Who is More Likely to Pay the Tax on Mobile Money Withdrawals?

Karia Sekumbo
and
Noela Ringo Constantine Manda

***Working Paper* DFSP-CCS-007**

AFRICAN ECONOMIC RESEARCH CONSORTIUM
CONSORTIUM POUR LA RECHERCHE ÉCONOMIQUE EN AFRIQUE

Bringing Rigour and Evidence to Economic Policy Making in Africa

Who is More Likely to Pay the Tax on Mobile Money Withdrawals?

By

Karia Sekumbo
World Bank's Development Impact Measurement Unit, Kigali, Rwanda

and

Noela Ringo Constantine Manda
Economic and Social Research Foundation

AERC Working Paper DFSP-CCS-007
African Economic Research Consortium, Nairobi
July 2024

THIS RESEARCH STUDY was supported by a grant from the African Economic Research Consortium. The findings, opinions and recommendations are, however, those of the author and do not necessarily reflect the views of the Consortium, its individual members or the AERC Secretariat.

Published by: The African Economic Research Consortium
P.O. Box 62882 - City Square
Nairobi 00200, Kenya

Contents

List of tables

List of figures

Abstract

This study investigated the distributional effects of a controversial tax that was instituted on mobile money withdrawals in 2021. The lowest taxable amount of TZS 1,000 (USD 0.0023) was taxed at the highest rate of 1% on every withdrawal while the largest taxable bracket (starting from TZS 3 million equivalent to USD 1,304.35) was taxed at a rate of 0.33% on every withdrawal. Almost immediately after its introduction, transaction volumes across mobile money platforms declined substantially. The country's policy-makers revised this tax multiple times before removing it altogether. Given this turnaround, we investigated how the burden of tax affects different consumer groups. Our data sources for this analysis comprised aggregated transaction- level data obtained from the Bank of Tanzania alongside nationally representative survey data. Relying on survey data answer choices, we constructed regression models assessing how social determinants contributed to mobile money use. Our findings revealed salaried respondents based in urban areas as being more likely to reduce consumption of mobile money services because of this transaction tax. We also observed gender dynamics at play as being female was associated with receiving less mobile money from friends and family. These results suggest that less wealthy respondents in rural areas with fewer substitutes were forced to contend with this tax while wealthier urban respondents substituted into different financial services. The results are consistent with those from other African countries such as Kenya, Ghana, Malawi and Uganda, which also attempted to introduce similar taxes on mobile money and faced similar outcomes.

1. Overview

Introduction

Taxation of the digital economy is a challenge confronting fiscal policymakers around the world. Within sub-Saharan Africa, governments have devised various mechanisms to tax the highly lucrative mobile money industry. Countries across the region have comparatively lower tax to gross domestic product (GDP) ratios (15.6%) when compared to their counterparts in developed economies (24.1%) (Clifford, K, 2020). Funding existing spending priorities has been a long-standing obstacle to development. Given this persistent challenge, domestic revenue mobilization has been highlighted as a significant policy imperative within international fora such as the United Nations Sustainable Development Goals. Second, as many countries in sub-Saharan Africa rely on a narrow set of commodities to fund their budgets, revenues have also been under considerable pressure since 2014, when global commodity prices began to nosedive. To compound these existing challenges were the adverse effects of the COVID-19 pandemic. As global economic activity came to a virtual standstill, so too did the externally driven demand for commodities and the prospects for foreign direct investment (FDI) and aid inflows, placing additional pressure on national coffers. In the wake of multiple macroeconomic shocks and their resultant implications on the resource envelope, policy-makers have been put under increasing pressure to diversify their revenue streams and broaden the tax base.

Given this background, our paper focuses on the distributional impacts of consumption taxes, with taxes on mobile money serving as a focal point. Our analysis focused on a particularly controversial tax that was introduced at the height of the COVID-19 pandemic, which was revised multiple times before it was removed altogether. Given these abrupt policy reversals, we specifically ask: Who is more likely to pay the tax on mobile money withdrawals? We believe that this question is pertinent as it provides additional context to the distributional impacts of consumption taxes on mobile money usage and greater clarity on why compliance levels are poor.

We investigated the distributional response to this tax given its controversial reception by the Tanzanian public. Leveraging responses to a nationally representative survey, we uncovered the consumption choices adopted by Tanzanian mobile money users after the tax was introduced and revised. In addition, we painted profiles of the different consumer segments that were most liable to pay the tax despite

its introduction. Finally, we explored emerging dynamics emanating from the introduction of this tax. Such patterns include relationships between age, gender and mobile money usage. This analysis is unique as it used survey-level data to inform fiscal policy. Our results add to the growing literature that policy-makers require to contextualize the distributional impacts of mobile money taxation.

Background

Our focus for this specific study is also relevant to other countries in the region. Tanzania provides an additional case study in sub-Saharan Africa where policy-makers have attempted to increase the tax intake from the consumption of mobile money services[1]. Specific to Tanzania, however, the government's national budget was experiencing significant pressures emanating from the adverse shocks of the COVID-19 pandemic and large existing commitments. As a result, alternative sources of revenue needed to be tapped into as a means of narrowing the widening fiscal deficit.

Given these macroeconomic conditions and the government's reluctance to borrow externally, the government looked to taxes on the growing mobile money industry as a solution. The levies were imposed on withdrawals of funds using mobile money wallets and were structured such that large transfers would ostensibly attract a higher set of fees and lower transfers would pay less[2]. In actuality, however, the lowest taxable amount of TZS 1,000 was taxed at the highest rate of 1% on every withdrawal while the largest taxable bracket (starting from TZS 3M) was taxed at a rate of 0.33% on every withdrawal.

Shortly after the tax was introduced, mobile network operators (MNOs) immediately bemoaned a drastic drop in their overall revenues from this key business segment. For example, Vodacom, Tanzania's largest MNO (M-Pesa market share was 41.7% as of 2021), reported a drastic decline in the number of customers from 7.447 million in the fourth quarter of 2020 to 7.118 million in the same quarter in 2021. This decrease also contributed to a massive drop in M- Pesa segment transaction values from 14.2 trillion to 10.7 trillion (a -24.8% decline) between the fourth quarter of 2020 and the fourth quarter of 2021[3].

Given the widespread discontent, the government reconsidered its initial fee arrangement and instituted a reduction in the taxes borne at all taxable tiers, barring the lowest taxable amount, in September 2021. Withdrawal amounts ranging from TZS 1,000 to 1,999 did not experience any change in the tax rate. However, the largest transaction tier saw a decrease in the rate from 0.33% to 0.23%. In the subsequent financial year, the rates were reduced once again before the tax was abolished altogether in September 2022 (ICTD, 2022). By opting to remove these taxes, the government was concerned about the negative implications, including but not limited to:

- **Changes in tax revenue:** If mobile money transactions continued to decline, the revenue of MNOs would also be adversely affected and as a result, the government would realize lower corporate taxes from this booming sector.

- **Implications for financial inclusion:** A reduction in mobile money transactions also signifies a migration away from the digital economy and a return to paper-based cash transactions, which result in substantial risks to consumers. In turn, this also hurts the governments' endeavours in moving towards a paperless monetary system.

- **National development priorities:** Without any drastic revisions to the tax schedule, the government would run the risk of failing to achieve its stated target of achieving 80% connections in digital and financial inclusion by 2025.

Despite these pertinent risks and concerns, the authors believe that a more thorough analysis of the distributional effects of the tax should have taken place. This would have allowed the tax to be reshaped such that it reflected consumers' capacities and willingness to pay. In turn, the government could retain modest revenues from this tax type while minimizing the risk of compromising the aforementioned development priorities.

To answer our research question, we relied on survey data obtained from a nationally representative panel survey conducted by Twaweza, a civil society organization that focuses on maximizing citizen agency and amplifying citizen voices. Within this round, citizens are also asked about various aspects of taxation, including awareness of it and their usage of mobile money after the tax was implemented.

In our analysis, we probed heterogeneity of mobile money usage after the tax was introduced. This entailed changes in mobile money consumption dependent on factors such as location, gender, age, education levels and income stream.

Our initial analysis indicated that virtually all respondents within the surveyed sample were aware of the tax and the importance of taxes to a country's development. However, despite this universal awareness, views and perceptions on government action to remove the tax differed substantially.

To probe factors influencing mobile money consumption, we constructed an ordinary least squares regression model where we probed an individual's' proclivity to consume mobile money as a function of various characteristics. Our analysis revealed strong linear relationships between an individual's location and gender as determinants of sending or spending less on mobile money and receiving funds from friends and family. We also observed that salaried urban workers were the most likely to reduce consumption of mobile money because of the tax. This key insight suggests that the existence of substitutes among wealthier populations may have contributed to the substantial decline in mobile money transaction values. Rural populations with fewer substitutes, however, may not have had any alternatives to turn to.

The rest of the paper is organized into a discussion of the existing literature on mobile money taxation and the key contributions provided by our research. We then dedicate a chapter to discussing the research design, listing the data sources used and the research design. This is followed by an entire chapter discussing the findings, before we conclude with a policy discussion and potential areas for future research.

