The Role of Financial Inclusion in Financial Development: International Evidence

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Abstract

This study examines whether financial inclusion can help to promote financial development. We analyze the determinants of financial development using a system generalized method of moments (System GMM) in a panel of 97 countries during 2004-2012. The empirical results suggest that financial inclusion is statistically significant determinant of financial development. Specifically, we found that the impact of financial inclusion on financial development is positive and significant. The GDP per capita has a positive and significant relation with financial development, thus enhancing of financial inclusion postulates financial development and hence economic development. The market based indicator namely stock market is insignificant determinant of financial inclusion. The results are robust using alternative estimation with financial development indicators (domestic credit to private sector and stocks traded, turnover ratio).
Keywords: Financial development, financial inclusion and system GMM.

A better understanding of how poor households use formal financial services or access to financial institution is important for theoretical and practical point of view of designing a strong policy for economic development. The academic literature has adequately discussed the close relation between financial development and economic growth (Levine, 2007). It is widely accepted that financial development is important for long term economic

development (Levine, 2003; Demetriades & Andrianova, 2004; Demetriades & Hussein, 1996; Goodhart, 2004).

The important role of financial inclusion is widely recognized by policy makers and in many countries financial inclusion become the policy priority. The problem of financial exclusion is not singularly faced by one country but the whole world. World statistics show that more than 2.5 billion of adult population is not availing the benefits of banking services (Global Financial Development Report, 2014). Because poor people have limited access to formal financial institutions and usually rely on informal sources to save or borrow. It has been observed that even "well-developed" financial systems have not succeeded to be "all-inclusive" and certain segments of the population remain outside the formal financial systems.

During 19th century economist realized that the banking system is more efficient, if the mobilizing savings, identifying better investment opportunities and efficient corporate control are managed appropriately. These issues occurred towards the early stage of economic development and in weak institutional environment. Meanwhile advocacy from market based put forward that market minimizes ingrained inefficiencies linked with bank, thus inclusive growth of economy initiates (Lee, 2012). Furthermore, the advocacy viewed bank-based systems to be effective for inclusive growth of the economy for countries with fragile legal system meanwhile market-based system possess its advantages with improved legal system (Rajan & Zingales, 1998).

In this paper, we test the hypothesis whether financial inclusion has an impact on financial development using a panel of 97 countries[1]. Empirically our study involves regressing two important proxies of financial development namely, domestic credit to private sector and stocks traded (turnover ratio).

This paper is organized into five sections as follows: section 2 describes the related literatures; section 3 elaborates the empirical model, econometric methodology and data sources; section 4; interprets the findings and section 5; contains conclusions and policy implications.

Literature Review

Numerous academic literatures have considered the role of financial development and economic growth. Financial market

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[1] List of countries reported in Table 1 and 2

plays a vital role in providing basic services in the modern economy, particularly in the processing of funds from surplus units to deficit units. Developed financial systems can help to promote economic growth (Levine, 2007). Empirical studies found significant relationship between financial development and economic growth (Demetriades & Hussein, 1996; Eita & Jordaan, 2007; King & Levine, 1993; Spiegel, 2001).

Recently, financial inclusion becomes the key issue, but still there is much progress to be made. Kumar (2013) revealed that increase in banking networks has positive impact on financial inclusion. Beck et al., (2007a, 2007b) found the increase in the number of bank branches will increase efficiency among the banks as well as a positive increase in growth rate. Financial inclusion is the way to utilize financial services at low cost and affordable to reduce informal accounts (Gwalani & Parkhi, 2014). Chakravarty & Pal (2013) developed an index to measure financial inclusion and found financial inclusion is robust for economic development in India. Mbutor & Uba (2013) investigated the relationship between financial inclusion and monetary policy in Nigeria. The improvement of financial inclusion has significant impact on monetary policy in Nigeria. Financial inclusion is the basic pillar for economic development and stability (Rao, 2012). From the cited literatures we found the importance of financial inclusion. But the role of financial inclusion related to promote financial development is rarely investigated in the recent literatures.

