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Bringing Rigour and Evidence to Economic Policy Making in Africa

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List of abbreviations and acronyms

2SLS	Two-Stage Least Squares
AFI	Alliance for Financial Inclusion
BRB	Bank of the Republic of Burundi
DFID	Department for International Development
GDP	Gross Domestic Product
GPFI	Global Partnership for Financial Inclusion
IV	Instrumental Variables
MFI	Microfinance Institutions
MFPDE	Ministry of Finance and Economic Development Planning
OLS	Ordinary Least Squares
UNDP	United Nations Development Programme

Abstract

Despite an improving financial inclusion situation across the developing world, there still exist wide gender gaps in financial inclusion, especially in fragile and post-conflict countries. Our study designed and implemented a survey consisting of 860 households across urban and rural Burundi to examine the effect of financial inclusion on household asset-based welfare from a gendered perspective. The study used the two-stage least squares (2SLS) regression method to overcome the endogenous nature of the financial inclusion index. The data revealed that most Burundian households preferred saving their money at home rather than at a financial institution. Also, mobile money was mainly employed as a means of receiving and withdrawing cash. Results from our 2SLS indicate that improved financial inclusion has a greater effect on the welfare of female-headed households than on male-headed households. This study recommends developing regulatory and institutional frameworks that can best encourage higher financial inclusion for female-headed households. Additionally, there is need for policies that can permit access to credit through the mobile money platform since that is the widely used financial inclusion avenue for female-headed households in Burundi.

Key words: *Burundi; Financial inclusion; Gender, Fragile and post-conflict countries; Welfare.*

1. Introduction

The definition of what constitutes and determines financial inclusion has evolved over the years. Diniz et al. (2012) define financial inclusion as entailing access to formal financial services at an affordable cost for all members of an economy, while Efobi et al. (2014) define financial inclusion as implying the increasing access to formal financial services such as bank accounts and/or the use of credit and savings facilities of a bank. Such definitions emphasize costs and the more formal banking system; however, Triki and Faye (2013) suggest that a definition of financial inclusion must consider all initiatives that make formal financial services available, accessible, and affordable to all members of the public. In an attempt to get a more definite definition of what financial inclusion is, numerous studies have been undertaken to determine the determinants of financial inclusion (for example, Mohammed et al., 2017; Allen et al., 2016; Cámara & Tuesta, 2015; Tuesta et al., 2015; Fungáčová & Weill, 2015; Efobi et al., 2014; Demirgüç-Kunt & Klapper, 2013, 2012). These studies have established that individual characteristics such as education level, age, income level, and gender are the main significant determinants of financial inclusion.

Financial inclusion has been documented to improve the welfare of individuals and households at large through its ability to improve investment in education, empowerment of women, and improvements in entrepreneurial propensities (Churchill & Marisetty, 2019; Bruhn & Love, 2014). Moreover, improved financial inclusion ensures greater household savings, increases capital for investment, broadens the class of entrepreneurs, and enables more individuals to invest in themselves and their families (Triki & Faye, 2013). Several studies (see, Koomson et al., 2020; Park & Mercado Jr., 2018; Mohammed et al., 2017; Swamy, 2014) have acclaimed the household welfare-enhancing nature of financial inclusion, mostly through poverty reduction. Despite the evidence on the welfare effect of financial inclusion above, most of these studies have focused on monetary measures of welfare and less attention has been given to alternative measures of household welfare, particularly household asset-based welfare.

Despite a global drive to enhance financial inclusion, Africa still lags even though financial inclusion is a key component of inclusive growth and development. Despite this low level of financial inclusion, access to financial services in Africa has been on the rise due to new technologies such as mobile money which has broadened access to financial services (Triki & Faye, 2013). Innovations in the delivery of financial

service, therefore, cast doubt on the results of existing literature on the welfare effect of financial inclusion, particularly since most of them resorted to ownership of a formal bank account as the sole measure of financial inclusion, thereby neglecting the use of financial products, access to credit, receipt of remittances, and government transfers and mobile money (Demirgüç-Kunt et al., 2018; Demirgüç-Kunt et al., 2015). Although Aslan et al. (2017) recognized and considered some of these new dimensions of financial inclusion, their analysis focused on their separate effect. This study overcomes this hurdle and contributes to the literature by examining the effect of financial inclusion on household welfare using a multidimensional index of financial inclusion developed by Aslan et al. (2017).

Although recent surveys point to an improved financial inclusion situation in Africa, there are sub-regional variations in account ownership at financial institutions ranging from 42% in Southern Africa, 23% in West Africa, 22% in Eastern Africa, 20% in North Africa, to 7% in Central Africa (Triki & Faye, 2013). Such average figures may be misleading for a country like Burundi which is a post-conflict and fragile country, and as such financial inclusion may tend to be lower because of decreasing market opportunities which makes individuals more risk-averse and hence withhold their savings even further from the formal financial system (Triki & Faye, 2013). Additional evidence from the 2017 Global Findex Database points to widening gender and locational gaps, especially in developing countries (Demirgüç-Kunt et al., 2018), and this situation may be dire in a fragile and post-conflict environment like Burundi where women and rural inhabitants may be under greater threat of conflict. However, there is hardly any evidence of a gendered and locational analysis of the effect of financial inclusion on household welfare, especially in the context of a fragile and post-conflict state. The objectives of this study are:

1. To explore access to and sources of credit, mode of savings, and the major uses of mobile money in Burundi from a gendered perspective.

2. To examine the effect of financial inclusion on household welfare using a multidimensional financial inclusion index generated from three indicators of financial inclusion.

Evidence from this study can inform donor agencies and governments to pursue targeted policies that can improve financial inclusion and maximize its effect on welfare, particularly in the context of fragile and post-conflict countries.

Background and context of the study

Burundi is classified as a fragile state because the country has been engulfed in several nationwide conflicts, notably in 1965, 1972, 1988, 1991, and from 1993 to 2005 (Fransen & Mazzucato, 2014). Upon attaining independence from Belgium in 1962, Burundi has had a turbulent history where the society has been confronted with indiscriminate

violence, fear of being attacked, child abuse, social fragmentation, and several armed struggles for political power and resources. Such protracted conflicts have led to the killing of about 300,000 people, an additional 300,000 becoming refugees, and the banishment of over 1.2 million Burundians.

