

The Growth Potential from Financial Inclusion¹

By

Govind Hariharan and Marcus Marktanner
ICA Institute
and
Kennesaw State University

Abstract

According to the World Bank, in 2011 only 50% of all adults (aged 15+) in the world had an account at a formal financial institution. The exclusion of large population shares from access to comprehensive banking services has been discovered as a major obstacle to development in recent years. In this paper we attempt to estimate within the framework of a simple Solow growth model the impact of financial inclusion on economic growth. Our preliminary results indicate that a 10 percent increase in financial inclusion has the potential to increase income per worker on average by 1.34 percent.

Contact Information:

Govind Hariharan
Executive Director India China America (ICA) Institute
Coles College of Business
Kennesaw State University
1000 Chastain Road
Kennesaw, GA 30144

Office: BB-476
Phone: +1(770)423-6580
Email: gharihar@kennesaw.edu

Marcus Marktanner
Associate Professor of Economics
Coles College of Business and INCM
Kennesaw State University
1000 Chastain Road
Kennesaw, GA 30144

Office: BB-458
Phone: +1(770)794-7750
Email: mmarktanner@kennesaw.edu

¹ This is an extremely preliminary draft submitted for Atlanta Fed/GSU International Development Economics Workshop. All comments are welcome.

The Growth Potential from Financial Inclusion

1. Introduction

Financial inclusion, which is typically understood as access to formal financial services such as credit, insurance and secure saving opportunities, has in recent years been identified as a critical engine of economic growth. This paper has three main objectives. Firstly, we review and test the significance of the literature's explanations for the lack of financial inclusion. Secondly, we estimate the growth potential associated with increasing financial inclusion using the framework of a traditional Solow Growth model. Lastly, we propose policy recommendations for increasing financial inclusion.

The paper is structured as follows. Section two assesses the problem of lack of financial inclusion from a quantitative and qualitative global perspective: Where in the world is financial inclusion lagging behind? What does the literature say about what causes it? In Section 3, we will review the literature and present casual empiricism. In section four we describe the data and methodologies to answer two questions: What variables explain the lack of financial inclusion? How much growth could be triggered by increasing financial inclusion? We present the results of our empirical analysis in section four and conclude with a summary of our findings and policy recommendations in section five.

2. A Review of the Financial Inclusion Problem

Lack of financial inclusion, which is understood as access to formal financial services such as credit, insurance and secure saving opportunities, has in recent years been identified as a critical engine of economic growth [Reference].

Sarma (2010, p. 3f), referring to Kempson and Whiley (1999a, 1999b), distinguishes between five factors that account for the lack of financial inclusion (exclusion): (1) Access exclusion due to geography and “risk management of the financial system”, (2) Condition exclusion “due to conditions that are inappropriate for some people,” (3) Price exclusion due to non-affordability of financial services, (4) Marketing exclusion due to the non-attractiveness of conducting business with certain groups within society (lending risk), and (5) Self-exclusion, due to “fear of refusal or due to psychological barriers.”

These different factors arise from either supply or demand side channels, which we will elaborate upon in more detail. For example, cultural and religious factors may undermine demand for banking services. In addition, strong tribal structures may imply a preference for clan-based lending and borrowing over modern banking, which many find too anonymous. Such traditions can be difficult to overcome. Modern banking requires literacy skills that are often not present. Potential customers need to invest time and effort in understanding banking opportunities and costs. There may be also a collective action problem. Unless a critical mass of people is willing to invest in banking literacy, everyone else will find that their individual efforts in developing banking literacy will not pay off. Because banking activity is costly in terms of

fees and transaction costs, opening a bank account only becomes attractive if the individual has a minimum income (Beck and Demirguc-Kunt, 2008, p. 386).

From an economic classification perspective, bank accounts are normal, if not luxury goods. Dealing with banks also requires trust in markets and regulatory oversight, which are often not in place, especially not in early stages of development or transitional periods. Demirguc-Kunt and Klapper (2012, p. 19) report seven self-reported reasons for lack of financial inclusion, which rank lack of trust sixth. In descending order of importance the other reasons were: (1) Not enough money, (2) Too expensive, (3) Family member already has account, (4) Too far away, (5) Lack of necessary documentation, (7) Religious Reasons. Last but not least, a strong informal sector in certain areas may also reduce demand for formal banking services (Sarma and Pais, 2011). Chibba (2009) also reports from a case study of Botswana a certain deterring “fear of complications” attitude, which is likely to be observable in other places as well.

