Financial development, bank savings mobilization and economic performance in Ghana: evidence from a multivariate structural VAR

Adenutsi, Deodat E.

University of Stellenbosch

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Deodat E. Adenutsi

Graduate School of Business

University of Stellenbosch

P.O. Box 610, Bellville 7535

Cape Town, Republic of South Africa

Email: deo.adenutsi@gmail.com

Abstract

This paper examines the implications of financial development for commercial bank savings mobilisation and economic performance in Ghana since the pursuit of financial reforms programme in September 1987. To achieve this objective a Structural Vector Autoregressive (SVAR) model on quarterly time series data spanning from 1987(3) to 2009(4) was employed. The methodological approach of the analysis hinged on the verification of the theoretical stance that financial development promotes improved financial intermediation, efficient resource mobilisation and allocation for higher economic performance. The empirical results suggest that, in Ghana, financial development has enhanced the performance of commercial banks by way of savings mobilisation but adversely impacted on long-run economic performance directly. Thus, financial development can only enhance long-run economic performance indirectly through increased savings mobilised by banks. The success of Ghana's financial reform programme is largely contingent on the depth of the financial market, which should be considered as the starting point in the sequencing of policy implementation. It is concluded that prudent and rigorous policy measures that will further enhance financial deepening are critically required and this should be seen by policymakers in Ghana as the necessary condition for resource mobilisation and long-run economic performance.

Keywords: Financial Development, Bank Savings Mobilisation, Economic Performance, SVAR Model

JEL Classification: C32 E13 E44 E58 G21

1.0 INTRODUCTION

The role of the financial system in economic growth has been at the centre of intense policy debate since the beginning of financial history. Financial development should, at least in principle, imply that financial resources are made available for the growth and development of the real sector of the

economy. In developing countries like those in Sub-Saharan Africa (SSA), however, financial systems have not been well-developed to play this vital role of intermediation. In SSA, the financial markets are often extremely fragmented with the various segments serving distinct groups of clients with similar features and needs, without functional direct and indirect linkages and interaction among the market segments (Nissanke and Aryeetey, 1999). As a solution to this financial market fragmentation, McKinnon (1973) and Shaw (1973) suggest abolishing government interference in the credit market while stabilising the price level through prudent macroeconomic policies. This, they argue should enable the formal financial sector to expand, leading to higher financial deepening (McKinnon, 1988).

In response to the McKinnon-Shaw hypothesis, many developing countries have since the mid-1980s, embarked on far-reaching reforms of their financial systems via liberalization towards market-orientation. Such development represents a policy response made up of a package of measures designed to remove undesirable state-imposed constraints on the efficient functioning of the financial system. These measures include the removal of interest rate ceilings, and the loosening of deposit and credit controls. In addition some countries established and/or actively promoted the development of their stock markets. These programmes of financial reforms and development in developing countries have been predicted on the presumption that a market-based financial system can most effectively mobilise savings, making them available for credit allocation in financing businesses and investment projects.

The emergence of what has become known as new theories of endogenous economic growth has given a new impetus to the relationship between growth and financial development as these models postulate that savings behaviour directly influences not only equilibrium income levels but also growth rates (Romer, 1986, 1990; Greenwood and Jovanovic, 1990; Bencivenga and Smith, 1991). On that account, the performance of financial markets are said to have a strong impact on real economic activity. Indeed, Hermes (1994) asserts that financial liberalization theory and the new growth theories basically assume that financial development, which is the outcome of financial liberalization, leads to economic growth. On the other hand, Murinde and Eng (1994) and Luintel and Khan (1999) argue that a number of endogenous growth models show a two-way relationship between financial development and economic growth.

In Ghana, financial sector development and reform programmes were broadly initiated in September 1987 with the overall objective of improving efficiency within the financial system and broadening the scope of financial services for higher resource mobilisation, improved intermediation, and thus ultimately promoting rapid economic growth. Since then, a number of financial and macroeconomic policies have been implemented in order to achieve this objective. Meanwhile, as at now, bank savings are low with limited access to credit by the private sector. It is also evident that the financial market remains shallow in spite of the fact that competition among banks has now become keener than during the pre-reforms era. It is, therefore, imperative to verify the extent to which the implementation of financial reforms and development programmes has improved savings mobilisation by commercial banks and subsequently promoted long-run economic performance in Ghana.

The remaining part of this paper is organised as follows. In Section 2 the theoretical underpinnings and policy practice on the role of the financial sector in resource mobilisation and advancing higher economic performance is provided. The theoretical framework upon which the empirical models rest constitutes section 3. In section 4 the empirical model and the methodological approach to the analyses are presented together with issues relating to data. The empirical results and analysis are presented in Section 5. Policy guidelines for action can be found in Section 6, which concludes the paper.

2.0 THEORETICAL CONSIDERATIONS AND POLICY PRACTICE

2.1 The Finance-Growth Nexus in Theory

Theoretically, the relationship between finance and economic growth appears quite complex as this relationship has the potential of passing through various transmission mechanisms. The channel of the linkage between financial development and economic performance is the functions that the financial sector performs. Basically, there are two fundamental considerations with regard to the role of a financial system. First, in an unstable macroeconomic environment of high risk and uncertainty, the onus lies on the financial system to provide the facilities for efficient risk-sharing and diversification. In an uncertain macroeconomic environment, the critical functions of modern financial markets go beyond the traditional mobilisation and allocation of financial resources to include risk-sharing and allocation, which has consequently motivated the pursuit of financial reform programmes with the emphasis on the development of the banking sector. In effect, both

the quantum and quality of financial resources are highly essential and hence must be taken into account in determining the efficient functioning of a contemporary financial market.

Second, there is the need to examine the role of financial markets in an asymmetrically-informed environment characterized by moral hazards and other agency problems commonly found in developing countries. The strategic linkage of financial institutions with imperfect information and agency costs gives the financial system a more vital role to play in realizing the efficient allocation of scarce financial resources in underdeveloped economies. In this regard it is imperative that a well-performing and liquid financial system must be capable of providing the mechanism for efficient intermediation among the various competing participants. It is in line with this premise that economic growth theories are generally formulated to take into account the role of interest rate in equilibrating savings and investment in an economy. From the neoclassical perspective, the optimal growth path is equal to the real interest rate, for which reason the transmission channel from finance to economic performance is of critical importance.

The McKinnon-Shaw financial liberalization hypothesis provides the fundamental theoretical framework for examining the implications of financial sector reforms on an economy (Reinhart and Tokatlidis, 2003; Agca *et al.,* 2007). This hypothesis postulates that the pursuit of financial repressive policies impairs economic growth through a mechanism of low savings rate. As real interest rates are regulated at abysmally low levels, public disincentive for saving increases vis-à-vis increasing demand for financial resources for investment purposes, which results in capital scarcity and inefficient allocation. In effect, under financial repression, financial institutions are impeded from achieving optimal allocation of resources to the productive sectors of the economy. In the course of implementing interest rate liberalization policy, because the equilibrium interest rate is determined under a more competitive condition, interest rates rise in real terms to levels that stimulate higher savings, thereby reducing disintermediation, and enhancing quality productive investment to promote improved economic performance. Consequently, the simplified versions of most popularly known economic growth models seem to suggest some important linkages between the financial system and the level of economic activity. For instance, as the financial sector develops, the potential loss associated with resource allocation is reduced; increases in the savings ratio are stimulated; and the productivity of financial resources is enhanced.

Yet still, as expected, there is lack of consensus on the theoretical role of financial liberalization in inducing domestic resource mobilisation. For example, recently Kelly and Movrotas (2008) contend that, in principle, financial development enhances the savings mobilisation process and channels financial resources towards sustainable economic development. Nevertheless, Bayoumi (1993), Bandierra *et al*. (2000) and Aghion *et al.* (2004) note that financial deregulation minimizes borrowing constraints, which could trigger instability in financial systems thereby reducing the incentives to save. Indeed, Liu and Woo (1994) postulate that a low level of financial development could serve as an incentive to households to save more towards initiating self-finance projects. In various empirical studies, Page (1994), Cardenas and Escobar (1998), Adenutsi (2002) and Krieckhaus (2002) find that financial savings positively impact on economic growth, although some endogenous theorists like Barro and Sala-i-Martin (1999) do not predict any significant long-run impact of savings on growth. Chaturvedi *et al*. (2009) find that a positive bi-directional causal relationship exists between savings rate and economic growth but inflation adversely impacts on growth, albeit with a positive effect on saving rate.

