


E-payment instruments and welfare: The case of Zimbabwe

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The literature shows that electronic payments are key to improving financial inclusion and achieving global development goals such as the United Nation's (UNs) Sustainable Development Goals. The benefits are premised on the welfare-enhancing effects of digital payments, which reduce costs, the probability of loss and risk for low-income consumers, as well as improve access to formal financial services. This study thus investigates the conditions under which these welfare-enhancing gains can be obtained. It considers the conditions under which e-payments can be welfare enhancing by using qualitative data from Zimbabwe. The severe liquidity constraints in Zimbabwe provide a good case for evaluating how well e-payments work, as the relative absence of cash has made the use of mobile money inevitable. Focus group data are analysed to understand participants' everyday experiences with the e-payment system in Zimbabwe. The results indicate that the key challenges with payment systems faced by households include high costs, malfunctions of the system at the point of sale, lengthy refund processes and limited acceptance. Participants indicate a strong preference for foreign exchange cash as a mode of payment. High levels of concentration in the mobile money market, lack of transparency by financial service providers and a strong preference for cash by retailers are the main drivers of system failure. Therefore, this study identifies the need for the government to address the lack of competition in the market, as well as address macroeconomic liquidity constraints.

Keywords: e-payments; welfare; financial inclusion; digital finance; Zimbabwe.

Introduction

The development of e-payment systems has spurred the debate on the future of cash. However, for the average person, this is a moot point owing to the variety of available payment options. For low- and middle-income households, this remains a pertinent question, as most are dependent on cash, even in more advanced economies. As such, the rapid development of mobile money in developing countries is providing the poor with an important payment option. Namely, the difficulties associated with the absence of modern bank infrastructure are being overcome by increased access to mobile financial services and, in particular, the ability to pay for goods and services via mobile phones.¹ In addition, as technological advances have significantly improved the affordability of mobile phones on top of improving access, mobile payments can reduce the cost of providing financial services by up to 90%.²

The literature suggests three building blocks of digital finance and related e-payments that are welfare enhancing. Firstly, efficient digital finance requires a robust and broad digital infrastructure, which includes widespread mobile connectivity and ownership, a national payment structure and a well-disseminated personal identification (ID) system. Many households in developing countries have a mobile subscription, ITU³ showing there are 103 mobile cellular subscriptions per 100 people in developing countries. Moreover, 78% of the population in sub-Saharan Africa is estimated to have at least 3G mobile network coverage. From a macro-perspective, the requisite infrastructure exists. Further, national payment and ID systems are largely well established in most sub-Saharan African countries.⁴ Secondly, a dynamic and sustainable financial service includes efficient and relevant financial services regulation. Adequate regulation protects investors, consumers and governments, but must also ensure the existence of competition for the development of efficient, quality and diverse financial products.⁵ Finally, there is a need to provide an array of financial products relevant to consumers. Whilst a wide range of services have been developed, most of these are in the formal sector. As a result, many people in less developed economies are unserved. The prevalence of

informal services is an indicator that the available services are not relevant to some population segments, especially in sub-Saharan Africa.

This study thus uses qualitative data to understand the effects of e-payments and to evaluate the conditions under which e-payments can be welfare enhancing. The empirical evidence on whether the conditions discussed above are sufficient for households to fully benefit from e-payments is limited, as the literature on digital payments largely focusses on remittances and the macro-benefits of digital finance as a whole. Further, a significant amount of research is based on developed countries and investigates the future of cash as a payment instrument,^{6,7,8,9} whilst the bulk of research on digital payment in Africa focusses on East Africa and M-Pesa in Kenya. These studies concentrate on the broad effects of M-Pesa livelihood and welfare.^{10,11,12,13,i} Moreover, these studies tend to focus on evaluating the effects of remittances. However, the literature is largely silent on the conditions under which e-payments can be welfare enhancing. Substantially, for the poor, the benefits associated with digital payments are linked to their ability to make e-payments. In other words, the associated reductions in costs and risk can significantly enhance welfare and improve their link to formal financial services. For example, the use of digital payments can create a digital footprint for users, which can increase transparency and the consequent access to credit. Understanding the conditions for welfare-enhancing payment systems is thus important from both an academic and policy perspective. Additionally, the failure of M-Pesa in South Africa exemplifies the importance of understanding the workings of mobile money and e-payments, particularly in settings different from Kenya.

This study considers the conditions under which e-payments can be welfare enhancing by using qualitative data from Zimbabwe. The severe liquidity constraints in Zimbabwe provide a good case for evaluating how well e-payments can work, as the relative absence of cash has made the use of mobile money inevitable. Specifically, the Reserve Bank of Zimbabwe indicated that 96% of all official transactions were conducted electronically in 2017.¹⁴ This study thus focusses on the actual use of mobile money rather than whether it will be used, as is the case for most studies on e-payments.

