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Drivers of digital payment adoption in Tanzania: What do consumers say?

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ABSTRACT

It is evident that digital payments play a significant role in advancing economic growth. Key digital payment stakeholders, such as customers, are important actors in shaping the digital payment ecosystem, particularly when their perceptions of the drivers of digital payments are considered in the development of appropriate adoption approaches. However, little is known about consumer perceptions of the drivers of digital payment adoption in Tanzania. This awareness would enable the government to design and implement workable mechanisms that would improve the drivers of digital payment adoption, reflecting the needs, preferences, and interests of consumers. This study analyzes consumer perceptions of the drivers of digital payment adoption in Tanzania. Using a questionnaire, responses from 261 members of the consumer consultative councils were collected and analyzed using hierarchical multiple regression. The study reveals that perceived drivers of digital payment adoption in Tanzania include enhanced policy development initiatives, operational capabilities of digital payment systems, improved system and positive customer experience, enhanced security and privacy, collaboration and fair treatment among stakeholders, and government support and regulatory frameworks. Moreover, it is found that the addition of enhanced policies, increased collaboration, and improved regulatory frameworks improves the prediction of an enhanced digital payment ecosystem in Tanzania beyond the identified drivers. This study enables policymakers, practitioners, and other players in the financial sector to develop and implement techniques that promote the digital payment environment and ultimately foster the development of inclusive finance and economic growth.

Contribution/Originality: This study plays a significant role in improving digital payment environments in Tanzania and related economies. It enlightens an understanding of workable policies and solutions that seek to improve an enabling environment for the widespread adoption of digital payments. It also influences the implementation of digital payment strategies that provide a positive customer experience.

1. INTRODUCTION

It is evident that economies around the globe need viable digital payment systems to thrive. This is because, in recent times, digital payments have been considered strategic drivers of economic growth, particularly in enhancing the financial system, formalizing informal businesses, increasing business and government revenues, promoting electronic commerce, improving operational efficiency, and reducing business and transaction costs. According to Luan, Van Tran, Van Quyet, and Kingsbury (2023), digital payments reduce transaction costs, including for people in rural areas. Moreover, digital payments help improve the country's security (Raj, Amilan, & Aparna, 2025). They also help reduce the cost of currency management and detect frauds (Khan, 2021). They play a vital role in mitigating economic crimes (Raj et al., 2025). Generally, digital payments bring convenience and economic efficiency (Luan et

al., 2023). Chen and Ren (2022) conclude that digital payment is a "favorable means for the development of inclusive finance".

Digital payments refer to the transfer of value from one account to another using a digital device such as a mobile phone or computer (Tan, Leong, & Richter, 2025). Their relevance worldwide increased rapidly during the pandemic (Huterska, Piotrowska, & Szalacha-Jarmużek, 2021). To date, digital payments have largely become a new normal in daily transactions. Consumers now regard them as convenient, secure, and fast. For example, digital cash can be easily transferred even to remote areas (Weber & Staples, 2022). This is because smartphones and internet services have increased adoption of digital payments in both urban and rural areas (Khan, 2021).

In order to influence users' adoption behavior, there should be system quality, information quality, usefulness, ease of use, and security (Abbasi, Sandran, Ganesan, & Iranmanesh, 2022). For example, to increase mobile app usage among consumers, mechanisms that improve the accessibility of services influencing positive attitudes should be established. These apps need to enhance customers' pleasant experiences, especially those related to personalized services, design, system quality, and navigation (Amoroso & Ackaradejruangsri, 2024). This is because, "when payments are digital, money becomes digital information that can be combined with other digital information that is not monetary" (Ortiz, 2024). Therefore, players in the digital financial ecosystem need to devise digital payment strategies reflecting that digital information is multifaceted. The main focus should be on enhancing a positive customer experience. This is why Albastaki (2024) argues that developing a cashless society requires businesses to implement online payment systems that enable customers to make digital payments swiftly and simply.

Although it is evident that the digitalization of financial services is a key driver of digital payment adoption (Błach & Klimontowicz, 2021), the failure to develop and implement effective digital payment systems that enhance customer experience reinforces cash preference. Acedański, Maciejewski, and Pietrucha (2024) confirm that cash remains preferred because it offers flexibility, especially in unpredictable situations where digital channels are unavailable. For example, the popularity of cash in Tanzania indicates that unfavorable conditions still hinder widespread digital payment adoption. Similar challenges are present in many African economies (Choruma et al., 2024; Mapanje, Karuaihe, Machethe, & Amis, 2023; Mpofu, 2022; Osabutey & Jackson, 2024).

Being a developing country whose economy would thrive due to increased adoption of digital payments, Tanzania needs to develop mechanisms that would forge a feasible digital payment environment. However, little is known about consumer perception of the drivers of such an environment. This is because, unless the government is aware of the drivers of digital payment as perceived by customers, it cannot design and implement strategies that seek to improve conditions for promoting digital payments in Tanzania that are in the best interest of consumers. Amoroso and Ackaradejruangsri (2024) confirm that consumers adopt and continue to use newer technologies when they perceive that the exchange benefits are higher than the exchange costs. Therefore, solutions that reflect the needs, interests, and preferences of consumers can easily attract them and eventually influence other players to adopt digital payments. This is why this study seeks to analyze consumer perception of the drivers of digital payment adoption in Tanzania.

This study contributes significantly to the improvement of digital payment environments in Tanzania and related economies. The preference for cash has hindered the development of inclusive finance and economic growth. This study will help the government and policymakers understand workable policies and solutions that seek to improve an enabling environment for the widespread adoption of digital payments in Tanzania. It will also assist businesses in developing and implementing digital payment strategies, which are informed by an understanding of the adoption drivers, to increase their customer base and sales, reduce costs, and provide a positive customer experience. The study also aims to help researchers understand and conduct studies focused on improving the existing digital payment environments in Tanzania and beyond, and to develop feasible models that advise on the best approaches for creating new digital payment environments that reflect the needs, interests, and preferences of consumers.

2. LITERATURE REVIEW

2.1. Digital Payment Literacy

Users need the required digital payment literacy. Financial knowledge influences customers' payment choices (Świecka, Terefenko, & Paprotny, 2021). User skills can stimulate the adoption of digital payments (Widayat, Masudin, & Satiti, 2020). According to Oyelami, Adebiyi, and Adekunle (2020), the adoption of digital payments can be fueled by the consumer's level of education and awareness. Users with more financial knowledge are likely to adopt digital payments provided that appropriate policies support digital payments (Świecka, Terefenko, Wiśniewski, & Xiao, 2021). It has also been found that digital payments are mostly preferred by educated than less educated people (Mouna & Jarboui, 2022). In their study, Nandru, Chendragiri, and Arulmurugan (2024) found that more educated people greatly use debit cards than less educated. Therefore, investing in education on how to handle digital payments is likely to influence adoption (Adil & Hatekar, 2020).

Educational programs can be used to raise awareness of the usefulness of digital payments (Khan, 2021). Users of mobile payments should receive proper training and guidance on the use of new technologies (Luan et al., 2023). Businesses should ensure that users are aware of the benefits and how to use digital payment systems (Rahman, Ismail, Bahri, & Rahman, 2022). Service providers should educate digital payment users and provide assistance in using the service where applicable (Sakib, Akter, Sahabuddin, & Fahlevi, 2025). They have a role in ensuring users receive proper education on the risks of improper use of digital payment systems (Raj, Amilan, & Aparna, 2024) and must use relevant educational programs to raise awareness of digital payments, especially regarding security matters (Kirmani, Haque, Sadiq, & Hasan, 2023). Educational campaigns by digital payment service providers should focus on increasing public awareness of payment safety (Balakrishnan & Lay Gan, 2023). Businesses need to ensure their users are aware of safety procedures in digital payment systems (Rahman et al., 2022). Additionally, Jingnan, Teo, Ho, and Hooi Ling (2023) state that digital payment systems can be strengthened by consistently creating awareness of fraud.

Stakeholders need to collaborate in implementing large-scale literacy programs on digital payments (Kasri & Yuniar, 2021). Key stakeholders should provide more digital payment education to influence the acceptance of digital payment technologies (Urhie et al., 2021). A cashless economy can be promoted when policymakers and relevant stakeholders raise awareness among people about the benefits of digital payments (Raj et al., 2025). In this regard, policies aimed at developing and implementing digital financial literacy programs should be established (Nandru et al., 2024). Service providers should also create policies and guidelines to educate users on how to operate digital payment systems (Kaur, Syan, Kaur, & Sharma, 2022). Additionally, government policies should focus on providing financial knowledge to address financial exclusion in rural areas (Chen & Ren, 2022). Many farmer households lack financial knowledge, which acts as a barrier to accessing financial services (Chen & Ren, 2022). Therefore, it can be concluded that customers are more likely to adopt digital payments if the government creates adequate awareness (Khan, 2021).

2.2. Supporting Infrastructure

The adoption of digital payments can be fueled by investment in supporting infrastructure (Islam, Hasan, & Fahim, 2024). Facilitating conditions such as digital payment infrastructure are key in influencing customers to make digital transactions (Widayat et al., 2020). For example, the adoption of mobile payment systems is likely influenced by facilitating conditions, particularly technology and training (Ramtiyal, Verma, & Rathore, 2024). The provision of adequate technological infrastructure has been a key enabler of digital payments (Nandru et al., 2024). Similarly, organizational and technical infrastructures supporting digital payments are key drivers of consumers' intention to engage in digital payment platforms (Kasri & Yuniar, 2021). The quality of infrastructure and resources needed for implementing digital payments should be enhanced (Kasri & Yuniar, 2021).

Devices such as smartphones are major factors in enhancing the adoption of digital payments (Błach & Klimontowicz, 2021; Lu & Kosim, 2024; Ortiz, 2024; Urhie et al., 2021; Widayat et al., 2020). Also, the user-perceived value can be defined in terms of the cost of using digital payment services, such as device and internet costs (Kirmani et al., 2023). This is why mobile phones and the internet are key components in digital payments (Nandru et al., 2024). However, apart from the internet, the adoption of digital payment systems depends on reliable infrastructure such as electricity (Srinivasan, Diatha, & Singh, 2025). Reliable electricity is especially needed in rural areas to guarantee uninterrupted services (Adil & Hatekar, 2020). Rural electrification stimulates banking services in rural areas. Although Luan et al. (2023) propose expanding banking services in rural areas, this cannot happen without reliable electricity and internet. Internet connectivity remains a major factor in enhancing digital payment adoption (Lu & Kosim, 2024; Oyelami et al., 2020; Titova, Cornea, & Lemeunier, 2021; Widayat et al., 2020).

It is evident that digital payments are not common in rural areas where many people do not own bank accounts (Luan et al., 2023). In this regard, efforts should be made to ensure that the rural population is accommodated in digital payment systems (Nandru et al., 2024). These efforts should focus on developing relevant policies, workable digital payment solutions, and investment in the required infrastructure. Policies that seek to promote and improve accessibility of cashless payment services, including those in rural areas, should be devised and implemented (Luan et al., 2023). Government policies should focus on supporting financial infrastructure development, particularly investment in ICT infrastructure (Mouna & Jarboui, 2022). Moreover, policies should seek to influence investment in informatics infrastructure (Luan et al., 2023).

Similarly, it should be noted that the lack of cashless instruments could reduce the usage rate of digital payments (Kotkowski & Polasik, 2021). For example, poor distribution of digital payment infrastructure can cause high switching costs (Saibil, Khoirunnisa, & Yusfiarto, 2023). Therefore, these challenges related to limited capacity in investing in the required infrastructure should be addressed by relevant digital payment players such as enterprises (Rahman et al., 2022). Investment in infrastructure should also focus on enhancing technological structures. This is why Jingnan et al. (2023) argue that mechanisms to improve technological structures for ensuring the security of digital payments should be devised and implemented. However, developing and managing such mechanisms require a well-trained workforce. This claim is supported by Rahman et al. (2022), who assert that businesses are more likely to adopt digital payments if challenges related to limited capacity in providing employee training are addressed. Tan et al. (2025) add that service providers should invest in employee training to keep them updated and to embrace digital payment use (Rahman et al., 2022).

2.3. Policy Development Initiatives

The government policies in motivating people to adopt digital payments have been instrumental in their adoption (Mouna & Jarboui, 2022). For example, government policy support has been a major driver of mobile payment adoption among micro-retailers (Fu et al., 2022). This is why Fu et al. (2022) recommend that government policies should seek to provide the necessary resources to promote mobile adoption. The promotion of digital payments depends on the availability of several resources, such as the medium of transmission, an enhanced banking system, relevant infrastructure, and other digital payment facilities.

Availability of facilities at merchants can stimulate the adoption of digital payments (Widayat et al., 2020). For example, service providers need to enhance accessibility for users in terms of owning debit cards, credit cards, and mobile money accounts, as well as usage in making payments and receiving services through card-based and mobile-based financial transactions (Nandru et al., 2024). Therefore, workable support mechanisms should be created to enable users to simply own and use debit and credit cards and mobile money services (Nandru et al., 2024). Moreover, the accessibility of mobile devices such as smartphones should be prioritized if the government seeks to promote and enhance digital payment services, especially in rural and isolated areas (Luan et al., 2023).

In their study, Chen and Ren (2022) propose that government policies should focus on developing digital finance in rural areas. In this regard, the government may opt to provide relevant incentives to attract more individuals, businesses, and digital payment service providers in rural areas to adopt digital payments. These incentives may also be offered by businesses, service providers, and other players in the digital payment ecosystem to influence their customers (Jaiswal, Mohan, & Deshmukh, 2023; Rahman et al., 2022).