2.2 Financial Reforms and Development, Financial Savings and Economic Performance

Keynes (1930) identifies the importance of the banking sector for improved economic performance. In the words of Keynes (1930: 220) bank credit *is the pavement along which production travels, and the bankers, if they knew their duty, would provide the transport facilities to just the extent that is required in order that the productive powers of the community can be employed at their full capacity*. Robinson (1952) similarly argue that financial development follows economic growth, and articulates this causality contention by suggesting that 'where enterprise leads, finance follows'.

Patrick (1966) distinguishes two possible causal relationships between financial development and economic growth. The first relationship described as 'demand following' views the demand for financial services as contingent on the growth of real income and on the commercialization and modernization of agriculture and other subsistence sectors. According to this assertion, the creation of modern financial institutions, their financial assets and liabilities and related financial services are a response to the demand for these services by investors and savers in the real economy (Patrick, 1966). According to this viewpoint the more rapid the average growth of real national output, the greater will be the demand by enterprises for external funds (the saving of

others) and hence financial intermediation, since under most circumstances firms will be less capable of financing expansion from internally generated depreciation allowance and retained profits. For this same reason, with a given aggregate growth rate, the greater the variance in the growth rates among different sectors or industries, the greater will be the need for financial intermediation to transfer savings to fast-growing industries from slow-growing industries and from individuals. The financial system can thus support and sustain the leading sectors in the process of growth. In this case an expansion of the financial system is induced as a consequence of real economic growth.

The second causal relationship between financial development and economic growth is termed 'supply leading' by Patrick (1966: 75). 'Supply leading' has two basic functions: to transfer resources from the traditional, low-growth sectors to the modern high-growth sectors and to promote and stimulate an entrepreneurial response in these modern sectors (Patrick, 1966). This implies that the creation of financial institutions and their services occurs in advance of demand for these services. Consequently, the availability of financial services stimulates the demand for these services by the entrepreneurs in the modern growth-inducing sectors.

It is believed that economic performance may be constrained by credit creation in underdeveloped economies where the financial systems are less developed, whereas in a more sophisticated financial environment, finance is viewed as endogenous responding to demand requirements. Obviously, this line of argument suggests that the more developed a financial system, the higher the likelihood of growth causing finance. In the view of Robinson (1952), therefore, financial development follows growth or, perhaps, the causation may be bi-directional. However, McKinnon (1973) and Shaw (1973), contributing to the earlier work of Schumpeter (1911), propounded the financial liberalization doctrine, arguing that state restrictions on the banking system restrain the quantity of investment. More recently, the endogenous growth literature has suggested that financial intermediation, a key measure of financial development, has a positive effect on steady-state growth and that government intervention in the financial system has a negative effect on the equilibrium growth rate (King and Levine, 1993).

Notwithstanding the above, the empirical support for the financial reforms and development hypothesis with respect to financial savings remains inconclusive. Whereas Fry (1978), Leite and

Makonnen (1986) and Adenutsi (2002) find that improved financial development promotes financial savings; Gupta (1984), Giovannini (1985), Stiglitz (1994), Levine and Zervos (1998), Bandiera *et al.* (2000) and Reinhart and Tokatlidis (2001) conclude that generally financial reforms and development indicators either have no significant statistical impact or a significant negative impact on financial savings especially for developing countries. For instance, for 50 sampled countries consisting of 14 advanced and 36 developing countries, Reinhart and Tokatlidis (2001) find that the impact of financial liberalization on savings is mixed but largely negative or approximately zero. Similarly, Bandiera, *et al.* (2000) analyzing time series data from 1970 to 1994 on Chile, Ghana, Indonesia, Korea, Malaysia, Mexico, Turkey and Zimbabwe conclude that broadly, interest rate does not significantly and positively impact on savings, but for Ghana and Indonesia, in particular, the impact has been significantly negative. The reasons assigned to the non-positive impact of financial development on savings are low incomes and the existence of imperfect financial markets. There are related empirical studies such as the study by Hellmann *et al.* (2000) that show that an increase in bank competition resulted in a weaker banking system.

On the impact of financial development on economic growth, Goldsmith (1969) in a study comprising 35 countries for the period 1860-1963 and Gupta (1984) for 12 sampled Asian less developed countries, conclude that on the whole the impact is significantly positive. In King and Levine (1993), and Rousseau and Wachtel (1998) find that financial development leads to economic growth. Levine *et al.* (2000) also find a significant impact of financial intermediation indices on economic growth and productivity but an ambiguous impact on saving and investment. Other empirical studies in which it is concluded that financial development is a stimulant for higher economic growth and productivity growth, include the studies by Moore *et al.* (2006), Das and Gosh (2006), Iimi (2004), Spiegel and Yamori (2003), and Honda (2003). In contrast, with reference to the Ghanaian economy, Adenutsi (2002) finds deleterious direct effects of financial liberalization on economic performance, but a positive indirect effect through improved mobilisation of savings by commercial banks. Again, in the case of the Ghanaian economy, Adenutsi (2011) reports that financial development in itself is detrimental to economic growth unless it succeeds in mobilising risk-free external resources such as remittances. Similarly, African Development Bank (1994) and Seek and El-Nil (1993) find no significant impact of financial reforms on economic growth for selected SSA countries.

2.3 Evidence of Financial Reforms and Development in Ghana

In September 1987, a comprehensive programme of financial reforms was introduced in Ghana. The main goals of the programme were:

- to enhance the soundness of the banking institutions by improving the regulatory framework and strengthening banking supervision by the Central Bank;
- to restructure the financially distressed banks following the formulation of specific restructuring plans; and
- to improve the mobilisation of resources and the efficiency of the allocation of credit by the domestic banking system.

Under the financial reforms and development programme interest rates were liberalized. The aim was to encourage competition in the domestic banking system. The move towards interest rate development was gradual. Interest rates were partially liberalized in 1987 with the removal of maximum lending rates and minimum time deposit rates. This was followed by the removal of minimum savings deposit rates and sectoral credit allocation in the following year. Controls on bank charges and fees were abolished in 1990. The bank specific credit ceilings, which had been the main instrument of monetary control during the adjustment programme, were replaced with an indirect method of monetary control involving the weekly auctioning of treasury bills and other government and Bank of Ghana securities, backed up with statutory cash reserve and liquid asset requirements.

A major step in the financial reforms programme was the enactment of an amended banking law in 1989. This new law provided a sound prudential and regulatory base for the banking system by requiring banks to maintain a minimum capital base equivalent to 6 percent of their risk adjusted net assets, by setting uniform accounting and auditing standards, and by introducing limits on risk exposure to single borrowers and sectors. Further, reporting requirements were strengthened, therefore, enabling the Bank of Ghana to improve its ability to regulate the banking systems effectively.

A restructuring plan for the banking sector was designed and approved by the government of Ghana in July 1989. The exposition behind this restructuring plan was the removal of all the

nonperforming loans and other claims on both public enterprises and the private sector from the portfolios of the banks. The Bank of Ghana issued promissory notes to temporarily replace nonperforming loans or other government guaranteed obligations to public enterprises for example at the end of 1988. After the validation of these non-performing assets, the promissory notes were either replaced by Bank of Ghana bonds, or offset against debts to the Bank of Ghana and the government. Largely as a result of the offset or replacement of non-performing assets, banks were able to meet the new capital adequacy requirements by the end of 1990. All of the more than 1300 non-performing bank assets were passed on to a newly created and wholly government-owned agency called the Non-Performing Assets Recovery Trust (NPART). The NPART was mandated to try to recover as many of these assets as possible by the end of 1995.

African Development Bank (1994) in its review of financial development in Ghana including the Financial Sector Adjustment Programme (FINSAP) reveals that although real interest rates turned positive in 1991 and 1992, largely through a fall in the rate of inflation, there is very little evidence that private or total savings are responsive to real interest rate changes. It was thus concluded that in Ghana the savings rate has still not recovered to the level of the 1970s. Sowa and Acquaye (1998) with quarterly data from 1972 to 1994, find that Ghana's financial reforms have not attracted banks to mobilise savings or intermediate finance in the formal financial sector because of the wide spread between lending and deposit rates. Besides, the development of the exchange rate and interest rates in nominal and real terms failed to have a significant impact on real imports, exports and inflation.

During the implementation of the financial reforms programme in 1988, 1989 and between 1991 and 1994, however, real interest rate gained positive values. The real deposit rate, for instance, turned positive in 1991 for the first time (Adenutsi, 2002). It was expected that these improvements would directly promote the mobilisation of savings and efficient credit allocation by commercial banks. This, however, did not happen as private savings with commercial banks have remained abysmally low and somehow inconsistent.

