Original article

Does Financial Inclusion Affect Profitability Of Commercial Banks?

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Abstract

The objective of this study is to investigate the impact of financial inclusion on commercial banks profitability in 60 countries between 2017 and 2021. The study used 300 observations from countries with developed and undeveloped banking systems. The paper applies estimation methods including pooled OLS, FEM, REM and GLS related to panel data as well as multicollinearity, heteroscedasticity tests for model selection. Similar to previous papers, this research proved that most financial inclusion indicators have positive correlation with commercial banks profitability. In addition, this research suggested 3 new variables and pointed out: “Institutions of commercial banks” “Outstanding-loans with commercial banks” positively impact banks profitability whereas “Outstanding-deposits with commercial banks” has negative influence on banks profitability. The majority of previous papers have explored the effect of financial inclusion at the national level, for example, the relationship between financial inclusion and economic growth. Meanwhile, this paper investigated the impact of financial inclusion on commercial bank profitability, an issue concerned recently.this study can assist countries achieve a higher level of financial inclusion to raise commercial banks profitability, thereby boosting economic growth.

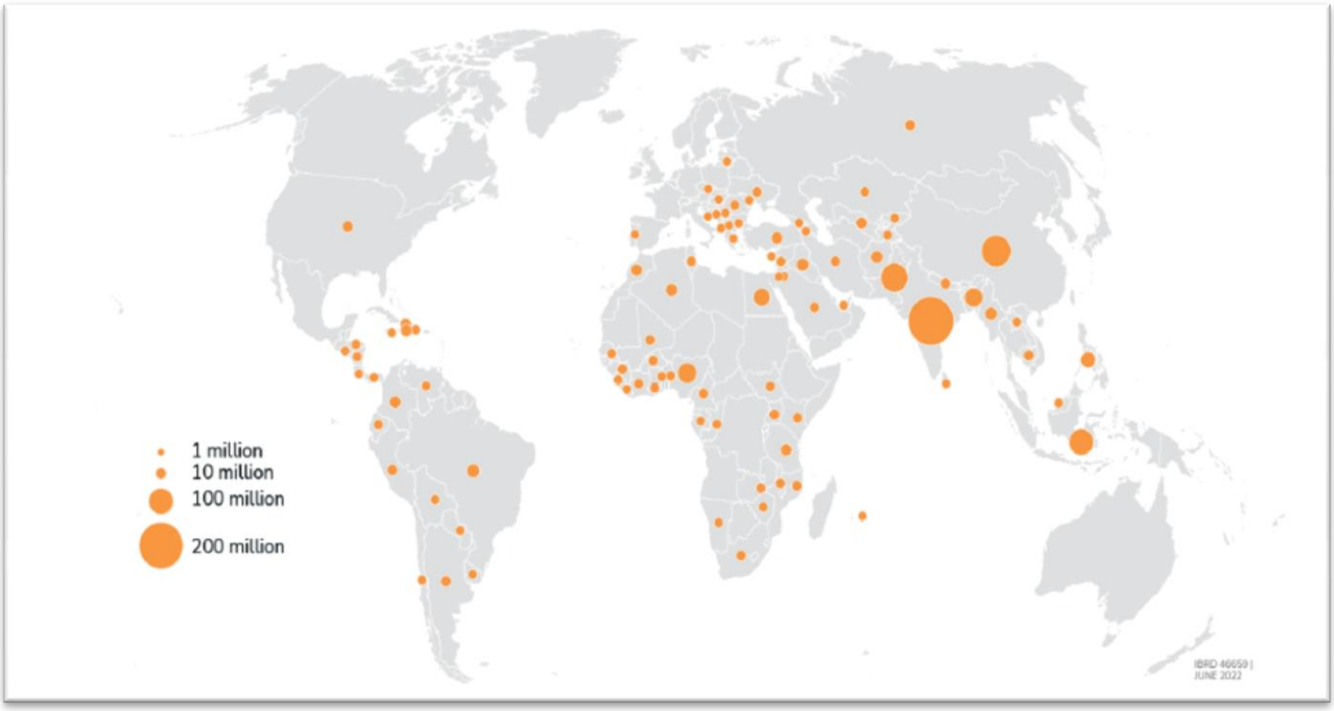
Keywords: Financial Inclusion; Commercial Banks; Banks Profitability; Return On Assets; Panel Analysis; Outstanding-Loans; Outstanding-Deposits

1. Introduction

The opening of international integration is currently an essential trend for the economic growth of countries all over the world. Commercial banks play a significant role in the economy by circulating capital and stimulating domestic investment. As a result, commercial banks must maintain stability in order to bear that vital responsibility, and profit is the top priority - it is not only a measure of a commercial bank's business success, but it also indirectly affects the economy's lifeblood.

According to the figure made by the world bank in 2021, globally, about 1.4 billion adults are still unbanked, most of them are women, those living in poverty, the less educated, they do not have an account at a financial institution or through a mobile money provider. Additionally, the competition between commercial banks is growing, this situation makes banks enhance customer market share to increase profits.as a result, banks are gradually shifting their focus to the subprime customer segment, broadening the scope to develop financial inclusion and improve access to financial services for individuals.

Map: Proportion Of Adult Population Without Access To Financial Services 2021



Source: Global Findex Database 2021

Financial inclusion first surfaced in the early years of the twenty-first century's second millennium, but it wasn't until the end of that decade, namely around 2017, that the world took notice. Financial inclusion in the broadest sense is the provision of appropriate and convenient financial services for all segments of society, especially vulnerable groups, in order to enhance access to financial services, contributing to economic growth. Financial inclusion is not limited to improving access to credit but includes improving financial literacy and protecting consumers. If all members of society have access to financial services, this will contribute to the circulation of investment and savings in the society. Therefore, financial institutions such as commercial banks could expand their customer market.