As a fragile country, the level of financial inclusion in Burundi is ultimately lower than the sub-regional average. A survey on financial inclusion in Burundi conducted by the Bank of the Republic of Burundi in 2012 revealed that only 3.7% of the adult population had access to a bank account in a traditional banking institution, while more than 23% of the population used formal or informal non-banking institutions. In effect, 73.3% of the population was completely excluded from the financial system. Another cause for concern was the significant demographic differences in Burundi's account ownership (GPFI & BRB, 2014). Concerning gender, men are twice likely to have an account compared to women while most youth (18-29 years) are 50% less likely to have a bank account compared to those above 30 years. Additionally, the account ownership rate is 89.5% among state employees, 52.1% for private-sector employees, 30.1% for traders, and 5.3% for farmers. The most pressing concern is the low number of women clients (only 28.3%) among microfinance institutions (MFI) clienteles. The survey attributed this low level of financial inclusiveness to socioeconomic factors such as the low average monthly income of approximately US$20 for more than 60% of the population, overdependence on agriculture and livestock as the main economic activity, and illiteracy level of approximately 40% of the population. Moreover, a report by MFPDE (2014) stated that other challenges and barriers to financial inclusion included: very low level of financial education among the population, low level of awareness of financial institutions, high use of informal financial services, and physical distance as a barrier to financial access outside the capital. Aterido et al. (2013) further noted that the cost of operating an account was the main barrier since the majority of the population is engaged in low-earning occupations. Also, cultural barriers continue to systematically restrict mostly women from participating in the financial sector (Aterido et al., 2013). Another form of barrier that largely limits the financial inclusion of women and the youth is the lack of collateral as a requirement in most financial transactions.

To address some of the barriers faced by women and youth in financial inclusion, several empowerment programmes have been instituted mostly by donor organizations in collaboration with the Government of Burundi to empower women economically. Two such prominent programmes are the “Solar Energy for Women's Empowerment” which is being undertaken by UNDP in collaboration with the Ministries of Energy and Gender to help empower women financially which may increase their financial inclusiveness in the future. The second prominent programme is the “Gender Equality and Women's Empowerment Programme II” which is being undertaken by CARE Norway to make women financially stable which will also increase their level of financial inclusiveness. Further recognizing the direct link between women's economic empowerment, financial inclusion, and poverty

reduction, Burundi in collaboration with some donor partners have strived to develop a national policy (National Financial Inclusion Strategy) that aims to boost female inclusiveness in the financial sector since financial stable females translate into better welfare status of households.

The formal financial sector of Burundi can be categorized into two broad sections. The first section consists of those that are governed by the laws and decrees initiated by the Central Bank such as commercial banks, microfinance institutions, and other financial institutions. The second section consists of those that are not under the regulations of the central bank but fall under their various ministries such as the postal services, insurance, and pensions sectors (GPFI & BRB, 2014). Over 95% of the points of service of these financial institutions are largely located within and around Bujumbura, the main city of Burundi. The concentration of financial institutions in and around the urban centre invariably excludes the rural population from becoming financially included.

This study broadly aligns itself with the global agenda of promoting gender equality through financial inclusion which targets poor mostly rural populations in fragile post-conflict countries. The existence of significant gender gaps in account ownership, formal savings, and formal credit access in Burundi curtails the drive toward gender equality (Zins & Weill, 2016). This study contributes to these visions and efforts to increase women's access to financial services.

2. Literature review

Theoretical perspectives

Discussions on financial inclusion in the existing literature have largely focused on financial access and use. The promotion of financial inclusion can lead to enhanced economic development while helping to address the challenge of inequality (Demirgüç-Kunt et al., 2013). This can be achieved when improved financial inclusion encourages people to invest in their future by saving, smoothening their consumption, and managing their financial risks (Demirgüç-Kunt et al., 2017). A report by the Department for International Development (DFID, 2004) further emphasized this point by indicating that financial inclusion can positively influence economic development at the national level via households, and firms when there is enhanced financial access through deliberately designed financial programmes. The economic development argument of improved financial inclusion posits that, productivity at the household level will rise due to investment in more assets thereby increasing future household income.

The linkage between financial inclusion and household welfare is transmitted through direct and indirect paths when considered within the financial development framework. Studies such as Rajan and Zingales (1998) and King and Levine (1993) attribute the direct linkage to widening access to credit, insurance, and other financial services which provides the needed resources to meet daily transaction needs for consumption, investment, and economic growth eventually. Other proponents of the direct linkage envisage that improved financial inclusion will enhance entrepreneurial possibilities and strengthen the productive asset capacity of especially the poor, thereby leading to the potential to achieve sustainable livelihoods (Demirgüç-Kunt et al., 2008; Jalilian & Kirkpatrick, 2002). Dating back to scholars such as McKinnon (1973) and Schumpeter (1934), the proponents of the indirect linkage between financial inclusion and household welfare argue that improved financial inclusion will induce economic growth which will lead to job creation, and increased government spending on areas such as education, health, and social protection which tends to improve the welfare of mostly the poor (Abosedra et al., 2016; Perotti, 1993).

The linkage between financial inclusion and welfare is mostly curtailed by market failure arising mainly from high transaction costs and information asymmetry that are endemic in financial markets (Aghion & Bolton, 1997; Stiglitz & Weiss, 1981). Such

costs tend to derail the drive for universal financial inclusion and create a class of economically excluded people. It is such economic exclusion that eventually leads to financial exclusion and therefore deprives such households of access to credit and income, and therefore limits their economic opportunities (Sen, 2000).

Empirical literature

Determinants of financial inclusion

Reasons for not owning a formal account at a financial institution have been documented to include inadequate revenue to use one, cost of operating an account, distance to financial institutions, and cumbersome documentation procedures (Triki & Faye, 2013). Other reviewed studies (for example, Mohammed et al., 2017; Allen et al., 2016; Cámara & Tuesta, 2015; Tuesta et al., 2015; Fungáčová & Weill, 2015; Efobi et al., 2014; Demirguc-Kunt & Klapper, 2013, 2012) have repeatedly revealed some variables like gender, rural, low income, and education level on the demand-side and bank size and charges on the supply-side as the ones influencing more the financial inclusion. Methodologies used in reviewed studies differ and the choice of the model depends on the nature of the study even though most of them were assessing factors that influence financial inclusion. Studies such as Coulibaly (2020), Muriu (2020), and Uddin et al. (2017) have dealt with both the demand-side and supply-side factors that determine financial inclusion. Studies that looked at the supply-side mostly employed corrective methods that helps to reduce the biases that are endemic in the demand-side studies.

Welfare impacts of financial inclusion

Although there are mixed results on the role of financial inclusion on poverty reduction, the bulk of empirical literature suggests that increased financial inclusion alleviates poverty. Applying a generalized method of moments using unbalanced panel data, Inoue (2019) disclosed the possibility of a synergic effect of financial inclusion and deepening on poverty reduction in India as findings from the study revealed a significant and negative relationship with poverty ratio for public sector banks. Similarly, Guarnish et al. (2018) used Pearson Correlation on household survey data in Indonesia and establish a negative and significant correlation between financial inclusion and poverty. The studies by Guarnish et al. (2018) and Inoue (2019) cast doubt on the poverty-reducing argument for financial inclusion.

