

Evolution of the Mobile Money Payment Market *in* Tanzania

Technical Note

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Authors

This document was prepared by Angela Garcia Vargas and Beniamino Savonitto. Other World Bank Group staff who contributed to this report include Bernard Mogaka Kinara, Carlos Sakyi-Nyarko, Deepa Chakrapani, Joseck Mudiri, Lisa Johnston, Maarten Froling, Matthew Saal, Maxim Valeriev Roussinov, Minakshi Ramji, and Rachel Cassidy.

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1

Introduction

Tanzania is one of the most vibrant mobile money markets in sub-Saharan Africa, with 45 percent of adult Tanzanians in possession of a mobile money account, compared with the region's average of 33 percent (World Bank Findex, 2021). By March 2023, this equated to 44 million open accounts and an annual transaction value in 2022 that reached US\$56 billion.¹ Mobile money accounts give holders access to a wallet through which they can transfer money, save, borrow, pay bills, and purchase goods and services through any mobile phone. Tanzania was one of the first markets offering mobile wallet holders the opportunity to earn interest on their balances and to allow interoperability across providers.²

¹ <https://www.tcra.go.tz/services/statistics>

² Di Castri & Gidvani, 2014, [Enabling Mobile Money Policies in Tanzania](#); IFC, [Achieving Interoperability in Mobile Financial Services](#); Mobile Money GSMA, 2016, [The impact of mobile money interoperability in Tanzania](#).

[°] All dollar amounts are U.S. dollars unless otherwise.

However, the transition from the early adoption of mobile money as a peer-to-peer (P2P) transfer channel into a broader digital financial services ecosystem has been slow. While most mobile money account holders in Tanzania are active, with 63 percent of accounts used at least twice a month for P2P transfers or bill payments, 43 percent of users still prefer to immediately convert their digital balances into hard cash.

The Global Findex 2021 data shows that just 1 percent of adults in Tanzania used a mobile phone for merchant payments in store in 2021, and only 0.7 percent used a card.³ A more recent nationally representative survey (Finscope 2023) found that while 33 percent of adults had made a digital merchant payment at least once, only 13 percent had done so over the past month and only 3 percent made it as a mobile merchant payment. What is interesting to note is that while the early phase of the COVID-19 pandemic catalyzed the growth of digital payments in Tanzania, the figures dropped substantially once measures to limit exposure to the virus began to phase out. Similar trends were noted in other countries where mobile-money ecosystems are in the early stage of development and offer only a limited value proposition. In addition, these changes in behavior after the peak of the pandemic coincided with regulatory changes in the mobile money market, which affected the whole ecosystem.

Given the potential of mobile money in Tanzania, various providers have been trying to capture the retail payment market since 2014.⁴ Vodacom Tanzania started offering Lipa Kwa M-PESA to cater directly to merchants, with a dedicated platform that gave them more control over transactions, and which could be expanded to offer other services. Tigo followed in 2016 with Lipa Hapa Kwa Tigo Pesa⁵ and Airtel joined later with Airtel Tap Tap. Interoperability across providers allowed merchants to accept payments from other networks and, at least initially, boosted use of the service.⁶

The International Finance Corporation (IFC) has long been engaged in the Tanzanian mobile money market with the aim of deepening and strengthening financial inclusion. A key outcome of this engagement so far has been the interoperability agreement reached in 2014, followed by continuous support and partnerships with key actors in the Tanzanian market.⁷

In 2022, dedicated mobile payments offerings, now commonly known as Lipa Kwa Simu (translating from Swahili as “pay by phone”), were still offered by all three major mobile money providers (Airtel, Tigo, Vodacom). Selcom, a payments aggregator, also offered a dedicated platform for merchants. Typically, a business account requires a business license and other know your customer (KYC) requirements but incurs no registration fees. Once registered, a merchant is assigned a unique account number and a QR code to display in store.

3 The latest Findex data estimates that 13 percent of adults in Tanzania have access to a debit or credit card.

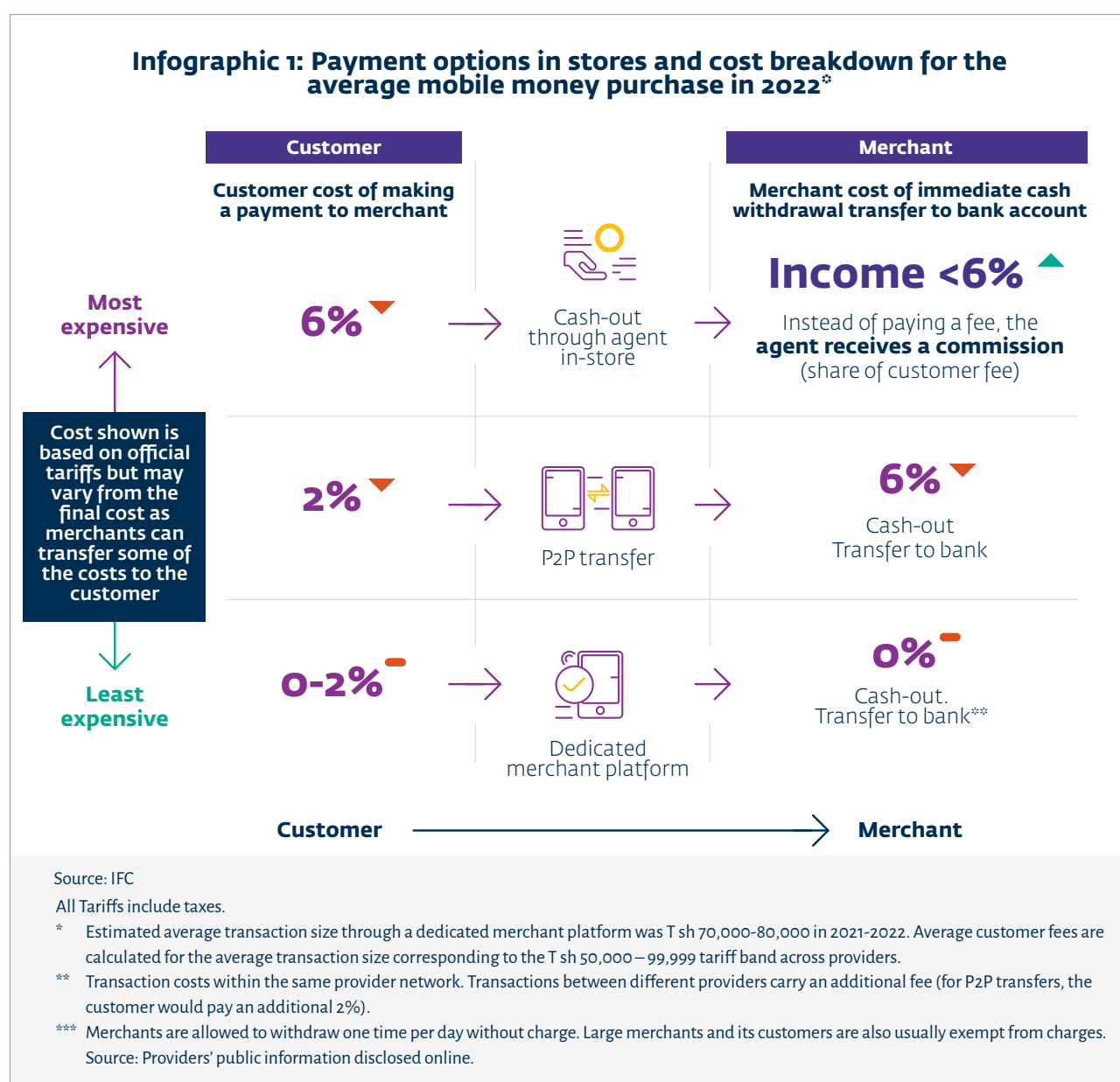
4 Tanzania: The Vodacom Turnaround Story, CGAP blog 2019. <https://www.cgap.org/research/publication/tanzania-vodacom-turnaround-story>

5 Quarterly Magazine of the Tanzania Communications Regulatory Authority, April-June 2017.

6 Ibid.

7 “Achieving Interoperability in Mobile Financial Services: Tanzania Case Study”, IFC 2015. See also “IFC Launches Campaign Promote Use of Mobile Money Interoperability Services in Tanzania” Press release, March 2017. Accessed in 2023 at <https://pressroom.ifc.org/all/pages/PressDetail.aspx?ID=16666>

Customers with a mobile wallet from any provider can send a payment to the merchant for a fee, the size of which depends on the transaction amount. While merchants do not pay anything to accept payments, they are typically charged a withdrawal or settlement fee for transfers to other accounts (See infographic and further discussion on pricing in section 6).



Box 1: study design

A longitudinal research approach was adopted for the study. Respondents surveyed at baseline were tracked over time to observe the adoption of mobile money and merchant payments by customers. This was complemented with an additional sample where baseline respondents could not be traced.

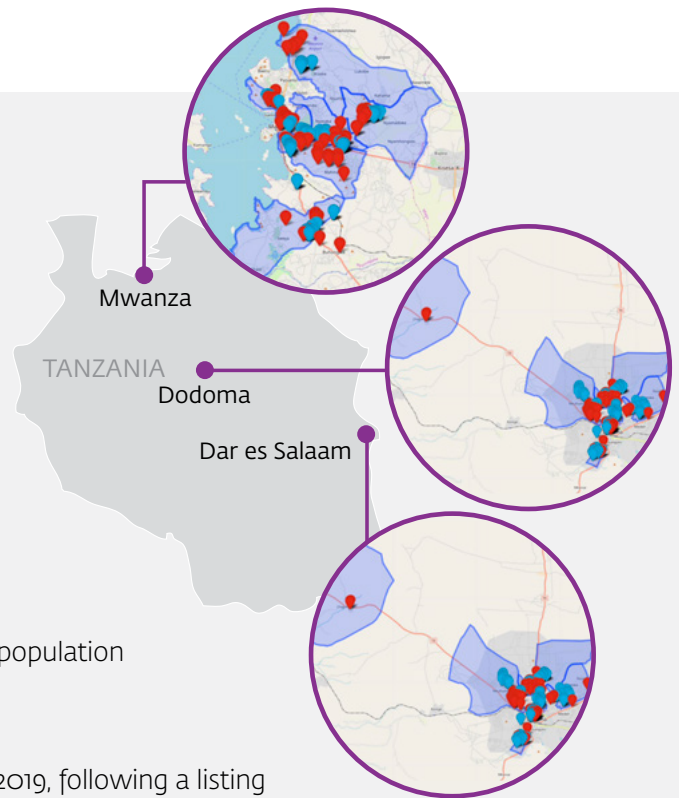
Where: The study was conducted in the urban areas of Dar es Salaam, Dodoma, and Mwanza (24 percent of the urban population in Tanzania). Forty enumeration areas across the three regions were randomly selected using proportional to population sampling (PPS) based on the 2012 census.

When: The baseline survey for this study was completed in 2019, following a listing of all merchants and households in the study areas. In addition, two short follow-up surveys and one final survey were conducted in July 2020, February 2021, and April 2022 to track respondents and monitor information on the use of mobile money services. Due to high attrition in the sample, additional listing exercises were conducted in 2022.