That is why we investigate the impact of financial inclusion on commercial bank profitability in order to assist policymakers in making the best decisions for the economy.

2. Literature Review

2.1 Bank Profitability

According To Mishkin, F. (2009) Bank Is A Financial Institution That Accepts Deposits And Lends Money, Payments And Other Financial Services. Banks Can Be Classified And Defined As: (I) The Function They Perform, (Ii) The Type Of Service They Provide And (Iii) The Legal Basis For Their Existence (Rose And Hudgins, 2008).Commercial Banks Mainly And Regularly Receive Deposits From Customers To Provide Credit And Perform Discount Operations And As A Means Of Payment. As A Business Organization, Commercial Banks' Operations Are Based On The Economic Accounting Regime With The Aim Of Making Profits. Commercial Banks Are Permitted By Law To Conduct A Wide Range Of Banking Business Operations, Such As: Receiving Term Deposits And Demand Deposits; Performing Discount Operations; Payment Services; And Raising Capital By Issuing Debt Certificates.

"Banking Activities Are Business And Regular Provision Of One Or A Number Of The Following Operations: Receiving Deposits, Granting Credit, Providing Payment Services Via Account" (Clause 12, Article 4 Of The Law On Credit Institutions 2020). Bank Profitability From Selling Liabilities With A Particular Set Of Characteristics (A Specific Combination Of Liquidity, Risk, Size, And Return) And Using The Proceeds To Purchase Assets Property Has A Number Of Other Characteristics (Mishkin, F.2009). Profit Reflects The Entire Revenue And Expenses Of The Bank, So Profit Becomes An Important Financial Indicator To Determine The Effectiveness Of The Bank's Operation. Roa (Return On Assets) Is A Measure Of How Efficiently A Bank Is Using Its Assets, Showing A Bank's Ability To Generate A Return On Its Assets While Roe Is An Indicator Of The Return On Equity Of Commercial Banks. Nim Reflects The Ability Of The Bank's Board Of Directors And Staff To Sustain The Growth Of Its Revenue Streams (Primarily From Loans, Investments And Service Fees) Relative To The Increase In Costs (Mainly Interest Payments On Deposits, Money Market Loans, Employee Salaries And Benefits).All Of The Proposed Factors Clearly Show How Efficiently A Bank Uses Its Overall Assets.. However, Roa Is Still An Indicator Applied By Many Studies Because Roa Concentrates On Determining How Effectively The Business's "Total Assets" Are Managed. Roa Indicates How Efficiently A Bank Uses Its Capital So Both Creditors And Owners Are Interested In Roa.

2.2Financial Inclusion

The World Bank Defines Financial Inclusion (FI) As Having Access To Practical And Reasonably Priced Financial Products And Services That Satisfy One's Requirements, Including Transactions, Payments, Savings, Credit, And Insurance, And That Are Provided In A Sustainable And Responsible Manner. Fi Was Described In A Study By Ozili In 2018 As The Supply Of And Access To Financial Services For All Members Of The Public, Especially The Poor And Other Excluded Groups. Another Definition Of Fi Is The Provision Of Banking Services At A Reasonable Cost To The Vast Majority Of Underprivileged And Low-Income Populations (Dev, 2006). The Use Of And Access To Formal Financial Services Is Another Method Of Explaining Fi (Sahay , 2015). These Definitions All Emphasize The Need Of Ensuring That Everyone In Society Has Access To The Available Financial Services. Therefore, Fi, In The Broadest Sense, Is The Provision Of Appropriate And Convenient Financial Services For All Members Of Society, Especially For Vulnerable Groups, In Order To Enhance Accessibility And Usage Of Financial Services, Contribute To Creating Livelihood Opportunities, Redistributing Capital Flows From Investment And Saving In Society, Thereby Fostering Economic Growth.

Azimi (2022) Proposed Three Dimensions Of Financial Inclusion: (I) Banking Penetration, (Ii) Usage And (Iii) Availability. Specifically, Bankingpenetration Is Access To Financial Services, Which Indicates The Number Of People Using Financial Services In An Economy, As Measured By The Number Of Deposit Accounts Per 1,000 Adults And Depositors Per 1,000 Adults; Availability Includes Two Key Metrics, The Number Of Banks Per 100,000 Adults And The Number Of Automated Teller Machines (Atms) Per 100,000 Adults; Usage Level Includes The Number Of Bank Loan Accounts Per 1,000 People And The Number Of Bank Borrowers Per 1,000 Adults. In Addition, According To The Imf's Financial Access Survey, Outstanding-Loans Of Commercial Banks (%Gdp), Outstanding-Deposits (%Gdp) Or Institutions Of Commercial Banks,... Are All Commonly Studied Financial Inclusion Indicators.

Nowadays, Financial Inclusion Is A Critical Component Of The Global Development Agenda, With Many Stakeholders Seeing It As A Driving Force In Everything From Agricultural Development To Education And Humanitarian Activities. This Is A Central Goal Of Many International Standard-Setting Bodies And National Governments, And Is Increasingly Seen As A Tool For Achieving Policy Goals Beyond The Financial Sector (Cgap).The United Nations Capital Development Fund (Uncdf) Believes That Financial Inclusion Is Not An End Goal But A Means To Many Other Goals. The World Bank Assesses Financial Inclusion As A Means To Achieve Its Goals As An Agent Promoting Economic Growth, Contributing To The Development And Maintaining Economic Stability Of A Country, While Supporting The Achievement Of 7 Out Of 17 United Nations Sustainable Development Goals (Sdgs).

2.3 FI’s impact on Bank Profitability

Overall, There Are Two Contrasting Findings About The Relationship Between Fi And Bank Profitability.