The economic benefits of financial inclusion are well documented in the literature. According to Han and Melecky (2013), financial inclusion leads to economic stability. Park and Mercado (2015) further postulate that financial inclusion is regarded as a key determinant of inclusive growth since access to financial services can make an economic agent execute long-term investment and consumption decisions, take

part in production practices and build resilience to unexpected short-term economic shocks. Bruhn and Love (2014), and Zhang and Posso (2019) also noted that financial inclusion favours the disadvantaged and the poor by increasing their incomes and ability to access employment opportunities. Lack of financial inclusivity hinders economic development, as lack of access to financial tools and services limits investment in education, and entrepreneurship (Demirgüç-Kunt & Klapper, 2012). Additionally, empirical evidence shows that financial inclusion favours women's empowerment and rural development (Swamy, 2014).

Also, Koomson et al. (2020) adopted the consumption-based measurement of poverty and probit model to measure the effect of a multidimensional measure of financial inclusion on poverty in Ghana. Two major effects of financial inclusion on poverty were revealed by the study. Firstly, the likelihood of households being poor was reduced by 27%. Secondly, the results showed that financial inclusion prevents exposure to future poverty by 28%. However, a study by Bruhn and Love (2014) used the difference-in-difference model on the opening of a new bank in Mexico and evaluate the impact of increased access to financial services for low-income individuals on entrepreneurial activity, employment, and income as indicators of poverty. Findings from the study revealed that new bank openings led to a 7.6% increase in the proportion of informational businesses and a 7% increase in income levels.

On financial inclusion, poverty, and income inequality in developing Asia, Park and Mercado Jr. (2015) put up some financial inclusion indicators based on availability and usage—commercial bank branches, borrowers from commercial banks, depositors with commercial banks, automated teller machines, and domestic credit to gross domestic product (GDP) ratio. Using factor analysis, one-one analysis of variance, and t-test on primary data from 540 beneficiaries of cooperative banks in northern states of India to examine the impact of financial inclusion on poverty alleviation, Lal (2018) found that access to financial inclusion: savings, loans, insurances, and credit have positive impacts on the lives of the poor.

3. Methodology

Study area

The study was carried out in Burundi, one of the fragile post-conflict African countries located on 3 25 S, 29 55 E with a total area of 27,830 square km (land: 25,680 square km and water: 2,150 square km). To the North, the country borders Rwanda, Tanzania to the East, Democratic Republic of Congo to the West, and Lake Tanganyika to the South-East. Burundi has one of the highest population densities in Africa (463 per square km or 1,199 people per square mile) and has a total estimated population of 11,890,784. The population of Burundi comprises of 86.2% rural population whose major livelihood strategy is agriculture (The World Fact Book, 2021). The country is administratively divided into three divisions, the largest of these divisions are the provinces (18 total provinces), followed by "communes" or municipals (117 communes in total), and the lowest administrative unit being 2,638 "collines" or hills/villages (2,638 collines in total).

Sample selection

A primary survey was conducted with 860 households across five provinces in Burundi (breakdown of sample in Table 1). A multi-stage cluster probability sampling with stratification was adopted to draw a sample of 860 male- and female-household heads in Burundi who are 18 years and above and thus qualify to own a financial account. For the purpose of this study, the country was sub-divided into North, South, East, West, and Central regions, where in each region one province was randomly selected, making a total of five out of 18 provinces which are Ngozi, Bujumbura Rural, Bujumbura Mairie, Rumonge, and Kayanza where data was collected in all the locations from 18 October 2021 to 11 November 2021. The required sample size for each province was based on size proportion (Krejcie & Morgan. 1970). Stratification was done in each province with respect to urban and rural areas where for each, one urban commune and one rural commune were selected making up a total of ten communes under the survey. Communes in this case were the clusters, where again, the required sample size for each cluster was obtained proportional to size. At least two villages (collines) from each cluster were sampled, leading to at least 20 primary sampling units, from which households/individuals were drawn. Importantly, because of the

high population dispersion between urban and rural, having a representative sample required allocation of the sample to be done proportional to size. The sampling frame for each village (colline) was based on the list of villages from the previous national census.

We designed and implemented a primary survey between October and November 2021. The survey questionnaire (in Appendix A) used for this study consisted of four main sections. The first section collected general information in relation to province, zone, village, area of residence, and length of stay in the community. Section two of the questionnaire consisted of questions on the socioeconomic and demographic characteristics of our respondents. Section three of the questionnaire gathered information on the various measures of financial inclusion; while the last section consisted of questions on the ownership of household assets.

Table 1: Distribution of sample in provinces and communes

Provinces	Frequency	Percentage
Bujumbura Mairie	193	22.44
Bujumbura Rural	129	15.00
Ngozi	197	22.91
Rumonge	116	13.49
Kayanza	225	26.16
Total sample	860	100

Source: Survey data (2021).

Measures of financial inclusion

Financial inclusion entails the level of access to and usage of basic financial services through formal financial institutions (Allen et al., 2016; Fungáčová & Weill, 2015). More specifically, financial inclusion is defined as the process of enhancing access to useful financial services and products that are required by vulnerable individuals in society, for example, low-income groups and weaker groups at affordable costs and in a transparent and fair way (Montfaucon, 2020). Notably, financial inclusion policies strive to incorporate the population that is unbanked into the formal financial system in order for them to have an opportunity of accessing financial services like payments, savings, and transfers to credits and insurance (Kostov et al., 2015). Measures of financial inclusion has evolved to encompass a wider range of ownership and use of financial products such as credit and debit cards, as well as electronic banking (Koomson & Ibrahim, 2018; Demirgüç-Kunt et al., 2015). Recent developments in the new generation of financial services accessed through mobile phones have necessitated the inclusion of mobile money as a measure of financial inclusion (Demirgüç-Kunt et al., 2018). Based on the foregoing discussion, we employ three binary indicators (formal bank account ownership, microfinance account

ownership, and mobile money account ownership) of financial inclusion for this study. The Pearson chi-square conducted indicates that male heads were significantly more included in all three measures of financial inclusion. These indicators and their level of use (frequencies) are presented in Table 2.

Table 2: Household financial inclusion by gender

Financial Inclusion Indicator	Overall		Female		Male		Chi²	p-value
	Yes	No	Yes	No	Yes	No		
Bank account	238	619	79	374	159	245	51.1	0.000
	(27.8)	(72.2)	(17.4)	(82.6)	(39.4)	60.6		
Microfinance account	250	606	112	342	138	264	9.62	0.002
	(29.2)	(70.8)	(24.7)	(75.3)	(34.3)	(65.7)		
Mobile money account	534	287	256	173	278	114	11.4	0.001
	(65)	(35)	(59.7)	(40.4)	(70.9)	(29.1)		

Notes: Numbers in parentheses are percentages. Chi2 = Pearson chi-square.
Source: Survey data (2021).