Literature review

E-payments are generally defined as any payments undertaken by using electronic means. They can also be defined as any payment alternatives to cash.¹⁵ A more technical definition suggests that e-payments can be defined as the transfer of payment value from the payer to the recipient through an electronic means.¹⁶ Electronic means can be broadly divided into business-to-consumer e-payments

i.M-Pesa is a mobile-phone based financial service platform for money transfer, financing and microfinancing services. It was launched in 2007 in Kenya and has since spread to various African countries. See Baer, Bounfour, and Housel (2018) for a discussion of why M-Pesa did not work in the South African context.

(B2C), e-payments between consumers or private-to-private payments (P2P), and electronic variations of traditional banking services.¹⁷ In practice, these payment types can overlap. For example, electronic banking services can be used between consumers and businesses, as well as between private individuals. Accordingly, for the purpose of this study, e-payments are broadly defined as¹⁸:

[P]ayments made using prepaid cards, debit and credit cards, loyalty cards, automated teller machine (ATM) cards, gift cards and store cards, as well as mobile phones and near-field communication (NFC) – enabled cards. (p. 2)

Welfare and e-payments

The literature on the welfare-enhancing effects of e-payments in Africa focusses almost exclusively on mobile money. This literature stream can be divided into two sub-streams: one focussing on money agents and the other on welfare impacts of remittances. In the first case, the results indicate that mobile money generally enhances welfare. Money agents benefit from increased income by engaging in money trade and can thus increase their consumption of basic goods and services such as food, clothes and education.^{19,20} However, the benefits from mobile money are negatively affected by fraud, poor information and network congestion.¹⁹

The second literature stream focusses on the welfare effects on households, measured almost exclusively through remittances.^{13,21} These studies show that the advent of mobile money has reduced the cost of remittances. Consequently, the level and frequency of remittances received by poor households have increased, which has enabled them to increase their consumption of both consumer and capital goods. For example, Kikulwe et al.²² show that the farmers who received remittances and used mobile money utilised more market inputs, such as fertilisers and labour, which resulted in increased production. Peprah et al.²¹ find similar results by using an adoption framework, whilst Lesley et al. show that increased remittances could widen occupational choices and improve informal risk sharing.

There are two points of departure for this study. Firstly, whilst the above studies shed light on whether e-payments have a welfare-enhancing effect, they do not evaluate the conditions under which this could take place. The benefits of e-payments or mobile money in the dominant literature are premised on, for instance, a well-functioning mobile money infrastructure. What happens when this infrastructure is weak, fragmented or inefficient? Can these benefits still accrue? Francis Wambalaba et al.¹⁹ attempt to determine these issues by identifying the challenges faced by money agents within M-Pesa. They find that a slow network, congestion and fraud reduce the benefits to money agents.

Secondly, this study considers all e-payment instruments, whilst the literature stream that details the benefits of mobile payments focusses almost exclusively on remittances. Further, these studies are largely quantitative and provide a good measure of the impact of remittances on consumption

and incomes, but they do not evaluate the challenges associated with using the various instruments, especially in an environment where systems and infrastructure may be imperfect. The next section reviews the literature on e-payments to identify relevant measures and provide a context for the empirical analysis.

Characteristics of e-payment instruments

E-payments are primarily designed to benefit consumers by improving convenience and lowering transaction costs.^{2,23} Because e-payment instruments do not have the same type of guarantee as cash, they have emerged as prepaid instruments rather than money. The implication is that e-payment instruments are a form of social relations, thus relying on the acceptance of both consumers and retailers. For this reason, unlike cash, the use of e-payment instruments relies on networked two-sided markets, which include the payment service provider as well as the merchant.^{24,25} Therefore, for consumers to increase the use of digital payments, the utilised instrument must be widely accepted.

By design, networked goods are affected by complementarities, externalities, switching costs and economies of scale. As a result, e-payments have little value in isolation, as the utility derived from any e-payment system will largely depend on other users also using the system. As more consumers use these instruments, the resulting network effects and externalities attract a critical mass on both sides of the market. Arango, Huynh, and Sabetti²⁶ find that the probability of paying by cash is significantly lower when card payments are perceived as widely accepted.

Although consumers benefit from an increase in the number of users of the same or complementary goods or services, this can lead to market concentration, and in turn result in a poor infrastructural set-up that limits consumer choice and the quality of services that consumers get.^{5,18} Related access channels critically affect competition and thus the quality and diversification of products received by consumers.⁵

E-payments in the context of a developing country are, to a large extent, in the form of mobile payments rather than card payments. For example, in 2018 only 22% of the adults in developing countries made credit and debit card payments compared with 80% of the adults in developed countries.¹ By contrast, mobile payments are significantly higher in developing countries. For instance, sub-Saharan Africa has the largest number of mobile accounts but only 10% of adults have a bank account. Kenya has the highest number of active mobile accounts in Africa, whose transaction value accounted for 3.3% of the Gross Domestic Product (GDP) in 2009.²⁷ At the same time, Japan has the highest number of mobile accounts amongst the developed countries, but their transaction value was only 0.05% of the GDP in 2017. This is because the presence of established e-payment systems such as card payments in more advanced economies limits the

penetration of mobile money.²⁸ For this reason, the discussion on e-payments in this article largely refers to mobile money.