Who: Customers: Approximately 4,000 households were listed in the chosen enumeration areas. Basic demographic and mobile provider usage information was collected for over 14,000 household members. A total sample of 800 individuals were randomly selected, stratified by enumeration area and gender. Individuals who didn't own a SIM card were not eligible for the survey. Due to high sample attrition in 2022, new sampling (including enumeration areas) and listing exercises were conducted in September 2022, and the full survey, covering 630 individuals, was completed in November/December 2022.

Merchants: Approximately 3,000 eligible merchants were listed. Only merchants with a valid tax identification number (TIN), any type of business license (necessary to open a merchant account), and those who were not exclusively agents/payment aggregators listed in specific wards were considered eligible. Six hundred merchants were randomly selected – stratified by region, type of store, and acceptance of mobile payments at listing to ensure representation of non-dukas stores and merchants accepting mobile payments.

The survey focused on interviewing people who were in charge of business decisions, usually, the owner or manager. The final sample surveyed included 600 merchants, of whom 41 percent were in Dar es Salaam, 31 percent in Mwanza and 28 percent in Dodoma. The analysis in this report uses weights and is representative of all eligible merchants and customers in the three urban areas.



Infographic 2: Potential for increased uptake of merchant payments



of urban merchants **accept mobile payments**



2/3

of these urban merchants have a **dedicated payment account**

Urban merchants are already highly connected:



80%

use a phone for **business operations**



53%

have at least one **smartphone**



52%

have a **business bank account**



37%

offer mobile money agent services in their stores

The survey provides insights into a representative sample of micro merchants who have a business license and operate in one of Tanzania's three largest urban centers.

Source: IFC

Growing acceptance of mobile money among small merchants

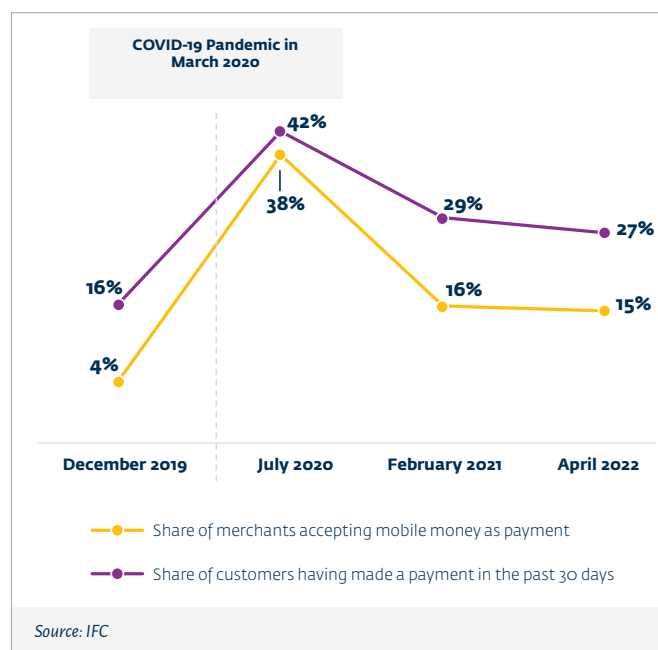
IFC conducted a series of surveys to document the adoption and usage of mobile merchant payments. The surveys gathered information for merchants and customers in three selected urban centers from 2019 to 2022 (see Box 1). This report focuses mostly on the data collected from merchants, as strengthening of the payment infrastructure on the retail side is paramount to the development of the market.

Overall acceptance of mobile payments for retail shows consistent growth

According to the survey data, 27 percent of merchants accepted customer payments via mobile money in 2022, up from 16 percent in 2019 (Figure 1). Acceptance in this case is defined as the willingness to allow customers to pay with mobile money including any type of transaction (P2P, P2B, cash-out at the store).⁸ Although Tanzania features interoperability across mobile providers, a fee is charged for accepting payments from different providers' wallets into one account. To avoid these fees, approximately 60 percent of the surveyed merchants have accounts with multiple providers as it costs nothing to open a mobile money account. While 90 percent of merchants accepting mobile payments reported receiving payments in the week before the survey, they still represent a relatively small share (13 percent on average) of their business's monthly transactions in 2022.

The early phase of the COVID-19 pandemic catalyzed the growth of digital payments both globally and in Tanzania (see Box 2).⁹

Figure 1: The evolution of mobile merchant payments, 2019-2022



While lockdowns and health measures in Tanzania were not as common as in other countries, significant disruptions were reported by respondents. For example, 84 percent of customers reported staying away from large crowds, and 33 percent stopped going to work, the store, schools, and/or places of worship during the first months of the pandemic. IFC surveys showed explosive growth in the share of households and businesses making use of digital payments between December 2019 and July 2020. Figure 1 shows that, at the peak of the pandemic, almost half of the surveyed merchants were accepting mobile payments while four out of 10 adults in the study areas reported paying for goods or services using mobile money. However, by early 2021, approximately half of these merchants and two thirds of customers had reverted to cash.

⁸ The survey asked merchants whether customers were able to pay using mobile money.

⁹ While lockdowns and health measures in Tanzania were not as strict as in other countries, significant disruptions were reported by respondents. For example, 84 percent of customers reported staying away from large crowds, and 33 percent stopped going to work, the store, schools, and/or places of worship during the first months of the pandemic.

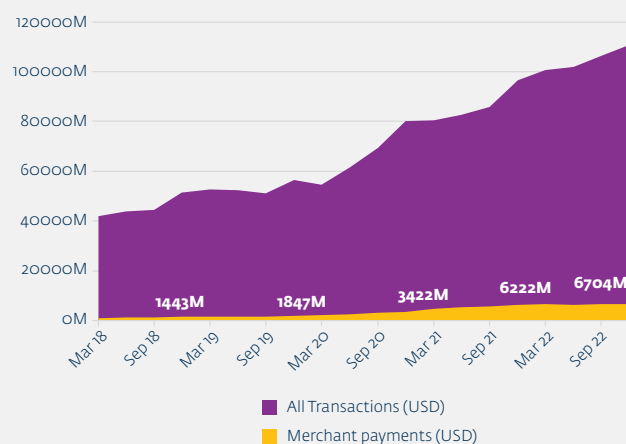
While the share of merchants and customers using digital payments in 2022 settled at significantly higher levels compared with 2019, the drop in active users reflected a limited value proposition that is typical of a mobile-money ecosystem in the early stage of development (Section 4 presents a detailed discussion of these limitations). This is in contrast to survey figures which show an increase in online sales, delivery and services during COVID-19, which persisted after the pandemic (see Section 3 for further details). Anecdotal data from 2023 suggests the dip in merchant transactions was temporary.

Box 2: Acceleration of digital payments during COVID-19

As evidenced in multiple settings (remittances¹⁰, cash-transfers payments¹¹, education, and others¹²), the COVID-19 pandemic contributed to a marked acceleration in the digital economy.

Globally, the value of mobile money transactions grew by an impressive 126 percent in 2020 and 130 percent in 2021. Mobile merchant payments doubled their value over two consecutive years reaching over US\$6 billion transacted in the last quarter of 2021 (Figure 2). The Global Findex data confirmed this trend. 40 percent of those who made a digital merchant payment in developing countries (7 percent of the adult population) made it for the first time after COVID-19 started.

Figure 2: Global value of transactions through mobile money services



Source: GSMA

Table 1 summarizes mobile money acceptance levels across merchant categories – ranging from kiosks (also referred to as dukas), to larger supermarkets, restaurants, and hotels. The data shows that mobile payment acceptance in 2022 was not restricted to a particular type of store, though some sectors have a higher acceptance rate. However, **acceptance is higher among larger stores**. Table 2 (panel A) shows that larger stores accept digital payments more often and receive a greater share of their total monthly payments digitally. Note that small differences within industries do not only reflect the differences in businesses' sizes. For example, while auto shops and fuel stations interviewed are, on average, larger than stores in other industries, they are more often part of larger chains or franchises which likely influences availability of electronic payment methods. Further regression analysis will delve more into these differences.

¹⁰ The journey so far: making cross-border remittances work for financial inclusion. FSI Insights No 43, 15 June 2022, and <https://www.knomad.org/publication/migration-and-development-brief-36>

¹¹ Social Protection and Jobs Responses to COVID-19: A Real-Time Review of Country Measures (English). COVID-19 Living Paper Washington, D.C. World Bank Group. <http://documents.worldbank.org/curated/en/10221643895832724/Social-Protection-and-Jobs-Responses-to-COVID-19-A-Real-Time-Review-of-Country-Measures>

¹² OECD Digital Economy Outlook 2020. Available at https://www.oecd.org/en/publications/2020/11/oecd-digital-economy-outlook-2020_3f7b7e58.html

Table 1: Mobile money acceptance and usage in 2022, breakdown by sector

	Share of merchants accepting mobile payments	Customer payments received through mobile money (% of total payments received by merchants accepting mobile money)
Auto shops/fuel stations Average transaction value 20,663 T sh	73%	33%
Hyper/Supermarkets Av. Trx value 6,628 T sh	52%	23%
Hotels, restaurants, cafes Av. Trx value 8,945 T sh	49%	20%
Large retail stores* Av. Trx value 9,213 T sh	40%	17%
Hardware Av. Trx value 17,814 T sh	32%	14%
Pubs, bars, clubs Av. Trx value 6,970 T sh	29%	10%
Small retail stores Av. Trx value 4,878 T sh	22%	6%
Dukas and Kiosks Av. Trx value 4,269 T sh	21%	9%

*Retail stores including boutiques, liquor stores, pharmacies, and saloons. Small stores are those with only one full-time employee.

Several other business characteristics correlate with higher acceptance (Table 2–panel B). In particular, businesses that are also agents – offering cash-in and cash-out on behalf of a mobile money operator – are more likely to accept mobile payments from their customers. While it seems natural for mobile money agents to be early adopters of digital payments, given their comfort and knowledge of the service, the interaction between the two services presents some significant challenges which may be attributable to the possibility of arbitraging fees (see Box 3). Bank account ownership, the availability of a smartphone for business purposes, and online sales also correlate with greater rates of digital payment acceptance. While women-owned businesses (see Infographic 3), unbanked businesses and businesses that only accepted cash payments are significantly less likely to be early adopters of digital merchant payments, survey data shows promising rates of adoption considering the early-stage of the digital payment ecosystem.

Table 2: Acceptance of mobile payments – breakdown by business characteristics

	Acceptance in 2022 ¹	% of monthly transactions made through mobile money ²
Panel A. Size		
Monthly sales		
Above median (1.82m T sh/ \$729 USD)	28%	16%**
Below median	25%	12%**
Total employees		
Above median (1.5)	37%***	15%***
Below median	21%***	9%***
Av transaction size		
Above median (3500T sh)	33%	15%**
Below median	25%	12%**
Daily customers		
Above median (20)	36%	14%
Below median	27%	12%
Panel B. Other business characteristics		
Agent services (37%)		
Yes	48%*	12%
No	14%*	13%
Men owned (40%)		
Yes	31%*	12%
No	24%*	13%
Bank account ownership (52%)		
Yes	38%***	14%**
No	16%***	8%**
Accepts cards (3%)		
Yes	84%***	20%**
No	25%***	12%**
Smartphone³ (53%)		
Yes	38%**	12%
No	22%**	13%
Sells online (11%)		
Yes	53%**	18%***
No	23%**	11%***
Offers delivery services (70%)		
Yes	32%	12%
No	16%	15%
Installments payments available (73%)		
Yes	32%**	12%
No	15%**	17%

¹ Statistically significant differences between groups are presented (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$).

