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Determinants of Financial Inclusion among Women Petty Traders in Dodoma City

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Abstract

This paper assesses the determinants of financial inclusion among women petty traders in the City Council of Dodoma. Specifically, the paper examines women's petty traders' status in using formal accounts, formal savings, formal credit, mobile money accounts, and socio-economic determinants of financial inclusion. The paper employed a cross-sectional research design whereby structured and semi-structured interviews and documentary review methods were used for data collection. Non-probability sampling techniques were employed to select a sample of 200 female petty traders. The data analysis employed in this study included both inferential and descriptive analysis. The result of the study indicates that most women petty traders use mobile money accounts and informal savings (save money at home, through Village Community Bank (VICOBA)/ person outside the home). Further, they lack enough money to open/maintain a formal account. The binary probit model result indicates that age, years of schooling, household size, marital status, lack of required documents, costs of financial service, and income are significant determinants of financial inclusion. Therefore, financial institutions should offer basic or low-fee accounts with reduced/simplified documentation requirements. Government payment should be conducted through banks to promote savings in formal financial institutions and financial literacy, and data on financial inclusion among women petty traders should be collected and analysed to facilitate the formulation of evidence-based policy.

Keywords: Financial inclusion, financial institutions, woman petty traders

1. Introduction

1.1. Background

Financial inclusion does not have a single acceptable definition around the world. Still, different countries refer to it based on the country's geographical, economic, social, and financial progress (Lotto, 2018). The World Bank defines financial inclusion as the share of individuals and firms that use financial services, i.e., transactions, payments, savings, credit, and insurance. Ndanshau and Njau (2021) define financial inclusion as the uptake and use of savings, credit, insurance, and money transfer services offered by formal and quasi-formal financial institutions at an affordable cost and time. FinScope (2023) defines financial inclusion as individuals 16 years of age or older who have or use financial products or services to manage their financial lives and financial exclusion as individuals 16 years of age or older who use no "external" financial mechanisms; they rely only on themselves, family, or friends for saving, borrowing, and remitting; their transactions are cash-based or in-kind.

The exclusion of women from formal financial services is a pressing concern that hampers economic empowerment and gender equality. The Global Financial Inclusion database for 2021 indicates that women comprise 54%, or 740 million, of the world's unbanked population. The gender gap in account ownership globally in developing countries and sub-Saharan Africa is 4%, 6%, and 12%, respectively (Demirgüç-Kunt *et al.*, 2022). According to the FinScope report for 2023, formal financial inclusion in Tanzania has grown by 11%, from 65% in 2017 to 76% in 2023. An increase in mobile money uptake caused this increase. The financial exclusion declined from 28% in 2017 to 18.7% in 2023; however, women, youth, and people in rural

areas that depend on agricultural activities remain the most excluded, with women accounting for 55% of the excluded (FinScope, 2023).

Having a more thorough and trustworthy database that gives information on financial inclusion split down by sex, Tanzania has gained recognition across the globe for having a more favourable legislative framework for it. The dependable database facilitates the creation of evidence-based policy (Landingham *et al*., 2015). The Microfinance Act of 2018 and its accompanying regulations were also passed, formalizing microfinance activities and fostering the growth of the microfinance sector with the purpose of better protecting consumers, the majority of whom are women, young people, and rural farmers (Jonas *et al*., 2021). In addition, achieving Tanzania's 2025 development strategy has gender equity recognized as a national objective (United Republic of Tanzania, 1999, sec. 3.1).

Financial inclusion is vital to sustainable economic development, fostering growth, and reducing poverty. In Tanzania, a significant portion of the population depends on the informal sector, with women petty traders playing a crucial role in this economy. The Tanzania Development Vision of 2025 indicates that 54.3% of small, medium, and micro enterprises are women-led businesses and fall under the informal sector, contributing to about one-third of the country's Gross Domestic Product (GDP). However, despite their economic contributions and government efforts to ensure financial inclusion, women petty traders often face barriers to accessing financial services, limiting their ability to save, borrow, invest, and expand their businesses (FinScope, 2023). The financial inclusion data in Dodoma city show a growth rate of 8.7 % from 67% in 2017 to 75.5% in 2023.

Moreover, the data show that 18% have an uptake of bank services, 57% do not have bank services but have an uptake of other formal services, and 6% do not have or uptake formal financial services but informal financial services. In comparison, 19% are financially excluded (FinScope, 2023). Moreover, the data show that women's financial inclusion dramatically contributes to the country's social, economic, and political growth. Therefore, it is crucial to understand the factors determining the growth rate among women in Tanzania. This study aims to explore the determinants of financial inclusion among women petty traders in Tanzania, shedding light on the challenges they encounter and the potential solutions to enhance their participation in the formal financial system.