2. Literature review

Background on mobile money

Our analysis adds to the existing literature on mobile money and the economy by homing in on the effects of taxation on individual consumers. Previous work on mobile money has focused primarily on its contributions to the economy via the financial system and its ability to provide financial services to underserved populations.

For example, in a review of existing literature surrounding mobile money and the economy, Aron (2018) provided insight on the core advantage of mobile money over traditional financial services. The author emphasized mobile money's strategic advantage in overcoming challenges that make it difficult for conventional banking to provide financial services to low-income consumers. Such challenges include but are not limited to: weak institutional infrastructure, the small size of deposits and excessive informality. Aron (2018) explained that mobile money has helped overcome these hurdles by providing readily available financial services at a low cost to a vast array of consumers whilst also ensuring that the revenues attained from a previously untapped market make it a commercially viable operation.

A standout example of such low cost, consumer friendly financial services is evident with M-Pesa. In their analysis of its overall impacts, Mbiti et al. (2015) cited multiple benefits associated with using M-Pesa. They found that the propensity of M-Pesa users to use informal savings tends to decrease while the probability of using banking channels and being banked altogether tends to increase as well. When the focus shifted to industry-wide spillovers, Mbiti et al. (2015) observed that the advent of M-Pesa compelled players within the traditional banking sectors to lower transaction fees and improve their range of products and services, which in some instances included direct partnerships with M-Pesa to enable remittance flows.

Despite these advantages to the mobile money industry, its success is contingent on solid foundations. For example, in their analysis of M-Pesa in Kenya, Mbiti et al. (2015) highlighted a permissive regulatory environment as being instrumental to the initiative's survival and growth. This growth occurred despite resistance from existing players. Further evidence to support this claim was also provided by Mattern et al. (2018) in their analysis of the payments ecosystem in Ghana and Tanzania. Within both these countries, the payment ecosystem developed rapidly as the regulators promoted an environment that enabled innovation and was also attentive to the specific needs of the industry.

Taxing mobile money consumers

The focus of our paper is on the effects of mobile money taxation whose incidence occurs through multiple channels: taxes borne by the operator and taxes paid by consumers. As consumption of mobile money services has grown, so too has the emphasis of taxation shifted to consumption taxes to take advantage of the ever-widening consumer base. Despite this impressive growth in consumption, very little literature exists on optimizing tax rates and the distributional effects of these taxes. Existing literature on mobile money taxation has often focused on the effects on consumption and the development of the industry. These insights have provided greater context to understanding the negative industry-wide effects experienced after the initial introduction of the tax on withdrawals. Within our analysis, we probed the distributional effects by leveraging survey data to uncover the heterogeneity of mobile money use in the wake of the tax on withdrawals.

For example, Katuslime et al. (2021) provided some evidence detailing the adverse consequences of unpredictable interest rates, foreign exchange movements and taxation on mobile money usage in Uganda.

Tarha (2021) provided some empirical evidence of the industry-wide effects of consumption taxes in his analysis of their impacts on mobile money usage across 10 different African countries. Across the panel of African countries that implemented consumption taxes (excise taxes, value added etc.), there was a notable increase in user fees levied by MNOs and a positive increase in the demand for cash, signalling a migration away from mobile money usage.

Furthermore, Ndung'u (2019) arrived at a similar set of conclusions. First, Ndung'u (2019) affirmed the positive demand for cash arising from such taxes as he argued that the burden disproportionately falls on low-income consumers. He also demonstrated that such consumption taxes often do not achieve their stated objectives of broadening the tax base or substantially increasing tax revenues. Despite a one-time jump in taxes from the initial "shock", in the long run tax revenues decrease as the industry experiences a decline in demand for services and the revenue authority realizes lower tax collections.

Okello et al. (2019) provided insight on the changes in mobile money usage and consumption after tax reductions. This analysis was conducted in Uganda where transaction tax exemptions were introduced. The findings demonstrated that such exemptions have a significant and positive impact on mobile money adoption and usage.

In addition to the positive demand for cash, initial evidence also pointed to the burden falling unequally on consumers of mobile money services. For example, within their analysis of the impacts on informal workers, Akua et al. (2022) revealed that transaction values decreased most notably among high-income consumers who had access to alternative channels. On the contrary, informal workers, street vendors and market traders had limited access to alternatives and in turn were compelled to pay the taxes if they intended to continue using the service.

As noted here, some of the existing literature points to a positive increase in the demand for cash after consumption taxes are introduced. These findings are not dissimilar to our observations as we also observed a decline in the aggregate value of mobile money transactions. Similarly, we also found that specific consumer segments (urban, salaried and female) were less likely to utilize mobile money services or receive funds after these taxes were introduced.

Distinct to the existing literature, however, was our research design and analytical approach. Within their conceptual framework, Katuslime et al. (2021) and Tarna (2021) use aggregated macroeconomic variables as determinants of mobile money consumption. Similarly, with their analysis, Katuslime et al. (2021) assed taxes in tandem with foreign exchange movements and interest rate volatility. While useful, this aggregated approach does not separate the different tax types from one another. Tarna (2021), however, distinguished the different types of tax in his analysis, but instead focused on their impact on the aggregate demand for cash. In this instance, aggregate demand for cash is the dependent variable.

While these initial findings are consistent with ours, challenges remain in solely relying on aggregated macroeconomic data to probe microeconomic impact. Indeed, Fehling (2019) highlighted these shortfalls when assessing the impact of mobile money taxation in Kenya. The analysis relied on aggregated data (from different countries) to probe microeconomic impact using a difference in difference research design. The results showed that the distinct impact of the tax could not be clearly identified as the decline in mobile money usage was consistent with regional events in other countries where in some cases taxes were not introduced.

What separates our analysis is our focus on an individual tax type and our use of survey data to assess impact on various consumer groups. This is similar to the analysis done by Akua et al. (2022) who emphasized the impact on consumers in Ghana. They took a multi-stage approach that: (i) leveraged an existing data set of self-employed workers; and (ii) selected a representative sample of small unregistered economic units in the Accra Metropolitan Area. This research design and analytical framework provides an additional layer of detail to our findings, where the level of consumer profiling was limited to urban/rural/peri-urban and classifications between wage earners and non-wage earners.

From this standpoint, the research design and analytical framework in our study contributes to the existing strand of literature by providing an additional regional perspective while also leveraging nationally representative survey data to paint a more comprehensive picture of the distributional effects of mobile money taxation. This design complements that of existing work done by Akua et al. (2022) but also provides greater dimension in gauging the micro-level impacts of mobile money consumption. As the survey instrument directly deals with perceptions of and responses to the tax, other confounding variables that may influence consumption are minimized. This removes some of the distortions that may exist when looking at aggregate macro-level data.

3. Research design

Data

To answer the research question, our analysis relied on two main data sources. The first was aggregated transaction level data captured by the Bank of Tanzania. The data captures mobile money values and volumes in circulation across the different MNOs in the country. The second was a nationally representative survey conducted by Twaweza, an East Africa-based civil society organization with representation in Tanzania, Kenya and Uganda.

The survey, titled *Sauti za Wananchi,* is Africa's first nationally representative high-frequency mobile phone survey conducted in Tanzania. The panel consists of 3,000 respondents whose opinions, perspectives and insights are periodically collected on a wide range of socio-economic factors. To date, seven rounds of consultations have been conducted with this panel. For this specific round, respondents were called between 18 June and 12 July 2022 and opinions were gathered on a wide array of socio-economic issues, with mobile money taxation also featuring among the topics of inquiry. The dates of the survey coincided with the dates when the levies were revised downwards for the third time after their initial introduction in July 2021 and the revisions in September 2021. Our analysis thus gauged consumer responses after the first two rounds of revisions. The schedule of taxes in July 2021 and the revised fees in September 2021 are shown in Appendix Table A1.

Methods

As the above-mentioned data set collects opinions and perspectives on multiple topics, we restricted our analysis to the questions that provided greatest insight on citizens' sensitivity to the tax changes. The answers to these questions were primarily multiple choice with predefined outcomes. Similarly, the respondents to the survey were categorized according to different identification factors (location, age, gender, employment status etc.). These two factors combined provide a unique way of capturing heterogeneity of consumer sensitivity to the tax on mobile money withdrawals. Captured below is a selection of the different survey questions and answer choices within each question.