There is a significant need for policies that aim to enhance digital competencies (Luan et al., 2023). These competencies should benefit digital payment participants such as businesses, service providers, and users. Benefits may include increased availability, reliability, and affordability. For example, support mechanisms can be established to provide affordable user charges (Nandru et al., 2024). Nandru et al. (2024) recommend reducing transaction costs to promote financial inclusion among rural populations. Consequently, governments should develop policies focused on lowering or eliminating transaction costs to ensure free means of payment (Mouna & Jarboui, 2022; Rahman et al., 2022). Besides government efforts, service providers should also reduce fees on digital payments (Luan et al., 2023). They can further incentivize digital payment adoption by offering discounts to customers who choose digital transactions (Luan et al., 2023).

This study proposes that customers perceive having sufficient policies to improve digital payments in Tanzania (Enhanced_policy), increased collaboration among digital payment stakeholders (Enhanced_collaboration), and an improved regulatory framework (Enhanced_regulatory) as vital for enhancing the digital payment ecosystem (Efforts_ecosystem). Additionally, the study suggests that policy development initiatives serve as drivers for adopting digital payments in Tanzania. These drivers are defined based on the following statements, emphasizing the importance of policy, collaboration, and regulation in fostering digital payment adoption and ecosystem growth.

- Policies that seek to provide rewards or higher return values to digital payment consumers should be devised and implemented (Policy1).
- The government should adopt effective fiscal incentives such as tax reductions for merchants and consumers who heavily make digital payments (Policy2).
- Favourable policies and incentives for the acquisition of digital payment technologies, infrastructures, and mobile devices must be devised to attract players' increased involvement in digital payments (Policy3).
- The government should introduce and enforce policies that limit cash transactions in the economy (Policy4).
- The government should provide favorable policies and incentives that promote and safeguard workable partnerships between banks, other digital payment service providers, and innovators (Policy5).
- The government should establish policies, laws, regulations, and practices that dictate digital payments in all its transactions (Policy6).
- The government should devise and manage enhanced protocols on consumer protections and fraud prevention (Policy7).

With regard to policy development initiatives, this study seeks to test the following hypotheses (see also Figure 1).

Hypothesis 1: Enhanced policy development initiatives drive the improvement of the digital payment ecosystem in Tanzania.

Hypothesis 2: The addition of Enhanced_policy improves the prediction of Efforts_ecosystem beyond Policy1, Policy2, Policy3, Policy4, Policy5, Policy6, and Policy7 alone.

Hypothesis 3: The addition of Enhanced_collaboration improves the prediction of Efforts_ecosystem beyond Policy1, Policy2, Policy3, Policy4, Policy5, Policy6, Policy7, and Enhanced_policy alone.

Hypothesis 4: The addition of Enhanced_regulatory improves the prediction of Efforts_ecosystem beyond Policy1, Policy2, Policy3, Policy4, Policy5, Policy6, Policy7, Enhanced_policy, and Enhanced_collaboration alone.

2.4. Operational Capabilities of Digital Payment Systems

Performance expectancy influences the intention to use digital payment systems (Linge, Chaudhari, Kakde, & Singh, 2023). Users prefer digital payment systems whose applications can improve payment transaction performance (Raj et al., 2024). This performance can be translated into efficiency. Therefore, Kasri and Yuniar (2021) claim that the payment system should enable swift payments. Users also prefer digital payment systems whose applications are efficient in task completion (Raj et al., 2024). Digital payments will continue to be preferred if systems provide real-time assistance and information (Munikrishnan, Mamun, Xin, Chian, & Naznen, 2024). Businesses should focus on improving fast digital payment processes (Chang, Chen, & Hashimoto, 2022).

The payment system should provide users with easy accessibility (Kasri & Yuniar, 2021). Almajali, Al-Okaily, Al-Daoud, Weshah, and Shaikh (2022) add that digital payment applications should have a user-friendly interface. Therefore, digital payment service providers may focus on designing a more attractive interface and providing feasible artificial intelligence services (Tang, Chau, Hong, Ip, & Yan, 2021). To support this, Luan et al. (2023) recommend simplifying banking services and digital payment methods. Oloveze, Ogbonna, Ahaiwe, and Ugwu (2022) found that simplified digital payment processes attract consumers for online shopping.

Digital payment adoption is influenced by constructs of systems (Kaur et al., 2022). Digital payments will continue to be preferred by consumers if there are well-integrated systems and processes (Munikrishnan et al., 2024). The adoption of digital payments can be accelerated when consumers find that the digital payment systems are compatible (Tang et al., 2021). Likewise, businesses are likely to adopt digital payments if they are compatible with their operations (Rahman et al., 2022). Raj et al. (2024) confirm that users prefer digital payment systems whose applications are compatible with multiple devices. In this regard, digital payment systems should function on all kinds of devices (Raj et al., 2025). This is supported by Fu et al. (2022), who argue that micro-retailers' existing payment systems should be integrated with mobile payment tools to ensure compatibility.

Enterprises are likely to adopt payment systems that will enable them to improve their operational and management efficiency (Fu et al., 2022). Digital payment systems reduce the costs of monitoring employees and customers (Srinivasan et al., 2025). For example, digital payment systems can record all transactions made by consumers, enabling them to manage their finances effectively (Lu & Kosim, 2024). However, system failure discourages users' intentions to use digital payment systems (Almajali et al., 2022). Customers are more likely to adopt digital payments if the systems are reliable and provide quality service (Khan, 2021). Therefore, digital payment service providers need to cooperate with financial institutions to ensure reliability (Balakrishnan & Lay Gan, 2023). Providers should also invest in system stability and quality, especially in preventing disruptions (Tan et al., 2025).

Digital payment developers and service providers have a role in ensuring that the characteristics of digital payment services are more appealing to influence extensive use of digital payments (Raj et al., 2024). Likewise, Jaiswal et al. (2023) add that mobile payment service providers need to improve system performance to attract and satisfy users. In this regard, service providers must invest in continuous innovations to offer unique experiences (Kirmani et al., 2023). They also need to cooperate with financial institutions to ensure digital payments are seamless, effective, and efficient (Balakrishnan & Lay Gan, 2023; Raj et al., 2024).

This study proposes that customers perceive the operational capabilities of digital payment systems as key drivers for adopting digital payments in Tanzania. The drivers are defined based on the following statements.

- Digital payment solutions must enhance faster transactions (Capability1).
- Digital payment solutions should have an instant information sharing capability (Capability2).
- Digital payment solutions must have a standardized approach in functionality to provide convenience (Capability3).
- The digital payment should be made easier and incredibly simple by avoiding complex authorization and sign-ups for users (Capability4).
- The cost of low-risk digital transactions should be reduced significantly (Capability5).

- Digital payment solutions that seek to eliminate intermediary transfer costs should be supported by the government and other key players (Capability6).

With regard to operational capabilities of digital payment systems, this study seeks to test the following hypotheses (see also Figure 2).

Hypothesis 5: operational capabilities of digital payment systems drive the improvement of digital payment ecosystem in Tanzania

Hypothesis 6: The addition of Enhanced_policy improves the prediction of Efforts_ecosystem over and above Capability1, Capability2, Capability3, Capability4, Capability5, and Capability6 alone.

Hypothesis 7: The addition of Enhanced_collaboration improves the prediction of Efforts_ecosystem over and above Capability1, Capability2, Capability3, Capability4, Capability5, Capability6, and Enhanced_policy alone.

Hypothesis 8: The addition of Enhanced_regulatory improves the prediction of Efforts_ecosystem over and above Capability1, Capability2, Capability3, Capability4, Capability5, Capability6, Enhanced_policy, and Enhanced_collaboration alone.

2.5. Enhanced System and Customer Experience

The user-perceived value can be defined in terms of convenience (Kirmani et al., 2023). Convenience is the key factor that can be used to improve the performance of digital payments (Raj et al., 2025). For example, the adoption of mobile wallets can be influenced by relative convenience (Mombeuil, 2020). Similarly, the performance of the mobile payment apps can also be influenced by convenience (Yi, Kim, & Oh, 2024). Therefore, digital payments are preferred by consumers due to the fact that they are convenient (Błach & Klimontowicz, 2021; Chen & Jiang, 2022; Munikrishnan et al., 2024; Oyelami et al., 2020).

2.5.1. System Usefulness

The system's usefulness is influenced by system quality, service quality, and information quality (Abbasi et al., 2022). The perceived usefulness is a key driver of technology adoption (Jingnan et al., 2023), such as a cashless technology (Kim & Lucas, 2024). The perceived usefulness has also been found to influence the adoption of a cardless technology (Nambiar & Bolar, 2023). For example, consumers are likely to adopt online shopping due to perceived usefulness (Oloveze et al., 2022). Likewise, perceived usefulness has also been reported to accelerate the adoption of e-wallets (Jingnan et al., 2023) and continued use of e-wallets (Abbasi et al., 2022). This is why Abbasi et al. (2022) propose that the e-wallet managers have a role to play in meeting the expectations of users in terms of usefulness.

2.5.2. System Ease of Use

The ease of use is a key driver of technology adoption (Jingnan et al., 2023). Also, the perceived ease of use is a key factor in the adoption of a cashless technology (Kim & Lucas, 2024). Similarly, the adoption of digital payments can be accelerated by perceived ease of use (Tang et al., 2021). Błach and Klimontowicz (2021) conclude that simplicity is one of the success drivers of the adoption of digital payments. This is because the user-perceived value can be defined in terms of ease of doing (Kirmani et al., 2023).

Digital payment systems should be user-friendly and simple to use (Ghosh, 2024; Namahoot & Jantasri, 2023; Sakib et al., 2025). Digital payments will continue being preferred by consumers provided that the digital payment systems are user-friendly and are simple to use (Khan, 2021; Munikrishnan et al., 2024; Namahoot & Jantasri, 2023; Raj et al., 2024). When there are many user-friendly payment methods and platforms, such as e-commerce, bank transfers, or crowdfunding platforms, consumers are likely to adopt and use digital payments (Kasri & Yuniar, 2021). For example, the design of the e-wallet application, particularly its user-friendliness, plays a significant role in influencing user acceptance of digital payments (Jingnan et al., 2023). When the features of e-wallets are familiar to

users, they will easily use them effortlessly to make payments (Abbasi et al., 2022). This is why Abbasi et al. (2022) found that ease of use influenced users' continued use of e-wallets.

Service providers should embrace digital payment systems that are easy to use (Kaur et al., 2022). Digital payment service providers may focus on improving the ease of use of digital payment systems (Tang et al., 2021). Likewise, businesses have a role in ensuring their digital payment systems are easy to use, including lowering the number of steps required to complete digital transactions (Rahman et al., 2022). This is why an uncomplicated registration and payment process is a key factor in adopting cashless technology (Kim & Lucas, 2024). Additionally, the simple and faster transaction process influences consumers to prefer digital payments (Kirmani et al., 2023). Błach and Klimontowicz (2021) argue that speed is a critical driver for the adoption of digital payments and can be used to improve their performance (Raj et al., 2025). Consumers also prefer digital payments because they save time due to high processing speed (Khan, 2021; Munikrishnan et al., 2024).

2.5.3. Relevance of Quality Service

Digital payment adoption is influenced by information quality and service quality (Kaur et al., 2022). The adoption of digital payments can be accelerated when consumers find that there is service quality (Tang et al., 2021). For example, the performance of mobile payment apps can be influenced by customer service (Yi et al., 2024). In this regard, digital payment service providers should improve the quality of their services to influence adoption (Saibil et al., 2023). They may also focus on improving system or information quality to drive customer satisfaction (Tang et al., 2021). Digital payments are preferred by consumers because they are accurate (Munikrishnan et al., 2024), and businesses adopt digital systems to increase customer service efficiency (Srinivasan et al., 2025).

2.5.4. Lessening the Transaction Costs

Transaction costs can influence the adoption of digital payments, either encouraging or discouraging it (Khan, 2021). Reasonable transaction costs are likely to impact digital payment adoption (Adil & Hatekar, 2020). Consumers tend to adopt digital payment systems that are financially attractive to them (Ghosh, 2024). Price value influences the intention to use digital payment systems (Linge et al., 2023), and mobile payment customers prefer systems offering competitive price value (Jaiswal et al., 2023). Adoption accelerates when consumers face no extra costs (Błach & Klimontowicz, 2021) or when transaction costs are minimized. Users are less likely to adopt systems with high device or transaction fees (Raj et al., 2025). Businesses are also less inclined to adopt digital payment systems if costs increase, especially when costs outweigh benefits (Srinivasan et al., 2025).

2.5.5. Meeting the Consumer Needs

Digital payment systems should meet the needs of their users (Namahoot & Jantasri, 2023). Service providers must stay updated with technological advances and manage the evolving, complex needs of users (Saibil et al., 2023). For example, mobile payment adoption is influenced by use context or customer attributes (Ramtiyal et al., 2024), such as income level (Oyelami et al., 2020) or age. This is why Oktavendi and Mu'ammal (2022) argue that digital payment characteristics should reflect user needs, especially among the younger generation. Anshari, Arine, Nurhidayah, Aziyah, and Salleh (2021) add that those who frequently interact with modern technologies, such as the younger generation, are likely to find digital payment systems easy to operate. Consequently, they are more easily influenced to adopt digital payments.

