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# DO FINANCIAL SECTOR REFORMS PROMOTE PRIVATE SECTOR INVESTMENT? THE CASE OF GHANA

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## ABSTRACT

*Extensive government intervention characterised financial sector policies in the post-independence period. Repression of the financial sector caused severe financial shallowing in Ghana. Ghana as part of Structural Adjustment Program (SAP) in 1986 implemented Financial Sector Adjustment Program (FINSAP), which was followed up in 2003 with the Financial Sector Strategic Plan (FINSSP). This paper sought to investigate whether financial sector reforms promote private sector investment in Ghana. The paper adopted an index for financial sector reforms from an IMF Working Paper by Abiad et al (2010), which took into account the multifaceted nature of financial reform and records financial policy changes along seven different dimensions: credit controls and reserve requirements, interest rate controls, entry barriers, state ownership, policies on securities markets, banking regulations, and restrictions on the financial account. By employing Fully Modified Least Squares (FMOLS) cointegration regression the study found that financial sector reforms promote private sector investment in Ghana as far as the study period is concerned. When the reforms were decomposed into types, behavioural and competitive reforms were found to be positive and impact significantly on private sector investment. However, behavioural reform was positive but insignificant. It was also identified that GDP per capita, public investment, deposit interest rate and inflation all have positive impact on private sector investment for the study period. The paper recommended for deepening the financial sector reforms in the country. In addition, the study recommended for low and stable inflation as well as fiscal discipline on the part of government.*

## KEYWORDS

Cointegration, FMOLS, Financial Sector Reforms, Ghana, Private Sector Investment.

## INTRODUCTION

Economic growth and development depend essentially on a country's ability to invest and make efficient and productive use of its resources. In this regard, the role of the private sector is important both in terms of its contribution to GDP and its ability to allocate and employ resources efficiently. During the 1960s and 1970s, financial policies in Less Developing Countries were influenced by the Keynesian economics. The theory argued that private sector decisions sometimes results in inefficient macroeconomic aftermaths. In Ghana, extensive government intervention characterised financial sector policies in its post- independence period. These policies were driven by the belief that, due to imperfections in the market coupled with the nature of the financial system inherited from the colonial era, the preferred pattern of investment could not be supported if government did not intervene in the financial markets (Bawumia, 2010). The financial sector was thus repressed.

The financial repression caused severe financial shallowing in Ghana. The broad money/GDP ratio, which had been relatively stable at around 20% from 1964-74, rose briefly in the mid-1970s (to a peak of 29% in 1976) and then collapsed to 12.5% in 1983. Moreover bank deposits became less attractive relative to cash: the currency/M2 ratio rose from 35% in 1970 to 50% in 1983, reflecting a process of disintermediation from the formal financial system. Bank deposits amounted to only 7.4% of GDP in 1984, having fallen from 19.5% of GDP in 1977. Aryeetey and Gockel (1990), in a study of the informal financial sector, found that street banking was increasing in contrast to formal sector intermediation. Credit to the whole of the non-government sector (which included both priority and non-priority sectors) amounted to only 3.6% of GDP in 1983, having fallen from 9.8% in 1977 (World Bank, 1986).

In the light of these challenges in the financial sector and coupled with high inflation, exchange rate over-valuation, low economic growth rate among others, Ghana turned to the International Monetary Fund (IMF) for its assistance in designing a policy package that includes measures to restore a macroeconomic stability. This led to coming into being of the Economic Recovery Program (ERP) in 1983 and eventually the Structural Adjustment Programme (SAP) in 1986.

Financial sector reform as part of the SAP known as Financial Sector Adjustment Program (FINSAP) focused on abolishing of directed credit allocation, interest rate liberalization, bank restructuring and privatization, development of money and capital markets, strengthening of prudential regulation and supervision as well as the move towards indirect and market determined instruments of monetary policy.

By the year 2001, a number of constraints still remained in the financial sector. These included high nominal interest rate spreads, low financial intermediation, crowding out of the private sector in the credit market, cash dominated banking system, absence of clear legal framework that addressed the rights and responsibilities of borrowers and lenders, among others (Bawumia, 2010). These issues led to home grown reforms, which were placed under the banner Financial Sector Strategic Plan (FINSSP) in 2003. The stated objectives of the FINSSP were; to make the financial sector the preferred source of finance for domestic companies, promote efficient savings mobilization, enhance the competitiveness of Ghana's financial institutions, and establish Ghana as the financial gateway to the Economic Community of West African States (ECOWAS) region, among others.

