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Determinants of financial development in Ghana

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Abstract

The paper aims at investigating the determinants of financial development in Ghana using the Autoregressive Distributed Lag (ARDL) approach. Using quarterly data from 1988 to 2010, the study found a unique cointegrating relationship between financial development trade openness, inflation, per capita income, reserve requirement and government borrowing. The regression results show that trade openness and per capita income are important determinants of financial development in Ghana. Further, inflation, interest rate, and reserve requirement exerted negative and statistically significant effects on financial development both in the short-run and long-run suggesting that these variables adversely influence financial development in Ghana. However, government borrowing did not have any significant effect on financial development both in the long-run and short-run suggesting that higher government borrowing from banking sector will not have any significant effect on private credit or even crowd in private sector credit. It is therefore recommended that Government of Ghana ensures an accommodative openness to trade; maintain low inflationary rate and high economic growth in order to stimulate financial development in Ghana. Moreover, Bank of Ghana should consider adjusting the cash reserve ratio of banks downwards while financial institutions are to also reduce their interest rate on lending.

Keywords: Time Series, Financial Development, Autoregressive Distributed Lag

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1. Background

Financial markets and institutions perform an important function in the economic development process, particularly through their role in allocating finance to productive activities. This role has been well researched and documented in the empirical literature, using a variety of econometric techniques. By and large, this literature suggests that well-functioning financial institutions and markets promote long-run economic growth (Beck et al., 2000). Nevertheless, an interesting question remains why, if financial development is so good for growth, have so many countries remained financially under-developed? More broadly, why have some economies developed well-functioning financial markets and institutions, while others have not? Given the finance-economic growth nexus it is imperative to understand the factors that could explain the difference in the level of financial development.

Policy measures such as financial and trade liberalisation have officially been declared as determinants of financial development. Freeing the financial system from government intervention allows a more efficient allocation of resources by various economic agents while liberalising trade reduces the power of interest groups who capture politicians to shape policies in their favour which impedes financial development. As such, the liberalisation process reduces inefficiency, improves transparency and fosters a competitive environment which is conducive for the economy as a whole (Seetanah et al., 2010).

With the support of the International Monetary Fund (IMF) and World Bank, financial market liberalisation in Ghana began in the late 1980s, under the Financial Sector Adjustment Programme (FINSAP), with the restructuring of distressed banks and cleaning up non-performing assets to restore banks to profitability and viability. The programme set prices right, initiated structural reforms, including fiscal and monetary operations, and privatizations including banks (Bawumia, 2010).

Studies that have ventured to highlight the short- run and long-run determinants of financial development in country specifics are elusive. More specifically, empirical studies in this area in Ghana to serve as a guide to policy makers are few (Acheampong, 2010; Adam and Tweneboah, 2009) and this has motivated this study. Given this background, the determinants of financial development in Ghana need to be examined carefully, since financial markets are found to have played an important role in promoting economic growth. Thus, the purpose of this study is to investigate the determinants of financial development in the context of Ghana.

2. Literature review

On the empirical side, Baltagi et al. (2007), using panel data techniques and annual data, proved that trade openness and financial openness together with economic institutions determines the financial development dissimilarity across countries. Their results showed that countries that are least open can benefit greatly in terms of financial development if they open either their trade or capital accounts. These countries can have even greater benefits if they open both, though opening only one can still result in banking sector development. On the other hand, countries that are most open benefit the least from added openness.

Dehesa et al. (2007) provided a cross-country empirical analysis of the determinants of financial deepening using a panel of 120 countries between 1997 and 2004. Their analysis suggested that in a high inflation environment, controlling inflation and reducing macroeconomic volatility should be given a priority.

Quarthey (2005) primarily investigated the interrelationship between financial sector development and poverty reduction in Ghana. This was done using time-series data from the World Development Indicators from 1970-2001. The main findings of his studies were, first, that even though financial sector development does not Granger-cause savings mobilization in Ghana, it induces poverty reduction; and second, that savings do Granger-cause poverty reduction in Ghana. Also, the effect of financial sector development on poverty reduction is positive but insignificant. This is due to the fact that financial intermediaries in Ghana have not adequately channeled savings to the pro-poor sectors of the economy because of government deficit financing, high default rate, lack of collateral and lack of proper business proposals. Another interesting finding of his study was that there was a long-run cointegration relationship between financial sector development and poverty reduction.