Most Papers Found A Positive Correlation, Such As Issaka Jajah . (2020), Which Conducted A Study Focusing On 48 Sub-Saharan African Countries. The Study Result Shows That Increasing Bank Branches And Atms Affirmatively Affected Bank Profitability. This Positive Impact Is Explained By The Fact That Expanding Bank Branches And Atms Result In Higher Bank Profitability As Larger Banks Can Invest More In Expanding Their Network. Another Study, Kumar . (2022), Focused On The Developed Market Economy Using A Sample Of 122 Japanese Banks, Also Uncovered The Positive Influence Of Bank Branches On Bank Profitability, Such As The Number Of Loan Accounts And Atms. In This Case, The Authors Assume That Increased Bank Networking Across Remote Areas Assures Bank Revenue. Shihadeh . (2018), Using A Sample Of 13 Jordanian Commercial Banks, Discovered That The Relationship Between Fi And Bank Profitability Depended On Fi Indicators. They Utilized Fi Indicators, Such As The Number Of Atms, Number Of Atm Services, And Number Of Credit Cards. The Results Revealed A Positive Relationship Between The Number Of Atms And Roa. The Study Suggests That The Availability Of Atms Made It Easy And Convenient For Customers To Deposit, Transfer, And Withdraw Money, Therefore, Increasing The Number Of Atms Positively Influenced Bank Profitability.

Meanwhile, A Negative Relationship Can Be Observed In A Study By Al-Eitan . (2022). Similar To Shihadeh . (2018), They Used A Sample Of 13 Jordanian Commercial Banks To Determine The Significant Role Of Fi On Bank Revenue. The Result Shows That The Profitability Of Jordanian Banks Was Negatively And Significantly Impacted By The Number Of Loan Accounts And The Deposit Size. Sedera, R. M. H., Risfandy, T., & Futri, I. N. (2022) Showed A Negative Sign Between 2 Variables: The Number Of Debit Cards And The Number Of Bank Accounts. In This Case, Debit Cards Are Deemed A Payment Method Linked Directly With The Bank Account (Sik & Lee, 2010), Which Might Not Directly Affect Banking Profitability. Debit Card Holders Have Only Utilized It As An Alternative Way To Substitute Cash Usage, For Instance, To Minimize And Avoid Carrying Cash To Be More Secure And Convenient.

Previous Research Had Found That The Number Of Branches Of A Commercial Bank (Branch) Has A Significant Correlation With The Profitability Of Commercial Banks. However, In Light Of The Reality Of 4.0 Technological Networks, The Impact Of This Aspect Has Diminished Because Individuals Rarely Conduct Counter Transactions And Instead Deal Online Via The Internet. As A Result, While Evaluating The Supply-Side Elements Of Financial Inclusion, The Measure Of Commercial Bank Institutions Supplements The Branch Indicator. Similar To The Branch Index, The Institutions Index Is Expected To Be Positively Correlated With The Profitability Of Commercial Banks.

Besides, There Are A Number Of Other Factors That Influence Commercial Bank Profitability. Loan Growth, According To Erin Wijayanti And Mardiana (2020), Had A Positive Impact On Bank Profitability Via Bank Capital. According To The Imf's Financial Access Survey Database, Outstanding Loan (Ol) Is One Of The Indicators Of Financial Inclusion That Experts Believe Has A Direct Relationship With Loan Growth, Hence Ol Is Thought To Have A Positive Correlation With Profitability.

Commercial Banks Serve As Financial Middlemen By Mobilizing Idle Capital From Savers And Then Distributing It To Individuals In Need Of Capital. As A Result, Outstanding-Loan (Ol) And Outstanding-Deposit (Od) Are Inextricably Linked. Furthermore, Based On Imf's Fas Database, Od Is One Of The Indicators Of Financial Inclusion, Hence Od Is Thought By Some Experts To Have An Impact On Commercial Bank Profitability. The Variable Ol Has A Positive Impact On Commercial Bank Profitability Because Lending Activities Generate Revenue For The Bank Through Interest Income, Whereas The Variable Od Is Expected

To Be Negatively Correlated With Commercial Bank Profitability Because The More Deposits Mobilized, The Higher The Interest Expense That The Bank Must Bear.

Table 1. Expected Sign And References Of Variables

Variable	Expected Signs	References
Return On Assets		Yussif Issaka Jajah (2022); Sedera, R.M.H (2022);Alshehadeh And A. Al-Khawaja (2022); Saleh F.A.K (2022); Al-Chahadah A.R (2020)
Outstanding-Loan From Commercial Banks	+	Erin Wijayanti And Mardiana (2020)
Outstanding-Deposit With Commercial Banks	-	Al-Eitan . (2022)
Institutions Of Commercial Banks	+	Proposed By The Research Team
Number Of Deposit Accounts	+	Saleh F.A. Khatib . (2022)
Number Of Credit Cards	+	David . (2016), Issaka Jajah . (2020)Sedera (2022)
Number Of Debit Cards	-	Sedera, R. M. H., Risfandy, T., & Futri, I. N. (2022)
Number Of Atms	+	Shihadeh . (2018), Issaka Jajah . (2020), Kumar . (2022)
Number Of Commercial Bank Branches	+	Shihadeh .(2018), Issaka Jajah .(2020), Kumar .(2022)

3. Model Specification

3.1 Data And Sample

In This Study, We Extracted The Data Of All Countries In The World From Various Sources. Data On The Financial Inclusion And Commercial Banks Were Collected From The World Bank, International Monetary Fund (Imf). The World Bank Provided Data On Return On Asset (Roa). The International Monetary Fund Provided Data On Institutions, Outstanding-Loans, Outstanding-Deposits, The Number Of Atms, Number Of Bank Branches, Number Of Deposit Accounts, Number Of Debit Cards, And Number Of Credit Cards.