As a result of the financial reforms programme, lending and discount rates have been very high compared to very low deposit rates. According to Dordunoo (1995), whilst in 1993 lending rates were between 39 percent and 41 percent on overdraft loans at compound interest, deposit rates

ranged between 6 percent and 12 percent on savings deposits. The high interest rate spread can be attributed mainly to lack of keen competition among the banks and partly to the high transaction cost of granting loans. Consequently, even though the share of banks' credit to the private sector increased from 13.6 percent in 1986 to 35.8 percent in 1993 private investment remained very low during the Economic Recovery Programme (ERP). Between 1983 and 1991, private investment to GDP ratio was 3.8 percent on the average, whilst the ratio increased slightly to 4.1 percent during the post-ERP period of 1992-97.

3.0 THEORETICAL FRAMEWORK

In line with the Keynesian macroeconomic framework, an equilibrium national income is a composite of household consumption expenditure (C), investment (I) representing expenditure on capital goods by firms, government spending on social infrastructure and other welfare services (G), and net income from the external sector, which is measured as export earnings less spending on imports (NX). Mathematically, this can be expressed as:

$Y = C + I + G + NX$, which implies that $Y = C + S + T + NX$ (1)

when $I \equiv S$ and $T \equiv G$ in equilibrium and when the government is running a balanced budget, and where S and T denote savings and tax revenue respectively. It follows that, in an economy with net transfer incomes equal to zero at equilibrium (as expected in the assumed ideal case), if Y_d is the disposable income, then from (1):

$Y - T \equiv Y_d = C + S \equiv C + I$, which follows that $Y_d = f(S)$ and $S = f(Y_d)$ (2)

Therefore, changes in Y_d should be considered as representing the general economic performance of a country. For a more specific representation, changes in actual *per capita* income are a measure of economic performance from both the theoretical and empirical viewpoints.

From (1) and (2) above, it should be clear that, more generally:

$Y_d = f(S, G, NX)$ just as $S = f(Y_d, G, NX)$ so long as $S = f\{Y_d = f(G, NX)\}$ (3)

The implication is that disposable income and savings depend on each other, with government spending and the external trade sector being potential determinants of both. However, the external sector performance of a typical developing economy is largely influenced by government policies on trade and exchange rate since the Ghanaian economy is small-open and, hence a price-taker in

the global market. Accordingly, openness to external trade which is also widely used as an index for economic globalisation, and exchange rate can be seen as a potential factor affecting economic performance in a typical import-dependent developing country such as Ghana. Besides, from endogenous growth models and the total factor productivity theory of economic growth, human capital is an essential determinant of long-run economic performance as it is critically required for higher technological advancement and entrepreneurship through research and development.

As noted in the previous section, the motivation for the pursuit of financial reforms and liberalization programmes in Ghana, and indeed, in any economy, is principally to enhance resource mobilisation and efficient resource allocation to finance pro-growth and development projects. This suggests that if the pursuit of financial liberalization programmes is truly successful, this should be reflected in various aspects of financial sector development such as improved financial deepening (an indication of higher public confidence in the banking system), improved financial widening (a measure of financial efficiency in credit allocation), and an "attractive" nominal savings rate[1] (an indication of improved financial competitiveness). Thus, financial development which embodies the improvement in quantity, quality and efficiency of financial intermediary services is expected to enhance financial resource mobilisation and credit allocation towards improved general economic performance with a reduced rate of inflation.

Theoretically, one important factor which adversely affect savings mobilisation by banks is higher inflation in a low-income country where the propensities to save are already low and close to zero. Again, as higher inflation is likely to (negatively) affect financial savings and hence private investment negatively due to credit constraints confronting financial institutions, a typical developing economy may (as well) suffer from lower performance as well due to low investment incentives[2] and the risks associated with rising prices and higher volatility. In this regard, inflation can be seen as a key factor that can obstruct savings mobilisation and economic growth in an economy. Moreover, it is believed that as commercial banks succeed in mobilising more financial resources within the domestic economy, excess liquidity will reduce, and given that government expenditure is essentially directed at the productive sectors of the economy (which is expected to

[1] This also measures the degree of money illusion and money neutrality hysteresis which are expected to be minimal under a competitive financial environment associated with reduced information asymmetry.
[2] For instance, effective demand for non-essential commodities and services may fall, demand for higher wages may increase, entrepreneurial profit margins may fall, and strategic business planning may become more complicated with low accuracy in forecasting.

be the case especially under multi-party democratic governance), the rate of inflation is expected to fall whilst prices become more stable. Consequently, whereas inflation can be seen as a determinant of savings mobilisation and economic growth, bank savings, economic performance and government expenditure also have the potential of affecting the rate of inflation in Ghana.

From the foregoing, bank savings mobilisation, economic performance and inflation are the endogenous variables within the analytical framework under consideration. The matrix of the key exogenous variables includes the financial development indicators aforementioned. The other matrix of the remaining exogenous variables comprises exchange rate, openness to international trade, government expenditure, and human capital development.

4.0 EMPIRICAL MODEL, METHODOLOGY AND DATA

4.1 The Empirical Model

In consistency with the theoretical framework espoused in 2.4 above, the explicit simultaneous system of which financial savings, economic performance and inflation are endogenous variables takes a general Structural Vector Autoregressive (SVAR) model of the form:

$$BSM_t = f\left(EPF_{t-l}, INF_{t-l}, \Pi_{t-l}, \Omega_t\right) \quad (4)$$

$$EPF_t = f\left(BSM_{t-l}, INF_{t-l}, \Pi_{t-l}, \Omega_t\right) \quad (5)$$

$$INF_t = f\left(BSM_{t-l}, EPF_{t-l}, \Pi_{t-l}, \Omega_t\right) \quad (6)$$

where

EPF is economic performance proxied by GDP per capita in US dollars.

INF is the rate of inflation in the domestic economy computed as quarterly changes in consumer price index.

BSM denotes bank savings mobilisation measured as the quarterly variation in the ratio of total bank deposits as a ratio of nominal GDP.

Π represents the set of exogenous financial development variables notably the average nominal savings deposit rate (NSR) paid by commercial banks on credit balances of savings accounts of customers; financial deepening (M_2 / GDP) denoted (FND); and financial widening measured as private sector credit as a ratio of total credit allocated by commercial banks (FNW). These variables measure the most fundamental aspects of financial development.

Ω is the matrix of other exogenous variables comprising government spending (GSP) which is a proxy for fiscal policy; *HCD* represents human capital development proxied by the enrolment in second cycle institutions; *EXR* is the average nominal exchange rate of the Ghanaian cedi to the US Dollar; and economic openness (OPN) proxied by exports plus imports as a ratio of GDP.

The subscripts t and l represent a particular time period and the maximum lag structure of the variables.

From (4-6), given the obvious element of simultaneity and hence endogeneity; and given that a functional relationship exists among the set of dependent variables (BSM, EPF, INF) and with the set of exogenous variables, three equations of simultaneity from (4-6) respectively are, thus, specified as follows:

$$BSM_t = \alpha_1 EPF_{t-l} + \alpha_2 INF_{t-l} + \alpha_3 \Pi_{t-l} + \alpha_4 \Omega_t + \alpha_0 + \mu_{1t} \quad (7)$$

$$EPF_t = \gamma_1 BSM_{t-l} + \gamma_2 INF_{t-l} + \gamma_3 \Pi_{t-l} + \gamma_4 \Omega_t + \gamma_0 + \mu_{2t} \quad (8)$$

$$INF_t = \phi_1 BSM_{t-l} + \phi_2 EPF_{t-l} + \phi_3 \Pi_{t-l} + \phi_4 \Omega_t + \phi_0 + \mu_{3t} \quad (9)$$

where α_0, γ_0 and ϕ_0 are intercepts of the three endogenous variables; $\alpha_1, ..., \alpha_4$; $\gamma_1, ..., \gamma_4$ and $\phi_1, ..., \phi_4$ are the coefficients of the explanatory variables; μ_{1t}, μ_{2t} and μ_{3t} are the disturbance terms in (7-9) respectively; and t is the time period. The *a priori* signs of the estimated coefficients are expected to be $\alpha_1, \gamma_0, \gamma_1, \phi_0 > 0$, $\alpha_0, \alpha_2, \gamma_0, \gamma_2, \phi_1, \phi_2 < 0$ while $\alpha_3, \alpha_4, \gamma_3, \gamma_4, \phi_3, \phi_4 < / > 0$. The specific estimated SVAR model, however, followed a systematic estimation procedure, essentially to determine the overall (static and dynamic) long-run implications of financial development for bank savings mobilisation and economic performance in Ghana.

