

DOES FINANCIAL INCLUSION MATTER IN ACHIEVING THE SDGS? AN EMPIRICAL ANALYSIS OF THE WELFARE EFFECTS OF FINANCIAL INCLUSION IN GHANA

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Outline of Presentation

- Motivation
- Previous Literature & Gap
- Financial Inclusion and Welfare: The TM
- Data & Empirical Estimation Strategy
- Empirical Results
- Conclusion

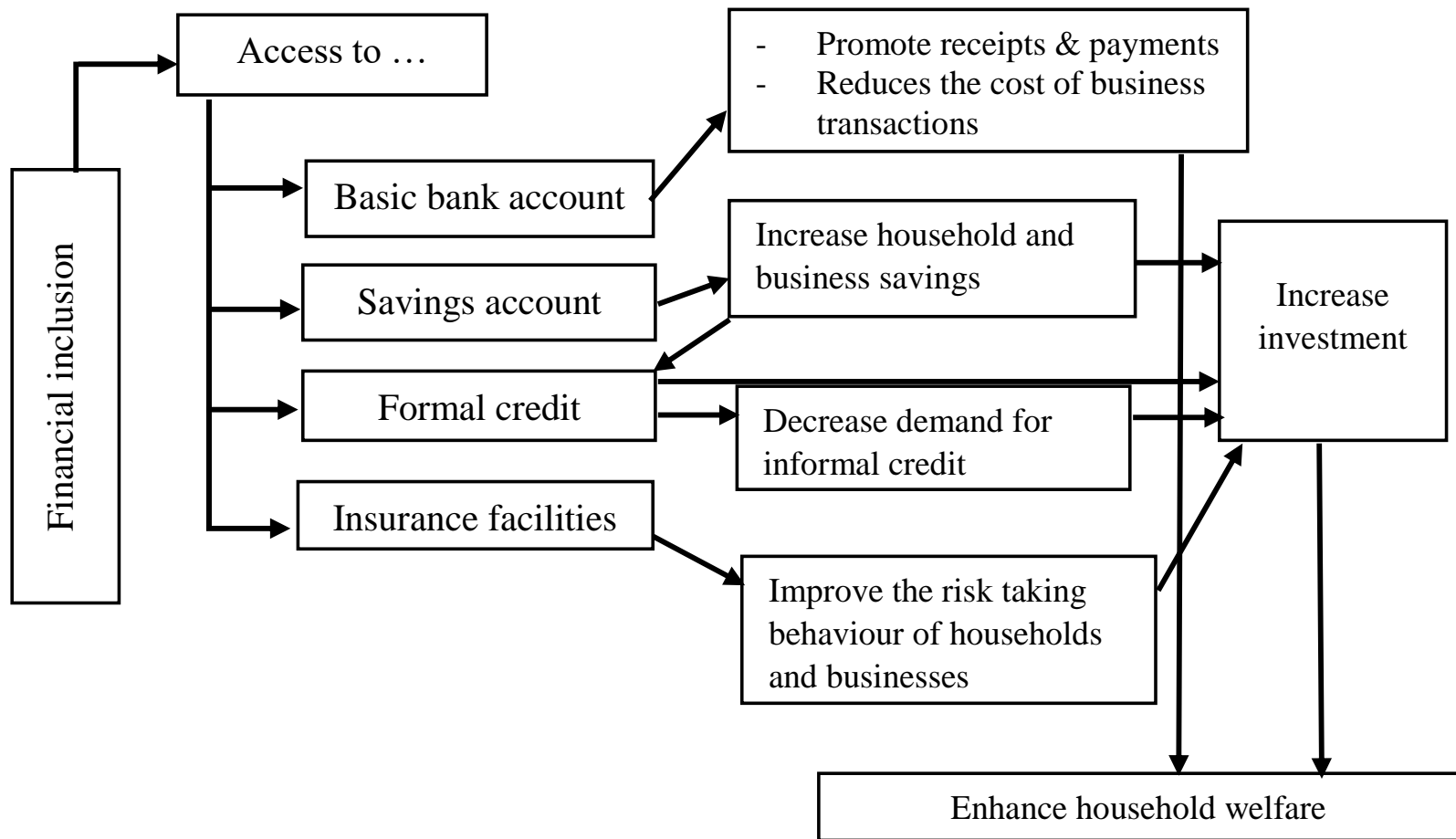
Motivation

- The level of financial inclusion, both globally and within countries, has improved tremendously in recent times.
- In 2017, 69% of adults, globally, were financially included;
 - ✓ 7 percentage points increase relative to its 2014 level and 18 percentage points higher than its 2011 level (Demirgüç-Kunt et al., 2018).
 - ✓ About half of adults in Ghana are financially included (InterMedia-CGAP, 2015).
- Does financial inclusion influence household welfare in Ghana?
 - ✓ Important for policy action – Goal 1 of SDGs.
 - Klapper et al. (2016) on the SDGs.