Adam and Tweneboah (2008) used multivariate cointegration and error correction model to examine the impact of Foreign Direct Investment (FDI) on the stock market development in Ghana. Results from their study showed that there is a long run relationship among foreign direct investment, nominal exchange rate and stock market development in Ghana. Their analysis suggests that external shocks to foreign direct investment affect the stock market in Ghana.

Acheampong (2007) examined the McKinnon-Shaw thesis within the context of Ghana's financial sector episode. Specifically, he investigated the savings and real interest rate nexus, investment and real interest rate nexus, and investment and economic growth nexus using quarterly data from 1988 to 2004 and the VAR methodology. His result vindicated the savings and real interest rate nexus, investment and real interest rate nexus and investment and economic growth nexus when long run analysis is applied. However, the causality test validated the real interest rate and savings nexus, investment and financial development nexus and a reverse causality running from economic growth to savings.

3. Methodology

3.1. Model Specification

Following the standard literature of Chin and Ito (2005); Huang (2006); and Seetanah et al. (2010), the economic model for financial development is specified as:

$$FD = f(TROP, INCPC, INFL, INTR, RR, GB) \dots \dots \dots (1)$$

where *FD* is financial development, *TROP* is trade openness, *INCPC* is per capita income, *INFL* is inflation, *INTR* is interest rate, *RR* is reserve requirement, and *GB* is government borrowing. The economic model in Equation (1) above can be written as an econometric model specified as:

$$FD_t = \beta_0 + \beta_1 TROP_t + \beta_2 INFL_t + \beta_3 INCPC_t + \beta_4 INTR_t + \beta_5 RR_t + \beta_6 GB_t + \varepsilon_t \dots \dots \dots (2)$$

where the coefficients $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5,$ and β_6 are the parameters of the respective variables, β_0 is the constant term (drift), t denotes time and ε is the error term. The following are expected $\beta_1 > 0, \beta_2 < 0, \beta_3 > 0, \beta_4 < 0, \beta_5 < 0, \beta_6 < 0$

3.2. Variables in the model

3.2.1. Financial development

Financial development is a process that marks improvement in quantity, quality, and efficiency of financial intermediary services. It is measured as the domestic credit to the private sector as a percentage of Gross Domestic Product (GDP).

3.2.2. Inflation

World Bank (2011) defined inflation as “a sustained increase in the general price level of prices for goods and services. It is measured as a percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services at specified intervals, such as yearly, monthly, daily etc.” Inflation is expected to be negatively linked to financial development.

3.2.3. Trade openness

This is the sum of exports and imports of goods and services measured as a percentage of Gross Domestic Product (GDP). With the advent of globalization more countries are increasingly embracing trade liberalization which has been empirically demonstrated to have positive effect on financial development

3.2.4. Per capita income

This is GDP per capita which is measured as the ratio of gross domestic product to total population and is an indicator of a country's living standard. Data are in constant local currency which implies the series are in real terms. A higher living standard is beneficial for enhance access to financial services.

3.2.5. Interest rate

This is measured using the prime rate. The prime rate is the annualized interest rate the central bank charges commercial, depository banks for loans to meet temporary shortages of funds. High prime rate restricts the supply of bank lending because the banks are unable to borrow large sums of money to lend to the private sector so as to enhance the services of financial intermediaries. Lower interest rate is beneficial for enhancing the activities of financial intermediaries to promote development in the financial sector.

3.2.6. Reserve requirement

World Bank (2011) defined reserve requirement or cash reserve ratio as “the central bank regulation that sets the minimum reserves each commercial bank must hold (rather than lend out) of customer deposits and notes. The reserve ratio is sometimes used as a tool in the monetary policy, influencing the country's borrowing and interest rates by changing the amount of loans available”. Low levels of reserve requirement serves as a tool to improving the activities of financial institutions to help boost financial development.