4.2 The Empirical SVAR Methodological Approach and Data

4.2.1 The SVAR Methodological Framework

SVAR methodology ameliorates the analysis of various economic issues by eliminating the problems of identification of the contemporaneous and dynamic relationships between a set of macroeconomic variables and the appropriate policy instruments. For any system of simultaneous equations the empirical relationships can be modelled within the SVAR framework as follows:

$$\Gamma_0 Y_t = \Gamma_1 Y_{t-1} + \Gamma_2 Y_{t-2} + ... + \Gamma_n Y_{t-n} + \varepsilon_t \quad (10)$$

such that Γ_i is an $N \times N$ matrix of parameters for $i = 0,1,2.....n$, Y_t is an $N \times 1$ vector of endogenous variables at time t, and ε_t is an $N \times 1$ multivariate white noise error process with $E(\varepsilon_t) = 0$ and $E(\varepsilon_t \varepsilon_j{}') = \{\begin{matrix} \sum & when, t = j \\ 0 & when, t \neq j \end{matrix}$ being its fundamental properties. Within the SVAR analytical framework, the structural innovations ε_t are assumed to be orthogonal, such that the structural disturbances are not serially correlated and the variance-covariance matrix $\sum$ is constant and diagonal (Bernanke, 1986; Asteriou, 2006).

Each equation in the SVAR is unique and has its own dependent variable which emerges after the contemporaneous matrix Γ_0 (in Equation 10) has been normalized along the principal diagonal. Similar to when estimating a system of traditional simultaneous equations, SVAR parameters are estimated in two stages, the first being deriving the reduced-form parameters from Equation 10.

$$Y_t = \Gamma_0^{-1}\kappa_1 Y_{t-1} + \Gamma_0^{-1}\kappa_2 Y_{t-2} + ... + \Gamma_0^{-1}\kappa_n Y_{t-n} + \Gamma_0^{-1}\varepsilon_t \quad (11)$$

$$Y_t = \mathrm{H}_1 Y_{t-1} + \mathrm{H}_2 Y_{t-2} + ... + \mathrm{H}_n Y_{t-n} + \omega_t \quad (12)$$

such that $\mathrm{H}_i = \Gamma_0^{-1}\kappa_i,\ i = 1,2,....n$, with ω_t which denotes $\Gamma_0^{-1}\varepsilon_t$ being the reduced-form system innovation with a normal distribution features of $\omega_t \sim iid(0, \sigma_\omega^2)$. When Equation (12), which is essentially a VAR model with N number of system equations, is estimated by Ordinary Least Squares (see Faust, 1998; Asteriou, 2006), and the VAR residuals ω_t are obtained, the innovations in the structural models represented by $E(\varepsilon_t \varepsilon_j{}') = \{\begin{matrix} \sum & when, t = j \\ 0 & when, t \neq j \end{matrix}$ are related to the reduced-form innovations as $E(\omega_t \omega_t') = \Gamma_0^{-1}(\varepsilon_t \varepsilon_t')\Gamma_0^{-1}$ and $\sigma^2 = \Gamma_0^{-1}\sum(\Gamma_0^{-1})'$.

Next, the identification of the contemporaneous matrix Γ_0 and the variance-covariance matrix $\sum$ which maximizes the likelihood function conditional on the parameter estimates of VAR derived from stage one (Hamilton, 1994). Therefore, following Hamilton (1994), the full information maximum likelihood of a dynamic SVAR can be specified as:

$$\ln L_t = -\left(\tfrac{1}{2}\right)\ln(2\pi) - \tfrac{1}{2}\ln\left|\Gamma_0^{-1}\sum\left(\Gamma_0^{-1}\right)'\right| - \tfrac{1}{2}\hat{\omega}'\Gamma_0^{-1}\sum\left(\Gamma_0^{-1}\right)'\hat{\omega} \quad (13)$$

where $\sum$ is restricted to be a diagonal matrix, and ω_t being the estimated residuals from the reduced VAR; and within a typical SVAR system, Γ_0 contains N^2 parameters, with δ having only $\frac{1}{2}\left[N(N+1)\right]$ discrete values. Naturally, a model identification problem arises because $\frac{1}{2}\left[N(N-1)\right]$ number of restrictions must be imposed on the simultaneous system in order to establish the exact identification conditions, for which otherwise, the system is under-identified[3]. The residuals obtained from the reduced-form VAR are then transformed into a system of structural equations by imposing restrictions based on relevant underlying theories and conclusions drawn from empirical studies on policy reaction functions rather than in accordance with the commonly used Choleski's decomposition approach. According to Bernanke (1986), Blanchard and Watson (1986), Sims (1986), and Sims and Zha (1998), this is the approach of orthogonalising the reduced-form residuals to recover from the underlying shocks.

As three endogenous variables were identified from the theoretical framework, three normalization restrictions were imposed such that the coefficients of BSM, EPF and INF take a value of unity in the first, second and third vector respectively, following Persaran and Shin (2002).

4.2.2 Tests for Unit Roots and Granger-Causality / Endogeneity

To begin with the estimation, a series of unit root tests (Dickey-Fuller GLS, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) and Ng-Perron) was conducted on all the variables in order to determine the order of integration of each variable. Conclusion on the order of integration was based on the coincidence of any two tests in case of a conflicting result among the three alternative tests. The results as presented in Table A1 in the Appendix show that, in general, each of the variables is integrated of order one[4]. Following this, it is the first-differenced version of each variable that was used in the empirical modelling.

After identifying cointegrating vectors, a causality test between financial development, bank savings mobilisation, economic performance and inflation was carried out. In essence, this was

[3] However, once the system is cointegrated, endogeneity bias is no longer a serious problem in a simultaneous model as proved by Mukherjee *et al.* (2003). Notwithstanding this, the system is over-identified according to the order condition but the rank condition test cannot be carried out since none of the exogenous variables is excluded from an equation in the SVAR framework.

[4] The most consistent results were obtained from DG-GLS and Ng-Perron suggesting that each variable is I(1) whereas KPSS suggested that the variables are mainly I(0).

also to verify the status endogeneity of variables as Hall and Milne (1994) demonstrate that weak erogeneity in a cointegrated system equals long-run causality. For instance, if the null hypothesis that *X* does not Granger-cause *Y* is rejected, the *X* vector is not weakly exogenous with respect to *Y* which also implies that *X* does cause *Y* in the long run.

Table 1: Results of Granger-Causality and Endogeneity Test

	F-Statistics				
Null Hypothesis	Lag 2[+]	Lag 3	Lag 4	Lag 8	Lag 12
BSM does not Granger cause FND	0.33864	0.30384	2.19578*	2.19521**	1.59775
FND does not Granger cause BSM	6.53082***	5.56541***	6.45519***	5.78450***	4.98218***
INF does not Granger cause FND	0.36691	0.39555	0.65850	1.64795	2.70168***
FND does not Granger cause INF	0.59105	0.49226	0.46315	0.42977	0.38983
EPF does not Granger cause FND	7.69093***	3.60977**	4.21835***	1.95588*	2.30509**
FND does not Granger cause EPF	6.29015***	4.32474***	7.41437***	2.75719***	4.52959***
INF does not Granger cause BSM	0.45125	0.09836	0.25824	0.44116	0.34227
BSM does not Granger cause INF	0.30784	0.07168	0.02849	1.76982*	1.67942*
EPF does not Granger cause BSM	0.24034	5.86117***	8.87776***	7.28306***	2.92585***
BSM does not Granger cause EPF	3.76010**	4.65621***	1.44058	2.17433**	3.58303***
EPF does not Granger cause INF	1.83983	1.12070	0.83249	0.56374	0.77520
INF does not Granger cause EPF	0.28157	0.08423	0.45928	0.54925	0.41974

Source: *Author's estimation*

[+] *optimal lag selected according to SIC*

*/**/*** *indicate 10%, 5%, 1% level of statistical significance respectively*

Quarterly data ranging 1987(3)-2009(4) was used in this study. The choice of the study period was based on the desire to investigate how financial development following the implementation of the financial reforms programme in September 1987 has influenced bank savings mobilisation and economic performance in Ghana. Real GDP *per capita* in US dollars as reported by the World Bank in *World Development Indicators* (WDI) was used to measure economic performance. Essential aspects of financial development were captured in the estimation. Thus, the indicators of financial development included the ratio of credit to the private sector out of the total which measures the financial widening aspect of financial development (FNW), broad money as a ratio of nominal GDP measuring financing deepening (FND) and nominal savings deposit rate (NSR) measuring financial competitiveness and efficiency which were obtained entirely on a quarterly basis from the Central Bank of Ghana (BoG). The rate of inflation was computed using Consumer Price Index (CPI) as reported by BoG on a quarterly basis. Enrolment to second-cycle schools as obtained from WDI was used as a proxy for human capital development (HCD). Like nominal exchange rate (EXR), government spending (GSP) was obtained entirely from various editions of

BoG Quarterly Statistical Bulletin. The generation of quarterly data of GDP and human capital development (HCD) followed the universally adopted repetitive procedure.