Previous Literature & Gap

- Several studies have investigated the effect of financial inclusion (measured multidimensionally) on a range of outcome variables;
 - ✓ Poverty, income inequality and financial inclusion (Park & Mercado Jr, 2015; Sarma & Pais, 2011; Chakravarty & Pal, 2013; Zhang & Posso, 2017).
- However, only a few of these studies examine the role of financial inclusion (measured multidimensionally) on welfare using micro-level data (Zhang & Posso, 2017).
 - ✓ Zhang & Posso relied on a household-level data from China.
- However, less is known about such a relationship in the context of Africa.
 - ✓ This study attempts to fill this void in the literature by employing a household-level data from Ghana
 - Use a multidimensional index of FI
 - Accounts for household- and region-specific idiosyncrasies

Financial Inclusion and Welfare: The Transmission Mechanism



Source: Author's illustration

Data & Empirical Estimation Strategy -1

- **Data:** Round six of the GLSS data set; 2012/13.
 - ✓ Nationally representative household survey.
 - ✓ Sample size: 16,772 households and 72,372 individuals.
- Empirical model

$$y_i = \beta Fin_i + \gamma X_i + \alpha_i + \varepsilon_i \quad (1)$$

y_i = household welfare; total consumption expenditure pae, food expenditure pae, income, and poverty status (upl-GHC1314).

Fin_i = household's financial deprivation status.

X_i = vector of control variables (eg. Age of head, occupation, locality, etc).

Data & Empirical Estimation Strategy -2

- Constructing an index of financial inclusion
 - ✓ Similar to the computational strategy of the MPI (Alkire & Santos, 2010; Dotter & Klasen, 2014).
 - ✓ FI → access to useful and affordable financial products and services that satisfy
 - the transactions and payments, savings, credit, and insurance needs of individuals (Demirguc-Kunt & Klapper, 2013; World Bank, 2017).
 - ✓ Our measure of FI will make use of 4 dimensions of FI – i.e. transactions and payment, savings, credit and insurance.
 - Each dimension is identified by a relevant indicator(s) as a measure.

Data & Empirical Estimation Strategy -3

Table 1: Dimensions, indicators, deprivation cut-offs and weights

Dimension (weight)	Indicator (weight)	Deprived if...
Transaction and payments (1/4)	Bank account (1/4)	No member of a household has a bank account
Savings (1/4)	Savings account (1/4)	No member of a household has a savings account
Credit (1/4)	Formal credit (1/4)	No member of a household has a loan from a formal financial institution
Insurance (1/4)	Insurance policy (1/4)	No member of a household subscribe to an insurance policy

- Using Table 1, for each household, we compute deprivation score for each indicator.
- The overall deprivation score (a weighted sum of the deprivation scores for each indicator) is then computed...
 - ✓ To give an idea of the extent to which a household is financially deprived.
 - ✓ It ranges from 0 to 100 and higher values indicates higher levels of financial deprivation.
 - ✓ We then compute a binary measure of financial deprivation (Fin_i in Eqn. 1) using a cross-dimensional cut-off of 50% (1/2 of the weighted indicators).

Data & Empirical Estimation Strategy -4

- Fin_i equals 1 if a household is financially deprived and zero otherwise.
 - ✓ Households that lack access to at least two dimensions of FI are considered financially deprived.
 - ✓ Robustness: use of two other cut-offs – i.e. 25% and 75% as well as the exclusion of each of the 4 dimensions of FI, one at a time, in computing the FD index.

Accounting for a potential endogeneity problem and selectivity bias

- Eq. (1) plausibly suffers from a potential endogeneity and selectivity bias
 - ✓ Endogeneity: resulting chiefly from reverse causality.
 - ✓ Selectivity: decision about whether use financial services or not
- PSM approach (Rosenbaum & Rubin, 1983; Caliendo & Kopeinig, 2008).
 - ✓ We used household-level demographic and contextual factors in the estimation of the propensity scores.
 - ✓ Following Caliendo & Kopeinig (2008), we apply a number of different matching algorithms.