² Only among merchants accepting mobile payments.

³ Includes only merchants who own at least one phone for business purposes.

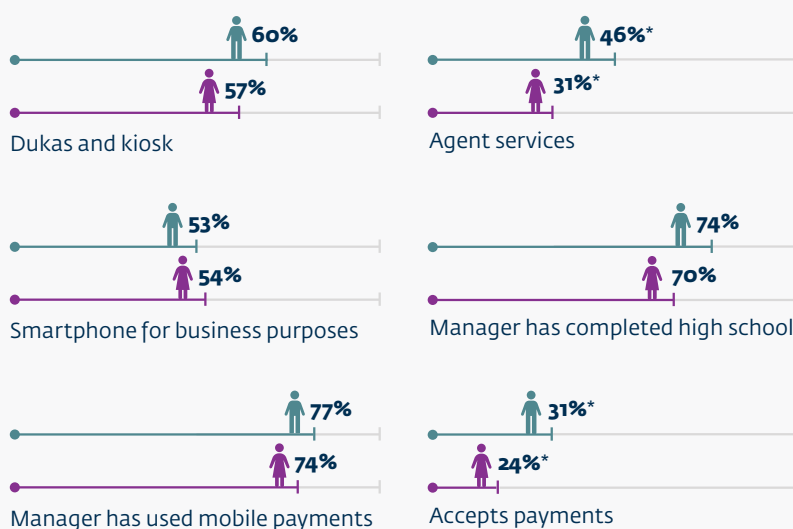
Women-Owned Businesses in Tanzania

More than half of the surveyed merchants (60 percent) reported having at least one woman owner. The survey provides evidence of high levels of digital connectivity among women-owned MSMEs in Tanzania, however there are small, persistent differences in their financial access and usage.

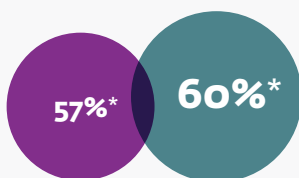
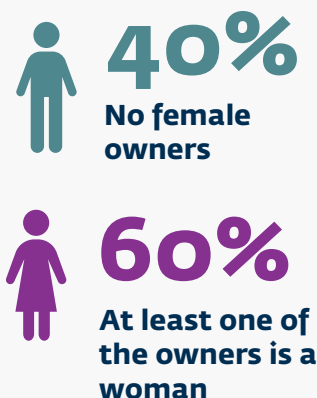
While the study found small, but statistically insignificant, differences in most indicators (as seen below) women-owned MSMEs in the sample reported a gap when it came to three important aspects: bank account ownership, offering of mobile agent services, and acceptance of mobile customer payments.

Micro enterprises

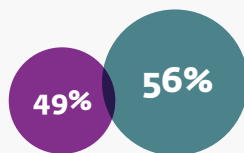
Merchant characteristics by ownership



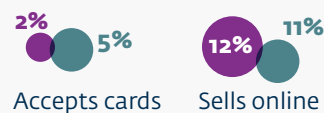
Gender breakdown of Merchants



Average transaction size below median value



Bank account ownership



Source: IFC

Statistically significant differences between groups are presented (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$).

While these differences help us to see which merchants have adopted mobile payments, further analysis is required to understand the most important determinants of adoption. Regression analysis (see Table 3) was deployed to identify the drivers of payment acceptance – including business and some respondent characteristics. The main specifications for this analysis focus on 2022 (Table 3, column 1 and 2), given the low up-take at baseline. However, the analysis is also available for 2019 (Table 3, column 3) and pooling both periods (Table 3, column 4). Additional specifications can be found in Annex A.

Consistent with the trends observed in the literature, larger enterprises (in this case defined by number of employees) are more likely to adopt new technologies.¹³ The analysis also shows that key determinants for whether a store accepts digital payments are whether they offer agent services and whether they pay any of their suppliers using mobile money.

As mentioned earlier, mobile money agent services are likely to appreciate the use case for customer purchases, as they have often facilitated transactions in the past, and already have a relationship with the mobile services provider (Box 3 discusses in detail the significant challenges arising when agents facilitate retail payments). As for the importance of paying suppliers, it confirms the value of developing the whole mobile money ecosystem, therefore increasing the use cases of mobile money for individuals and businesses alike.

Having a business bank account does not appear to be a significant determinant of acceptance of mobile payments which is a key departure from previous financial services.

It is important to note, however, that more than half of the merchants represented in the survey (52 percent) have a business account and an additional 8 percent of merchants use a personal bank account for businesses purposes. Offering online sales is significant in a few specifications but loses significance once the regression includes the average transaction size as a control.

Transaction size, together with a respondent's education level is more strongly correlated with adoption at baseline (when mobile payment services were nascent) but loses importance as the market stage progresses. The results show similar insights for the role of the industry on acceptance – auto shops and fuel stations, large and small retail stores, hyper/supermarkets, and hardware stores have a significant coefficient at baseline but appear less significant due to higher variance in 2022. Hotels, restaurants and cafes, however, appear consistently more likely to accept mobile payments during the entire study period. Note that the regression analysis confirms relevance of the industry remains after controlling for other characteristics such as business size, etc.

While there is a gender gap in acceptance of digital payments when men- and (at least one) women-owned firms are compared, but there is no gender gap overall once the analysis controls for key business characteristics. Controlling for such characteristics shows that the overall gender gap is attributable to differences in the sector in which men- and (at least one) women-owned firms operate, and their provision of agent services, rather than being directly attributable to gender (see Annex B for additional regressions focusing on the gender gap).

¹³ Comin, Diego; Cirera, Xavier; Cruz, Marcio. 2022. Bridging the Technological Divide: Technology Adoption by Firms in Developing Countries. The World Bank Productivity Project. © Washington, DC: World Bank. <http://hdl.handle.net/10986/37527> License: CC BY 3.0 IGO.

Table 3: Determinants of merchant acceptance of mobile payments

	(1)	(2)	(3)	(4)
	Acceptance	Acceptance	Acceptance	Acceptance
Total paid employees	0.012 *** (0.004)	0.014 *** (0.003)	0.014 * (0.007)	0.016 *** (0.006)
Unpaid part-time employees	-0.008 (0.008)	0.043 (0.028)	0.005 (0.043)	0.026 * (0.014)
Log average transaction size		0.025 (0.023)		0.009 (0.009)
Owns business bank account	0.069 * (0.040)	0.040 (0.061)	0.037 (0.044)	0.054 (0.039)
Sells online	0.055 *** (0.019)	-0.002 (0.014)		
Paid suppliers with mobile money	0.211 *** (0.051)	0.222 *** (0.061)	0.005 *** (0.001)	0.007 *** (0.001)
Agent services	0.204 *** (0.064)	0.212 *** (0.071)	0.213 *** (0.013)	0.241 *** (0.034)
Respondent mobile payments usage	0.113 *** (0.038)	0.119 (0.093)		
High school or more	0.045 (0.047)	0.112 *** (0.035)	-0.012 (0.049)	0.058 *** (0.014)
Female owner	-0.000 (0.015)	-0.004 (0.032)	0.014 (0.029)	0.003 (0.009)
Auto shops/fuel stations	0.276 * (0.126)	0.219 (0.164)	0.184 *** (0.042)	0.183 * (0.096)
Hotels, restaurants and cafes (HORECAS)	0.170 *** (0.042)	0.121 ** (0.049)	0.180 *** (0.067)	0.141 *** (0.035)
Large retail stores	0.096 *** (0.033)	0.046 (0.034)	0.099 *** (0.030)	0.084 *** (0.007)
Hyper/Supermarkets	0.123 * (0.072)	0.044 * (0.022)	0.404 *** (0.082)	0.250 *** (0.088)
Small retail stores	0.026 (0.029)	0.050 ** (0.025)	0.034 ** (0.015)	0.037 *** (0.003)
Pubs, bars, clubs	0.010 (0.023)	-0.093 (0.090)	0.007 (0.092)	-0.059 (0.081)
Hardware	0.103 *** (0.029)	0.049 (0.056)	0.073 (0.048)	0.059 *** (0.020)
FE y=2022				0.072 * (0.043)
Observations	541	386	576	968
Specification	Endline only Probit	Endline only Probit	Baseline Probit	Baseline and Endline Probit

Cluster-robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All coefficients for probit models shown correspond to the average marginal effect dy/dx . The dependent variable is a dummy that takes the value of 1 if the merchant reported allowing customers to pay using mobile money at their store. Total paid employees is the numbers of full-time and part-time (0.5) employees. Average transaction size (and sales) has a high non-response rate for all survey rounds, therefore specifications including this variable drop about 150 observations compared to those without it (both results are shown for comparison purposes).

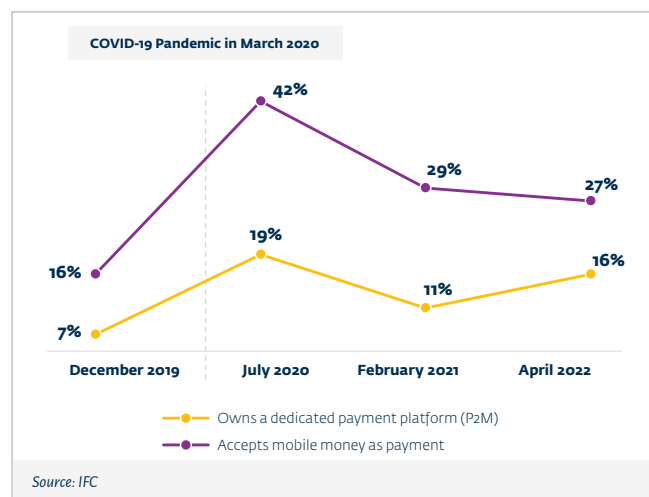
The case for dedicated merchant payment platforms

A dedicated merchant platform is the formal mechanism to process payments made via a mobile money or banking platform (including cards) to a retail or online merchant in exchange for goods or services. Using a merchant platform over a personal account offers a cheaper way to convert electronic money to cash for both merchants and customers (See infographic 1 and further discussion on pricing in Section 6). A dedicated merchant platform gives mobile network operators (MNOs) the opportunity to tailor their service to the needs of a particular segment, for example they often allow higher money balances than a personal account.¹⁴ Other features include unique control over the account, access from different devices, a digital way for merchants to keep track of their finance/sales records, and special safety and business management add-ons.

In 2022, dedicated mobile payments offerings, now commonly known as Lipa Kwa Simu (translating from Swahili as “pay by phone”), were still offered by all three major mobile money providers (Vodacom, Tigo, Airtel). Selcom, a payments aggregator, also offered a dedicated platform for merchants.

Merchant payment platforms are becoming more widely accepted over time. In 2019, the acceptance of mobile payments via dedicated merchant platforms was uncommon as only 7 percent of merchants held such an account.

