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The paradox of the financial inclusion-poverty nexus in Malawi

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Abstract

The global concerted drive for financial inclusion (FI) as a solution for poverty reduction (PR) is confronted by indications that a majority of the target cite low incomes or poverty itself as a barrier to FI. This is paradoxical as it implies that the FI drive could especially leave the core-poor behind. This study offers a perspective on the foundations of the expectations of the FI-PR drive and the possible reasons for the paradox. The study then investigates the paradox from a different, indirect and independent perspective. Models are estimated for the FI-income and income-FI linkages using variables derived from a 2013 Malawi national household survey. The results indicate a bi-directional positive FI-income relationship and a negative poverty/low income–FI one implying support for the FI-PR push but also supporting the poverty-FI barrier effect. Other unsettling but familiar results indicate that the brunt of the FI-poverty imbalance is borne by the obviously weaker segments of society because poverty itself is associated with households that are larger, headed by those who are females, older, and with lower educational levels. The major implications of the present findings are dire in that the brokerage approach to reduce poverty via FI would not be a reliable one for the very low-income, the core-poor. These would need unconventional FI interventions and improvements on the direct PR approaches including addressing production and employment outcomes.

Keywords: Financial Inclusion–Poverty nexus; Malawi.

1. Introduction

For newly developing countries, the usual expectation would be that for sustainable economic development to occur, there is need for structural transformation. This requires the share of the primary sector in GDP and exports to decline while that of the secondary sector growing and of the tertiary sector growing even more to service the growth and diversification of the other sectors and itself. In the tertiary sector, financial services are the lifeblood of all economic activity and the economy. A competitive financial sector can provide efficiency with expanded outreach of financial services at lower prices. This is one of the reasons financial inclusion (FI) is associated with not only economy-wide developmental effects but micro ones too in terms of poverty reduction (PR) at the household level. It has been identified as an enabler to seven of the seventeen Sustainable Development Goals (SDGs) where holding of basic transaction accounts by households leverages them to other financial services such as credit and insurance, to start and expand businesses, invest in education or health, manage risk, and weather financial shocks. In short, FI can improve the overall quality of the lives of the low-income in the short-term and long-term through investments in business and education of their children to break the long-term cycle of poverty (Chibba, 2009; World Bank Group, 2017; & Beck *et al*., 2009).

In its earlier and simplest form, financial inclusion was defined as all initiatives that make formal financial services *available, accessible and affordable* to all segments of the population (Triki & Faye, 2013). But, global economic underdevelopment is staggering with an estimated 2 billion people having no access to formal financial services and more than 50% of adults in the poorest households are unbanked (World Bank, 2017). The barriers to account opening include distance from a financial service provider, lack of necessary documentation papers, lack of trust in financial service providers, and religion. Though obviously important, these have tended to be overshadowed by lack of enough money cited globally by 59 percent of adults as a reason for not having an account (World Bank, 2017). This implies that affordability can indeed be an issue especially for the low income.

For Malawi, which is among the poorest in the world, 80 percent of the population is rural, depending on smallholder agriculture and characterized by high levels of both poverty and financial exclusion. The national poverty rate is high at 50.7 percent, and ultra-poverty at 25 percent (National Statistical Office [NSO], 2012). Inequality as an attribute of poverty has been worsening with the

Gini coefficient of per capita income rising from 0.390 in 2004 to 0.452 in 2011 (NSO, 2012). Financial exclusion among the adult population is estimated at 46 percent i.e. those not using any financial products/services, neither formal nor informal to manage their financial lives (Finscope, 2014). In 2012, 59 percent of Micro, Small and Medium Scale Enterprises (MSMEs) were financially excluded, with 20 percent using informal mechanisms for managing business finances, and only 22 percent using products offered by commercial banks (Finscope, 2012). Reflecting global trends, financial exclusion is prevalent among women, and rural communities due to low income levels, poor physical and institutional infrastructure, and lack of collateral, among other reasons.

Considering that a large part of the population across the globe and Malawi is financially excluded, the World Bank Group has expressed optimism to achieving "universal financial access by 2020" because access to credit, insurance, savings and payments opens up opportunities for the poorest quintile to increase their income sustainably (Aguera, 2015). Similarly, the Malawi Government in collaboration with various stakeholders have implemented different initiatives to improve access to formal financial services. Interventions that are more direct have taken the form of mobile banking, internet banking and mobile money payment services (TNM Mpamba and Airtel money). These mechanisms have greater potential to reach the unbanked populations and serve the previously excluded than the traditional banking systems (Mandiwa, 2014; Nkuna, Lapukeni, & Kaunde, 2016).

Notwithstanding its importance, the literature explaining the FI-PR nexus is still scanty and can be selective in the direction of the linkage as well as the coverage of the poorest countries in empirical studies. Considering the global perspective and interest on the issue, the dearth of evidence presents a case for more analytical perspectives and independent empirical investigation of the paradox of the seeming bi-directional and adverse FI-poverty link. The present study offers an analytical perspective of the FI-PR link and potential problems. It then uses household survey data from Malawi to estimate models investigating whether the assumed FI-PR link can be statistically and independently corroborated and whether FI can be formally established as an affordability issue i.e. whether poverty can be a barrier to FI. For all stakeholders (Government and non-government), such linking of financial inclusion and poverty can contribute to policy frameworks that can be more relevant especially for the core-poor.

2. Review of literature

2.1. The FI-Poverty transmission routes: a critical perspective

For the most part the theoretical basis to provide specific guidance about the expected transmission mechanism(s) on the FI-Poverty nexus or as some would have it, the FI–inequality nexus has not been quite forthcoming in the literature. It would be insightful to offer a perspective of the FI-PR linkage. Below we suggest that the FI-PR enthusiasm can be explained from at least three perspectives: a) a framework based on basic microeconomics concepts; b) the link between FI and its nemesis (and origin),financial exclusion (FE), and c); economic theories that subsume, maybe longer-term and spontaneous, FI and PR outcomes in the link between financial development and general economic performance. Perhaps the urgency in the FI-PR push has emanated from the first two sources providing a normative, "FI ought to" argument while the third has provided the broader justification.

Left to private decision-making and markets, FI and Poverty can be linked via Engel's Law[1]. In the FI-poverty context, the utility maximization problem for low-income households can be characterized as comprising of direct utility goods in the form of basic necessities such as food and social services, and non-necessities. There would also be another category of goods like savings or financial services which would feature through the indirect utility function and make the budget constraint for the primal problem binding for all households i.e. expenditure on the poverty basket plus FI equals income. In the poverty reduction sense, the FI goods can be considered as playing a brokerage/ facilitator role, not being direct utility or production goods. With all goods having non-negative prices, Engel's Law would have the poorer households unable to afford some or all non-necessities which in less developed countries would most likely be non-food goods including FI products. This is because much as FI is supposed to alleviate poverty, this will be determined by effective demand for the FI products i.e. willingness and ability to pay or affordability determined by pricing, but also by barriers mentioned above.