Regarding The Sample, The Researchers Used All Commercial Banks Available In The Population As A Sample To Obtain A More Generalized Result Covering The Whole Banking Industry. Based On The World Bank, There Were 190 Countries Where Commercial Banking Data Is Collected. Therefore, The Researchers Eliminated The Banks On The List Since They Used A Different Ratio Type And Measurement Than Conventional Banks. The Researchers Also Eliminated Several Banks With Incomplete Data In The Sample Period Of 2017-2021. Then, The Final Sample Contained 60 Out Of 190 Commercial Banks From 2017 To 2021, Yielding 300 Bank-Year Observations.

3.2Variables And Measurements

Dependent Variable: The Return On Assets (Roa) Variable Was Chosen As The Dependent Variable In This Research Model Due To Its Importance And Coverage. As The Name Implies, Roa Is Computed By Dividing Return By Total Assets. Profit Might Be Earning Before Tax (Ebt), Earning After Tax (Eat), Or Retained Earnings (Re), Although Most Commonly Eat Is Used. Total Assets Are Documented Annually On Commercial Bank Balance Sheets.

Independent Variable: On The Supply Side Of Financial Inclusion, Seven Elements Have Been Studied:

1) Outstanding-Loan: According To Law Insider, Outstanding-Loan Means A Loan That The Consumer Is Legally Obligated To Repay, Regardless Of Whether The Loan Is Delinquent Or Is Subject To A Repayment Plan Or Other Workout Arrangement, Except That A Loan Ceases To Be An Outstanding Loan If The Consumer Has Not Made At Least One Payment On The Loan Within The Previous 180 Days.
2) Outstanding-Deposit: An Outstanding Deposit Is That Amount Of Cash Recorded By The Receiving Entity, But Which Has Not Yet Been Recorded By Its Bank. All Outstanding Deposits Are Listed As Reconciling Items On The Periodic Bank Reconciliation Prepared By The Receiving Entity. These Deposits Are Subtracted From The Book Balance Of The Receiving Entity To Arrive At The Bank Balance. (Accountingtools - Accounting Cpe Courses&Books, 2022)

3) Institutions: The Number Of Commercial Banks, For Example, In Vietnam, There Are 50 Banks, Comprising Four State-Owned Banks And 46 Private Banks.
4) Deposit Accounts: A Deposit Account Is Described In The Cambridge Dictionary As A Bank Account That Pays Interest And In Which You Normally Store Money For A Long Period, Which Is A Somewhat Simplified And Incomplete Interpretation Because The Above Definition Only Applies To One Type Of Deposit Account - A Savings Account. In Addition To Other Forms Of Deposit Accounts Such As Transaction Accounts, Is One Sort Of Deposit Account.
5) Credit Cards: A Credit Card Is A Type Of Credit Facility, Provided By Banks That Allow Customers To Borrow Funds Within A Pre-Approved Credit Limit. Banks Charge Fees From Their Credit Card Users In The Form Of Annual Fee, Cash Advance (Withdrawal) Fee, Balance Transfer Fee, Late Payment Fee, Foreign Transactions Fee, Etc. Interest Is Also A Source Of Great Revenue For Banks As The Interest Rates On Credit Cards Are Very High.
6) Debit Cards: A Debit Card Is The Card That Is Linked To The User's Checking Account At A Bank Or Credit Union. It Can Be Used To Buy Goods Or Services Or To Get Cash From An Atm By Deducting Money Directly From A Consumer’s Checking Account When It Is Used.The Amount Of Money That Can Be Spent With It Is Tied To The Account Size.
7) Atms: A Self-Service Banking Outlet That Offers A Number Of Services For Customers Such As Withdrawing Money, Checking Bank Balance, And Transferring Funds With A Bank Card.
8) Bank Branches: A Physical Location Of A Commercial Bank That Provides Face-To-Face Services For Customers Of A Bank.

Table 2: Variable Description And Hypotheses

Variable	Coded	Description	Hypothesis
Dependant Variable			
Return On Assets	Roa	Bank Return On Total Assets (%, After Tax)	
Independent Variable			
Outstanding-Loan	Ol	Outstanding-Loan From Commercial Banks (% Of Gdp)	H1:
Outstanding-Deposit	Od	Outstanding-Deposit With Commercial Banks (% Of Gdp)	H2: Outstanding-Deposit Has A Negative Correlation With Commercial Banks Profitability
Institutions	Ins	Number Of Commercial Banks	H3: Institutions Have A Positive Correlation With Commercial Banks Profitability
Deposit Accounts	Da	Number Of Deposit Accounts Per 1,000 Adults	H4: Deposit Accounts Have A Positive Correlation With Commercial Banks Profitability
Credit Cards	Cc	Number Of Credit Cards Per 100,000 Adults	H5: Credit Cards Have A Positive Correlation With Commercial Banks Profitability
Debit Cards	Dc	Number Of Debit Cards Per 100,000 Adults	H6: Debit Cards Have A Negative Correlation With Commercial Banks Profitability
Atms	Atm	Number Of Atms Per 100,000 Adults	H7: Atms Have A Positive Correlation With Commercial Banks Profitability
Branches	Bra	Number Of Bank Branches Per 100,000 Adults	H8: Branches Have A Positive Correlation With Commercial Banks Profitability

3.3 Model

The Researchers Estimated The Following Empirical Model To Investigate The Impact Of Financial Inclusion On Bank Profitability:

$$ROA_{it} = \beta_0 + \beta_1 OL_{it} + \beta_2 OD_{it} + \beta_3 INS_{it} + \beta_4 DA_{it} + \beta_5 CC_{it} + \beta_6 DC_{it} + \beta_7 ATM_{it} + \beta_8 BRA_{it} + \mu_{it} \quad (1)$$

Where I Indicates An Individual Bank; T Refers To The Time Period (Year); B0 Is The Constant Intercept; Roa Is The Profitability Proxies Of The Bank; Ol,Od, Ins,Da,Cc,Dc,Atm,Bra Measure The Fi Indicators; B1–B7 Are The Coefficients Of The Function; And µit Is The Error Term.