Empirical Model, Methodology and Data
Dynamic empirical model

Our empirical specification is aimed at explaining the pace in financial development and its variation across countries by utilizing an empirical model that allows the testing of the main hypothesis of interest. We included real GDP per capita as a control variable for financial development because it has been found that real GDP per capita promote financial development (Demetriades & Hussein, 1996; Calderon & Lui, 2002; Yang & Yi, 2008; Law & Azman-Saini, 2012). We also included trade openness and financial openness because it has been found that openness affect financial development (Rajan & Zingales, 2003; Chinn & Ito, 2006; Baltagi et al., 2009; Law & Azman-Saini, 2012) therefore the expected sign for trade openness and financial openness is uncertain. We include institutional quality indicators because it has been found that strong institutional quality improves

financial development and economic growth and the expected sign is positive (Law & Habibullah, 2006; Demetriades & Law, 2006; Balach & Law, 2015). We also include public debt, because the profitability of domestic banks rises with greater public debt but it reduces their efficiency if public debt exceeds a certain level of threshold (Hauner, 2009). Therefore, public debt is expected to carry a negative sign (Hauner, 2009). The expected sign for financial inclusion is positive.

Given this aim, our empirical strategy endeavors to make maximum use of both the time and cross-country dimensions of available data sets, which dictates using data at an annual frequency in the estimation. Our empirical model is therefore as follows:

$$\ln FD_{it} = \beta_{oi} + \beta_{1i} \ln FD_{it-1} + \beta_{2i} \ln FI_{it} + \beta_{3i} \ln GDPC_{it} + \beta_{4i} \ln PD_{it} + \beta_{5i} \ln TO_{it} + \beta_{6i} \ln FO_{it} + \beta_{7i} \ln INS_{it} + u_{it}$$
(1)

where FD is financial development, FI is financial inclusion, GDPC is real gross domestic product (GDP) per capita, PD is public debt, TO is trade openness, FO is financial openness, INS is institutional quality and the subscript i and t index countries and time respectively. Moreover, u_{it} is an error term that contains country specific effect and time specific effects.

$$u_{it} = \mu_i + \varepsilon_i + \gamma_{it}$$
(2)

From equation (2), γ_{it} are assumed to be independent and identically distributed with mean zero and variance.

Dynamic Panel GMM estimation

The presence of lagged dependent variable in the empirical model Eq (1) shows a correlation between the regressors and the error term. Arellano & Bond (1991) who suggested the econometric method for the estimation of equation that primarily stood with dynamic GMM estimators that later was developed by Arellano & Bover (1995) and Blundell & Bond (1998) that further made its application possible in the literature. The selection of the estimation was solely based to deliver country specific effects and its simultaneity bias. Its applicability to the dataset is best explained in the baseline Equation (1). Arellano & Bond (1991) advised the removal of country specific effect by means of transformation of Equation (1) to first difference and elimination

of simultaneous bias is done by utilization of lagged levels of the regressors as an instrument. Arellano & Bover (1995) figured out from the study that certain modeling strategy may perhaps be inadequate if its explanatory variables are unrelated. In order to put an end to certain inadequacy, a far more effective system GMM estimator was put forward that combined the level and difference equations (Arellano & Bover, 1995; Blundell & Bond, 1998). For the level equation the lagged difference of the regressors are utilized as additional instrument. The effectiveness of this modeling strategy was tied with the reduction of its inaccuracy for several estimators and its biasness.

GMM estimator possessed two variants i.e. the one step and the two step estimators. Meanwhile, the two step estimator has more advantages of its efficiency of optimal weighting metrics as compared with one step estimator (Law & Azman-Saini, 2012). To its contrast Windmeijer (2005) cautioned that its applicability of sample with a smaller cross-section dimension as witnessed in the present findings forward biased standard errors and biased estimated parameter and thus leads toward over identification test (Bowsher, 2002). Roodman (2009) pointed out that rapid proliferation of instrument as the primary cause as recent findings evidenced. Thus, author preferred unconventional idea for reducing down the dimensionality of the instrumental variable matrix.

To the credentials of Arellano and Bond GMM procedure, two diagnostics are resulted to test the first order and second order serial correlation in the disturbances. The null absence of first serial order serial correlation obliges its rejection whereas avoids the rejection of the second order serial correlation. The two step system GMM estimator appliance meant to analyze the role of financial inclusion over financial development. The specialty of dynamic panel data GMM estimator is glued with the number of moment conditions increases with T. Hence, a Sargan test is opted to know the over identification restriction. To the persuading creditability witness that too many moment conditions creates bias meanwhile optimizing efficiency. Baltagi et al., (2009) put forward the utilization of the subset of moment conditions so that an equilibrium or balance occurs for reducing bias and loss in efficiency.