1.2. Literature Review

1.2.1. Theoretical literature review

A theoretical literature review on the determinants of financial inclusion among women petty traders would involve summarising and discussing critical theoretical frameworks and concepts. Capability Approach: The Capability Approach, developed by Amartya Sen and Martha Nussbaum in 1988, postulates that freedom to achieve well-being is a matter of what people can do and be (Byskov, 2017). So, the *theory* suggests that financial inclusion is not solely about access but also about enhancing individuals' capabilities to make meaningful choices. It emphasizes the importance of empowerment and agency, particularly for women petty traders. Institutional Theory: The theory explains how institutions' rules, beliefs, and norms are linked with the external institutional environment (Lammers and Garcia, 2017). For this study, this theory examines how formal and informal institutions, such as financial regulations, cultural norms, and social networks, shape individuals' access to financial services. It considers how these institutions may either facilitate or hinder financial inclusion for women in this category. Gender and Development Theories: Gender theories, such as the Harvard Framework, indicate that there is an economic difference in resource allocation between males and females that is influenced by community norms, demographic conditions, institutional structures, general economic conditions, legal

parameters, training, and education, as well as the attitude of the community toward development (Candida *et al*., 2005). The Gender and Development Framework highlights the role of gender norms and power dynamics in shaping women's access to resources. These theories help in understanding the specific challenges faced by women petty traders. Financial literacy Models indicate that when formal and semi-formal organizations adopt these models, they will significantly impact their decision-making and financial behaviour. For example, individuals who participated in financial literacy training are more likely to borrow and subscribe to insurance services (Bhandare *et al*., 2021). These models can be applied to analyse how psychological and behavioural factors influence women's financial inclusion decisions. Human Capital Theory: Human Capital Theory suggests that investments in education and skills can improve individuals' economic outcomes, further leading to higher economic growth (Berniell, 2020). This theory was applied to analyse how education influences women's financial inclusion decisions.

1.2.2. Empirical literature review

1.2.2.1. Studies conducted in Africa

Mamudu (2016) studied the determinants of financial inclusion in Ghana. The findings reveal that the age of individuals, literacy levels, wealth class, distance to financial institutions, lack of documentation, lack of trust for formal financial institutions, money poverty, and social networks, as reflected in family relations, are the significant determinants of financial inclusion in Ghana. Wokabi and Fatoki (2019) studied the determinants of financial inclusion in East African countries (Kenya, Uganda, Tanzania, Rwanda, and Burundi). The results revealed that the study found that rural population and income are significant determinants of financial inclusion, with rural population negatively related to financial inclusion. Unemployment and interest rates, although statistically insignificant, had a negative and positive relationship with financial inclusion, respectively. Siano *et al*. (2020) conducted a study on mobile banking. The study was based on an innovative solution for increasing financial inclusion in sub-Saharan African countries: evidence from Nigeria. The study findings revealed the assertion that users adopt mobile banking because of utility expectancy (perceived usefulness), effort expectancy (perceived ease of use), and social influence expectancy (opinions of friends or relatives). Evans and Adeoye (2016) studied the determinants of financial inclusion in Africa. A dynamic panel data approach was applied in the study. The result indicated that per capita income, broad money (% of GDP), literacy, internet access, and Islamic banking presence and activity are significant factors explaining the level of financial inclusion in Africa.

In contrast, domestic credit provided by the financial sector (% of GDP), deposit interest rates, inflation, and population have insignificant impacts on financial inclusion. Zins and Weill (2016) studied the determinants of financial inclusion in Africa. The findings indicated that being a man, more prosperous, educated, and older favours financial inclusion, with a stronger influence on education and income. Soumaré *et al*. (2016) conducted a study analysing the determinants of financial inclusion in Central and West Africa. The findings revealed that access to formal finance is driven by gender, education, age, income, residence area, employment status, marital status, household size, and degree of trust in financial institutions. Additionally, household size hurts account ownership.

1.2.2.2.Studies conducted in Tanzania

Lotto (2018) studied the determinants of financial inclusion in Tanzania. The result indicated that being a man with better education and older increases the chance of financial inclusion and that, as the level of education increases, the individual is more likely to be financially included. Furthermore, the gender gap increases the chance of financial exclusion. Using the Global Findex 2017 database, Lotto (2022) examined

Tanzania's financial inclusion level and factors that influence it, comparing it to other East African Region members. Contrary to predictions, the results showed that Tanzania has less developed financial inclusion than other East African nations. In addition to being positively correlated with household income and education levels, financial participation is adversely correlated with gender. The association between age and financial inclusion is also nonlinear.

Ndanshau and Njau (2021) empirically investigated demand-side determinants of financial inclusion in Tanzania. The results indicated that being male, middle-aged, living in an urban area, being formally employed, having more income, and being more educated increased financial inclusion in Tanzania. While lack of sufficient money and unawareness of financial services were the most common challenges that increased financial exclusion, Mndolwa and Alhassan (2020) found that gender differences in financial inclusion are particularly prominent in formal savings, formal accounts, and mobile money accounts in their study on gender disparities in financial inclusion: lessons from Tanzania. Lower levels of education and income and women's overdependence on males help explain gender differences in financial inclusion.