The origins of the FI-Poverty enthusiasm have been traced to an observation in 2005 about the strong correlation between financial exclusion (FE) and poverty[2]. In an economic perspective, this makes FE a "bad" which needs to be

[1] Attributed to Ernst Engel (1821-96) who in a 1857 paper stated that the proportion of expenditure going to food (as a necessity) falls as income rises.

[2] Traced to an Indian central bank governor.

minimized or eliminated. FI would do the job since the FE-poverty association appears to be reasonable common sense because for the poor it excludes potentially transformational FI goods.

The foregoing notwithstanding the positive link between FI and PR is neither straight forward/direct nor even assured despite assurances of the poor's ability through FI to "save, access credit which can help smoothing consumption and spur investment for better incomes". Though some interesting insights are coming out from attempts to explain empirical results these have not led to a clarification and simplification of the transmission channel(s).

The FI-Poverty link involves inter-temporal choice with several dimensions of time at several levels: micro, macro and international. At the primal, micro level the available inter-temporal choices can be distinguished as involving FI as a) *transactional* (including precautionary) i.e. the Engels' Law goods and/ or b) *transformational* or target FI goods. A number of scenarios for the FI-PR can be proposed:

Scenario 1:Transactional choices/activities (short and medium-term)
The emerging definition of relevant FI transactional decisions and activities involving transaction accounts or services has been extended to include newer services such as sending and receiving money. Following Stigliz and Weiss (1981), Beck and Demirgüç-Kunt (2008) and others on investment theory an argument could be advanced that the benefits of FI are highest for the poor and formerly excluded. This is the entry dividend from the reduced costs e.g. for later access to higher level or transformational FI services like credit. This perspective is driving current experimental work with discriminating transactional accounts among smallholder farmers and villagers in Malawi with the aim of advancing and graduating them to higher-order transformational transactions (Brune *et al*.,2011). *Proposition 1a: Confronting Engels' Law: the poverty basket crowds-out FI goods but technology, financial innovations and related interventions can crowd-in the FI by lowering the barriers to FI for the poor. Proposition 1b: initial lower rung transactional FI entry goods pave the way for progressive transformational FI.*

Scenario 2:Transformational activities (the medium-term)
Outside the experimentations, the transformational choices are more discretional and strategic and aimed to change economic welfare including the poverty status. But this also has different time perspectives which suggest a possible two but linked FI-PR channels. There is the medium-term e.g. and especially involving

saving/borrowing for entrepreneurial activity. Investment theory again suggests that particularly for the micro and small enterprises in the informal sector their entry dividend would be lower-cost borrowing from formal sources as compared to the curb market. This would certainly be good for business activity and jobs in the lower-income segments of the economy. *Proposition 2: FI for the informal and small scale enterprises lowers transaction and borrowing costs which is good for their growth and related jobs and PR.*

Scenario 3: Transformational activities (the long-term) and human capital theory The longer term transformational activities are through investment in the human capital which can be shorter-term like investments in own skills training/ upgrading. But it could be longer-term to include the emphasis on human capital development through generational commitments to children's education, later known as the "inter-generational bargain" on which Adam Smith and John Stuart Mill's placed much importance for the global issue of "the wealth of nations" (see *Journal of International Development*, special issue 2000).

At the macro and international levels, the HR factor is incorporated in the earlier proponents for financial sector development in general (Schumpeter, 1911). Later the endogenous growth theory argues that investments in research and development, physical and human capital are major determinants of economic growth and poverty reduction (Romer, 1994). All this potential can be harnessed through financial sector development which implies FI.

Financial sector liberalization makes the sectors more competitive and more efficient with diverse players and products that include first line FI goods and extended outreach into the rural areas to support inclusive economic growth and employment (King & Levine, 1993; Beck *et al*., 2007). FI itself can raise the economic potential by promoting financial deepening through savings, investments (including human capital and innovation) and the monetisation of the economy (Mckinnon, 1973; Shaw, 1973). Just as there is a positive link between FI and economic growth, empirically studies in cross-country and individual countries suggest a strong negative correlation between poverty and overall economic growth (Hoekman *et al*., 2001).

It is now emerging from empirical observations that the medium-term route (entrepreneurship) might be linked to the longer-term human capital one, with the latter influencing the former. The social capital argument suggests that entrepreneurship and access to finance outcomes are often determined by social network ties including family in terms of education and even access to

credit (Coleman, 1988; Narayan, 1999). *Proposition 3a: The transformational FI-Poverty is not just long-term but macro and subsumed in many trends. Proposition 3b (the HR route): On the balance, the likelihood of being enterprising (non–poor) is not stochastic but determined by long-term even dynastic (ascribed/family) factors that can affect income such as education, location, skills acquisition, and even financial prospects.* This combined entrepreneur-dynastic FI-PR channel would be exclusivist and not amenable to quick response interventions and can leave the critical poor in the informal activities (Schmied & Marr, 2016).

Notwithstanding the FI route, this can also lead to unintended consequences where loans (transformational FI) are pushed and not based on assets to sustain cash flows. The Adhra Pradesh episode in India attests to this where loan interventions led to suicide when farmers got caught up in a cycle of debt, drought and crop failure (Kruger, 2015).

Scenario 4: Poverty-FI-The paradox of reverse causality
Even the HR route and the intergenerational bargain itself is susceptible to dilemmas and paradoxes regarding the FI-PR line of causality. Chiwaula and Kaluwa (2007) paused a dilemma that in poor countries the bargain can be broken for a number of poverty related reasons including affordability of the education, the nutritional requirements for brain development of the under-five and resilience to disease, all of which can interfere with educational attainment. In a similar vein for FI and poverty, one could ask, "If FI can be an answer to poverty, could there also be the dilemma that poverty itself could be a barrier to FI?" Global evidence reviewed above strongly suggests that "lack of enough money" or "low income" feature highly among the barriers to FI. *Proposition 4:The possibility of endogeneity-poverty negatively influencing FI.*

Scenario 5: (the very long-term or providence shot) is Scenario 2 with mutually beneficial labor market conditions and effects. *Proposition 5: The (lucky) and enterprising will create jobs to pull others out of poverty.* The issue would be whether and how there can be enough entrepreneurs doing what and where?

Despite the fact that some ways have been devised for handling especially issues in propositions 3 and 4 like using macro-economic time-series for Zambia (Odhiambo, 2009) or macro-panels for the US (Beck, Demirgüç-Kunt, Honohan, & Bank, 2008), aggregate FI and PR variables tend to miss out or misrepresent micro issues. Similarly, although cross-section cross-country data sets such as Findex have become available some critical variables like access to finance may be prone to selection bias with possible model misspecification because

the important skills variable is unobserved and yet as implied in Proposition 3b the skilled, a priori, can achieve a higher income than others.

2.2. Empirical review

2.2.1. Determinants of Financial Inclusion

Despite its recently hyped potential in reducing poverty, empirical literature on financial inclusion is still rare. Among the existing literature, Demirgüç-Kunt and Klapper (2013) analyzed the use of financial services in 148 countries by using 2011 data from the World Bank's Global Findex database. Based on three conventional measures of financial inclusion namely: ownership of a bank account, savings on a bank account and use of bank credit, their results indicate that FI is influenced by differences in income among countries and individuals within countries.