Figure 3: Share of mobile money acceptance by merchants and adoption of dedicated payment platforms



But by April 2022, two-thirds of merchants accepting payments had signed up for a dedicated merchant platform. This is consistent with the initial low frequency of electronic payments in the economy and the higher “entry cost” of registering to use such platforms. Data collected during the COVID-19 pandemic also shows a slower rate of adoption of merchant platforms as it was easier to use existing personal and agent accounts to deal with the sudden increase in demand for electronic payments (Figure 3). The slower rate of adoption, however, can ensure a better customer journey as reflected in the limited decline of merchant platforms once the peak of the pandemic was over, compared with the reduction in overall acceptance.

¹⁴ While providers have begun to recognize retail transactions are made through P2P and cash-outs and are able to identify these kinds of transactions via data analytics, registration through a merchant platform is still the prefer way to tailor services for retail transactions.

Anecdotal data from providers in 2023 suggest the growth in registrations in the merchant platforms has continued increasingly fueled by the explosive growth in number and volume of payments through mobile money.

Figure 4 shows the share of businesses leveraging merchant payment platforms across all surveyed sectors. This widespread adoption of mobile payments is key to ensuring that customers can use mobile money in their daily lives. IFC estimates that approximately 500,000 merchants across the country had signed up for a dedicated mobile payment platform by the end of 2022.¹⁵ While adoption of payment platforms has increased greatly, it is important to understand what drives merchants to use specific methods of payment since the benefits of the payment platforms should strongly incentivize its adoption.

Figure 4: Merchant acceptance of mobile payments and adoption of dedicated payment platforms, breakdown by industry

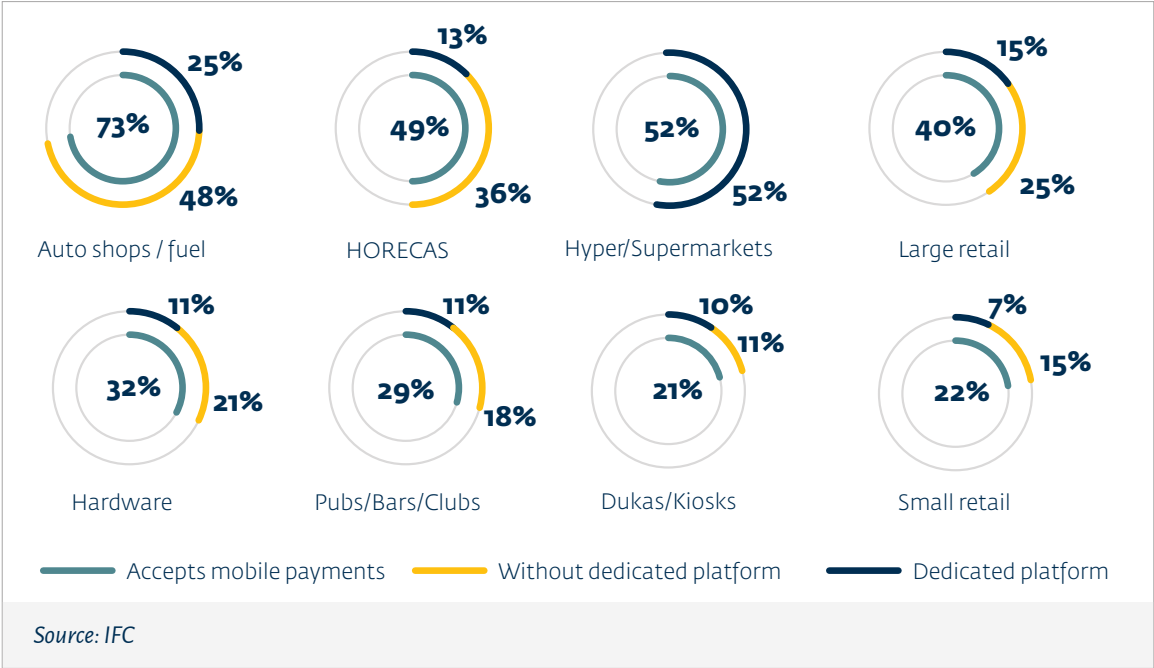


Table 4 shows the regression analysis for the drivers of adopting a dedicated payment platform – conditional on accepting digital payments. Store size is key when it comes to overall acceptance, however, in this case possession of a business bank account is a stronger determinant than that shown in Table 3. While there are numerous reasons as to why owning a business bank account may be linked to adoption of dedicated payment platforms, two mechanisms are relevant when thinking about financial inclusion. Firstly, while mobile money is reaching all types of stores, financial savvy is likely still a key factor in the adoption of more advanced financial services. Secondly, payment platforms are often designed and marketed to merchants who can settle their e-balance by transferring money to their bank account.

¹⁵ IFC estimates based on publicly disclosed numbers on merchants enrolled by providers and extrapolating survey data.

However, in Tanzania merchants have the option of cashing out at comparable prices, which could indicate why merchants without bank accounts may be discouraged if there is not enough information about such options. Another determinant is the average transaction size, which suggests that stores receiving larger transactions have a stronger use-case for dedicated payment platforms. Conversely, businesses that have unpaid employees (a proxy of informality) are less likely to sign up for a dedicated platform.

A key characteristic that is relevant for overall acceptance, but detrimental for the adoption of dedicated platforms, is offering agent services. This increases the probability of a merchant accepting mobile money as payment but decreases the likelihood of uptake of a dedicated payment platform. This highlights the dynamics between the two services (offering cash-in and cash-out on behalf of a mobile money operator and accepting mobile payments from customers), which will be explored further in the next sections and Box 3. The type of industry also seems to have a positive effect on overall acceptance, but almost no difference in the type of account.

Table 4. Determinants of adoption of dedicated mobile payment's platforms

	(1)	(2)	(3)	(4)
	Adoption	Adoption	Adoption	Adoption
Total paid employees	0.029*** (0.008)	0.012*** (0.003)	0.006 (0.006)	0.011*** (0.004)
Unpaid part-time employees	-0.090*** (0.018)	-0.024* (0.014)	0.005 (0.138)	-0.011 (0.057)
Log average transaction size		0.123*** (0.006)	0.078** (0.034)	0.107*** (0.008)
Owns business bank account	0.201*** (0.038)	0.197*** (0.045)	0.182*** (0.036)	0.173*** (0.039)
Sells online	0.080 (0.119)	0.135 (0.150)		
Paid suppliers with mobile money	0.048 (0.045)	0.063* (0.027)	0.004 (0.003)	0.004 (0.004)
Agent services	-0.274*** (0.105)	-0.189*** (0.054)	0.132 (0.112)	-0.063 (0.072)
Respondent mobile payments usage	0.052 (0.040)	0.117 (0.120)		
High school +	0.172 (0.197)	0.266 (0.176)	-0.169*** (0.057)	0.144 (0.202)
Female owner	0.015 (0.019)	0.082 (0.074)	-0.143 (0.160)	-0.007 (0.094)
Auto shops/fuel stations	-0.300*** (0.063)	-0.332** (0.133)	0.154 (0.233)	-0.173*** (0.032)
Hotels, restaurants and cafes (HORECAS)	-0.021 (0.207)	-0.148 (0.197)	0.081 (0.164)	-0.128 (0.182)
Large retail stores	-0.055 (0.054)	-0.125*** (0.037)	0.032 (0.069)	-0.060** (0.030)
Hyper/Supermarkets			0.101 (0.081)	0.174 (0.193)
Small retail stores	0.234 (0.173)	0.195 (0.233)	0.088 (0.223)	0.173 (0.111)
Pubs, bars, clubs	0.045 (0.030)	0.319*** (0.064)	0.003 (0.083)	0.161*** (0.056)
Hardware	0.077 (0.054)	-0.058*** (0.022)	-0.110 (0.095)	-0.099** (0.046)
Dummy y=2022				0.440*** (0.023)
Observations	203	142	138	289
Specification	Endline	Endline	Baseline	Baseline /endline
	Probit	Probit	Probit	Probit

Cluster-robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All coefficients for probit models shown correspond to the average marginal effect dy/dx . The dependent variable is a dummy that takes the value of 1 if the merchant reported having a dedicated merchant payment number/account, and 0 if merchant allows customers to pay using mobile money at their store but does not have a dedicated merchant payment number/account. Total paid employees is the numbers of full-time and part-time (0.5) employees. Average transaction size (and sales) has a high non-response rate for all survey rounds, therefore the main specification including this variable has about 60 observations less (both results are shown for comparison purposes).

Customer demand for mobile merchant payments

Customer demand shows similar growth but remains low.

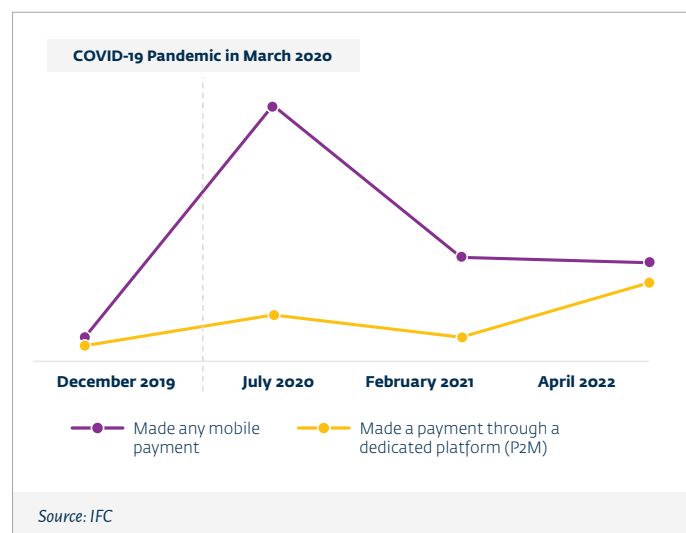
In 2022, 15 percent of surveyed adults reported using mobile money to pay for goods and services in the previous 30 days (Figure 5). This is up from 4 percent in 2019. A recent nationally representative survey (Finscope 2023) found similar results: while 33 percent of adults had made a digital merchant payment at least once, only 13 percent did so over the past month. It is important to keep in mind that at the time of the survey in 2022, the mobile money market had been severely affected by regulatory changes (See Box 4 for more details) which contributed, at least in part, to low growth rates in 2021 and 2022.

For payments through Lipa Kwa Simu and Selcom, the data shows that most individuals making mobile payments have used dedicated platforms to pay for goods and services. In 2022, 12 percent of respondents were using such services – the highest share reported over the study period.

Digital merchant payments – defined as those who made any mobile payment in exchange for goods or services in the past 30 days- are mostly used by younger, employed respondents in the survey sample (Infographic 4). Smartphone users were twice as likely to use merchant payments than feature phone users, while respondents with prior financial services experience were more than three times more likely to adopt merchant payments compared with previously unbanked individuals.

While smartphone users (38 percent of the population) are making significantly more mobile payments than those without a smartphone, there is an important caveat. Although smartphones are expected to make payments more convenient, most users have never used a QR code for payments.