1.3 Research gap

Financial inclusion plays a significant role in fostering the economic growth of a country. To improve access to financial services, the government, financial institutions, and other stakeholders must remove obstacles hindering financial inclusion. Various studies have been conducted to indicate determinants of financial inclusion in Africa and Tanzania, but all of them were conducted at the macro level; none of them pursued these studies at the micro level, specifically on women, who remain the most excluded people by at least 55% (Finscope, 2023). The current study fills the existing gap by investigating the status of individual financial inclusion variables under study. Therefore, this study assessed determinants of financial inclusion among women petty traders in Dodoma City: A case of Majengo, Sabasaba, and Veyula markets. This study contributes to the available knowledge regarding the financial inclusion among women petty traders. The result is essential in designing policies enabling women's participation in formal financial services. Lastly, the study stimulates further research on financial inclusions.

2. Materials and Methods

The study was conducted in Majengo, Sabasaba, and Veyula markets in Dodoma City. These markets were selected because of the presence of female petty traders who conduct business in the area. A cross-sectional study design was adopted in this study. This research design was adopted because it is suited to findings on the occurrence of a situation as it stands at the time of the study. The participants in a cross-sectional study were selected based on the inclusion criteria: women petty traders. The study population under this study comprises all women petty traders located at Majengo, Sabasaba, and Veyula markets in Dodoma City. A sample size of 200 women petty traders was determined based on the statistical power required, the ability of the researcher to gain access to the study subjects, and the desired degree of precision (Taherdoost, 2017). Purposive sampling was used to select female petty traders in the Majengo, Sabasaba, and Veyula markets in Dodoma City. The criteria used for selecting women petty traders in purposive sampling include those the age of 16 years and above, those that were located in Majengo, Sabasaba, and Veyula markets, those with permanent fixed spaces (everyday activities for them include food vending, selling second-hand clothes, etc.) also those with a semi-fixed operation (everyday activities for them include selling fruits and vegetables, shoes, selling sweets, etc.). Primary data were collected directly from the sampled women petty traders through questionnaires, and secondary data came from unpublished and published documents related to the study.

2.1. Description of Variables and Measurement

2.1.1 Measurement of Dependent Variables

Formal account

The existence or use of an account with a formal financial service provider, such as a bank (e.g., NMB, CRDB, EQUITY BANK, ADB, TPB, etc.), or a non-bank financial institution, i.e., SACCOS by a woman petty trader. A dummy variable 1 indicated If a woman petty trader owned an account; otherwise, it is zero.

Formal saving

A woman who has saved formally over the past six months using an account at a formal financial institution, including banks and non-bank financial institutions. A dummy variable one was used to indicate if a woman petty trader did save money in banks and non-financial institutions; otherwise, it is zero.

Formal credit

A female small business owner who borrows money from a formal financial institution has formal credit. A female petty trader was asked to name the credit sources she had utilized in the previous 12 months. A dummy variable would be one if a female small-business owner answered YES and zero otherwise.

Mobile money account

A woman petty trader questioned the use of or receipt of payment via a mobile phone utilizing a service like MPESA, TIGO-PESA, HALO-PESA, or AIRTEL MONEY. If a woman petty trader selects "yes," the dummy variable Mobile money account equals one; otherwise, it equals zero.

Table 1: Description of the explanatory variables

Variable	Measurement
Age	A continuous variable representing the actual age of a female petty trader.
Income	A continuous variable represents a woman petty trader's actual income per day.
Education level	A continuous variable represents how long a female petty trader spends in school.
Lack of document/device	A dummy variable equal to one if lack of document or device (phone) leads to financial exclusion of a women petty trader, zero otherwise.
Age^2	A continuous variable representing the square of the age of a female petty trader to capture possible non-linearity between the use of financial services and an individual's age.
Marital status	The dummy variable equals one if a woman has married zero otherwise.
Household size	The continuous variable represents the size of the household of a female petty trader.
Cost of financial service	The dummy variable equals one if the cost of financial service reasons for financial exclusion, 0 otherwise.
Financial literacy	The dummy variable is equal to one if having financial literacy increases financial inclusion; otherwise, it is 0.

2.2. Data Analysis

Data analysis was done using a descriptive analysis that calculated frequencies and percentages. Inferential analysis (binary probit model) was employed to show the causal relationship between dependent variables (formal account, formal saving, formal credit, and mobile money account) and independent variables.

The binary probit model with marginal effect examined the causal relationship between financial inclusion and its drivers. The model

included women engaging in petty trading with an account from formal or non-bank financial institutions, saving, borrowing, and using mobile money services, with dependent variables being dummy variables.

2.2.1 Econometric model

A binary probit model with marginal effect was employed to examine the determinants of financial inclusion in Tanzania, similar to (Mndolwa Frolence, 2017 Lotto, 2018 Mndolwa and Alhassan, 2020). This model was appropriate since the dependent variables (financial inclusion status) were dichotomous. Modelling a dichotomous dependent variable may use a binary logit or probit model, and both approaches arrive at the same result and conclusions. Binary probit was used because of the assumptions of normal distribution of error term, and it also allows random taste variation, correlated error term, unequal error variance, and captures any substitution pattern (Tundui, 2012).