The World Bank Group²⁹ argues that, in developing countries, the cornerstone of each payment is the transaction account, which can be hosted by a bank or independent payment service provider. This is the account from which and to which payments are made. By design, these accounts require sufficient funds for payments to be made, essentially providing a value store. On the one hand, this benefits consumers, as it inadvertently 'forces' low-income households to save. On the other hand, these mobile accounts need to be efficient so as not to lead to restricted access for low-income households such as in the case of banks.

Unstructured supplementary service data (USSD) is the cheapest and most convenient mobile money service interface available for low-income consumers and thus the most commonly used in Africa. For it to work, mobile money providers need to collaborate with mobile network operators (MNOs). This can result in network congestion and a lower quality of voice and short message service (SMS) services.^{30,31} Additionally, MNOs may restrict USSD access to their partner microfinance providers. For example, despite its dominance in the mobile network operating market, in Zimbabwe, Econet only provides USSD services for *ecocash*. In cases where an MNO allows access to other providers, interconnection fees are usually very high.^{5,32} This dominance generates significant market power and is reinforced by the network effects of two-sided markets. Therefore, consumers have no alternative providers to turn to in the face of inefficiencies and service failure.

The infrastructural needs for card payments are different, but nevertheless significant. As with mobile money, several players within the supply chain are involved in ensuring that the infrastructure for card payments works. For example, a basic payment at the point of sale requires the merchant to have a point-of-sale (POS) machine. The machine in turn requires access to an efficient network, which creates a supply chain within the payment system. The failure or malfunction at any one of these points can affect the finality of a card payment. Van Laere et al.³³ show that, when the critical infrastructure for card payments breaks down or malfunctions, there are negative welfare effects, as consumers fail to pay for basic items such as food, housing and medicine. This is exacerbated in a market where the main payment instrument for basic commodities is digital, such as in Zimbabwe. They also show that these failures affect vulnerable groups most and reduce trust in the overall payment system.

E-payments are perceived to have lower costs of transmission and management,^{2,34} which reduces the overall cost of providing electronic financial services for payment service providers, who can then pass these benefits to consumers.^{2,35} Moreover, because consumers can access mobile financial services remotely, it reduces the need to travel to banks, which

are often very far for most low-income households. Further, the digital storage of mobile money entails that the poor can reduce the risk of loss and theft.³⁶ Therefore, e-payments are particularly beneficial for rural and remote areas, which is why they have generated significant interest as a vehicle for the expansion of financial inclusion in developing countries.^{37,38} Klapper and Singer¹⁵ emphasise the importance of digital payments in increasing financial inclusion and for the achievement of several Sustainable Development Goals. An efficient e-payments system must thus reduce costs for consumers.

The literature also argues the importance of security. Although e-money reduces the risk of theft and loss, e-payments are not immune to fraud and personal information theft. In 2019, Symantec³⁹ showed that the financial sector was the most targeted by spear phishing attacks. Therefore, an e-payment system must have an increased security level. Accordingly, to a large extent, the level of security concerns can be linked to the level of transaction finality. For example, fraudsters prefer to attack payment instruments that have a rapid final settlement because this limits the possibility of countermanding stolen funds.⁴⁰ Correspondingly, consumers and retailers prefer payment instruments with immediacy to meet retailer needs.⁴¹ Whilst e-payments have a high level of finality and immediacy which benefit the customer, they also increase the potential risks associated with it.

Based on this review, the welfare effect of e-payments can be evaluated based on how well an e-payment system satisfies the basic characteristics of a payment instrument. These characteristics are summarised in Table 1.

Research design and methods

Research approach and questions

This study used a qualitative method to explore the conditions under which e-payments can be welfare enhancing by probing participants' experiences with various payment methods in a liquidity-constrained economy – Zimbabwe. The purpose was to understand participants' experiences with different payment instruments and with e-payments. Because of the exploratory nature of the study, the research questions are broad and open-ended, focussing on three aspects. Firstly, what is the general experience of participants with various payment instruments? Secondly, what are the perceptions about the benefits and constraints associated

with different payment systems? Thirdly, what are the perceived effects of the various payment instruments on livelihood?

Participants and data collection

The data were collected through focus group discussions in April 2019. Three separate group discussions were held for groups with different demographics. The first group comprised university employees and students. The second group were factory employees, which included two managers. The third group was a group of casual workers and shop floor employees in a peri-urban location. Despite the different demographics of these groups, the discussion soon reached saturation, as all three groups were bringing up almost the same information. Participants shared various experiences at the POS with services such as transport or transferring money to relatives in villages in remote areas. These experiences were recorded and transcribed. Emerging themes were very similar across the narratives.

Data trustworthiness

To start with, the nature of the study needed a neutral moderator. This is because the enquiry is driven by a nationwide phenomenon. Therefore, the focus groups were facilitated by two moderators: one from Zimbabwe and one from outside Zimbabwe. Further, the discussion audio was recorded and transcribed verbatim in the language in which the discussion took place. All three discussions used a mixture of Ndebele, Shona and English. The transcripts were then translated into English. To ensure consistency and accuracy, different individuals were used to transcribe and translate. Moreover, as Korstjens and Moser⁴² outline, credibility is required to ensure the confidence of the research findings in that the inferences drawn are an accurate representation of participants' original meaning or views. Member validation was used by sharing the facilitator's understanding and interpretations with the participants. Additionally, triangulation was used by consulting secondary sources especially cases reported in the media.