Since users have different needs and perceptions, their continuance behavior cannot be explained by a single solution (Abbasi et al., 2022). For example, in their study, Amoroso and Ackaradejruangsri (2024) found that consumer attitudes towards the value of mobile wallet apps were influenced by perceived benefits such as time-saving, convenience, value for money, and flexibility. This, in turn, influenced their intention to continue using mobile wallet apps. Therefore, adoption of mobile wallets can be influenced by relative advantages (Mombeuil, 2020). When

customers perceive benefits positively, their continuance intention increases (Amoroso & Ackaradejruangsri, 2024). User acceptance is a critical factor in driving app effectiveness (Albastaki, 2024).

This study proposes that customers perceive enhanced system and customer experience as a key driver of adopting digital payments in Tanzania. The driver is defined based on the following statements.

- A digital payment solution should simplify the interaction between consumers and merchants (Convenience1).
- There must be realistic user feedback and complaint management mechanisms in digital payments (Convenience2).
- Digital payment solutions should not require customers to provide more personal information (Convenience3).
- Digital payment solution should encompass a wide range of digital payment methods (Convenience4).

With regard to enhanced system and customer experience, this study seeks to test the following hypotheses (see also Figure 3).

Hypothesis 9: Enhanced system and customer experience drives the improvement of digital payment ecosystem in Tanzania.

Hypothesis 10: The addition of Enhanced_policy improves the prediction of Efforts_ecosystem over and above Convenience1, Convenience2, Convenience3, and Convenience4 alone.

Hypothesis 11: The addition of Enhanced_collaboration improves the prediction of Efforts_ecosystem beyond Convenience1, Convenience2, Convenience3, Convenience4, and Enhanced_policy alone.

Hypothesis 12: The addition of Enhanced_regulatory improves the prediction of Efforts_ecosystem beyond Convenience1, Convenience2, Convenience3, Convenience4, Enhanced_policy, and Enhanced_collaboration alone.

2.6. Concepts on Security and Privacy

Digital payments will continue to be preferred by consumers provided that digital payment systems embrace security, secrecy, and integrity (Munikrishnan et al., 2024). In their study, Luan et al. (2023) found that mobile payment users need assurance of safety and security when using digital payment services. Therefore, digital payment service providers should focus on enhancing privacy protection and establishing security mechanisms that guarantee the safety of consumer information (Amoroso & Ackaradejruangsri, 2024).

2.6.1. Perceived Risk

Users refuse to engage in digital payments due to perceived risks (Jingnan et al., 2023). These risks include privacy issues and performance concerns (Chang et al., 2022). Adoption of digital payments can be accelerated when consumers perceive decreased risks (Chen & Jiang, 2022; Tang et al., 2021). The preference for mobile payment systems is also influenced by perceived risks (Ramtiyal et al., 2024). Digital payments will continue to be preferred if systems are secure and risk-free (Munikrishnan et al., 2024). Even among younger generations, security and privacy risks are key factors influencing adoption (Oktavendi & Mu'ammal, 2022).

There is a negative relationship between privacy risk and perceived value (Jingnan et al., 2023). The user-perceived value can be defined in terms of risks, particularly the risk to the security of users' money (Kirmani et al., 2023). For example, in their study, Fu et al. (2022) revealed that micro-retailers were concerned about the risk of systems being attacked, leading to hacking or misappropriation of consumer data. Jingnan et al. (2023) also found that risks surrounding e-wallet services include fraud, identity theft, and intrusion of sensitive data. Therefore, concerns about perceived risk and potential threats should be minimized (Amoroso & Ackaradejruangsri, 2024). This can be achieved through creating a risk-free environment for digital payments (Jingnan et al., 2023).

Digital payment users should be informed about the potential risks associated with digital payment systems (Raj et al., 2024). Service providers need to identify and address risks and provide security measures related to digital payments to build trust among users and the public (Raj et al., 2025). They should also focus on reducing consumer

perceptions of risk by developing and managing fraud management systems (Namahoot & Jantasri, 2023). For example, designing sound communication channels that address security and privacy issues can influence trust and lower perceived risks among mobile wallet service consumers (Amoroso & Ackaradejruangsri, 2024).

2.6.2. Relevance of Enhanced Trust

Trust is a key factor in influencing the use of digital payment systems (Almajali et al., 2022). The adoption of digital payments can be fueled by consumer trust (Oyelami et al., 2020). As revealed by Khan (2021), customers embrace trustworthy digital payment systems. Therefore, perceived trust plays a vital role in influencing digital payment adoption (Sakib et al., 2025). Perceived trust, especially for new users, is a major factor in adopting mobile payment solutions (Jaiswal et al., 2023). Trust can be established by the digital payment system's usefulness, ease of use, and enhanced security, particularly in protecting users' financial information (Tan et al., 2025). User trust is influenced by security measures of digital payment systems (Khan, 2021).

Trust can also be enhanced through the use of modern and safe technology (Kaur et al., 2022). It can also be improved through workable strategies and solutions. This is why Jingnan et al. (2023) propose that service providers implement innovative strategies to increase trust among users regarding digital payment systems. Service providers should focus on ensuring their digital payment systems are trusted by consumers, particularly through transparent communication and privacy policies (Namahoot & Jantasri, 2023). Additionally, they should continuously work to enhance the trustworthiness of their payment applications (Raj et al., 2024). It should also be noted that digital payment adoption is influenced by the trust and reputation of service providers (Kaur et al., 2022).

2.6.3. Relevance of Enhanced Security

Security is one of the success drivers of the adoption of digital payments (Błach & Klimontowicz, 2021; Linge et al., 2023). The adoption of digital payments can be accelerated when consumers perceive that there is security (Tang et al., 2021). For example, in their study, Abbasi et al. (2022) found that security influenced users' continued use of e-wallets. Mombeuil (2020) supports this claim by revealing that the adoption of mobile wallets can be influenced by perceived security. In this regard, e-wallet managers have a role in meeting users' security expectations (Abbasi et al., 2022). Users demand the security of their transactions (Jaiswal et al., 2023).

The adoption of digital payments can be fueled by security measures (Oyelami et al., 2020; Sakib et al., 2025). Security measures may include biometrics or authentication to prevent hacking (Rahman et al., 2022; Sakib et al., 2025). Digital payment systems should identify authentication and secure other information (Tang et al., 2021). Focus may be on user verification and accessibility using PIN, fingerprint, password, or one-time code (Błach & Klimontowicz, 2021). Additionally, digital payment systems can be strengthened by enabling multiple encryptions (Jingnan et al., 2023) and end-to-end encryption (Sakib et al., 2025).

The mechanisms to ensure the integrity of personal information for the purpose of ensuring the security of digital payments should be devised and implemented (Jingnan et al., 2023). In this regard, digital payment systems should be updated to prevent security issues (Tang et al., 2021). Key players, such as businesses, should focus on improving secure digital payment processes, including the prevention of monetary loss (Chang et al., 2022; Srinivasan et al., 2025). Therefore, investment in security improvements should be prioritized in digital payment adoption (Adil & Hatekar, 2020).

All relevant players in the digital financial ecosystem should take deliberate investment measures. For example, Raj et al. (2024) recommended that service providers play a role in ensuring secure digital payments. Similarly, Namahoot and Jantasri (2023) proposed that service providers should employ efforts to protect security systems, especially in cases involving money loss or data theft. They need to cooperate with other players, such as financial institutions, to ensure digital payment security (Balakrishnan & Lay Gan, 2023).

2.6.4. Relevance of Enhanced Privacy and Safety

Privacy influences the intention to use digital payment systems (Linge et al., 2023). For example, the adoption of mobile wallets can be influenced by perceived privacy (Mombeuil, 2020). Investment in improving privacy is likely to influence digital payment adoption (Adil & Hatekar, 2020). Businesses should invest in data protection (Chang et al., 2022) because customers who feel their personal data are not being misused are more likely to adopt digital payments (Widayat et al., 2020).

The adoption of digital payments can be fueled by safety measures (Oyelami et al., 2020). Safe digital payment systems are highly preferred by individuals (Raj et al., 2025). Therefore, businesses should focus on improving a safe digital payment process (Chang et al., 2022). For example, the safety of digital payment systems helps decrease the risk of payment accounts being stolen (Tang et al., 2021). Jingnan et al. (2023) propose that safety firewalls should be constructed to prevent incursions. Generally, mechanisms to prevent payment defaults can stimulate the adoption of digital payments (Widayat et al., 2020).

This study proposes that customers perceive enhanced security and privacy as key drivers of adopting digital payments in Tanzania. The driver is defined based on the following statements.

- Digital payment solutions must value security and privacy (Protection1).
- Successful digital payment system depends on appropriate financial consumer protection framework. Client data must be safeguarded through workable data protection and privacy legislations (Protection2).
- Digital payments users must feel confident that their funds are protected and accessible (Protection3).
- There should be appropriate transparency mechanisms in digital payments (Protection4).

With regard to enhanced security and privacy, this study seeks to test the following hypotheses (see also Figure 4).

Hypothesis 13: Enhanced security and privacy drives the improvement of digital payment ecosystem in Tanzania.

Hypothesis 14: The addition of Enhanced_policy improves the prediction of Efforts_ecosystem beyond Protection1, Protection2, Protection3, and Protection4 alone.

Hypothesis 15: The addition of Enhanced_collaboration improves the prediction of Efforts_ecosystem over and above Protection1, Protection2, Protection3, Protection4, and Enhanced_policy alone.

Hypothesis 16: The addition of Enhanced_regulatory improves the prediction of Efforts_ecosystem over and above Protection1, Protection2, Protection3, Protection4, Enhanced_policy, and Enhanced_collaboration alone.

2.7. Collaboration and Fair Treatment among Stakeholders

The adoption of digital payments is stimulated by support from financial institutions (Widayat et al., 2020) and the shared interest and willingness of enterprises and consumers (Fu et al., 2022). For example, collaboration among enterprises, financial institutions, and digital payment service providers particularly regarding trustworthiness, reliability, and consistency is crucial for promoting digital payment adoption (Wang, Nguyen, Jiang, Nguyen, & Saleem, 2023). Likewise, increased cooperation between policymakers and service providers can also influence digital payment adoption (Saibil et al., 2023).

Stakeholders in the financial technology sector have a role in ensuring that the digital payment ecosystem is user-friendly and that appropriate incentives exist to accelerate digital payment adoption (Rosli, Saleh, Ali, & Abu Bakar, 2023). The development of digital payment systems should involve relevant stakeholders, such as users, to enhance the system's value and usefulness (Tan et al., 2025). For example, collaboration among stakeholders like financial institutions and online shops can focus on expanding the number of users and increasing their confidence in digital payment services (Saibil et al., 2023). Consumers' intention to use digital payments is greatly influenced by benefits such as the avoidance of physical contact (Munikrishnan et al., 2024; Wang et al., 2023).

This study proposes that customers perceive collaboration and fair treatment among stakeholders as key drivers of adopting digital payments in Tanzania. The drivers are defined based on the following statements.

- There must be collaboration among players in the digital payment ecosystem in order to devise initiatives that enhance digital payments experiences (Stakeholder1).
- Players in the digital payment ecosystem must be treated fairly in order to deliver outstanding digital payments experiences for users (Stakeholder2).
- More digital payment service providers should be integrated in order to advance service performance and efficient methods to pay (Stakeholder3).
- Successful digital payments should depend on the interest in digital payments from both the entrepreneur and the customer (Stakeholder4).
- The digital payment solutions must be designed to reflect the needs and the business environment of users and supply chain actors (Stakeholder5).
- Frequent campaigns that seek to educate consumers on digital payments should be carried out by relevant authorities and in collaboration with key players in the industry (Stakeholder6).

With regard to collaboration and fair treatment among stakeholders, this study seeks to test the following hypotheses (see also Figure 5).

Hypothesis 17: Collaboration and fair treatment among stakeholders drives the improvement of digital payment ecosystem in Tanzania.

Hypothesis 18: The addition of Enhanced_policy improves the prediction of Efforts_ecosystem over and above Stakeholder1, Stakeholder2, Stakeholder3, Stakeholder4, Stakeholder5, and Stakeholder6 alone.

Hypothesis 19: The addition of Enhanced_collaboration improves the prediction of Efforts_ecosystem over and above Stakeholder1, Stakeholder2, Stakeholder3, Stakeholder4, Stakeholder5, Stakeholder6, and Enhanced_policy alone.

Hypothesis 20: The addition of Enhanced_regulatory improves the prediction of Efforts_ecosystem over and above Stakeholder1, Stakeholder2, Stakeholder3, Stakeholder4, Stakeholder5, Stakeholder6, Enhanced_policy, and Enhanced_collaboration alone.

2.8. Government Support and Regulatory Framework

Policy makers have a role in ensuring that the information technology infrastructure is deployed (Saibil et al., 2023). These infrastructures play a vital role in promoting widespread adoption of digital payments in urban and rural areas. For example, through these infrastructures, the government can reduce the unbanked population (Nandru et al., 2024). The government can also develop and implement policies that focus on enabling people to easily open bank accounts through many channels (Mouna & Jarboui, 2022). In this regard, the number of internet and mobile banking users, and the number of merchants accepting m-payments, can be increased, leading to successful adoption of digital payments (Błach & Klimontowicz, 2021).

