

Financial Inclusion and Development: A Cross Country Analysis

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Abstract

The issue of financial inclusion is a development policy priority in many countries. This paper presents a cross country empirical analysis of the relationship between financial inclusion and development. Using the index of financial inclusion developed in Sarma (2008), the paper attempts to identify the factors that are significantly associated with financial inclusion. Levels of human development and financial inclusion in a country move closely with each other, although a few exceptions exist. Among socio-economic factors, as expected, income is positively associated with the level of financial inclusion. Going beyond income, inequality, literacy and urbanisation are other important factors. Further, physical infrastructure for connectivity and information are also significantly associated with financial inclusion. Among the banking sector variables, NPA and CAR are negatively associated with financial inclusion. Government ownership of banks is not significantly associated with financial inclusion while foreign ownership is found to be negatively associated. Interest rate does not seem to be significantly associated with financial inclusion.

KEY WORDS: Financial Inclusion, Index of Financial Inclusion, Human Development Index

JEL Classification: G21, O16, O50

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1. Introduction

Financial inclusion refers to a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy. An inclusive financial system has several merits. It facilitates efficient allocation of productive resources and thus can potentially reduce the cost of capital. In addition, access to appropriate financial services can significantly improve the day-to-day management of finances. An inclusive financial system can help in reducing the growth of informal sources of credit (such as money lenders), which are often found to be exploitative. Thus, an all-inclusive financial system enhances efficiency and welfare by providing avenues for secure and safe saving practices and by facilitating a whole range of efficient financial services.

The importance of an inclusive financial system is widely recognized in the policy circle and recently financial inclusion has become a policy priority in many countries. Initiatives for financial inclusion have come from the financial regulators, the governments and the banking industry. Legislative measures have been initiated in some countries. For example, in the United States, the Community Reinvestment Act (1997) requires banks to offer credit throughout their entire area of operation and prohibits them from targeting only the rich neighbourhoods. In France, the law on exclusion (1998) emphasises an individual's right to have a bank account. In the United Kingdom, a 'Financial Inclusion Task Force' was constituted by the government in 2005 in order to monitor the development of financial inclusion.

The banking sector has also taken a lead role in promoting financial inclusion. In India, the Reserve Bank of India (RBI) has initiated several measures to achieve greater financial inclusion, such as facilitating 'no-frills' accounts and "General Credit Cards" for low deposit and credit. The German Bankers' Association introduced a voluntary code in 1996 providing for an 'everyman' current banking account that facilitates basic banking transactions. In South Africa, a low cost bank account called 'Mzansi' was launched for financially excluded people in 2004 by the South African Banking Association. Alternate financial institutions such as micro-finance institutions and Self-Help Groups have also been promoted in some countries in order to reach financial services to the excluded.

Literature on financial exclusion has defined it in the context of a larger issue of social exclusion of certain groups of people from the mainstream of the society. Leyshon and Thrift (1995) define financial exclusion as referring to *those processes that serve to prevent certain social groups and individuals from gaining access to the formal financial system*. Carbo et al. (2005) have defined financial exclusion as *broadly the inability (however occasioned) of some societal groups to access the financial system*. According to Conroy (2005), *financial exclusion is a process that prevents poor and disadvantaged social groups from gaining access to the formal financial systems of their countries*. According to Mohan (2006) *financial exclusion signifies the lack of access by certain segments of the society to appropriate, low-cost, fair and safe financial products and services from mainstream providers*. A Government Committee on financial inclusion in India defines financial inclusion *as the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as the weaker sections and low income groups at an affordable cost* (Rangarajan Committee, 2008).

Thus, the definitions on financial inclusion/exclusion, conceptual as well as functional, provide an indication that financial exclusion occurs mainly to people who are at the

margins of the society. The issues of financial exclusion have been of interest to scholars for some time now. Of the issues raised in academic debates, an important question is whether economic development leads to an all-inclusive financial system. It has been observed that even 'well-developed' financial systems such as those in the US and the UK have not succeeded to be 'all-inclusive' and certain segments of the population remain outside the formal financial systems.¹ Another issue of interest is whether low level of financial inclusion is associated with high income inequality (Kempson et al., 2004).