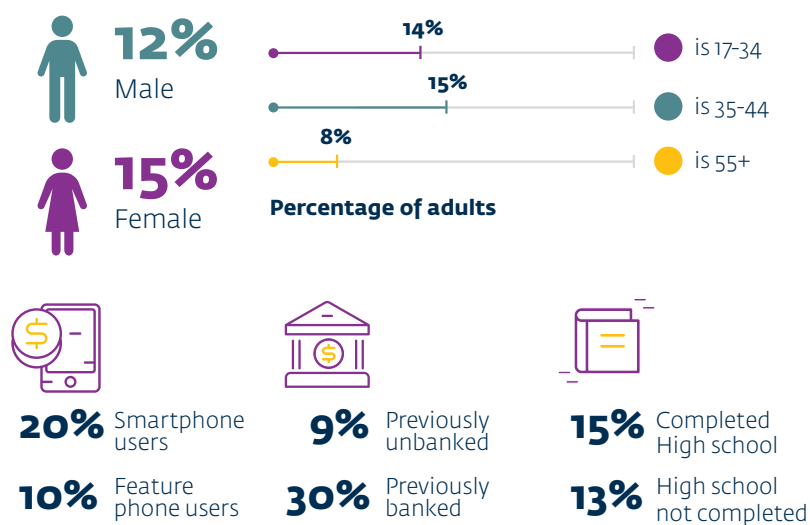
Figure 5: Share of customers who reported using mobile money payments and dedicated payment platforms



In fact, the survey indicates that all transactions are conducted through the USSD channel. This result points to smartphone users being a proxy for tech savviness rather than a reflection of the channel's convenience and highlights the difficulty in changing behavior that is as embedded in the mobile money ecosystem as it is in the native USSD channel. The survey did not collect data on other reasons that may influence customer's preference for the USSD channel.

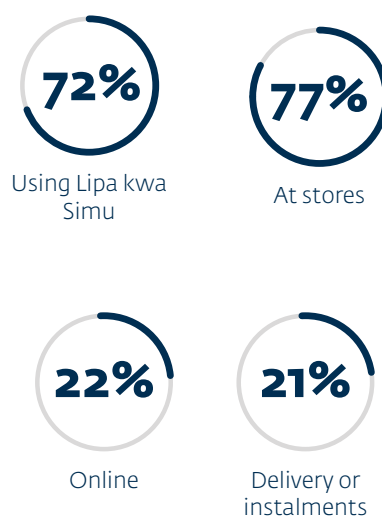
Infographic 4: Profile of merchant payment users

Share of adults who paid using mobile money (past 30 days)



How are adults making mobile payments?

(% of all adults who made payments in the past 30 days)



Source: IFC

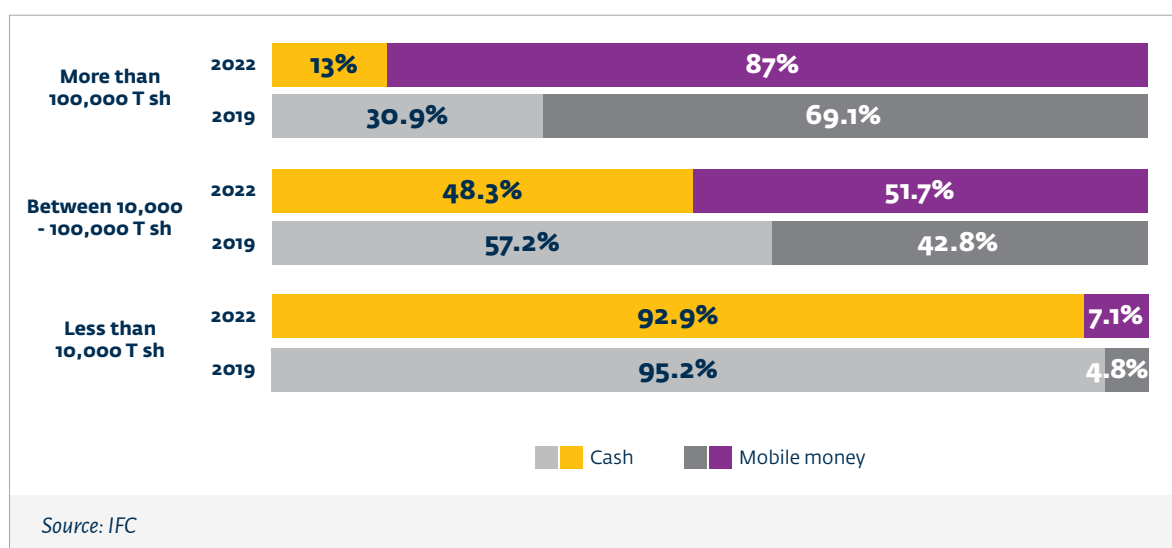
The data also shows that mobile payment users have continued to buy goods/services online (22 percent of those making mobile payments) or through delivery and instalments (21 percent). This is consistent with survey figures on the merchant side showing an increase in online sales, delivery and services during COVID-19, which persisted after the pandemic (see Section 3 for further details).

A growing mobile money ecosystem

Cash is still the preferred form of merchant payment in Tanzania, but there are signs of a gradual decline particularly for larger payments.

The survey reveals that merchants see a strong use case for larger payments, with 87 percent of surveyed merchants preferring to use mobile money to accept larger-value payments (>100,000 Tanzanian shillings (T sh) or US\$43) over cash. This preference was already present in 2019, however, the proportion of merchants stating a preference for mobile payments has increased across all amounts over the period (Figure 6). While this preference makes sense for larger payments, where the “cost” of transacting in cash is more salient, it may limit adoption for smaller merchants.

Figure 6: Preference for mobile money over cash among merchants (2019-2022)



The survey collected data to understand the perceived “cost” of transacting in cash from the merchant’s perspective. It found that the reported time needed to process a payment is significantly higher for cash (7.5 minutes on average) compared with mobile money (5 minutes on average). For larger cash payments this seems to be more salient as merchants estimate almost 10 minutes needed – though no difference is found when processing mobile payments. In addition, 25 percent of merchants reported having issues with cash such as theft or lost/misplaced cash, counterfeit cash, and torn/damaged currency. These issues were more prevalent among merchants reporting an above-median average transaction size (3500THZ/ 7 USD). For example, while 8 percent of merchants with below-median average transaction size reported facing torn/damaged currency in the past 12 months, 17 percent of the larger transaction size merchants reported being affected.¹⁶ Similarly, 14 percent of the larger transaction size merchants reported having lost money due to theft from outsiders compared with 7 percent of other merchants.¹⁷

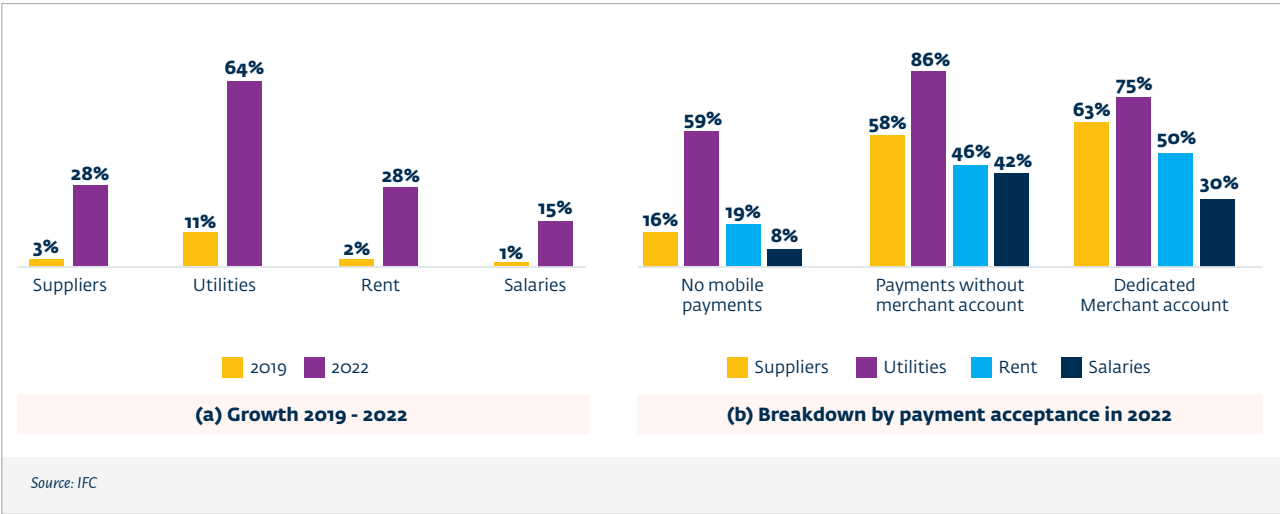
¹⁶ The difference among means for these two groups is statistically significant at 5%.

¹⁷ The difference among means for these two groups is statistically significant at 10%.

The entire mobile money ecosystem has grown considerably over the past few years boosting the use-case for e-wallets. When businesses were interviewed in 2019, they did not use mobile payments as part of their operations and usually paid bills, suppliers and employees in cash.

By 2022, however, most merchants (70 percent) were making at least one type of payment through mobile money, with approximately two thirds paying utility bills using mobile money in the month before the survey (Figure 7a). The survey also indicates an important growth in payments to suppliers and employees, which shows that digitalization is taking place at all levels. This growth in use-cases creates a cycle in which more merchants use mobile money for all kinds of business transactions and, therefore, are willing to receive payments as they do not need to be cashed out. It is important to note that while about half of the merchants have a business bank account, these were rarely used for business payments. This digitalization of different payment streams aligns with the aggressive push for merchant payments in Tanzania with IFC's support. However, more research would be useful to understand the direction of causality between payment acceptance and other business payments.

Figure 7: Share of business payments made through mobile money



70 percent of the merchants reported offering delivery services in 2022, up from 22 percent in 2019.

11 percent of merchants were selling their products on social media and other online platforms

Figure 7 shows mobile business payments are much more common among merchants accepting mobile payments, but there are no clear differences between the type of account used, which suggests that the value proposition of dedicated merchant platforms could improve. When asked whether the ability to make business payments was part of the reason they signed up for a dedicated platform, only 54 percent of merchants said they used the service to pay bills and utilities, while 40 percent said they used it to pay suppliers.

The majority (78 percent) reported using the payments platform to store or safekeep their money, and 32 percent of merchants said they had a dedicated merchant service to access loans.

This digitalization of sales is partly a result of the COVID-19 pandemic. When asked if they started using, or increased the use of internet, online social media, specialized apps, or digital platforms in response to COVID-19 outbreak, 79 percent of merchants agreed. Moreover, 53 percent reported an increase in customers requesting deliveries in light of social distancing and health concerns, and about 85 percent of all merchants said mobile money allowed them to sell more goods/services for delivery.

Additional benefits of dedicated mobile payment platforms reported by the surveyed merchants include, improved financial and cash management, safety (most merchants believed accepting money on the platform was safer), time saved on cash management activities and the ability to easily keep track of transactions and sales. The share of merchants who appreciate such features has also increased.

When merchants were first interviewed in 2019, 58 percent agreed that they spent less time managing cash since they started the service. This number increased significantly to 72 percent in 2022. Similarly, there's been a significant increase in the proportion of merchants who recognize the safety benefits of using a dedicated platform over the period (72 percent in 2019 rose to 93 percent in 2022). In 2019, four out of 10 merchants noted that the marketing materials provided helped them to stand out, but by 2022, this figure rose to eight out of 10.