Sample questions (sensitivity measures)

- Awareness of tax (Yes/No/Refuse to Answer)
- Awareness of tax reduction (Yes/No/Refuse to Answer)
- Taxes on mobile money transaction by sender and receiver is a right thing (Yes/No/Refuse to Answer)
- I sent/spent less using mobile money services since the tax was introduced (Yes/No/Refused to Answer)
- I received less from family and friends since the tax was introduced (Yes/No/Refuse to Answer)

Heterogeneity of respondents

- By Gender (Male/Female)
- By Age (18–24/Between 25–59/Over 60)
- By Education level (At least primary/Primary/Secondary)
- By Earnings category (Employed wage earner/Non-wage earner)
- By Household position (Head of household/dependent)

Baseline model

Against this backdrop, we developed an ordinary least aquares regression model where the answer choices were dependent variables to a sample of the questions provided in the survey instrument. The independent variables were the various measures of heterogeneity (Location, Gender, Age, Education level, Earnings category, Household headship) that could alter the outcomes of the dependent variable. The specification for the baseline model was:

$$\begin{aligned} \text{Sensitivity.Measure t} = \alpha &+ \beta_1 \text{Location}_t \\ &+ \beta_2 \text{Gender}_t \\ &+ \beta_3 \text{Age}_t \\ &+ \beta_4 \text{Education.Level}_t \\ &+ \beta_5 \text{Earnings.Category}_t \\ &+ \beta_6 \text{Household.Headship}_t + \epsilon \end{aligned}$$

In addition, we explored interaction effects between the dependent variables. To do this, we combined the binary effects of two sensitivity measures against the aforementioned independent variables. The specification for this model was:

$$\begin{aligned}\text{ReceivingLessandSpendingLess}_t = \alpha &+ \beta_1 \text{Location}_t \\ &+ \beta_2 \text{Gender}_t \\ &+ \beta_3 \text{Age}_t \\ &+ \beta_6 \text{Education.Level(Primary/No.Primary)}_t \\ &+ \beta_7 \text{Earnings.Category(Wage.Earner/Dependent)}_t \\ &+ \beta_8 \text{Household.Headship}_t + \epsilon\end{aligned}$$

The 1 July cut off

Using results obtained in the baseline model, we tested additional dimensions of sensitivity to the tax. As a second step, we segmented the baseline model into two groups of respondents: those that were interviewed before and after 1 July. The rationale behind this was to examine whether there were any changes in consumption patterns after the tax was revised downwards once again[4]. This segmentation would provide some insights into whether the downward revisions were successful in quelling the initial reduction in demand for mobile money services.

Interacted dependent variables

To probe the heterogeneity of responses to tax changes, we interacted the previously mentioned socio-demographic factors and the two time periods which our analyses is segmented into. That is, we assessed whether different socio-demographic variables contributed to different consumption patterns after the tax was revised downwards.

Heterogeneity of responses

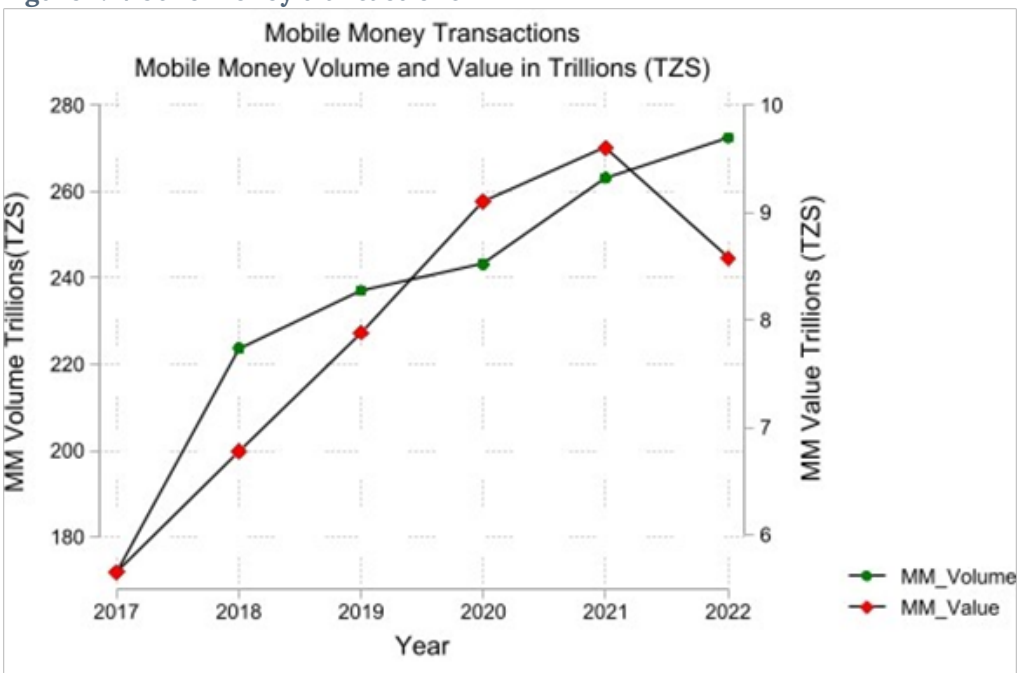
- By Gender (Male/Female) after 1 July
- By Age (18–24/Between 25–59/Over 60) after 1 July
- By Education level (At least primary/Primary/Secondary) after 1 July
- By Earnings category (Employed wage earner/Non-wage earner) after 1 July
- By Household position (Head of household/dependant) after 1 July

4. Findings

Preliminary analysis

An initial analysis of aggregate transaction values and volumes across mobile money users suggests that the burden of taxation (by way of reducing transacting on the platform) does not fall equally on all mobile money users. As evidenced in Figure 1, in 2021 (when the tax was first introduced), mobile money transaction values declined substantially despite a substantial increase in mobile money transaction volumes. More specifically, within the periods where the tax was first introduced and later revised downwards by 30%, we observed that mobile money volumes increased by 8% despite mobile money values decreasing by 10%.

Figure 1: Mobile money transactions



Source: BOT data 2017 - 2022

This trend is also reflective of an initial observation made of Vodacom Tanzania's M-Pesa customer base. The total number of M-Pesa users declined by 4.4%, yet this decrease also coincided with a 24.8% decline in transaction values. Cumulatively, this suggests that higher transaction values taken at the firm level and on a national scale contributed to the greatest decline in transaction values on mobile money platforms, even if the total number of consumers may have been increasing within these time periods. From this perspective, the pre-identified measures of sensitivity help shape a more comprehensive picture of the socio-demographic distribution of the tax burden.

Survey data overview

Across the four prescribed measures of sensitivity, we observed that all respondents within the sample were aware of the tax. Despite this universal awareness, changes in sending, spending and receiving patterns were not the same across the board. Similarly, not all respondents were aware of the revisions to the tax schedule after it was introduced. These initial results suggest that there were variations in consumption patterns after the tax was revised multiple times. Given these initial insights, we then turned our attention to the regression models to better understand the existence of linear relationships between the pre-specified control variables and the different measures of sensitivity to the tax.

Table 1: Summary statistics of outcome variables
Descriptive statistics

Variables	Obs.	Mean
Panel A: Main outcome variables		
Aware of tax change	2308	1.000
Aware of tax reduction	2308	0.701
Sent/ spent less on mobile money services	2308	0.570
Received less from family and friends via mm services	2308	0.586
Panel B: Other control variables		
Social-economic characteristics		
Age	2308	38.00
Female = 1	2308	0.467
At least primary = 1	2308	0.931
Earners = 1	2308	0.743
Household head = 1	2308	0.789
Urban = 1	2308	0.373

Baseline model

Within the first model, the results demonstrated a strong linear relationship between the location of the respondents and their overall awareness of the tax reduction. A possible reason for this is greater proximity to various media outlets when compared to rural counterparts. Within the second regression, statistically significant relationships were observed between gender, age, earnings category, and receiving less from friends and family via mobile money.

Interestingly, the third model also demonstrated a direct relationship between location and earnings category and the propensity to send or spend money via mobile money services. That is, respondents based in urban areas and respondents who were reported as earning a regular income showed a greater proclivity to send or spend less via mobile money services in the wake of the tax. When the second and third dependent variables were paired, repeat patterns emerged as urban-based or female respondents were reported to receive and spend less from mobile money services as a result of the tax. A possible reason as to why location (rural vs urban) and earnings category play an important role in how consumers respond to mobile money taxes is the availability of information and substitutes. More information channels and alternative forms of financial services are readily available in urban settings. Therefore, consumers have access to information on tax changes and can readily opt out of a financial service if the costs are deemed too burdensome.

With respect to gender dynamics, a possible reason arising from this is that females receive less from family and friends via mobile money as a result of the tax, given family and household dynamics. Often, women are positioned as caregivers and not active participants. A direct consequence of male-headed households opting out of mobile money services is that male recipients remit less via mobile money to females.

Taken together, the baseline model indicated emerging patterns of location, gender, earnings category and age as having a significant bearing on one's sensitivity to mobile money taxation. Having said this, the R squared figures clearly demonstrate that a myriad of other factors exist that influence mobile money usage. We explored additional factors in greater detail in subsequent models.