This paper attempts to examine the relationship between financial inclusion and development. In doing so, it attempts to identify empirically country specific factors that are associated with the level of financial inclusion. Empirical literature on determinants of financial exclusion mostly comprises analysis based on primary surveys within a country or a region.² In a recent paper, Beck et al. (2007) have studied financial sector outreach and its determinants by using cross country data. They have used several indicators of banking sector outreach and examined the determinants of each of these indicators separately. In this paper, we use an index of financial inclusion (IFI) developed in Sarma (2008) to investigate macro level factors that can be associated with financial inclusion. The paper first attempts to understand the relationship between IFI and the Human Development Index (HDI), the most widely used development index. Then it presents the results of an empirical analysis to determine country specific factors associated with the level of financial inclusion. We find that at the macro level, the factors responsible for financial exclusion are similar to those found in individual countries through survey based analysis. Our results are also in line with Beck et al. (2007).

The paper is organised as follows. In Section 2 we briefly describe the Index of Financial Inclusion (IFI), a multidimensional index developed to measure the inclusiveness of a country's financial system. In Section 3 we will present the broad relationship between IFI and HDI, followed by an empirical analysis of factors significantly associated with IFI in Section 4. Section 5 concludes the paper.

2. Index of Financial Inclusion (IFI)³

The index of financial inclusion is a measure of inclusiveness of the financial sector of a country. It is constructed as a multidimensional index that captures information on various aspects of financial inclusion such as banking penetration, availability of banking services and usage of the banking system. The IFI incorporates information on these dimensions in one single number lying between 0 and 1, where 0 denotes complete financial exclusion and 1 indicates complete financial inclusion in an economy. Sarma (2008) has developed a method of computing the IFI for several dimensions of financial inclusion. Based on the availability of comparable data, Sarma (2008) has computed the values of IFI for 54 countries using the three basic dimensions of financial inclusion—accessibility, availability and usage of banking services. Accessibility has been measured by the penetration of the banking system proxied by the number of bank A/C per 1000 population. Availability has been measured by the number of bank branches and number of ATMs per 100,000 people. The proxy used for the usage dimension is the volume of credit plus deposit relative to the GDP. A dimension index for each of these dimensions has been first computed by the following formula:

$$d_i = \frac{A_i - m_i}{M_i - m_i} \quad (1)$$

where

A_i = Actual value of dimension i

m_i = lower limit for dimension i , given by the observed minimum for dimension i

M_i = upper limit for dimension i , given by the empirical 94th quantile for dimension i

For the availability dimension, two separate indexes are first calculated; one for bank branch and the second for ATMs. A weighted average of these two indexes, using 2/3rd weight for bank branch index and 1/3rd weight for ATM index is considered as the index for the availability dimension.⁴

After calculating the dimension indexes, they are given the following weights – 1 for the index of accessibility (penetration), 0.5 for the index of availability and 0.5 for the index of usage. The reason for giving less weight for the indexes of availability and usage dimensions in the present index is the lack of adequate data on some important indicators that completely characterize these dimensions. For example, as far as availability of banking services is concerned, many countries have moved towards internet banking, thus reducing the importance of physical bank outlets. Therefore, using data only on physical outlets (such as bank branches and ATMs) can give an incomplete picture of the availability of banking services. Similarly, using data on credit and deposit can only partially depict the usage of the financial system as other services of the banking system such as payments, transfers and remittances are not included. In the absence of such data, a complete characterization of these dimensions is not possible.

After giving weights to the dimensions, the final IFI is computed as follows

$$IFI = 1 - \sqrt{\frac{(1 - p_i)^2 + (0.5 - a_i)^2 + (0.5 - u_i)^2}{1.5}}$$

where p_i , a_i and u_i denote respectively the weighted dimension indexes for the dimensions accessibility (or penetration), availability and usage.

In this paper, we use the IFI computed by Sarma (2008) for 54 countries.⁵ From within this group of 54 countries, however, we have excluded countries that can be unambiguously characterized as overseas financial centres (OFC).⁶ The OFCs are defined by the IMF as centres “where the bulk of financial sector activity is offshore on both sides of the balance sheet (that is the counterparties of the majority of financial institutions’ liabilities and assets are non-residents), where the transactions are initiated elsewhere, and where the majority of the institutions involved are controlled by non-residents.”⁷ Thus, the empirical investigation in this paper is based on the data for 49 countries.