Data, Measurement and Sources

To achieve objective of the study, this study used two dataset for financial development measures namely: domestic credit to private sector and stocks traded turnover ratio. Ninety seven countries are used for both proxies of financial development. Most data points are from 2004, and majority of data lies within the range of 2004-12, thus the most available data is used for estimation. The list of countries is presented in Table 1.

This study deployed two different proxies' for financial development; the bank based indicator that we used in this paper is domestic credit to private sector while the capital market based indicator is stocks traded turnover ratio (both indicators are expressed as percentages of GDP). These two proxies are collected from World Development Indicators (WDI). Further, this study employed two different indicators to capture the financial inclusion i.e. commercial bank branches per 100,000 adults and ATMs per 100,000 adults (Gimet & Lagoarde-segot, 2012; Kumar, 2013). The two indicators are sourced from international monetary fund (IMF). Public debt is collected from International monetary fund (IMF) measured as percentage of GDP[2]. The annual data on real GDP per capita (based on 2005 U.S. dollar constant prices) and trade openness (sum of exports and imports of goods and services % of GDP) were obtained from the World Development Indicators. The Chinn-Ito Financial Openness Index of capital account openness (KAOPEN) is used to measure the financial openness. In this study we used six indicators of institutional quality which was measured by averaging these six indicators that collected from World Governance Index (WGI) such as: Control of Corruption, Government Effectiveness, Political Stability, Regulatory Quality, Rule of Law, Voice and Accountability.

These variables are summarized in Tables 1, which provide the definition and source of all key variables, their units of measurement, means, standard deviations (overall, between and within countries), and minimum and maximum values.

Table 1. *Summary of variables: Annual data from 2004-2012*

Variable	Source	Unit of Measurement	Mean	SD	Max	Min
Domestic credit	WDI	Percentage	69.12	51.991	311.0	1.124

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[2] Gross general government debt

to private sector		of GDP			63	
Commercial bank branches	IMF	Per 100,000 adults	23.134	20.797	112.265	.920
ATMs	IMF	100,000 adults	53.924	48.158	290.032	.124
Trade openness	WDI	Percentage of GDP	91.774	54.525	439.657	22.138
Financial Openness	The Chinn-Ito	Capital account openness index	1.050	1.488	2.389	-1.888
Public Debt	IMF	Percentage of GDP	49.312	31.548	238	3.7
Institutional quality	WGI	0-100	58.275	24.473	99.676	5.373
GDP per capita	WDI	constant 2005 US$	14971.66	17497.07	86129.4	214.439
Countries N=97						

Countries: Argentina, Armenia, Australia, Austria, Bangladesh, Barbados, Belgium, Bolivia, Botswana, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, El Salvador, Estonia, Fiji, Finland, France, Germany, Ghana, Greece, Guyana, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea, Kuwait, Kyrgyz Republic, Latvia, Luxembourg, Malawi, Malaysia, Malta, Mauritius, Mexico, Moldova, Mongolia, Morocco, Namibia, Nepal, Netherlands, New Zealand, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Saudi Arabia, Serbia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Zambia, Zimbabwe.

Table 2. *Summary of variables: Annual data from 2004-2012*

Variable	Source	Unit of Measurement	Mean	SD	Max	Min
Stocks traded, turnover ratio	WDI	Percentage of GDP	48.652	58.768	404.067	0
Commercial bank branches	IMF	Per 100,000 adults	23.134	20.797	112.265	0.920
ATMs	IMF	100,000 adults	53.924	48.158	290.032	0.124
Trade openness	WDI	Percentage of GDP	91.774	54.525	439.657	22.138
Financial Openness	The Chinn-Ito	Capital account openness index	1.050	1.488	2.389	-1.888
Public Debt	IMF	Percentage of GDP	49.312	31.548	238	3.7
Institutional quality	WGI	0-100	58.2755	24.473	99.676	5.373
GDP per capita	WDI	constant 2005 US$	14971.66	17497.07	86129	214.439

Countries
N=97

Countries: Argentina, Armenia, Australia, Austria, Bangladesh, Barbados, Belgium, Bolivia, Botswana, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, El Salvador, Estonia, Fiji, Finland, France, Germany, Ghana, Greece, Guyana, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea, Kuwait, Kyrgyz Republic, Latvia, Luxembourg, Malawi, Malaysia, Malta, Mauritius, Mexico, Moldova, Mongolia, Morocco,

Namibia, Nepal, Netherlands, New Zealand, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Saudi Arabia, Serbia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Zambia, Zimbabwe.