A brief on the payment systems in Zimbabwe

In Zimbabwe, the National Payment System has been in place since 2001 and is monitored by the Reserve Bank of Zimbabwe. In 2009, a period of record hyperinflation led the country to abandon the local currency in favour of five foreign currencies as legal tender. Of these, the United States (US) dollar was chosen as the official currency. This was followed by a period of worsening cash shortages. In 2016, the Reserve Bank started to push for an electronic-based payment system.^{14,43,44} The result was a large shift of official transactions to digital payments. The Reserve bank declared that 96% of the official payments in 2017 were made electronically. Additionally, retail e-payment transactions increased, with transaction values and volumes rising by 216% and 343%, respectively.^{14,43} In 2019, the Reserve Bank of Zimbabwe announced that, in volume terms, more than 99%

TABLE 1: Welfare effects of payment instruments.

Instrument characteristic	Welfare enhancing	Welfare reducing
Cost	Low cost (relative to using cash)	High cost
Acceptance	Widely accepted	Not widely accepted
Security and risk	Secure personal information, high possibility of countermanding	High levels of fraud and risk of loss of personal information, poor possibility of countermanding
Convenience	High immediacy and finality, efficient network, efficient supply chain, speed of transaction	Network congestion, inefficient supply chain

of transactions were made through online and mobile banking platforms.⁴⁵ This would make Zimbabwe the world's first cashless society.

The basic requisite infrastructure for digital payments in Zimbabwe already exists, as 88.2% of the population has mobile cellular subscriptions and an Internet penetration rate of 59.8%.⁴⁶ Further, the National Payment System has been established and run by the Reserve Bank of Zimbabwe. One of the infrastructural disadvantages in Zimbabwe is the limited competition in the mobile payment market. Although three mobile payment companies exist, Econet's *ecocash* dominates the market, having over 90% of the market share of active mobile money subscriptions.⁴⁶ Its dominance is so apparent that mobile money in Zimbabwe is generally referred to as *ecocash*.

Digital payments are important in Zimbabwe, as the Reserve Bank of Zimbabwe¹⁴ indicated that 96% of all official payments in 2017 were made electronically. Yet, consumers complain about the high charges they face, as well as the system and infrastructural failures associated with e-payments in the country. In 2018, the government of Zimbabwe introduced a 2% tax on all e-payments.ⁱⁱ The country thus provides a good environment to investigate the extent to which the relevance of the building blocks of digital payments cascades to the everyday experiences of consumers and how this affects their welfare.

Data analysis

The focus group discussions were recorded and transcribed verbatim. The transcripts were then used to identify the themes related to the experiences of the participants and how they in turn underscore the nature of requisite infrastructure required for a welfare-enhancing e-payment system. The discussion questions were deliberately designed to allow the participants to explore all avenues in their experiences. The identification of themes was therefore inductive, relying on participants' narratives. The data from each focus group were categorised by using key phrases. These categories were then organised into themes. Table 1-A1 shows a sample of relevant phrases and how they were categorised.

The emergent themes are used to structure the discussion around the experiences of the participants with e-payments. These experiences were then evaluated considering the prerequisites discussed earlier to determine how they played out in the Zimbabwean context and impacted consumer welfare.

Results and discussion

The payment system in Zimbabwe centres around four modes of payment. These include cards (mainly debit cards), mobile money, Internet-based bank payments and multiple-currency cash. Despite the official data showing a high usage of e-payment instruments, the participants indicated that

ii. The previous charge was 5 cents per transaction.

their preferred method of payment is cash. The US dollar and South African rand are the preferred currencies. The low levels of local production, which failed to meet consumer demand, have resulted in import dependency and an increased demand for and the resultant shortage of foreign exchange.

The government introduced measures to curb the impact of US dollar shortages and promote the widespread use of other currencies in the currency basket. These measures were introduced in 2016 and required 40% of all new US dollar foreign exchange receipts from exports to be converted to rands and euros at the official rate. This led to an increased preference for payments in US dollars and South African rands by retailers to circumvent the restrictions imposed by the Reserve Bank. Next to cash, real time gross settlement (RTGS) bonds circulate in the country as a surrogate currency since 2016 and are preferred above e-payments. The preference for cash is driven by several intertwined factors, including the high costs associated with e-payments, poor infrastructure, eroded productivity within the country and the lack of acceptance by some retailers. These form the basis for participants' evaluation of the conditions under which e-payments impact their welfare.