In a related but multifaceted study, Demirgüç-Kunt *et al*. (2013) analysed financial inclusion in the context of legal discrimination against women in developing countries. They observed that in countries where women face legal restrictions in their ability to work, they are less likely to own an account as well as to save and borrow relative to men. Their results suggest that apart from income other individual characteristics such as education, employment status, rural residency, age and gender remain significantly related to usage of financial services. After controlling for other individual and country characteristics their results also confirm that manifestations of gender norms such as the level of violence against women and the incidence of early marriage influence women's lower participation.

Using 2014 data from the World Bank's Global Findex Database on 37 African countries, Zins and Weill (2016) examined the determinants of financial inclusion in Africa. Their results show that gender, wealth, education and age influences financial inclusion. In addition, mobile banking is driven by the same determinants as traditional banking; and the determinants of informal finance differ from those of formal finance.

Fungáčová and Weill (2014) also used the World Bank's Global Findex Database for 2011 with formal ownership of account, formal savings and formal credit as the main financial inclusion indicators to analyse financial inclusion in China relative to other BRICS countries, namely Brazil, Russia, India and South Africa. Their results indicate that the high level of financial inclusion in China is facilitated by greater use of formal accounts and savings than in the other BRICS countries but the use of formal credit is however less frequent in

China. Their findings also show that borrowing from family or friends was the most common way of obtaining credit in all BRICS countries but other channels of borrowing are not very commonly used by individuals in China. Lastly, their results indicate that higher income, better education, being male and older are associated with greater use of formal accounts and credit in China. This implies a negative effect of lower income on FI.

For Nigeria, Efobi *et al*. (2014) examined access to and use of banking services by individuals using the financial inclusion data from Global Findex 2011. They find that apart from income, individual's attributes such as gender, age, education and ICT inclination significantly explained use of banking services in Nigeria.

Nkuna *et al*. (2016) have used both primary and secondary data to assess the role of commercial banks and digital finance in promoting financial inclusion in Malawi. They suggest that little had been achieved by the conventional channels in reaching the unbanked population particularly in the rural areas despite growth in commercial banks' infrastructure. As in other empirical studies reviewed above, they also confirm that women are more excluded than men largely due to low levels of income and education. They also postulate that although Mobile Money Operators (MNOs) have a great potential in providing financial services to the unbanked, their impact has been limited due to high levels of inactivity both at subscriber and agent level. This can be contrasted to the experience in Kenya where mobile money has largely replaced cash transactions and has significantly contributed to the monetisation of the economy.

Some studies have used indices such as number of accounts per 1000 adults as a proxy for penetration and financial inclusion (Sarma, 2008; Amidžić *et al*., 2014; & Honohan, 2008). The problem with this proxy is that it can overstate usage because one person may have several bank accounts (Kendall *et al*., 2010). In addition, Efobi *et al*.(2014) point out that foreigners who own accounts in a particular country will also increase and misrepresent the financial inclusion rate in that country. In this regard, the purpose of achieving universal financial access for the benefit of the poor will be obstructed.

2.2.2. Financial inclusion and poverty

A number of studies have addressed the possible effects of financial inclusion on poverty (Park & Mercado Jr., 2015; Burgess & Pande, 2005; Brune, Giné, Goldberg, & Yang, 2013; Agyemang-Badu, Agyei, & Duah, 2018; Kim, Yu, & Hassan, 2017; Mohammed, Mensah, & Gyeke-Dako, 2017). Much of this

literature is based on the linkages among financial access, deepening, economic growth and poverty reduction (Jappelli & Pagano, 1994; Kirkpatrick, Sirageldin, & Aftab, 2000; Odhiambo, 2009).

Park and Mercado (2015) tested the impact of financial inclusion on poverty and income inequality in 37 developing Asian economies. Using their own indicator they assessed the effect of various macroeconomic and country-specific factors on financial inclusion. Their results indicate that demographic characteristics, rule of law and per capita income significantly affect financial inclusion, and financial inclusion significantly reduced poverty and income inequality.

An evaluation of the impact of a policy-driven large state-led bank branch expansion program in India on rural poverty was undertaken by Burgess and Pande (2005). Their findings reveal that the programme significantly reduced rural poverty meditated by increased deposit mobilization and credit disbursement by the banks in rural areas. This suggest the relevance and importance of specific supply-side factors and interventions.

Following Park and Mercado (2015) and Sarma (2008), Agyemang-Badu *et al*. (2018) constructed a financial inclusion index taking into consideration country specific indicators to depict the state of financial inclusion in 48 African countries. They also investigated the impact of financial inclusion on specific macroeconomic performance determinants. The results show that financial inclusion is inversely related to both poverty and income inequality in Africa. Kim *et al*. (2017) assessed the impact of financial inclusion on economic growth in Organization of Islamic Cooperation (OIC) countries and found that financial inclusion positively affects economic growth.

Using a similar approach, Odhiambo (2009) examined the inter-temporal causal relationship between financial sector development and poverty reduction in Zambia. Three proxies of financial development were used, namely broad money supply (M2/GDP), domestic money bank assets (DMBA), and domestic credit to the private sector as gross domestic product ratio (DCP/GDP) against private per capita consumption as a proxy for poverty reduction. Using the autoregressive distributed lag-bounds testing procedure, the study finds that when the broad money supply ratio (M2/GDP) is used as a proxy for financial sector development, it is poverty reduction that seems to cause the development of the financial sector. However, when the DCP and the DMBA are used, financial development seems to cause poverty reduction, and not the other way round.

The impact of financial inclusion on poverty reduction among low-income individuals in Sub-Saharan Africa was explored by Mohammed *et al*. (2017) using data from 35 Sub-Saharan African countries based on the 2011 Global Findex database. By employing the treatment effect model and propensity score matching techniques, their results suggest that the poor who are financially included derive net wealth benefit and larger welfare benefit than those who are not financially included.

In a field experiment, randomly selected smallholder farmers in Malawi were offered two types of formal accounts, either ordinary accounts or both ordinary and "commitment" accounts (Brune *et al*., 2013). Commitment accounts customers had restricted access to their own funds until a future specified date (e.g. until next planting season so that funds could be preserved for farm input purchase). The experiment improved savings culture among rural Malawians and access to commitment savings account improved the well-being of poor household by tying access to savings for agricultural input use.

Majanga (2016) also analysed the history and current status of FI in Malawi and its associated impact on individual, societal, and overall nation development. Financial inclusion is found to have a direct relationship with economic performance and that individual economic independence, financial literacy, and accessibility play crucial roles in determining the levels of financial inclusion in an economy.

In a different thrust, Ardington & Leibbrandt (2004) examined the impact of formality of employment on the utilization of financial services in South Africa using data from the October 2000 Income and Expenditure Survey and the September 2000 Labour Force Survey. They find that access to formal financial services is limited to salaried workers and high income earners since access to a commercial bank account required identification documents such as pay slips, national ID among others, from registration process through to transacting the account. This excluded the poor and the unemployed who would not have the necessary identification documents. This formality barrier made the absence of basic financial services particularly in rural areas a major obstacle to growth and poverty reduction.