As far as the supply side is concerned, the absence of clearly specified land and property titles is a major obstacle for banks to offer the full range of financial services. In regions that practice partible inheritance law, for example, land titles can often not be transferred easily because they are inefficiently small or are shared by too many stakeholders. Similarly, if a region has a small economic base, banking activities will not be offered due to the lack of economies of scale on the side of the banks. Operational costs may be a consideration when banks need to decide whether or not to serve remote or sparsely populated areas (Claessens and Perotti, 2007; Andrianaivo and Kpodar, 2011). Setting up a bank is often associated with high sunk and fixed costs, which can serve as a market entry barrier and lend first movers monopolistic market power that prevents financial inclusion of certain strata of the society. Financial market regulation and

oversight are therefore important to correct market power. Chibba (2009, p. 224) explicitly reports market power as a source of lack of financial inclusion in the case of Botswana, which is, however, a problem that can be observed in other countries as well. He moreover laments “poor governance in areas such as monetary policy, land ownership, public sector agency government, government procurement, and the legal and regulatory framework.”

For example, in many developing countries, cell phone providers have successfully entered the market for the safe transfer of funds. Cell phone users use their phones to transfer money to other family members or to pay bills to businesses. Cell phone companies have therefore excellent access to data that can be used to build a credit profile of cell phone users. This credit profile could serve as a substitute for the absence of collateral and reduce high transaction costs of gathering information about borrowers (Claessens and Perotti, 2007, p.757). It seems accordingly plausible to assume that a market would evolve in which cell phone companies either use these credit profiles as an input factor for banks willing to expand their credit business, or even enter the market for credit themselves. To which extent this will occur, however, depends substantially on the regulatory quality of the country (Thulani, D., et.al, 2011, p. 13)

Lack of financial inclusion is costly to society and the individual. As far as the individual is concerned, lack of financial inclusion forces the unbanked into informal banking sectors where interest rates are higher and the amount of available funds much smaller. Because the informal banking structure is outside any legislative framework, any dispute between lenders and borrowers cannot be settled legally. Borrowers are at much greater risk of usury and exploitation. Poverty and informal banking sectors often constitute a vicious cycle that borrowers cannot escape. This is particularly true in rural areas where tenancy farmers are pushed into borrowing

funds for fertilizer, machinery and seeds at the beginning of the growing season that the farmers then cannot repay after the harvest is being sold. This middlemen problem is discussed, for example, in Global Partnership for Financial inclusion (GPFI) and International Finance Corporation (IFC), 2011).

As far as the social benefits are concerned, financial inclusion increases the amount of available savings, increases efficiency of financial intermediation, and allows for tapping new business opportunities. Historically, a main reason for why many European countries introduced universal banks under the auspices of the state was the fear that market based competitive banking would not free the social benefit from comprehensive financial inclusion and instead cause social costs from rural-urban migration. State sponsored universal banking has therefore contributed to greater economic diversification in rural areas than is the case in more competitive banking environments (World Bank, 2012, p. 11). The basic idea of the social cost associated with lack of financial inclusion can be simply illustrated as in Figure 1.

Where in the world is lack of financial inclusion the biggest problem? Figure 2 shows on the y-axis the variable “Account at a formal financial institution (% age 15+)” for the year 2011 from the World Bank’s Global Financial Inclusion Database, and on the x-axis the natural log of GDP per person in the labor force age in \$2000 from the World Bank Development Indicator Database.

Figure 3 maps observations that are in Figure 2 above the trend line as relative financial inclusion surplus countries, and observations below it as relative financial inclusion deficit countries. The map shows strong differences among Latin America and Asia. Latin America is a relative financial inclusion deficit region, while Asia – especially Central and East Asia, but not

West Asia and South Asia – is a relative financial inclusion surplus region. The difference between the United States and Europe is also worth noting as Europe is largely a financial inclusion surplus region, while the US has a deficit. The Arab world is also largely a relative financial inclusion surplus region. Africa south of the Sahara shows no uniform trend.