Costs associated with e-payments

The costs cited by participants included premiums charged by retailers and e-payments, the 2% tax by the government, the payment of charges by payment system providers and opportunity costs associated with a poor infrastructure. The larger and more established supermarkets accept all forms of payment, and their pricing is uniform across these various modes of payment, whilst informal retailers and small shops prefer cash and use a multi-tier pricing system. Larger shops are considered expensive for many of the goods purchased by middle- and low-income households. Most consumers thus prefer to purchase their goods from informal retailers and corner shops, which are perceived to be cheaper and more conveniently located. A survey of prices showed that the cost differences could be significant, as shown in Table 2.

One participant indicated that:

'It's cheaper to buy from the market the same things you buy from the supermarket. It's cheaper on the street except that you need cash to buy from the street. Besides, you know if you buy a bag of potatoes it is sold at 14 Zimbabwean dollars in the supermarket. If you go to the market, it's 9 Zimbabwean dollars. So I will be trying to save money to make it stretch. So, we prefer cash to buy from the market.' (P1, female, seamstress)

The preference for cash is also driven by the costs associated with alternative payment instruments. Contrary to the general indications in the literature, the perception in Zimbabwe is that e-payments are costly. Consumers face three points of charges when making payments as follows. Firstly, the government introduced a 2% tax on mobile e-payments in 2017. Secondly, the payment service providers

TABLE 2: Cost differential in cash United States dollar prices.†

Product purchased	Electronic Bank payment		Bankcard		Ecocash		RTGS		Other cash	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Beef	0.94	33	1.07	37.5	1.60	55.9	1.45	31.7	-0.03	-1.1
Mealie meal	1.32	32.9	1.45	36.1	2.08	51.8	2.01	31.7	-0.15	-3.7
Onion	0.24	32.8	0.37	56.7	0.41	56.1	0.36	31.7	-0.16	-1.1
Tomato	0.20	32.9	0.33	50.7	0.33	56.1	0.28	31.7	0.15	1.2

Source: Simatele M, Mbedzi E. Payment choices, costs and risks: The case of Zimbabwe. *Cogent Econ Financ.* Forthcoming.⁴⁷

†, All prices are calculated as deviations from United States of America dollar prices at the prevailing rate of RTGS3, 039/USD. Prices are presented as average prices in the townships of Harare and Bulawayo.

charge a cost of between 1% and 3% per transaction. Participants indicated that they pay an average charge of 6% per transaction in costs. These rates are much higher in rural areas, where transaction costs can be as high as 10%, in addition to the 2% government tax.

'It's not easy, it's just not easy, as for eco-cash they top another amount. If I have 10 Zimbabwean dollars, I need to top another 2 Zimbabwean dollars and my salary doesn't allow for that. So, we prefer to get United States dollars, since the whole country is running after United States dollars.' (P2, female, factory manager)

The high demand for cash, which is constrained in terms of supply, has led to the development of a parallel market for cash, where both foreign and local currencies are sold in exchange for electronic money. Many consumers use their wages and salaries on this market to buy cash at a premium of between 15% and 20%. Many of the participants indicated that this accounts for the high level of e-payments reflected in official government documents. One of the participants explained:

'I never got my salary from the bank this month and already have now spent from my account. I used everything but never got cash from the bank.' (P3, male, shopkeeper)

Another narrated:

'Some of these transactions are done by us to get cash. We will be transacting using these methods to get cash at a premium, so that we can pay cash in the informal market. So the government can't really track these transactions. We use e-payments as a means to get cash, then we use cash in the market.' (P4, male, university lecturer)

The cash shortage affects rural areas comparatively more. Whilst remittances such as *ecocash* are quite efficient, the use of mobile money for payments is negatively affected by the constraints above. The recipients of remittances choose to buy cash at a premium than pay for goods and services using *ecocash*. The premium on cash in rural areas can be up to 20%, in addition to the payment service provider charges paid for the transfer. The main reason cited is the tax and base charges levied by the payment service providers. The money agents in rural areas are often shop owners. Therefore, the recipients of mobile money are forced to make a minimum purchase in the shop before they can withdraw their money. A participant gave an example:

'When she goes for collection, they can't give her 10 Zimbabwean dollars, they say we will give you 5 Zimbabwean dollars and then you have to buy ABC from his shop for the other 5 Zimbabwean dollars.' (P5, female, casual worker)

To curb liquidity constraints, the Reserve Bank of Zimbabwe has introduced various currencies at different points in time to address liquidity problems with little success. A surrogate currency in the form of bond notes was introduced in 2016. This was followed by the RTGS virtual dollar in February 2019. By November 2019, the government had introduced another currency, the Zimbabwean dollar. This was the first time that the government printed notes since 2009. As a further measure to curb liquidity problems, the Reserve Bank also placed a ban on mobile money for cash transactions. This resulted in a pushback, with the reversal of the ban 3 days later. Instead, a limit of \$100 per transaction was imposed.⁴⁵ Despite these efforts, the cash shortage and the ensuing mobile money to cash premium costs have continued.