The general thrust of the literature on the relationship between financial inclusion and poverty suggests that access to financial services is likely to play an important role in growth, development and poverty reduction. Other studies suggest that financial sector participation is limited to people with higher levels

of income which means that effective use of financial services and products will tend to be sub-optimal by excluding poor people. These mixed findings present a case for additional empirical research and especially that focusing on the most relevant sample, the poorer countries like Malawi.

3. Methodology

3.1. Data source

Apart from consumer price indices used to determine real incomes, all the variables used in this study have been derived from the Financial Literacy and Consumer Protection Baseline Survey 2013 dataset (Chirwa & Mvula, 2014). This is cross-sectional data that was collected by Wadonda Consultancy in conjunction with the Reserve Bank of Malawi between July and November 2013.

The baseline covered a randomly selected national representative sample of 4,999 households throughout Malawi across four strata: cities, district urban districts, peri-urban centres and rural areas reflecting different income levels. The dataset provides information on individual characteristics, ownership of bank account and the use of formal financial services enabling the construction of financial inclusion indicators.

3.2. Determinants of financial inclusion

As a first step, a probit model has been specified to analyse the determinants of financial inclusion in Malawi. The probit estimation was used because the dependent variables are categorical. Three traditional indicators of financial inclusion have been used namely: formal ownership of an account, formal savings, and formal credit. These measures have been used in other studies as reviewed above (Efobi *et al*., 2014; Demirgüç-Kunt & Klapper, 2013; Mohammed *et al*., 2017; and Fungáčová & Weill, 2014). *An individual is therefore defined as being financially included if he/she accesses at least one of the formal financial services or products mentioned.*

The econometric model specified below follows those of Fungáčová and Weill (2014); Efobi *et al*. (2014); and Mohammed *et al*. (2017). The model has been modified to accommodate other considerations which are likely to be of importance in the Malawi context like location and ICT inclination (use of mobile phone for financial transactions). The probit regression model becomes:

$$\Pr\left(fin\_incl_i^k\right) = \Phi(\alpha_0 + \alpha_1 income_i + \alpha_2 age_i + \alpha_3 age_i^2 + \alpha_4 hhsex_i + \alpha_5 loc_i + \alpha_6 educ_i + \alpha_7 info\_borr._i + \alpha_8 ICT\_inclination_i) \quad (1)$$

Where $fin\_incl_i^k$ denotes financial inclusion, subscript *(i)* denotes adult representative of each household, and superscript k =1, 2 and 3 representing financial inclusion indicators. The implication is that three equations are estimated using three dependent variables namely: formal ownership of an account, formal savings and formal credit. From the three indicators, a composite aspect of financial inclusion is developed using Stata by recoding all the three traditional indicators into a new aggregate variable. This is a dummy indicating whether an individual is financially included or not, which is the benchmark for this study.

$\propto_0$ is the intercept. *Income* is natural log of per capita income; age_i is number in years for the adult representative; age_i^2 is age-squared capturing non-linearity in the model; $hhsex_i$ is sex of the adult representative (female=1 and male=0); loc_i represents location (urban=0 and rural=1); edu_i is education level for the household head measured in four levels from "no education" up to "university or tertiary"; $info\_borr._i$ is informal borrowing (money lenders, family/friends and employers); and $ICT\_inclination_i$ is usage of mobile phones for financial transactions (transfers, receipts, buy talk time and bill payments).

3.3. Financial inclusion and poverty

In the second step, the poverty model is specified with poverty being implied in income levels. In measuring monetary poverty there is an unsettled debate regarding whether poverty in less developed countries should be modelled using either income or consumption expenditure. It is argued that income and consumption vary from time to time, but income usually varies more significantly than consumption (Haughton & Khandker, 2009). As a result, current consumption is usually preferred to current income as an indicator of living standards in poor countries (NSO, NEC, & IFPRI, 2001).

However, this does not mean that consumption is a perfect measure of well-being because intra-household needs vary, but also households under-declare what they spend on illicit items or luxuries e.g. alcohol (Haughton & Khandker, 2009). As such, neither consumption nor income is an ideal measure of household well-being.

In this study, per capita income is used as a proxy for economic welfare and very lower incomes signifying poverty. This is because available data did not provide comprehensive information on consumption expenditure. Besides, Maki & Ohira (2014) using cross-sectional data from many countries empirically demonstrate that the Engel's curve in very poor households is upward sloping,

with the usual implication that given income, poor households' priority is on necessities (Haughton & Khandker, 2009). This provides some vindication on the use of per capita income as a measure of welfare.

According to this study, poverty status refers to whether the per capita income of a household is above or below the poverty line used as a threshold level[3]. In Malawi, the total poverty line was estimated at MK85, 852 implying that a household was poor if its per capita income is below this poverty line and non-poor if above this poverty line (NSO, 2014).

The poverty model has been specified using various individual characteristics and a dummy of the predicted value indicating whether an individual is financially included or not as follows:

$$ln\, y_i = \beta_0 + \beta_1 HHsize_i + \beta_2 hhsex_i + \beta_3 age_i + \beta_4 age_i^2 + \beta_5 loc_i + \beta_6 fin\_inc_i + \beta_7 educ_i + \beta_8 emp\_status_i + \varepsilon_i \quad (2)$$

Where $ln\, y_i$ is the natural log of per capita income; emp_status_i is employment status captured as a dummy for employed and self employed; fin_inc_i is financial inclusion captured as a dummy (financially included=1, and 0 otherwise). β_0 is the intercept and ε_i is the error term. The rest of the variables are as defined for equation (1).

The relationship between financial inclusion and poverty is prone to endogeneity due to selection bias, omitted variables and measurement error. But perhaps even more importantly in this case and as the literature suggest, there is a *prima facia* argument for a bi-directional link. To overcome any endogeneity problem, this study used Two Staged Least Squares estimator (2SLS) to estimate the parameters (Cameron & Trivedi, 2005). This approach requires the use of an instrumental variable for financial inclusion. Due to lack of guidance on this from the literature, the predicted value of financial inclusion from the first step has been used as an instrumental variable.

3.4. Dependent variables for financial inclusion

As alluded earlier, three indicators of financial inclusion have been used namely formal ownership of an account, formal savings, and formal credit. The dependent variables that need further elaboration are savings and credit, and the definitions vary depending on the data set.

Formal savings: the survey question used in this case is: *Do you currently have*

[3] The poverty line gives the monetary cost to a given person, at a given place and time, required to achieve this threshold level of welfare.

any of the following: Investments (e.g. stocks, mutual funds); Pensions; General Insurance (car insurance, household contents insurance, building insurance; health insurance, life insurance or income replacement insurance; semi-formal savings (MFIs); and bank/formal savings? This variable takes the value of 1 for those who responded 'yes' and 0 otherwise.

Formal Credit: This was derived from the question related to semi-formal micro finance institution (MFIs) loan or bank loan. The relevant question was: *Do you currently have any of the following: Mortgages; Formal credit (loans from bank, credit cards); and Semi-formal credit (credit from microfinance institutions)?* This is a dummy variable which takes the value of 1 for 'yes', and 0 otherwise.

3.5. Independent variables for the determinants of FI and poverty

In this section, detailed explanations are provided on the expectation of the various independent variables specified in equations (1) and (2).