The following econometric model was used:

$Y_i = \beta X_i + \mu_i$ 1

Where by:

Y_i = 1, if a women petty trader chooses to be financially included

Y_i =0, if a women petty trader makes a choice not to be financially included

μ_i = Error term

Equation one represents a model with a binary choice (binary probit model) involving the estimation of the probability of a women petty trader being financially included (Y_i) given a set of factors (X_i) which are independent variables

The mathematical representation of the model is presented below;

P (Y_i=1) = F ($\beta_i X_i$) 2

P Y_i=0) = 1- F ($\beta_i X_i$) 3

Whereby;

Y_i= Is the observed response of ith women petty trader who is either included or not included in the formal financial market

Y_i=1, if a women petty trader is financially included in the formal financial market

Y_i =0, if a women petty trader is not financially included in the formal financial market

3. Results and Discussion

3.1 Demographic Characteristics

Results from Table 2 show that the study sample comprises 200 women petty traders. Their background characteristics were established by looking at their age, marital status, education level, household size, type of activities, and daily income. The result reveals that 12 (6%) of women petty traders who participated in filling questionnaires were from the age category of 16-25, 62 (31%) of woman petty traders were from the age category of 26-35, 103 (51.5%) of women petty traders who participated in filling questionnaires were from the age category of 36-45 and 23 (11.5%) of women petty traders who participated in filling questionnaires were over 45 years old. This indicates that most women are younger and fewer are old, so the results will indicate the views of young, middle, and old-age women petty traders concerning determinants of financial inclusion who are in the active, productive group. Also, study findings revealed that 82 (41%) of women petty traders were married, 46 (23%) of women petty traders were divorced, 16 (8%) of women petty traders were widows, and 56 (28%) of women petty traders were single. The findings also revealed that 12 (6%) of women traders have no formal education, 98 (49%) of women petty traders have primary education, 66 (33%) of women petty traders have attained secondary education, and 24 (12%) of women petty traders attained a tertiary level of education.

The findings also demonstrate that 70 (35%) of women petty traders' households comprise 1-3 people, 103 (51.5%) of women petty traders' households comprise 4-6 people, and 27 (13.5%) of women petty traders households comprise above six people. Moreover, findings revealed that 26 (13%) of women petty traders engage in food vending activities, 133 (66.5%) of women petty traders engage in selling fruits and vegetables, and 41 (20.5%) of women petty traders engage in

other activities like selling second-hand clothes. Furthermore, 6 (3%) of women petty traders have less than 5000/= Tanzanian shillings income per day, 104 (52%) of women petty traders have income per day ranging from 5000-15000 Tanzanian shillings, 44 (22%) of women petty traders have income per day ranging from 15001-25000 Tanzanian shillings and 46 (23%) of respondents have income per day above 25000/= Tanzanian shillings.

Table 2: Demographic Characteristics of Women Petty Traders

Variables	Category	Frequency	Per cent
Age	16 – 25	12	6.0
	26 – 35	62	31.0
	36 – 45	103	51.5
	Above 45	23	11.5
Marital status	Married or Living together	82	41.0
	Divorced or separated	46	23.0
	Widowed	16	8.0
	Single	56	28.0
Educational level	No Formal education	12	6.0
	Primary education	98	49.0
	Secondary education	66	33.0
	Tertiary education	24	12.0
Household size	1 – 3	70	35.0
	4 – 6	103	51.5
	Above 6	27	13.5
Type of activities	Food vending	26	13.0
	Fruits and Vegetables	133	66.5
	Others	41	20.5
Income earned per day	Less than 5000	6	3.0
	5000-15000	104	52.0
	15001-25000	44	22.0
	Above 25000	46	23.0

3.2. Financial Inclusion Status

The results in Table 3 indicate that the majority of women petty traders, 194 (99%), have mobile money accounts, while 54 (27.6%) have formal accounts, 47 (24%) use formal credit, and 38 (19.4%) use formal savings. This result concurs with the work of Demirgüç-Kunt *et al*. (2022), who concluded that mobile money has become essential in enabling financial inclusion among women in Sub-Saharan Africa because it acts as a driver of owning and using accounts through mobile payments, saving and borrowing. The results suggest that mobile money has helped women access financial services due to its ease of use.

Table 3: Financial Inclusion Status

Use of financial service	Response (N)	Percent of cases
Formal account	54	27.6
Mobile money account	194	99.0
Formal saving	38	19.4
Formal credit	47	24.0

*Based on multiple responses

3.3. Reasons for Non-Use of Formal Account

Results from Table 4 reveal that reasons for the majority of female petty traders not opening/using a formal account in financial institutions or microfinance institutions were indicated by 118 (96.7%) whereby they lack enough money, 68 (55.7%) they have no trust with financial/microfinance institutions, 66 (54.1%) due to the long distance to the location of financial institutions, 64 (52.5%) whereby they perceive that financial services are too expensive, 60 (49.2%) whereby they lack necessary documentations, and 34 (27.9%) of them were because family members already have an account in formal financial/microfinance institutions. The result concurs with the result of the FinScope report 2023, which concluded that most of the people in Tanzania were not financially included because of insufficient income, which cannot even enable them to open an account. The result of the study conducted by Fungácová and Weill (2014) states that reasons for financial exclusion are long distance to financial institutions, high costs of financial services, lack of trust, lack of money, and because a family member has one.