Table 2: Baseline model
General: OLS Regression

Variables	(1)	(2)	(3)	(4)
	Aware of tax reduction	Received less from family and friends via mm services	Sent/ spent less on mm srvices	Received and sent less (combined)
Urban = 1	0.0697***	0.0243	0.164***	0.188***
	(0.0202)	(0.0225)	(0.0220)	(0.0329)
Female = 1	0.0146	0.0751***	-0.00426	0.0709**
	(0.0200)	(0.0217)	(0.0213)	(0.0314)

continued next page

Table 2 Continued

Variables	(1)	(2)	(3)	(4)
	Aware of tax reduction	Received less from family and friends via mm services	Sent/ spent less on mm srvices	Received and sent less (combined)
Age	-0.00141	0.00187**	-0.000705	0.00116
	(0.000856)	(0.000889)	(0.000894)	(0.00123)
At least primary = 1	0.0570	0.0331	-0.00103	0.0320
	(0.0400)	(0.0413)	(0.0401)	(0.0560)
Earners = 1	-0.00456	-0.0685***	0.0445*	-0.0240
	(0.0227)	(0.0237)	(0.0244)	(0.0339)
Household head = 1	0.0353	0.0317	0.0319	0.0635
	(0.0256)	(0.0275)	(0.0272)	(0.0396)
Constant	0.643***	0.467***	0.480***	0.947***
	(0.0604)	(0.0632)	(0.0617)	(0.0888)
Observations	2,308	2,308	2,308	2,308
R-squared	0.009	0.010	0.032	0.016

Robust standard errors in parentheses
***p<0.01, **p,0.05, *p<0.1

Downward revisions

Building on the initial results, we added time dimensions to the regression models to probe consumption responses to downward revisions. This was done by segmenting our data according to the dates of the interview(s) and using a 1 July cut-off date[5] as a marker that signified a revised tax code.

Table 3: Post 1 July cut-off date
Cutoff: After 1st July

Variables	(1)	(2)	(3)	(4)
	Aware of tax reduction	Received less from family and friends via mm services	Sent/ spent less on mm srvices	Received and sent less (combined)
Urban = 1	0.0656**	-0.0262	0.150***	0.124***
	(0.0266)	(0.0311)	(0.0304)	(0.0448)
Female = 1	0.0345	0.0243	-0.00597	0.0184
	(0.0262)	(0.0296)	(0.0289)	(0.0418)
Age	0.000766	0.000316	-0.000101	-0.000691
	(0.00117)	(0.000128)	(0.00131)	(0.00175)

continued next page

Table 3 Continued

Variables	(1)	(2)	(3)	(4)
	Aware of tax reduction	Received less from family and friends via mm services	Sent/ spent less on mm srvices	Received and sent less (combined)
At least primary = 1	0.0881	-0.000258	-0.00759	0.00785
	(0.0578)	(0.0595)	(0.0589)	(0.0833)
Earners = 1	0.0340	-0.0487	0.0656**	0.0169
	(0.0296)	(0.0317)	(0.0326)	(0.0457)
Household head = 1	0.0259	0.0702**	0.0194	0.0896*
	(0.0321)	(0.0356)	(0.0350)	(0.0512)
Constant	0.533***	0.544***	0.486***	1.041***
	(0.0793)	(0.0839)	(0.0829)	(0.118)
Observations	1,227	1,227	1,227	1,227
R-squared	0.011	0.008	0.032	0.010

Robust standard errors in parentheses
***p<0.01, **p<0.05, ^p<0.1

Once again, significant relationships were observed with respect to the location of the respondents, their earnings category and their mobile money consumption patterns. That is, urban-based respondents who are regular earners were reported to have persistently received or spent less via mobile money despite the reduction. This revised model also did not reveal statistically significant relationships with respect to gender and age as was the case before.

Table 4: Tax changes and gender
Interaction of two variables: After 1st July and gender

Variables	(1)	(2)	(3)	(4)
	Aware of tax reduction	Received less from family and friends via mm services	Sent/ spent less on mm srvices	Received and sent less (combined)
Interviewed after 1st July (**A**)	0.0607**	0.00815	-0.00837	-0.000219
	(0.0265)	(0.0289)	(0.0286)	(0.0424)
A*B	-0.0164	-0.0600	-0.0262	-0.0862
	(0.0383)	(0.0410)	(0.0410)	(0.0593
Paid	0.0317	-0.0840**	-0.0261	-0.110**
	(0.00293)	(0.0340)	(0.00331)	(0.0513)
Female = 1 (**B**)	0.0206	0.0104***	0.00947	0.113***
	(0.0287)	(0.0297)	(0.0300)	(0.0437)

continued next page

Table 4 Continued

Variables	(1)	(2)	(3)	(4)
	Aware of tax reduction	Received less from family and friends via mm services	Sent/ spent less on mm srvices	Received and sent less (combined)
Age	-0.00105	0.00166*	-0.000841	0.000823
	(0.000858)	(0.000901)	(0.000902)	(0.00124)
At least primary = 1	0.0526	0.0406	0.00177	0.0424
	(0.0401)	(0.0412)	(0.0403)	(0.0560)
Rural = 1	-0.683***	-0.0267	-0.165	-0.192***
	(0.0203)	(0.0224)	(0.0220)	(0.0329)
Earners = 1	-0.00189	-0.0584**	0.0460*	-0.0125
	(0.0232)	(0.0242)	(0.0250)	(0.0345)
Household head = 1	0.0393	0.0313	0.0306	0.0619
	(0.0257)	(0.0276)	(0.0273)	(0.0395)
Constant	0.0666***	0.494***	0.654***	1.149***
	(0.0624)	(0.0654)	(0.0636)	(0.0917)
Observations	1,308	2,308	2,308	2,308
R-squared	0.013	0.014	0.033	0.020

Robust standard errors in parentheses
***p<p0.01, **p<0.05, *p<0.1

Salaried workers

Given these findings, we surmised that the relationship between mobile money consumption and taxes may be informed by an individual's wealth status and ability to substitute away from mobile money into other services. To test this, we added an extra layer of detail by separately assessing the interactions between salaried workers (a sub-component of regular earners) and the 1 July cut-off date. That is, we probed whether salaried workers interviewed after 1 July continued to reduce mobile money consumption despite a reduction.

Indeed, the results from this adjusted model affirmed our hypothesis. Salaried workers were also reported to have sent or spent less via mobile money services after the 1 July cut-off date. Therefore, despite repeated attempts by fiscal authorities to alleviate the burden of this consumption tax, wealthier consumers continued to reduce their transaction levels via mobile money.

This analysis reflects the insights captured in the preliminary findings. The evidence points to a small number of consumers with larger transaction values as being most sensitive to taxes on mobile money consumption. The sensitivity is demonstrated through reducing consumption on mobile money platforms and instead transacting on different avenues. Within the aggregated transaction level data from the Bank of

Tanzania, mobile money volumes (number of consumers) continued to increase yet transaction values (the quantity circulating on mobile money platforms) declined. Similarly, data captured from M-Pesa demonstrated that a 4.4% decline in consumers accounted for 24.8% decline in transaction values [6].

While these initial findings are promising, the limitations should not be overlooked. Despite uncovering some insights on the distributional effects of the taxes, the regression models do not reveal the entire picture. This is evidenced by the large constants and the low R squared figures.

Table 5: Salaried workers after 1 July

Interaction of two variables: After 1st July and paid salary/ wage

Variables	(1)	(2)	(3)	(4)
	Aware of tax reduction	Received less from family and friends via mm services	Sent/ spent less on mm srvices	Received and sent less (combined)
Interviewed after 1st July (**A**)	0.0454**	-0.0274	-0.0378*	-0.0652**
	(0.0206)	(0.0222)	(0.0222)	(0.0317)
Paid salary/wages **(B)**	-0.00753	-0.122**	-0.114**	-0.236***
	(0.0479)	(0.0520)	(0.0516)	(0.0804)
A*B	0.0666	0.0643	0.150**	0.214**
	(0.0589)	0.0668)	(0.0652)	(0.101)
Urban = 1	0.0689***	0.0276	0.166***	0.194***
	(0.0203)	(0.0224)	(0.0220)	(0.0328)
Female = 1	0.0120	0.0729***	-0.00438	0.0685**
	(0.0200)	(0.0217)	(0.0214)	(0.0314)
Age	-0.00109	0.00159*	-0.000920	0.000670
	(0.000856)	(0.000900)	(0.000902)	(0.00124)
At least primary = 1	0.0535	0.0414	0.00361	0.0451
	(0.0401)	(0.0414)	(0.0403)	(0.0563)
Earners = 1	-0.00304	-0.0599**	0.0435*	-0.0164
	(0.0233)	(0.0243)	(0.0250)	(0.0345)
Household head = 1	0.0389	0.0308	0.0296	0.0604
	(0.0256)	(0.0276)	(0.0272)	(0.0394)
Constant	0.606***	0.487***	0.507***	0.994***
	(0.0620)	(0.0657)	(0.0641)	(0.0910)
Observations	2,308	2,308	2,308	2,308
R-squared	0.014	0.014	0.035	0.022

Robust standard errors in parentheses
***p<0.01, **p<0.05, ^p<0.1

5. Conclusions

From the outset, the paper attempted to uncover the distributional effects of the tax on mobile money withdrawals. In trying to answer the question, we conducted our analysis in sequential stages. To begin, we gathered preliminary insights on changes in mobile money consumption on a national and firm level. By examining data from the Bank of Tanzania,[7] we observed that mobile money transaction values declined sharply in the year that the tax was introduced despite volumes (total number of subscribers) increasing annually. Boiling this down to firm-level dynamics through an analysis of M-Pesa (Tanzania's largest MNO), we also observed that a small share of M-Pesa's total user base contributed to the substantial declines in M-Pesa transaction values and firm-wide earnings for Vodacom (M-Pesa's parent company) in the year that the tax was first introduced. Given these insights, we leveraged survey data to explore linkages between socio-demographic characteristics and various measures of one's sensitivity to mobile money taxes.