Real per capita income: In the database, income was defined in nominal terms. For the purpose of this study, monthly income was deflated using Consumer Price Index (2013) for each month to get the present values at month of the beginning of the survey. Then all the real monthly incomes for each household were added to get annual income. The annual income for each household was then divided by household size to obtain real per capita income. The CPI was obtained from the Reserve Bank of Malawi (2015). It is expected that income is positively related to financial inclusion.

Age of household head in years is intended to capture lifecycle effects on households' welfare from the household head's ability to provide for the household hence a positive relationship is expected for both FI and Income. Age squared (age^2) captures possible nonlinearity in the relation between age and financial inclusion (Fungáčová & Weill, 2014). As an individual's age increases, the probability of financial inclusion goes up. But beyond a certain point further increase in age does not necessarily make financial inclusion probable.

Sex (female=1): Drawing from Efobi *et al*. (2014) and Mohammed *et al*. (2017) it is expected that sex defined in this manner will be negatively related to financial inclusion. It is also expected that female-headed households are likely to be poor unlike male-headed households.

Household size: The higher the household size the lower the income per capita. An addition of one more member beyond the initial size to a household will negatively lead to a reduction in welfare of the household.

Educational level: According to the Financial Literacy and Consumer Protection Baseline Survey 2013, each respondent falls within six grouped educational levels, namely: Some or no primary, Primary (Std 1-5), Primary (Std 6-8), Junior Secondary (Form 1-2), Secondary (Form 3-4) and Tertiary (college or university). For the purpose of this study, educational levels have been reclassified into four categories, measured from 0 to 3, namely: no education, primary education, secondary education and tertiary education. The expectation is that the likelihood of financial inclusion increases with level of education.

Location: rural locations (=1) in Malawi are poorly served in terms of bank branch operations which reduces access to formal financial services among rural people (Kadale Consultants & Oxford Policy Management [OPM], 2009). A negative relationship is therefore expected between rural location and financial inclusion.

Informal Borrowing: Although at present the treatment of this variable behaviourally is far from satisfactory and settled, it is included in order to observe, at least empirically, the effect of other sources of borrowing and how they can influence individual's level of financial inclusion. The relevant question was: *What do you and your household do when you run short of money for food or other necessary items?* Respondents could give multiple responses[4]. Individuals who borrow from employers are more likely to be issued cheques or use bank accounts and hence increasing the likelihood of being financially included than those who borrow from family and friends. A positive relationship is expected between borrowing from employers and money lenders and financial inclusion. Efobi *et al*. (2014) argued that individuals' ability to manage his/her immediate sources of finance without necessarily seeking external debt enables them to be financially included but this counters the expectation with regard to employers and money lenders.

ICT Inclination/mobile usage for financial transactions: Efobi *et al*. (2014) suggest that individuals' level of ICT inclination can be measured by either *whether they have a debit card (yes=1, no=0)* or *whether they used mobile network to make any financial transaction in the past 12 months (yes=1, no=0)*. For this study, individual's level of ICT inclination has been derived from "whether an individual has used mobile network to make any financial

[4] Borrow from family, friend or work colleague; Cash gifts from family or friends; Borrow from employers/ salary advance; Borrow from bank/use credit card/go into overdraft, Borrow from local money lender (e.g. Katapila); Ganyu; Sell assets such as household items or livestock; Buy on credit (Informally) from shops, etc.

transaction" and from the following question: *Have you ever used your mobile phone to conduct any of the following financial transactions: Receive money e.g. salary or pension; Transfer money; Pay bills; Buy airtime or Me2U-sending airtime in a month? (yes=1, no=0)*. A positive relationship is expected between ICT inclination and financial inclusion.

3.5.1. Preserving sample integrity with control variable

The survey and dataset included problems faced by individuals when using financial services. Based on the survey design, this was supposed to capture barriers to financial inclusion for those already accounted for but subsequently facing transaction costs e.g. in terms of both travelling and waiting time. The relevant question was: *When using financial services, have you personally experienced any of the following problems:"waiting a long time to withdraw money from the bank" and "the ATM not working when you need to withdraw money"*. Respondents were allowed to make multiple choices. Although these attributes were relevant to the survey and the sample, experience with them already implied access to financial services and inclusion but not to FI as a prospective outcome. But excluding the relevant households from the ex post sample would also compromise the integrity of the randomness of the sample and excluding the variables from the model would amount to model misspecification, which was confirmed by tests. A decision was therefore made to retain the full sample and the variables in the estimation, but only as control variables.

4. Diagnostic testing

Before interpretation of the results, it is necessary to give the results of the diagnostic tests which were carried out to verify the appropriateness of the model.

To test the likelihood of incorrect model specification, the link test was used. The results show that all the models are properly specified when the FI model includes the tele-banking problems[5]. Apart from this, multicollinearity test shows the existence of high correlation between age and age squared. This study considered multicollinearity as an essentially data deficiency problem and adopts a "*do nothing approach*" (Gujarati, 2004). Adding age squared to age allows more accurate modelling of the effect of different ages, rather than assuming that the effect is linear for all ages. The effect of nonlinearity of age squared accounts for the effect of older individuals' decision in all the models.

[5] See Appendix 1

5. Results

In analyzing all the results, Stata was used. Table 1 outlines the measures and mean of financial inclusion indicators. Almost 28 percent of adult respondents reported owning an account at a formal financial institution and the remaining 72 percent were unbanked, confirming the findings of Demirgüç-Kunt and Klapper (2012) that less than 25 percent of the adult population in Africa owns a bank account. Out of those who were banked only 15 percent used this to save, and only 1 percent used it to access credit from commercial banks. For Malawi, Finscope (2014) finds that almost 17 percent of individuals used savings products and 2 percent had used credit/loan products from a commercial bank. Above all, only 32 percent of adult Malawians use formal financial services to manage their financial lives, and 68 percent remained financially excluded. These results validate the assertion by Nkuna *et al*. (2016) that little had been achieved by conventional channels in reaching the unbanked population in Malawi.

Table 1: Statistical Summary ofthe Financial Indicators

Variables	Measures	Response	Percent (Mean)
Formal Account	Have: a bank account	Yes=1, 0 otherwise	27.71
Formal Savings	Have:		
	1. Pension;	Yes=1, 0 otherwise	2.74
	2. Bank(formal)savings;	Yes=1, 0 otherwise	14.35
	3. Semi formal savings (MFIs);	Yes=1, 0 otherwise	4.49
	4. Investment account	Yes=1, 0 otherwise	1.22
	5. GeneralInsurance	Yes=1, 0 otherwise	0.73
	6. Health, Life & Income Insurance	Yes=1, 0 otherwise	0.96
Formal Credit	Have:		
	1.Mortgage;	Yes=1, 0 otherwise	0.04
	2.Semi-formal credit (MFIs);	Yes=1, 0 otherwise	2.60
	3. Bank credit	Yes=1, 0 otherwise	0.77
Fin. Inclusion	At least one of the formal financial services	Yes=1, 0 otherwise	32.43

Source: Author's estimates based on Baseline Financial Literacy and Consumer Protection Survey 2013 dataset.