Customers are likely to adopt digital payments if the government builds necessary trust (Khan, 2021). The trust from new and existing adopters can be influenced by regulatory measures, particularly the implementation of workable policies (Jaiswal et al., 2023). For example, the government has a role in ensuring the legality of service providers to reduce security and privacy risks (Oktavendi & Mu'ammal, 2022). Therefore, the government should devise and implement policies that promote smooth licensing for service providers (Saibil et al., 2023). Additionally, it must ensure that digital payment service providers disclose their products' terms and conditions in simple language (Amankwa, Amissah, & Okoampa-Larbi, 2023). The government also needs to ensure that digital payment service providers operate honestly (Amankwa et al., 2023).

The government should devise and implement policies that ensure the security of user data and personal profiles (Saibil et al., 2023). It should also devise and implement policies that ensure the security of deposit funds (Saibil et al., 2023). In this regard, mechanisms to enhance legal structures for ensuring the security of digital payments should be devised and implemented (Jingnan et al., 2023). For example, customers are likely to adopt digital payments if the government provides a concrete cybersecurity framework and infrastructure (Khan, 2021).

On the other hand, the government must ensure that digital payment service providers act fairly in their operations (Amankwa et al., 2023). This fairness includes the commitment to address concerns from their users. Digital payment adoption can be influenced by the existence of a proper redress mechanism (Kaur et al., 2022). The government must ensure that digital payment service providers "provide accessible, timely, efficient complaint handling, dispute resolution, and redress mechanisms" (Amankwa et al., 2023). Islam et al. (2024) recommend that regulators should create mechanisms enabling consumers to report safety concerns.

This study proposes that customers perceive government support and the regulatory framework as key drivers of adopting digital payments in Tanzania. The driver is defined based on the following statements.

- Successful digital payment system depends on an enhanced regulatory environment (Regulatory1).
- The digital payment service providers should be regularly assessed by relevant authorities (Regulatory2).
- The government should devise initiatives that seek improvements in ICT infrastructures in all parts of the country (Regulatory3).
- The government should enact mechanisms that encourage greater adoption of digital payment technologies in the digital payment ecosystem (Regulatory4).
- Successful digital payments depend on uninterruptible power supply (Regulatory5).
- Successful digital payments depend on good mobile network coverage (Regulatory6).
- Successful digital payment system depends on robust digital networks (Regulatory7).
- Shared infrastructures that seek to reduce costs and increase access to digital payments should be jointly developed by key stakeholders in the digital payment ecosystem (Regulatory8).

With regard to government support and regulatory framework, this study seeks to test the following hypotheses (see also Figure 6).

Hypothesis 21: The government support and regulatory framework drives the improvement of digital payment ecosystem in Tanzania.

Hypothesis 22: The addition of Enhanced_policy improves the prediction of Efforts_ecosystem beyond Regulatory1, Regulatory2, Regulatory3, Regulatory4, Regulatory5, Regulatory6, Regulatory7, and Regulatory8 alone.

Hypothesis 23: The addition of Enhanced_collaboration improves the prediction of Efforts_ecosystem beyond Regulatory1, Regulatory2, Regulatory3, Regulatory4, Regulatory5, Regulatory6, Regulatory7, Regulatory8, and Enhanced_policy alone.

Hypothesis 24: The addition of Enhanced_regulatory improves the prediction of Efforts_ecosystem beyond Regulatory1, Regulatory2, Regulatory3, Regulatory4, Regulatory5, Regulatory6, Regulatory7, Regulatory8, Enhanced_policy, and Enhanced_collaboration alone.

3. METHODOLOGY

This study aimed to analyze the perceived drivers of digital payment adoption in Tanzania using hierarchical multiple regression. The focus was to collect data from respondents representing consumers in various areas. In this regard, we relied on consumer representatives' bodies established by Tanzanian law. These bodies include the Land Transport Regulatory Authority Consumer Consultative Council (LATRA-CCC), Energy and Water Utilities Regulatory Authority Consumer Consultative Council (EWURA-CCC), Tanzania Communications Regulatory Authority Consumer Consultative Council (TCRA-CCC), and the Tanzania Civil Aviation Authority Consumer Consultative Council (TCAA-CCC).

From these councils, we drew a population of 368 respondents categorized as members of the council (17), management team (11), employees (4), and regional consumer committees (336). All respondents were asked to complete a questionnaire, and from July 2023 to May 2024, we received 261 responses, representing a 70.92% response rate. Contributions came from LATRA CCC (76.62%), EWURA CCC (70.70%), TCRA CCC (69.16%), and TCAA CCC (62.96%).

3.1. Variables and Measurement

Under the category of Policy Development Initiatives, we have the following independent variables: Policy1; Policy2; Policy3; Policy4; Policy5; Policy6; Policy7; Enhanced_policy; Enhanced_collaboration; and Enhanced_regulatory. The dependent variable is Efforts_ecosystem.

Under the category of Operational Capabilities of Digital Payment Systems, we have the following independent variables: Capability1, Capability2, Capability3, Capability4, Capability5, Capability6; Enhanced_policy, Enhanced_collaboration, and Enhanced_regulatory. The dependent variable is Efforts_ecosystem.

Under the category of Enhanced System and Customer Experience, we have the following independent variables: Convenience1, Convenience2, Convenience3, Convenience4, Enhanced_policy, Enhanced_collaboration, and Enhanced_regulatory. The dependent variable is Efforts_ecosystem.

Under the category of Enhanced Security and Privacy, we have the following independent variables: Protection1, Protection2, Protection3, Protection4, Enhanced_policy, Enhanced_collaboration, and Enhanced_regulatory. The dependent variable is Efforts_ecosystem.

Under the category of Collaboration and Fair Treatment among Stakeholders, we have the following independent variables: Stakeholder1, Stakeholder2, Stakeholder3, Stakeholder4, Stakeholder5, Stakeholder6, Enhanced_policy, Enhanced_collaboration, and Enhanced_regulatory. The dependent variable is Efforts_ecosystem.

Under the category of Government Support and Regulatory Framework, we have the following independent variables: Regulatory1; Regulatory2; Regulatory3; Regulatory4; Regulatory5; Regulatory6; Regulatory7; Regulatory8; Enhanced_policy; Enhanced_collaboration; and Enhanced_regulatory. The dependent variable is Efforts_ecosystem.

Additional independent variables are defined as follows:

- There is a possibility of having sufficient policy development initiatives in improving digital payments in Tanzania (Enhanced_policy).
- There is a possibility of increased collaboration among digital payment stakeholders in Tanzania (Enhanced_collaboration).
- There is a possibility of improving the regulatory framework for digital payments in Tanzania (Enhanced_regulatory).

The dependent variable is defined as follows:

- There is a possibility of improving digital payment ecosystem in Tanzania (Efforts_ecosystem).

Both independent variables (including additional variables) and the dependent variable were measured using a 7-point Likert scale: 1=Strongly disagree; 2=Disagree; 3=Disagree somewhat; 4=Undecided; 5=Agree somewhat; 6=Agree; 7=Strongly agree.

4. RESULTS

In analyzing the perceived drivers of digital payment adoption in Tanzania, we first employed Principal Components Analysis (PCA) to determine whether there were relationships between the drivers and their respective categories: enhanced policy development initiatives; operational capabilities of digital payment systems; improved system and positive customer experience; enhanced security and privacy; collaboration and fair treatment among stakeholders; and government support and regulatory framework. It was found that drivers had at least one correlation with another driver ($r \geq 0.3$), as shown in Table 1.

The results also show that all drivers had KMO values greater than 0.740, confirming the adequacy of sampling as shown in Table 2. Moreover, the overall KMO measure was 0.900, and Bartlett's Test of Sphericity was statistically significant ($p < 0.001$), as shown in Table 3. Additionally, as shown in Table 4 and Table 5, six components were retained. The Rotated Component Matrix appears to be a simple structure, with each variable loading strongly on only one component.

Table 1. Correlation Matrix.

Variables		Protection1	Protection2	Protection3	Protection4	Convenience 1	Convenience 2	Convenience 3	Convenience 4	Policy1	Policy2	Policy3	Policy4	Policy5	Policy6	Policy7	Regulatory1	Regulatory2
Correlation	Protection1	1.000																
	Protection2	0.113	1.000															
	Protection3	0.335	0.443	1.000														
	Protection4	0.103	0.395	0.476	1.000													
	Convenience1	0.073	0.541	0.270	0.424	1.000												
	Convenience2	0.040	0.529	0.247	0.357	0.690	1.000											
	Convenience3	-0.018	0.366	0.209	0.406	0.445	0.527	1.000										
	Convenience4	0.240	0.232	0.427	0.369	0.270	0.366	0.294	1.000									
	Policy1	0.040	0.328	0.143	0.247	0.383	0.490	0.389	0.257	1.000								
	Policy2	0.011	0.334	0.248	0.310	0.438	0.427	0.367	0.212	0.298	1.000							
	Policy3	0.087	0.365	0.322	0.243	0.352	0.384	0.217	0.215	0.221	0.441	1.000						
	Policy4	0.161	0.511	0.298	0.267	0.430	0.492	0.347	0.367	0.287	0.442	0.375	1.000					
	Policy5	-0.022	0.478	0.156	0.293	0.532	0.582	0.431	0.313	0.344	0.427	0.260	0.754	1.000				
	Policy6	0.029	0.295	0.062	0.210	0.345	0.321	0.260	0.140	0.309	0.300	0.253	0.417	0.420	1.000			
	Policy7	0.138	0.336	0.251	0.261	0.376	0.291	0.190	0.235	0.226	0.452	0.400	0.427	0.399	0.424	1.000		
	Regulatory1	0.076	0.510	0.288	0.373	0.565	0.483	0.342	0.167	0.401	0.455	0.451	0.545	0.619	0.481	0.457	1.000	
	Regulatory2	0.123	0.430	0.266	0.326	0.503	0.450	0.326	0.225	0.267	0.363	0.240	0.557	0.627	0.334	0.397	0.552	1.000

Table 1 Continued. Correlation Matrix.

Variables		Protection1	Protection2	Protection3	Protection4	Convenience 1	Convenience 2	Convenience 3	Convenience 4	Policy1	Policy2	Policy3	Policy4	Policy5	Policy6	Policy7	Regulatory1	Regulatory2
Correlation	Regulatory3	0.471	0.211	0.445	0.267	0.162	0.123	0.025	0.388	0.030	0.168	0.147	0.343	0.164	0.039	0.337	0.144	0.203
	Regulatory4	0.349	0.238	0.322	0.261	0.191	0.130	0.130	0.251	-0.004	0.181	0.249	0.211	0.119	0.058	0.363	0.144	0.118
	Regulatory5	0.197	0.373	0.191	0.195	0.430	0.391	0.285	0.157	0.291	0.267	0.207	0.358	0.352	0.341	0.277	0.438	0.350
	Regulatory6	0.163	0.343	0.310	0.167	0.255	0.249	0.081	0.234	0.180	0.237	0.235	0.378	0.333	0.118	0.511	0.386	0.261
	Regulatory7	0.187	0.254	0.206	0.276	0.320	0.224	0.102	0.124	0.185	0.158	0.182	0.239	0.236	0.285	0.353	0.366	0.216
	Regulatory8	-0.016	0.403	0.107	0.162	0.518	0.512	0.292	0.095	0.315	0.349	0.221	0.389	0.512	0.252	0.344	0.467	0.514
	Stakeholder1	0.215	0.439	0.250	0.244	0.497	0.387	0.339	0.188	0.287	0.272	0.264	0.260	0.325	0.248	0.263	0.422	0.259
	Stakeholder2	0.046	0.437	0.266	0.308	0.488	0.413	0.307	0.206	0.281	0.328	0.214	0.252	0.340	0.115	0.254	0.338	0.296
	Stakeholder3	0.137	0.337	0.404	0.425	0.404	0.297	0.234	0.297	0.082	0.321	0.204	0.362	0.309	0.123	0.257	0.236	0.288
	Stakeholder4	0.007	0.300	0.203	0.324	0.471	0.398	0.294	0.131	0.162	0.299	0.228	0.207	0.330	0.119	0.150	0.348	0.322
	Stakeholder5	0.151	0.342	0.180	0.210	0.440	0.464	0.203	0.237	0.268	0.345	0.205	0.308	0.341	0.184	0.318	0.385	0.306
	Stakeholder6	0.064	0.489	0.178	0.272	0.544	0.488	0.473	0.190	0.313	0.365	0.184	0.324	0.489	0.343	0.265	0.401	0.324
	Capability1	-0.011	0.462	0.090	0.208	0.611	0.565	0.401	0.156	0.351	0.441	0.228	0.364	0.529	0.254	0.254	0.488	0.446
	Capability2	0.149	0.448	0.156	0.097	0.529	0.411	0.266	0.209	0.316	0.258	0.163	0.396	0.453	0.261	0.200	0.404	0.405
	Capability3	0.202	0.226	0.140	0.049	0.380	0.273	0.101	0.193	0.214	0.153	0.086	0.243	0.237	0.121	0.277	0.220	0.209
	Capability4	0.157	0.299	0.058	0.170	0.483	0.383	0.333	0.074	0.210	0.288	0.091	0.294	0.358	0.341	0.152	0.418	0.329
	Capability5	0.166	0.363	0.103	0.168	0.487	0.396	0.315	0.168	0.193	0.260	0.111	0.403	0.391	0.316	0.159	0.314	0.179
	Capability6	0.102	0.340	0.104	0.244	0.424	0.374	0.338	0.121	0.303	0.372	0.147	0.416	0.459	0.322	0.287	0.425	0.297

Table 1 Continued. Correlation Matrix.