3. IFI and HDI

Table 1 presents the IFI computed for 49 countries and the corresponding human development index (HDI) along with their ranks. Austria, with an IFI value of 0.95 leads the list while Madagascar with an IFI value of 0.01 ranks the lowest. India has an IFI value of 0.20 and is ranked 29th. In line with Sarma (2008), countries having IFI value between 0.5 and 1 are classified as high IFI countries, those having IFI values between 0.3 and 0.5 are termed medium IFI countries and the rest having IFI values below 0.3 are classified as low IFI countries. By this classification, only 11 of the 49 countries classify as high IFI countries. These include high-income and OECD countries such as Belgium, Denmark, Spain, Greece, France and Norway.⁸ The high IFI countries also include middle income countries such as Malaysia (upper middle-income) and Iran and Thailand

(lower middle-income). The medium IFI countries are 9 of the 49 in the list. Of these, Italy and Trinidad & Tobago are high income countries while the rest such as Russia, Bulgaria, Chile, Turkey, Lithuania, Romania and Jordan are upper middle income countries (UMC). While it is not surprising that the list of low IFI countries is dominated by low income countries, there are some exceptions. For example, Saudi Arabia, a high income country is found to have low IFI. Similarly, Brazil, Lebanon, Venezuela, Argentina and Mexico, from the upper middle-income category are found to be having low IFI.

A comparison of IFI with human development index (HDI) shows that all the countries with high and medium IFI values belong to the group that is classified by the UNDP as countries with high human development ($HDI > 0.7$). Saudi Arabia, a high HDI country is found to have a low IFI value. Other countries having a high or medium HDI but a low IFI are Brazil, Lebanon, Venezuela, Argentina and Mexico.

On the one hand, countries such as Albania, Armenia, Peru and Mexico have relatively higher levels of human development as compared to their levels of financial inclusion. On the other hand there are countries such as Iran, Thailand, Turkey and Namibia that perform relatively better in financial inclusion than with human development.

Notwithstanding these exceptions, IFI and HDI seem to move in the same direction. As observed from Table 1, the IFI and HDI for the set of 49 countries move closely with each other. The correlation coefficient between IFI and HDI values and ranks is found to be about 0.74 and is highly significant.⁹ From this, it can be generally concluded that countries having high level of human development are also the countries with a relatively high level of financial inclusion.

Region-wise, we find that a majority of the East European countries had medium level of financial inclusion, while a large number of Latin American countries had low financial inclusion. All countries in south Asia and Sub-Saharan Africa for whom IFI values were estimated have low levels of financial inclusion. While having a low value of IFI, India performs better than its neighbours Pakistan and Bangladesh. As data on east and south-east Asian countries are limited, we are unable to make any further comment on their performance.

Small countries with a relatively large emigrant worker population may have relatively higher levels of financial inclusion if the emigrant workers use the banking system for remittances. For example, countries such as Jordan, Guyana and the Dominican Republic have a relatively large emigrant population and a share of remittances to GDP of over 15 per cent. In these countries, the higher IFI rank compared with HDI rank can perhaps be attributed to this phenomenon. However, as noted in the literature on migration and remittances, a large share of remittances to less developed countries occurs through informal sources including family channels, travelling friends, local money lenders and a complex network of informal remittance systems (COMPAS, 2005, El Qorchi et al., 2003; Puri and Ritzema, 1999).¹⁰ Hence it is not possible to establish a relationship between migration, remittances and financial inclusion.