Table 4: Reasons for not opening/using a formal account

Reasons for not opening/using a formal account	Response*	Percent of cases
Long distance to the location of financial/microfinance institutions	66	54.1
Financial services are too expensive	64	52.5
Have no trust in financial institutions	68	55.7
Lack of necessary documentation	60	49.2
Lack of enough money to use financial institution services	118	96.7
Family member already has an account	34	27.9

*Based on multiple responses

3.4 Ways of saving

Results from Table 5 indicated that most women petty traders save money through VICOBA, at home, or a person outside the family 144 (85.7%). In comparison, 93 (55.4%) saved money through mobile phones, and 38 (22.6%) saved money through a bank or another formal microfinance institution. The result concurs with the FinScope report of 2023, which indicated that the preferred means of saving remains informal, with (47%) Tanzanians saving at home. Also, Mori's study (2019) suggests that most Tanzanians keep money at home. The majority of women petty traders' means of saving remain informal because they have limited access to formal financial institutions; they deal with small amounts of money daily, so informal saving methods become more practical; also, informal saving methods are more flexible, so women contribute to their savings when they have cash available, furthermore, some women do not have the necessary documentation to open a formal account.

Table 5: Ways of Saving

Ways of saving	Response*	Percent of cases
If the respondent saved money through BANK or another formal MFI	38	22.6
If respondents saved money through a mobile Phone Money Account	93	55.4
If the respondent saved money through VICOBA, home, or a person outside the family	144	85.7

Operator based ∗ Based on multiple responses

3.5. Regression results on determinants of financial inclusion among woman petty trader

In examining the determinants of financial inclusion among women petty traders, the joint influence of all explanatory variables; age, primary education, secondary education, tertiary education or more, income level, household size, marital status, financial literacy, and distance were analysed by using the binary probit model. Table 6 displays the result of binary probit model estimations for the leading financial inclusion indicators. The marginal effect of the estimations was presented to explain the direction (the sign of the marginal impact) and the strength (the absolute value of the marginal effect) for each of the explanatory variables' impact on the financial inclusion of respondents. Formal accounts, formal savings, formal credit, and mobile money accounts were displayed at the top of each column.

Table 6: Determinants of financial inclusion among female petty trader

Variable	Formal account	Formal saving	Formal credit	Mobile money
Age	-0.349	0.0109	0.146**	0.262***
	(0.582)	(0.144)	(0.071)	(0.058)
Income	0.254***	0.119**	0.146**	0.643***
	(-0.059)	(-0.049)	(-0.071)	(-0.059)
Years of schooling	0.045**	0.125***	0.183***	0.045**
	(-0.019)	(-0.048)	(-0.073)	(-0.019)
Household size	-0.635***	0.000187	-0.001	-0.967***
	(-0.068)	(0.017)	(-0.019)	(-0.045)
Marital status	-0.147**	-0.049***	-0.814**	-0.159**
	(-0.071)	(-0.066)	(-0.069)	(-0.067)
Financial literacy	0.157	0.069	-0.036	0.142
	(-0.168)	(-0.168)	(-0.137)	(-0.169)
Cost of financial services	-0.050*	-0.557**	-0.813***	0.157
	(0.030)	(-0.065)	(-0.066)	(-0.176)
Lack of necessary	-0.999***	-0.999***	-0.010	-0.334***
document	(-0.000)	(-0.000)	(-0.050)	(-0.045)
Age^2	-0.332***	-0.317***	-0.328**	-0.024
	(-0.045)	(-0.042)	(-0.052)	(-0.025)
Observation	200	200	200	200
Pseudo r square	0.284	0.187	0.166	0.283
Log of likelihood	64.05	37.39	13.66	63.7

Table 6: Determinants of financial inclusion among female petty trader

Robust standard error presented in brackets

*significant at a 10% level, ** significant at a 5% level, *** significant at a 1% level

3.5.1 Determinants of inclusion in formal account

Results from Table 6 show that income has a positive sign and is statistically significant at a 1% level, which indicates that an increase in the income of a female petty trader increases the probability of owning a formal account. In particular, those women petty traders with more income were 25% more likely to hold a formal account than those with lower income. This result concurs with that of Kaligis *et al.* (2018), which indicates that income positively and significantly influences formal account ownership. Higher-income levels can facilitate more accessible access to formal banking institutions. In contrast, lower income may lead to reliance on informal financial methods due to barriers such as account fees and minimum balance requirements. Women petty traders with higher income levels are more likely to own a formal bank account

because they have the financial means to meet account requirements such as maintaining minimum balances and paying fees.