Variables		Regulatory3	Regulatory4	Regulatory5	Regulatory6	Regulatory7	Regulatory8	Stakeholder 1	Stakeholder 2	Stakeholder 3	Stakeholder 4	Stakeholder 5	Stakeholder 6	Capability1	Capability2	Capability3	Capability4	Capability5	Capability6
Correlation	Regulatory3	1.000																	
	Regulatory4	0.545	1.000																
	Regulatory5	0.218	0.159	1.000															
	Regulatory6	0.480	0.336	0.395	1.000														
	Regulatory7	0.189	0.265	0.381	0.293	1.000													
	Regulatory8	0.055	0.171	0.374	0.348	0.381	1.000												
	Stakeholder1	0.338	0.302	0.460	0.386	0.376	0.411	1.000											
	Stakeholder2	0.239	0.216	0.416	0.445	0.272	0.417	0.540	1.000										
	Stakeholder3	0.395	0.253	0.220	0.211	0.252	0.129	0.241	0.372	1.000									
	Stakeholder4	0.095	0.114	0.311	0.223	0.245	0.314	0.294	0.427	0.416	1.000								
	Stakeholder5	0.341	0.219	0.417	0.409	0.308	0.434	0.333	0.398	0.439	0.358	1.000							
	Stakeholder6	0.153	0.148	0.449	0.271	0.247	0.381	0.496	0.583	0.327	0.477	0.385	1.000						
	Capability1	0.095	0.059	0.437	0.272	0.379	0.581	0.529	0.580	0.363	0.427	0.483	0.647	1.000					
	Capability2	0.244	0.121	0.411	0.257	0.379	0.390	0.445	0.495	0.342	0.442	0.406	0.499	0.608	1.000				
	Capability3	0.302	0.171	0.306	0.263	0.336	0.327	0.350	0.331	0.281	0.342	0.403	0.408	0.363	0.570	1.000			
	Capability4	0.039	-0.024	0.429	0.138	0.335	0.411	0.382	0.266	0.261	0.354	0.394	0.385	0.543	0.522	0.435	1.000		

Variables		Regulatory3	Regulatory4	Regulatory5	Regulatory6	Regulatory7	Regulatory8	Stakeholder 1	Stakeholder 2	Stakeholder 3	Stakeholder 4	Stakeholder 5	Stakeholder 6	Capability1	Capability2	Capability3	Capability4	Capability5	Capability6
	Capability5	0.159	0.112	0.373	0.266	0.258	0.322	0.439	0.328	0.237	0.284	0.324	0.404	0.395	0.456	0.357	0.612	1.000	
	Capability6	0.144	0.128	0.389	0.248	0.366	0.350	0.376	0.302	0.386	0.359	0.337	0.442	0.467	0.481	0.341	0.473	0.475	1.000

Table 2. Anti-image matrix.

Variables		Protection1	Protection2	Protection3	Protection4	Convenience1	Convenience2	Convenience3	Convenience4	Policy1	Policy2	Policy3	Policy4	Policy5	Policy6	Policy7	Regulatory1	Regulatory2
Anti-image Correlation	Protection1	0.743[a]																
	Protection2	0.048	0.921[a]															
	Protection3	-0.171	-0.292	0.852[a]														
	Protection4	0.074	-0.167	-0.140	0.846[a]													
	Convenience1	0.037	-0.025	0.016	-0.160	0.947[a]												
	Convenience2	-0.018	-0.135	-0.010	0.019	-0.345	0.932[a]											
	Convenience3	0.111	0.072	-0.057	-0.188	0.056	-0.185	0.901[a]										
	Convenience4	-0.086	0.142	-0.227	-0.169	0.002	-0.141	-0.101	0.889[a]									
	Policy1	-0.078	-0.026	0.018	-0.085	0.003	-0.199	-0.168	-0.095	0.911[a]								
	Policy2	0.086	0.121	-0.108	-0.041	-0.006	0.017	-0.038	0.028	-0.070	0.926[a]							
	Policy3	-0.009	-0.047	-0.090	0.055	-0.022	-0.174	0.033	-0.033	0.028	-0.205	0.879[a]						
	Policy4	-0.090	-0.224	0.024	0.128	0.082	-0.033	-0.091	-0.076	0.029	-0.140	-0.185	0.882[a]					
	Policy5	0.161	0.079	0.128	-0.032	0.037	-0.157	0.001	-0.137	0.030	0.040	0.167	-0.507	0.905[a]				
	Policy6	0.097	0.046	0.079	-0.034	0.047	-0.040	0.093	-0.043	-0.123	0.024	-0.016	-0.131	0.032	0.851[a]			
	Policy7	-0.030	-0.071	0.085	0.044	-0.153	0.092	-0.067	-0.016	0.019	-0.254	-0.157	0.078	-0.066	-0.315	0.855[a]		
	Regulatory1	-0.009	-0.051	-0.132	-0.126	-0.157	0.121	0.045	0.156	-0.119	-0.037	-0.225	-0.049	-0.243	-0.170	-0.007	0.930[a]	
	Regulatory2	-0.153	-0.017	-0.068	-0.104	-0.115	0.034	-0.040	0.051	0.056	0.020	0.099	-0.117	-0.218	-0.044	-0.138	-0.101	0.916[a]

Note: a. Measures of Sampling Adequacy (MSA).

Table 2 Continued. Anti-image matrix.

Variables		Protection1	Protection2	Protection3	Protection4	Convenience1	Convenience2	Convenience3	Convenience4	Policy1	Policy2	Policy3	Policy4	Policy5	Policy6	Policy7	Regulatory1	Regulatory2
Anti-image Correlation	Regulatory3	-0.224	0.157	-0.140	-0.172	0.061	-0.005	0.127	-0.076	0.061	-0.026	0.107	-0.198	0.057	0.027	-0.044	0.079	-0.062
	Regulatory4	-0.172	-0.094	0.061	-0.032	-0.049	0.038	-0.147	-0.016	0.140	-0.035	-0.105	0.060	-0.020	0.027	-0.119	0.029	0.095
	Regulatory5	-0.072	-0.002	0.006	0.065	-0.043	-0.026	-0.041	0.021	-0.027	0.019	0.007	-0.083	0.089	-0.115	0.081	-0.029	-0.093
	Regulatory6	0.119	-0.041	-0.100	0.103	0.132	0.022	0.108	-0.039	-0.041	0.121	0.036	-0.072	-0.034	0.193	-0.370	-0.146	0.066
	Regulatory7	-0.070	0.108	-0.089	-0.245	0.070	0.036	0.128	0.030	0.015	0.158	0.012	-0.041	0.053	-0.104	-0.170	-0.054	0.140
	Regulatory8	0.097	-0.035	-0.052	0.084	-0.079	-0.095	0.019	0.090	-0.028	-0.027	0.042	-0.035	-0.099	0.026	-0.004	0.068	-0.261
	Stakeholder1	-0.068	-0.116	0.013	0.079	-0.101	0.062	-0.141	0.012	-0.027	0.038	-0.115	0.188	-0.031	-0.072	0.106	-0.104	0.061
	Stakeholder2	0.054	0.026	-0.032	-0.164	-0.001	-0.004	0.044	0.012	-0.043	-0.058	0.013	0.028	0.065	0.101	0.007	0.053	0.010
	Stakeholder3	0.089	-0.012	-0.216	-0.134	-0.133	0.094	0.011	0.005	0.114	0.011	-0.008	-0.151	-0.028	-0.003	-0.042	0.173	-0.010
	Stakeholder4	0.043	0.111	-0.007	-0.143	-0.042	-0.095	0.000	0.055	0.103	-0.053	-0.119	0.117	-0.019	0.093	0.117	-0.059	-0.092
	Stakeholder5	-0.028	-0.043	0.147	0.057	0.042	-0.190	0.058	-0.059	-0.052	-0.090	0.028	0.118	0.045	0.020	0.015	-0.131	0.047
	Stakeholder6	-0.102	-0.194	-0.020	0.029	-0.050	0.049	-0.234	0.046	0.063	-0.033	0.067	0.144	-0.212	-0.262	0.029	0.064	0.105
	Capability1	0.072	-0.027	0.161	0.102	-0.058	-0.115	0.017	-0.036	-0.013	-0.167	-0.010	0.047	-0.042	0.169	0.038	-0.048	-0.063
	Capability2	0.005	-0.216	0.026	0.294	-0.124	0.113	-0.021	-0.079	-0.102	0.056	-0.014	0.013	-0.081	-0.077	0.152	0.001	-0.133
	Capability3	0.034	0.115	-0.023	0.093	-0.056	-0.010	0.150	-0.070	-0.114	0.098	0.035	-0.089	0.093	0.178	-0.222	0.049	0.056
	Capability4	-0.176	0.031	0.015	-0.065	0.007	0.021	-0.158	0.060	0.137	-0.062	0.071	0.085	0.048	-0.140	0.063	-0.133	-0.054
	Capability5	-0.068	-0.060	0.040	0.005	-0.221	-0.014	-0.027	-0.009	0.082	-0.030	0.065	-0.184	-0.053	-0.104	0.108	0.131	0.229
	Capability6	-0.045	0.035	0.090	-0.064	0.078	-0.007	-0.040	0.092	-0.104	-0.123	0.096	-0.059	-0.053	0.022	-0.051	-0.071	0.081

Table 2 Continued. Anti-image matrix.

Variables		Regulatory3	Regulatory4	Regulatory5	Regulatory6	Regulatory7	Regulatory8	Stakeholder1	Stakeholder2	Stakeholder3	Stakeholder4	Stakeholder5	Stakeholder6	Capability1	Capability2	Capability3	Capability4	Capability5	Capability6
Anti-image Correlation	Regulatory3	0.796[a]																	
	Regulatory4	-0.322	0.842[a]																
	Regulatory5	0.002	0.022	0.956[a]															
	Regulatory6	-0.266	0.011	-0.161	0.850[a]														
	Regulatory7	0.136	-0.137	-0.147	-0.015	0.874[a]													
	Regulatory8	0.141	-0.169	0.041	-0.081	-0.172	0.915[a]												
	Stakeholder1	-0.249	-0.056	-0.094	-0.046	-0.096	-0.077	0.927[a]											
	Stakeholder2	0.094	-0.027	-0.094	-0.249	0.078	-0.104	-0.201	0.921[a]										
	Stakeholder3	-0.143	-0.020	0.070	0.135	-0.037	0.233	0.062	-0.138	0.863[a]									
	Stakeholder4	0.111	-0.020	-0.025	-0.114	-0.012	-0.022	0.047	-0.031	-0.192	0.921[a]								

Variables		Regulatory3	Regulatory4	Regulatory5	Regulatory6	Regulatory7	Regulatory8	Stakeholder1	Stakeholder2	Stakeholder3	Stakeholder4	Stakeholder5	Stakeholder6	Capability1	Capability2	Capability3	Capability4	Capability5	Capability6
	Stakeholder5	-0.168	-0.001	-0.124	-0.136	-0.007	-0.175	0.122	0.013	-0.287	-0.020	0.923[a]							
	Stakeholder6	-0.012	-0.003	-0.109	0.020	0.095	0.113	-0.010	-0.228	0.067	-0.198	-0.014	0.895[a]						
	Capability1	-0.008	0.118	0.040	0.023	-0.182	-0.185	-0.156	-0.143	-0.154	0.098	-0.055	-0.320	0.920[a]					
	Capability2	-0.162	0.008	0.024	0.086	-0.160	0.140	0.065	-0.226	0.044	-0.169	0.016	0.092	-0.191	0.897[a]				
	Capability3	-0.106	0.018	0.034	0.077	-0.070	-0.116	-0.056	0.031	-0.015	-0.085	-0.088	-0.254	0.155	-0.302	0.862[a]			
	Capability4	0.089	0.135	-0.120	0.030	-0.002	-0.076	0.004	0.135	-0.050	-0.032	-0.081	0.143	-0.225	-0.098	-0.223	0.886[a]		
	Capability5	0.022	-0.001	0.034	-0.139	0.020	0.011	-0.138	-0.057	0.069	0.002	-0.017	-0.015	0.123	-0.040	0.001	-0.397	0.890[a]	
	Capability6	0.062	-0.015	-0.066	-0.035	-0.091	-0.033	-0.060	0.125	-0.226	-0.043	0.057	-0.080	0.001	-0.147	-0.006	-0.045	-0.148	0.946[a]

Note: a. Measures of Sampling Adequacy (MSA).

Table 3. KMO and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.900
Bartlett's Test of Sphericity	Approx. Chi-Square	4945.091
	df	595
	Sig.	<0.001

Table 4. Total variance explained.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.842	33.833	33.833	11.842	33.833	33.833	4.575	13.073	13.073
2	2.736	7.817	41.651	2.736	7.817	41.651	4.429	12.653	25.725
3	2.120	6.058	47.708	2.120	6.058	47.708	3.535	10.099	35.824
4	1.597	4.563	52.271	1.597	4.563	52.271	3.090	8.827	44.652
5	1.322	3.776	56.047	1.322	3.776	56.047	2.679	7.656	52.307
6	1.153	3.293	59.340	1.153	3.293	59.340	2.461	7.033	59.340
7	1.100	3.144	62.484						
8	0.935	2.671	65.155						
9	0.920	2.628	67.783						
10	0.865	2.471	70.254						
11	0.795	2.270	72.524						
12	0.769	2.197	74.721						
13	0.710	2.028	76.749						
14	0.662	1.892	78.641						
15	0.626	1.789	80.431						
16	0.603	1.722	82.153						
17	0.592	1.691	83.844						
18	0.518	1.480	85.325						
19	0.470	1.342	86.667						
20	0.441	1.260	87.926						
21	0.429	1.225	89.152						
22	0.407	1.162	90.313						
23	0.392	1.121	91.434						
24	0.381	1.089	92.524						
25	0.351	1.002	93.526						
26	0.319	0.912	94.438						
27	0.303	0.865	95.303						
28	0.292	0.834	96.137						
29	0.258	0.738	96.875						
30	0.229	0.654	97.529						
31	0.206	0.588	98.117						
32	0.187	0.533	98.650						
33	0.176	0.504	99.154						
34	0.166	0.475	99.629						
35	0.130	0.371	100.000						

Note: Extraction Method: Principal Component Analysis.