4.2.3 The Cointegration Test

To determine whether or not the system variables move towards long-run steady state, a cointegration test was performed following Johansen and Juselius's (1990) maximum likelihood procedure. With this test, it was possible to identify the maximum likelihood estimators of the unconstrained cointegrating vectors and also to determine empirically the number of cointegrating vectors without relying upon arbitrary normalization. The results of the cointegration test reported in Table A2 in the Appendix show that the series individually exhibit a random walk with strong evidence of an equilibrium long-run relationship among the system variables having three cointegrating equations by both the trace and the maximum eigenvalue criteria.

4.2.4 Derivation of Impulse Response Functions and Test for Variance Decompositions

An empirical SVAR model is imperative in analyzing the dynamic characteristics of the model by deriving the impulse response functions and estimating the forecast variance decompositions. To analyse the dynamic responses of the endogenous variables to independent one-standard deviation shocks emanating from the variables within the empirical SVAR system, it was necessary to draw on impulse response functions. The forecast error variance decomposition was also estimated from the empirical SVAR system in order to explain the proportion of a shock to a specific endogenous variable.

5.0 THE EMPIRICAL RESULTS AND ANALYSES

5.1 Results of the Estimated Static and Dynamic SVAR Models

The results of the estimated static SVAR model are presented in Table 2 below. The results show that, in the static long run, financial deepening as a component of financial development is the only positive factor that enhances bank savings mobilisation in Ghana. Nominal savings rate and human capital development are factors that undermine higher savings mobilisation by commercial banks whilst factors such as economic performance, inflation, financial widening, exchange rate, government spending and openness to international trade do not affect banks' savings mobilisation. This could imply that, in the long run, the key macroeconomic determinants of bank savings mobilisation are not static but dynamic in nature.

Table 2: Results of the Estimated Static SVAR Model

Variable	BSM	EPF	INF
BSM	**1.00000**	**2.78545**	**8.11729**
		[0.9337]	[0.9292]
EPF	**0.00887**	**1.00000**	**-0.20494**
	[0.9337]		[-0.6276]
INF	**0.00732**	**-0.02390**	**1.00000**
	[0.9229]	[-0.6276]	
FND	**0.17031**	**31.9006**	**-19.6307**
	[1.6516]*	[3.0638]***	[-1.6706]*
FNW	**0.00160**	**5.18089**	**19.2928**
	[0.0197]	[2.4598]**	[3.2040]***
NSR	**-0.00759**	**0.25004**	**1.53040**
	[-1.8931]*	[2.3519]**	[5.6134]***
EXR	**-9.69E-05**	**0.00374**	**0.00294**
	[-0.5228]	[13.7987]***	[2.0702]**
GSP	**-0.00879**	**-0.98635**	**1.14530**
	[-0.7954]	[-3.5664]***	[1.3282]
HCD	**-0.01594**	**0.62575**	**-0.68264**
	[-2.1620]**	[3.2745]***	[-1.6852]*
OPN	**0.00017**	**0.39387**	**0.11581**
	[0.0808]	[11.7606]***	[0.7172]
CONSTANT	**-0.15067**	**165.557**	**29.1967**
	[-0.2142]	[4.4889]***	[2.2294]**
R-squared	0.306606	0.992818	0.56314
Adjusted R-squared	0.217349	0.992010	0.50725

Source**: Author's estimation* **/**/ denote 10%, 5% and 1% significance level*
90 observations included; [] = t-statistics

The static long run results again reveal that financial development is the most important propeller of higher economic performance as financial deepening, financial widening and nominal savings rate have individual positive effects on economic performance. Whereas increases in government spending as well as depreciation of the local currency (the Ghanaian cedi) are detrimental to higher economic performance, openness to external trade and human capital development positively impact on economic performance in Ghana. The estimated result from the static inflation model shows that, overall, improvements in financial development by way of increases in the depth of the financial sector and improved human capital development are significant in reducing the rate of inflation in Ghana. Furthermore, in the static long run, increases in the nominal savings rate, financial widening and exchange rate depreciation directly contribute to higher rates of inflation in Ghana, whilst variations in openness to international trade and government spending have no impact on the rate of inflation in Ghana.

The results of the dynamic SVAR model are presented in Table 3. The empirical results show that

the financial widening component of financial development and openness to international trade does not have any long-run dynamic effects on variations in bank savings mobilisation, economic performance or inflation.

The results show that, although, the dynamic impact of financial deepening on bank savings mobilisation vary overtime (from negative to positive over the first and second lag values), the overall impact of financial deepening on bank savings mobilisation in Ghana is positive for the period under investigation (Table 3). Increases in the first and second lag values of inflation, and nominal savings rate have inconsistent impacts on the rate of inflation, moving from positive to negative, whilst increases in the immediate initial values of government spending and human capital development increase the rate of inflation in the long run. The overall long-run dynamic impact of initial economic performance on current economic performance is positive just as the second lag of government spending whereas those of banks savings mobilisation, human capital development and financial deepening significantly inhibits economic performance.

From the combined static and dynamic results, it is apparent that, in the long run, improved financial development by way of financial deepening, financial widening, and financial efficiency is the foremost macroeconomic factor that positively impact on bank savings mobilisation in Ghana. Besides financial development, only higher economic performance proxied by increased per capita income has a positive marginal impact on bank savings mobilisation; and although the exchange rate depreciation promotes increased savings mobilisation by banks, the estimated coefficient is insignificant or approximately zero. Improved human capital development proxied by secondary school enrolment is the only factor which, in the long run, impedes bank savings mobilisation probably. A probable explanation of this result is that, given the low income level of Ghanaians, households might dissave to pay for education especially during secondary school admission. Another possible explanation is that the educated might be more sophisticated and hence could diversify their saving and investment portfolios away from bank deposits. Openness to international trade, government spending, inflation and financial widening have no long-run impact on bank savings mobilisation in Ghana.

Table 3: Estimated Results of Dynamic Long-Run SVAR Model

	Estimated SVAR System Equations		
	BSM	EPF	INF
BSM(-1)	**0.510607**	**-8.746051**	**0.285699**
	[4.26807]***	[-2.29036]**	[1.05843]
BSM(-2)	**0.162376**	**9.191571**	**3.063629**
	[1.28306]	[2.27543]**	[1.59227]
EPF(-1)	**0.085609**	**0.672528**	**-0.032467**
	[1.10846]	[4.16401]***	[-0.15698]
EPF(-2)	**0.090933**	**0.315424**	**-0.119482**
	[1.87075]**	[1.86105]**	[-0.55052]
INF(-1)	**0.111008**	**-0.104807**	**1.306487**
	[0.43316]	[-1.41054]	[13.7311]***
INF(-2)	**-0.002577**	**0.091449**	**-0.506681**
	[-1.10224]	[1.22529]	[-5.30152]***
FND(-1)	**-0.931069**	**-30.65578**	**3.119484**
	[-2.09097]**	[-2.15687]**	[1.51396]
FND(-2)	**1.136636**	**-51.67280**	**16.75322**
	[2.23717]**	[-3.18630]***	[0.80673]
FNW(-1)	**0.020356**	**-1.487566**	**2.668737**
	[0.25474]	[-1.58322]	[1.81708]*
FNW(-2)	**0.005388**	**1.487259**	**0.031342**
	[0.06777]	[1.58599]	[0.10964]
NSR(-1)	**0.011536**	**-0.264341**	**0.637311**
	[1.68651]*	[-1.13891]	[2.14429]**
NSR(-2)	**-0.006820**	**0.212205**	**-0.490151**
	[-1.00987]	[0.98440]	[-1.77564]*
EXR(-1)	**-6.07E-05**	**0.000651**	**0.004388**
	[-1.09578]	[0.36829]	[1.93794]**
EXR(-2)	**8.89E-05**	**-0.000698**	**0.040142**
	[1.73937]*	[-0.42802]	[1.98832]**
GSP(-1)	**-0.000412**	**0.367889**	**0.123765**
	[-0.03742]	[1.04803]	[1.77534]*
GSP(-2)	**-0.004152**	**0.893981**	**-0.359744**
	[-0.35891]	[2.42110]**	[-0.76083]
HCD(-1)	**-0.023884**	**-0.663313**	**0.890279**
	[-1.69863] *	[-1.99094]**	[1.75789]*
HCD(-2)	**0.016245**	**0.494504**	**-0.364144**
	[1.02035]	[1.97308]**	[-0.55957]
OPN(-1)	**-0.000275**	**0.043445**	**-0.086601**
	[-1.10250]	[0.50708]	[-0.78934]
OPN(-2)	**0.003001**	**-0.069029**	**0.034109**
	[1.12050]	[-0.80759]	[1.31163]
CONSTANT	**0.920059**	**3.050044**	**20.56631**
	[1.82081]*	[2.18718]**	[1.22233]
R-squared	0.667917	0.884427	0.926543
Adj. R-squared	0.538937	0.847264	0.904616