Data Analysis and Results

This section presents the results of the estimation of the equations (2) and (3) using dynamic system GMM. Tables 3 and 4 show empirical results of banking and capital market development where the financial inclusion terms are treated either exogenous or endogenous. In the empirical results two different indicators of financial development were employed namely: domestic credit to private sector and stocks traded, turnover ratio. It is important to mention the moment condition use lags of dependent variable (Baltagi et al., 2009). Table 3 presents the results using 97 developed and developing countries data set with commercial bank branches and ATMs as the main independent variables of financial inclusion, respectively. Two separate regressions are presented for each of the two different measures of financial inclusion.

The results show that the lagged dependent variable is statistically significant at 1 %, which suggests that the dynamic GMM is a suitable estimator. Results suggested that the both types of financial inclusion promote financial development with positive and statistically significant coefficient at the 1% level. It implies that the financial inclusion promote bank based financial development. Additionally, the institutional quality is statistically significant determinant of banking sector development, where financial development is measured by domestic credit to private sector. The coefficient of real GDP per capita is positive and statistically significant determinant of financial development. In contrast, trade openness is with negative sign and significant determinant to domestic credit. This may be due to time period used in the study which was from 2004 to 2012 and trade liberalization before this time period.

Table 3. *System GMM (Bank Based)*

Measure of financial development (Domestic credit to private sector)	
Financial inclusion (Commercial bank	Financial inclusion (ATMs per 100,000

	branches per 100,000 adults)		adults)	
Financial development$_{t-1}$	0.760*** (0.002)	0.898*** (0.001)	0.765*** (0.002)	0.858*** (0.002)
Financial inclusion	0.065*** (0.0168)	0.011 (0.006)	0.047*** (0.009)	0.017*** (0.004)
GDP per capita	0.339* (0.013)	0.041*** (0.005)	0.078*** (0.017)	0.053*** (0.004)
Public Debt	0.007 (0.008)	-0.051*** (0.002)	-0.027*** (0.009)	-0.053*** (0.003)
Trade openness	-0.214*** (0.191)	-0.194*** (0.009)	-0.233*** (0.019)	-0.198*** (0.005)
Financial openness	0.047*** (0.009)	0.004* (0.002)	0.033*** (.012)	-0.005* (0.002)
Institutional quality	0.161*** (0.059)	0.077*** (0.021)	0.066 (0.071)	0.076*** (0.013)
Treatment of financial inclusion	Lagged	Endogenous	Lagged	Endogenous
Number of observation	498	498	482	482
Sample period	2004-2012	2004-2012	2004-2012	2004-2012
Number of time period (T)	09	09	09	09
Number of groups	72	72	72	72
Number of instruments	42	66	42	61
Number of countries (N)	97	97	97	97
Sargan test (p-value)	43.95 (0.117)	58.164 (0.469)	45.482 (0.10)	58.344 (0.285)
First order serial correlation test (p-value)	-1.377 (0.168)	-1.38 (0.167)	-1.361 (0.174)	-1.366 (0.172)
Second order serial correlation test (p-value)	1.052 (0.292)	1.067 (0.285)	1.034 (0.300)	1.044 (0.296)

Note: All regressions are estimated using the system GMM estimator (Arellano and Bover, 1995). Figures in parentheses are standard errors. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

The findings recommend that the different financial inclusion indicators respond equally, the effect of financial inclusion on financial development is robust for banking sector development. Importantly, when financial inclusion indicators treated as endogenous does not change the results. Specially, the results do not change the sign or statistical significant of variables.

An only commercial bank branch is not statistically significant but the ATMs is statistically significant with positive coefficient. The results also found that public debt is negative and significant effect on financial development (see, Hauner, 2009). Hence, it is important to mention that the diagnostic tests were found satisfactory as reported in Table 3. The sargan test did not reject the over-identification restrictions. The null-hypothesis of the absence of first order serial correlation and absence of second order serial correlation were not rejected[3].

