



# Monetary Deepening and Economic Growth in Ghana

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**Abstract:** Using quarterly data from 1993 to 2018, this study examined the connection between economic development and financial deepening for the instance of Ghana. Real GDP per capita was used to assess economic growth while lending to the private sector and broad money were used to gauge financial deepening. Other factors were interest rate, government spending/GDP, and gross fixed capital formation/GDP. The results showed a positive long-run relationship between financial deepening as measured by credit to the private sector/GDP and economic growth but no such relationship when financial deepening was measured by broad money/GDP. This relationship was found using the Johansen cointegration approach, vector error correction, vector autoregressive, and Granger causality approaches. The capital stock was shown to be the most significant determinant of economic growth according to the forecast error variance decomposition results. Economic expansion has the greatest bearing on capital stock and financial deepening. Financial deepening was the most significant determinant of real interest rates. When credit to the private sector and GDP were used as proxies for financial deepening, the study revealed support for the endogenous growth forecast. However, when financial deepening was proxied by wide money to GDP, evidence for the demand-pulling hypothesis was discovered. According to the report, the Bank of Ghana should think about improving the institutional, legal, and regulatory environment to let financial institutions carry out their duties without interference. The government may also think about continuing its consistent development strategy and ensuring that the banking sector reforms are implemented.

**Keywords:** Economic Growth, financial deepening, banking sector, Ghana

## 1. INTRODUCTION

A financial system is made up of a network of financial markets, institutions, companies, homes, and governments that take part in it and control how it operates. The advantages of a sound and advanced financial system are related to the mobilization of savings and effective financial intermediation roles (Gibson & Tsakalotos, 1994). The key function of financial systems in the saving-investment-growth nexus is to act as an effective vessel for: channeling funds from surplus to deficit units by mobilising resources and ensuring an efficient transformation of funds into real productive capital; creating sufficient liquidity in the economy by borrowing short-term and lending long-term; reducing information costs, providing

risk management services and reducing risks from the system through diversification and techniques of risk sharing and risk pooling; mobilising savings from atomised individuals for investment, thereby solving the problem of indivisibility in financial transactions and mobilising savings that are invested in the most productive ventures irrespective of the source of the savings. This can be achieved either by direct market based financing or by indirect bank-based finance (Levine, 2004; Emenuga, 2004; Nowbutsing, Ramsohok & Ramsohok, 2010).

Over the past few decades, the role of financial deepening in economic growth has attracted significant attention from finance and development experts and

has been debated extensively. This debate can be characterised into four main theoretical propositions: the supply-leading hypothesis (McKinnon, 1973; Shaw, 1973; Neusser & Kugler, 1998), demand-pulling hypothesis (Robinson, 1952; Patrick, 1966; Ireland, 1994), the endogenous growth theory (Greenwood & Smith, 1997; Blackburn & Hung, 1998) and the Stern-Lucas proposition (Kuznets, 1955; Meir & Seers, 1984; Lucas, 1988; Stern, 1989). Given these alternative theoretical paradigms, empirical evidence especially time series studies have generally been mixed and inconclusive. Interestingly, specific studies on the finance-growth nexus in sub-Saharan African countries especially Ghana are very few. Some of these studies have used cross-country regression method. This method is saddled with heterogeneity bias. As such, it fails to address the country-specific effects of financial development on economic growth, which may lead to inconsistent and misleading estimates (Quah, 1993; Caselli, Esquivel, & LeFort, 1996; Ghirmay, 2004). In addition, some other studies using time series employed a bivariate VAR framework (Al-Yousif, 2002; Quartey & Prah, 2008). Quartey and Prah (2008) found evidence for both the demand-pulling and independent hypotheses in Ghana when different measures of financial development were used. However, bivariate tests suffer from omitted variables problem and lead to erroneous causal inferences (Loizides & Vamvoukas, 2005). Frimpong and Adam (2010) using a trivariate VAR found evidence for the bi-directional causality proposition in Ghana. However, the introduction of an additional variable in the causality framework may not only alter the direction of causality but also the magnitude of the estimates (Loizides & Vamvoukas, 2005).

It is against this background that this study seeks to investigate the cointegration and causal relationship between financial deepening and economic growth in Ghana using a quadivariate vector autoregressive (VAR) and vector error correction (VECM) framework. The advantages of this technique are that: First, it is possible to distinguish between the short-run and long run causality if the variables are cointegrated. Second, endogeneity is less of a problem since it treats all variables as potentially endogenous. Finally, it models relationships among macroeconomic variables in a dynamic manner since it is common for macroeconomic variables to be affected by their own past values. Thus, it enables us to study the impact of unanticipated shocks on the endogenous variables (impulse response functions). The relative importance of each variable in explaining the variations in the endogenous

variables can also be examined (variance decomposition analysis).