Figure 1

Social Cost from Lack of financial inclusion

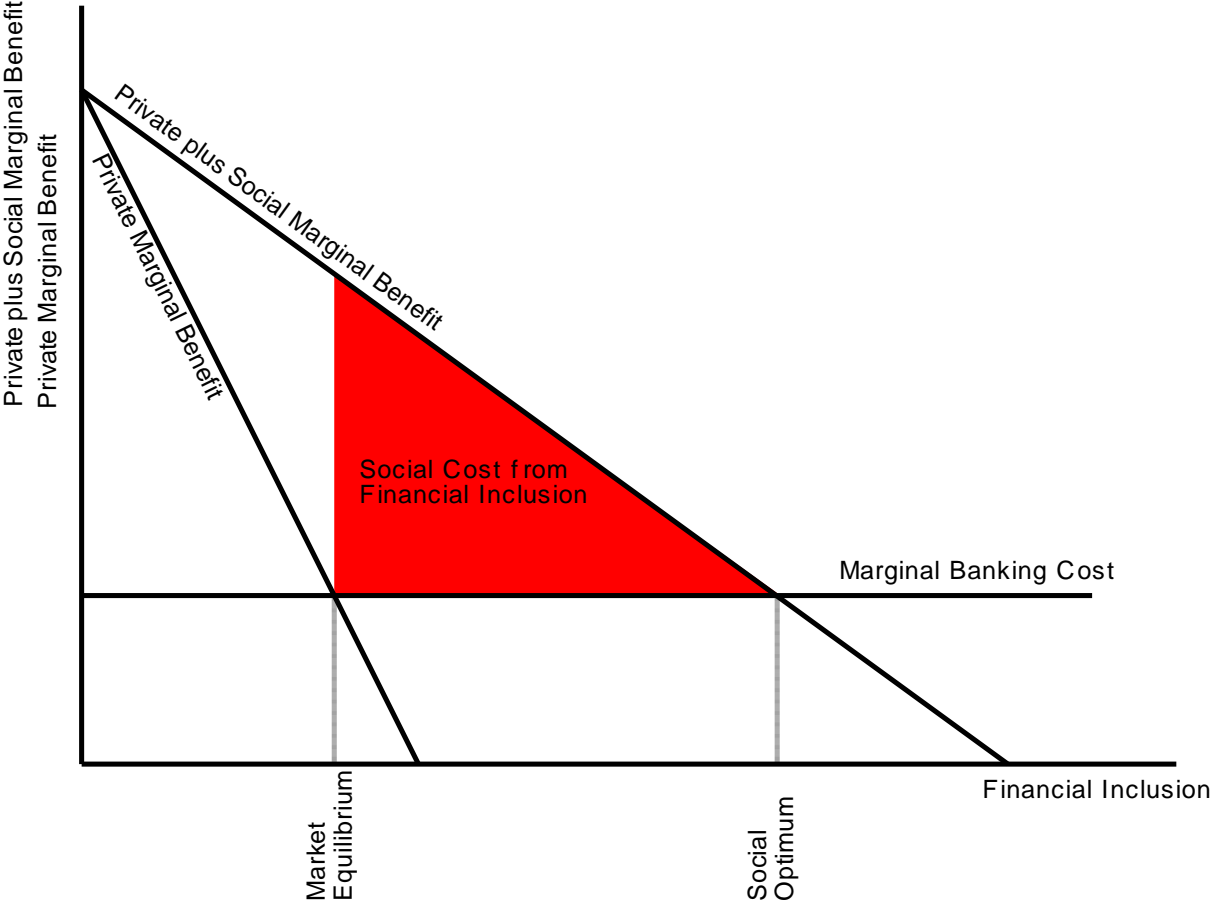


Figure 2

Income per Person in the Labor Force (\$2000) vs. Account at a Formal Institution (% age 15+)

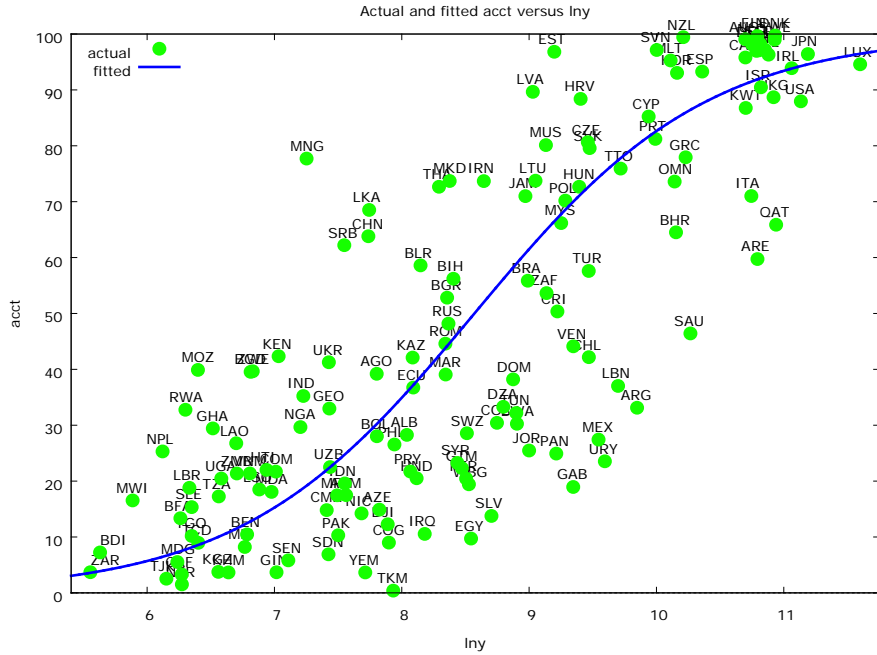
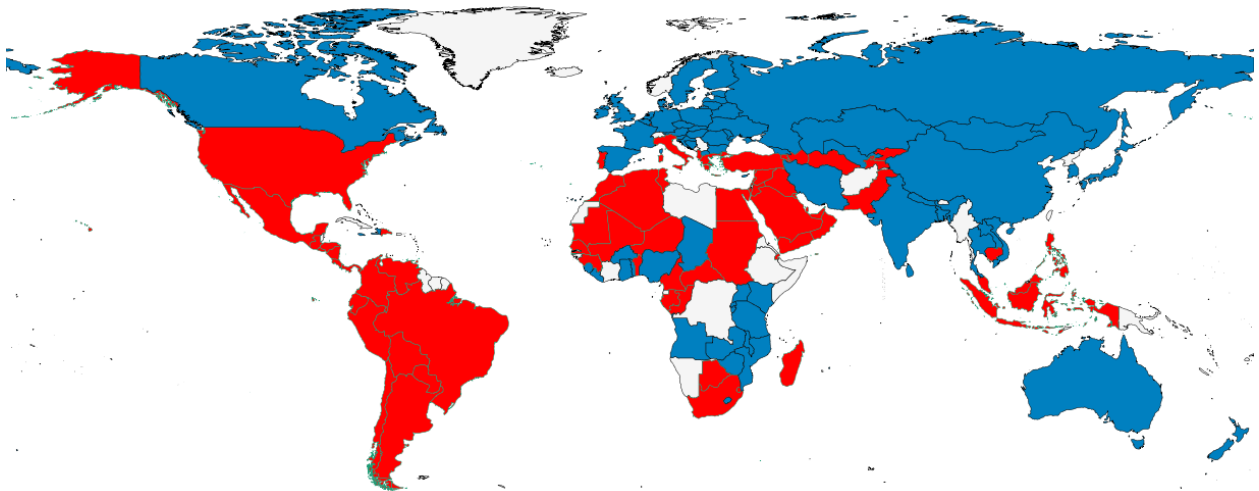