Years of schooling had a positive sign and were statistically significant at a 5% level, which indicates that an additional year of schooling for a woman petty trader increases the probability of owning a formal account. In particular, those women petty traders with more years of schooling were 46% more likely to hold a formal financial account than those with fewer years of schooling. These findings concur with the work of Mamudu (2016), Ndanshau and Njau (2021), and Kaliba *et al*. (2023), who concluded that literate people are more likely to be financially included than illiterate people. The link between years of schooling and owning a formal account often involves improved financial literacy, increased access to information about banking services, and enhanced economic opportunities, as education provides women petty traders with skills and knowledge to navigate the system. Higher years of schooling are expected to correlate positively with owning a formal account because increased education tends to enhance financial awareness, promote economic participation, and improve the ability to engage with formal banking services, contributing to higher rates of formal account ownership.

Household size has a negative sign and is statistically significant at a 1% level, indicating that those women petty traders with a large household size were less likely to own a formal account. In particular, those women petty traders with large household sizes were 63% less likely to hold a formal account than those with small household sizes. The result concurs with the work of Mndolwa and Alhassan (2020), who indicated that since the traditional role of women in most developing countries is home-keeping, the income that women get from their day-to-day activities is used to buy necessary goods for all household members in the economy, hence limiting access to formal financial services. Women petty traders with more enormous households may face more complex financial management, potentially impacting women's access to formal accounts due to competing priorities and resource allocation within a family. In addition, cultural and social norms may shape women's financial autonomy within larger households, affecting their likelihood of owning a formal account. With more members, there could be increased financial demand, potentially limiting the resources available to individual family members, including women petty traders.

Marital status has a negative sign and is statistically significant at a 5% level, indicating that being a married petty trader decreases the probability of owning a formal account. In particular, those married petty traders were 14% less likely to own a formal account than those who did not. Results concur with the work of Allen *et al*. (2016), who concluded that being a married young adult acts as a barrier to formal account ownership more than otherwise. Marital status impacts women's access to formal financial accounts due to various factors. Cultural norms may restrict financial independence among married women, leading to limited control over their accounts. Also, unequal power dynamics within marriages can affect women's ability to open and manage formal accounts independently, hindering their ability to own a formal account.

The cost of financial services has a negative sign, and it is statistically significant at a 10% level, indicating that those women petty traders who perceive financial services as too expensive are less likely to own a formal account. In particular, those women petty traders who perceived that financial services were too expensive were 5% less likely to own a formal account. The result concurs with the work of Bozkurt *et al*. (2018), Allen *et al*. (2016), and Mamudu (2016), who concluded that financial service charges act as a barrier to account ownership for most people. Account maintenance fees, transaction fees, account opening costs, and minimum balance requirements discourage women petty traders from opening or maintaining formal accounts because they have lower incomes.

Lack of necessary documents has a negative sign and is statistically significant at a 1% level, which indicates that being a woman petty trader and lacking necessary documents decreases the probability of owning a formal account. In particular, being a woman petty trader without essential documents reduces the likelihood of holding a formal account by 99%. This result concurs with the work of Allen *et al*. (2016) and Mamudu (2016), who concluded that the lack of necessary documents is a barrier to account ownership. The financial institution requires documents such as government-issued identities to verify the account holder's identity. Lack of identification acts as a barrier to establishing an account.

Age has a positive but insignificant relationship with owning a formal account. Age 2 has a negative sign and is statistically significant at a 1% level, indicating that as a woman petty trader approaches old age, every extra year gain leads to a decrease in the probability of owning a formal account by 33%. The result concurs with the result of Mndolwa (2017), who concluded that as people's age increases, the likelihood of being financially included increases up to a certain age, and their probability of financial inclusion declines.

3.5.2. Determinants of inclusion in formal saving

Results from Table 6 show that income has a positive sign and is statistically significant at a 5% level. This indicates that a woman who works as a small business owner will be more likely to save money at a formal financial institution if her income rises. Women small traders, in particular, were 11% more likely to save with formal financial institutions when their daily income was higher than when their daily income was lower. According to Ayenew (2014) and Bhabha *et al*. (2014), women are more likely to save money when their income is higher. Women with higher incomes have greater access to regulated financial institutions and save more money. Income influences saving in a formal financial institution by giving women petty traders the financial capacity to set aside a portion of their earnings for saving. As the income of women petty traders increases, the expectation is that their capacity to save in formal financial institutions will also rise. Higher-income allows for more outstanding disposable funds, making it feasible for them to set aside a portion for holding. With increased financial stability, women petty traders may be more inclined to utilize formal financial institutions to secure and grow their savings.

Years of schooling have a positive sign and statistically significant 1% level, which indicates that those women petty traders with more years of schooling were more likely to save in formal financial institutions than those with fewer years of schooling. In particular, petty traders with more years of schooling were 12% more likely to save in formal financial institutions than those with fewer years of schooling. The work of Towo and Ishengoma (2019) suggests that education level influences positive savings among Tanzanians. Also, Mndeme and Sinde (2022) indicate that the likelihood of saving increases with education. More years of schooling among women petty traders can positively impact holding in formal financial institutions by fostering financial literacy, increasing income potential, promoting risk awareness, providing access to information, and encouraging a long-term planning mindset.