### Theoretical model specification

The theoretical literature predicts a positive link among financial deepening, real interest rate, investment and economic growth. The McKinnon-Shaw thesis attempts to explain the positive link between financial deepening and economic growth through complementarity between money, capital, and debt intermediation hypotheses. McKinnon (1973) assumed that investment is lumpy and self-financed and hence cannot be materialised unless adequate savings are accumulated in the form of bank deposits. On the other hand, the debt-intermediation view presented by Shaw (1973) postulates that financial intermediaries promote investment and raise output growth through borrowing and lending. These two arguments suggest that an increased level of financial development, which can be the outcome of financial liberalisation, will lead to higher output growth. In order to reach higher savings and investment rates, they recommended that governments should abolish interest rate controls and give up raising seignorage through inflationary monetary policies (Luintel & Khan, 1999). As a result, real interest rates will rise to the market clearing values. A positive real interest rate, in these models, increases financial depth through the increased volume of financial saving mobilisation and promotes growth through increasing the volume and productivity of capital. Higher real interest rates exert a positive effect on the average productivity of physical capital by discouraging investors from investing in low return projects (World Bank, 1989; Fry, 1995). Similarly, the endogenous growth literature also predicts a positive relationship between financial depth, real income, investment and real interest rate (King & Levine, 1993a). This prediction is common to both the McKinnon-Shaw model and the endogenous growth literature. This is because Well-developed financial markets promote investment and growth by channelling financial resources to the most productive uses. Based on these theoretical postulates, consider an algebraic representation of the simplest endogenous growth model - the 'AK' model by Rebelo (1991) maximised for labour:

$$Y_t = AK_t \beta_1 l_t \epsilon_t$$

Where Y denotes the aggregate output at time t, K is the aggregate capital stock at time t, l represents natural log and  $\epsilon_t$  is an error term while A denotes total factor productivity growth (TFP).

## 2. MATERIAL AND METHODS

We adopted the ex-post facto research design in this study. Data were collated from the Central Bank of Ghana Statistical Bulletin while the Multiple Regression Model (MRM) was adopted. The choice of multiple regression models is based on the use of more than single independent variables in a regression model (see, Onwumere, 2005). The general form for a multiple regression analysis is given in the form below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \mu \dots \dots \dots (1)$$

Where

Y = dependent variable

$\beta_0$  = equation constant

$\beta_1, \beta_2 \dots \beta_n$  = coefficients of explanatory variables

$X_1 X_2 \dots X_n$  = independent or explanatory variables

$\mu$  = error term

Given the above general multiple regression function and our proxies for financial deepening as broad money velocity, money stock diversification, economic volatility, market capitalization; the following acronyms suffice:

Gross Domestic Product = GDP

Broad Money Velocity = BMV

Money Stock Diversification = MSD

Economic Volatility = EV

Market Capitalization = MC

Market Liquidity = ML

Adopting Levine (2000) modified standard growth regression equation in line with the objectives of this paper to examine the impact of financial deepening on economic growth in Ghana, we have:

$$EG f (BMV, MSD, EV, MC, ML) = 0 \dots \dots \dots (2)$$

Equation 2 is interpreted as economic growth being a function of broad money velocity, money stock diversification, economic volatility, market capitalization and market liquidity. Rearranging equation 2 in line with the model, we have:

$$EG = \beta_0 + \beta_1 BMV + \beta_2 MSD + \beta_3 EV + \beta_4 MC + \beta_4 ML + \mu \dots \dots (3)$$

### Description of our Explanatory Variables

#### Economic Growth

GDP is proxied in this work for economic growth. It is the total aggregate value of goods and services produced in a country over a given period (normally a year). The GNP which should have been more appropriate is the total value of goods and services produced by all the nationals whether within and outside the country over a given period in the economy.