Source**: Author's estimation* **/**/ denote 10%, 5% and 1% significance level*
[ ] = t-statistics; n=88(included after adjustments)

5.2 Results of Variance Decomposition

The forecast error variance decomposition mechanism was pursued to explore the interactions among endogenous variables over a 5-year or a 20-quarter response horizon. Table A3 in the

Appendix reports the proportion of the variations of the three endogenous variables as explained by each other and other system variables. The empirical results show that over the forecast horizon, the main variations in each endogenous variable are strongly explained by its own shock followed by minimal shocks emanating from financial development variables, with financial deepening leading the pack. In particular, apart from being largely affected by its own shock (averaging 70% over the initial five years), bank savings mobilisation is also influenced by marginal shocks originating nominal savings rate, financial deepening and human capital development throughout the forecast period in a descending order of importance respectively. The three most important variables from which bank savings mobilisation responds to shocks within the short term (i.e. within the 1st year) are financial deepening, nominal savings rate and exchange rate. During the medium term (i.e. between the 2nd and 3rd years), nominal savings rate, financial deepening, and human capital development are the leading variables that emit shocks to bank savings mobilisation. Human capital development, nominal savings rate, financial deepening and financial widening are the leading variables that shock bank savings mobilisation in the long term. In Table 4 below, a summary of the results of the variance decomposition of the endogenous variables is presented.

Table 4: Summary of Variance Decomposition Results

	Other System Variables Emitting Shocks *(average % in parenthesis)*			
	Short-Term Horizon (Year 1 / Quarter 0-4)	*Medium-Term Horizon (Year 2-3 / Quarter 5-12)*	*Long-Term Horizon (Year 3-5 / Quarter 13-20)*	*Forecast Horizon (Year 1-5)*
BSM	FND (3.8), NSR (3.6), EXR (2.1), HCD (2.0)	NSR (5.7), FND (4.8), HCD (4.2), EXR (2.3), GSP (1.3)	HCD (7.6), NSR (5.7), FND (4.5), FNW (4.4), EXR (2.3), GSP (1.5)	NSR(4.0), HCD (3.5), FND (3.4), EXR (1.7), FNW (1.3)
EPF	FND (5.8), GSP (5.6), INF (1.8), BSM (1.5), HCD (1.4)	FND (15.4), GSP (8.6), FNW (6.0), BSM (2.6), HCD (1.7), INF (1.3)	FND (14.8), FNW (9.8), GSP (6.1), HCD (2.8), BSM (2.6)	FND (9.5), GSP (5.8), FNW (4.8), BSM (1.9), HCD (1.5)
INF	FND (2.9), EXR (2.7), NSR (1.7), OPN (1.2), BSM (1.2)	OPN (8.9), FND (8.8), EXR (4.4), NSR (2.5), BSM (1.7), HCD (1.4), FNW (1.0)	OPN (9.8), FND (8.6), EXR (6.0), NSR (3.2), HCD (2.2), BSM (2.0), FNW (1.4)	FND (5.8), OPN (5.8), NSR (2.0), BSM (1.3), HCD (1.1)

***Source**: Author's compilation* ***Note:** For detailed decompositions including those less than 1% see Table A4*

It is clear from Table 4 that, bank savings mobilisation, economic performance and inflation are largely self-driven and hence not significantly driven by the other variables within the SVAR system, since over the initial 5 years, the proportion of variation in any of these endogenous variables to itself averaged about 70 percent.

5.3 Results of Impulse Response Functions

Impulse response functions were analysed to enable us examine the dynamic responses of the endogenous variables to one standard deviation shocks originating from the variables within the empirical SVAR system over the initial five years. The magnitudes of the shocks are measured by the independent shocks of the corresponding orthogonal errors obtained from the estimated SVAR model. The derived impulse response functions reported in Figure A1 in the Appendix reaffirm the fact that each of the endogenous variables responds mainly to its own shock rather than to shocks stemming from the remaining system variables. For instance, a one-standard deviation positive shock to innovation of bank savings mobilisation causes it to spring instantaneously above its equilibrium level, followed by a sharp initial drop during the first two quarters, and a stagnation between the 2nd and the 3rd quarters before continuing to decline gently until the 6th quarter beyond which it dissipates. Bank savings mobilisation does not significantly respond to shocks emanating from other variables within the system.

A positive one standard deviation shock to economic performance due to innovations of economic performance causes economic performance to rise instantaneously on impact. This is followed by an immediate decline over the first year (i.e. between the 1st and 4th quarters) before resurgence in a continuous upward deviation from its equilibrium throughout the 5-year forecast period. In response to a one-standard deviation positive shock to innovations from financial deepening, economic performance will initially drop slightly over the first-two quarters; disappear between the 2nd and the 4th quarters, and re-surface with a marginal rise between the 4th and the 7th quarters, after which its significance fades away completely. A marginal latent rise between the 2nd and the 3rd quarter followed by a drop between the 3rd and the 6th quarter constitutes the response of economic performance to an independent shock originating from fiscal policy represented by government spending. None of the remaining variables within the SVAR system significantly elicit a response from economic performance as a result of a one-standard deviation shock over the 20-period forecast horizon.

Apart from reacting to its own one standard deviation shock, only innovations of exchange rate and financial deepening appear to force a slight temporary upward response from inflation over the initial three quarters. There were no impulse responses from inflation due to individual one-standard shocks emanating from remaining system variables for the 5-year forecast horizon.

From the observed impulse response functions derived over the initial 5-year horizon, the sizes of the one standard deviation shocks from the financial development variables, fiscal policy proxied by government spending, and indeed, the remaining explanatory variables within the SVAR system can be described as generally marginal, temporary and insignificant. Only financial deepening as a component of financial development has been reasonably consistent in eliciting a temporary marginal response from the endogenous variables within the system,)

6.0 CONCLUSIONS, POLICY IMPLICATIONS AND RECOMMENDATIONS

The conclusions that can be drawn from the key findings of this paper are:

i. In the long run, improved financial deepening is the only component of financial development that significantly promotes bank savings mobilisation in Ghana. Specifically, an increase in deepening the Ghanaian financial sector by 100 percent will lead to at least a 21 percent increase in the amount of deposits mobilised by commercial banks as a ratio of GDP. The overall positive impact on nominal interest paid by commercial banks on deposits is negligible in increasing savings mobilisation in the long run. Financial widening by way of increasing the proportion of bank credits allocated to the private sector does not, in the long run, influence savings mobilisation of commercial banks in Ghana.

ii. Economic performance has a positive long-run impact on savings mobilisation in Ghana although the impact is not robust as a 100 percent rise in income per capita has a mere 9 percent positive impact on bank savings mobilisation. In turn, bank savings mobilisation impacts significantly on economic performance to the tune of 45 percent for an upward 100 percent variation in deposits as a ratio of GDP mobilised by commercial banks in Ghana.

iii. In the long-run, improved financial widening and financial efficiency components of financial development are more important than financial deepening as far as higher economic performance is concerned when the impact analysis in considered directly.

iv. The total impact of improved financial development on the rate of inflation is negative but negligible taking into account the estimated coefficients of financial deepening, financial

widening and nominal interest rate paid on bank deposits from the estimated static and dynamic models.

v. A bi-directional causality exists between financial deepening and economic performance, while a uni-directional causal relation runs from financial deepening to bank savings mobilisation, and also from bank savings mobilisation to economic performance.

vi. The direct overall impact of financial development on long-run economic performance is negative; suggesting that, in Ghana, the mechanism of transforming savings mobilised into investible funds might still be weak due to information asymmetry. It could also imply that the vital entrepreneurial class to bear the risks of accessing capital from banks to initiate productive ventures is absent. All the same, in view of the fact that financial development significantly promotes higher bank savings mobilisation but impacts negatively on economic performance directly; it can be concluded that, in Ghana, in the long run, financial development promotes higher economic performance indirectly through increased prior savings with commercial banks, so long as bank savings mobilisation impacts positively on economic performance.