Acceptance

Smaller shops do not generally have the facilities to allow consumers to pay for their goods using cards. Card payments are typically used in larger shops. However, most small shops accept mobile payments. No formal registration is required for receiving such payments, as opposed to card payments, which require retailers to be registered for a POS machine. Consequently, mobile payments are widely accepted in comparison with card payments. Nevertheless, cash is the only accepted mode of payment by street vendors, who are the main source of goods for low-income households. One participant explained why cash is important:

'Besides swiping, there are some things where I need to use cash for. For example if I get cash, I need transport and I need to buy tomatoes. Where am I going to get the cash for that?' (P2, female, factory manager)

Convenience

Despite the general acceptance of mobile payments, their usage is hampered by infrastructural capacity. All participants lamented the frequent network failures associated with both mobile and card payments. On the one hand, mobile payments rely on the efficiency of MNOs, which is not always the case. This problem is pronounced in rural areas, being exacerbated by their geographical remoteness. On the other hand, card payments rely on Internet efficiency, which is frequently lacking. As a result, whilst all e-payments are hampered by the frequent network failures, the mobile network outages are less frequent than the Internet network ones. The main effect of network inefficiency is that transactions are often incomplete. Whilst retailer points indicate that payments have been declined, payment service providers often show that money has been deducted from the consumer's account.

The refund processes are lengthy and cumbersome and can take up to 4 weeks. One participant narrated:

'I went to the petrol station and then swiped 50 Zimbabwean dollars for fuel but it failed and the machine showed that the money came out of my account. I tried for the second time, it failed. So what they require now is that look, you go to get your refund, the garage has to write a letter. You go to the bank for them to give you the bank statement, then you know it's time consuming and takes about 4 weeks for your money to be refunded from the suspense account. They call it the suspense account; I don't know what that means.' (P4, male, university lecturer)

Another problem associated with e-payments is the lack of pricing transparency. Participants indicated that mobile money charges are not clear within and across networks. This lack of transparency also affects card payments, whilst information about the functionality of debit and credit cards is not available. Participants indicated they had to hold multiple cards to conduct different transactions:

'I am still trying to establish because these two banks are local banks. I bank with CBZ [Commercial Bank of Zimbabwe] and I opened an FCA [Foreign Currency Account] account and to do international transactions I was supposed to use a TT [telegraphic transfer], which is a change of my account to do foreign transactions, but unfortunately the process takes a long time. Naturally, I was supposed to use my Visa card. When I asked my bank if I could use my Visa card and I was told that I can't. I had to use someone's card from FBC. FBC is also a local bank, but it's giving me the option to do international transactions. I am still trying to figure out what's happening.' (P6, female, university lecturer)

Security and trust

Despite the high costs and network problems associated with mobile money, many participants indicated that mobile money is more secure than both cash and bank deposits:

'The advantage we have with ecocash is that it protects our money. It is safe because you don't have to go around carrying cash. You can lose your phone but because your cash is recorded somewhere I was to be able to access your cash by using another phone. Moreover, it is safer and quicker to send money to the village.' (P3, male, shopkeeper)

Many participants remit money to relatives in rural areas and find that, despite the associated costs, it is the most convenient way to remit. They added that owing to the poor infrastructure in rural areas, the only alternative to mobile money is to send money through bus drivers, who charge 10% to take the cash. When added to the cost of obtaining the cash, it makes this alternative too expensive. Further, bus drivers have been known to abscond with the money. The real-time nature of *ecocash* for remittances also makes it preferable to cash. When physical cash is handed over to drivers, it can take up to 3 days for the recipients to get it. However, the lengthy and cumbersome refund processes have eroded faith in the e-payment system. Several participants indicated they felt that the suspense accounts used to hold money when a transaction is declined were used illegally by banks and payment service providers to defraud consumers:

'I believe that the money then forms a suspense account, which is then used illegally by these service providers.' (P7, male, university student)

These problems have also eroded trust in the banking system. One participant said:

'It is no longer safe to keep your money in the bank in Zimbabwe because you will go through countless bank charges. There is no interest. They even charge you for checking your bank balance on your mobile phone. They charge you about 39 cents.' (P8, female, factory worker)

Livelihoods

Participants also indicated that the inefficient payment system has negative effects on their livelihoods. The dependence on imports and the preference for payments in US dollars means that prices are constantly increasing owing to the changes in the exchange rate. Although prices are also indicated in bonds, these are directly linked to the exchange rate. Further, many small shops vary their prices depending on the instrument used by the consumer. The prominence of a parallel market for cash has inevitably led to frequent increases in basic commodity prices. By August 2019, the inflation rate reached 300%, returning the country to the pre-dollarisation levels and making Zimbabwe the world's most inflationary economy.