However, it is difficult to compute GNP or get realistic figures especially for Ghana (a developing country) because of the difficulty involved in generating values for the country's citizens outside the country. Thus, we used the GDP growth rate as the measure of economic growth in this study, hence:

$$GDPGR_n = \frac{GDP_{n2} - GDP_{n1}}{GDP_{n1}} \dots \dots \dots (4)$$

Where

GDPGR<sub>n</sub> = Gross Domestic Product Growth Rate

GDP<sub>n2</sub> = Gross Domestic Product for the current year

GDP<sub>n1</sub> = Gross Domestic Product for the previous year

#### Broad Money Velocity

This is the ratio of M2 to nominal GDP and is often called the monetization ratio as used by King and Levine (1993). It reflects the depth of the financial market relative to the overall economy. Increases in this ratio indicate further expansion in the financial sector relative to the rest of the economy. We have:-

$$BMV = \frac{M2}{GDP} \dots \dots \dots (5)$$

Where

BMV = Broad Money Velocity

M2 = Total Monetary Liability

GDP = Gross Domestic Product

#### Money Stock Diversification

This is the ratio of demand deposits to the narrow money stock. Vogel and Buser (1976) argue that this measure represents the complexity, or sophistication of the financial market (primarily banks). An increase in this ratio implies a higher degree of diversification of financial institutions and a greater availability or use of non-currency balances (bank deposits) in the transaction process. In this paper, we adopted narrow money stock denoted as M1. Therefore;

$$MSD = \frac{DD}{M1} \dots \dots \dots (6)$$

Where

MSD = Money Stock Diversification

DD = Demand Deposit

M1 = Money Supply

#### Economic Volatility

This reflects the extent to which financial services are provided to the private sector. It is a measure of financial development. It is credit issued by financial institutions to the non-financial private sector as a share of GDP. The use of this measure is because it is more inclusive than other measures of financial development, and it also captures an important activity of the financial

sector; namely, channeling funds from savers to investors in the private sector (Ang, 2007). Thus, it was proxied as:

$$EV = \text{Credit to Private Sector/GDP} \dots\dots\dots (7)$$

Where

EV = Economic Volatility

GDP = Gross Domestic Product

### Market Capitalization

Market Capitalization is a measure that equals the value of listed shares divided by GDP. The assumption behind this measure is that overall market size is positively correlated with the ability to mobilize capital and diversify risk on an economy-wide basis hence adopting Demirguc-Kunt and Levine (1996), Levine and Zervos (1998) approach, we proxied market capitalization as:-

$$MC = \text{Market Capitalization/GDP} \dots\dots\dots (8)$$

Where

MC = Market Capitalization

GDP = Gross Domestic Product

### Market Liquidity

Two main measures of market liquidity are found in literature, market turnover ratio and market value traded ratio. While market-turnover ratio equals the value of total shares traded divided by market capitalization, the market value traded ratio measure is given as total value of shares traded on the Stock Exchange. The ratio equally measures the organized trading of firm equity as a share of national output. In this way, it should positively reflect liquidity on an economy-wide basis. In this paper, we adopted the market-value traded ratio because of its economic wide approach in measuring market exchange divided by GDP (see, Guha Deb and Mukherjee, 2008). Thus, we have:-

$$ML = \text{Total Value of shares traded/GDP} \dots\dots\dots (9)$$

Where

ML = Market Liquidity

GDP = Gross Domestic Product

### 3. FINDINGS

From the analysis/results, broad money velocity, also called monetization ratio represented by M2/GDP had a positive non-significant impact on gross domestic product growth rate in Ghana (t = .185, coefficient of BMV = .919). This ratio indicates that an expansion of

the financial sector will affect positively on the economy though insignificantly. Money stock diversification, represented by DD/MI, had a negative non-significant impact on Gross Domestic Product growth rate (t = -.712, MSD coefficient = -.734). The implication is that the Ghanaian economy is not sophisticated enough to increase the degree of diversification of financial institutions which will provide greater availability or use of non-currency balances (bank deposits) in its matrix. In addition, economic volatility, represented by credit to the private sector/GDP, had a negative non-significant impact on gross domestic product growth rate in Ghana (t = -.888, EV Coefficient = -6.742). The result indicates that the financial services sector did not impact positively as expected to induce economic growth. Market capitalization, represented by MC/GDP, had a negative non-significant impact on economic growth in Ghana (t = -.749, MC Coefficient -1.006) during the period studied, implying that the size of the Ghana Stock Market is yet to mobilize capital and diversify risk on an economy-wide basis. However the market liquidity, represented by total value of shares traded/GDP, had a positive non-significant impact on economic growth (t = .979, ML Coefficient = 20.276). This implies that the Ghanaian Stock Market enhances liquidity though not significantly, thus deepening the economy. The result also indicates that there was a positive relationship between the broad money velocity/market liquidity and economic growth while there was a negative relationship between money stock diversification/ economic volatility/ market capitalization and economic growth.