[5] See Appendix 1.

5.2. Income as a determinant of financial inclusion (FI)

Table 2 presents results on the determinants of FI in Malawi among which income is of key interest. Much as four models have been estimated, interpretation of the results mainly focuses on the composite FI, column 4 which is the benchmark for this study.

Table 2: Average Marginal Effects from Probit Regression

Variables	Formal Account dy/dx	Formal Savings dy/dx	Formal Credit dy/dx	Financial Inclusion dy/dx
Age	0.005***	0.003**	0.003**	0.005***
	(0.002)	(0.001)	(0.001)	(0.002)
Age squared	-0.000***	-0.000	-0.000**	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.046***	-0.002	0.002	-0.038***
	(0.013)	(0.010)	(0.006)	(0.014)
Rural	-0.008	0.003	0.013*	0.005
	(0.014)	(0.011)	(0.007)	(0.016)
Education	0.031***	0.022***	0.003	0.032***
	(0.004)	(0.004)	(0.002)	(0.005)
Income	0.057***	0.038***	0.015***	0.065***
	(0.005)	(0.004)	(0.002)	(0.005)
Borrow family	-0.008	-0.022***	-0.003	-0.018*
	(0.010)	(0.008)	(0.005)	(0.011)
Borrow employer	0.030	0.004	0.033**	0.043
	(0.040)	(0.029)	(0.013)	(0.046)
Borrow money lenders	-0.006	0.092***	0.053***	0.089**
	(0.036)	(0.026)	(0.013)	(0.038)
Pay Bills	0.109	0.008	0.020	0.084
	(0.077)	(0.070)	(0.018)	(0.087)
Buy talk time	0.060***	0.045***	-0.005	0.070***
	(0.013)	(0.010)	(0.006)	(0.015)
Receive money	0.076*	0.089***	0.009	0.120**
	(0.042)	(0.030)	(0.016)	(0.049)
Making Transfers	0.131**	0.064*	-0.009	0.128*
	(0.060)	(0.038)	(0.018)	(0.069)
ATM Broken[b]	0.245***	0.180***	0.005	0.289***
	(0.024)	(0.016)	(0.010)	(0.028)
Waiting long time[b]	0.208***	0.146***	0.019**	0.216***
	(0.020)	(0.014)	(0.009)	(0.023)
PseudoR2	0.3319	0.3954	0.1031	0.2737
Prob>chi2	0.0000	0.0000	0.0000	0.0000
N	4919	4919	4919	4919

b= control variables, see text. Robust standard errors in parentheses
**p< 0.10, **p< 0.05, ***p< 0.01*

Income (poverty): Of key interest in this study, real per capita income is very significantly associated with financial inclusion. This means that individuals with higher income are more likely to access formal financial services as compared to those with little or no income. The corollary to this is that poverty itself would be a barrier and a binding constraint to financial inclusion. In Malawi, as elsewhere, poverty itself tends to be positively correlated with age, sex (women) but negatively correlated with education.

Other variables: On average, educational attainment at all levels (primary, secondary and tertiary) significantly and positively correlates with FI. Higher levels of education help the average person understand the risks and rewards of accessing and using formal financial services more easily. Similarly, the level of financial inclusion increases with age, but is reduced for 'female'. The result for age squared is negative suggesting a non-linear effect of older age associated with lower FI. The results are not surprising since women are typically income disadvantaged, being involved in un-monetised activity and overburdened with most household expenditures resulting in slimmer streams of cash income as compared to men.

Reliance or access/availability of informal sources of borrowing like family and friends has a negative effect on FI and especially on savings accounts, the most basic FI service, while access to borrowing from employer has a positive impact on formal credit, the higher level of FI. These results reflect a strong sense of association: borrowers from family and friends tend to be unbanked and those able to borrow from employers also having access to formal credit elsewhere. Borrowing from moneylenders has the most prominent all-round (savings and credit) profile in the formal financial inclusion in Malawi. Money lenders operate in rural and urban environments serving both the waged (public servants and other) and the self-employed. Their *modus operandi* typically requires demonstrable evidence of eligibility such as having a savings account into which earnings such as salaries are received.

Use of mobile phones for financial transactions has proven success within the context of "Buying talk time", "Making Transfers" and "Receive Money". This supports the findings of Efobi *et al*.(2014) and Vighneswara (2014) that ICT inclination among individuals enhances the extent of financial inclusiveness. The provision of financial services through mobile phone accounts like sending, receiving and buying talk time is clearly FI-oriented and effective, client oriented with quick outreach extension. The results here are most likely coincidental (by association) and not represented in the type of modelling presented here and give much room for further thought.

5.3. Financial inclusion and poverty

This section presents results capturing the effects of FI on poverty. Both the linear regression and non-linear discrete models have been estimated using income and poor/non-poor as continuous and limited dependent variables respectively. The two models presented in Table 3 point to the same results with minimal variations regarding marital status. The results for the 'Poor/non-poor' in the third column have opposite signs to those in the second column. 'Income' reflecting a reduction in the probability of being poor with higher income and vice versa. The results are therefore consistent with each other and the interpretation leads to the same conclusion.

Table 3: Results for the Poverty Models

Variables	**Natural log of per capita income**	**Poor (dy/dx)**
Financial inclusion	2.003***	-0.160***
	(0.101)	(0.009)
Household size	-0.159***	0.022***
	(0.009)	(0.003)
Age	0.010*	-0.003*
	(0.006)	(0.002)
Age squared	-0.000**	0.000**
	(0.000)	(0.000)
Female	-0.209***	0.056***
	(0.064)	(0.016)
Rural	-0.508***	0.094***
	(0.048)	(0.009)
Education	0.054***	-0.018***
	(0.017)	(0.003)
Married	0.049	0.021
	(0.064)	(0.015)
Employed	0.148*	-0.042**
	(0.081)	(0.019)
Self employed	0.075	-0.028
	(0.068)	(0.018)
_cons	10.196***	
	(0.159)	
r2	0.175	
Adjusted r2	0.174	
Chi2	2546.081	
Wald chi2		1018.73
Pseudo R^2		0.3582
N	4919	4919

Robust standard errors in parentheses

**p< 0.10, **p< 0.05, ***p< 0.01*

From the results, FI is strongly associated with higher per capita income and vice versa. This corroborates Mohammed *et al*.(2017) who found that financial inclusion is greatly associated with reduced poverty in Sub-Saharan Africa or in other words FI is positively associated with higher incomes. In Malawi the expectation is that with FI the poor would access funds available for investment in agricultural production, starting or expanding micro and small enterprises thereby creating employment and increasing household income and smoothing consumption (Government of Malawi [GoM], 2010). This is an expected long-term effect of FI and not whether FI does influence income levels and poverty reduction. The results of the determinants of FI suggest that low incomes or poverty might actually be a barrier to FI which makes FI ineligible as a solution to poverty reduction. Highlighting the determinants of economic welfare gives a perspective of issues that need to be focused on in order to address poverty as an outcome and FI as a prospective broker.