Measures of household welfare

Methods of examining the socio-economic position of a household are categorized into two broad groups: money-metric measures and alternative approaches (Prakongsai, 2006). Over the years, economists have been noted to use the money-metric approach because it is easy to measure and widely understood by the general public. In such terms, a household whose income or expenditure falls below a specified threshold is considered poor and hence has lower welfare or standard of living (Falkingham & Namzie, 2001). However, measurement problems associated with the use of income and expenditure data, particularly in developing countries, have necessitated the need for alternative measures (Sahn & Stifel, 2001).

Issues associated with monetary measures of welfare gave rise to the generation of the household asset index as an alternative measure of household welfare. Introduced since 1998 by studies such as (Sahn & Stifel, 2001; Filmer & Pritchett, 1998), this method uses information on household assets to describe the welfare status of a household. Sahn and Stifel (2001) argued that, the asset-based measure of household welfare ranks higher than that of income or expenditure measures of welfare because: (1) household assets are fewer and easier to measure, (2) data on household assets have better accuracy and validity, and (3) assets are less likely to contain reporting bias and valid to be assessed by the interviewer. Following Finan et al. (2005), this study employs six household durables to create a household welfare index for Burundian households. The assets used in our study are presented in Table 3 where respondents were asked to answer yes or no to the ownership of such assets. The Pearson chi-square conducted revealed that male-headed households owned significantly more assets than female-headed households.

Table 3: Household asset ownership by gender

Household Asset	Overall		Female		Male		Chi^2	p-value
	Yes	No	Yes	No	Yes	No		
Motorcycle	55	774	22	418	33	356	4.04	0.044
	(6.6)	(93.4)	(5.0)	(95.0)	(8.5)	(91.5)		
Bicycle	288	541	151	289	137	252	0.07	0.786
	(34.7)	65.3	(34.4)	(65.6)	(35.2)	(64.8)		
Refrigerator	50	779	19	421	31	358	4.86	0.028
	(6.0)	(94.0)	(4.3)	(95.7)	(8.0)	(92.0)		
Television	229	600	89	351	140	249	25.66	0.000
	(27.6)	(72.4)	(20.2)	(79.8)	(36.0)	(64.0)		
Radio	545	284	248	192	297	92	36.62	0.000
	(65.7)	(34.3)	(56.4)	(43.6)	(76.4)	(23.6)		
Mobile phone	591	238	292	148	299	90	11.12	0.001
	(71.3)	(28.7)	(66.4)	(33.6)	(76.9)	(23.1)		

Notes: Numbers in parentheses are percentages. Chi2 = Pearson chi-square.
Source: Survey data (2021).

Construction of indexes for financial inclusion and household asset (welfare)

The generation of a composite indicator for both financial inclusion and household asset include methods such as principal component analysis, factor analysis, and multiple correspondence analysis (Koomson et al., 2020; Aslan et al., 2017; Tuesta et al., 2015; Akotey & Adjasi, 2014). Multiple correspondence analysis is regarded as the most appropriate and efficient tool to apply to index building when the set of indicators are categorical rather than continuous. The multiple correspondence analysis is non-parametric and it is not associated with preconditions of multivariate normality and linearity (Aslan et al., 2017).

Financial inclusion index

Constructing the financial inclusion index required that: (i) all indicators included are directly related to financial inclusion, and (ii) all information on the personal characteristics or environment of the individual that may bias the empirical estimation are excluded (Aslan et al., 2017). Responses to the questions on the various indicators of financial inclusion were Yes/No/missing, this justified the use of the multiple correspondent analysis for creating a financial inclusion index which was a continuous variable.

The Burt approach to multiple correspondence analysis was applied in the creation of a financial inclusion index using principal normalization which scales the coordinates by the principal inertias. Results presented in Table 5 show that the multiple correspondence analysis with Burt matrix and adjustments explain 97.12% of the total inertia in one dimension. It is worth noting that the cumulative percentage for the principal inertias does not add up to 100% because these are lower-bound estimates in the Burt method with adjustments (STATA, 2015). The resultant financial inclusion index is a continuous variable for which a unit increase suggests an enhancement in the level of financial inclusion. The mean values for the various financial inclusion indicators are shown in Table 4, and the results indicate that financial inclusion among Burundians is very low and requires targeted government interventions.

Table 4: Indicators used for generating the financial inclusion index

Financial inclusion indicators	Units	Mean	Std. Dev.
Ownership of bank account	Categorical	1.272	0.448
Ownership of microfinance account	Categorical	1.292	0.455
Ownership of mobile money account	Categorical	1.650	0.477
Financial inclusion index	Continuous	0.030	0.996

Note: Std. Dev.: standard deviation.
Source: Computed from survey data (2021).

Table 5: Multiple correspondence analysis for financial inclusion index

Dimension	Principal inertia	%	Cumulative %
Dimension 1	0.153	97.12	97.12

Source: Computed from survey data (2021).

Household asset index

The household asset index is a welfare composite indicator generated from specific underlying assets of a particular household (Johnston & Abreu, 2013). In this regard, a household asset index, say ASSTi is a function of specific underlying variables, say Pij, such that, Pij denotes household i's ownership or lack of asset j. This can be illustrated as;

$$\mathrm{ASST}_i = f(\mathrm{P}_{ij}) \tag{1}$$

This can be expanded as:

$$\mathrm{ASST}_i = \mathrm{P}_{i1} + \mathrm{P}_{i2} + \ldots + \mathrm{P}_{im}\,, \tag{2}$$

Where: P_{ij} is a categorical variable that takes the value of 1 if household *i* owns asset *j*, and 0 if otherwise.

Given this brief background, the multiple correspondence analysis was adopted to create a household asset index following Akotey and Adjasi (2014). Using the Burt approach to multiple correspondence analysis, the result in Table 7 shows that 80.02% of the total inertia in the two dimensions is explained by the Burt matrix and adjustment. Dimensions 1 and 2 were retained for the creation of the household asset/welfare index. Again, it is worth noting that the cumulative percentage for the principal inertias does not add up to 100% because these are lower-bound estimates in the Burt method with adjustments (STATA, 2015). The resultant household asset index is a continuous variable for which a unit increase suggests an enhancement in the level of household welfare. The mean values for the various household assets are shown in Table 6. The results show that majority of the sample, and Burundi for that matter, are asset poor and hence have lower household welfare.

Table 6: Household assets used for generating household asset/welfare index

Financial inclusion indicators	Units	Mean	Std. Dev.
Ownership of motorcycle	Categorical	1.066	0.249
Ownership of bicycle	Categorical	1.347	0.476
Ownership of refrigerator	Categorical	1.060	0.238
Ownership of television	Categorical	1.276	0.447
Ownership of radio	Categorical	1.657	0.475
Ownership of mobile phone	Categorical	1.713	0.453
Household asset/welfare index	**Continuous**	**-1.51e-08**	**1.001**

Note: Std. Dev.: standard deviation.
Source: Computed from survey data (2021).