3.2.7. Government borrowing

This the domestic credit extended to the central government by the financial institutions. It is measured as credit to the government as a percentage of Gross Domestic Product (GDP). A high government borrowing has the potential of crowding out the private sector credit.

3.3. Estimation procedure

3.3.1. Cointegration test

In order to implement the bounds test procedure for cointegration, the following restricted (conditional) version of the ARDL model is estimated to test the long-run relationship between Financial Development and its determinants. This framework is implemented by modeling equation (2) as a conditional ARDL, as:

$$\begin{aligned} \Delta FD_t = & \alpha_0 + \beta_1 FD_{t-1} + \beta_2 TROP_{t-1} + \beta_3 INFL_{t-1} + \beta_4 INCPC_{t-1} + \beta_5 INTR_{t-1} + \beta_6 RR_t + \beta_7 GB \\ & + \sum_{i=1}^p \phi_{1i} \Delta FD_{t-i} + \sum_{i=1}^p \phi_{2i} \Delta TROP_{t-i} + \sum_{i=1}^p \phi_{3i} \Delta INFL_{t-i} + \sum_{i=1}^p \phi_{4i} \Delta INCPC_{t-i} + \sum_{i=1}^p \phi_{5i} \Delta INTR_{t-i} \\ & + \sum_{i=1}^p \phi_{6i} \Delta RR_{t-i} + \sum_{i=1}^p \phi_{7i} \Delta GB_{t-i} + \varepsilon_t \end{aligned} \quad (3)$$

The null hypothesis of no long run relationship among the variables in equation (3) is tested against the alternative hypothesis of the presence of long run relationship among the variables denoted by: F_{FD} (FD|INCPC, INTR, INFL, TROP, RR, GB). This is specified as:

$$\begin{aligned} H_0 : & \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0 \\ H_1 : & \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0 \end{aligned}$$

3.4. Long-run and short-run dynamics

Once cointegration is established, the next step is to estimate the following ARDL ($p, q1, q2, q3, q4, q5, q6$) model in order to obtain the long run coefficients.

$$\begin{aligned}
 FD_t = & \alpha_0 + \sum_{i=1}^p \beta_1 FD_{t-i} + \sum_{i=0}^{q_1} \beta_2 TROP_{t-i} + \sum_{i=0}^{q_2} \beta_3 INCPC_{t-i} + \sum_{i=0}^{q_3} \beta_4 INFL_{t-i} \\
 & + \sum_{i=0}^{q_4} \beta_5 INTR_{t-i} + \sum_{i=0}^{q_5} \beta_6 RR_{t-i} + \sum_{i=0}^{q_6} \phi_7 GB_{t-i} + v_t
 \end{aligned} \tag{4}$$

This is followed by the estimation of the short-run parameters of the variables with the error correction representation of the ARDL model. By applying the error correction version of ARDL, the speed of adjustment to equilibrium is determined. When there exist long run relationship among the variables, then the unrestricted ARDL error correction representation is estimated as:

$$\begin{aligned}
 FD_t = & \alpha_0 + \sum_{i=1}^p \phi_{1i} \Delta FD_{t-i} + \sum_{i=0}^{q_1} \phi_{2i} \Delta TROP_{t-i} + \sum_{i=0}^{q_2} \phi_{3i} \Delta INCPC_{t-i} + \sum_{i=0}^{q_3} \phi_{4i} \Delta INFL_{t-i} \\
 & + \sum_{i=0}^{q_4} \phi_{5i} \Delta INTR_{t-i} + \sum_{i=0}^{q_5} \phi_{6i} \Delta RR_{t-i} + \sum_{i=0}^{q_6} \phi_{7i} \Delta GB_{t-i} + \lambda ECT_{t-1} + v_t
 \end{aligned} \tag{5}$$

where the coefficients are the short-run dynamics, while λ is the speed of adjustment to long-run equilibrium following a shock to the system and ECT_{t-1} is the error-correction term, the residuals from the cointegration equation lagged one (1) period defined as:

$$\begin{aligned}
 ECT_t = & FD - \alpha_0 - \sum_{i=1}^p \phi_{1i} \Delta FD_{t-i} - \sum_{i=0}^{q_1} \phi_{2i} \Delta TROP_{t-i} - \sum_{i=0}^{q_2} \phi_{3i} \Delta INCPC_{t-i} - \sum_{i=0}^{q_3} \phi_{4i} \Delta INFL_{t-i} \\
 & - \sum_{i=0}^{q_4} \phi_{5i} \Delta INTR_{t-i} - \sum_{i=0}^{q_5} \phi_{6i} \Delta RR_{t-i} - \sum_{i=0}^{q_6} \phi_{7i} \Delta GB_{t-i}
 \end{aligned} \tag{6}$$

4. Empirical results

4.1. Results of unit root test

The results of the Augmented Dickey-Fuller test shown in Table 1 indicate that all the variables are non-stationary at their levels and stationary in the first difference at the 1% level of significance. This implies that all the variables are integrated of order one or I(1). Since the variables are shown to be non-stationary and also their order of integration is the same, we can proceed to test for cointegration.

4.2. Results of the bounds test for cointegration

The results of the bound test procedure for cointegration analysis between financial development and its determinant are presented in Table 2. As show in Table 2, the joint null hypothesis of lagged level variables (that is, variable addition test) of the coefficients being zero (no cointegration) is rejected at 1 percent significance level. This is because the calculated F-statistic value of 4.709 ($F_{FD(.)}=4.709$) exceeds the upper

bound critical value of 4.540 at 99% level. This means there exist a long run relationship between financial development and its determinants.

Table 1. Results of Unit Root Test: ADF Test

Levels		First Difference				
Variables	ADF-Statistic	Lag	Variables	ADF-Statistic	Lag	I(0)
FD	-1.3492 [0.6036]	1	Δ FD	-6.1739 [0.0000]***	0	I(1)
FDD	-1.8706 [0.3447]	1	Δ FDD	-4.7257 [0.0002]***	0	I(1)
INCPC	-1.6868 [0.4345]	1	Δ INCPC	-4.9194 [0.0006]***	0	I(1)
TROP	-2.0296 [0.2739]	1	Δ TROP	-4.4545 [0.0005]***	0	I(1)
INTR	-0.8564 [0.7974]	5	Δ INTR	-4.3540 [0.0007]***	3	I(1)
INFL	-2.5104 [0.1165]	3	Δ INFL	-6.1175 [0.0000]***	2	I(1)
RR	-2.1484 [0.2260]	0	Δ RR	-7.1367 [0.0000]***	3	I(1)
GB	-2.3624[0.1255]	1	Δ GB	-4.3052 [0.0008]***	0	I(1)

Source: Authors computation

Table 2. Results of Bounds Tests for the Existence of Cointegration (intercept only)

	90% Level		95% Level		99% Level	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
K						
6	2.141	3.250	2.476	3.646	3.267	4.540
Dependent Variable						F-Statistic
F_{FD} (FD INCPC, INTR, INFL, TROP, RR, GB)						4.709

Note: Critical values were obtained from Pesaran and Pesaran (1997), Appendix C, Table F, pp. 478, and K is the number of regressors.

Source: Authors computation

4.3. Results of the long run relationship

As shown in Table 3, all the estimated coefficients have their a priori expected signs. From the results, the coefficient of trade openness is statistically significant at 1 percent significance level. This means that increases in trade openness has the potential of stimulating financial development in Ghana at the aggregate level over the study period. This positive effect of trade openness on financial development lends support to the argument by Rajan and Zingales (2003) which claim that greater openness is associated with changes in sectoral structure that increase the demand for external finance which has the potential of enhancing the activities of financial institutions.

This result confirms most findings in many empirical studies in the literature. Specifically, it concurs with a study by Seetanah et al. (2010) who found a positive effect of trade openness on financial development for Mauritius. Huang and Temple (2005) also investigated the effect of trade openness on financial development for 88 countries and found statistically positive effect of trade openness on financial development in the long-run for lower- income group like Pakistan and Vietnam.