Table 1 Index of financial inclusion and human development index, 2004

Sl No.	Country	Index of financial inclusion (IFI)		Human development index (HDI)	
		Value	Country rank	Value	Country rank
1	Albania	0.079	43	0.784	23
2	Argentina	0.148	35	0.863	10
3	Armenia	0.041	47	0.768	27
4	Austria	0.953	1	0.944	3
5	Bangladesh	0.117	39	0.530	44
6	Belgium	0.908	2	0.945	2
7	Bolivia	0.064	45	0.692	38
8	Bosnia & Herzegovina	0.163	33	0.800	18
9	Brazil	0.283	21	0.792	20
10	Bulgaria	0.413	14	0.816	14
11	Chile	0.404	15	0.859	11
12	Colombia	0.229	26	0.790	21
13	Czech Republic	0.525	10	0.885	9
14	Denmark	0.906	3	0.943	4
15	Dominican Republic	0.253	23	0.751	33
16	Ecuador	0.177	30	0.765	29
17	El Salvador	0.213	28	0.729	35
18	France	0.702	6	0.942	5
19	Greece	0.763	5	0.921	8
20	Guatemala	0.227	27	0.673	40
21	Guyana	0.252	24	0.725	36
22	Honduras	0.148	36	0.683	39
23	India	0.198	29	0.611	42
24	Iran, I.R. of	0.527	9	0.746	34
25	Italy	0.439	12	0.940	6
26	Jordan	0.298	20	0.760	31
27	Kenya	0.105	41	0.491	49
28	Lebanon	0.265	22	0.774	26
29	Lithuania	0.333	18	0.857	12
30	Madagascar	0.009	49	0.509	46
31	Malaysia	0.530	8	0.805	17
32	Mexico	0.145	37	0.821	13
33	Namibia	0.234	25	0.626	41
34	Nicaragua	0.076	44	0.698	37
35	Norway	0.595	7	0.965	1
36	Pakistan	0.113	40	0.539	43
37	Papua New Guinea	0.057	46	0.523	45
38	Peru	0.125	38	0.767	28

39	Philippines	0.167	32	0.763	30
40	Romania	0.315	19	0.805	16
41	Russia	0.424	13	0.797	19
42	Saudi Arabia	0.151	34	0.777	25
43	Spain	0.784	4	0.938	7
44	Thailand	0.514	11	0.784	24
45	Trinidad and Tobago	0.354	17	0.809	15
46	Turkey	0.387	16	0.757	32
47	Uganda	0.021	48	0.502	47
48	Venezuela	0.176	31	0.784	22
49	Zimbabwe	0.096	42	0.491	48

Source: Sarma (2008)

Note: The HDI ranks given in this table are re-ranks based on the HDI value for only the set of 49 countries.

4. Factors associated with financial inclusion

The factors that affect financial inclusion are likely to be several and their interaction with each other complex. At the moment, without going into the complexity of the how a large number of factors *together* bring about the level of financial inclusion in a country, we attempt to simply identify factors that are associated, with some degree of significance, to the index of financial inclusion. We do this by carrying out three sets of regressions of the IFI on three different sets of variables. In a sense, the three sets of variables indicating socio-economic factors, factors relating to physical infrastructure and banking sector factors are independent of each other.¹¹ Further, data for all variables are not available for all 49 countries for which we have computed the IFI. Thus, if we include all variables or regressors in a single regression equation, the number of observations (countries) in the panel reduces to 20, leaving us with very little statistical precision. This also partly explains our resort to three separate regressions.

The first regression is a regression of the IFI on a set of socio-economic variables such as income, employment, inequality, literacy and so on. The second regression attempts to capture the role of physical infrastructure. The third regression attempts to see the affect of banking sector variables such as soundness indicators, ownership pattern and prevailing rate of interest on financial inclusion. The data for the regressions are from the World Development Indicators (WDI) for the latest/comparable year.¹²

In the regression equations, the dependent variable is a logit transformation of the index of financial inclusion described earlier. Unlike the IFI which lies between 0 and 1, the transformed variable lies between $-\infty$ and ∞ . This allows us to carry out the classical OLS regression. The transformed variable is a monotonically increasing function of IFI, and

hence it preserves the same ordering as IFI. The transformed variable is a logit function of the original variable IFI, as defined below.

$$Y = \ln\left(\frac{IFI}{1 - IFI}\right)$$

The general form of the regression equation is

$$Y = a_0 + a_1X_1 + a_2X_2 + \dots a_nX_n + \varepsilon$$

Where $X_1, X_2,$ and so on are regressor variables, a_1, a_2 and so on are the parameters to be estimated from the data and ε is the error term following classical OLS assumptions.