Data & Empirical Estimation Strategy -5

Table 2: Descriptive statistics of main regression variables

Variable	Description	Mean	Std. Dev.	Range
<i>Measures of household welfare</i>				
lwelfare	log of household total consumption (including food and non-food) expenditure per equivalent adult and adjusted for variations in prices across households.	8.22	0.76	5.9 – 10.88
lfoodx	log of household total food expenditure per equivalent adult and adjusted for variations in prices across households.	6.85	0.77	3.0 – 11.5
Income	log of household total gross income per annum.	8.78	1.41	0.69 – 14.60
Non-poor	a binary measure of household welfare and it takes a value of 1 if the household is classified as non-poor (based on the upper poverty line) and zero otherwise.	0.67	0.47	0 – 1
P ₀	This a poverty incidence measure and it is computed using the upper poverty line.	0.34	0.47	0 – 1
P ₁	This a poverty gap measure and it is computed using the upper poverty line	0.12	0.22	0 – 0.97
P ₂	This is a poverty gap square measure and it is computed using the upper poverty line.	0.06	0.14	0 – 0.94
Finc _i	This is a measure of households' level of financial inclusion and it takes a value of 1 if a household is financially excluded (or deprived) and zero if it is financially included.	0.10	0.30	0 – 1

Empirical Results

-1

Table 3: Baseline estimation: Effect of financial inclusion on household welfare

VARIABLES	I	II	III	IV
	lwelfare	lfoodx	Income	Mfx_non-poor
<i>Finc_i</i>	-0.226*** (0.046)	-0.091* (0.050)	-0.266*** (0.095)	-0.054** (0.022)
Age_head	-0.001 (0.010)	-0.001 (0.011)	0.080*** (0.020)	0.000 (0.004)
Age_head2	0.000 (0.000)	0.000 (0.000)	-0.001*** (0.000)	0.000 (0.000)
Sexhead (<i>Base: female</i>)	0.233*** (0.044)	0.155*** (0.045)	0.242*** (0.091)	0.054*** (0.021)
Household_size	-0.140*** (0.010)	-0.128*** (0.011)	0.106*** (0.016)	-0.016*** (0.003)
Other Controls	YES	YES	YES	YES
Constant	8.158*** (0.426)	7.453*** (0.423)	6.167*** (0.646)	
Observations	1,025	1,025	1,013	1,025
Adjusted R-squared	0.421	0.296	0.137	
Region FE	YES	YES	YES	YES
F-statistic	30.47	17.43	8.765	

Notes: Standard errors clustered at the household-level are in parenthesis; *** p<0.01, ** p<0.05, * p<0.1

Empirical Results

-2

Table 4: Effect of financial inclusion on household welfare; household poverty status disaggregated estimations

VARIABLES	I	II
	Non-Poor HH	Poor HH
$Finc_i$	-0.230** (0.100)	-0.402* (0.227)
Age_head	0.077*** (0.021)	0.087 (0.063)
Age_head2	-0.001*** (0.000)	-0.001 (0.001)
Sexhead (<i>Base: female</i>)	0.223** (0.097)	-0.027 (0.231)
Household_size	0.126*** (0.018)	0.111*** (0.038)
Other Controls	YES	YES
Constant	6.220*** (0.771)	5.811*** (1.732)
Observations	919	94
Adjusted R-squared	0.131	0.334
Region FE	YES	YES
F-statistic	7.650	3.217

*Notes: Standard errors clustered at the household-level are in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Empirical Results

-3

Table 5: Financial inclusion and household welfare; effect of the various dimensions of financial inclusion

VARIABLES	Dependent variable: (log) household consumption per equivalent adult			
	I	II	III	IV
Bank_account	-0.318*** (0.013)			
Access_credit		-0.133*** (0.042)		
Access_insurance			-0.249*** (0.013)	
Savings_account				-0.260*** (0.013)
Controls included	YES	YES	YES	YES
Constant	8.126*** (0.093)	8.151*** (0.415)	8.092*** (0.097)	8.024*** (0.094)
Observations	10,458	1,025	10,458	10,462
Adjusted R-squared	0.409	0.415	0.395	0.400
Region FE	YES	YES	YES	YES
F-statistic	276.5	29.80	248.7	248

*Notes: Robust standard errors are in parenthesis; *** p<0.01, ** p<0.05, * p<0.1*