Within this first stage of analysis, we observed that location and gender contributed to the usage of mobile money. Regarding location, we observed that urban respondents were more likely to consume less mobile money by way of sending and spending as a result of the tax. However, females were less likely to receive mobile money from friends and family because of this tax.

Given these results we added an extra dimension to our analytical model by including additional variables and interacting the sensitivity measures. We identified salaried workers as being very sensitive to mobile money taxation. Similarly, continuing from the results observed earlier, gender and location were sensitive to taxes on mobile money either directly through reductions in spending or indirectly through receiving less from family and friends.

Two key takeaways stand out in our analysis: Wealthier, salaried workers based in urban settings were most sensitive to the changes in tax and were most likely to stop transacting on mobile money platforms after the tax was introduced. This thereby implies that low-income urban and less wealthy rural respondents are the ultimate payers of this tax as they were unable to substitute away from mobile money consumption after the introduction of the tax. Their urban counterparts, however, had more options. In addition, the results also shed light on patterns of resource allocation within a household. Being female entailed receiving less from family and friends, thus shedding light on how the tax affected female financial empowerment.

Policy options and areas of future research

The research findings provide key insights on why the tax on withdrawals was eventually rescinded. Policy-makers ultimately underestimated the substitution power that wealthier, urban respondents had in opting out of the tax.

Nonetheless, as the findings also provide greater direction on the distributional impacts and responses to the tax, this sets the stage for proficient course correction. As the tax was revised three separate times, the transaction-level data captured by MNOs and the Tanzania Communications Regulatory Authority (TCRA) provides three key data points capturing customer responses at each price point. Taken together, these three data points provide us with a range where substitution effects can be estimated. From here, the point of revenue optimization on higher end transactions can be obtained.

Once the elasticity has been estimated, adequate price points at each transaction tier can be constructed. This then affords policy-makers greater leverage to lessen the burden on the rural populations or low-income urban customers by reducing fees, especially considering that the incidence of taxation fell hardest on low transaction amounts.

Notes

1. Other countries that have attempted to implement similar taxes on mobile money consumption include Uganda and Malawi.

2. Government Notice No. 496A, 30 June 2021: Amendment to National Payment Systems Act.

3. Vodacom Tanzania Limited Q1 2023 Interim Report.

4. 1 July marks the beginning of a new financial year in Tanzania and is the first official day when the revised budget is implemented.

5. This date (1 July) marks the beginning of a new financial year, which also entails implementation of changes to the tax code.

6. Vodacom Tanzania Limited, Q1 2023, Interim Report

7. Bank of Tanzania, Mobile Money Transaction Level Data, 2022

References

Akua Anyidoho, N.; Gallien, M.; Rogan, M. and van den Boogaard, V. (2022), *"Mobile Money Taxation and Informal Workers: Evidence from Ghana's E-Levy", ICTD Working Paper 146, Brighton: Institute of Development Studies,* DOI:10.19088/ICTD.2022.012

Aron, J. 2018. "Mobile money and the economy: A review of the evidence". *The World Bank Research Observer,* 33(2): 135–188. https://doi.org/10.1093/wbro/lky001

Clifford, K. 2020. *"The causes and consequences of mobile money taxation: An examination of mobile money transaction taxes in sub-Saharan Africa".* GSMA.

CSBAG, Civil Society Budget Advocacy Group, *"Shaping Uganda's Tax Policies: A Case of the citizen led Campaign against the 1 percent tax on mobile money trans- actions in Uganda"* CSBAG (2018).

Fehling, J. *"How did the introduction of a mobile money tax in Kenya influence the usage of mobile money?"* Lund University Publications (2019).

ICTD, 14th October 2022, *Tanzania to waive electronic mobile money transfer levy, except on mobile money?,* International Centre for Tax and Development, https://www.ictd.ac/blog/tanzania-waive-electronic-money-transfer-levy-except-mobile-money/.

Katusiime, L. 2021. "Mobile money use: The impact of macroeconomic policy and regulation." *Economies*, 9(2): 51.

Mattern, M. and C. McKay. 2018. *"Building inclusive payment ecosystems in Tanzania and Ghana."* Consultative Group to Assist the Poor (CGAP), https://www.cgap.org/research/publication/building-inclusive-payment-ecosystems-in-tanzania-and-ghana (2018).

Mbiti, I. and D.N. Weil. 2015. "Mobile banking: The impact of M-Pesa in Kenya". In S. Edwards, S. Johnson, D.N. Weil, eds., *African successes: Volume III: Modernization and development.* University of Chicago Press.

Ndung'u, N.S. 2019. *"Taxing mobile phone transactions in Africa: Lessons from Kenya.",* Brookings Institute Africa Growth Initiative Policy Brief, https://www.brookings.edu/articles/taxing-mobile-phone-transactions-in-africa-lessons-from-kenya

Okello, G., C. Bongomin, P. Yourougou and J.C. Munene. 2019. *"Digital financial innovations in the twenty first century. Do transaction tax exemptions pro mote mobile money services for financial inclusion in developing countries?",* Journal of Economic and Administrative Sciences (2019).

Tarna Silue. E-money, Financial Inclusion and Mobile Money Tax in Sub-Saharan African Mobile Networks 2021, Centre d'etudes et de Recherches Sur le Developpment International (2021), https://uca.hal.science/hal-03281898/document.

UNCDF (2021), United Nations Capital Development Fund, *"The Impact of Mobile Money Taxation in Uganda",* (2021).

A Appendices

A.1 Tax changes in 2021

Appendix Table A1: Electronic mobile money withdrawal fees in Tanzanian shillings (TZS)

(As at July 2021, 1 United States Dollar is roughly equivalent to 2,300 Tanzania Shillings)

Withdrawal Amount	July 2021	Revised fees in September 2021
1 to 999	NIL	NIL
1,000 to 1,999	10	10
2,000 to 2,999	16	11
3,000 to 3,999	27	19
4,000 to 4,999	56	39
5,000 to 6,999	100	70
7,000 to 9,999	125	88
10,000 to 14,999	320	244
15,000 to 19,999	610	427
20,000 to 29,999	960	672
30,000 to 39,999	1,100	770
40,000 to 49,999	1,500	1,050
50,000 to 99,999	2,050	1,435
100,000 to 199,999	2,530	1,771
200,000 to 299,999	2,940	2,058
300,000 to 399,999	3,500	2,450
400,000 to 499,999	4,100	2,870
500,000 to 599,999	5,200	3640
600,000 to 699,999	6,400	4,480
700,000 to 799,999	7,100	4,970
800,000 to 899,999	7,520	5,264
900,000 to 1,000,000	8,900	6,230
1,000,001 to 3,000,000	9,400	6580
3,000,001 and above	10,000	7,000

A.2 OLS key

Appendix Table A2: Definitions of key terms in analysis

Key terms:
Earners = 1: Earning wages or salary from regular job - gov't/public sector; earning wages or salary from regular job - private sector, running own business by providing services; earning wages from occasional /casual job; running own business in retail or manufacturing; rearing livestock, poultry, pigs, fish, or bees and selling it or its byproducts, and agriculture.

Earners = 0: Getting a grant, pension, or any subsidy and getting money/remittance from family or friends, and growing something and selling it, such as crops,fruits, vegetables, or byproducts.

Age groups: Youth (18-24). Adults (25-59) and Elderly (60+)

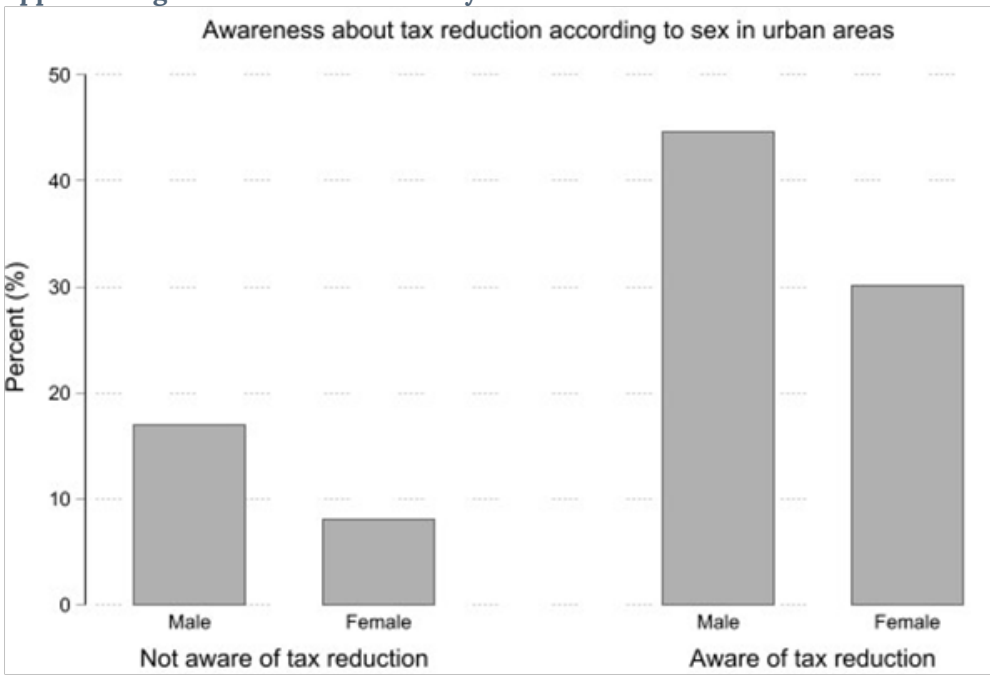
Education level: Primary/at leat primary education=1 and at most primary education=0

Received and sent less (combined) - 0 "No adverse effect" i "Received/Sent Less" 2 "Received and sent less."