The rate of change of Y with respect to a unit change in the variable X_i will be given by the derivative of y with respect to X_i , which is

$$\frac{dY}{dX_i} = \frac{a_i \exp(a_i X_i)}{(1 + \exp(a_i X_i))^2}$$

Thus, the direction of change in Y corresponding to a unit change in X_i is determined by the sign of a_i while the magnitude of the change depends on the value of a_i as well as X_i .

4.1. Results of the regression on socio economic variables: The literature on financial inclusion has identified financial exclusion as reflection of a broader problem of “social exclusion”. In the industrialised and high income countries having a well-developed banking system, studies have shown that the exclusion from the financial system occurs to persons who belong to low-income groups, the ethnic minorities,

immigrants, the aged and so on (Barr, 2004; Kempson and Whyley, 1998; Connolly and Hajaj, 2001). There is also a geographical factor; people living in rural areas and in locations that are remote from urban financial centres are more likely to be financially excluded (Leyshon and Thrift, 1995; Kempson and Whyley 2001). Further, countries with low levels of income inequality tend to have relatively high level of financial inclusion (Buckland et al, 2005; Kempson and Whyley, 1998). In other words, the levels of financial inclusion inevitably rise in response to both prosperity and declining inequalities.

Another factor that can be associated with financial inclusion is employment (Goodwin et al., 2000). The unemployed or those with irregular and insecure employment are less likely to participate in the financial system. Studies have found that payment of wages through automated cash transfer (ACT) has been one of the main influences on financial inclusion in the UK. Recent evidence also suggests that the continued payment of social security benefits and the State pension in cash is significantly related to financial exclusion (Kempson and Whyley, 1999).

Informal sector or the informal economy accounts for a large and significant share of employment in several less developed countries (ILO, 2002). In these countries and elsewhere in the industrialised countries, formal sector employment could imply participation in the formal financial system through receiving wages and salaries routed through the formal banking system. Formal employment also implies inclusion in employment related social security system, benefits of which are availed through the formal banking system. Thus the proportion of formal sector employment would be an important indicator of the level of financial inclusion. Since we have not found reliable

cross country data on the proportion of formal sector workers, in the present analysis, this aspect is not being covered.¹³

The results of the first regression that we have attempted where the IFI variable (i.e., the transformed IFI) is regressed over some basic socio-economic variables are presented in Table 2. In the regression equation the IFI variable is regressed over GDP per capita, which is a proxy for income, adult literacy (in order to account for demographic factor, adult literacy is considered instead of total literacy), unemployment, rural population and income inequality as indicated by the Gini coefficient.

Table 2: Results of regressing IFI on socio-economic variables

Variable	Coef.	Std. Err.	t	P> t
ln(GDP)	1.02*	0.166	6.16	0.00
Adultlit	-0.008	0.013	-0.61	0.55
Ruralpop	0.002	0.008	0.28	0.78
Unemploy	0.004	0.011	0.36	0.72
Ginicoeff	-1.848	1.246	-1.48	0.15
Constant	-7.647*	1.8	-4.25	0.00

Notes: Number of observations = 47

F (5, 41) = 21.20, Prob > F = 0.000

R² = 0.721, Adj R² = 0.687

* - Variable significant at 0.01 level.

The variables in Tables 2 and 3 are:

ln(GDP) – logarithm of GDP per capita (in 2000 constant USD)

Adultlit – percentage of literate people aged 15 years and above in total population

Unemploy – percentage of unemployed people in the total labour force

Ruralpop – percentage of total population living in rural areas

Ginicoeff – Gini coefficients indicating income inequality

As seen in Table 2, the coefficient for GDP per capita is positive and highly significant and explains financial inclusion almost single handed. This is not surprising and establishes, in other words, that income levels matter in explaining financial inclusion. Higher the income level, both at the individual level and for a country, higher is the financial inclusion. Now, in order to probe further into the socio-economic factors that can be associated with financial inclusion, we have attempted a related regression, without the GDP variable. The results of the same are presented in Table 3.