The effects on livelihoods can be significant for low-income households. Participants complained that their salaries are very low and, if the transaction 'hangs', they must find alternative sources of money to pay for groceries whilst they wait for the lengthy resolution process to be completed. The reversal times are much longer for bankcards than for *ecocash*. Whilst mobile payment reversals take between 48 and 72 h to reverse, bankcard and bank mobile payment reversals can take up to 4 weeks. Once the consumer has submitted a letter to the bank, the bank will issue the statement upon payment, which adds to the costs incurred by the consumers. One of the participants indicated the need to use smaller shops that do not accept e-payment instruments:

'Bigger shops tend to be more stable when it comes to pricing, and they seem to conform to official rates, as required by the central bank. Small shops are highly sensitive to events in the money market and, therefore, change their prices and payment terms frequently. But sometimes you find that things that are not in bigger shops are there in the smaller shops.' (P4, male, university lecturer)

Another further explained why this was so important:

'Also, you must remember that most of them get their goods from outside the country. So they need the foreign exchange to pay for their stock. So, they sell their goods in cash and foreign exchange. For example, a bag of potatoes at the supermarket can be 14 Zimbabwean dollars and 9 Zimbabwean dollars at the vendors.' (P9, male, factory worker)

E-payments and welfare

The experiences of participants have indicated that e-payments in Zimbabwe have had both welfare-enhancing

TABLE 3: Welfare effects of e-payments.

Instrument characteristic	Welfare enhancing	Welfare reducing
Cost	-	High transactions costs, including intermediate money transfer tax, MNO charges, charges for checking balances, opportunity costs as a result of delayed refund processes, excessive bank charges, inflation tax
Acceptance	Widely accepted, but not by street vendors	Not accepted by informal businesses, especially street vendors
Security and risk	Mobile money is very secure Secure remittances	Suspense accounts, lack of transparency
Convenience	Can quickly remit money to relatives	Frequent network failures, lack of competition in supplier markets

MNO, mobile network operator.

and welfare-reducing effects. The framework shown in Table 3 is used to summarise the findings. However, in line with the literature, the largest benefit from e-payments is from remittances.^{13,21} E-payment instruments, especially mobile money, enable consumers to send money cheaply and securely to relatives. This indirectly affects the welfare of consumers through their extended family welfare. Moreover, mobile money is cited as being very secure relative to other forms of payment.

These positive effects are countered by the high transaction costs. The lack of alternatives places a burden especially on low-income consumers. As previously indicated, both remittances and purchases can attract up to 20% in implicit and explicit surcharges on a single transaction. Chiroga et al.⁴⁸ and World Bank Findex⁴⁹ indicate that the greatest benefit of mobile money to the poor is the reduction of payment costs. However, the consumers in Zimbabwe are not benefitting from these reduced costs, even for remittances.

In an efficient system, the immediacy and finality of e-payments provide significant benefit to consumers. In this case, we find that the infrastructure is also highly congested and transactions frequently fail at the POS. This poor quality of infrastructure and services can also be attributed to the lack of competition within the market, which leads to congestion. The Zimbabwean financial sector and mobile network show significant concentration. For example, Econet's *ecocash* held about 95% of the mobile payment market in October 2019 and processed 99.7% of all mobile transaction in the last quarter of 2019.^{50,51} Its dominance is reflected by the fact that mobile money is generally referred to as *ecocash*, despite the presence of two other mobile money providers. The networked nature of mobile money implies that switching costs are high, especially given the very few alternatives. The quality of service has further been eroded by electricity shortages.

Mobile money is generally accepted, but not as widely by street vendors. For instance, Tacoli,⁵² Skinner and Haysom⁵³ and Patel et al.⁵⁴ highlight the importance of street vending as a source of food security and livelihood for the poor. Therefore, any payment instrument that fails to be generally accepted amongst street vendors is likely to disadvantage the poor.

Conclusion

The study investigates whether the use of e-payments in Zimbabwe is welfare enhancing. Whilst the government

highlighted the successful mass transition to e-payments to circumvent the persistent cash shortage, anecdotal evidence suggests that this shift may be out of obligation and may not be fully benefiting consumers. Consumer perspectives were evaluated by using a focus group setting, which showed that despite the infrastructure, national payment and ID systems being in place, the malfunctions of these systems often lead to high transactions costs for consumers. Moreover, the poor infrastructure also limited their acceptance of e-payment instruments and eroded the faith of consumers in the National Payment System. This resulted in a strong preference for foreign currencies, particularly the US dollar and the South African rand.

We conclude that e-payments are welfare enhancing through remittances, but largely welfare reducing owing to the persistent infrastructure and system failures. It is therefore not sufficient to have the prerequisites of digital finance in place, as the quality of these prerequisites matters as well. In Zimbabwe, the access to the network was overridden by its poor quality, resulting in negative welfare effects. Despite the presence of the well-established National Payment System, the lack of competition in the e-payment market has resulted in poor quality services and limited options for consumers. Econet's *ecocash* holds more than 90% of the mobile network market, which means it has significant market power. Moreover, the dominance of Econet on both the mobile network and mobile money markets has led to significant congestion, eroding consumer experience with both services. The experiences of consumers suggest that the regulatory framework in the country has not sufficiently addressed the need for increased competition. Moreover, the participants complained significantly about the lack of transparency in terms of pricing and product options. This resulted in increased search costs for consumers, who often opted to stay with the same provider, further consolidating market concentration.

Finally, the lack of faith in the National Payment System has broader macroeconomic implications. The preference for foreign currencies as a mode of payment has continued to fuel inflation. Merchants link their local prices to the exchange rate in real time. The continued increase in demand for foreign exchange vis-à-vis the supply is likely to maintain the high inflation rate. The government thus needs to put measures in place to restore faith in the payment system and curb inflationary expectations.