Table 7: Multiple correspondence analysis for household asset/welfare index

Dimension	Principal inertia	%	Cumulative %
Dimension 1	0.029	73.21	73.21
Dimension 2	0.003	6.82	80.02

Source: computed from survey data (2021).

Analytical procedures

Descriptive statistics

Descriptive statistics (mainly frequencies and percentages) were used to identify and describe the main sources of credit, the main modes of savings, and the main uses of mobile money accounts in Burundi. The chi-square test was conducted to assess differences in main sources of credit, the main modes of savings, and the main uses of mobile money accounts by gender.

Estimation technique and empirical model

To address the second objective of the study, a 2SLS model was estimated. Following Adelekan and Omotayo (2017) and Ajayi and Oyekale (2012), the study employed the Two-stage Least Squares (2SLS) regression to examine the effect of financial inclusion on household welfare in Burundi. This method was adopted because the financial inclusion variable is considered potentially endogenous (Koomson et al., 2020; Koomson & Ibrahim, 2018; Swamy, 2014). Endogeneity, in this case, stems from unobserved transaction costs which may be directly related to a household's assets ownership/welfare; as such, the presence of a financial institution (either a bank and/or microfinance) in one's locality and ownership of a mobile money account by a relative/neighbour (both binary) were used as instruments to address this problem. Cameron and Trivedi (2010) observed that a valid instrument must have a direct relationship with the potentially endogenous variable, but must not have a direct relationship with the dependent variable. The presence of a financial institution within one's community satisfies both conditions because, on the one hand, the presence of a financial institution in one's community implies proximity and hence reduces the transaction costs and increases the level of access to greater financial products and services (Brown et al., 2015). On the other hand, the presence of a financial institution in one's community can only influence household welfare only through its influence on the factors that affect financial inclusion. Again, the ownership of a mobile money account by a relative is likely to influence an individual to get a mobile money account for easy transfer of money (for example remittances) between relatives living in different parts of the country; on the other hand, a relative's ownership of a mobile money account can only influence one's welfare only through its effect on financial inclusion.

After justifying the use of our instruments, we proceed by estimating the two-stage least square. Traditionally, estimation of the two-stage least squares begins with stage one which regresses the financial inclusion index on our instruments and other covariates, and step two follows by plugging in fitted values from stage one into the second equation to be estimated by OLS (Adelekan & Omotayo, 2017). However, Angrist and Pischke (2009) indicates that such a stepwise estimation opens the door for mistakes hence, the use of the ivregress 2sls command in STATA for this study to avoid such mistakes.

The estimated models are given as:

Reduced form equation (stage 1)

$$FI\_Index_i = \delta_0 + \delta_1 CommBank_i + \delta_2 ComMicrofin_i + \delta_3 RelativeMomo_i + \delta_4 Gender_i + \delta_5 Age_i + \delta_6 Educ_i + \delta_7 Area_i + \delta_8 Yrslived_i + \delta_9 SocNetwk_i + \delta_{10} Electric_i + \delta_{11} Hhlivestoc_i + \delta_{12} Hhsize_i + + \mu_i \quad (3)$$

Structural equation (stage 2)

$$\begin{aligned}\text{Welfare}_i = {} & \theta_0 + \theta_1 \text{FI\_Index}_i + \theta_2 \text{Gender}_i + \theta_3 \text{Age}_i + \theta_4 \text{Educ}_i + \theta_5 \text{Area}_i + \theta_6 \text{Yrslived}_i + \\ & \theta_7 \text{SocNetwk}_i + \theta_8 \text{Electric}_i + \theta_9 \text{Hhlivestoc}_i + \theta_{10} \text{Hhsize}_i + \theta_{11} \text{Marital}_i + \theta_{12} \text{EducFI}_i + \\ & \theta_{12} \text{SocNetwkFI}_i + \theta_{13} \text{HhlivestocFI}_i + \theta_{14} \text{AreaFI}_i + \theta_{15} \text{GenderFI}_i + \theta_{10} \text{ElectricFI}_i + \varepsilon_i\end{aligned} \quad (4)$$

Where: FI_Index is financial inclusion, Welfare is household asset-based welfare, CommBank is bank within community (1=yes and 0 otherwise), ComMicrofin is microfinance within community (1=yes and 0 otherwise), RelativeMomo is relative mobile money account ownership (1=yes and 0 otherwise), Gender is the gender of the head of household (1=male and 2=female), Age is the age of the head of household (measured in years), Educ is whether household head has any formal education (1=yes and 0 otherwise), Area is the area of residence (2=urban and 1=rural), Yrslived is the number of years continuously lived in the community (measured in years), SocNetwk is membership of a social network (2=yes and 1 otherwise), Electri is household access to electricity (2=yes and 1 otherwise), Hhlivestoc is household livestock ownership (2=yes and 1 otherwise), Hhsize is the size of the household, and Marital is the marital status of the respondent (1=unmarried and 2=married). The model included six interaction terms; these were six variables that interacted with the financial inclusion index.

Summary statistics

From the summary statistics displayed in Appendix B, it is evident that urban households have greater household assets than their rural counterparts. In terms of gender, male-headed households have greater ownership of household assets than female-headed households. This suggests that female-headed households have lower welfare status compared to male-headed households in Burundi. Again, urban households were more financially included than rural households. There exists a wide gap between the level of financial inclusion in rural and urban areas. Financial inclusion in Burundi, in general, can be regarded as low; however, there is a gender dimension to this phenomenon. Male-headed households were seen to be more financially included than female-headed households in Burundi. Ownership of mobile money accounts was the major driver in the general level of financial inclusion.

4. Results and discussion

Main sources of credit, savings mode, and uses of mobile money

Table 8 indicates that approximately 28% of our respondents reported having access to credit in the past five years. The study identified seven major sources of credit for households in Burundi; these include relatives and friends, public bodies, banks, microfinance institutions, community-based organizations, mutual support groups, and private loan structures. About 31.8%, 37.2%, 2.9%, and 2.5% of our respondents reported getting credit from relatives and friends, microfinance institutions, community-based organization and private loans, respectively; these sources showed no significant gender differences. About 20.1% of the respondents with access to credit reported getting credit from banks, and males had significantly higher access to bank credit than females (27.5% versus 9.9%, P<0.001). Female heads reported significantly higher access to credit through mutual support groups than male household heads (22.8% versus 9.4%, P<0.004).