Based on the above findings, the following policy implications and recommendations are advanced:

i. For commercial banks in Ghana to improve upon domestic resource mobilisation there is a need for policy makers to boost public confidence in the banking sector. This is because with higher public confidence in the financial system, the amount of currency circulating outside the banking system is likely to reduce, resulting in excess liquidity. Apart from this, improved financial efficiency resulting in the payment of more attractive returns on bank deposits could serve as an important means by which commercial banks in Ghana can mobilise higher domestic resources in the long run. More specifically, it is suggested that commercial banks and indeed other formal sector deposit mobilisation institutions should spread to the rural centres with specialized services aimed at mobilising deposits from this large segment of the Ghanaian population who are currently either non-banked or under-banked.

ii. Although, generally, improved financial development has a significant negative impact on

long-run economic performance arising from the dynamic effects of higher financial deepening, there is the need for policy reorientation towards improved financial sector development that lays emphasis on increased credit allocation to the private sector and attracting the saving public with higher interest payable on bank deposits. With consistent improvement in financial widening and efficiency through higher private sector credit allocation and attractive interest rates on savings, the overall impact of financial development on economic performance could turn positive, if the anticipated positive impact out if the Ghanaian banking industry becomes more competitive and efficient with diversified risks.

iii. Further development of the Ghanaian financial system, though necessary and desirable for its positive and significant influence on bank savings mobilisation, should not be considered as an end in itself. Efforts are also required in order to erect proper structures like the expansion and the development of the capital market to absorb the likely increase in demand for funds that can be invested. Together with the implementation of other policies, this measure will help promote the efficiency of equity markets, raise corporate savings or even encourage foreign inflows, needed as complements to financial development in a developing country like Ghana. In this regard, all supporting or associated reforms must help to integrate the financial markets fully as a necessary condition to synchronize the revealed benefits of financial development in totality.

iv. Given the direction of the observed causal effects, policymakers should consider the sequencing and focus of financial sector development towards improved savings mobilisation and economic performance as essentially important. For instance, in order to ensure long-run growth through domestic resource mobilisation, the financial deepening component of financial development cannot be ignored or downplayed. In fact, as the evidence shows, financial deepening is the only element of financial development that can cause higher savings mobilisation by banks, which in turn positively impacts on long-run economic performance in Ghana. Therefore, there is the need to put premium on financial deepening to create the necessary platform for improved economic performance through higher resource mobilisation in Ghana in the long run. It can, thus, be concluded that, in the long run, programmes of financial reforms and development are central to higher resource mobilisation and economic performance in Ghana, with financial deepening being

the necessary condition for its success.

v. It is imperative for financial institutions in Ghana to selectively allocate more credit to the investing private sector to boost the financing pro-growth and development projects rather than over-concentrating on employee loans and pre-financing generally non-productive personal assets such as the purchase of private cars under bank auto-loans for customers who are salaried workers. Without this, higher private sector credit allocation will not have the desired impact on long-run growth, and the economy could even suffer from overheating, culminating in higher inflation in the long-run. This appears to be the situation for Ghana for the period studied.

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Appendix

Table A1: Results of Unit Root Tests

DF-GLS		BSM	EPF	CPI	EXR	FND	FNW	GSP	HCD	NSR	OPN
Level	I	*-1.866*	***2.859***	-1.047	0.998	1.436	-1.353	-0.676	*1.837*	-0.881	0.843
	II	***-4.512***	-0.939	-2.761	-1.501	-0.734	-2.361	***-5.828***	-2.579	-1.735	-1.418
First Difference	I	***-3.924***	**2.027**	-1.571	**-2.494**	-1.087	***-14.399***	***-8.886***	***-9.903***	***-8.503***	***-2.808***
	II	**-3.627**	-0.113	*-2.880*	**-3.264**	-0.053	***-15.417***	***-9.127***	***-10.331***	***-8.519***	**-3.398**
KPSS											
Level	I	0.131	**1.186**	*0.416*	***1.171***	***1.060***	***0.793***	***1.181***	***1.172***	**0.712**	***1.036***
	II	*0.127*	***0.279***	0.073	***0.231***	***0.331***	0.114	0.111	*0.137*	**0.201**	***0.219***
First Difference	I	0.053	0.371	0.043	*0.386*	*0.454*	0.134	0.188	0.106	0.077	*0.364*
	II	0.053	**0.155**	0.035	0.058	**0.180**	0.078	**0.185**	0.106	0.079	0.068
Ng-Perron											
Level	I	*-6.641*	3.003	-2.914	2.308	**11.672**	-4.674	-1.272	1.826	-1.962	1.878
	II	-4.778	-1.089	**-20.106**	-7.873	-0.588	-9.630	***-35.714***	-11.896	-5.714	-8.999
First Difference	I	***-14.669***	*-6.248*	***-175.051***	***-18.704***	*6.578*	***-36.825***	***-49.511***	***-61.879***	***-61.670***	*-6.270*
	II	**-19.733**	-8.208	***-416.776***	***-43.369***	6.200	***-33.483***	***-242.733***	***-52.498***	***-51.496***	**-18.520**

Asymptotic Critical Values:

	with trend only			*with trend and constant*		
	1%	5%	10%	1%	5%	10%
DF-GLS (average)	-2.5928	-1.9447	-1.6142	-3.6408	-3.0812	-2.7880
KPSS	0.7390	0.4630	0.3470	0.2160	0.1460	0.1190
NG-PERRON	-13.8000	-8.1000	-5.7000	-23.8000	-17.3000	-14.2000

Source*: Author's estimation*

Notes*: Italics, bold, and bold-italics imply significant at 10%; 5% and 1% respectively.*
I and II denote trend only; trend & intercept respectively
Optimal lag length was selected based on SIC

Table A2: Results of Johansen Maximum Likelihood Cointegration Test

Series: BSM EPF EXR FND FNW GSP HCD INF NSR OPN
Lags interval (in first differences): 1 to 2
Unrestricted Cointegration Rank Test

Hypothesized		**Trace**		**Maximum Eigenvalue**	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Statistic	Critical Value
None *	0.588786	287.0780	197.3709	77.31177	58.43354
At most 1 *	0.555099	209.7663	159.5297	70.46169	52.36261
At most 2 *	0.429574	139.3046	125.6154	48.83934	46.23142
At most 3	0.325345	90.46523	95.75366	34.23913	40.07757
At most 4	0.243466	56.22610	69.81889	24.27370	33.87687
At most 5	0.157211	31.95240	47.85613	14.88040	27.58434

Both trace and maximum eigenvalue tests indicate 3 cointegrating eqn(s) at the 0.05 level
** denotes rejection of the hypothesis at the 0.05 level*
*Critical values for significant **trace** statistics: 197.3709;159.5297; 125.6254 respectively*
*Critical values for significant **max-eigenvalue** statistics: 58.43354, 52.36261, 46.23142 respectively*

Source*: Author's estimation*

Table A3: Variance Decompositions of the Dynamic Long-Run Unrestricted SVAR Model

Variance Decomposition of BSM:

Period	BSM	EPF	INF	EXR	FND	FNW	GSP	HCD	NSR	OPN
1	100.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	88.930	0.0003	0.0121	2.4615	3.5648	0.2173	0.1558	2.1907	2.4575	0.0098
3	87.588	0.1591	0.0586	2.0971	3.0413	0.3074	0.1386	1.9622	3.7130	0.9351
4	84.950	0.3384	0.0615	1.8502	4.6635	0.2920	0.3141	1.8232	4.7574	0.9491
5	83.452	0.3194	0.1247	1.9986	5.1448	0.2991	0.6424	1.8666	5.2350	0.9171
6	82.101	0.3737	0.1429	2.3080	5.0464	0.3664	1.0379	2.2485	5.4626	0.9122
7	80.821	0.4035	0.1446	2.4314	4.9249	0.4226	1.3647	2.9203	5.6313	0.9362
8	79.643	0.3970	0.1771	2.4261	4.8273	0.5105	1.5077	3.7506	5.8037	0.9568
9	78.553	0.3990	0.1975	2.3837	4.7530	0.6893	1.5504	4.6003	5.9128	0.9614
10	77.480	0.4095	0.1944	2.3461	4.7084	1.0144	1.5560	5.3908	5.9497	0.9504
11	76.418	0.4137	0.2100	2.3194	4.6704	1.4829	1.5516	6.0671	5.9315	0.9350
12	75.387	0.4100	0.2738	2.3044	4.6307	2.0390	1.5438	6.6031	5.8882	0.9196
14	73.589	0.3983	0.4886	2.2992	4.5646	3.1763	1.5246	7.2644	5.7979	0.8967
16	72.270	0.4127	0.6425	2.2831	4.5235	4.1540	1.5074	7.5663	5.7432	0.8976
18	71.336	0.4893	0.6762	2.2476	4.4830	4.9012	1.4931	7.7152	5.7249	0.9334
20	70.587	0.6408	0.6683	2.2184	4.4406	5.4375	1.4778	7.7981	5.7305	1.0006