Marriage status has a negative sign and is statistically significant at the 1% level, suggesting that being a woman small business owner reduces the likelihood of saving in authorized financial institutions. Being a woman small trader minimizes the probability of saving in regulated financial institutions by 4%. The findings support the findings of Bashir *et al*. (2013), who found that married status has a detrimental impact on saving behaviour. Several factors contribute to a lower probability of saving in formal financial institutions among married women petty traders because married women petty traders may have joint financial responsibilities with their spouses, which affects their saving pattern; married women petty traders have

limited financial autonomy, with collective decision making involving their spouses which results in lower savings in formal financial institutions. Also, cultural norms surrounding financial practices and decision-making among married petty traders influence them to rely on informal methods.

The cost of financial services has a negative sign. It is statistically significant at a level of 5%, which suggests that women small-time traders are less likely to save in formal financial institutions if they believe financial services to be too expensive. Women small traders, in particular, were 55 percent less likely to save in formal financial institutions when they believed financial services to be overly expensive. This is due to the difficulty in obtaining and operating a formal financial institution account, which also reduces their saving capacity due to the high expenses of financial services.

Lack of necessary documents has a negative sign and is statistically significant at a 1% level, indicating that being a woman petty trader who lacks necessary documents decreases the probability of saving in formal financial institutions. In particular, a woman petty trader who lacked the necessary documents was 99% less likely to save in formal financial institutions. Many financial institutions require specific documents to open accounts, get loans, or save. Without the necessary documents, women petty traders may be excluded from using these services, limiting their ability to save.

Age has a positive sign but an insignificant relationship with saving in formal financial institutions. Age^2 has a negative sign and is statistically significant at a 1% level, which indicates that as a woman petty trader reaches old age, every extra year gained leads to a decrease in savings at formal financial institutions by 31%. This result concurs with the result of Lotto (2018), who indicated that the probability of financial inclusion among people increases in a particular age group, and the probability of being financially included decreases. Ayenew (2014) indicates that savings increase to a specific limit as women age and then decrease. This suggests that as women age, they receive less income, limiting the amount available for saving.

3.5.3. Determinants of inclusion in formal credit

Results in Table 6 indicate that age has a positive sign and is statistically significant at a 5% level, and age is negative, implying that age has a linear relationship with the decision to obtain loans through formal financial institutions up to a certain point where it assumes a quadratic function. Therefore, as a woman petty trader's age increases, the probability of borrowing from formal financial institutions increases up to a certain age. Their probability of borrowing from a formal financial institution starts to decline. This finding concurs with the work done by Ndanshau and Njau (2021), who concluded that the probability of one being financially included increases with age.

Income has a positive sign and is statistically significant at a 5% level, indicating that as the income of a woman petty trader increases, the probability of borrowing through formal financial institutions also increases. In particular, as the income of a woman petty trader increases, the probability of borrowing from formal financial institutions also increases by 14%. The work of Ali and Ghildiyal (2023) suggests that higher income influences borrowing and saving through formal financial institutions. Increased income and financial capacity make it easier to afford loan repayments, making borrowing more feasible. Higher-income levels often result in a favourable credit assessment, making it easier for women petty traders to obtain credit; also, higher income may enable women petty traders to provide sufficient collateral, enhancing their chances of obtaining credit, and higher income may result in better debt servicing capacity making women petty traders with more income attractive borrowers to formal financial institutions.

Years of schooling have a positive sign and are statistically significant at a 1% level. This indicates that as a women petty trader's

schooling increases, the probability of borrowing from formal financial institutions also increases. In particular, the years of schooling of a female petty trader increase the probability of obtaining loans through formal financial institutions by 18%. Education increases understanding of loan terms, enabling women to make informed decisions about borrowing in formal financial institutions. Years of schooling positively influence women petty traders to access credit in formal financial institutions because education increases financial literacy, enabling women petty traders better to understand the credit process, terms, and conditions; also, education equips women petty traders with skills in business management which are crucial when applying for credit since formal financial institutions tend to assess the borrower's ability to manage funds effectively and education contribute to asset accumulation and property ownership which can be used as collateral for loans.

Marital status has a negative sign and is statistically significant at a 5% level, indicating that being a married petty trader decreases the probability of borrowing through a formal financial institution. In particular, the findings show that a married petty trader is 81% less likely to borrow through a formal financial institution. This implies that married women tend to prioritize household financial needs over formal borrowing, choosing to allocate resources to the household rather than seeking loans.

The costs of financial services have a negative sign. They are statistically significant at a 1% level, indicating that those women petty traders whose costs are too expensive were less likely to borrow from formal financial institutions. The results show that those women petty traders whose financial services are too expensive were 81% less likely to borrow through a formal financial institution. In response to high formal financial service costs, some women petty traders may turn to informal sources of credit, which can be riskier but more affordable in the short term.

3.5.4. Determinants of inclusion in mobile money account

Results in Table 6 indicate that age has a positive sign and is statistically significant at a 1% level, implying that as women petty traders' age increases, the probability of using a mobile money account also increases. The study's findings indicate that, as the age of a woman petty trader increases, the probability of using mobile money accounts increases by 26%. The result concurs with the work of Lotto (2018), who argued that mobile phone account ownership is higher among adults with families by about 52%, followed by youths at about 32%.