Notes:
STATA calculates days since January 1, 1960

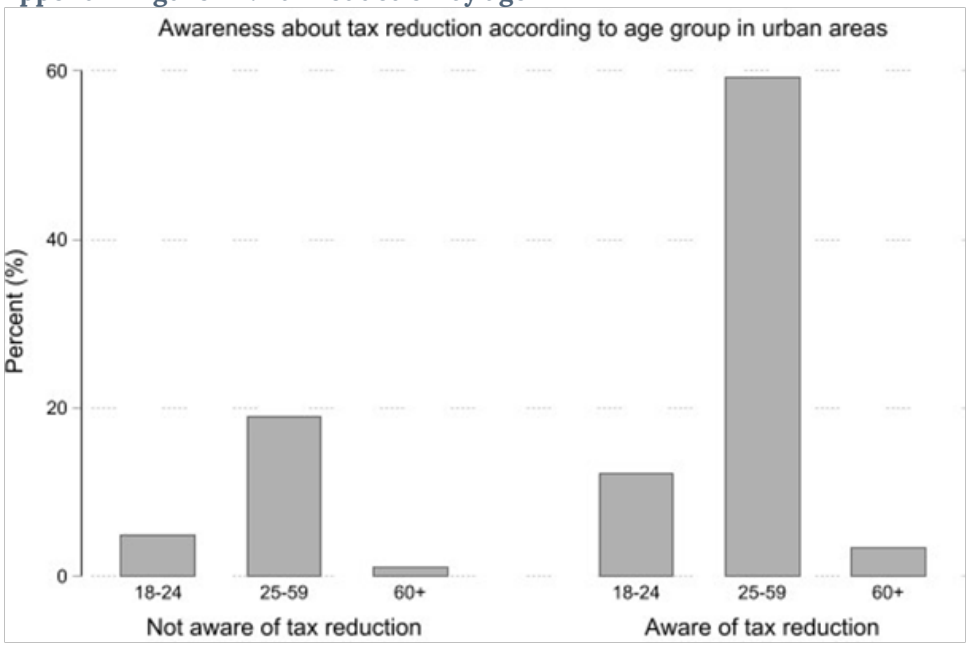
A.3 Tax reduction by sex in urban areas

Appendix Figure A3: Tax reduction by sex in urban areas



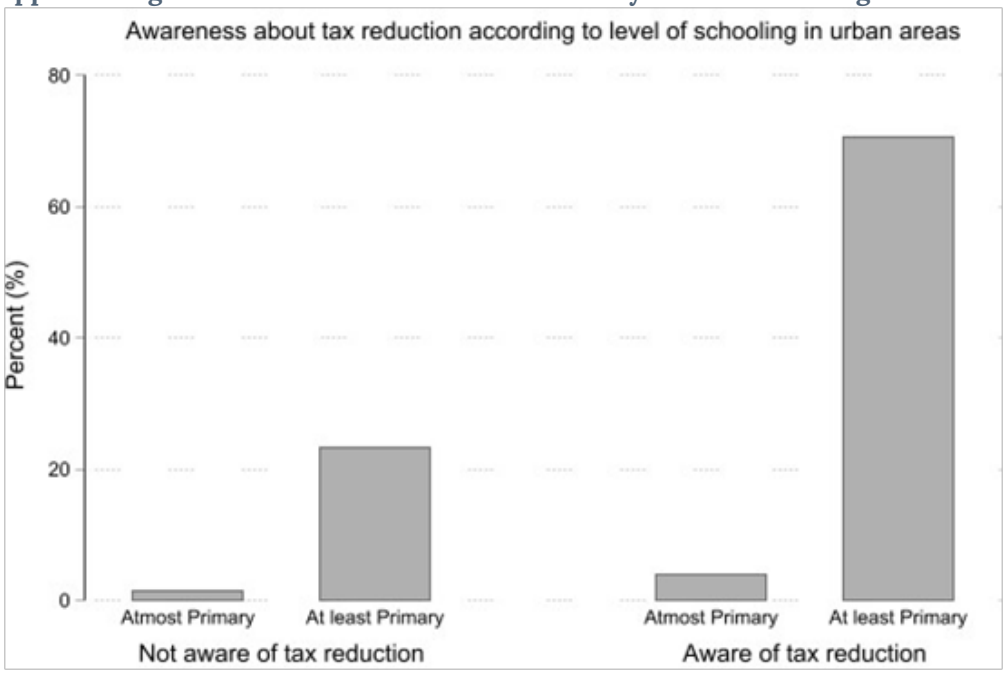
A.4 Awareness of tax reduction by age in urban areas

Appendix Figure A4: Tax reduction by age



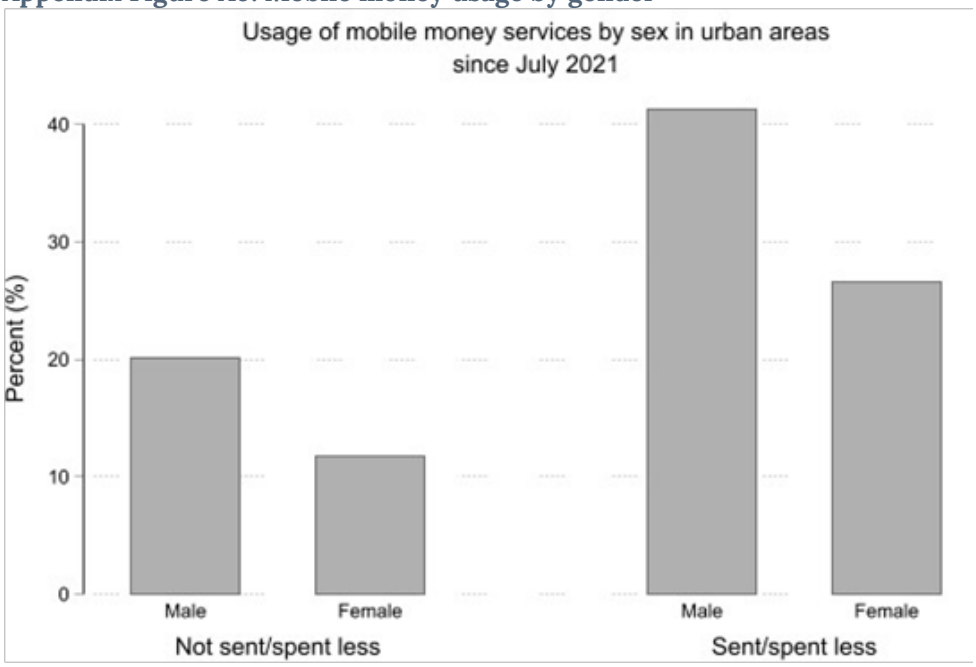
A.5 Awareness of tax reduction by level of schooling in urban areas