Empirical Results

-4

Table 6: Financial inclusion and household welfare; test of alternative computations of the financial inclusion index

	Dependent variable: (log) household consumption per equivalent adult			
	I	II	III	IV
	Bank account	Formal credit	Insurance	Savings account
Finc _i excluding:				
FincBA	-0.239*** (0.041)			
FincFC		-0.298*** (0.012)		
FincINS			-0.227*** (0.044)	
FincSAV				-0.245*** (0.043)
Controls included	YES	YES	YES	YES
Constant	8.309*** (0.403)	8.112*** (0.094)	8.144*** (0.425)	8.324*** (0.404)
Observations	1,025	10,458	1,025	1,025
Adjusted R-squared	0.426	0.406	0.422	0.426
Region FE	YES	YES	YES	YES
F-statistic	31.62	257.8	30.98	31.98

Notes: Robust standard errors are in parenthesis; *** p<0.01, ** p<0.05, * p<0.1.

Empirical Results

-5

Table 7: Financial inclusion and household welfare; a test of the use of different cut-offs

VARIABLES	I	II
	Cut-offs used to construct $Finc_i$	
	75%	25%
<i>Dependent variable: (log) household total consumption expenditure per adult equivalent</i>		
$Finc_i$	-0.198*** (0.058)	-0.250*** (0.041)
Controls included	YES	YES
Constant	8.080*** (0.426)	8.315*** (0.403)
Observations	1,025	1,025
Adjusted R-squared	0.415	0.428
Region FE	YES	YES
F-statistic	28.98	32.36

Notes: Robust standard errors are in parenthesis; *** p<0.01, ** p<0.05, * p<0.1.

Empirical Results

-6

Table 8: Endogeneity corrected estimation of the effect of financial inclusion on household welfare

		<i>Finc_i</i> (index of financial deprivation)	
		Observed coefficient	Standard error
<i>PSM estimations with different matching methods</i>			
	1-NN	-0.475***	0.043
Nearest-Neighbour Matching	2-NN	-0.475***	0.048
	3-NN	-0.475***	0.050
Radius Matching		-0.475***	0.055
Kernel Matching		-0.475***	0.040
Local linear matching		-0.475***	0.058
<i>PSM estimation by HH poverty status</i>			
	Non-poor HH	-0.504***	0.093
	Poor HH	-0.434*	0.237
<i>Baseline result</i>			
	OLS	-0.226***	0.046
<i>OLS estimation by HH poverty status</i>			
	Non-poor HH	-0.230**	0.100
	Poor HH	-0.402*	0.227

*Notes: Bootstrap standard errors with 100 replications are reported in PSM estimations; Robust standard errors are reported in simple OLS estimations; ***, **, and * indicates significance at the 1%, 5% and 10% levels respectively.*

Empirical Results

-7

Table 9: Effect of financial inclusion on households' farm and non-farm enterprise income

VARIABLES	Model				
	I	II	III	IV	V
Panel A: Dependent variable: (log) household total non-farm enterprise income					
Finc _i	-0.554*** (0.161)				
Bank_account		-0.396*** (0.046)			
Access_credit			-0.320** (0.160)		
Access_insurance				-0.183*** (0.050)	
Savings_account					-0.481*** (0.046)
Panel B: Dependent variable: (log) household total agricultural income					
Finc _i	-0.208 (0.130)				
Bank_account		-0.235*** (0.042)			
Access_credit			0.044 (0.126)		
Access_insurance				-0.135*** (0.049)	
Savings_account					-0.256*** (0.040)

Notes: Robust standard errors are in parenthesis; *** p<0.01, ** p<0.05, * p<0.1.

Conclusion

- Financially deprived households have lower welfare levels compared to their financially included counterparts.
 - Robust to alternative measurement of the financial inclusion index, to the use of different cut-off points and to control for potential endogeneity.
- The welfare effects of FI is much larger for the poor than for the non-poor.
 - ✓ Beyond improving household welfare, FI may also help in bridging the income gap between the poor and the rich.
- Possible transmission channels: effects on households' farm and non-farm enterprise incomes.
- Providing improved access to formal financial services to households, especially poor households, will not only improve household welfare but will also facilitate reductions in inequality.
 - ✓ FI is a plausible tool that could be deployed towards the realisation of the SDGs, notably, the reduction in the incidence of poverty and vulnerability as well as inequality.



THANK YOU

Comments & Suggestions