Since This Study’s Datasets Consisted Of Cross-Sectional And Time-Series Dimensions, The Researchers Used Panel Data Analysis To Estimate The Equation (1). The Researchers Also Utilized Fixed-Effects Analysis To Allow For A Quasi-Correlation Between Firm-Level Controls And Bank-Fixed Characteristics (Wooldridge, 2016).

4 Results And Discussion

4.1 Descriptive Statistics

The Descriptive Statistics In Table 3 Demonstrated The Mean, Standard Deviation, Maximum And Minimum Values Of Variables Examined In This Research.

Dependent Variable Measuring Bank Profits: Roa As A Measure Of Bank Profitability Ranged From -2,05% To 3,57%, With A Mean Value Of 0,824%. Roa's Dispersion Was 0.925

Independent Variables Measuring Level Of Financial Inclusion: There Was A Considerable Difference Between The Maximum And Minimum Values Of Institutions Of Commercial Banks. Atms Per Hundred Thousand Adults (Atm) Had A Median Of 51.16. On Average, There Were 17 Commercial Banks Branches Per 100,000 Adults, With A Minimum Of 2.3 And A Maximum Of 72 Branches. Of All Variables, Number Of Deposit Accounts Per 1000 Adults Had The Highest Standard Deviation. This Index Suggested That There Was A Significant Difference In The Number Of Deposit Accounts Between Countries. The Median Number Of Debit Cards Was 1010.271 Which Was Approximately Three Times Higher Than That Of Credit Cards. According To Statistics, Debit Cards Were More Familiar Among The Adult Populations In 60 Countries Than Credit Cards. The Median Value Of Outstanding Loans From Commercial Banks (% Of Gdp) Was Nearly 1.2 Times Lower Than That Of Outstanding Deposits, With Respectively 55.75% And 67,17%. This Implies That Commercial Banks Not Only Generate Profits But Also Manage Liquidity Risk.

Table 3: Descriptive Statistics

Variable	Obs	Mean	Std.Dev	Min	Max
Economy	0				
Year	300	2019	1.416576	2017	2021
Outstanding-Loan	300	55.7548	35.12677	6.658603	179.4393
Outstanding-Deposit	300	67.17236	42.87444	16.15948	251.2613
Institutions	300	40.68333	47.41593	4	253
Deposit Accounts	300	1643.526	1232.325	108.318	7247.314
Credit Cards	300	321.4046	436.5138	0.0158556	2679.179
Debit Cards	300	1010.271	699.7601	31.65458	4169.87
Atms	300	51.1606	35.50629	2.795872	170.1871
Branches	300	17.01033	12.41654	2.318851	72.06519
Roa	300	0.8244313	0.925117	-2.053496	3.571036
Eco	300	30.5	17.34704	1	60

4.2 Correlation

Table 4: Correlation Matrix Of Variables

	Roa	Ins	Atm	Bra	Da	Cc	Dc	Od	Ol
Roa	1.0000								
Ins	0.1699	1.0000							
Atm	0.2068	0.2794	1.0000						
Bra	0.2354	0.3761	0.5500	1.0000					
Da	0.2125	0.1202	0.4596	0.3543	1.0000				
Cc	0.0418	0.3816	0.5717	0.3713	0.7119	1.0000			
Dc	0.1969	0.2666	0.6710	0.3504	0.6665	0.7699	1.0000		
Od	0.1809	0.3911	0.2732	0.2962	0.2572	0.3260	0.2776	1.0000	
Ol	0.3212	0.4274	0.4316	0.3679	0.3946	0.4238	0.3802	0.7963	1.0000

The Table 4 Shows The Correlation Coefficient Between The Variables, We Observe That All Variables Have A Positive Correlation With Roa. This Indicates That An Increase In The Overall Financial Ratio In The Bank Tends To Increase Roa. The Correlation Coefficient Of The Variables In The Research Model Is Low, Thus The Problem Of Multicollinearity Is Unlikely To Occur When Performing Regression Estimation (Gujarati, 2008). Furthermore, According To Kennedy (2008), If The Absolute Value Of The Correlation Coefficient Between Two Variables Is Greater Than 0.8, The Multicollinearity Problem In The Model Is Considered High; At The Same Time, The Estimated Coefficients May Lose Their Statistical Significance And Their Signs May Be Opposite To Expectations; The Estimated Results Lack Reliability. However, According To The Results Presented In Table 4, There Are No Correlation Coefficients Greater Than 0.8, So The Correlation Between The Variables Is All At An Acceptable Level. This Is An Important Sign In The Validation And Selection Of A Suitable Model.

4.3 Result Of The Regression Analysis

First, The Authors Re-Estimated The Model Using The Ols Method.