Appendix Figure A5: Awareness of tax reduction by level of schooling



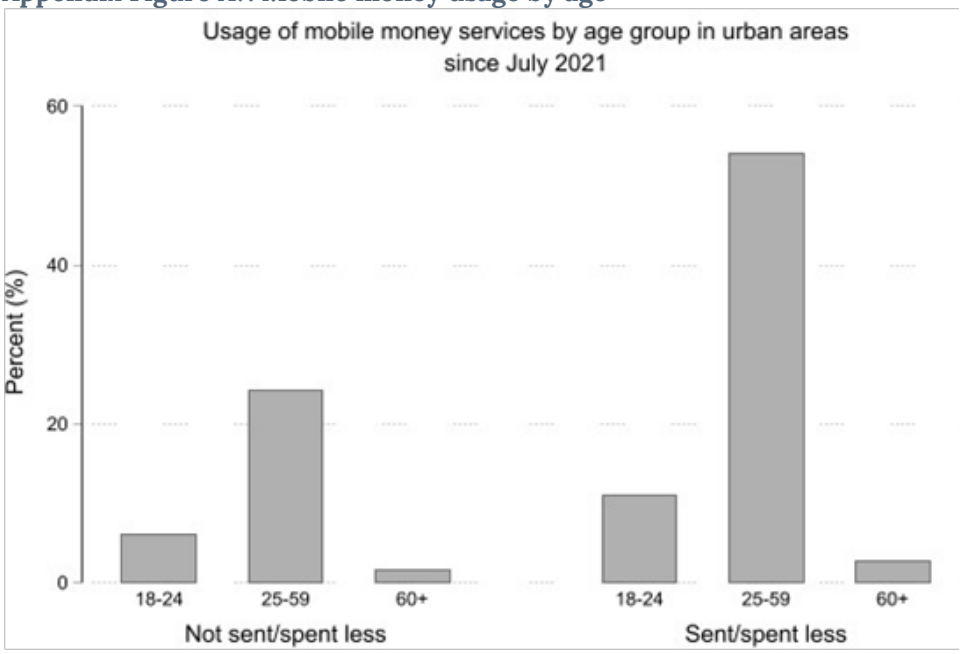
A.6 Mobile money usage by gender

Appendix Figure A6: Mobile money usage by gender



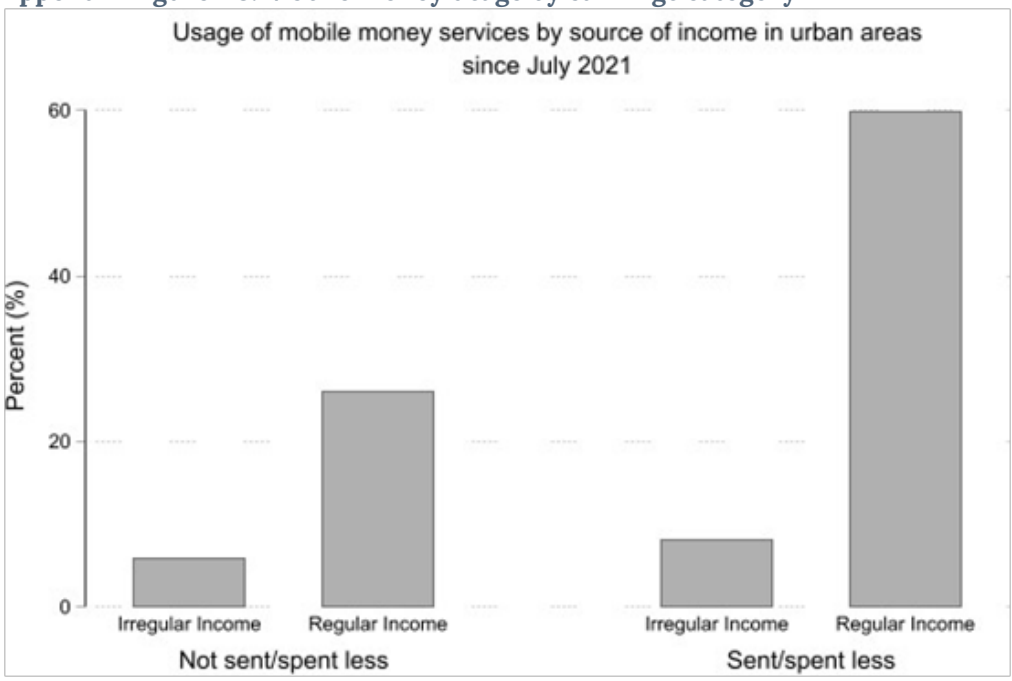
A.7 Mobile money usage by age

Appendix Figure A7: Mobile money usage by age



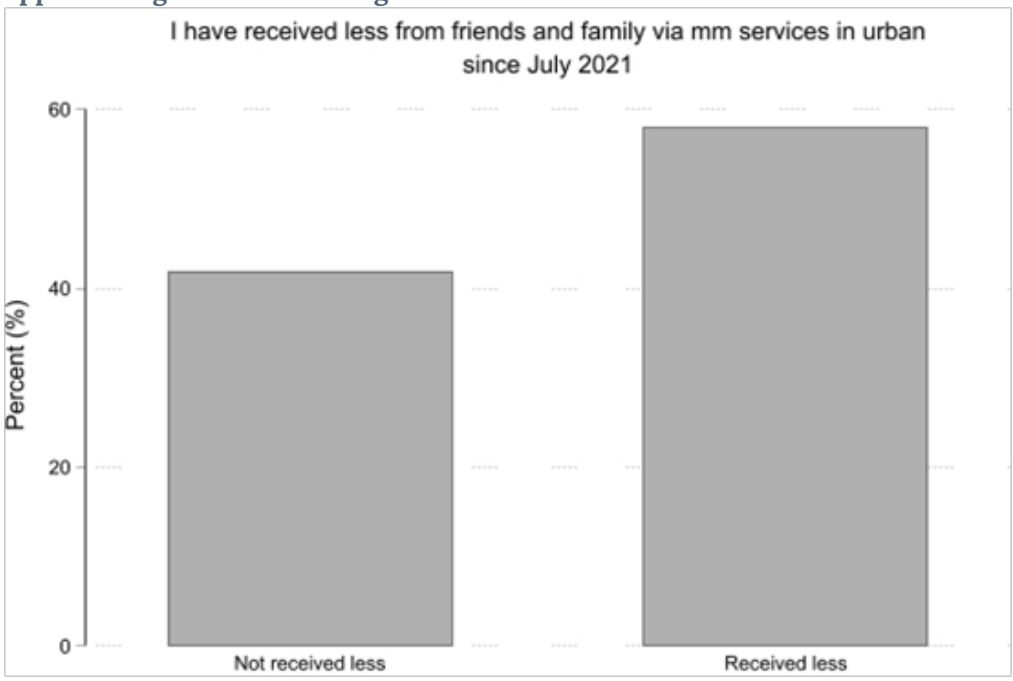
A.8 Mobile money usage by earnings category