Table 5. Rotated Component Matrix[a].

Variables	Component					
	1	2	3	4	5	6
Capability4	0.773					
Capability5	0.706					
Capability2	0.669					
Capability3	0.612					
Capability6	0.580					
Capability1	0.485					
Policy4		0.758				
Policy5		0.737				
Policy7		0.600				
Policy1		0.572				
Policy6		0.538				
Policy2		0.526				
Policy3		0.419				
Convenience3			0.701			
Convenience4			0.589			
Convenience2			0.573			
Convenience1			0.487			
Protection3				0.682		
Protection1				0.649		
Protection4				0.517		
Protection2				0.467		
Regulatory3					0.762	
Regulatory2					0.668	
Regulatory6					0.655	
Regulatory1					0.627	
Regulatory4					0.584	
Regulatory5					0.481	
Regulatory8					0.438	
Regulatory7					0.423	
Stakeholder4						0.625
Stakeholder3						0.609
Stakeholder1						0.513
Stakeholder2						0.500
Stakeholder6						0.458
Stakeholder5						0.406

Note: Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 25 iterations.

4.1. Relevance of Enhanced Policy Development Initiatives

Based on Model 1 as shown in Table 6, we find that Policy1, Policy2, Policy3, Policy4, Policy6, and Policy7 statistically significantly predict Efforts_ecosystem. However, Policy5 does not. In Model 2, the addition of Enhanced_policy to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of .055. In Model 3, the addition of Enhanced_collaboration to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of 0.004. Similarly, in Model 4, the addition of Enhanced_regulatory to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of 0.013, as shown in Table 6.

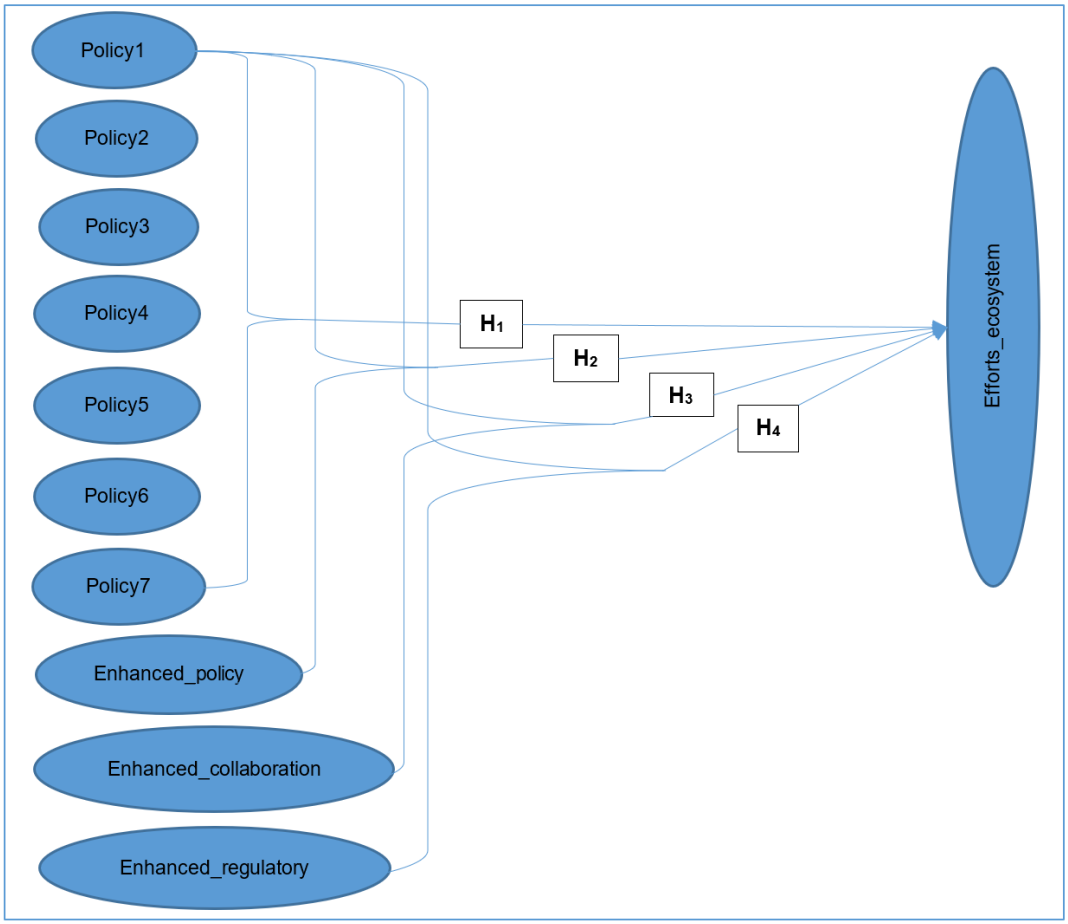

Figure 1. Relevance of enhanced policy development initiatives.

We therefore reveal that all the null hypotheses (for Hypotheses 1, 2, 3, and 4) are rejected, leading to the following conclusions: enhanced policy development initiatives drive the improvement of the digital payment ecosystem in Tanzania; the addition of Enhanced_policy improves the prediction of Efforts_ecosystem over and above Policy1, Policy2, Policy3, Policy4, Policy5, Policy6, and Policy7; the addition of Enhanced_collaboration improves the prediction of Efforts_ecosystem over and above Policy1, Policy2, Policy3, Policy4, Policy5, Policy6, Policy7, and Enhanced_policy; and the addition of Enhanced_regulatory improves the prediction of Efforts_ecosystem over and above Policy1, Policy2, Policy3, Policy4, Policy5, Policy6, Policy7, Enhanced_policy, and Enhanced_collaboration.

Table 6. Hierarchical multiple regression – enhanced policy development initiatives.

Dependent Variable: Efforts_ecosystem								
Variables	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	B	**β**	**B**	**β**	**B**	**β**	**B**	**β**
Constant	6.074***		9.245***		9.218***		8.758***	
Policy1	0.176***	0.240	0.066**	0.090	0.056**	0.077	0.047*	0.064
Policy2	0.414***	0.577	0.120***	0.167	0.109***	0.152	0.131***	0.182
Policy3	0.201***	0.837	0.076***	0.316	0.063***	0.263	0.089***	0.371
Policy4	0.176***	0.321	0.081***	0.146	0.067***	0.122	0.093***	0.169
Policy5	0.009	0.006	-0.570***	-0.396	-0.644***	-0.448	-0.476***	-0.331
Policy6	0.123***	0.212	0.038*	0.066	0.036*	0.061	0.039*	0.066
Policy7	0.281***	0.329	0.691***	0.809	0.730***	0.854	0.668***	0.781
Enhanced_policy			-0.634***	-0.722	-0.667***	-0.760	-0.697***	-0.793
Enhanced_collaboration					0.027***	0.074	0.026***	0.072
Enhanced_regulatory							0.126***	0.179
R^2	0.871		0.926		0.930		0.943	
F	243.584***		392.591***		371.780***		413.482***	
ΔR^2	0.871		0.055		0.004		0.013	
ΔF	243.584***		186.366***		16.174***		55.973***	

Note: N = 261. *p < 0.05, **p < .01, ***p < 0.001.

4.2. Relevance of Operational Capabilities of Digital Payment Systems

In Model 1, as shown in Table 7, we find that Capability1, Capability2, Capability3, Capability4, Capability5, and Capability6 significantly predict Efforts_ecosystem. In Model 2, adding Enhanced_policy to predict Efforts_ecosystem resulted in a significant increase in R^2 of 0.032. Similarly, in Model 3, adding Enhanced_collaboration led to a significant R^2 increase of 0.002. In Model 4, adding Enhanced_regulatory caused a significant R^2 increase of 0.003, as shown in Table 7.

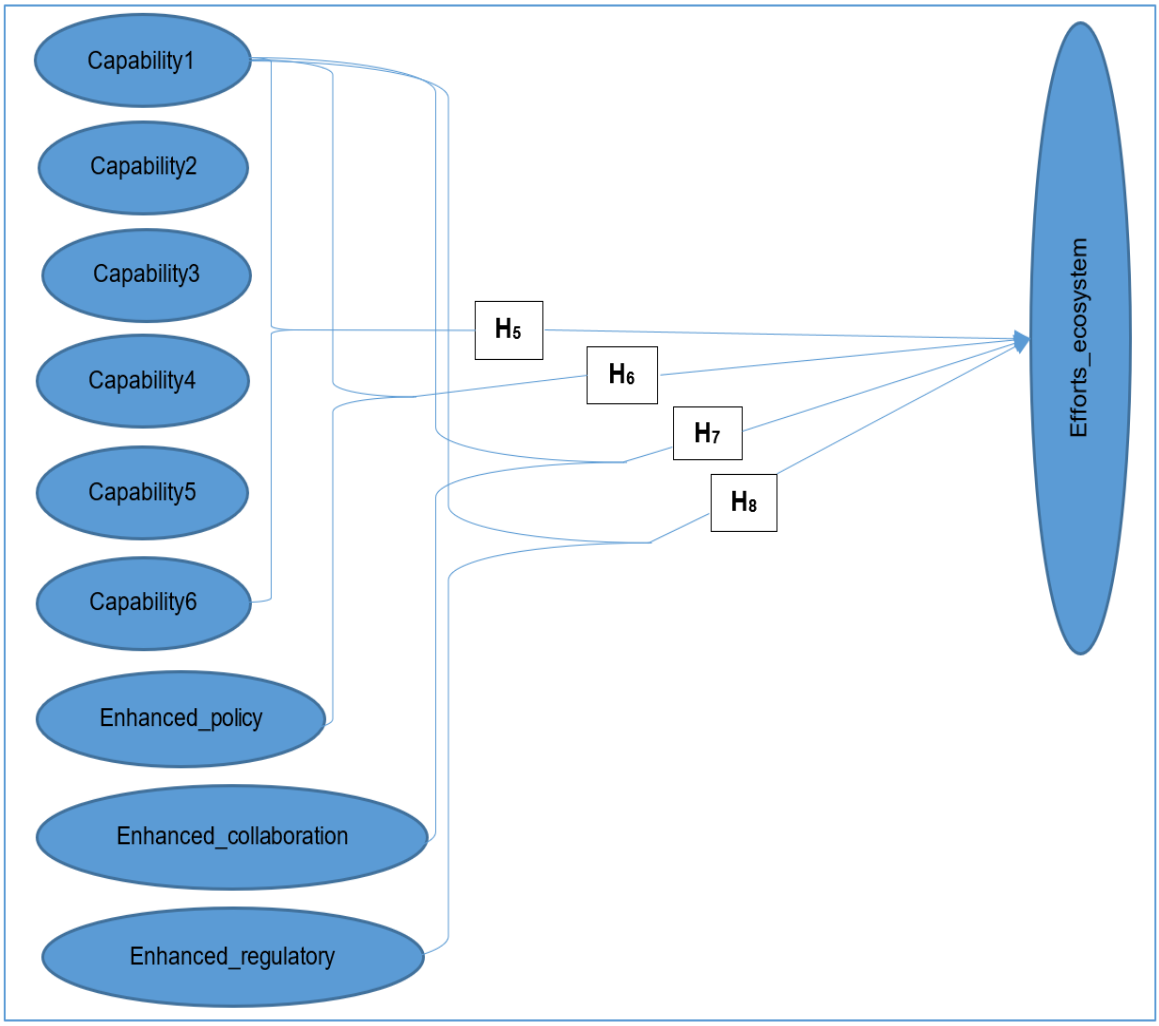

Figure 2. Relevance of operational capabilities of digital payment systems.

All the null hypotheses (for Hypotheses 5, 6, 7, and 8) are rejected, leading to the following conclusions: operational capabilities of digital payment systems drive the improvement of the digital payment ecosystem in Tanzania; the addition of Enhanced_policy improves the prediction of Efforts_ecosystem beyond Capability1, Capability2, Capability3, Capability4, Capability5, and Capability6; the addition of Enhanced_collaboration improves the prediction of Efforts_ecosystem beyond Capability1, Capability2, Capability3, Capability4, Capability5, Capability6, and Enhanced_policy; and the addition of Enhanced_regulatory improves the prediction of Efforts_ecosystem beyond Capability1, Capability2, Capability3, Capability4, Capability5, Capability6, Enhanced_policy, and Enhanced_collaboration.

Table 7. Hierarchical multiple regression – operational capabilities.