The removal of the GDP variable reduces the predictability of the regression as seen from the lower values of R^2 and adjusted R^2 in the second regression (Table 3) when compared with the first regression, which included the GDP variable (Table 2). Notwithstanding the loss of predictability, we find significant association of some socio-economic variables in the regression with the IFI. First, the Gini coefficient is found to be negatively and significantly associated with financial inclusion. Thus, income inequality is negatively associated with financial inclusion, more precisely, higher the income inequality, higher is the likelihood of financial exclusion. Two other variables are associated with financial inclusion at 10 per cent level of significance. They are adult literacy and rural population. Adult literacy is positively and significantly associated with financial inclusion implying that higher the adult literacy, higher will be the financial inclusion. Rural population or the proportion of rural population is found to be negatively associated with financial inclusion. In other words, urbanization is positively associated with financial inclusion. The “unemployment” variable has an expected sign but it is not found to be significant.¹⁴

Table 3: Results of regressing IFI on socio economic variables (without GDP)

Variable	Coef.	Std. Err.	t	P> t
Adultlit	0.031**	0.016	1.90	0.07
Ruralpop	-0.018**	0.010	-1.91	0.06
Unemploy	-0.021	0.014	-1.57	0.13
Ginicoeff	-4.345*	1.615	-2.69	0.01
Cons	-0.75	1.932	-0.39	0.70

Notes: Number of observations = 47

F(4, 42) = 9.05, Prob > F = 0.00000

R² = 0.4630, Adj R² = 0.4119

* - Variable significant at 0.01 level, ** - Variable significant at 0.10 level.

4.2 Results of the regression on infrastructure related variables

Access to financial services requires basic infrastructure to be in place. Infrastructure such as a road network, telephone and television network, access to information through newspapers, radio, cable TV, computer and internet can play a role in enhancing financial inclusion by facilitating easy mobility and awareness about financial services.¹⁵ The road network can be taken as an indicator of the general level of physical infrastructure in a country. Also, (paved) road network is a basic requirement or a prerequisite for setting up of bank branches and ATM networks in rural and less densely populated areas. All other variables used in the regression equation are indicators of connectivity and information availability. We present the results of the regression on IFI (i.e. logit of IFI) on some infrastructure related variables in Table 4.

Table 4: Results of regression of IFI on infrastructure variables

Variable	Coef.	Std. Err.	t	P> t
P_road	0.763*	0.258	2.96	0.01
Phone	0.363**	0.168	2.16	0.04
Newspaper	0.002	0.002	1.04	0.31
Radio	-0.001	0.001	-1.66	0.11
CableTV	-0.002	0.002	-0.65	0.52
Computer	-0.002	0.002	-0.83	0.42
Internet	.006**	0.003	2.34	0.03
Constant	-3.833*	0.806	-4.76	0.00

Notes: Number of observations = 36

$F(7, 28) = 19.89$, Prob > F = 0.000

$R^2 = 0.833$, Adj $R^2 = 0.791$;

* - Variable significant at 0.01 level, ** - variable significant at 0.05 level

The variables in Table 4 are:

P_road – Paved roads (in Km) per square Km of land area.¹⁶

Phone – logarithm of the number of telephone (land line and mobile) subscription per 1000 population.

Newspaper – Number of daily newspapers per 1000 population

Radio – Number of radios per 1000 population

CableTV – Number of cable TV subscription per 1000 population

Computer – Number of personal computers per 1000 population

Internet – Number of internet users per 1000 population

As seen in Table 4, physical infrastructure like network of paved road is highly positively significant in enhancing financial inclusion. Similarly, telephone and internet subscriptions are also found to be positive and significant. The variables for density of radios, newspapers cable TV and computers do not show any significant relationship with financial inclusion in our estimation. Telephone and internet usage being positively associated with the level of financial inclusion indicate that connectivity and information

play an important role in financial inclusion. This is in line with Beck et al. (2007), who found telephone network to be positively associated with banking outreach.

4.3 Results of the regression on banking variables

In this regression we have attempted to see the extent to which the structure and health of the banking sector explains the level of financial inclusion. The variables considered are indicators of the health of the banking system, ownership pattern and interest rate. The specific variables on the soundness or health of the banking system are the non-performing assets (NPA) as a percentage of total assets and the capital asset ratio (CAR) of the banking system. Lower the NPA, better is the health of the banking system while in case of the CAR, higher the CAR, better is the health of the banking system. For ownership pattern, shares of foreign banks and government owned banks in the total banking sector assets have been considered. The real interest rate indicates the cost of capital in the banking system or the attractiveness of the banking system. Table 5 presents the results of regressing our dependent variable (transformed IFI) on the banking variables.