Now examining Table 4 the regression related to capital market development that utilizes stocks traded, turnover ratio measure of financial development. The finding reveals that the different proxy of financial development results differently to financial inclusion variables. Where the effect of financial inclusion on financial development is robust for bank based proxy, while the Stocks traded, turnover ratio case is different. The sample size is consisted with developing and developed countries, many of countries have underdeveloped capital market. The results of Table 4 illustrate the financial inclusion with negative sign and statistically significant, which further shows that the financial inclusion does not promote the capital market. This suggest us that the use of stocks traded, turnover ratio might not be a good indicator of financial development. Specially, when financial inclusion indicators treated as endogenous does not change the results. Only the magnitudes of coefficients are changed. In terms of other explanatory variables in capital market development, the coefficient of real GDP per capita is positive and statistically significant determinant of capital market development. The finding also suggests the impact on trade openness on financial development is more efficient in capital market (Law and Habibullah, 2009) and this finding is consistent with theory. In contrast, the financial openness is negative and a significant determinant of financial development[4]. It is also found that the institutional quality is positive and significant when treated exogenous and endogenous with commercial bank branches. While, institutional quality is negative coefficient and statistically significant treated as endogenous with ATMs.

Table 4. *System GMM (Market Based)*

Measure of financial development

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[3] See (Baltagi et al., 2009)

[4] See (Law & Azman-Saini, 2012)

	(Stocks traded, turnover ratio (%))			
	Financial inclusion (Commercial bank branches per 100,000 adults)		Financial inclusion (ATMs per 100,000 adults)	
Financial development$_{t-1}$	0.683*** (0.002)	0.684*** (0.011)	0.600*** (0.027)	0.639*** (0.0123)
Financial inclusion (Lagged)	-0.294*** (0.081)	-0.271*** (0.033)	-0.632*** (0.074)	-0.589*** (0.040)
GDP per capita	0.110 (0.138)	0.051 (0.077)	1.254*** (0.164)	1.052*** (0.068)
Public Debt	-0.439*** (0.049)	-0.361*** (0.029)	-0.248*** (0.026)	-0.303*** (0.020)
Trade openness	0.228 (0.156)	0.210*** (0.050)	0.449*** (0.143)	-0.124** (0.053)
Financial openness	-0.184*** (0.033)	-0.134*** (0.023)	-0.228*** (.026)	-0.287*** (0.022)
Institutional quality	0.710* (0.366)	0.906*** (0.169)	-0.115 (0.317)	-0.837*** (0.132)
Treatment of financial inclusion	Lagged	Endogenous	Lagged	Endogenous
Number of observation	478	483	459	468
Sample period	2004-2012	2004-2012	2004-2012	2004-2012
Number of time period (T)	09	09	09	09
Number of groups	72	72	72	72
Number of instruments	42	55	42	55
Number of countries (N)	97	97	97	97
Sargan test (p-value)	47.519 (0.070)	52.615 (0.265)	47.010 (0.071)	56.971 (0.151)
First order serial correlation test (p-value)	-3.294 (0.001)	-3.349 (0.0008)	-3.732 (0.0002)	-3.264 (0.001)
Second order serial correlation test (p-value)	1.434 (0.151)	1.442 (0.149)	1.278 (0.201)	1.579 (0.114)

Note: All regressions are estimated using the system GMM estimator (Arellano and Bover, 1995). Figures in parentheses are standard errors. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

The sargan test did not reject the over-identification restrictions. The null-hypothesis of the absence of first order serial correlation and absence of second order serial correlation were not

rejected[5]. The lagged dependent variable is positive and statistically significant with both cases. As concerned with the regression of stock market development, we have taken a second lag of the stocks traded turnover ratio to capture the more dynamics of this variable. Moreover, the results from both data sets suggest that the commercial bank branches and ATMs are statistically significant determinants of banking sector development. Hence, financial inclusion promotes banking sector development. In contrast, our findings also suggest that the commercial bank branches and ATMs are statistically insignificant determinants of capital market development.

Robustness check

Difference GMM was carried out to check the robustness. This robustness check examines the sensitivity of the results to alternative method. We report the results of estimating the domestic credit to private sector[6] and stocks traded, turnover ratio[7] in Table 5 and 6 respectively. The results of Table 5 difference GMM are quantitatively similar to the results reported in Table 3 of system GMM estimator. The significant of dependent variable shows that model is dynamic and remarkably mostly the coefficients have the same sign as those obtained in system GMM. Financial inclusion and real GDP per capita are statistically significant determinants of domestic credit. Therefore, the empirical results of Table 5 are robust to the different method of estimation.