Dependent Variable: Efforts_ecosystem								
Variables	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	B	**β**	**B**	**β**	**B**	**β**	**B**	**β**
Constant	5.919***		8.713***		8.453***		8.424***	
Capability1	0.349***	0.250	0.274***	0.197	0.273***	0.196	0.249***	0.178
Capability2	0.927***	0.682	0.592***	0.435	0.598***	0.440	0.581***	0.427
Capability3	0.421***	0.924	0.330***	0.724	0.325***	0.713	0.330***	0.725
Capability4	0.244***	0.234	0.246***	0.235	0.241***	0.231	0.248***	0.238
Capability5	0.906***	0.332	0.710***	0.260	0.673***	0.247	0.740***	0.272
Capability6	0.114**	0.103	0.123***	0.112	0.130***	0.118	0.120***	0.109
Enhanced_policy			-0.506***	-0.309	-0.496***	-0.303	-0.623***	-0.380
Enhanced_collaboration					0.031*	0.043	0.033**	0.045
Enhanced_regulatory							.132***	0.096
R^2	0.897		0.929		0.931		0.934	
F	367.227***		473.721***		423.441***		393.259***	
ΔR^2	0.897		0.032		0.002		0.003	
ΔF	367.227***		115.906***		5.996*		11.442***	

Note: N = 261. *p < 0.05, **p < 0.01, ***p < 0.001.

4.3. Relevance of Enhanced System and Positive Customer Experience

Based on Model 1 as shown in Table 8, we find that Convenience1, Convenience2, Convenience3, and Convenience4 statistically significantly predict Efforts_ecosystem. In Model 2, the addition of Enhanced_policy to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of 0.003. In Model 3, the addition of Enhanced_collaboration to the prediction of Efforts_ecosystem did not lead to an increase in R^2 (ΔR^2=0.000), although the full model (Model 3) was statistically significant, $R^2 = 0.976$, $p < 0.05$. In Model 4, the addition of Enhanced_regulatory to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of .001 as shown in Table 8.

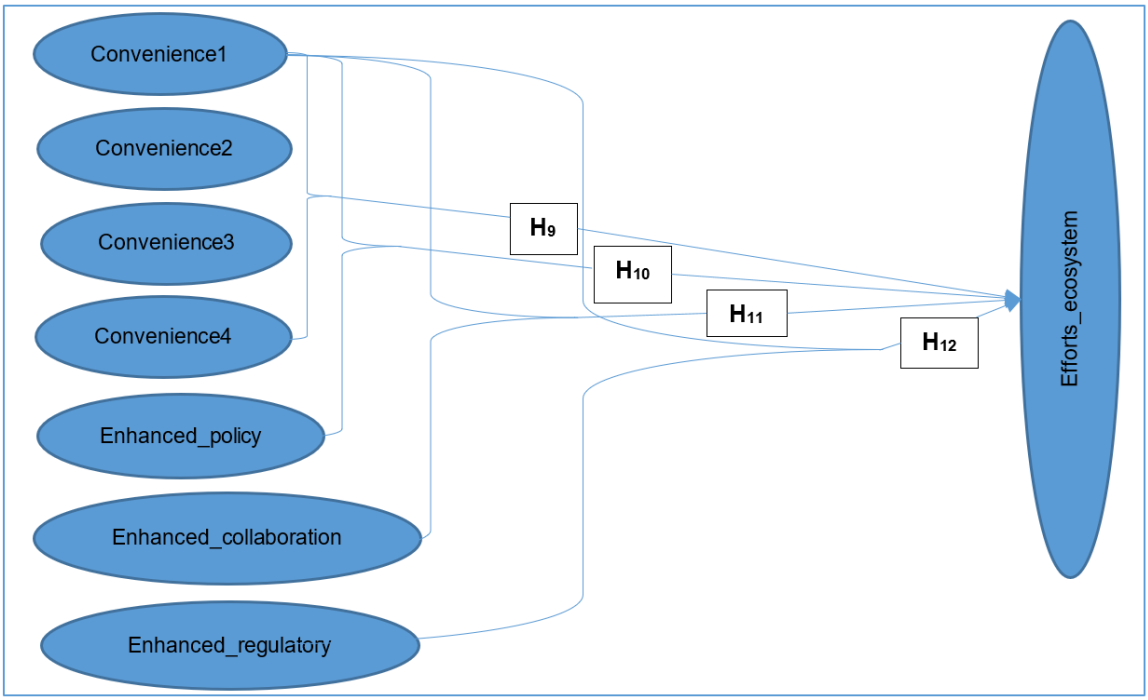

Figure 3. Relevance of enhanced system and positive customer experience.

We therefore reveal that all the null hypotheses (for Hypotheses 9, 10, 11, and 12) are rejected, leading to the following conclusions: enhanced system and customer experience drive the improvement of the digital payment ecosystem in Tanzania; the addition of Enhanced_policy improves the prediction of Efforts_ecosystem over and above Convenience1, Convenience2, Convenience3, and Convenience4 alone; the addition of Enhanced_collaboration

improves the prediction of Efforts_ecosystem over and above Convenience1, Convenience2, Convenience3, Convenience4, and Enhanced_policy alone; and the addition of Enhanced_regulatory improves the prediction of Efforts_ecosystem over and above Convenience1, Convenience2, Convenience3, Convenience4, Enhanced_policy, and Enhanced_collaboration.

Table 8. Hierarchical multiple regression - enhanced system and positive customer experience.

Dependent Variable: Efforts_ecosystem								
Variables	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	B	**β**	**B**	**β**	**B**	**β**	**B**	**β**
Constant	6.527***		7.581***		7.643***		7.817***	
Convenience1	0.480***	0.398	0.196***	0.163	0.156**	0.130	0.117*	0.097
Convenience2	0.548***	0.819	0.401***	0.598	0.386***	0.577	0.409***	0.611
Convenience3	0.822***	0.818	0.803***	0.799	0.807***	0.803	0.858***	0.854
Convenience4	0.754***	0.750	0.599***	0.596	0.577***	0.574	0.566***	0.564
Enhanced_policy			-0.196***	-0.226	-0.218***	-0.251	-0.205***	-0.236
Enhanced_collaboration					0.009*	0.026	0.009*	0.025
Enhanced_regulatory							-0.041**	-0.055
R^2	0.972		0.976		0.976		0.977	
F	2263.040***		2049.057***		1742.935***		1552.975***	
ΔR^2	0.972		0.003		0.000		0.001	
ΔF	2263.040***		33.787***		6.132*		10.775**	

Note: N = 261. *p < 0.05, **p < 0.01, ***p < 0.001.

4.4. Relevance of Enhanced Security and Privacy

In Model 1, as shown in Table 9, we find that Protection1, Protection2, Protection3, and Protection4 statistically significantly predict Efforts_ecosystem. In Model 2, the addition of Enhanced_policy to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of 0.001. In Model 3, the addition of Enhanced_collaboration to the prediction of Efforts_ecosystem did not lead to an increase in R^2 (ΔR^2=0.000), although the full model (Model 3) was statistically significant, $R^2 = 0.988$, $p < 0.01$. In Model 4, the addition of Enhanced_regulatory to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of .001 as shown in Table 9.

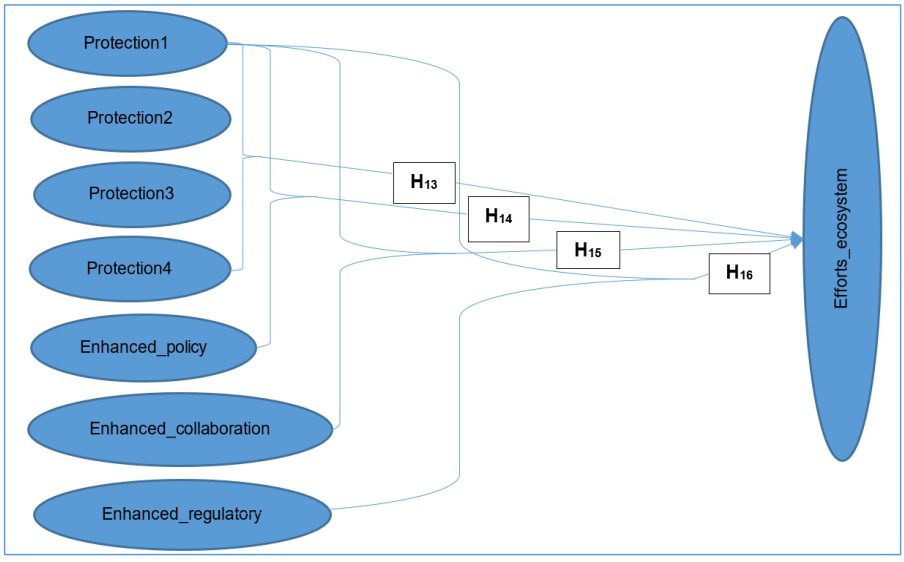

Figure 4. Relevance of enhanced security and privacy.

All the null hypotheses (for Hypotheses 13, 14, 15, and 16) are rejected, leading to the following conclusions: enhanced security and privacy drive the improvement of the digital payment ecosystem in Tanzania; the addition of Enhanced_policy improves the prediction of Efforts_ecosystem beyond Protection1, Protection2, Protection3, and Protection4; the addition of Enhanced_collaboration improves the prediction of Efforts_ecosystem beyond

Protection1, Protection2, Protection3, Protection4, and Enhanced_policy; and the addition of Enhanced_regulatory improves the prediction of Efforts_ecosystem beyond Protection1, Protection2, Protection3, Protection4, Enhanced_policy, and Enhanced_collaboration.

Table 9. Hierarchical multiple regression - enhanced security and privacy.

Dependent Variable: Efforts_ecosystem								
Variables	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	B	**β**	**B**	**β**	**B**	**β**	**B**	**β**
Constant	5.975***		6.614***		8.004***		8.780***	
Protection1	1.743***	0.587	1.493***	0.503	1.483***	0.499	1.228***	0.413
Protection2	0.633***	0.223	0.535***	0.189	0.584***	0.206	0.397***	0.140
Protection3	0.955***	0.696	0.844***	0.616	0.823***	0.600	0.677***	0.494
Protection4	1.485***	1.334	1.365***	1.226	1.254***	1.127	1.101***	0.989
Enhanced_policy			-0.127**	-0.078	-0.135**	-0.083	-0.091*	-0.056
Enhanced_collaboration					-0.194**	-0.102	-0.197**	-0.104
Enhanced_regulatory							-0.193***	-0.123
R^2	0.987		0.988		0.988		0.989	
F	4912.792***		4047.406***		3492.732***		3177.156***	
ΔR^2	0.987		0.001		0.000		0.001	
ΔF	4912.792***		8.521**		9.939**		16.361***	

Note: N = 261. *p < 0.05, **p < 0.01, ***p < 0.001.

4.5. Relevance of Collaboration and Fair Treatment among Stakeholders

Based on Model 1 as shown in Table 10, we find that Stakeholder1, Stakeholder2, Stakeholder3, Stakeholder4, and Stakeholder6 statistically significantly predict Efforts_ecosystem. In Model 2, the addition of Enhanced_policy to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of 0.056. Also, in Model 3, the addition of Enhanced_collaboration to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of 0.001. Similarly, in Model 4, the addition of Enhanced_regulatory to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of 0.001, as shown in Table 10.

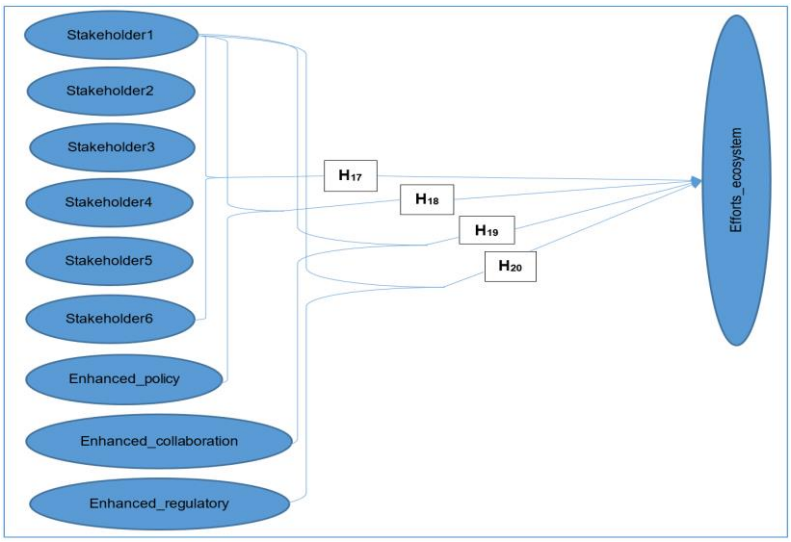

Figure 5. Relevance of collaboration and fair treatment among stakeholders.

We therefore reveal that all the null hypotheses (for Hypotheses 17, 18, 19, and 20) are rejected, leading to the following conclusions: collaboration and fair treatment among stakeholders drive the improvement of the digital payment ecosystem in Tanzania; the addition of Enhanced Policy improves the prediction of Efforts Ecosystem over and above Stakeholder1, Stakeholder2, Stakeholder3, Stakeholder4, Stakeholder5, and Stakeholder6 alone; the addition of Enhanced Collaboration improves the prediction of Efforts Ecosystem over and above Stakeholder1, Stakeholder2, Stakeholder3, Stakeholder4, Stakeholder5, Stakeholder6, and Enhanced Policy alone; and the addition

of Enhanced Regulatory improves the prediction of Efforts Ecosystem over and above Stakeholder1, Stakeholder2, Stakeholder3, Stakeholder4, Stakeholder5, Stakeholder6, Enhanced Policy, and Enhanced Collaboration alone.

Table 10. Hierarchical multiple regression - collaboration among stakeholders.