Five main avenues for saving were identified among households in Burundi as presented in Table 8. About 59.9% of our respondents reported home savings as their main form of savings, female heads significantly opted for home savings compared to their male counterparts (69.6% versus 49.1%, P<0.000). Significantly more male heads saved at microfinance institutions and banks than their female counterparts (28.5% versus 20.8%, P<0.009 and 26.6% versus 10.2%, P<0.000), respectively. The use of mobile money accounts and local savings groups showed no gender dynamics. While the use of local savings groups was minimal among both male and female respondents, the use of mobile money as a saving avenue was high among both males and females.

The major uses of mobile money accounts in Burundi were classified under three broad categories. These major uses include paying bills, receiving money and for savings purposes. The majority of respondents (71.45%) reported that they mainly use their mobile money account to receive money. Significantly more males used their mobile money accounts to receive money than their female counterparts (74.66% versus 68.23%, P<0.056). Significantly more males reported using their mobile money accounts to pay various bills than their female counterparts (19.28% versus 9.39%, P<0.000).

Table 8: Sources of credit, savings mode and uses of mobile money

Variable	Overall		Female		Male		Chi^2	p-value
	Freq.	%	Freq.	%	Freq.	%		
Access to credit	240	28.10	101	22.30	139	34.66	16.10	0.000
Credit sources								
Relatives and friends	76	31.8	32	31.7	44	31.9	0.001	0.974
Public body	4	1.67	0	0	4	2.9	2.977	0.084
Bank loan	48	20.1	10	9.9	38	27.5	11.30	0.001
Microfinance	89	37.2	39	38.6	50	36.2	0.142	0.707
Community-based organization	7	2.9	3	2.9	4	2.9	0.001	0.974
Mutual support group	36	15.1	23	22.8	13	9.4	8.126	0.004
Private loan structure	6	2.5	3	2.9	3	2.2	0.151	0.697
Mode of savings								
Home saving	512	59.95	314	69.6	198	49.1	37.22	0.000
Local group	50	5.85	29	6.43	21	5.2	0.574	0.449
Microfinance	209	24.47	94	20.8	115	28.5	6.815	0.009
Bank	153	17.92	46	10.2	107	26.6	38.69	0.000
Mobile money	339	39.7	169	37.5	170	42.2	1.973	0.160
Use of Mobile money								
Pay bills	104	14.34	34	9.39	70	19.28	14.43	0.000
Receive money	518	71.45	247	68.23	271	74.66	3.666	0.056
Save money	386	53.24	190	52.49	196	53.99	0.166	0.684

Notes: Chi2 = Pearson chi-square; Freq = frequencies; and % = percentage.
Source: Survey data (2021).

Regression results

The results of the first stage regression, which considers the determinants of financial inclusion, are presented in Appendix C. All the three instruments had a positive and significant impact on the financial inclusion level of a household. Before proceeding to analyse the effect of financial inclusion on household asset-based welfare, we begin by interpreting the Durbin-Wu-Hausman test of endogeneity and the Basmann test of overidentification. Result for the Durbin-Wu-Hausman test of endogeneity in all the models is significant at the 0.01 alpha level, so the null hypothesis of no endogeneity is rejected (STATA, 2015). The result implies that the standard OLS model is inconsistent in explaining the effect of financial inclusion on household asset-based welfare, hence the need to interpret estimates from the two-stage least squares model. Comparison of the estimates from the OLS model (which does not account for endogeneity) and the two-stage least squares model show that the OLS model underestimates (biased downwards) the effect of financial inclusion of household asset-based welfare. The

Basmann test of overidentifying restrictions produced statistically insignificant results, which imply that our instruments are valid (STATA, 2015). After justifying the use of the two-stage least squares model, we now proceed to interpret the results obtained through the two-stage least squares model. It is noteworthy that an improvement in financial inclusion is echoed in an increase in the value of the financial inclusion index by one unit.

Overall, financial inclusion has a positive effect on household welfare (see Table 9). An improvement in financial inclusion of a household increases that household's welfare by about 272%. This welfare-enhancing effect of improved financial inclusion supports findings of previous studies (Koomson et al., 2020; Ofori-Abebrese et al., 2020; Mohammed et al., 2017; Swamy, 2014). Alliance for Financial Inclusion (AFI, 2015) pointed out that improvement in financial inclusion enhances the entrepreneurial ability of the beneficiaries which in turn increases household income and hence improvement in household welfare. Gender-wise, interacting financial inclusion with gender revealed that improved financial inclusion for female-headed households led to about a 31.5% increase in welfare than male-headed households. This indicates that the impact of financial inclusion on the welfare of female-headed households is more pronounced than in male-headed households. The difference in the impact of financial inclusion between male-headed and female-headed households observed in this study is similar to findings in other studies (Koomson et al., 2020; Swamy, 2014). Greater financial access has been demonstrated to be connected with reduced reliance on local output and an increase in investment in human capital (Amendola et al., 2016). The impact of financial inclusion on female-headed households is greatest because less privileged households, such as female-headed households, tend to benefit more from being financially included than non-poor households (Iddrisu & Danquah, 2021).

Improved financial inclusion among formally educated household heads led to about a 47.3% increase in household welfare. This may be due to the fact that educated individuals are able to make the most out of the opportunities presented by being financially included. Moreover, urban households that were more financially included witnessed a 39.1% increase in household welfare. The effect of financial inclusion on household welfare was more pronounced in urban Burundi. This may be due to the significant differences in financial infrastructures between rural and urban Burundi (BRB, 2012). These results are in tandem with the findings of Mallick and Zhang (2019) who found that overall welfare grew as a result of financial inclusion, even though such growth in welfare was greater in urban households than in rural households. Access to electricity for the more financially included households resulted in a 106% increase in household welfare. This may be because the most readily accessible form of financial inclusion, which is mobile money, is highly dependent on the availability of electricity. Having access to electricity ensures that mobile phones are always switched on and that can further enhance transactions that lead to household betterment.

On the contrary, financially included households that belong to social networks such as mutual support groups experienced about 9% reduction in household welfare, albeit significant. Financially included households with household livestock

experienced about 60% reduction in household welfare. The seemingly negative association improved financial inclusion has with household livestock may be due to the fact that households looking to be financially included tend to sell off some livestock to purchase assets such as mobile phones, and as such reduce household welfare in the short to medium term. However, we postulate that such a reduction in welfare may not persist over time since the household is likely to begin enjoying the benefits of being financially included in the long term.