### 4. DISCUSSION

This study examined the relationship between financial deepening and economic growth in Ghana using quarterly time series data from 1993 to 2018. Specifically, it investigated the long run and causal relationship between financial deepening and economic growth in Ghana using the cointegration, vector error correction (VECM), vector autoregressive (VAR) and Granger causality approaches. It employed Johansen (1988) approach to cointegration and the VECM to examine the long run and short-run dynamics among the variables used in the estimation. The VAR approach was used to conduct variance decomposition analysis in order to identify which variables contributed to the forecast error variance of a targeted variable. Finally, the study examined the causal relationship between financial deepening and economic growth including other variables in the model using both the pairwise Granger-causality and the VECM based causality techniques.

The variables employed in the study included real GDP per capita, the ratio of gross fixed capital formation to GDP, share of credit to private sector to GDP, share of broad money to GDP, real interest rate and the share of government expenditure to GDP. All tests and estimations were conducted using the econometric view (Eviews) 5.0 package. The study observed that, the debate on the nature of the relationship between financial deepening and economic growth is still ongoing and has been characterized into four main paradigms: Patrick is opposing supply-leading and demand-pulling hypotheses, the mutual impact of finance and growth proposition and the Stern-Lucas proposition. However, empirical evidence, especially time series studies have generally been mixed and inconclusive. The cointegration analysis revealed the presence of one economically interpretable long-run relationship among real GDP per capita, credit to private sector to GDP, gross fixed capital formation to GDP and real interest rate. No cointegration was found when financial deepening was measured by M2Y. Capital stock and financial deepening in the long-run model exhibited a positive and significant relationship with economic growth (real GDP per capita) except for real interest rate, which was negatively related to growth. This result answers the first hypothesis and vindicates partially the McKinnon-Shaw hypothesis that financial deepening affects growth positively through investment. This is also consistent with the predictions of the endogenous growth literature. It could not, however, vindicate the positive effect of financial deepening on growth through real deposit rate since real deposit rate impacted negatively on growth.

The empirical evidence from the VECM showed that all the variables except real interest rate exhibited both positive and negative effects on economic growth in the short-run with the positive impacts being dominant. The share of government expenditure to GDP, which served as a policy variable, was deleted because it was not significant although it was positively related to growth. The speed of adjustment, though significant, did not carry the expected negative sign. The implication is that economic growth followed its own path when destabilised in the short-run. This was attributed to the fact that the real side of the economy is saddled with sticky expectations and other constraints, which may stifle growth and productivity and obscure the tendency of reversion to equilibrium from disequilibrium. The evidence from the forecast error variance decomposition suggests that the variables that influenced economic growth significantly were capital stock and financial deepening. Similarly, the forecast error variance decomposition of financial deepening

revealed that economic growth and interest rate were the variables that exerted much influence. The results of the Granger-causality test suggested a bi-directional causality between economic growth and financial deepening when the ratio of credit to private sector to GDP was used to proxy financial deepening. Similarly, the study found a bi-directional causality between the share of gross fixed capital formation to GDP and economic growth and between financial deepening and interest rate. However, the direction of causality changed to unidirectional running from economic growth to financial deepening when the ratio of broad money to GDP was used to proxy financial deepening.

## 5. CONCLUSION

Given the current turbulence in the financial sector and its associated effects, the finance-growth nexus has attracted the attention of development practitioners, financial professionals, scholars, and policy officials. From the results of the forecast error variance decomposition, the most important variable for economic growth is capital stock. For financial deepening and capital stock, the most influential variable is economic growth. Considering real interest rates, financial deepening is the most important variable. Consistent with the endogenous growth predictions, the study found evidence for bidirectional causality between economic growth and financial deepening when credit to private sector to GDP is used to proxy financial deepening. This suggests that growth can stimulate development of financial resources and financial deepening could stimulate growth. Therefore, Government policies should also be geared towards increasing money supply and efficient capital market that will enhance overall economic efficiency, increase investor confidence, create and expand liquidity, mobilize savings, enhance capital accumulation, transfer resources from traditional sectors to growth inducing sectors and also to promote competent entrepreneurial response in various sectors of the economy.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest regarding the research, authorship, and/or publication of this article.

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## Data Availability

Data used for this research is available upon request from the corresponding author.

## Notes

1. I appreciate the anonymous reviewer's comments, which I have noted and worked on to improve the manuscript's scholarly caliber and visibility.
2. All references to "ratings" or "levels" emphasize Financial Deepening and Economic Growth in Ghana variability and apply to quantitative and qualitative measurements.

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