Table 5: Results of regression of IFI on banking variables

Variable	Coef.	Std. Err.	t	P> t
NPA	-0.125*	0.033	-3.81	0.00
CAR	-0.130**	0.061	-2.14	0.04
asset_foreign	-0.025**	0.008	-3.24	0.00
asset_govt.	-0.013	0.012	-1.06	0.30
Interest Rate	-0.029	0.022	-1.31	0.20
Cons	2.347*	0.584	4.02	0.00

Notes: Number of observations = 34

F(5, 28) = 8.13, Prob > F = 0.0001

R² = 0.592, Adj R² = 0.519

* - Variable significant at 0.01 level, ** - variable significant at 0.05 level.

The variables in Table 5 are:

NPA – Non-performing assets as a percentage of total assets of the banking sector

CAR - Capital asset ratio of the banking sector

asset_foreign - Share of foreign banks in the total banking sector assets

asset_govt - Share of the government in the total banking sector assets

Interest rate – real interest rate prevailing in the economy

As seen from the results in Table 5, the level of NPA of the banking system in an economy is found to be significantly and negatively associated with financial inclusion. The widely held view for high NPA of a banking system is that NPAs are a result of providing credit to the low income groups (who are more likely to default), sometimes to comply with the “directed lending” programmes such as the “priority sector lending” in India. If lending to the poor and consequent default on their part was in fact the cause for NPA, then higher levels of NPAs should be associated with higher levels of financial inclusion. Our results show the opposite, they indicate higher level of NPA to be associated with lower level of financial inclusion. Thus, efforts to include more people into the financial system is not the significant cause for the NPA, on the contrary, the cause for NPAs lies elsewhere.¹⁷

Another proxy for the health of the banking system, the capital asset ratio (CAR) is found to have a negative coefficient that is significant at 0.05 level. Thus, highly capitalized banking systems seem to be less inclusive. This is not surprising, as banking systems having high CAR tend to be more cautious in lending, thus negatively affecting financial inclusion.

High share of foreign ownership in the banking system is found to be negatively associated with financial inclusion. In our sample of 49 countries, we have observed that countries such as Madagascar, Armenia and Jordan with high share of foreign banks in the total banking sector assets (more than 60 per cent) have very low IFI values (0.009, 0.041 and 0.298 respectively). While countries with high financial inclusion, such as Denmark, Austria, Belgium and France have very low share of foreign banks in their total banking sector assets (lower than 3 per cent in each of these countries).

Advocates of banking sector liberalization have argued that entry of foreign banks will increase the supply of credit and improve efficiency by increasing competition (WTO 2005). This argument, however, may not always be true, as shown by several studies. For example, an IMF study by Detragiache et al. (2006) found that in poor countries, a stronger foreign bank presence is robustly associated with less credit to the private sector. In addition, they found that in countries with more foreign bank penetration, credit growth is slower and there is less access to credit. Gormley (2007) found that in case of India, the entry of foreign banks is associated with an overall decrease in credit availability for firms. Using cross country data, Beck et al. (2007) have also found a significantly negative association between share of foreign banks' assets and number of accounts (credit as well as deposit) per capita in a country. Literature has termed this as "cream skimming" by foreign banks, in which foreign banks indulge in serving only the wealthy borrowers due to informational asymmetries. Our finding on the negative association between financial inclusion and foreign banks' asset share seems to be in line with these evidences.

Share of government ownership in the banking system, our results show, does not have a significant association with financial inclusion. This can be interpreted as the inefficacy

of state owned banks in bringing about financial inclusion. Similarly, the real interest rate does not show any significant relationship with financial inclusion.

5. Conclusion

Literature has identified financial exclusion as a manifestation of social exclusion. In this paper we have attempted a cross country study on factors associated with financial inclusion. Using an index of financial inclusion (Sarma, 2008), we first describe the broad relationship between financial inclusion and human development. We find that level of human development and that of financial inclusion are strongly positively correlated, although few exceptions exist.