Table 9: Instrumental variables (2SLS) regression

Household Welfare Index	OLS		2SLS	
	Coef.	St. Err	Coef.	St.Err.
Financial inclusion index	0.313**	0.128	2.727***	0.824
Education##Financial Inclusion	0.003	0.078	0.473**	0.184
Social Network##Financial Inclusion	-0.106*	0.061	-0.09	0.072
Household livestock##Financial Inclusion	-0.296***	0.058	-0.607***	0.128
Urban##Financial Inclusion	0.071	0.081	0.391**	0.178
Female##Financial Inclusion	0.145**	0.059	0.315*	0.172
Electricity##Financial Inclusion	0.081	0.077	1.066***	0.393
Urban	0.407***	0.086	-0.372***	0.103
Formal education	0.163**	0.077	0.12	0.131
Social network	-0.110*	0.061	-0.146**	0.073
Female	0.109*	0.058	0.129*	0.069
Household livestock ownership	-0.116*	0.060	-0.145**	0.072
Electricity access	0.285***	0.073	-0.204**	0.091
Married	-0.030	0.061	-0.115	0.078
Household size	-0.043***	0.012	-0.035**	0.014
Age of respondent	0.000***	0.000	0.000	0.000
Years lived in the community	0.069	0.052	0.001	0.003
Constant	1.22***	0.190	0.826***	0.265
Number of observations	833		828	
R-squared		0.399		0.131
Prob > Chi2/F		0.000		0.000
Durbin chi2				39.92***
Wu-Hausman				
Basemann chi2 (p-value)				41.28***
2.77 (0.25)				
Instrumented: *Financial Inclusion index****; Instruments:*** *Availability of Bank and/or Microfinance Institution in the community and Relative/Neighbour owning a mobile money account.*				

Notes: *** p<.01, ** p<.05, * p<.1. Coef = coefficients, St Err = robust standard errors.

5. Conclusion and policy implications

The study observed that male-headed households were more financially included than female-headed households in all the various measures of financial inclusion. Mobile money account ownership showed the highest (59.58%) financial inclusion for female-headed households among the three indicators of financial inclusion. We further observed significant gender differences in terms of access to credit, mode of saving, and the use of mobile money. In most of the cases, females were at the disadvantage and hence need targeted policies to enable them to attain the levels of their male counterparts. Financial inclusion has been heralded as a panacea to improving the welfare of the marginalized in society, especially in post-conflict and fragile states such as Burundi. The study has established that the welfare effect of improved financial inclusion is greater in female-headed households, urban households, educated households, as well as households with access to electricity.

Based on our findings, the study proposes that more resources must be committed to ensuring a serene environment for financial institutions to operate in to improve the level of financial inclusion. Ensuring a serene environment for financial institutions to operate within may entice the populace to shift from home savings and start saving in such institutions. Our study found low patronage of microfinance institutions, especially among female-headed households; to this effect, we recommend a total review of the regulatory and institutional framework guiding the microfinance sector to make it more attractive for female-headed households. Given the relatively higher inclusion of females in mobile money account ownership, policies should be put in place to institute a small loan structure that women can access through their mobile money platforms. Lastly, banks should find innovative ways such as “group loans” to overcome the challenge of collateral mostly faced by female-headed households in their quest to access credit from banks.

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Appendixes

Appendix A. Survey questionnaire

Evaluation of the Impact of Financial Inclusion on Poverty Reduction in Burundi

PART 1: General Information

1	Name of enumerator		
2	Name of respondent		
3	The contact number of respondent		
4	Province	Kayanza Ngozi Gitega Rumonge Buja R Buja M	[ ]0 [ ]1 [ ]2 [ ]3 [ ]4 [ ]5
5	Commune		
6	Zone		
	Village		
7	How long have you stayed in this community (years)		
8	Area of residence	Urban Peri-urban Rural	[ ]0 [ ]1 [ ]2

PART 2: Socio-Demographic Characteristics

SD	Category	Variables	Code
201	Gender	Male	[ ]0
		Female	[ ]1
202	Age (years)		
203	Highest educational level	No formal education	[ ]1
		Primary school	[ ]2
		Junior high school	[ ]3
		Senior secondary school	[ ]4
		Tertiary education	[ ]5
		Postgraduate	[ ]6
204	Marital status	Single	[ ]1
		Married	[ ]2
		Divorced	[ ]3
		Widowed	[ ]4
205	Size of household (including respondent)		
206	How many years have you spent in this occupation?		
207	Are you a member of a social network	Yes	[ ]1
		No, if NO, go to 301	[ ]2
			[ ]3
			[ ]4
			[ ]5
			[ ]6
			[ ]7
208	Which social network do you belong to	Farmers group	[ ]1
		Savings and loans group	[ ]2
		Women group	[ ]3
		Denominational group	[ ]4
		Solidarity group	[ ]5
		Community based organization	[ ]6
			[ ]7
209	Has any member of your household migrated to another area in the last 12 months?	Yes	[ ]0
		No	[ ]1

PART 3: Financial Inclusion

FI	Category	Variables	Code
301	Do you have a bank account	Yes, if YES, go to 303	[ ]0
		No	[ ]1
302	Why don't you have a bank account	Low income	[ ]1
		Physical disability	[ ]2
		Long distance to financial institution or branch	[ ]3
		Low level of awareness	[ ]4
		Low level of financial literacy and capabilities	[ ]5
		Lack of trust and confidence	[ ]6
		Religious belief	[ ]7
		Complex financial products	[ ]8
		Inefficient regulations	[ ]9
303	How many times did you use your bank account last month?		
304	Do you have an ATM card	Yes	[ ]0
		No, if NO, go to 306	[ ]1
305	How many times did you use it last month?		
306	Do you have a mobile phone	Yes	[ ]0
		No, if NO, go to 310	[ ]1
307	Do you have a mobile money account?	Yes	[ ]0
		No, if NO, go to 310	[ ]1
308	Did you use it to do any of these transactions?	Paying bills	[ ]3
		Receiving money	[ ]2
		Saving money	[ ]1
		None	[ ]0
309	Does any member of your household own a mobile money account	Yes	[ ]0
		No	[ ]1
310	Did you use any mobile money account for transactions last month (whether yours or not)	Yes	[ ]0
		No	[ ]1
311	Do you belong to any local savings and credit group	Yes	[ ]0
		No	[ ]1
312	Do you have an account with any microfinance institution	Yes	[ ]0
		No	[ ]1
313	Have you borrowed before	Yes	[ ]0
		No, if NO, go to 316	[ ]1

314	How much did you borrow?	Formal financial institution	[ ]1
		Microfinance	[ ]2
		Group association	[ ]3
		Family and friends	[ ]4
		Local money lender	[ ]5
		Mobile money agent	[ ]6
315	What was the source of the loan	Relatives and friends	[ ]1
		Public body (government-led structure)	[ ]2
		Banks	[ ]3
		Microfinance institutions	[ ]4
		Community based organization	[ ]5
		Mutual support group	[ ]6
		Private loan structure	[ ]7
		Other, specify ( )	
316	Do you receive remittances	Yes	[ ]0
		No	[ ]1
319	Do you have any banks in your community	Yes	[ ]0
		No	[ ]1
320	Do you have any microfinance institutions in your community	Yes No	[ ]0 [ ]1
321	What is the distance from your house to the nearest financial institution (minutes)	Less than 30 minutes	[ ]0
		30 minutes	[ ]1
		45 minutes	[ ]2
		1 hour	[ ]3
		1 hour 30 minutes	[ ]4
		2 hours	[ ]5
		More than 2 hours	[ ]6
322	What is the distance from your house to the microfinance institution (km)		
323	Do you have a relative or neighbour who works in a bank/microfinance/mobile money provider?	Yes	[ ]0
		No	[ ]1
325	Do you receive government transfers	Yes	[ ]1
		No	[ ]2
326	What mode do you use for your savings	Home	[ ]0
		Local group	[ ]1
		Microfinance institution	[ ]2
		Bank	[ ]3
		Mobile money account	[ ]4
		Other, specify ( )	