Persistent barriers to mobile merchant payments

While the study shows strong progress in merchant payment acceptance, significant barriers remain in the growth of Tanzania's mobile payments ecosystem. These include the relatively low use of digital payments among customers and merchants with access to the service, and the mixed evidence emerging from the adoption of dedicated payment platforms.

It is worth considering the factors influencing whether payments are made through dedicated payment platforms. One of the most compelling value propositions (vs personal accounts or withdrawing at/as an agent) is the reduced cost for both the customer and the business. Currently, customers pay only a nominal fee for payments at most small merchants, and free payments are frequently advertised, particularly for large merchants.¹⁸ Although fee structures vary across providers, they are significantly lower than withdrawing cash from an agent or ATM.

However, whereas transfer and withdrawal fees are widely advertised for customers, fees for merchant payments were not usually part of the same tariff structure and are difficult to verify. In addition, customers in Tanzania face continuously evolving merchant payment pricing. One of the market leaders, for example, has removed and added fees since the early introduction of the merchant platform.¹⁹



44 percent of adults incorrectly believe that there was no difference in fees when making a payment through Lipa Kwa Simu or a personal mobile money account

The survey also shows that many merchants (59 percent) charge customers a higher price when attempting to pay through mobile money, possibly to cover their cost of converting to cash, including those who accept payments through a dedicated platform.

These issues partly explain why 44 percent of adults incorrectly believe that there was no difference in fees when making a payment through Lipa Kwa Simu or a personal mobile money account at the time of the survey. Recently, providers have simplified pricing and its advertising, but perceptions around high fees can have a long-lasting effect on the service's usage.

¹⁸ Tariffs consulted for Vodacom, Tigo, Airtel, Masterpass or Mastercard QR during the study period. Providers often offered a different price structure to large and high-value (defined by each provider) merchants, as well as customers paying at these stores, to encourage adoption.

¹⁹ CGAP (2019). Tanzania: The Vodacom Turnaround Story.

Another factor affecting the cost of a dedicated platform is whether the merchant offers services as a mobile money agent. In 2022, four out of 10 surveyed merchants offered such services, slightly up from 2019. While this means merchants are more familiar with the mobile money ecosystem, there is a potential conflict, as agents earn a fee from processing cash-in and cash-out transaction on behalf of the mobile money providers (see Box 3). **Merchants offering agent services are likely to facilitate retail payments but often process them as withdrawals. This severely affects the customer experience as they are subject to higher fees.**

Box 3. Agent services and merchant payments

Agent services benefit the merchant through a small commission for each transaction. When merchants were initially interviewed for the study in 2019, approximately one third offered agent services on top of the store's main business. Respondents estimated that agent services accounted for 21 percent of their business income, on average.

A dedicated payment service for businesses already offering agent services implies a potential reduction in commission for an agent that may have been able to charge the customer for withdrawing money from their account before making a purchase. Competing interests between receiving digital payments for goods and services and processing cash withdrawals as an agent of a mobile money provider, represents a well-known challenge for the growth of the ecosystem. Agents will often attempt to get clients to convert their electronic balance to cash before making a payment to earn the agent cash-out revenue. There have been cases where they circulate money through both accounts, therefore arbitraging the market and using low fees associated with a dedicated merchant platform as well as the agent commission. This is not unique to the Tanzanian market²⁰ but the survey sheds light on the magnitude of some of these practices.

The infographic summarizes payment acceptance for stores acting as agents for a mobile money operator. While stores offering agent services accept mobile payments more often than other merchants, nearly half of them don't have a dedicated merchant payment service and use their agent account to receive payments. Among stores that offer agent services and have a dedicated payment account, 71 percent actively asked customers to withdraw cash instead of processing a digital payment transaction.

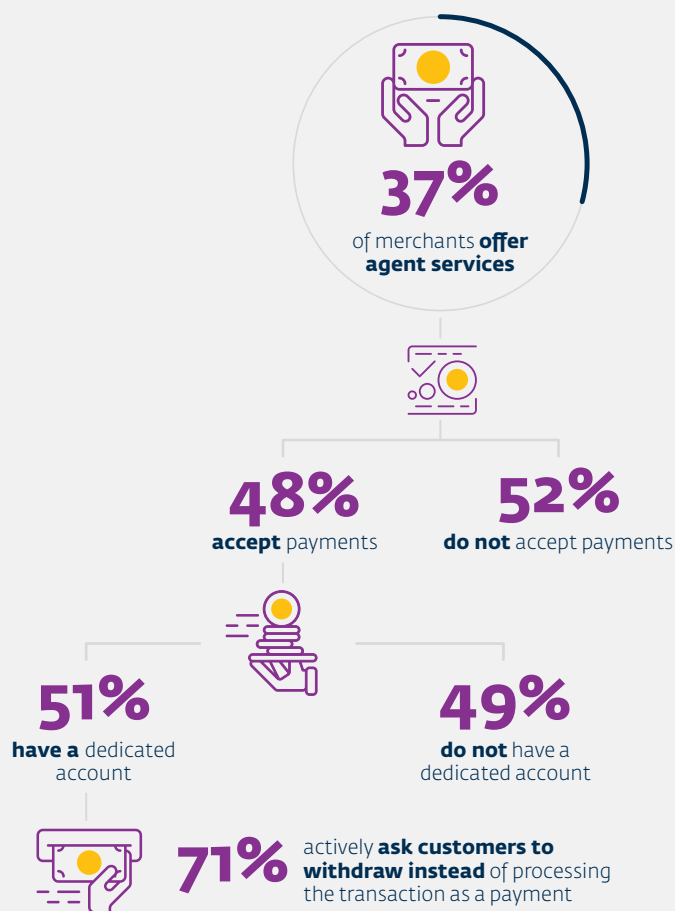
²⁰ Examples of this issue can be found at: Handbook Merchant Payments. IFC 2021; <https://www.primebusiness.africa/cbn-places-service-restriction-on-pos-agents-across-nigeria/>

Secondly, the study considered any significant differences between the additional fees charged when receiving payments. Agents more commonly add fees than those who do not offer agent services (67 percent of agents reported adding fees compared with 44 percent of other merchants). In fact, 20 percent of agents would add a fee of more than 10 percent of the sale's value for small transactions. This observation is not unique in the mobile ecosystem.

A recent study by Innovations for Poverty Action discusses price transparency across different countries including Tanzania and shows that, in addition to official provider fees, users often face a barrage of hidden extra fees applied by agents. 7 percent of transactions in Tanzania were subject to additional fees, with cash-out services most commonly affected.²¹

Thirdly, the study tested whether merchants offering agent services at baseline were more likely to accept mobile payments from customers in 2022, which would show that it was due to familiarity with the ecosystem. We found no evidence that offering agent services at baseline was a determinant of take up of dedicated payment platforms. More qualitative evidence would be needed to confirm if the possibility of additional revenue for agents drove up adoption of the platforms.

Infographic 5: Type of payments used among merchants offering agent services



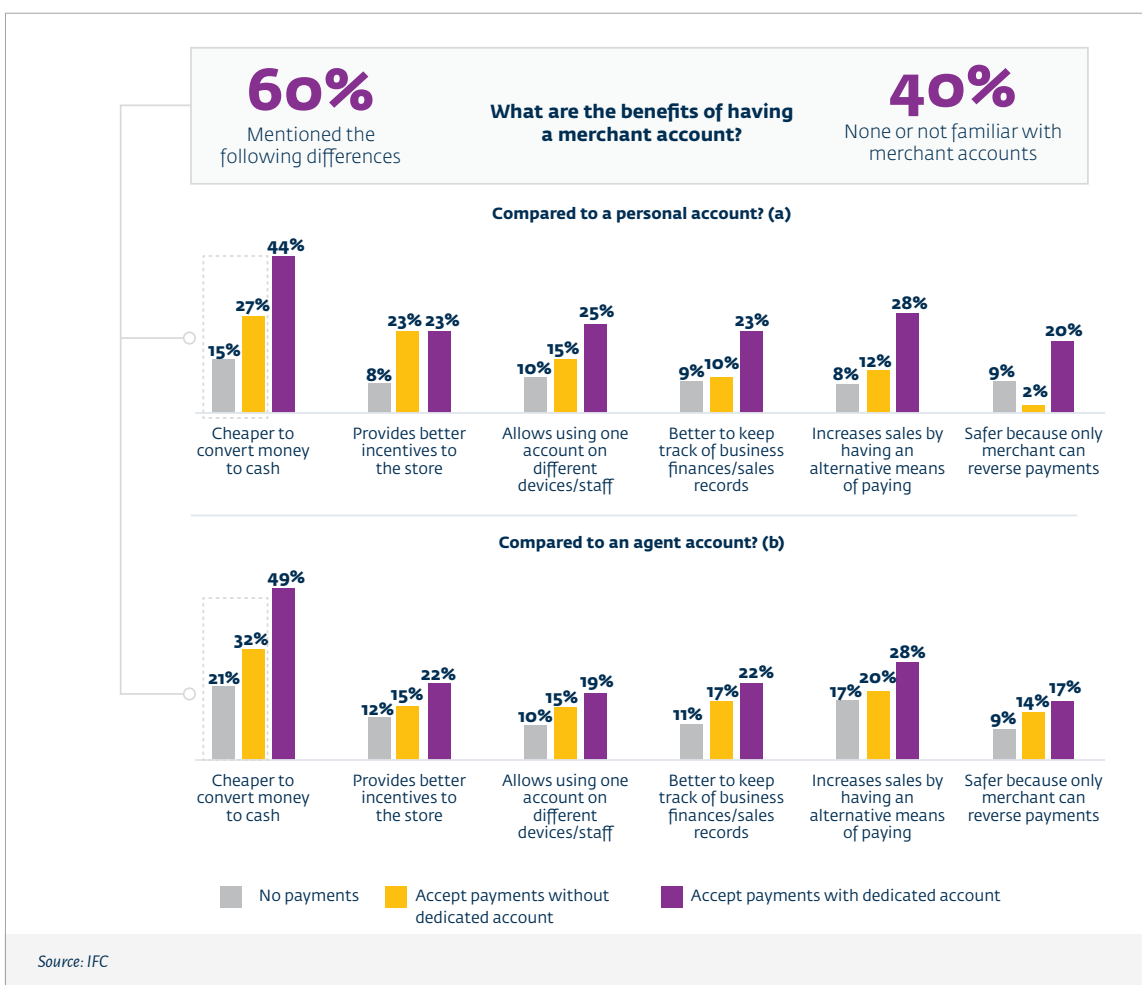
Source: IFC

²¹ <https://poverty-action.org/uncovering-true-costs-mobile-money-services>

Overall, merchants lack knowledge of the value of signing up for a dedicated payments platform over that of other mobile money accounts (figure 8). On average, **40 percent of merchants said they were unfamiliar with dedicated payment platforms, or that these services are no different from agent or personal accounts**. While merchants with a dedicated platform consistently mentioned some of the advantages of these accounts compared with personal mobile accounts, the share of correct answers is still low (approximately a quarter) except for pricing. Furthermore, when comparing dedicated platforms versus agent accounts, very few merchants recognized the benefits (Figure 8b). The share of merchants who correctly identified the advantages is similar, regardless of whether the merchant offered agent services, or not.