Furthermore, the coefficient of inflation carried the expected negative sign and is statistically significant at 5 percent significance level. That is, inflation which captures macroeconomic instability has had a significant adverse effect on financial development in Ghana. This result is in line with McKinnon (1991) theory which claims that price stability is crucial for financial intermediation and that high inflation rates deter long-term contracting, aggravates informational asymmetry and moral hazard and that inflation impede financial development. Moreover, inflationary environment deteriorates financial development by lowering money supply and restricting financial resources for investment projects. Furthermore, high inflation is linked with high opportunity cost of holding money that declines the efficiency of financial institutions and hence reduce development in the financial sector. The result also confirms most findings of empirical studies in the literature. Particularly, it agrees with studies by Bittencourt (2008) who found a negative effect of inflation on financial development for Brazil as well as Wahid et al. (2011) for Bangladesh.

Moreover, the coefficient of per capita income also had positive effect on financial development and is statistically significant at 1 percent significance level. This means that as an individual's real income increases, he or she contribute positively to financial development through savings or purchasing of financial products from the financial market in Ghana. It is argued here that increasing level of income encourages the use of financial institutions and claims; therefore growth in income per head is important for financial development. This result is also in line with the endogenous growth model which claims that economic growth influences the development of the financial system by creating demand for financial products, hence leading to financial sector deepening which in turn promotes further growth (King & Levine, 1993). Thus, real per capita income which reflects an aggregation of past growth has its coefficient summarizing the long-run positive relationship between growth and financial development. The result also confirms findings in empirical studies in the literature by Nair (2008) and Wahid, et al. (2011) who found a positive effect of real per capita income on financial development for India and Bangladesh respectively. It also concurs with finding by Erzen, (2008) for higher income countries like Australia, France, and Canada as well as middle income countries like Egypt, Mexico, and Poland.

In addition, consistent with expectation, the coefficient of interest rate is negative in sign and is statistically significant at 10 percent significant level. Thus, interest rate has had an adverse effect on financial development in the Ghanaian economy over the study period. It is argued here that high interest rate charged by the central bank has the potential of widening the interest rate spread (the difference between lending rate and deposit rate) of banks. This means that larger banking sector's interest rate spread discourages potential savers due to low returns on deposits and thus limiting financing for potential borrowers. Cottarelli and Kourelis (1994) also argue that the use of prime rate by the Central Bank as a monetary policy signal reduces the response of lending rates to changes in money market rates which reduces the flexibility of banks performing their financial activities. The result also confirms the theoretical argument that, high prime rate restrict lending by the banks which is a tool for financial development. On the empirical side, it concurs with findings by Cottarelli and Kourelis (1994). They found that interest rate negatively impact financial development for South Africa, Germany, and Belgium.

Table 3. Estimated Long-Run Coefficients using the ARDL Approach

ARDL(2, 1, 1, 0, 0, 0) selected based on SBC		Dependent Variable: FD		
Regressor	Coefficient	Standard Error	T-Ratio	P-values
Constant	-1.8835	0.75727	-2.4872	[0.015]**
TROP	0.087231	0.0095863	9.0995	[0.000]***
INCPC	0.034143	0.012768	2.6742	[0.009]***
INFL	-0.011502	0.0053446	-2.1520	[0.034]**
INTR	-0.016322	0.0083096	-1.9643	[0.053]*
RR	-0.017913	0.0086175	-2.0787	[0.041]**
GB	-0.015756	0.025294	-0.62291	[0.535]

Source: Authors computation

Again, the coefficient of reserve requirement is statistically significant at 5 percent significant level and is negative in sign. The result suggests that repressive financial policy have indeed a negative impact on financial development process in the case of Ghana. This result is in line with theoretical argument by Giorgio (1999) who used a simple model to show that the optimal level of reserve requirements is likely to be inversely linked to the degree of financial development of an economy. In addition, it tends to support the McKinnon-Shaw thesis which claims that high reserve requirements retard financial development. In the empirical literature, it concurs with the findings by Ang (2008) who found that reserve requirement negatively impact financial development for Malaysia.