327	Are you aware of mobile money	Yes No	[ ]0 [ ]1
328	Are you aware of any bank product	Yes	[ ]0
329	Do you know any financial institution	No Yes No, if NO, go to 331	[ ]1 [ ]0 [ ]1
330	Mention the name of one financial institution you know		
331	What transaction have you done with any financial institution before	Borrow Saving Deposit Withdrawal None	[ ] [ ] [ ] [ ] [ ]

PART 4: Household Assets and Housing Condition

HA	Category	Variables	Code
403	Which household assets do you own	Vehicle Motorcycle Bicycle TV Radio Mobile phone Computer Refrigerator None	[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
404	How many rooms does your household occupy?		
405	What materials were used for the walls of your house	Wood Iron sheet Clay bricks Baked bricks Soil bottomed Cement blocks	[ ]0 [ ]1 [ ]2 [ ]3 [ ]4 [ ]5
406	What materials are used for your roof	Straw/grass/thatch Iron sheets Tiles Slate	[ ]0 [ ]1 [ ]2 [ ]3
407	What is your main source of water?	River Fountain Borehole Pipe Other, specify ( )	[ ]0 [ ]1 [ ]2 [ ]3

408	What is your source of energy for cooking	Wood Farm residue Charcoal Firewood Electric stove Gas stove None Other, specify ( )	[ ]0 [ ]1 [ ]2 [ ]3 [ ]4 [ ]5 [ ]6
409	What toilet facility do you have	Septic tank/cesspool Modern toilets/latrines None	[ ]0 [ ]1 [ ]2
410	Is your house painted	Yes No	[ ]0 [ ]1
412	Does any member of your household own any livestock, herds, poultry or other farm animals	Yes No	[ ]0 [ ]1
413	Does any member of your household own an agricultural land	Yes No, if NO, go to 415	[ ]0 [ ]1
414	How many hectares do members of this household own		
415	Does your house have electricity	Yes No	[ ]0 [ ]1

Appendix B. Summary statistics

Table B1: Summary statistics of variables used in the study

Variables	Overall		Location				Gender			
			Rural		Urban		Female		Male	
	Mean	Std Dev.	Mean	Std Dev.	Mean	Std Dev.	Mean	Std Dev.	Mean	Std Dev.
Household Welfare										
Motorcycle	1.066	0.249	1.044	0.205	1.121	0.327	1.050	0.218	1.085	0.279
Bicycle	1.347	0.476	1.422	0.494	1.163	0.370	1.344	0.476	1.352	0.478
Mobile phone	1.713	0.453	1.669	0.471	1.820	0.385	1.663	0.473	1.769	0.422
Radio	1.657	0.475	1.615	0.487	1.762	0.427	1.563	0.497	1.763	0.425
Refrigerator	1.060	0.238	1.012	0.108	1.180	0.385	1.043	0.204	1.080	0.271
Television	1.276	0.447	1.125	0.331	1.649	0.478	1.200	0.401	1.360	0.481
Financial Inclusion										
Bank account	1.278	0.448	1.132	0.338	1.649	0.338	1.173	0.378	1.394	0.489
Microfinance account	1.292	0.455	1.236	0.425	1.433	0.497	1.245	0.431	1.343	0.475
Mobile money account	1.650	0.477	1.554	0.497	1.887	0.318	1.596	0.491	1.709	0.455
Socio-Demographics										
Gender	1.470	0.499	1.426	0.495	1.583	0.494				
Area of residence	1.283	0.451					1.222	0.416	1.349	0.477
Years in Community	25.06	16.67	25.89	16.85	22.96	16.04	25.30	17.10	24.84	16.19
Age	40.26	13.45	40.73	14.06	39.05	11.69	40.55	14.09	39.95	12.71
Household size	5.505	2.531	5.648	2.476	5.140	2.634	5.407	2.362	5.624	2.703
Education	0.691	0.462	0.608	0.489	0.901	0.299	0.602	0.490	0.790	0.408
Social network	1.370	0.483	1.357	0.479	1.403	0.492	1.363	0.481	1.379	0.486
Married	1.677	0.468	1.689	0.463	1.646	0.479	1.720	0.449	1.638	0.481
Access to electricity	1.438	0.496	1.254	0.436	1.901	0.299	1.329	0.470	1.560	0.497
Household livestock	1.397	0.490	1.466	0.499	1.226	0.419	1.399	0.490	1.395	0.490

Source: Survey data (2021).

Appendix C. First stage regression results from IV 2SLS

Table C1: First stage regression

Financial Inclusion Index	Coef.	St.Err.	t-value	p-value	Sig
Bank in community	0.026	0.068	5.44	0.000	***
Microfinance in community	0.066	0.021	3.10	0.002	***
Relative has mobile money account	0.069	0.023	2.95	0.003	***
Education##Financial inclusion	0.195	0.020	9.74	0.000	***
Social network##Financial inclusion	0.003	0.017	0.17	0.863	
Household livestock##Financial inclusion	0.144	0.015	9.34	0.000	***
Urban##Financial inclusion	-0.165	0.021	-7.74	0.000	***
Female##Financial inclusion	0.181	0.015	12.27	0.000	***
Electricity##Financial inclusion	0.457	0.014	33.72	0.000	***
Urban	-0.007	0.023	-0.29	0.774	
Formal education	-0.105	0.021	-5.09	0.000	***
Social network	0.023	0.017	1.39	0.164	
Female	-0.011	0.016	-0.72	0.472	
Household livestock ownership	0.026	0.017	1.56	0.119	
Electricity access	-0.047	0.020	-2.31	0.021	**
Married	0.039	0.017	2.34	0.020	**
Household Size	-0.003	0.003	-0.94	0.348	
Age of respondent	0.000	0.000	1.03	0.072	
Years lived in the community	-0.039	0.014	-2.79	0.005	***
Constant	0.826	0.265	3.11	0.002	***
Number of observations		828	F (19, 808)	930.31	
R-squared		0.956	Prob > F	0.000	
Adj R-squared		0.955	Root MSE	0.212	

Notes: *** p<.01, ** p<.05, * p<.1

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