These data points signal a limited perceived differentiation between payments through dedicated platforms and other transactions. Efforts to increase awareness about the differences and to financially incentivize adoption of merchant payment channels by further differentiating fees, could help to increase adoption and use of merchant payments.

Figure 8: Benefits of having a merchant account for the business compared to using a personal or agent account?

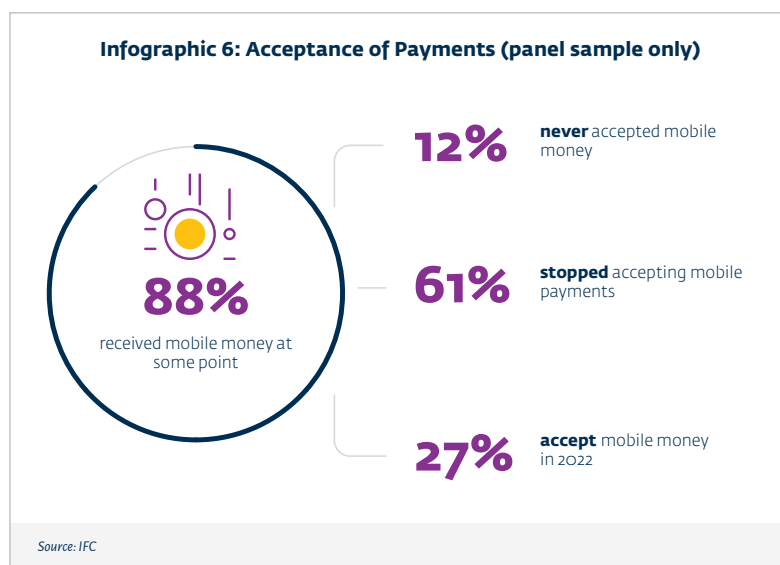


IFC's study indicates that accepting electronic payments or signing up for a merchant account are only a small piece of the digitalization puzzle.

Many merchants in the sample accepted payments at some point during the study period, but discontinued the service after trying it out, which is not uncommon at the early stage of ecosystem development. For the sub-sample of merchants that participated in multiple survey rounds, overall acceptance increased from 16 percent in December 2019 to 42 percent in July 2020, before falling to 27 percent in April 2022 (see Figure 1).

The same pattern was observed for dedicated merchant platforms among this subsample (Figure 3). Given this pattern, the study analyzed how many merchants accepted payments at any point of the study period. The data shows that as many as 61 percent of merchants used mobile money (mostly as P2P) to accept customer payments at any point between 2019 and 2022 but were not accepting payments when the survey was conducted in 2022.

Common reasons for stopping accepting payments depend on the type of account. Among merchants who signed up for a dedicated payment platform and closed it (54 percent) a third mentioned that they had lost their SIM card or closed their mobile account; 25 percent had a bad experience with mobile money; and 21 percent found cash more convenient.



A small percentage mentioned high fees (15 percent) or taxes (10 percent). For merchants who accepted payments before, but without a dedicated payment account, the most common reasons were that fees and charges were too high (60 percent) followed by not currently having mobile accounts (43 percent) or that cash was more convenient (30 percent). The difference in the share of merchants indicating fees and charges as a reason, emphasizes how a **poor understanding of the dedicated platforms ends up affecting customers and merchants alike.**

An additional issue affecting adoption and usage of mobile money was the introduction of mobile money taxation in 2021 (see Box 4). Regulatory and policy interventions such as Tanzania's new tax structure have already shown a negative effect on the mobile money sector and disproportionately affect smaller businesses and low-income groups.²² While the initial tax has been significantly reduced, it is unlikely to be completely removed.

²² UNCDF, 2021. <https://www.uncdf.org/article/7313/the-impact-of-mobile-money-taxation-in-uganda#:~:text=Results percent20indicate percent20a percent20strong percent20correlation,taxes percent20are percent20applied percent20to percent20withdrawals>.

Box 4. Mobile money tax and its impact on the mobile ecosystem

Tanzania, like several other countries in the region, introduced a mobile money tax in July 2021, which has affected the mobile ecosystem. Initially, the tax was levied on mobile money transfers and withdrawal transactions and excluded merchant, business, and government payment transactions.²³ The tax is on top of VAT (18 percent) and excise duty (10 percent) on mobile money transfer and withdrawal fees, all automatically charged to customers when initiating a transaction. The tax was reduced in September 2021 and again in October 2022, but remains a controversial issue in the country as it has significantly increased transaction fees.²⁴ GSMA, which represents the interests of MNOs, reported that the initial tax raised the average transfer cost by more than 250 percent, increasing the average transaction cost by about three times the average fee for East Africa.²⁵

The initial tax structure seemed to benefit mobile payments as it was a relatively less expensive option to use the funds already available in mobile wallets. While industry data reported a slower growth trend in the total number and value of transactions in 2021 and 2022 – particularly marked by a drastic reduction of more than 25 percent in P2P and cash-out transactions per month between June and September 2021 – merchant payments have grown significantly. However, the latest fee structure, as of October 2022, puts merchant payments on a par with that of P2P transfers, which may significantly affect the growth trend in the short and medium term.

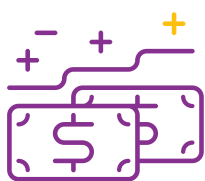
Overall, the growth trend of the mobile ecosystem has been deeply affected. The latest report by GSMA estimated that the tax decreased transactions by 30 percent (for P2P) and 60 percent (for withdrawals) in March 2023, compared with a scenario without tax. As the tax is higher for middle-value transactions (10,000 to 200,000 T sh, or US\$4 to US\$8), the potential repercussions for payments are significant as digital payments are usually of high value.

The survey included several questions to identify how merchants experienced the tax as originally introduced. As of April 2022, there was no consensus among merchants on the effect of the policy as it may be hard to isolate it from other trends like overall digitalization. However, merchants without a dedicated payment platforms reported a decrease in the number of customers wanting to pay with mobile money more often than those with a dedicated payment platform, due to the initial exception of these transactions on the tax structure. Moreover, two-thirds of merchants accepting mobile money payments noticed an increase in customers asking to pay to their merchant account instead of through the agent, or by transfer to their personal account in response to the tax.

²³ GSMA (2022). Tanzania Mobile Money Levy Impact Analysis.

²⁴ GSMA (2023). Tanzania Mobile Money Levy Impact Analysis 2023.

²⁵ Ibid



Overall, **continual changes in the tax structure affect the entire ecosystem**, with the result that people **revert to using cash** thereby reducing the number of those willing to use digital payments. The latest fee structure applied from October 2022 (see Box 4) puts merchant payments and P2P transfers on a par, which may **significantly affect the growth of digital payment platforms in the short and medium term**

Conclusions and recommendations

Tanzania's mobile money ecosystem continues to be one of the most vibrant in the region, with mobile merchant payments showing tremendous growth from 2019 to 2022 when the study was completed. This positively contributes to financial inclusion in Tanzania and results in a substantive increase in digital payments.

An upward spike of acceptance and usage of mobile money was spurred by COVID-19 and its restrictions around movement. Although this was followed by a marked drop at the end of the pandemic, this study confirms that customers and merchants are still eager to use the service, which has improved safety, speed, convenience, and cost of transactions.

As the mobile money ecosystem continues to mature, acceptance of mobile payments among micro and small merchants is fundamental to ensure mobile money is widely and frequently used. By 2022, a significant share of merchants in virtually all industries, and with different levels of financial access, accepted digital payments with some frequency. However, there is a clear need for a stronger value proposition for broader adoption, especially for growing the volume of digital transactions through dedicated merchant payment platforms. Although the market experienced significant growth in number and volume of transactions since the completion of the survey, the insights from the study are relevant to encourage increased digitalization of the customer and merchant journeys.

The study highlights some key barriers and opportunities for this transition, including:

- **Acceptance and adoption of digital merchant payments are only a piece of the digitalization puzzle.** While most merchants have used mobile payment platforms to accept payments, there is a clear need for additional onboarding and day-to-day support.
- **Further education is needed** to improve awareness of, and familiarity with, key features of merchant payments. There is also a need to improve various mobile services to ensure consistent customer experience across the entire mobile ecosystem.
- **Full integration of dedicated platforms with other business use-cases can boost usage.** Merchants are using mobile money to pay utilities, suppliers, and salaries. However, the study finds limited integration with the current payment platforms offered by mobile money providers and few synergies among use cases to drive adoption.
- **Lack of clarity and potential conflict for merchants who also perform agent services for MNOs.** This arbitrage and routing of merchant transactions through agent-facilitated withdrawals is likely to negatively affect customer experience and uptake.

- **Clear, stable, and mutually consistent fee structures, together with consistent messaging, is important to attracting and retaining customers and merchants alike.**

While transaction cost is one of the most compelling value propositions of the payment platforms, few users recognize this advantage.

- **Avoiding changes in branding and service price** is conducive to increasing awareness and allowing customers and merchants to familiarize themselves with the platforms. While merchant adoption is an iterative and evolving process, it may require price adjustments as the market changes. Tracking price evolution and its impact in the market is key for future market development.

ANNEXES

Annex A. Determinants of mobile payments' acceptance (Regression analysis)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total paid employees	0.010* (0.003)	0.009** (0.002)	0.012*** (0.004)	0.014*** (0.003)	0.021* (0.007)	0.018 (0.006)	0.014* (0.007)	0.011 (0.007)	0.016*** (0.006)
Unpaid part-time employees	-0.005 (0.008)	0.031 (0.032)	-0.008 (0.008)	0.043 (0.028)	0.010 (0.038)	0.012 (0.037)	0.005 (0.043)	0.006 (0.042)	0.026* (0.014)
Log average transaction size		0.028 (0.019)		0.025 (0.023)		0.025** (0.006)		0.023*** (0.003)	0.009 (0.009)
Owens business bank account	0.069 (0.037)	0.047 (0.059)	0.069* (0.040)	0.040 (0.061)	0.027 (0.043)	0.016 (0.041)	0.037 (0.044)	0.026 (0.040)	0.054 (0.039)
Sells online	0.083* (0.026)	0.022 (0.026)	0.055*** (0.019)	-0.002 (0.014)					
Paid suppliers with mobile money	0.300* (0.071)	0.327* (0.090)	0.211*** (0.051)	0.222*** (0.061)	0.008* (0.002)	0.008* (0.002)	0.005*** (0.001)	0.005*** (0.001)	0.007*** (0.001)
Agent services	0.230 (0.093)	0.231 (0.101)	0.204*** (0.064)	0.212*** (0.071)	0.296*** (0.023)	0.298*** (0.023)	0.213*** (0.013)	0.214*** (0.015)	0.241*** (0.034)
Respondent mobile payments usage	0.085* (0.025)	0.102 (0.081)	0.113*** (0.038)	0.119 (0.093)					
High school +	0.042 (0.041)	0.092 (0.040)	0.045 (0.047)	0.112*** (0.035)	-0.004 (0.045)	0.000 (0.042)	-0.012 (0.049)	-0.007 (0.047)	0.058*** (0.014)
Female owner	0.004 (0.016)	-0.002 (0.029)	-0.000 (0.015)	-0.004 (0.032)	0.020 (0.024)	0.025 (0.022)	0.014 (0.029)	0.017 (0.026)	0.003 (0.009)
Auto shops/fuel stations	0.287 (0.103)	0.249 (0.144)	0.276** (0.126)	0.219 (0.164)	0.201 (0.084)	0.143 (0.089)	0.184*** (0.042)	0.102* (0.059)	0.183* (0.096)
Hotels, Restaurants and Cafes (HORECAS)	0.174* (0.044)	0.148 (0.078)	0.170*** (0.042)	0.121** (0.049)	0.188* (0.059)	0.181* (0.058)	0.180*** (0.067)	0.168*** (0.060)	0.141*** (0.035)
Large retail stores	0.106 (0.046)	0.059 (0.030)	0.096*** (0.033)	0.046 (0.034)	0.097 (0.046)	0.091 (0.053)	0.099*** (0.030)	0.094** (0.038)	0.084*** (0.007)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