Finally, even though the coefficient of government borrowing had it expected negative sign, it is not statistically significant. This means that government borrowing do not crowd out the private sector credit to lead to a decline in financial development in Ghana. This result is support the argument by Emran and Subika (2009, pp. 4) which claim that "higher government borrowing from banking sector may not have any significant effect on private credit or even crowd in private sector credit. For example, when the banks have excess liquidity, a higher lending to the government may not result in any significant reduction of credit to the private sector. It has also been argued that government borrowing might actually induce the banks to undertake relatively more risky private lending, because the safe government assets in a bank's portfolio allow it to bear more risk".

4.4. Results of the short run dynamic model

Once the long-run cointegrating model has been estimated, the next step is to model the short-run dynamic relationship among the variables within the ARDL framework. Thus, the lagged value of all level variables (a linear combination is denoted by the error-correction term, ECM_{t-1}) is retained in the ARDL model. Table 4 presents the results of the estimated error-correction model of financial development for Ghana using the ARDL technique. The model is selected based on the SBC.

The results from the ARDL model as displayed in Table 4 suggest that the ultimate effect of previous period value of financial development on current values of financial development in the short-run is positive

and statistically significant at 1 percent significant level. The implication is that current values of financial development are affected by previous quarters' values of financial development in Ghana. This is expected in that previous growth and expansion in the financial sector serves as an indication of prosperity and may attract more investment leading to more growth. This result is in line with finding in the empirical studies by Bittencourt (2008) as well as Baltagi, et al. (2007). These results for the short run were all consistent with the results obtained in the long run.

Table 4. Estimated Short-Run Error Correction Model using the ARDL Approach

ARDL(2, 1, 1, 0, 0, 0) selected based on SBC		Dependent Variable: ΔFD		
Regressor	Coefficient	Standard Error	T-Ratio	P-values
Constant	-0.58304	0.26166	-2.2283	[0.029]**
$\Delta FD(-1)$	0.36536	0.097408	3.7508	[0.000]***
$\Delta TROP$	0.071637	0.017566	4.0782	[0.000]***
$\Delta INCPC$	0.020919	0.0030828	6.7856	[0.000]***
$\Delta INFL$	-0.0034486	0.0016098	-2.1423	[0.035]**
$\Delta INTR$	-0.0052945	0.0029699	-1.7827	[0.078]*
ΔRR	-0.0055450	0.0030513	-1.8173	[0.073]*
ΔGB	-0.0048771	0.0077375	-0.63032	[0.530]
$ECM(-1)$	-0.30955	0.068634	-4.5102	[0.000]***
R-Squared	0.72485	R-Bar-Squared	0.63095	
DW-statistic	2.0726	F-stat. F(8, 79)	8.1242	[0.000]
DW-statistic	2.0726			

Source: Authors computation

5. Conclusion

In line with the empirical literature, the study has shown that trade openness and income per capita are statistically important determinants of financial development in Ghana and positively impact it. Again, the results presented in this study imply that inflation, interest rate, and reserve requirement are statistically important determinants of financial development but have a negative impact, both in the long-run and in the short-run. However, government borrowing did not have any significant effect on financial development.

The policy implications are that, Governments of developing countries whose economies are not yet open to international trade now have an incentive to open their borders to stimulate development in their financial sector. More specifically, Government of Ghana needs to improve her trade to allow for a well functioning financial sector with all its concomitant benefits. Another, the Government of Ghana needs to put measures in place to maintain low inflationary rate in the Ghanaian economy. This is because poor macroeconomic performance only brings deleterious effects to a developing economy, that is, high inequality, erratic growth, and most importantly, a restrictive financial sector.

Further, the Central Bank needs to consistently reduce the cash reserve ratio of banks to help increase the availability of credit to aid in their financial activities to promote financial development. Moreover, financial institutions in Ghana need to also consider reducing their interest rate on lending to attract borrowing from the private sector so as to boost development in the financial sector of the economy. Finally, to ensure development in the financial sector, the government needs to first ensure that there is growth in the economy by maintaining macroeconomic stability. In this regard the government through the Bank of Ghana could consider enhancing the improved institutional, legal and regulatory framework to enable financial institutions perform their roles without friction as well as ensure efficient allocation of resources to promote financial development and growth.

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