Dependent Variable: Efforts_ecosystem								
Variables	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	B	**β**	**B**	**β**	**B**	**β**	**B**	**β**
Constant	5.902***		9.741***		9.514***		9.440***	
Stakeholder1	0.283***	0.205	0.198***	0.144	0.197***	0.143	0.188***	0.136
Stakeholder2	0.912***	0.677	0.463***	0.344	0.470***	0.349	0.468***	0.348
Stakeholder3	0.420***	0.930	0.290***	0.643	0.288***	0.639	0.293***	0.649
Stakeholder4	0.251***	0.243	0.240***	0.232	0.237***	0.230	0.241***	0.233
Stakeholder5	1.040***	0.385	0.716***	0.265	0.704***	0.261	0.739***	0.274
Stakeholder6	0.084*	0.077	0.101***	0.093	0.104***	0.096	0.100***	0.092
Enhanced_policy			-0.697***	-0.423	-0.683***	-0.414	-0.736***	-0.447
Enhanced_collaboration					0.023*	0.034	0.025**	0.036
Enhanced_regulatory							0.066*	0.047
R^2	0.900		0.956		0.957		0.958	
F	380.801***		782.381***		698.932***		631.182***	
ΔR^2	0.900		0.056		0.001		0.001	
ΔF	380.801***		320.237***		6.025*		4.803*	

Note: N = 261. *p < 0.05, **p < 0.01, ***p < 0.001.

4.6. Relevance of Government Support and Regulatory Framework

In Model 1, as shown in Table 11, we find that Regulatory1, Regulatory2, Regulatory3, Regulatory4, Regulatory5, Regulatory6, Regulatory7, and Regulatory8 statistically significantly predict Efforts_ecosystem. In Model 2, the addition of Enhanced_policy to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of 0.001. In Model 3, the addition of Enhanced_collaboration to the prediction of Efforts_ecosystem did not lead to an increase in R^2 (ΔR^2=0.000), although the full model (Model 3) was statistically significant, R^2 = 0.987, p < 0.01. In Model 4, the addition of Enhanced_regulatory to the prediction of Efforts_ecosystem led to a statistically significant increase in R^2 of 0.001, as shown in Table 11.

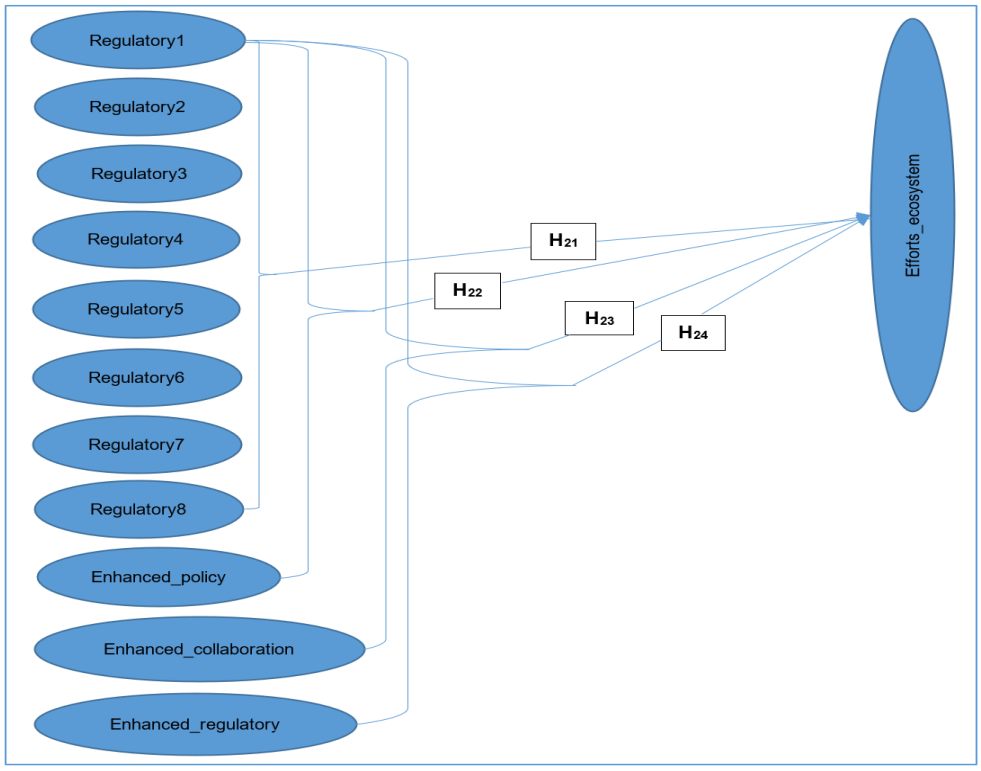

Figure 6. Relevance of government support and regulatory framework.

All the null hypotheses (for Hypotheses 21, 22, 23, and 24) are rejected, leading to the following conclusions: the government support and regulatory framework drive the improvement of the digital payment ecosystem in Tanzania; the addition of Enhanced Policy improves the prediction of Efforts Ecosystem beyond Regulatory1, Regulatory2, Regulatory3, Regulatory4, Regulatory5, Regulatory6, Regulatory7, and Regulatory8; the addition of Enhanced Collaboration improves the prediction of Efforts Ecosystem beyond Regulatory1, Regulatory2, Regulatory3, Regulatory4, Regulatory5, Regulatory6, Regulatory7, Regulatory8, and Enhanced Policy; and the addition of Enhanced Regulatory improves the prediction of Efforts Ecosystem beyond Regulatory1, Regulatory2, Regulatory3, Regulatory4, Regulatory5, Regulatory6, Regulatory7, Regulatory8, Enhanced Policy, and Enhanced Collaboration.

Table 11. Hierarchical multiple regression - government support and regulatory framework.

Dependent Variable: Efforts_ecosystem								
Variables	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	B	**β**	**B**	**β**	**B**	**β**	**B**	**β**
Constant	6.195***		7.085***		7.012***		7.078***	
Regulatory1	1.483***	0.649	1.291***	0.564	1.277***	0.558	1.280***	0.560
Regulatory2	1.061***	0.836	0.945***	0.745	0.922***	0.726	0.937***	0.738
Regulatory3	1.797***	0.943	1.687***	0.886	1.665***	0.874	1.692***	0.888
Regulatory4	0.059***	0.043	0.055**	0.040	0.053**	0.038	0.056***	0.041
Regulatory5	0.208***	0.155	0.182***	0.135	0.182***	0.135	0.181***	0.135
Regulatory6	0.156***	0.345	0.142***	0.315	0.138***	0.306	0.135***	0.299
Regulatory7	0.111***	0.108	0.102***	0.099	0.097***	0.094	0.096***	0.093
Regulatory8	0.557***	0.206	0.510***	0.189	0.494***	0.183	0.479***	0.177
Enhanced_policy			-0.167**	-0.101	-0.173***	-0.105	-0.107*	-0.065
Enhanced_collaboration					0.015**	0.022	0.011*	0.017
Enhanced_regulatory							-0.073***	-0.052
R^2	0.986		0.987		0.987		0.988	
F	2280.309***		2105.922***		1950.215***		1909.365***	
ΔR^2	0.986		0.001		0.000		0.001	
ΔF	2280.309***		10.672**		8.160**		19.984***	

Note: N = 261. *p < 0.05, **p < 0.01, ***p < 0.001.

5. DISCUSSION

It has been found that customers perceive policy development initiatives as a contributing factor to the enhancement of digital payment adoption in Tanzania. These findings are consistent with those by Chen and Ren (2022); Jaiswal et al. (2023); Mouna and Jarboui (2022); Luan et al. (2023); Rahman et al. (2022), and Fu et al. (2022), who confirm that favorable policies play a vital role in promoting digital payments. These policies aim to reward consumers, include sound fiscal incentives, foster favorable policies and incentives for acquiring technologies, infrastructure, and devices, and implement workable policies that limit cash transactions. Other policies focus on promoting partnerships among ecosystem players, efficiently regulating transactions, and protecting consumers while addressing fraud issues. The government should focus on creating favorable avenues that stimulate sound policy development initiatives for digital payments.

We have also realized that the operational capabilities of digital payment systems are regarded as key drivers of digital payment adoption. The significance of capable digital payment systems has also been reported by Raj et al. (2024), Munikrishnan et al. (2024), Fu et al. (2022), and Linge et al. (2023). They include the capability to enhance faster transactions, convenience, and user-friendliness, information sharing capability, and the capability of the solutions to eliminate intermediary transfer costs and to reduce the cost of low-risk digital transactions. We argue that investing in developing relevant digital payment solutions, and the commitment from the government, investors, and other players in employing the required resources to improve the operational capabilities of the systems, should be prioritized.

We have also found that customers perceive that digital payment systems should be enhanced by focusing on delivering a positive customer experience in order to increase the digital payment adoption rate in Tanzania. As reported by Tang et al. (2021), the focus on delivering a positive customer experience should be on improving the

quality of the system and information. In this regard, the enhancement of interaction between consumers and merchants and the provision of sound complaint management mechanisms should be prioritized. Moreover, systems that require little personal information and are ready to provide users with more options should be encouraged.

This study also reveals that enhanced security and privacy are perceived as key drivers for adopting digital payments in Tanzania. These findings align with those in Błach and Klimontowicz (2021); Linge et al. (2023); Luan et al. (2023); Munikrishnan et al. (2024); Oyelami et al. (2020); Sakib et al. (2025), and Tang et al. (2021), which confirm the importance of security, safety, and privacy issues in digital payment adoption. The study emphasizes that developing digital payment solutions should focus on improving security and privacy. It also highlights the importance of establishing a suitable financial consumer protection framework for security and privacy. Enhancing data protection and privacy legislation is crucial to building trust among digital payment users. Additionally, appropriate transparency mechanisms are vital in promoting digital payments in Tanzania.

It has been revealed that collaboration and fair treatment among stakeholders are perceived as key drivers of adopting digital payments in Tanzania. These findings are supported by Wang et al. (2023), Saibil et al. (2023), and Rosli et al. (2023), who reveal the role of enhanced collaboration among key players in promoting digital payments. The study shows that the aim is to enhance digital payment experiences, which will eventually increase the adoption rate. It is also believed that the adoption rate will increase when more service providers are integrated, both entrepreneurs and customers are interested in digital payments, digital payment solutions reflect the needs of all relevant actors, and there is adequate investment in digital payment education.

This study also reveals that government support and a sound regulatory framework are paramount in driving the adoption of digital payments in Tanzania. In their studies, Amankwa et al. (2023), Islam et al. (2024), Jingnan et al. (2023), Khan (2021), Mouna and Jarboui (2022), Oktavendi and Mu'ammal (2022), and Saibil et al. (2023) reveal the significance of government support in influencing the adoption of digital payments. The study argues that a cashless society can be achieved in Tanzania, provided there is an enhanced regulatory environment where service providers are regularly assessed. It is also found that commitments to improving ICT and other supporting infrastructures stimulate adoption. Efforts to improve mobile network coverage and robust digital networks should be employed by the government. Key players in the digital payment ecosystem should also embrace mechanisms that allow them to reduce costs, particularly through shared infrastructures.

We have also realized that customers perceive that sufficient policies, increased collaboration among stakeholders, and the improvement of the regulatory framework for digital payments are contributing factors in driving the improvement of the digital payment ecosystem in Tanzania. This study argues that government efforts, in collaboration with key players in the ecosystem, should be employed in the development and implementation of sound digital payment policies and in creating favorable environments for the growth and sustainability of digital payments in Tanzania.

6. CONCLUSION

Digital payments play a significant role in promoting financial inclusion, efficiency, productivity, sustainability, and the formalization of economic activities. The study reveals several drivers for the adoption of digital payments in Tanzania. This study argues that the government of Tanzania should establish an incentive mechanism that seeks to support consumers and businesses that embrace digital payments. The government should also reduce or eliminate taxes on digital payment facilities and infrastructure to increase adoption rates. Efforts should also be employed in limiting cash transactions. The government should promote partnerships among players in the ecosystem and engage key players in finding solutions for fraud challenges. Additionally, this study argues that a cashless society is achieved when there is a commitment to promote innovation in digital payments. These innovations should be supported by all relevant stakeholders, including policymakers, to enhance the capabilities of digital payment systems.

This study argues that there is a great need for devising and implementing policies that stimulate the improvement of digital payment systems and create a positive customer experience. We also argue that policy development initiatives should focus on enhancing security and privacy, particularly in improving consumer protection, and investing in establishing and managing appropriate transparency mechanisms that increase trust among digital payment users in Tanzania. Moreover, we argue that, under the coordination and influence of the government of Tanzania, relevant stakeholders in digital payment systems should collaborate in promoting a digital payment ecosystem that embraces the needs and interests of its players. Furthermore, active participation of all relevant stakeholders in developing and implementing workable policies on digital financial literacy should be enhanced.

We also argue that the role of the government in supporting the promotion of digital payments, particularly in the provision and management of a sound regulatory framework, is of paramount importance in driving the adoption of digital payments in Tanzania. We also argue that digital payments can thrive if the government of Tanzania, service providers, merchants, customers, financial institutions, telecommunication companies, and other related stakeholders cooperate in developing and implementing feasible policies, strategies, solutions, and a friendly environment that advances a cashless society.

Regarding the limitation of this study, we argue that it did not focus on the perceptions of individual consumers. Instead, it relied on those of consumer representatives. We argue that there is no evidence to prove that the perceptions of consumer representatives are the same as those of individual consumers. There is a possibility that individual consumers would provide different opinions, leading to different results. Future researchers may wish to focus on the perceptions of individual consumers from specific industries.

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Transparency: The author states that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
Competing Interests: The author declares that there are no conflicts of interests regarding the publication of this paper.

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