Our empirical analysis confirms that income as measured by per capita GDP is an important factor in explaining the level of financial inclusion in a country. Going beyond per capita GDP, we find that income inequality, adult literacy and urbanisation are also important factors. Further, physical and electronic connectivity and information availability, indicated by road network, telephone and internet usage, also play positive role in enhancing financial inclusion. These findings strengthen the assertion that financial exclusion is indeed a reflection of social exclusion, as countries having low GDP per capita, relatively higher levels of income inequality, low rates of literacy, low urbanisation and poor connectivity seem to be less financially inclusive.

From among the banking sector variables, we find that the proportion of non-performing assets is inversely associated with financial inclusion, indicating that attempts by different countries towards greater financial inclusion have not contributed in any way to the non-performing assets of the banking system. The capital asset ratio (CAR) is seen to be negatively associated with financial inclusion. In other words, when the CAR

of a country is high, the banking system tends to be more cautious in opening its doors to the financially excluded. Foreign ownership in the banking sector is seen to be negatively affecting financial inclusion, while government ownership does not have a significant effect. Finally, interest rate does not seem to be significantly associated with financial inclusion.

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Notes

- ¹ For a review of financial exclusion in developed economies and the policy response to it, see Kempson et al. (2004).
- ² See, for example, Solo and Manroth (2006) for Colombia, Siedman and Tescher (2004) for the US, Corr (2006) for Ireland, Collard et al. (2001) for UK, Djankov et al. (2008) for Mexico and European Commission (2008) for the European Union.
- ³ The section draws mainly from Sarma (2008).
- ⁴ For further details on the concept and estimation of the IFI see Sarma (2008).
- ⁵ Sarma (2008) has also estimated a second set of IFI based only on two dimensions (availability and usage) for which data are available for a larger set of 100 countries. We do not use the two-dimensional IFI in this paper as one of the most important dimensions viz accessibility, is not incorporated in the two-dimensional IFI. The data for computing the IFI is from World Bank's WDI database and from World Bank's website.
- ⁶ From among the estimations by Sarma (2008) we have excluded Fiji, Malta, Mauritius, Singapore and Switzerland.
- ⁷ OFCs as defined by the IMF refer to economies that have relatively large numbers of financial institutions engaged primarily in business with non-residents, wherein the financial sector's external assets and liabilities are disproportionately large when compared with domestic financial intermediation. OFCs are also known to provide one or more of the following services: low or zero taxation; moderate or light financial regulation; banking secrecy and anonymity (IMF 2000).
- ⁸ The World Development Report classifies economies into four income groups depending on the gross national income (GNI) per capita, calculated using the World Bank Atlas method. The groups are: low income (LIC), \$905 or less; lower middle income (LMC), \$906–3,595; upper middle income (UMC), \$3,596–11,115; and high income, \$11,116 or more.
- ⁹ The calculated value of the t-statistic is 7.489, which is significant at 0.0001 level of significance.
- ¹⁰ The terms used to describe informal remittance systems vary from country to country, however, despite the different names used, the operational mechanisms are similar (Maimbo 2004).
- ¹¹ In other words, better performance or achievements of a country in one set of factors does not necessarily imply similar performance in the other set.
- ¹² WDI obtains data from national governments and from other international multilateral organisations such as the IMF, ILO and so on. We have also attempted regression estimations using data that are directly provided by the International Financial Statistics of the IMF for banking variables, ILO for employment Statistics and so on and the results remain the same.
- ¹³ The ILO has made an attempt to provide data on the informal employment. These estimates are provided for about 70 countries (ILO 2002).
- ¹⁴ As is well accepted, in the case of a large number of underdeveloped countries such as India, the data on unemployment do not include large sections of the workforce who are under employed often working in the informal sector. An indicator for unemployment + underemployment we believe will show up as having a significant and negative relationship with financial inclusion.
- ¹⁵ Telephone lines per 1000 people, internet users per 100 people, personal computers per 100 people are also indicators used in the millennium development goals (MDR).
- ¹⁶ We have repeated the same regression with paved roads per 1000 population and have obtained similar results.
- ¹⁷ Reddy (2002) has pointed out that the main 'culprits' for NPA in India are the large industries and not the priority sectors that cover the weaker sections. Since this issue is not the immediate concern of this paper, we do not probe it further.