Research Article

Determinants of financial inclusion: Evidence from Tanzania

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Abstract

The study assessed the factors influencing financial inclusion. The assessment used secondary data sources from Bank of Tanzania and World Bank data covering 11year period from 2012 to 2022. Using longitudinal time line panel data, model diagnostic test and regression were analysis tools employed. The results of analysis showed that per capita income and inflation rate were positive and insignificant determinants of financial inclusion index while networking of banks financial institutions' branches and age dependence ratio found to have negative and insignificant determination on financial inclusion. Moreover, domestic credits provision, steady money supply and deposit interest rate were found to be positive and significant determinants of financial inclusion index. In light of this it is recommended that all customers should deposit money banks to make sure their goods and services are alluring since doing so will encourage the Tanzanian people to save more.

1. Context Overview

Financial inclusion is a condition of being accessed to financial services and products. Financial product includes credits, savings, insurance and money transferring [1]. Moreover Stephen, Raphael and Shayo defined financial inclusion as a condition of being accessed to adequate, affordable and quality financial services/products of the need [2]. Financial inclusion has been a debatable subject matter especially in developing countries. The debate came following the facts that financial inclusion is a multi dimensional aspect which require integration among three player's i.e. financial providers, users and regulators by the model called integration and holism. Short of that the purported motive of establishing effective and sound financial system for achieving financial inclusion cannot be revealed.

2. Theoretical Overview

The study adopted a Financial Innovation and Access Model. This model was founded by Silber stipulating on the effects of financial user (needy group) being easily accessed to financial services and products [3]. The model suggests on creating formal financial systems which avoid leakage or loss money when circulating outside the defined/regulated financial system. Moreover, the model suggested on the use of digital systems to increase access.

Despite of the revealed innovative proposals by Lakuma, Marthy and Muhumuza on sustaining effective and sound financial inclusion i.e [4]. ensuring steady access to financial services by creating a regulated financial system but the effects of informal/unregulated financial system is not pinpointed. Thus, this has been a knowledge gap the current has fulfilled. To full fill such a gap is that having confined/regulated financial system, per capita income, domestic credits provision, steady money supply, inflation rate, bank branches, deposit interest rate and age dependence ratio would be are to be under control. Either the seven identified predictors above were the issues under discussion.

The financial innovation and access model suggested on adopting systems in increasing accessibility but nothing has said on the point that apart from increasing accessibility of financial services, digital systems do also help needy group being accessed to affordable, adequate and of the needy financial services/products. What was said by Silber in the model of financial innovation and access was digital systems require an environment with a steady internet subscription, telecommunication network and electricity supply which then has explicitly uncovered by this study under investigation [3].

3. Methodology

The study's research design was ex-post facto. In this study, the sample studies from 2012 to 2022 in the duration of the sample for the variables. The information for this article was compiled from secondary sources. The secondary data sources were like world bank data, 2015; IMF report 2020 and Bank of Tanzania (BoT) 2020. A number of diagnostic tests were run to make sure the regression results was accurate and supported by science. The study's model can be stated in terms of econometrics as follows:-

FI = f(PCI, DCP, Ms, FIN, ADR, DR, R)   (1)

Where FI = financial inclusion index
f = function
PCI = per capita income
DCP = domestic credits provision
Ms = Money supply
FT_N = financial institutions branches/network
ADR = age dependence ratio

DR = deposit interest rate
R = Inflation rate
Econometrically, the model I respecified as:-
FI= β_0 + β_1PCI+ β_2DCP + β_3Ms + β_4FIN + β_5ADR + β_6DR+β_7R+ ε (2)
Where, β_0 = constant value
β_1 - β_7 = parameter estimate
ε = stochastic error/term

F-statistic	1.526140	Prob (6,7)
Obs *R-Squared	8.7801138	Prob.chi-square (6)
Scaled explained SS	2.363476	Prob.chi-square (6)

Source: Econometric Computational Analysis (2022)

Table 1: Heteroskedasticity test: Breusch-Pagan-Godfrey

The white heteroskedasticity clearly revealed that the model is homoscedastic .This is because its p-value is greater than 5 percent significant level. Hence, it is conveniently conclude that the results are viable.