Table 5: The Results Of Ols Regression

Source	Ss	Df	Ms		Number Of Obs	=	300
Model	58.9674534	8	7.37093167		F(8,291)	=	10.89
					Prob>F	=	0.0000
Residual	196.929134	291	0.67673242		R-Squared	=	0.2304
					Adj R-Squared	=	0.2093
Total	255.896587	299	0.85584143		Root Mse	=	0.82264

Roa	**Coef**	**Std.Err**	**T**	**P>|T|**	**[95% Conf. Interval]**	
Ol	0.0104075	0.0025063	4.15	0.000	0.0054747	0.0153403
Od	-0.0039403	0 .0018758	-2.10	0.037	-0.0076321	-0.0002485
Ins	0 .0027201	0.0012481	2.18	0.030	0.0002636	0.0051766
Da	0 .0001959	0 .0000617	3.18	0.002	0.0000745	0.0003173
Cc	-0.0011894	0.0002019	-5.89	0.000	-0.0015869	-0.000792
Dc	0 .0003701	0.0001241	2.98	0.003	0.0001257	0.0006144
Atm	0.00000161	0.0021009	0.00	0.999	-0.0041332	0.0041364
Bra	0.0081587	0.0049233	1.66	0.099	-0.0015312	0.0178485
Cons	-0.0541574	0.1218762	-0.44	0.657	-0.294028	0.1857132

The Pooled Ols Model Explained 20.93% Of The Change In Financial Inclusion Affecting The Profits Of Commercial Banks. As Table 5 Shows, There Are 6 Independent Variables That Are Significant At The 5% Level. However, The Estimates Based On The Pooled Ols Model Do Not Reflect The Impact Of The Differences Among Countries. Therefore, The Author Used The Breusch Pagan Lagrangian Multiplier Test To Choose Between The Ols Regression And Rem Models. The Breusch Test Raised Two Hypotheses:

H0: The Ols Multiple Linear Regression Model Is Appropriate And Effective

H1: The Random Effect Rem Model Is Appropriate And Effective

Table 6: The Results Of Breusch And Pagan Lagrangian Multiplier Test For Random Effects

Roa[Eco,T]=Xb+U[Eco]+E[Eco,T]

Estimated Results:

	Var	Sd = Sqrt(Var)
Roa	0.8558414	0.925117
E	0.3388316	0.5820924
U	0.3651115	0.6042446

Test: Var(U) = 0			
	Chibar2(01)	=	123.32
	Prob > Chibar2	=	0.0000

According To The Table, The Model Has Prob>Chibar2 = 0.0000 < 0.05, With A 95% Confidence Level We Reject H0 And Accept H1. Thus, Between The Two Models, Ols And Rem, The Rem Model Is More Appropriate. The Group Continues To Run The Hausman Test To Choose Between The Fem And Rem Models That Are Appropriate For The Collected Data Set. The Hausman Test States Two Hypotheses:

H0: The Random Effect Rem Model Is Appropriate And Effective

H1: The Fixed Effect Fem Model Is Appropriate And Effective.

Table 7: The Result Of Hausman Test

Test: H0: Difference In Coefficients Not Systematic			
	Chi2(8)	=	$(b-B)'[V_b - V_B)^{-1}](b-B)$
		=	18.93
	Prob > Chi2	=	0.0152

The Result Shows That Prob>Chi2 = 0.0152 < 0.05, With A 95% Confidence Level We Do Not Have Enough Basis To Reject H0. Thus, Between The Two Models, Fem And Rem, The Fem Model Is More Appropriate. Next, To Test The Model's Suitability, The Authors Use Two Tests To Check The Existence Of The Phenomenon Of Changing Errors And The Self-Correlation Test.

First, The Authors Use The Wald Test (Greene 2000) With Two Hypotheses:

H0: The Fem Model Does Not Have A Changing Error Phenomenon

H1: The Fem Model Has A Changing Error Phenomenon.

Table 8: The Result Of Wald Test

Modified Wald Test For Groupwise Heteroskedasticity In Fixed Effect Regression Model

H0: Sigma(I)^2 = Sigma^2 For All I			
	Chi2(60)	=	37973.62
	Prob > Chi2	=	0.0000

The Result Shows That The Null Hypothesis H0 Is Rejected With A P-Value Of 0.0000 <0.05, Meaning That There Exists A Phenomenon Of Changing Error Variance In The Model.

Next, The Authors Also Examine The Autocorrelation In The Model, Posing Two Hypotheses:

H0: There Is No Autocorrelation Phenomenon

H1: There Is An Autocorrelation Phenomenon.

Table 9: The Results Of Wooldridge Test

H0: No First-Order Autocorrelation		
F(1,59)	=	1.840
Prob > F	=	0.1801

The Result Shows That The Null Hypothesis Is Accepted, Meaning That There Is No Autocorrelation In The Model With A P-Value = 0.1801 > 0.05. Due To The Existence Of Heteroscedasticity, The Authors Use The Fgls Method To Mitigate This Phenomenon In Their Model.

Table 10: The Results Of Gls Regression

Coefficients: Generalized Least Squares Panels: Heteroskedastic Correlation: No Autocorrelation					
Estimated Covariances	=	60	Number Of Obs	=	300
Estimated Autocorrelations	=	0	Number Of Groups	=	60
Estimated Coefficients	=	9	Time Periods	=	5
			Wald Chi2(8)	=	270.51
			Prob > Chi2	=	0.0000

Roa	Coef	Std.Err	T	P>|T|	[95% Conf. Interval]	
Ol	0.0079917	0.0014282	5.6	0.000	0.0051925	0.0107909
Od	-0.0022343	0 .0011102	-2.01	0.044	-0.0044103	-0.0000582
Ins	0 .00279	0.0007144	3.91	0.000	0.0013899	0.0041902
Da	0 .0001653	0 .0000354	4.67	0.000	0.0000959	0.0002347
Cc	-0.0010748	0.0001234	-8.71	0.000	-0.0013167	-0.0008329
Dc	0 .0003359	0.00006	5.6	0.000	0.0002184	0.0004534
Atm	0.0001268	0.0010881	0.12	0.907	-0.0020058	0.0022595
Bra	0.0091312	0.0029114	3.14	0.002	0.0034249	0.0148375
Cons	-0.0162155	0.620084	0.26	0.794	-0.1053188	0.1377497

With A 5% Significance Level, There Are 7 Independent Variables That Affect The Comprehensive Financial Performance Of The Bank, Of Which 5 Have A Positive Impact, Including Institutions, Branches, Da, Dc, Ol, And 2 Have A Negative Impact, Cc And Od, On The Commercial Bank's Profits. The Results Of The Model's Diagnostics And Remediation Show That The Model Is Statistically Acceptable.