Figure 3

Relative Financial Inclusion Deficit and Surplus Countries



Legend: Red = Deficit, Blue = Surplus

The regional differences suggest that regional characteristics matter. Especially when comparing Latin America, the Arab Region, and East Asia, one cannot help but think that socioeconomic factors are important. Specifically, we argue that in addition to income levels, factors such as income inequality, natural resource rents, productive economic capacity, and democracy play an important role. Table 2 summarizes our expectations as regards to the size of the coefficients.

Table 2

Hypothesis Table: Expected sign of Independent Variables when Dependent Variable is Account at a formal financial institution (% age 15+)

GDP per Worker	Income Inequality	Natural Resource Rents	Manufactures and Services Export Shares (% GDP)	Democracy (Polity2 score)
+	-	-	+	+

Countries with higher per capita income eliminate many of the arguments supporting lack of financial inclusion. People in high income countries save more, are more banking literate, and can offer more securities. Markets for banking services are accordingly less likely to fail (Ardic,O.,et al,2011). Because income inequality is often the result of unequal economic opportunities and monopolized markets that lead to the marginalization of the relative poor, lack of financial inclusion should be more present in countries with great income disparities (Ardic,P.O.,et.al,2011). Economies that rely heavily on the extraction of natural resources, rentier states that are based on authoritarian bargains, make the natural case for unequal economic development and monopolized markets. Likewise, countries with strong share of GDP

with productive and competitive manufactures and services exports provide more decentralized economic opportunities for wage earners that are attractive to serve by financial service industries. We therefore hypothesize that countries with a high share of natural resources rents have on average more lack of financial inclusion, more productive economies more financial inclusion. Lastly, as democracy is a vehicle to correct many of the determinants of financial inclusion through redistribution, we hypothesize that democracies favor financial inclusion through established institutions (Claessens and Perotti, 2007, p.761; Deininger and Squire, 1998s, p.272).

How does an increase of financial inclusion affect economic growth? Using a typical production function in which output depends on capital and total factor productivity, there is good reason to assume that an increase of financial inclusion could affect both capital accumulation and total factor productivity. As financial inclusion increases the amount of funds being made available and reduces borrowing costs, capital should increase (Claessens and Perotti, 2007, p.758). In addition, building a banking service infrastructure is capital, too. Moreover, the expansion of financial inclusion (FI) is likely to facilitate the matching process between savers and investors, which increases total factor productivity (Claessens,S.,2006). We therefore hypothesize that

$$\text{Output}=F[\text{Total factor Productivity (FI), Capital(FI)}] \quad (1)$$

3. Data and Methodology

Determinants of Financial Inclusion

In line with the above hypothesis table 2, we use the following data sources and variables to test the determinants of financial inclusion.