Household size has a highly significant negative influence on per capita income and welfare. Increasing the household size beyond the initial size makes it difficult for the household to improve its economic situation. The results show significant effects for age and age squared, which are respectively positively and negatively correlated with welfare. As the study is based on a sample of adults, increases in age leads to a decline in per capita income and this reflects smallholder farming livelihoods.

Being a female household head has a highly significant and negative correlation with per capita income. For Sub-Saharan Africa, Mohammed *et al*. (2017) found similar results and attributes this to lower educational levels, fewer economic opportunities and low incomes. The present results also reveal that households in rural areas would be substantially poorer relative to households in urban areas, again reflecting smallholder agriculture based livelihoods.

Education of the household head is positively and significantly related to per capita income. Mohammed *et al*. (2017) and National Statistics Office (NSO) *et al*. (2001) found similar results. The impact gets greater the higher the levels of education as the human capital and economic prospects improve.

Employment Status and Marital Status: participation in regular wage employment (employed) is positively and significantly associated with per capita income, while self-employment has no significant effect. Being married does not matter in influencing household economic welfare.

6. Conclusion and policy implications

The major contributions of this study have been firstly to offer a perspective of the FI-PR link and possible sources of problems and then providing independent confirmation that the FI-PR link is positive but also that poverty itself might stand in the way for FI. The biggest lesson of the study is therefore that FI may not be as reliable a broker for poverty reduction as is being touted because FI can still leave the core-poor behind. This result has also been known but the implications for the FI agenda may still be underplayed. For the very low-income (the poor), the counsel of wisdom would be to rethink the FI even by definition. For example some lower-profile stakeholders have begun experimenting with concepts and models aimed at lowering the income barriers with new but still informal interventions for local implementation like village savings and loans associations (VSLAs). The lesson to be drawn by the results is therefore not to stop or delay the FI-PR train, which works for some, but for resources to be spared for interventions that prepare the excluded to get on board through lower-rung informal FI services.

Biographical Notes

Ben Kaluwa is professor of economics at University of Malawi-Chancellor College. He holds an MA in Quantitative Economics (University of East Anglia, UK) and PhD in Economics (University of Edinburgh, Scotland). His research interests and publications cover macro and microeconomic issues but most relate to market conduct and performance.

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References

Aguera, P. (2015). Finance For All: Promoting Financial Inclusion In Central Africa. ECCAS Regional Conference on "Financial Inclusion, Growth and Poverty Reduction", 23 March 2015 (pp. 1-19). Brazzaville, Congo: World Bank.

Agyemang-Badu, A. A., Agyei, K., & Duah, E. K. (2018). Financial Inclusion, Poverty and Income Inequality:Evidence from Africa. *Spiritan International Journal of Poverty Studies*, Volume 2 (2).

Ardington, C., & Leibbrandt, M. (2004). Financial Services and the Informal Economy. Retrieved from http://www.uct.ac.za/depts/cssr/pubs.html

Beck, T., & Demirgüç-Kunt, A. (2008). "Access to Finance: An Unfinished Agenda". *The World Bank Economic Review*, 22 (3), 383-396.

Beck, T., Demirguc-Kunt, A., & Honohan, P. (2009). Access to Financial Services: Measurement, Impact and Policies. *The World Bank Research Observer*, 24 (1), 119- 145.

Beck, T., Demirgüç-Kunt, A., Honohan, P., & Bank, W. (2008). Finance for All? Policies and Pitfalls in Expanding Access. Policy Research Reports. University of Califonia, Berkeley: World Bank.

Brune, L., Giné, X., Goldberg, J., & Yang, D. (2013). Commitments to Save: A Field Experiment in Rural Malawi. World Bank Policy Research Working Paper No. 5748. Washington, DC.

Burgess, R., & Pande, R. (2005). Can Rural Banks Reduce Poverty? Evidence from the Indian Social Banking Experiment. *American Economic Review*, 95 (3), 780-795

Cameron, C. A., & Trivedi, P. K. (2005). Microeconometrics: Methods and Applications. New York: Cambridge University Press.

Chibba, M. (2009). Financial Inclusion, Poverty Reduction and the Millennium Development Goals. *European Journal of Development Research*, 21 (2), 213-230.

Chirwa, E. W., & Mlachila, M. (2004). Financial Reforms and Interest Rate Spreads in the Commercial Banking System in Malawi. IMF Staff Papers, 51 (1), 96-122.

Chirwa, E. W., & Mvula, P. M. (2014). Malawi Baseline Financial Literacy and Consumer Protection Final Report. Wadonda Consultant Ltd.

Chiwaula, L., & Kaluwa, B. (2007). Household Demand For Complementary Infant Foods in Two Low-Income Districts of Malawi. *Journal of International Developmen*t, 20, 686- 697.

Coleman, J. (1988). Social Capital In the Creation of Human Capital. *American Journal of Sociology*, 94, 95-120.

Demirgüç-Kunt, A., & Klapper, L. (2012). Financial Inclusion In Africa: An Overview. Policy Research Working Paper 6088. World Bank.

Demirgüç-Kunt, A., & Klapper, L. (2013). Measuring Financial Inclusion: Explaining Variation in Use of Financial Services across and Within Countries. Brookings Papers on Economic Activity, 279-321.

Demirgüç-Kunt, A., Klapper, L. F., & Singer, ,. D. (2013). Financial Inclusion and Legal Discrimination Against Women: Evidence from Developing Countries. World Bank Policy Research Working Paper (6416) .

Efobi, U., Beecroft, I., & Osabuohien, E. (2014). Access to and use of bank services in Nigeria: Micro-econometric evidence. *Review of Development Finance*, 4 (2014), 104-114.

Finscope. (2014). Finscope Consumer Survey Malawi 2014. Finmark Trust.

Finscope. (2012). FinScope MSME Survey Malawi 2012. Finmark Trust.

Fungáčová, Z., & Weill, L. (2014). Understanding Financial Inclusion In China. Laboratoire de Recherche en Gestion & Economie Working Paper 2014-06.

Government of Malawi (GoM). (2014). Annual Economic Report. Lilongwe: Ministry of Finance, Economic Planning and Development.

Government of Malawi (GoM). (2015). Annual Economic Report. Lilongwe: Ministry of Finance, Economic Planning and Development.

Government of Malawi (GoM). (2010). The Malawi National Strategy for Financial Inclusion (2010-2014). Lilongwe: Ministry of Finance, Financial Sector Development Unit, Economic Affairs Division.

Government of Malawi (GoM). (2011). Malawi Growth and Development Strategy II, 2011-2016. Lilongwe: Ministry of Economic Planning and Development.

Government of Malawi (GoM). (2006). Malawi Growth and Development Strategy: From Poverty to Prosperity, 2006-2011. Lilongwe: Ministry of Economic Planning & Development.

Greene, W. H. (2003). Econometric Analysis. Upper Saddle River, New Jersey: Prentice Hall.

Gujarati, D. N. (2004). Basic Econometrics, 4th ed. McGraw-Hill.

Haughton, J., & Khandker, S. R. (2009). Handbook On Poverty and Inequality. World Bank Publications.

Hoekman, B., Michalopoulos, C., Schiff, M., & Tarr, D. (2001). Trade Policy and Poverty Alleviation. World Bank Working Paper No. 2733 . Washington DC:World Bank.