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Competing interests

The author declares that he has no financial or personal relationships that may have inappropriately influenced him in writing this research article.

Author's contribution

M.S. is the sole author of this research article.

Ethical consideration

Ethics clearance was obtained through the University of Fort Hare (clearance number: SIM003). Ethical approval was sought and granted, and the purpose of the study was clearly explained to the participants. Each participant gave individual consent for participating in the focus groups. No names were recorded and participants were informed of their right to leave the focus groups at any time if they so wished.

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Data availability

The authors confirm that the data supporting the findings of this study are available within the article.

Disclaimer

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Appendix starts on the next page →

TABLE 1-A1: Sample coding.

Key phrase	Attribute	Theme
Challenge		
People will want extra amount.	Charges on ecocash	Cost
Sometimes the system is down.	Network problems	Infrastructure
In the end, it's becoming too expensive.	Expense of making payment	Cost
You have to wait for cash or use another card.	Difficult making payments	Infrastructure
Like with my bank, I can move funds to my mobile account. But if I have something I have to purchase online, I have to reverse funds to the bank.	Transfer of funds between bank and ecocash Network	Convenience/welfare
When it reverses, it clears off my mobile phone account but does not immediately reflect on my bank account. It takes about 48 hours to appear on the bank account.	Difficult paying Suspense account	Infrastructure Trust
Transaction is then declined. You get a message that it has been declined; while that happens, that money has been deducted from your account.	Difficult paying Suspense account	Infrastructure
Cash it is a struggle, there is always long queue.	Cash shortage	Convenience
When you want to purchase something using a dollar, it is difficult for you to get change.	Cash shortage Change in dollars	Acceptance
Last week I spent three hours in the queue trying to get fuel.	Queuing	Convenience
Through the bank to get the US dollars, it takes a long procedure.	Cash shortage	Cost
The downside of the e-payment system is the very high charges that they charge us.	High charges	Cost
Ecocash is expensive too because you are charged twice. The government and ecocash take their share. As a result, you are left with nothing from your salary because of the charges.	Ecocash charges Loss of real income	Cost Welfare
For you to get \$10 cash you may be charged \$13 on ecocash. The additional \$3 is nothing but bank charges which is about 30% of the actual sent amount.	Charges on ecocash	Cost
Ecocash has also a disadvantage of poor network connectivity.	Poor network	Infrastructure
You sometimes get to the shop and fail to transact because the network is poor.	Poor network	Convenience
Ecocash agents are there available in the rural areas, but the problem with village people they now charge you to access your cash because of the cash unavailability in Zimbabwe.	Cash shortage Double charge	Welfare Cost
These charges are in addition to the normal service charges and the 2% statutory tax.	Double charge	Cost
When she goes for collection, they can't give her \$10, they say we will give you \$5 and then you have to buy ABC from his shop for the other \$5.	Double charge	Cost
First and foremost, sending hard cash has its own risks.	Risks of sending cash	Security
That would be worse because the person you are sending the money will be charged several times. Every time they use the money, they will incur charges per transaction.	Double charge of ecocash	Cost
You fail to transact because they won't have network.	Poor network	Infrastructure
I don't think it is network; they are using our cash while it is in suspense.	Distrust of PSP	Trust
We end up losing trust in these electronic payments.	Loss of trust	Trust
One of the things that I am concerned with is about these 3 weeks of having your money hanging somewhere.	Suspense account	Trust
It is no longer safe to keep your money in the bank in Zimbabwe because you will go through countless bank charges.	Not safe in banks	Trust
Besides swiping, there are some things where I need to use cash. For example if I get cash, I need transport and I need to buy tomatoes. Where am I going to get the cash for that?	Need for cash in some retailers	Acceptance
I did and we went to ecocash wanting to get the statement showing that the money indeed gone out of the account. It is the same case again with swiping. If it happens with swiping, going to the bank to get the bank statement will take you a long period of time. It will take over 4 weeks for the money to be restored.	Payments not going through Ecocash and card payments	Infrastructure
Yes, there are cases of theft. If your phone is stolen, you can retrieve your records, ecocash account and money in the account. If you are carrying cash and you get robbed, you cannot recover the cash. The disadvantage is that in sending money both the sender and the receiver are charged. Sometimes to get cash you have to add some money.	Theft Reduced possibility of theft/loss	Security
US dollars on the black market are just a phone call away, you just have to make yourself available.	Preference for forex	Convenience
In Zimbabwe, cash is the preferred payment method because it doesn't have hassles. No interest rates, no taxes and long queues. It is very cheap and affordable to use cash.	Preference for cash charges	Cost Convenience
Convenience wise, vendors are all over. The super markets are not all over and people do business with them.	Preference for vendors who don't accept cards	Acceptance
Small shops are highly sensitive to events happening in the money market and therefore change their prices and payment terms frequently.	Price discrimination	Welfare
Small shops are highly sensitive to events happening in the money market and therefore change their prices and payment terms frequently.	Price discrimination	Welfare

PSP, payment service provider.