Table 3

Data Description and Sources

Variable	Abbreviation	Source
Account at a formal financial institution (% age 15+)	acct	The Global Financial Inclusion (Global Findex) Database.
GDP per worker	y	Calculated as the ratio of GDP (constant 2000 US\$), Y, and total Labor Force, L, available at 2011 World Bank Development Indicator Database (2011 WDI).
Income Inequality	gini	United Nations University, World Institute for Development Economics Research (UNU-WIDER), World Income Inequality Database V2.0c May 2008.
Total Natural Resource Rents (% GDP), sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.	nrr	2011 WDI
Manufactures and Services Trade Share (% GDP), exports and imports of manufactures and services of GDP.	msts	Calculated from 2011 WDI data.
Polity2 score (measures democratic practice on a scale from -10 to +10 with higher values indicating greater institutionalization of democratic procedures).	polity	Marshall, M., Jaggers, K., and Gurr, T. (online), Polity IV Project, Political Regime Characteristics and Transitions, 1800-2010.

The dependent variable “acct” is the observation for the year 2011. At the time of writing this paper, the Global Findex Database has only observation for the year 2011. All other variables are 1995-2010 averages of available data. An average from a long period was chosen to maximize

the number of observations (for example, data on income inequality is rather scarce). Although averages were taken, the variables under consideration are also rather sticky over time. We therefore believe that the benefit from increasing the number of observations outweighs any possible information distortion from aggregation.

We test the significance of the independent variables using a logistic regression because the dependent variable “acct” is bounded between zero and 100.

Estimation of Growth Potential Associated with Financial Inclusion

We first estimate for a country the simple Solow growth equation

$$y = Ak^\alpha \tag{2}$$

where

y= income per worker

A=Total factor productivity

k=capital per worker

α =production elasticity of capital per labor

In order to estimate equation (1), we use the following available variables from the World Bank Development Indicator Database, using again 1995-2010 averages of available data:

- GDP per worker (constant 2000 US\$) - y
- Gross capital formation (annual % growth) - $GCFgr$
- Gross capital formation (constant 2000 US\$) - GCF

Capital per labor, k , is estimated using the formula

$$k = \frac{GCF}{GCFgr} \frac{1}{L} \quad (3)$$

We then run the double-log regression

$$\ln y_i = \beta_0 + \beta_1 \ln k_i + u_i \quad (4)$$

The results of equation (4) are then used to estimate the parameters A and β_1 as

$$A_i = \beta_0 + u_i \quad (5)$$

$$\alpha = \beta_1 \tag{6}$$

Endowed with estimates for k and A , we then test, using regular OLS estimates, the following two equations:

$$\ln A_i = \beta_0 + \beta_1 \ln Acct_i + \sum_j \beta_j Controls_{i,k} + u_i \tag{7}$$

$$\ln k_i = \gamma_0 + \gamma_1 \ln Acct_i + \sum_j \gamma_j Controls_{i,k} + u_i \tag{8}$$

The coefficients “beta 1” and “gamma 1” are then the estimated financial inclusion elasticities of total factor productivity and capital per worker, respectively. The financial inclusion elasticities of total factor productivity and capital per worker can then be used for policy simulation purposes. Control variables are income inequality, natural resource rents, manufactures and services trade shares, and polity. (It is not controlled for per capita income, because, by assumption, income per worker depends on capital per worker and total factor productivity, not the other way around.)

4. Empirical Results

Normality Tests

In a first step, we checked the normality of the various variables. The results are summarized in Table 4. All variables except for gini and msexpshr (ln) are non-normally distributed. While some of the non-normally distributed variables became “more normal” after a natural log transformation, normality must not be taken for granted. Statistical significance tests of the regression coefficients must therefore be handled with the usual care.

Table 4

Normality Tests (H0: Data is normal)

Original Variable	χ^2 Test against Normality (p-value)	χ^2 Test against Normality of ln-transformed data (p-value)	Did ln-transformation help?	Variable used in regression
acct	<0.01	<0.01	no	acct
y	<0.01	<0.01	yes	lny
gini	0.09	0.07	no	Gini
msexpshr	<0.01	0.24	yes	lnmsexpshr
nrr	<0.01	<0.01	yes	Lnnrr
polity2	<0.01	<0.01	no	Polity2

Multicollinearity

In order to get an idea of the “independence of the independent variable,” Table 5 shows that multicollinearity in subsequent regression must not be ruled out. Especially combinations on the right hand side of “lnmsexpshr and lnrr (r=-0.61), “lny and lnmsexpshr (r=0.57),” “polity2 and lnrr (r=-0.46),” “gini and lnmsexpshr (r=-0.41),” and “lny and lnrr (-0.40)” need to be carefully watched.

Table 5:

Pearson Correlation Matrix

	acct	lny	gini	polity2	lnrr	lnmsexpshr
acct	1.00	0.80	-0.47	0.35	-0.51	0.62
lny	0.80	1.00	-0.37	0.24	-0.40	0.57
gini	-0.47	-0.37	1.00	-0.14	0.21	-0.41
polity2	0.35	0.24	-0.14	1.00	-0.46	0.29
lnrr	-0.51	-0.40	0.21	-0.46	1.00	-0.61
lnmsexpshr	0.62	0.57	-0.41	0.29	-0.61	1.00

Determinants of Financial Inclusion – Logistic Regression Results

Table 6 summarizes the regression results of the determinants of financial inclusion.