Table 5. *Difference GMM*

	Measure of financial development (Domestic credit to private sector)	
	Financial inclusion (Commercial bank branches per 100,000 adults)	Financial inclusion (ATMs per 100,000 adults)
Financial development$_{t-1}$	0.620***	0.619***
	(0.003)	(0.003)
Financial inclusion	0.088***	0.053**
	(0.022)	(0.021)

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[5] See (Baltagi et al., 2009)

[6] Bank based variable

[7] Market based variable

GDP per capita	0.192***	0.279***
	(0.048)	(0.77)
Public Debt	0.063***	0.054***
	(0.014)	(0.018)
Trade openness	-0.047	-0.070**
	(0.031)	(0.031)
Financial openness	0.014	0.018*
	(.009)	(.010)
Institutional quality	0.137*	0.121
	(.081)	(.082)
Number of observation	425	409
Number of groups	68	68
Number of instruments	35	35
Sample period	2004-2012	2004-2012
Number of time period (T)	09	09
Number of countries (N)	97	97
Sargan test (p-value)	29.93	27.928
	(0.317)	(0.414)
First order serial correlation test (p-value)	-1.374	-1.356
	(0.169)	(0.175)
Second order serial correlation test (p-value)	1.075	1.055
	(0.282)	(0.291)

Note: All regressions are estimated using the system GMM estimator (Arellano and Bond, 1991). Figures in parentheses are standard errors. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

In Table 6 we report the robustness check of stocks traded, turnover ratio as the proxy of capital market. The results of estimating the stocks traded, turnover ratio are also quantitatively relatively similar with those results obtained with system GMM in Table 4. The entire coefficients have similar sign expect GDP per capita; financial inclusion statistically insignificant determinant of stocks traded, turnover ratio because of underdeveloped stock market in most of developing countries.

Table 6. *Difference GMM*

	Measure of financial development (Stocks traded, turnover ratio (%))	
	Financial inclusion (Commercial bank branches per 100,000 adults)	Financial inclusion (ATMs per 100,000 adults)
Financial development$_{t-1}$	0.625***	0.462***

	(0.056)	(0.062)
Financial inclusion (Lagged)	-0.254*	-0.452***
	(0.138)	(0.116)
GDP per capita (Lagged)	-0.253	1.326***
	(0.370)	(0.289)
Public Debt	0.320***	-0.251***
	(0.019)	(0.078)
Trade openness (Lagged)	1.114***	0.706***
	(0.031)	(0.237)
Financial openness (Lagged)	-0.182***	-0.12***
	(0.055)	(0.044)
Institutional quality	-0.696	-0.004
	(.747)	(0.835)
Number of observation	341	334
Number of groups	68	66
Number of instruments	28	28
Sample period	2004-2012	2004-2012
Number of time period (T)	09	09
Number of countries (N)	97	97
Sargan test (p-value)	26.367	27.746
	(0.154)	(0.115)
First order serial correlation test	-3.353	-3.224
(p-value)	(0.000)	(0.001)
Second order serial correlation test	1.400	1.470
(p-value)	(0.161)	(0.141)

Note: All regressions are estimated using the system GMM estimator (Arellano and Bond, 1991). Figures in parentheses are standard errors. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Conclusions

This study examines whether the financial inclusion can help to promote financial development or not. We analyze the determinants of financial development using a system generalized method of moments (system GMM) in a panel of 97 countries during 2004-2012. Although financial inclusion is recently getting popularity, but no available econometric evidence has linked with the effects of financial inclusion on financial development.

In the empirical part, the results indicate that there is still much to do in the area of financial inclusion. The empirical results based on dynamic system GMM estimations and two different indicators of financial inclusion suggest that the number of bank branches and ATMs significantly improve banking sector development. On the other hand, the empirical results of financial inclusion indicators illustrate an insignificant relationship stock

market development. Most of developing countries have underdeveloped stock market and may be less number of bank branches. The findings show that the different financial development indicators respond differently to financial inclusion.

Our findings lead to conclude that governments need to develop better understanding of financial inclusion and financially excluded people may decide to open accounts in banking sector due to effective policies. The finding of this paper may suggest the international policy makers for long term economic development and financial development. Apart from above findings, also globalization and advance technology may affect financial inclusion. We admit that there might be additional factors that could be introduced to the analysis, but this must be left for future research.

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