Honohan, P. (2008). Cross-Country Variation in Household Access to Financial Services. *Journal of Banking and Finance*, 32 (11), 2493–2500.

Jappelli, T., & Pagano, M. (1994). Saving, Growth, and Liquidity Constraints. *The Quarterly Journal of Economics*, 109 (1), 83-109.

Kadale Consultants & Oxford Policy Management (OP M). (2009). Supply Side Study of Financial Inclusion in Malawi. Final Report. Finscope Study.

Kendall, J., Mylenko, N., & Ponce, A. (2010). Measuring Financial Access Around the World. World Bank Policy Research Working Paper No 5253 .

Kim, D.-W., Yu, J.-S., & Hassan, M. K. (2017). Financial Inclusion and Economic Growth in OIC Countries. *Research in International Business and Finance*, 1-14.

Kirkpatrick, C., Sirageldin, I., & Aftab, K. (2000). "Financial Development, Economic Growth, and Poverty Reduction". *The Pakistan Development Review*, 39 (4), 363-388.

Kruger, G. (2015, November 4). Why we Need to Rethink Our Approach To Financial Inclusion. Retrieved from weforum: http://www.weforum.org/agenda/2015/why-we-need-to- rethink-our-aproach-to-financial-inclusion.

Majanga, B. (2016). The Journey to Financial Inclusion in Malawi- What Does the Future Hold? *International Journal Economics and Financial Research*, 2 (9), 169-175.

Maki, A., & Ohira, S. (2014, September). Engel's Law in Vietnam and the Philippines: Effects of In-Kind Consumption on Inequality and Poverty. Havard-Yenching Working Paper Series.

Mandiwa, M. (2014). Access to Financial Services In Malawi: Policies and Challenges. Ministry of Finance, Economic Planning and Development, Malawi.

Mckinnon, R. I. (1973). Money and Capital Economic Development. Brookings Institution Press.

Melecky, M., & Han, R. (2013). Financial Inclusion for Financial Stability: Access to Bank Deposits and the Growth of Deposits in the Global Financial Crisis. World Bank Policy Research Working Paper 6577 . World Bank.

Mohammed, J. I., Mensah, L., & Gyeke-Dako, A. (2017). Financial Inclusion and Poverty Reduction in Sub-Saharan Africa. *The African Finance Journal*, Volume 19 (1).

Montiel, P. J. (2003). Macroeconomics In Emerging Markets. Cambridge University Press.

Narayan, D. (1999). Bonds and Bridges: Social Capital and Poverty. Poverty Research Working Paper No.2167, World Bank, Washington, D.C.

Nkuna, O., Lapukeni, A., & Kaunde, P. (2016, March). Financial Inclusion In Malawi: An Assessment. AERC XVIII. Senior Policy Seminar on "Financial Inclusion in Africa", March 2016 . Nairobi, Kenya.

National Statistical Office (NSO). (2014). Integrated Household Panel Survey 2010-2013: Household Socio-Economic Characteristics Report. Zomba: National Statistical Office.

National Statistical Office (NSO). (2012). Integrated Household Survey 2010-2011: Household Socio-Economic Characteristics. Zomba: Government of Malawi.

National Statistical Office (NSO), National Economic Council (NEC), &Integrated Food Policy Research Institute (IFPRI) (2001). The Determinants of Poverty In Malawi, 1998: An analysis of the Malawi Integrated Household Survey, 1997-98. Zomba, Lilongwe and Washington D.C.: The National Statistical Office, The National Economic Council and The Integrated Food Policy Research Institute.

Odhiambo, N. M. (2009). The Inter-temporal Causal Relationship Between Financial Sector Development and Poverty Reduction In Zambia. *Savings and Development*, 32 (2), 141-158.

Park, C.-Y., & Mercado Jr., R. V. (2015, January). Financial Inclusion, Poverty, and Income Inequality in Developing Asia (January 2015). Asian Development Bank Economics Working Paper Series No. 426.

Reserve Bank of Malawi (RBM). (2015). *Financial and Economic Review*. 45 (2).

Romer, P. (1994). The origins of endogenous growth. *The Journal of Economic Perspectives*, 8 (1), 3-22.

Sarma, M. (2008). Index of financial inclusion: Indian Council for Research on International.

Schmied, J., & Marr, A. (2016). Financial Inclusion And Poverty: The Case Of Peru. *Regional and Sectoral Economic Studies, Euro-American Association of Economic Development*, 16 (2), 29-40.

Schumpeter, J. A. (1911). The Theory of Economic Development. New York: Oxford.

Shaw, E. (1973). Financial Deepening in Economic Development. New York: Oxford.

Stiglitz, J. E., & Weiss, A. (1981). Credit Rationing In Markets with Imperfect Information. *The American Economic Review*, 71 (3), 393-410.

Triki, T., & Faye, I. (2013:25). Financial Inclusion in Africa. (T. Triki, & I. Faye, Eds.) African Development Bank (AfDB) Group.

Vighneswara, S. (2014). Financial inclusion, gender dimension and economic impact on poor households. *World Dev*., 56, 1–15.

World Bank (WB). (2017, April 05). Financial Inclusion: Overview. Retrieved April 13, 2018, from http://www.worldbank.org/en/topic/financialinclusion/overview

World Bank (WB). (2014). Global Financial Development Report 2014: Financial Inclusion. The World Bank Group. www.stata.com/manuals13/rivregresspostestimation.pdf. (n.d.).

Zins, A., & Weill, L. (2016). The Determinants of Financial Inclusion in Africa. *Review of Development Finance*, 6, 46-57.

Appendix

Diagnostic Test Results: Correct Model Specification (Linktest Results)

All the models show that hat squared is insignificant as compared to non-squared model.

Appendix 1: Composite Financial Inclusion Model

Financial inclusion	Coef.	Std. Err.	z	P>|z|	[95%Conf. Interval]
_hat	1.000	.033	30.44	0.000	.936 1.064
_hatsquared	-.002	.028	-0.06	0.951	-.057 .053
_cons	.001	.036	0.04	0.970	-.069 .072

Appendix 2: Formal Account Model

Financial inclusion	Coef.	Std. Err.	z	P>|z|	[95%Conf. Interval]
_hat	.996	.030	32.73	0.000	.937 1.056
_hatsquared	-.0327	.024	-1.34	0.181	-.081 .015
_cons	.031	.040	0.79	0.427	-.046 .109

Appendix 3: Formal Savings Model

Financial inclusion	Coef.	Std. Err.	z	P>|z|	[95%Conf. Interval]
_hat	.982	.031	32.00	0.000	.922 1.042
_hatsquared	-.036	.027	-1.34	0.181	-.088 .017
_cons	.043	.049	0.88	0.377	-.052 .138

Appendix 4: Formal Credit Model

Financial inclusion	Coef.	Std. Err.	z	P>|z|	[95%Conf. Interval]
_hat	1.246	.462	2.70	0.007	.341 2.150
_hatsquared	.077	.142	0.54	0.587	-.201 .355
_cons	.180	.364	0.49	0.621	-.533 .892