless Economy in India: Challenges and Opportunities. *Inspira- Journal of Modern Management & Entrepreneurship, 12(*1), 141 – 145.

IvyPanda. Electronic Money: Challenges and Solution Reports. Available at: https://ivypanda.com/essays/electronic-money-challenges-and-solutions/.

Jia Yi, C., Huan, L. Y., Xuan, L. J., & Yee, W. C. (2020). Factors of E-Wallet Adoption Among Generation Z. *Master's Dissertation*, University of Tunku Abdul Rahman.

Joshi, K. (2018). Cashless Transaction Challenges And Remedies. *International Journal of Creative Research Thoughts*, Conference on Recent Innovations in Emerging Technology & Science, April 6-7, 2018.

Kampen, S. V., Bohn, F., & Vaal, A. D. (2018). CBDC: Implications of Narrowing the Traditional Banking System. *Master's Dissertation*, Radboud University Nijmegen.

Kaur, P. (2019). Cash to Cashless Economy: Challenges & Opportunities. *International Journal of 360 Management Review, 7(*1), 520 – 528.

Kulkarni, A. (2022). Public Perception of the Digital Rupee in India. *MSc Project Submission Sheet,* School of Compounding, National Collage of Ireland. Retrieved from: https://norma.ncirl.ie/5845/1/adityakulkarni.pdf.

Kumar, P., & Chaubey, D. S. (2018). An Analysis of Growth Pattern of Cashless Transaction System: An Evidence from Lucknow City. *Doctoral Thesis*, Uttaranchal University. Retrieved from: http://hdl.handle.net/10603/211275.

Lakhwani, R. (2022). Effects of Covid-19 Pandemic on Digital Payment Ecosystem. *International Journal of Engineering Research & Technology, 11*(3), 358 – 362.

Mineraltree. Seven Advantages of Electronic Payments for Your Business. Available at: https://www.mineraltree.com/blog/the-advantages-of-electronic-payments/.

Morris, C. Electronic Money Definition and Overview. *Tipalti*. Available at: https://tipalti.com/electronic-money-emoney-explained/.

NCR. (2021). Some Key Challenges of a Cashless Society. Available at: https://www.ncr.com/blogs/banking/cashless-society.

Ong, H. B., & Chong, L. L. (2022). The Effect of Cashless Payments on the Internet and Mobile Banking. *Journal of Financial Services Marketing, 28(*1), 178 – 88.

Pritchard, J. (2022). The Pros and Cons of a Cashless Society. *The balance*. Retrieved from: The Pros and Cons of Moving to a Cashless Society (thebalancemoney.com).

Pertiwi, E. I. F. P., Puspita, R. E., Thaker, M. A. B. M. T., Pratiwi, S. K., & Mustofa, N. H. (2021).

An Evaluation of E-Money's Growth, Barriers, and Challenges to Build Green Finance on Post-Covid. *E3S Web of Conferences 317*, 05014

Sarangi, B. (2022). Socioeconomic Determinants and Challenges of Online Shopping: A Case Study of Utkal University, Vani Vihar. *International Journal of Research and Analytical Reviews, 9*(4), 666 – 685.

Sharma, T. (2019). Cashless Economy in India: Benefits & Challenges Ahead. *International Journal of Applied Business and Economic Research, 17(*1), 233 – 239.

Sova, K. (2013). Electronic Money Trends in User's Perspective. *Master's dissertation*, Turku University of Applied Sciences.

Tee, H. H., & Ong, H. B. (2016). Cashless Payment and Economic Growth. *Financial Innovation*, (2016) 2:4. DOI: https://doi.org/10.1186/s40854-016-0023-z.

Wikipedia. Digital Currency. Available at: https://en.wikipedia.org/wiki/Digital_currency.

Wikipedia. Near Field-communication. Available at: Near Field Communication – Wikipedie (wikipedia.org).

Wikipedia. Unified Payment Interface. Available at: https://en.m.wikipedia.org/wiki/Unified_Payments_Interface.