Income has a positive sign and is statistically significant at a 1% level, implying that as the income of a woman petty trader increases, the probability of using a mobile money account also increases. The study's findings indicate that an increase in the income of a woman petty trader increases the probability of using a mobile money account by 64%. This result does not concur with the result of Lotto (2018), who indicated that the income level of individuals decreases the probability of one owning and using a mobile account. Higher income among women petty traders positively influences ownership of mobile money accounts because increased income enables them to afford mobile phones, making financial inclusion through mobile money accounts more accessible, and higher-income women may have more exposure to financial literacy initiatives, improving their understanding of the benefits and convenience offered by mobile money accounts.

Years of schooling have a positive sign and are statistically significant at a 5% level, implying that as the years of schooling of a woman petty trader increase, the probability of using a mobile money account also increases. The results show that an additional year of schooling for a woman petty trader increases her probability of using a mobile money account by 4%. The result concurs with Jack and Suri (2011), who indicated that increasing education enables individuals to own and use

mobile money. Moreover, Lotto (2018) indicated that ownership of mobile phones increases with education. Education contributes to digital literacy, awareness, and a positive perception of technology, all of which play crucial roles in encouraging women petty traders to own and use mobile money accounts.

The household size of a woman petty trader has a negative sign. It is statistically significant at a 1% level, implying that an increase in the size of the household of a woman petty trader decreases the probability of using a mobile money account. In particular, those women petty traders with larger household sizes were 96% less likely to use mobile money accounts.

The negative impact of household size on women petty traders' use of mobile money accounts is rooted in the fact that financial resources may be stretched thin, limiting the funds available for technology expenses like owning mobile phone devices.
Marital status has a negative sign and is statistically significant at a 5% level, implying that being a married woman petty trader decreases the probability of using a mobile money account. In particular, being a woman petty trader decreases the usage of mobile money accounts by 15%. Married women petty traders may not prioritize opportunities to own and use mobile money accounts if their spouses are primary decision-makers in financial matters.

Lack of necessary documents/phone has a negative sign and is statistically significant at a 1% level, implying that being a female petty trader who lacks necessary documents/phone decreases the probability of using a mobile money account. In particular, those women petty traders who lacked necessary documents/phones were 33% less likely to use mobile money accounts. This result concurs with the FinScope report of 2023, which indicated that people who do not use mobile money accounts claim they do not have the necessary documents/devices or a phone to use services.

4. Conclusion and Recommendations

4.1. Conclusion

Tanzania is among Sub-Saharan countries with a low level of financial inclusion compared to developed countries, where a large percentage (55%) of financially excluded people (women, youth, and people in rural areas) comprise women. This study assesses the determinants of financial inclusion among women petty traders in Tanzania using primary data collected among 200 female petty traders in Dodoma City from the Majengo, Veyula, and Sabasaba markets.

Findings from multiple responses indicate that most women petty traders use mobile money accounts and informal savings, i.e., save money at home through VICOBA/ person outside the home; also, the majority indicate that they lack enough money for opening/maintaining a formal account. Findings from binary probit regression revealed that as the income of a woman petty trader increased, the probability of both having a formal account, saving in a formal financial institution, borrowing from a formal financial institution and using a mobile money account, an additional years of schooling to a woman petty trader increase the probability of both having a formal account, saving in a formal financial institutions, borrowing from a formal financial institutions and using a mobile money account, as well as being a married woman petty trader decrease the probability of both having a formal account, saving in a formal financial institution, borrowing from a formal financial institution and using a mobile money account, an increase in the size of household members decrease probability of both having a formal account, saving in a formal financial institution, borrowing from a formal financial institution and using a mobile money account, an increase in the cost of financial service decrease in the probability of both having a formal account, saving in a formal financial institution and borrowing from a formal financial institution as well as the lack of necessary documents decrease the probability of both having a formal account, saving in a formal financial

institution, borrowing from a formal financial institution and using a mobile money account.

4.2. Recommendations

Findings indicate that the high cost of financial services reduces the probability of having a formal account, saving in formal financial institutions, and borrowing from formal financial institutions; hence, the financial institutions should offer basic or low-fee accounts with a reduced/simplified documentation requirement. Also, findings indicate that the majority of women petty traders use mobile money accounts and use informal savings, i.e., save money at home, through VICOBA/ person outside the home; therefore, government payments should be conducted through banks to promote savings in formal financial institutions; policymakers should prioritize initiatives that promote economic empowerment among women petty traders through providing access to financial services like saving accounts, credit facilities, and microloans tailored to their needs. In addition, findings indicate that additional years of schooling for a woman petty trader increase the probability of having a formal account, saving in formal financial institutions, borrowing from formal financial institutions, and using a mobile money account; hence, policies that incentivize education such as scholarships should be implemented to encourage a higher level of schooling; investment in a digital literacy program should be made to ensure that women petty traders regardless of their education level, can use online platforms and technology for financial transaction. Financial literacy resources should be developed and disseminated to bridge the information gap.

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