Hyper/Supermarkets	0.142 (0.071)	0.070 (0.036)	0.123 [*] (0.072)	0.044 [*] (0.022)	0.417 ^{***} (0.076)	0.403 ^{**} (0.079)	0.404 ^{***} (0.082)	0.382 ^{***} (0.095)	0.250 ^{***} (0.088)
Small retail stores	0.020 (0.030)	0.033 (0.018)	0.026 (0.029)	0.050 ^{**} (0.025)	0.030 (0.012)	0.027 (0.010)	0.034 ^{**} (0.015)	0.033 ^{***} (0.013)	0.037 ^{***} (0.003)
Pubs, bars, clubs	0.013 (0.041)	-0.083 (0.071)	0.010 (0.023)	-0.093 (0.090)	-0.011 (0.088)	-0.021 (0.076)	0.007 (0.092)	-0.001 (0.079)	-0.059 (0.081)
Hardware	0.099 ^{**} (0.017)	0.044 (0.045)	0.103 ^{***} (0.029)	0.049 (0.056)	0.060 (0.046)	0.030 (0.062)	0.073 (0.048)	0.041 (0.055)	0.059 ^{***} (0.020)
FE y=2022	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	-0.097 (0.069)	-0.364 (0.226)			-0.003 (0.017)	-0.274 [*] (0.067)			0.072 [*] (0.043)
Observations	541	386	541	386	581	576	581	576	968
Specification	Endline ols	Endline ols	Endline PROBIT	Endline PROBIT	Baseline ols	Baseline ols	Baseline PROBIT	Baseline PROBIT	Baseline /endline PROBIT
R-squared	0.330	0.363			0.251	0.257			

Cluster-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All coefficients for probit models shown correspond to the average marginal effect dy/dx. The dependent variable is a dummy that takes the value of 1 if the merchant reported allowing customers to pay using mobile money at their store. Total paid employees is the numbers of full-time and part-time (0.5) employees. Average transaction size (and sales) has a high non-response rate, therefore specifications (2,4) including this variable drop about 150 observations compared to those without it (1,3). Both results are shown for comparison purposes).

Annex B. Gender gap on mobile payments' acceptance (Regression analysis)

	(1)	(2)	(3)	(4)	(5)
Female owner	-0.068 [*] (0.019)	-0.063 [*] (0.016)	-0.054 (0.022)	0.001 (0.023)	
High school +		0.113 [*] (0.037)	0.109 (0.040)	0.075 (0.040)	0.075 (0.040)
Respondent mobile payments usage			0.213 ^{***} (0.018)	0.155 ^{**} (0.017)	0.154 ^{**} (0.020)
Agent services				0.323 [*]	

		(0.093)	
Auto shops/fuel stations		0.513** (0.070)	0.512** (0.072)
HORECAS		0.281** (0.041)	0.281** (0.044)
Large retail stores		0.171* (0.054)	0.170* (0.050)
Hyper/Supermarkets		0.235* (0.080)	0.232 (0.095)
Small retail stores		0.031 (0.014)	0.030 (0.011)
Pubs, bars, clubs		0.110 (0.039)	0.107 (0.049)
Hardware		0.155** (0.031)	0.153* (0.036)
Female owner x No agent services			-0.012 (0.084)
Agent services x only male owners			0.305 (0.174)
Female owner x Agent services			0.032 (0.155)
Constant	0.311** (0.049)	0.228*** (0.023)	0.070* (0.062)
Observations	590	590	581
R-squared	0.006	0.019	0.217

Cluster-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is a dummy that takes the value of 1 if the merchant reported allowing customers to pay using mobile money at their store.

Cluster-robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is a dummy that takes the value of 1 if the merchant reported allowing customers to pay using mobile money at their store.

Annex C. Determinants of adoption of dedicated mobile payment's platforms (Regression analysis)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Total paid employees	0.010 (0.005)	0.007 (0.004)	0.092 ^{***} (0.024)	0.037 ^{***} (0.010)	0.013 (0.006)	0.008 (0.007)	0.036 [*] (0.021)	0.019 (0.020)	0.034 ^{***} (0.012)	0.034 ^{***} (0.013)
Unpaid part-time employees	-0.082 ^{**} (0.016)	-0.022 (0.011)	-0.289 ^{***} (0.058)	-0.078 [*] (0.044)	0.005 (0.137)	0.002 (0.150)	0.036 (0.395)	0.014 (0.419)	-0.038 (0.068)	-0.010 (0.426)
Log average transaction size		0.123 ^{***} (0.004)		0.398 ^{***} (0.020)		0.080 (0.038)		0.236 ^{**} (0.114)	0.198 [*] (0.109)	0.197 ^{**} (0.099)
Owens business bank account	0.215 ^{**} (0.036)	0.201 [*] (0.049)	0.646 ^{***} (0.099)	0.638 ^{***} (0.147)	0.205 ^{***} (0.031)	0.184 ^{**} (0.041)	0.594 ^{***} (0.098)	0.552 ^{***} (0.124)	0.494 ^{***} (0.108)	0.493 ^{***} (0.102)
Sells online	0.102 (0.107)	0.119 (0.120)	0.257 (0.371)	0.435 (0.474)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Paid suppliers with mobile money	0.034 (0.046)	0.048 [*] (0.014)	0.154 (0.140)	0.205 ^{**} (0.083)	0.005 (0.004)	0.004 (0.004)	0.012 (0.009)	0.011 (0.009)	0.010 (0.012)	0.010 (0.013)
Agent services	-0.282 (0.099)	-0.179 [*] (0.048)	-0.882 ^{**} (0.377)	-0.611 ^{***} (0.183)	0.128 (0.141)	0.148 (0.120)	0.325 (0.394)	0.399 (0.342)	-0.168 (0.200)	-0.171 (0.222)
Agent services	-0.282 (0.099)	-0.179 [*] (0.048)	-0.882 ^{**} (0.377)	-0.611 ^{***} (0.183)	0.128 (0.141)	0.148 (0.120)	0.325 (0.394)	0.399 (0.342)	-0.168 (0.200)	-0.171 (0.222)
Respondent mobile payments usage	0.058 (0.035)	0.145 (0.123)	0.166 (0.129)	0.379 (0.389)						
High school +	0.183 (0.221)	0.297 (0.201)	0.553 (0.653)	0.861 (0.593)	-0.199 (0.082)	-0.177 (0.082)	-0.552 ^{***} (0.194)	-0.514 ^{***} (0.153)	0.411 (0.643)	0.408 (0.613)
Female owner	0.012 (0.033)	0.057 (0.078)	0.048 (0.064)	0.264 (0.247)	-0.150 (0.176)	-0.149 (0.169)	-0.434 (0.469)	-0.435 (0.463)	-0.022 (0.299)	-0.023 (0.278)
Auto shops/fuel stations	-0.197 ^{***} (0.013)	-0.300 (0.172)	-0.983 ^{***} (0.184)	-1.138 ^{**} (0.573)	0.328 (0.249)	0.129 (0.257)	0.975 (0.623)	0.451 (0.667)	-0.522 ^{***} (0.114)	-0.517 ^{***} (0.113)
HORECAS	0.063 (0.173)	-0.120 (0.241)	-0.068 (0.655)	-0.478 (0.648)	0.128 (0.157)	0.084 (0.177)	0.356 (0.431)	0.240 (0.478)	-0.392 (0.611)	-0.390 (0.586)

Large retail stores	-0.025 (0.096)	-0.102 (0.053)	-0.171 (0.179)	-0.402*** (0.126)	0.019 (0.096)	0.022 (0.096)	0.092 (0.240)	0.095 (0.215)	-0.175 (0.138)	-0.171* (0.103)
Hyper/Super-markets	0.471** (0.084)	0.397 (0.154)			0.137 (0.086)	0.095 (0.096)	0.410** (0.198)	0.299 (0.228)	0.514 (0.614)	0.520 (0.552)
Small retail stores	0.230 (0.204)	0.211 (0.246)	0.853 (0.700)	0.704 (0.920)	0.060 (0.242)	0.087 (0.244)	0.170 (0.648)	0.261 (0.664)	0.507* (0.291)	0.506* (0.294)
Pubs, bars, clubs	0.076 (0.032)	0.319 (0.154)	0.145 (0.097)	1.357** (0.664)	0.086 (0.071)	0.007 (0.108)	0.235 (0.161)	0.008 (0.252)	0.463*** (0.143)	0.464*** (0.153)
Hardware	0.084 (0.063)	-0.042 (0.029)	0.249 (0.204)	-0.188*** (0.065)	-0.031 (0.138)	-0.130 (0.131)	-0.066 (0.387)	-0.360 (0.296)	-0.300* (0.179)	-0.304** (0.124)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FE y=2022										
Interaction lnavtrx									-0.215 (1.529)	-0.205 (1.672)
* FE 22									0.175 (0.142)	0.176 (0.139)
Interaction unpaidemployee										-0.034 (0.432)
Constant	0.382 (0.243)	-0.959** (0.184)	-0.467 (0.779)	-4.623*** (0.598)	0.332 (0.335)	-0.561 (0.710)	-0.485 (0.907)	-3.127 (2.030)	-3.371* (1.903)	-3.366* (1.870)
Observations	214	150	203	142	143	138	143	138	289	289
Specification	Endline only	Endline only	Endline only	Endline only	Baseline only	Baseline only	Baseline only	Baseline only	Baseline /endline	Baseline /endline
R-squared	0.232	0.270			0.157	0.175				

Cluster-robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All coefficients for probit models shown correspond to the average marginal effect dy/dx . The dependent variable is a dummy that takes the value of 1 if the merchant reported having a dedicated merchant payment number/account, and 0 if merchant allows customers to pay using mobile money at their store but does not have a dedicated merchant payment number/account. Total paid employees is the numbers of full-time and part-time (0.5) employees. Average transaction size (and sales) has a high non-response rate for all survey rounds, therefore the main specification including this variable has about 60 observations less (both results are shown for comparison purposes).