Equations: Untitled
Specification: f (PCI, DCP, Ms, FI_N, ADR, DR, R)
Omitted variables: Squares of fitted values

	Value	df	Probability
t-statistic	2.101452	6	0.7046
F-statistic	3.166205	(1,6)	0.2503
Likelihood ratio	6.421207	1	0.0306
F-test summary:			
	Sum of Sq.	df	Mean Square
Test SSR	219.2674	1	219.2674
Restricted SSR	401.5215	7	61.92175
Unrestricted SSR	287.2014	6	39.84238
LR test summary:			
	Value	df	
Restricted log L	-46.77190	7	
Unrestricted Log L	-44.23142	6	

Source: Econometric Computational Analysis (2022)

Table 2: Ramsey Reset Test

The Ramsey Reset test clearly revealed that the model is well specified. This is because it p-value is greater than 5 percent significant level. Hence, it can be conveniently included that model is fit for prediction.

4. Regression Result

Having satisfied the ordinary least square assumption, the regression result is presented here below in Table 3.

Dependent variable: FI
Method: Least squares
Date: 8/12/2022:Time ; 4:41
Sample(adjusted): 2012-2022
Included observations: 10

Variable	Coefficient	std error	t	Prob.
Constant	531.2625	236.5734	2.012422	0.2114
PCI	42.6341	57.4584	1.240321	0.1386
DCP	41.25572	63.0818	0.678021	0.5402
Ms	16.97242	5.2196	3.871502	0.0196
FIN	-127.6634	114.4620	-1.276014	0.9510
ADR	-39.4217	887.4912	-0.028120	0.1420
DR	36.15247	11.8756	-0.029971	0.8652
R	5.24216	15.54655	0.25578	0.67326
R-squared	0.84220	Mean dependent variable		29.7302
Adjusted R-Squared	0.63071	S.D dependent variable		9.40216
Standard error of regression	5.76710	Akaike info Criterion		6.56420
Sum Squared residue	170.9864	Schwarz Criterion		6.89201
Log likelihood	-35.16617	Hannan-Quing Criterion		6.56741
F- statistic	2.94123	Durbin –Watson stat		2.01242
Prob. (F- statistic)	0.044705			

Source: Econometric Computational Analysis (2022)

Table 3: Ordinary Least Square Result

The coefficient of determination (R-djusted) of the model is 0.63071, according to the regression result in Table 3 above which means that for the time period under consideration, based on the statistics that are currently available, PCI, DCP, Ms, FIN, ADR, DR and R together accounted to 63.07% of the total variation in FI in Tanzania. This is supported by the Durbin Watson statistics, which show that there is no first order serial auto correction an is about 2 (ie 2.0124).The model is statistically significant as indicated by the Fisher's ratio, which is a measure of the statistical significance of the overall model. As the result, the following explanatory variables are discussed.

4. Per Capita Income and Financial Inclusion

Per capita income being a measure of national output showed that financial inclusion in Tanzania was positively but insignificant impacted by per capita income, a ratio of gross domestic product (GDP) to total population size. This is supported by the fact that the coefficient of per capita income is positive and the p-value is greater than 5 percent level of significance. This means that if a nation's production capability is effectively promoted. Per capita income has the power to enhance its financial inclusion index programme. This means that Tanzania's ability to obtain and use financial products and services would increase as their economic well-being rises. Van, Vo, Nguyen and Vo reported that per capita income significantly affected the financial inclusion [5].

Provision of Domestic Credits and Financial Inclusion
Provision of credits by financial institutions to real sector activity suggested that the variable has a positive and significant effect on the Tanzania financial inclusion index measure. This indicates that the p-value is below the acceptable level of significant of 5 percent and that the coefficient of domestic credits provision is positive. Thus from these results it can be concluded that lending to the private sector in Tanzania stimulates both national output and financial inclusion index. This fact comprehend with the statement that businesses and the true private sector face funding constraints, and that the buildup of the idle funds from the unbanked financial needy population which makes up

a sizeable position of Tanzanian's population would then enable banks to make available loanable funds and provision of domestic credits activity that stimulates and moves the production possibility frontiers of nation outward. These positive and significant effects of provision of domestic credits to private sector on financial inclusion index were consistent as those by Sharma and Goel [6]. The variable however was found to be a negligible predictor of financial inclusion index in investigation [7].