Table 6:

Logistic Regression Results (DV="acct")

	I	II	III	IV	V	VI
Constant	-9.356*** (0.624)	3.899*** (0.758)	-0.674*** (0.201)	1.211*** (0.260)	-2.956*** (0.408)	-6.731*** (1.126)
lny	1.092*** (0.072)					0.893*** (0.099)
gini		-0.094*** (0.018)				-0.039*** (0.012)
polity2			0.129*** (0.027)			0.030 (0.025)
lnnrr				-0.867*** (0.133)		-0.003 (0.145)
lnmsexpshr					1.133*** (0.140)	0.254 (0.160)
N	143	122	141	138	129	110
Adj. R2	0.62	0.18	0.14	0.23	0.33	0.71
F-Stat	228.46	27.05	22.87	42.68	65.47	51.72

Std. Errors in parentheses; *** = significant at 1%, ** = significant at 5%, * = significant at 10%.

The regression results show that all independent variables are highly significant in bilateral regressions (Models I to V). All coefficients also carry the expected sign. When running all independent variables simultaneously (Model VI), per capita income and income inequality are the most robust variables. All other independent variables are longer significant. The variable manufactures and export share is close to significant at the 10% level with a p-value of 0.11.

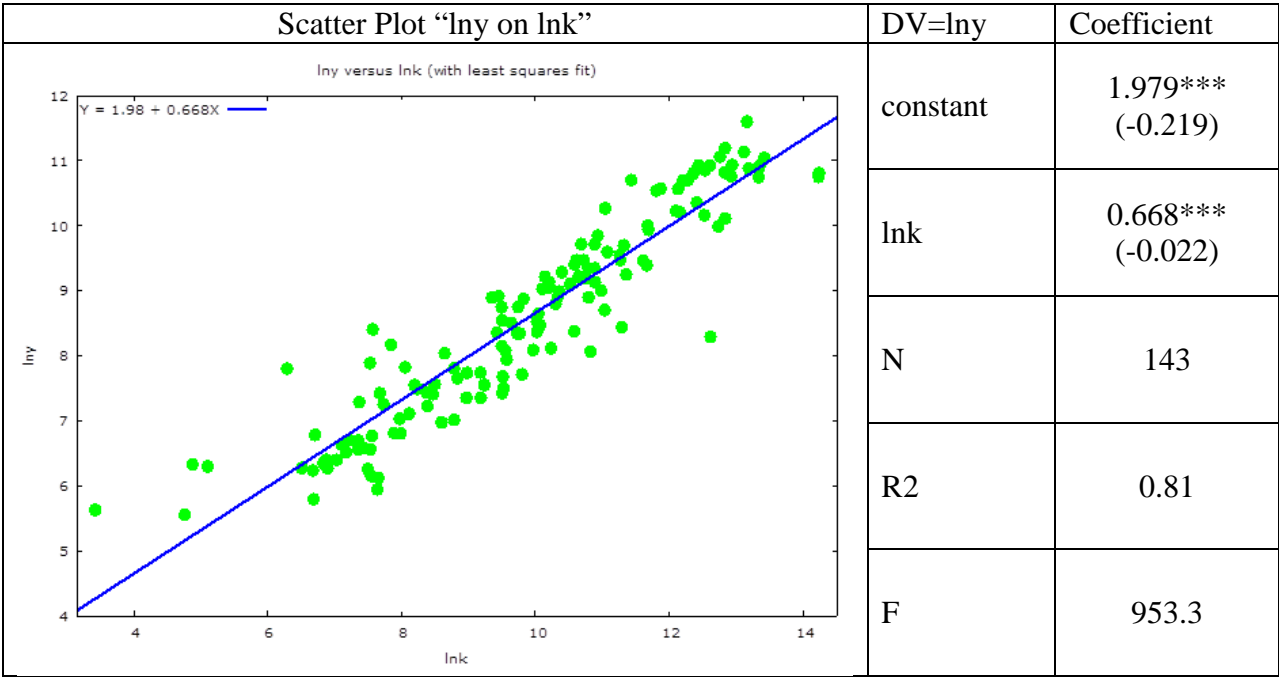
Despite the loss of significance, all variables kept the expected signs. We attribute the loss of significance to multicollinearity problems and not the loss of socioeconomic significance. The transmission mechanism from various socioeconomic variables is surely highly complex and involves direct and indirect effects.

Estimation of the Solow Growth Equation

Figure 4 shows the scatter plot of “lny on lnk” and the regression results of Equation (4).