Appendix Figure A8: Mobile money usage by earnings category



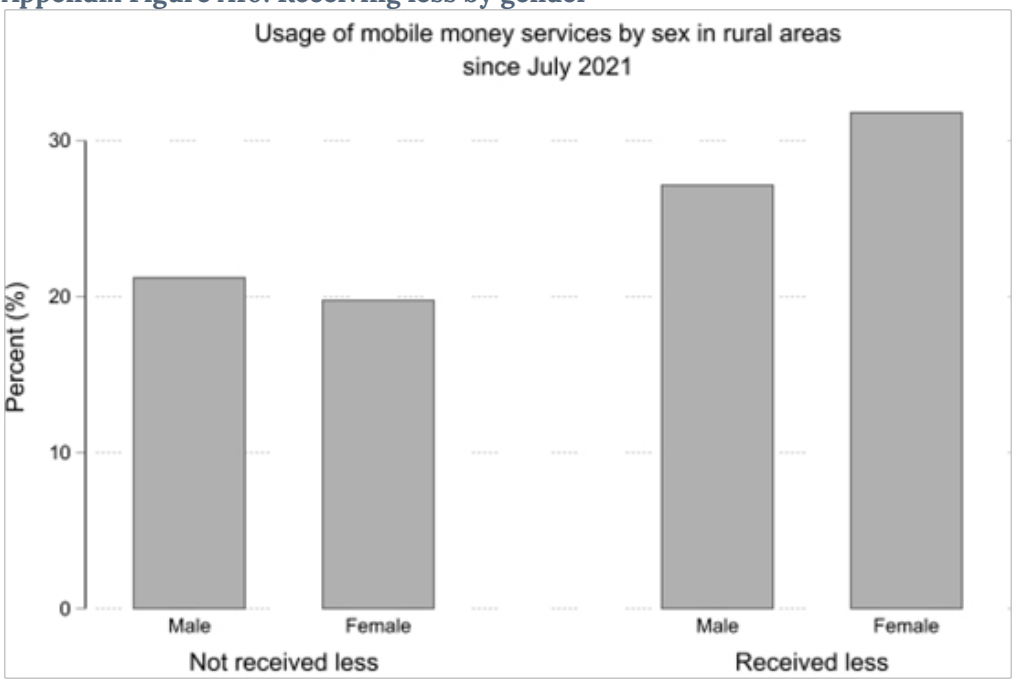
A.9 Receiving less by location

Appendix Figure A9: Receiving less within urban districts



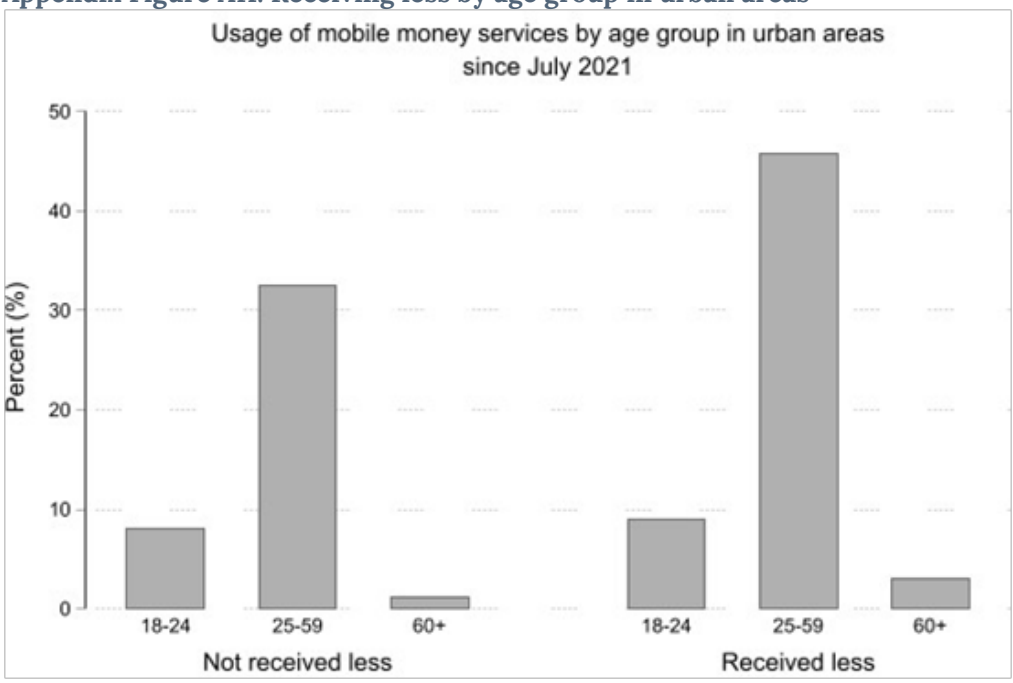
A.10 Receiving less by gender

Appendix Figure A10: Receiving less by gender



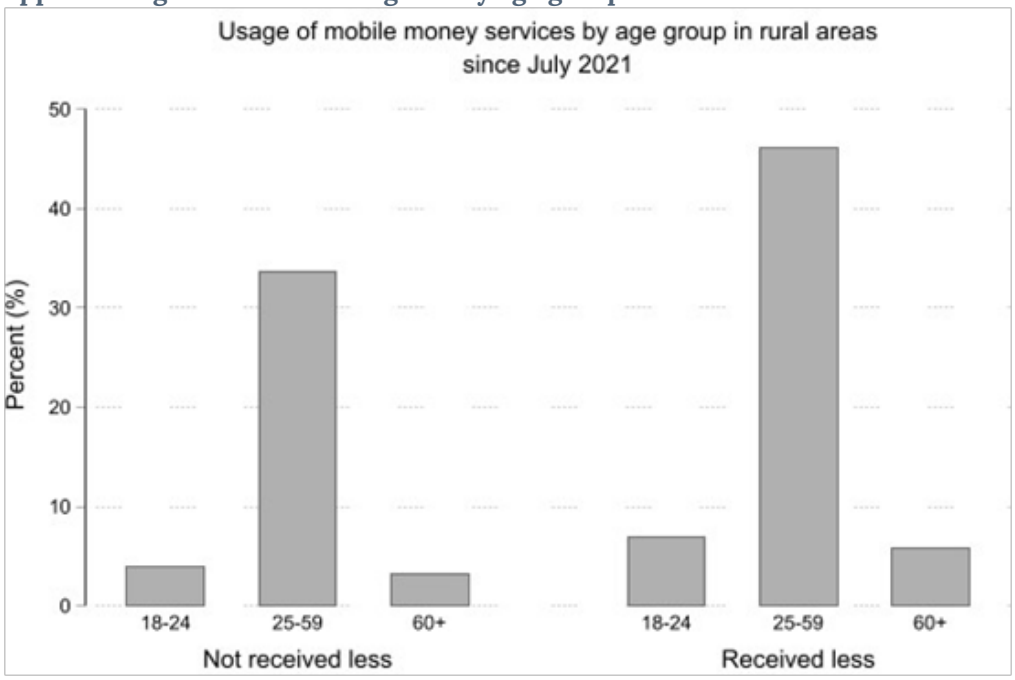
A.11 Receiving less by age group in urban areas

Appendix Figure A11: Receiving less by age group in urban areas



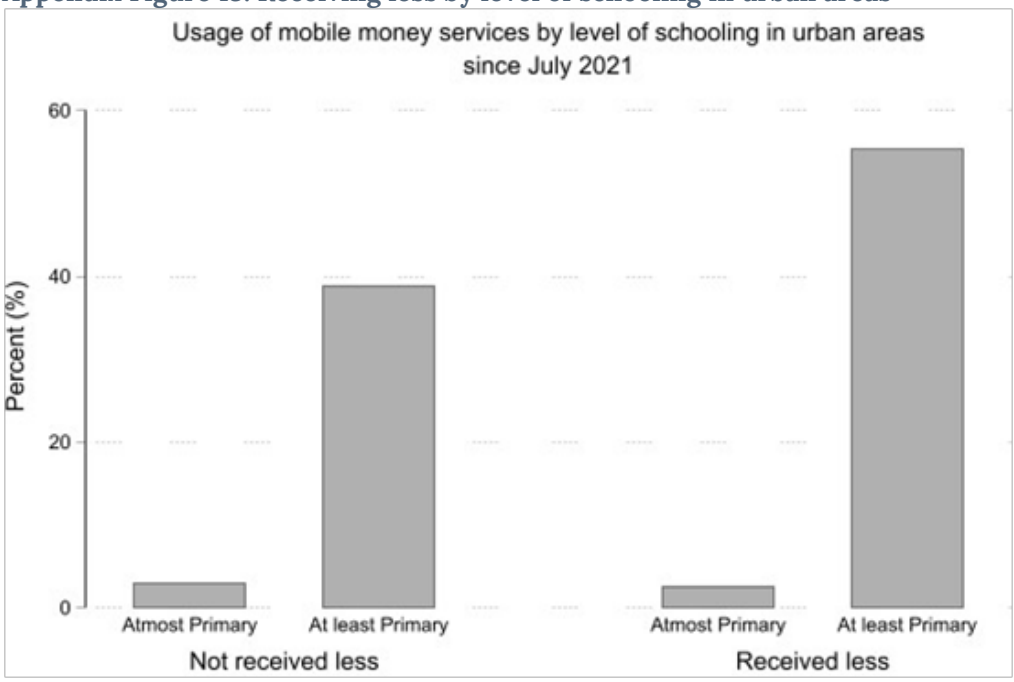
A.12 Receiving less by age group in rural areas

Appendix Figure A12: Receiving less by age group in rural areas



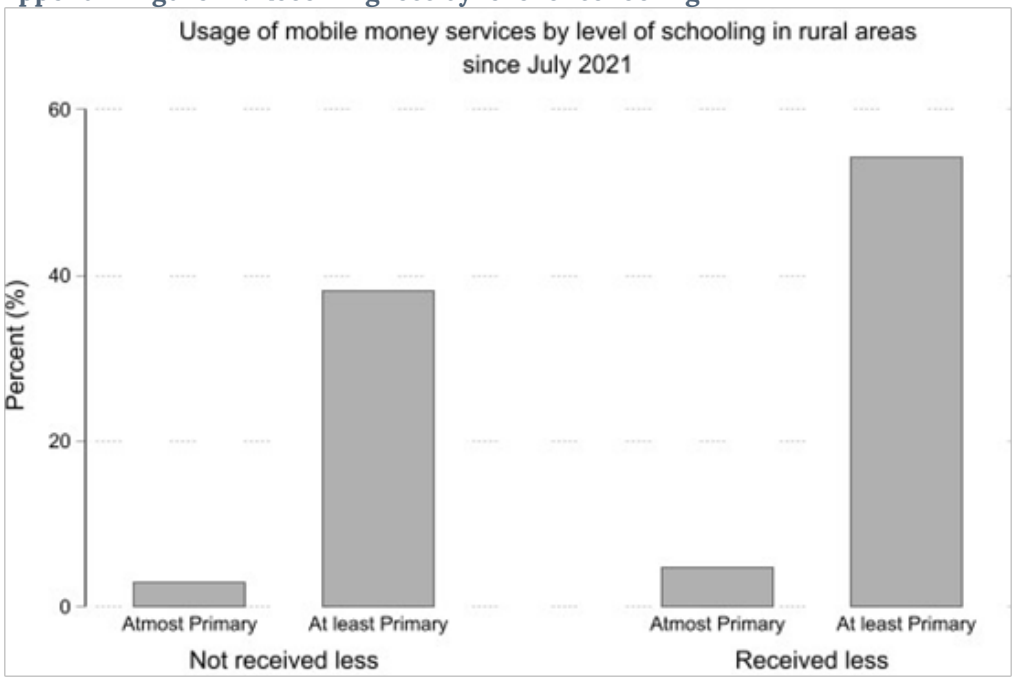
A.13 Receiving less by level of schooling in urban areas

Appendix Figure 13: Receiving less by level of schooling in urban areas



A.14 Receiving less by level of schooling in rural areas

Appendix Figure 14: Receiving less by level of schooling



Mission

To strengthen local capacity for conducting independent,
rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

Bringing Rigour and Evidence to Economic Policy Making in Africa

- Improve quality.
- Ensure Sustainability.
- Expand influence.

www.aercafrica.org

Learn More

www.facebook.com/aercafrica

www.instagram.com/aercafrica_official/

twitter.com/aercafrica

www.linkedin.com/school/aercafrica/

Contact Us
African Economic Research Consortium
Consortium pour la Recherche Economique en Afrique
Middle East Bank Towers,
3rd Floor, Jakaya Kikwete Road
Nairobi 00200, Kenya
Tel: +254 (0) 20 273 4150
communications@aercafrica.org