4.5 Discussions Of The Result

Table 11 Summarizes The Predicted And Actual Indicators Of The Correlations Between The Financial Inclusion Index And Commercial Bank Profitability:

Table 11: The Comparison Of Actual And Expected Signs Of Fi Indicators With Significant Variables

Variables	Ol	Od	Ins	Da	Cc	Dc	Atm	Bra
Coefficient (P-Value)	0.00799 (0.000)	-0.00223 (0.044)	0.00279 (0.000)	0.00016 (0.000)	-0.00107 (0.000)	0.00033 (0.000)	0.00012 (0.907)	0.00913 (0.000)
Expected Sign	+	-	+	+	+	-	+	+
Actual Sign	+	-	+	+	-	+		+
Statistically Significant Level	1%	5%	1%	1%	1%	1%		1%

As A Result, The Important Findings Of The Regressions Presented In Table 11 Were:

First Of All, Outstanding-Loan Has A Positive Correlation With Commercial Banks Profitability, With The Significance Level Of 1%. This Result Was Consistent With The Study Of Erin Wijayanti And Mardiana (2020). Lending Is The Primary Activity Of Banks Because It Is Their Main Revenue Stream (Ebimobowei And Felix, 2023). Furthermore, A Bank With A Large Proportion Of Loans In Its Portfolio Will Be Less Risky Than A Bank That Prefers To Invest In Stocks, Bonds, And Other Non-Traditional Activities (Iannotta, 2007). According To Bitar (2018), Traditional Lending Is Less Expensive To Manage And Supervise Than Financial Derivatives.

Secondly, Outstanding-Deposit Has A Negative Impact On Commercial Banks' Profitability At A Significant Level Of 5%, According To The Study Result Of Al-Eitan (2022). Banks Typically Make Money By Raising Capital From Depositors And Compensating Them With A Certain Interest Rate - This Is The Interest Cost Of Banks (Ebimobowei And Felix, 2023). In The Study Of Do Hoai Linh And Vu Kieu Trang (2019), The Author Shows That Deposit Growth In The Commercial Banking System

Will Lead To Increased Interest Payments, And Is Also Related To Investment. Investing In Assets Of Lower Credit Quality And Attracting Competitors In New Markets Reduces Bank Profits. As A Result Of The Expenditure Required To Obtain This Deposit, The Outstanding Balance Of Deposits Has A Negative Impact On The Profitability Of Commercial Banks.

Thirdly, Institution Has A Positive Effect On Commercial Profitable Banks With The Significance Level Of 1%, Similar To The Branch Variable. The Greater The Density Of Commercial Bank Institutions, The Larger The Market Share For The Banking System In General, And Commercial Banks In Particular, Because Customers In The Underbank Area Will Have Access To Financial Services. The Increased Number Of Customers Will Bring Expected Revenue For Commercial Banks. Furthermore, The Diversification Of Financial Institutions, Particularly Commercial Banks, Will Provide Clients With More Options For Depositing And Lending. Customers Can Deposit Or Borrow Money From Many Banks. Just Like Not Putting Eggs In The Same Basket, Customers Can Deposit Or Borrow Money From Many Different Banks, Or For Large Investments, Many Banks Will Cooperate To Reduce Risks And Limit Expenses.

Fourthly, Number Of Credit Cards Has A Negative Correlation With Commercial Bank Profitability With A 1% Significance Level. Generally, Banks Can Gain More Profits From Credit Cards, Especially If These Cards Are Used Outside The Issuing Country. However, In This Study, We Found A Negative Relationship Between The Number Of Credit Cards And Roa. This Can Be Explained By Two Main Reasons. Many Customers Use Credit Cards And Pay Their Debts On Time, In This Case, Banks Will Lose Their Main Source Of Revenue From Interest And Overdue Debt Penalties. Moreover, We Used The Number Of Credit Cards Issued Even When They Were Unused By Customers. If Customers Do Not Use The Cards, Banks Not Only Can Not Make Money From Issuing The Credit Cards, But Also Suffer From Card Issuance And Management Costs.

Fifthly, The Hypothesis That “Number Of Debit Cards Has A Positive Impact On Roa” Is Accepted With A Significance Level Of 1%. This Result Is Similar To The Study Of Almaleeh Et Al (2020). Debit Cards Are Linked To Customers’ Checkable Deposit Accounts. Checkable Deposit Is Considered A Cheap And Important Source Of Capital In Banking Activities. The More People Have Debit Cards, The More Likely It Is That The Bank Will Raise More Payment Deposits. If Banks Make Effective Use Of This Source Of Capital, It Will Deliver Greater Profitability. In Addition, Debit Card Fees (Including Transaction, Withdrawal, Management,..) Also Contribute To Great Revenue For Commercial Banks.

Sixthly, The Deposit Account Has A Positive Effect On Commercial Banks With The Significance Level Of 1%. This Result Is Similar To The Study Of Saleh F.A. Khatib Et Al. (2022). In Our Research, This Variable Has The Lowest Impact Of All The Indicators Because It Represents The Intermediation Role Of The Bank. Banks Must Take Advantage Of This Type Of Deposit To Make Their Business Capital Because In The Process Of Capital Turnover Of Banks, There Is A Difference Between The Amounts Withdrawn And Transferred. Therefore, The Higher The Deposit Account, The More Capital Can Be Raised.