Figure 4

Estimating the A and alpha of the Solow Growth Equation



The regression results suggest that the production elasticity of capital per labor is $\alpha=0.668$ and the average total factor productivity $A=7.235$ ($\exp 1.979$). We therefore assume for each country the production function

$$y_i = \exp(1.97893 + u_i) k_i^{0.668} \quad (9)$$

Does Financial Inclusion Determine TFP and Capital Accumulation? – OLS Regression Results

Table 7 reports the regression results of total factor productivity and capital per worker on financial inclusion and other control variables. The results indicate that financial inclusion is highly significant and robust explanatory variable for both “Total Factor Productivity” and higher capital per capita levels. Specifically, the results suggests that a 1 percentage point increase in the variable “acct,” after controlling for other socioeconomic factors, increases total factor productivity and capital per labor by 0.6% and 4%, respectively.

Table 7

OLS Regression Results (DV=lnA and lnk)

	DV=lnA (Total Factor Productivity)		DV=lnk (Capital per capita)	
const	1.944*** (0.072)	1.621*** (0.324)	7.462*** (0.227)	6.313*** (1.075)
acct	0.003*** (0.001)	0.006*** (0.002)	0.051*** (0.004)	0.041*** (0.006)
Gini		0.004 (0.005)		0.021 (0.017)
polity2		0.004 (0.009)		0.039 (0.031)
lnnrr		0.039 (0.055)		0.132 (0.183)
lnmsexpshr		0.041 (0.059)		0.289 (0.197)
N	125	100	125	100
Adj. R2	0.047	0.083	0.566	0.590
F-Stat	7.07	2.80	162.66	29.56

Economic Significance

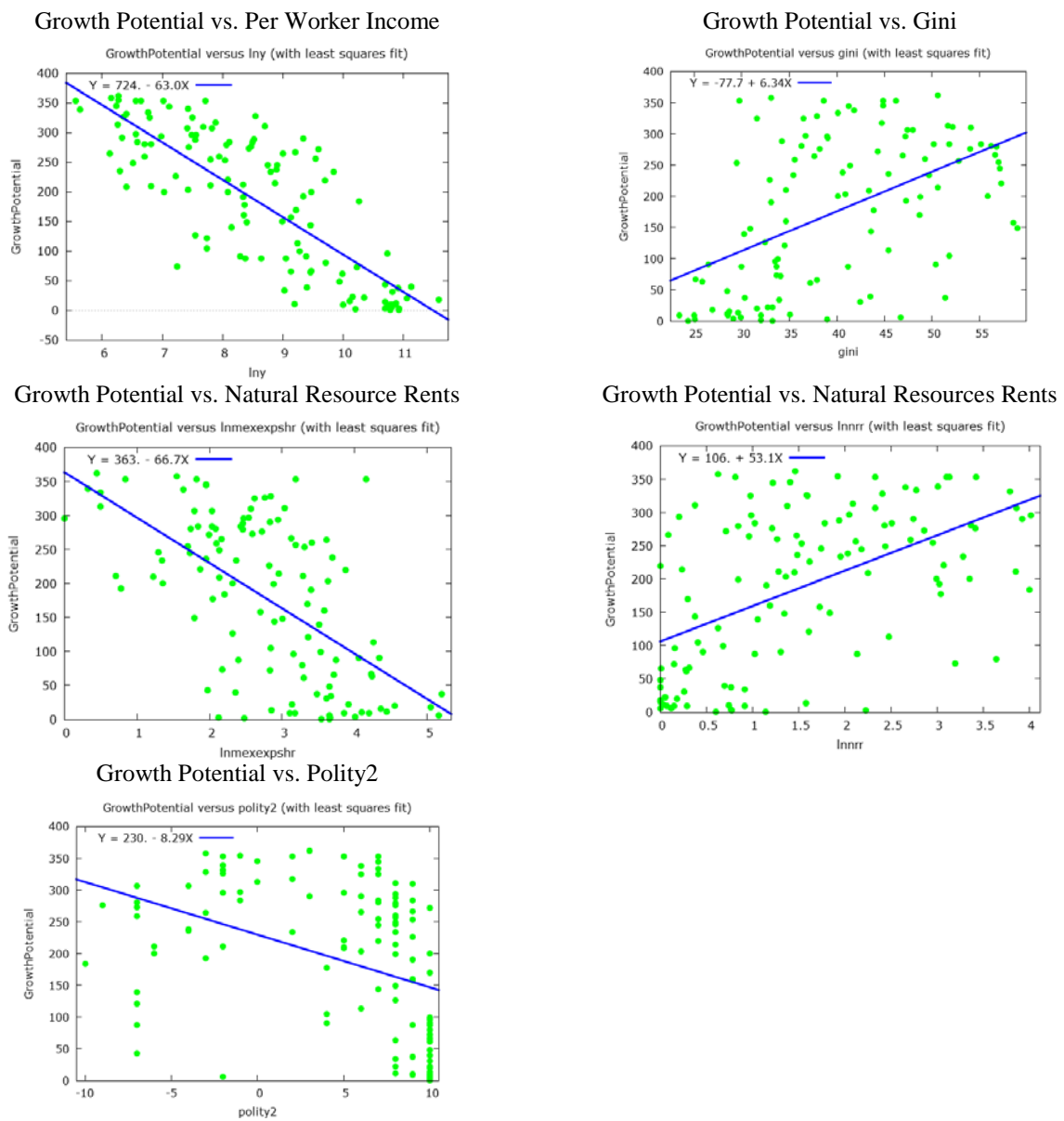
A final question is: What is the economic significance of our finding? In order to answer this question, we use the semi-elasticities calculated in Table 7 after controlling for socioeconomic factors and calculate the per capita incomes assuming that the country manages a full transition towards a 100 percent financial inclusion. Our findings suggest that the growth dividend of complete financial inclusion can reach up to 362% (as is the case of Niger in our simple simulation example).