## STATEMENT OF PROBLEM

Though Ghana embarked on financial sector reforms, the major question arising is whether these financial sector reforms has aided private sector investment in Ghana. This is because while some studies have reported that certain countries experienced higher savings and investment following liberalization (Fry, 1978; de Melo, 1986; Khatkhate, 1988), others have registered disasters in other economies that undertook financial liberalization (Diaz-Alejandro, 1985; Barandiaran, 1987; Atiyas, 1989). Even though very limited studies had been conducted on the relationship between private sector investment and financial sector reforms in Ghana (Ahiawodzi, 2012; Siaw and Anokye, 2009), none of these studies took into consideration the gradual changes that occurred as far as reforms in the financial sector is concerned. Rather these studies used indicators such as real interest rate, credit to private sector and a dummy of zero and one as a proxy for financial sector reforms, thus neglecting other important reform measures. But according to According to Gibson and Tsakalatos (1994); Demetriades and Luintel (1996), any analysis of financial sector reforms that does not take full account of this glut of policies will not provide useful insight into how financial reforms have affected investment. This paper is thus concerned with conducting an empirical analysis to assess whether financial sector reforms promote private sector investment in Ghana, by employing developed index to capture the gradual changes in the financial sector reforms. Not all, by decomposing the index developed into types, the study seeks to assess the individual impacts of these types of reforms on private sector investment in Ghana.

## OBJECTIVE OF THE STUDY

The objective of the paper is to find out whether financial sector reforms promote private sector investment in Ghana.

## IMPORTANCE OF THE STUDY

In Ghana's quest to sustain the middle income status achieved as well as achieving the Millennium Development Goals by 2020, the role of private sector investment becomes paramount. Analysis of private sector investment and financial sector reforms is of interest both from a policy and theoretical perspective. Insofar as policy is concerned, if the reform does impact on private investment, then policies will be deepened to enhance more reforms in the financial sector. Also, if the reform does have an impact on private investment, it would further underscore the need for the liberalisation, hence the importance for this study.

## STUDY HYPOTHESIS

$H_0$: financial sector reforms do not promote private sector investment in Ghana
$H_1$: financial sector reforms promote private sector investment in Ghana

## LITERATURE REVIEW

### THEORETICAL REVIEW

McKinnon (1973) and Shaw (1973) both argue that financial repression exerts a negative effect on saving, investment and the rate of economic growth. McKinnon's model stipulates that the higher the real rate of interest, the more willing the investor to accumulate real money balances before investing, while Shaw argues that the accumulation of financial capital is caused by higher real interest, mainly through an increase in the extent of financial intermediation. Both models argue that the removal of ceilings on deposits results in positive real interest rates, which increases saving, that is, the availability of funds for investment. When events following the implementation of qfinancial liberalisation prescriptions did not confirm their theoretical premises (Atiyas 1989, Diaz-Alejandro 1985, Larrain 1989), there occurred a revision of the main tenets of the thesis. Initially, the response of the proponents of the financial liberalisation thesis was to argue that where liberalisation failed, it was because of the existence of implicit or explicit deposit insurance coupled with inadequate banking supervision and macroeconomic instability (McKinnon, 1988a, 1988b; 1991; Villanueva and Mirakhor, 1990; World Bank, 1989). These conditions were according to them conducive to excessive risk-taking by the banks, which lead to 'too high' real interest rates, bankruptcies of firms and bank failures. Thus the financial liberalization analysis also led to recommendations, which included adequate banking supervision, aiming to ensure that banks had a well-diversified loan portfolio, macroeconomic stability, which refers to low and stable inflation and a sustainable fiscal deficit, and the sequencing of financial reforms (Cho and Khatkhate, 1989; McKinnon, 1988b; Sachs, 1988; Villanueva and Mirakhor, 1990).