Variance Decomposition of EPF:

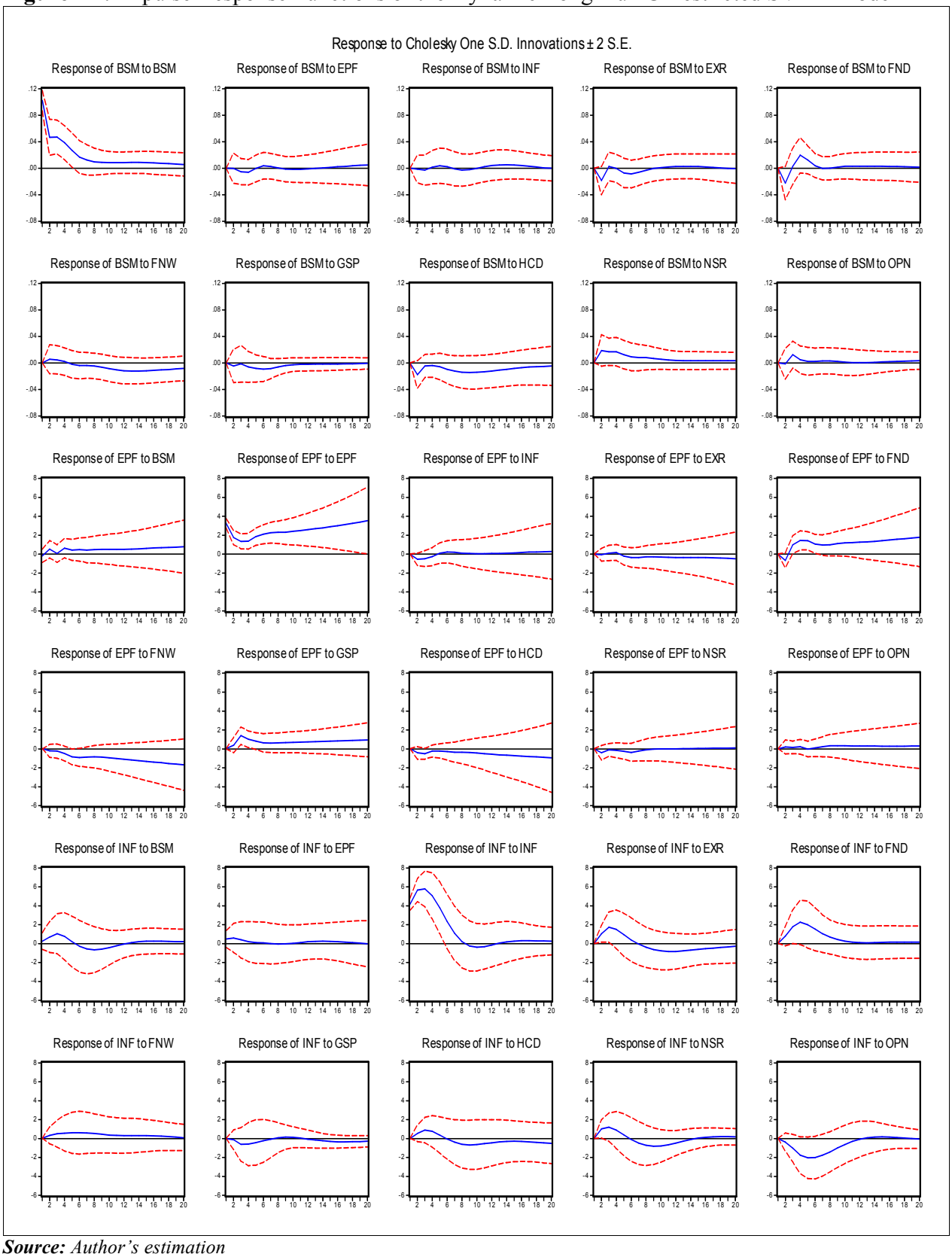
Period	BSM	EPF	INF	EXR	FND	FNW	GSP	HCD	NSR	OPN
1	0.3303	99.670	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1.8689	89.277	2.0006	0.0408	3.0192	0.2843	0.9392	1.1822	1.1609	0.2271
3	1.4074	75.074	2.6734	0.0865	6.9278	0.5133	9.8638	2.2701	0.9226	0.2615
4	2.5629	65.562	2.3799	0.1780	13.288	1.3462	11.509	1.9819	0.8269	0.3657
5	2.5773	61.720	1.9050	0.2630	16.353	3.2724	11.010	1.7399	0.8679	0.2909
6	2.6515	61.312	1.6877	0.5241	16.181	4.7314	9.9580	1.6395	1.0537	0.2608
7	2.5845	62.086	1.4984	0.7301	15.444	5.5799	9.1334	1.6368	0.9982	0.3083
8	2.6232	62.701	1.3099	0.7887	15.001	6.0844	8.5212	1.6436	0.8844	0.4422
9	2.6399	62.883	1.1447	0.8123	14.947	6.5023	8.0809	1.6737	0.7715	0.5445
10	2.6414	62.856	1.0053	0.8388	14.991	6.9290	7.7143	1.7387	0.6766	0.6086
11	2.6098	62.796	0.8878	0.8751	14.977	7.3822	7.3899	1.8503	0.5966	0.6388
12	2.5758	62.710	0.7888	0.9069	14.897	7.8406	7.0995	1.9986	0.5288	0.6536
14	2.5359	62.365	0.6371	0.9358	14.756	8.7288	6.6261	2.3383	0.4207	0.6559
16	2.5458	61.829	0.5428	0.9381	14.730	9.5511	6.2358	2.6538	0.3402	0.6337
18	2.5806	61.299	0.4940	0.9444	14.739	10.258	5.8822	2.9218	0.2800	0.6005
20	2.6202	60.858	0.4678	0.9679	14.752	10.818	5.5628	3.1519	0.2353	0.5669

Variance Decomposition of INF:

Period	BSM	EPF	INF	EXR	FND	FNW	GSP	HCD	NSR	OPN
1	0.3890	1.2696	98.342	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1.0020	1.0451	91.827	1.9902	1.1861	0.1784	0.0354	0.5357	1.9421	0.2581
3	1.6445	0.7304	84.044	4.1468	3.8825	0.3504	0.4172	1.0820	2.4821	1.2203
4	1.5864	0.5524	79.038	4.5983	6.4713	0.4785	0.5679	1.1830	2.3550	3.1694
5	1.3709	0.4763	76.026	4.4386	7.9563	0.6226	0.6021	1.0868	2.0879	5.3331
6	1.3231	0.4446	73.682	4.2057	8.6916	0.7857	0.5969	1.0106	1.9448	7.3147
7	1.4533	0.4286	71.669	4.0555	8.9827	0.9467	0.5792	1.0637	2.0135	8.8074
8	1.6544	0.4198	70.012	4.0472	9.0292	1.0744	0.5684	1.2406	2.2594	9.6947
9	1.8121	0.4130	68.771	4.1913	8.9645	1.1607	0.5690	1.4657	2.5826	10.070
10	1.8864	0.4075	67.901	4.4541	8.8755	1.2162	0.5692	1.6686	2.8766	10.145
11	1.8974	0.4092	67.297	4.7769	8.8011	1.2568	0.5646	1.8176	3.0791	10.101
12	1.8859	0.4235	66.857	5.1013	8.7468	1.2933	0.5630	1.9139	3.1792	10.036
14	1.8928	0.4791	66.206	5.6175	8.6678	1.3696	0.6077	2.0137	3.1957	9.9504
16	1.9419	0.5240	65.693	5.9258	8.6057	1.4415	0.7170	2.0912	3.1749	9.8846
18	1.9858	0.5349	65.283	6.0886	8.5618	1.4822	0.8368	2.2295	3.1834	9.8144
20	2.0188	0.5322	64.935	6.1608	8.5297	1.4863	0.9311	2.4576	3.1945	9.7539

***Source**: Author's estimation* ***Note**: Period is the same as quarter, therefore, 4 quarters equal one year*

Figure A1: Impulse Response Functions of the Dynamic Long-Run Unrestricted SVAR Model



Source: *Author's estimation*