For illustration purposes, we also correlate the potential growth dividend from financial inclusion with the socioeconomic control variables, which shows that the growth dividend from

financial inclusion is greater, when income is low, inequality high, the productive economic sector weak, and levels of democracy low. This is shown in Figure 5.

Figure 5

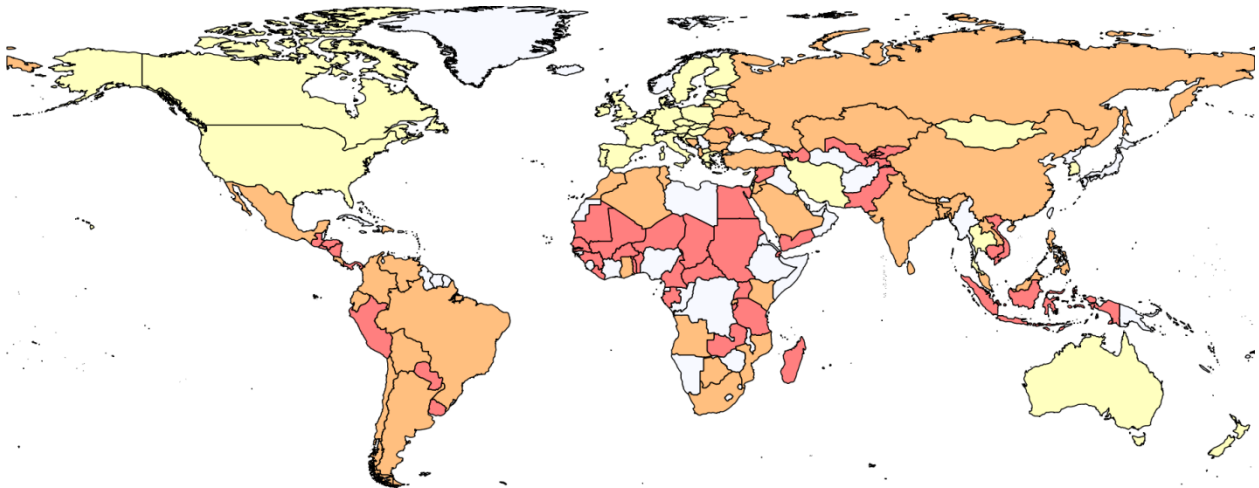
Growth Potential from Financial Inclusion vs. Socioeconomic Factors



Lastly, Figure 6 provides a global view of the distribution of growth potentials according to terciles. According to Figure 6, the highest growth potentials of financial inclusion are in Central America, Sub-Saharan Africa, the Middle East and North Africa, and South East Asia.

Figure 6

Global Distribution of Growth Potentials from Financial Inclusion



Legend: Grey=no observation, yellow=low growth potential, orange=medium growth potential, red=high growth potential (according to terciles).

5. Conclusions

Lack of financial inclusion is a complex socioeconomic phenomenon that includes factors as diverse as geography, culture, religion, history, socioeconomic inequality, structure of the economy, and economic policy. While this paper is still explorative in nature, one cannot think but while lack of financial inclusion is the result of many socioeconomic problems, financial inclusion is also a substantial part of these problems' solution.

This paper finds that financial inclusion is still a huge untapped source of economic growth and development. Specifically, financial inclusion is a robust and significant correlate of a country's total factor productivity and ability to form capital.

An important question therefore is: What stands in the way of greater financial inclusion? Of course, while exact answers can only be given through country specific case studies, a universal factor may be ignorance of economic policy. Many developing countries have a long tradition of state interventionism and capital controls. With structural adjustment programs being introduced in the 1980s and 1990s, financial market reforms swept over many developing countries. These markets, however, have largely failed to reach large segments of the society. More government may be needed again to correct the conditions on the ground that account for the failing of financial markets. Depending on the country, such policies may include financial regulation, land reforms, educational programs, and competition policy.