Seventhly, Number Of Atms Has No Significant Impact On Commercial Banks.This Finding Can Be Explained As The Presence Of Atms Is Not Necessarily Contributing To Bank Profits. In The Study Of Al-Chahadah (2018), Issaka Jajah (2020), Almaleeh (2020), Saleh (2022) The Number Of Atms Has A Positive Impact On Profitability Of Commercial Banks. These Studies Have Concluded That The Increase In The Number Of Atms Creates Favorable Conditions For Customers To Deposit, Transfer And Withdraw Money, Thereby Positively Affecting The Profitability Of Commercial Banks. However, The Development Of Mobile And Internet Banking May Replace Or Reduce The Use Of Atms, Where Customers Can Do Transactions And Payments Remotely. With Mobile Technology, Banks Are Able To Cut Down On Operational Costs While Still Maintaining Client Satisfaction. The Fact That Any Client Of A Bank Can Make Use Of Their App To Request A Service, Such As Opening An Account Or Even The Ability To Schedule Debit Orders Or Other Payments From An Application.

Eighthly, Number Of Bank Branches Also Positively Impacted The Bank's Profitability With The Significance Level Of 1%. This Result Is Also Shown In The Study Of Al-Chahadah (2018), Which Emphasized The Interdependence Between The Growth In Bank Branches And The Number Of Customers Leading To Increased Deposits, Loan Portfolios, And Risk Diversification. The Expansion Of The Number Of Commercial Bank Branches, Especially In Remote Areas, Will Facilitate The Bank's Access To A Group Of Customers Who Have Never Used Formal Financial Products And Services, Thus Contributing To An Increase In Revenue And Improving The Profitability Of Commercial Banks Kumar (2022). Thus, A Bank Can Enhance Its Performance Through Branching By Penetrating Underserved Locations While Improving Commercial Banks Need To Have A Strategy To Expand Cooperation With Telecommunications, Financial Technology, And Payment Intermediaries To Improve New Services And New Payment Technology Which Is Affordable, Convenient And Suitable For Individual Payment Transactions.

5 Recommendations

5.1 Recommendations For Commercial Banks

The Results Indicate That Financial Inclusion Has A Significant Role In Improving Bank Profitability. This Suggests That Commercial Banks Must Be Aggressive In Pursuing Financial Inclusion Policies And Strategies.

Firstly, Commercial Banks Should Develop Diversified Lending Products For All Individuals And Businesses, Especially Low-Income Groups; Small And Medium Enterprises. Improving The Efficiency Of Lending Will Contribute To Ensuring And Increasing Profits For Banks,Since Lending Is The Main Profit-Making

Secondly, Commercial Banks Should Expand Their Network Of Branches, Helping To Bring Finance Closer To People, Especially In Remote And Rural Areas

Thirdly, Commercial Banks Should Focus On Researching New Financial Services Instead Of Investing In Atms As It Costs Banks A Lot And Doesn’t Bring Profits For Banks

Fourthly, Commercial Banks Should Determine A Reasonable Deposit Interest Rate To Avoid Putting Pressure On The Bank Itself To Pay The Cost Of Capital Mobilization.

5.2 Recommendations For Policymakers

Policymakers Are Important In Supporting The Field Of Inclusive Finance Which Improves Profitability Of Commercial Banks.

There Are 4 Recommendations Made By The Author For Policymakers:

Firstly, Perfect The Legal Framework Related To The Provision Of Financial Products And Services, Especially Those Based On Digital Technology Application

Secondly, The Financial Infrastructure Continues To Be Improved And Efficiency Increased. The State Bank Should Invest And Upgrade Important Payment Systems Such As: Interbank Electronic Payment System; The System Of Clearing And Switching Financial Transactions; Automated Clearing System For Retail Payment Transactions

Thirdly, Expand The Coverage Of Service Supply Points Of Commercial Banks In Rural And Isolated Areas, Create Favorable Conditions For Those Living In Poverty To Access Financial Services.

Fourthly, Policymakers Should Create An Enabling Environment To Improve Literacy Of Financial Products And Services, Especially The Primary Educational Level For Promoting Wiser Use Of Financial Services. Ministries And Sectors Need To Implement Training Programs To Enhance Financial Knowledge And Skills For Individuals And Businesses. The Ministry Of Education And Training Should Integrate Financial Literacy Into The National General Education Program.

6.Limtations And Future Research Directions

6.1 Limitations

The Limitations Of This Research Were That

I. The Area Of Research Didn't Include Every Country Because Of Insufficient Data. Therefore, The Study Didn't Cover All Regions Of The World.

II. 8 Indicators Of Financial Inclusion, When Used Individually, Didn't Reflect The Full Extent Of Financial Inclusion.

6.2 Future Research Directions

(I) It Is Possible To Replace The Return On Assets With Return On Equity Or Net Interest Margin For Future Research.

(I) Data From Vietnamese Commercial Banks Can Be Used To Study The Impact Of Financial Inclusion On The Profitability Of Commercial Banks Within The Country.

Conclusions

Based on the research overview and theoretical basis, the authors have identified the components of financial inclusion that affect the profitability of commercial banks in 60 countries around the world. propose a research model for the topic. Due to the research results assessing the impact of financial inclusion on the profitability of commercial banks, the authors have discovered two new components of financial inclusion that affect profitability: number of commercial banks and outstanding loans at commercial banks (as % of GDP). From there, give a formal research model for the research paper. Carrying out quantitative research through model estimates using OLS, FEM, REM methods and Breusch and Pagan Lagrangian tests, Hausman test, Wald test, multicollinearity test, autocorrelation test have been done. Additionally the factor which has the strongest impact on profitability is the number of commercial bank branches (BRA).

According to the results of analyzing the impact of financial inclusion on the profitability of commercial banks, the study has provided policy implications for commercial banks and policy makers.

Data Availability

The data, mostly secondary data, was collected based on the sources have been cited and presented in the study and references. Authors can access the data online

Conflicts of Interest

We -the authors declare that there is no conflict of interests regarding the publication of this paper.

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