5. Steady Money Supply and Financial Inclusion
Steady money supply and financial inclusion found to be positively significant impacted each other. The variable's positive coefficient and p-value below the 5 percent level of significance served as indicator of this. This, either mean that the country's intrinsic financial inclusion level increases in proportion to the level of money supply. This result more over indicates that currently there is to much money in circulation. More so, despite of the increase in bank financial services following liberalization where more than 51 banks are operating in Tanzania, the mobilization and allocation of deposit liability through loans and advances encourages financial inclusion index among Tanzanian's non banked population. The blessing results of this kind were consistent with that by Chinoda and Kwenda which found that money supply is a significant predictor of financial inclusion index [8].

6. Network of Financial Institutions' Branches and Financial Inclusion
The network /branches of financial institutions now banks indicated that the network exert a negative effect on financial inclusion index. This however revealed to be statistically insignificant. This is an indication that the coefficient of spreading of financial institutions is negative and the p-value is above the 5 percent pearable level of significance .This implies that networking /spreading of bank financial institutions branches and the financial services rendered stimulates financial access at an insignificant rate. These results support the findings by Emara and Said found that networking of bank branches has a insignificant impact on financial inclusion index[5, 9].

7. Age Dependence Ratio and Financial Inclusion

Age dependence ratio found to be negatively insignificant impacted on financial inclusion index in Tanzania. This shows that the coefficient of dependent rate is negative and the p-value is greater than the acceptable level of significance of 5 percent. This either recommends that the dependent rate is high at the moment; it is unrelated to the financial inclusion index level. The fact is that, this variable has a statistically insignificant effect on financial inclusion might be caused by this. Adil and Jalil found that countries with greater age dependence ratio have less economic inclusive [10].

8. Deposit Interest Rate and Financial Inclusion

Deposit interest rate found to be positively and significant related to financial inclusion index of Tanzanians. Deposits are of different forms suggested in this discussion included saving deposits certificate of deposits, and other deposits besides current account deposits. Despite the fact that the effect was statistically small, the measure of significance indicated that it was. This is an indicator the deposit interest rate coefficient is positive and the p-value is greater than the acceptable level of significance of percent. The study by Uddin, Chowdhury and Islam supports this conclusion while that by Le, Chuc and Taghizadeh-Hesary contradict the results. These contradicting results show that deposit interest rate lacks the ability to draw new accounts and repeat deposits [11, 12]. Therefore, it is crucial to offer rates and products that are alluring to keep and open new accounts in order to draw in savings and deposits.

9. Inflation and Financial Inclusion

The analysis showed that inflation is positive insignificant factor on financial inclusion index. This was a proven fact by the regression result being above the acceptable significance level of 5 percent .This either show that financial inclusion index in Tanzania was peripheral.

10. Conclusion and Recommendations

Financial inclusion being a condition of accessing to financial services found to be determined by per capita income, domestic credit provision, money supply networking of financial institution branches, age dependence ratio, deposit rate an inflation rate. To be more specific per capita income and inflation rate found to be positively but insignificantly impacted on financial inclusion index. Adequate domestic credits provision, money supply and deposit interest rates revealed to have positive significant effect on financial inclusion index though networking of financial institutions/ banks and age dependence ratio found to have negative insignificant effect on financial inclusion index.

Therefore it is from these positive results, this study recommend that per capita income should be improved upon as it is a potential determinant of financial inclusion in Tanzania, the current status on provision of domestic credits should be improved upon as it is a potential influencing factor of financial inclusion in Tanzania. The effective financial systems should be established by making sure that customer open accounts of which this may be stimulated by reducing deposit interest rates. More over it is recommended for banks and other financial institutions open up more other branches in remote rural areas for rural populace into the formal financial sector.

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