Another financial liberalization development is related to the emergence of the 'New Growth' theory, (Aretis 2005). This development incorporates the role of financial factors within the framework of new growth theory, with financial intermediation considered as an endogenous process. A two-way causal relationship between financial intermediation and growth is thought to exist. The growth process encourages higher participation in the financial markets, thereby facilitating the establishment and promotion of financial intermediaries. The latter enable a more efficient allocation of funds for investment projects, which promote investment itself and enhance growth (Greenwood and Jovanovic, 1990).

The well-known debate on bank-based and capital market-based financial systems has recently been followed by empirical investigation that concludes in the negative (Arestis et al., 2004). This has led to two further developments that might be termed the 'financial services' view (Levine, 1997, Arestis et al., 2004), and the 'finance and law' view (La Porta et al, 1998, Levine, 1999). The *financial services* view attempts to minimise the importance of the distinction between bank-based and market-based financial systems. It is financial services themselves that are by far more important, than the form of their delivery. In the financial services view, the issue is not the source of finance. It is rather the creation of an environment where financial services are soundly and efficiently provided. The emphasis is on the creation of better functioning banks and markets rather than on the type of financial structure. The '*finance and law*' view maintains that the role of the legal system in creating a growth-promoting financial sector, with legal rights and enforcement mechanisms, facilitates both markets and intermediaries. It is a fact that while the degree of financial development has changed over the last 100 years or so, legal origins in each country have not changed by much (Arestis, 2005).

### THE CRITICS OF THE FINANCIAL LIBERALIZATION THESIS

Neo-Keynesian and Post-Keynesian economists have argued that financial liberalisation reduces effective demand and economic growth and increases instability in the financial system (Burkett and Dutt (1991); Stiglitz (1994); Taylor (1983)). The post-Keynesian approach contests the view that investment matches saving for a market determined equilibrium interest rate since an investment decision depends on expectations about future demand, political stability among others. Saving, in the Keynesian tradition, is primarily a function of income rather than interest rates. Thus, an increase in saving does not necessarily raise investment as proposed by the financial liberalisation thesis. Gibson and Tsakalotos (1994) highlight that increase in interest rate causes real exchange rate appreciation. This exerts a negative impact on the tradable sector by making exports more expensive and induces a rise in trade deficit. Also, with increase in interest rate, banks may experience losses especially in cases where the banks lend on long-term and borrow on short-term basis, simply because banks cannot change lending rates on old credits during the agreed period

### EMPIRICAL REVIEW

De Melo and Tybout (1986) analysed the effects of financial liberalisation on savings and investment for Uruguay for the period 1974 to 1983. They specified separate single equation models for savings and investment variables, with the interest rate as a proxy for financial liberalisation. After employing the Ordinary Least Squares method, they could not detect any significant effect of the interest rate on the savings and investment ratios. Hence this cast doubt on the efficacy of the financial liberalisation policy with respect to Uruguay.

Guncavdi et al (1998) studied the effect of financial liberalization on aggregate private investment functions for Turkey for the study period of 1963 – 1992. By employing a neoclassical model in error correction form, the study indicated that short-run dynamics of investment were affected by financial liberalization by reducing sensitivity to the availability of credit. However there was no evidence of increased sensitivity to the cost of capital. Also, estimation of an Euler equation model indicated that credit constraints remained binding after liberalization. They concluded that financial liberalization had brought a significant structural change to private investment functions, even though credit constraints continue to operate.

Peter Blair Henry (2000) analysed the growth rate of real private investment following stock market liberalization in eleven (11) emerging markets from 1977-1994. Using events study techniques; the study found that 9 out of the 11 countries experienced growth rates of private investment above their non-liberalization median in the first year following liberalization. For the second and third years following liberalization, this number was 10 out of 11 and 8 out of 11 countries, respectively. The paper concluded that, the fact that stock market liberalizations were consistently followed by a temporary increase in the growth rate of real private investment that cannot be explained by contemporaneous economic reforms, domestic aggregate demand conditions or world business cycle effects suggests that capital account liberalization may matter for investment after all.

Laeven (2003), sought to find out whether financial liberalisation reduces financing constraints using panel data for thirteen (13) developing countries by constructing an index of domestic financial liberalisation of the banking sector. Using the Generalised Method of Moments (GMM) estimation, he found out that financial liberalisation affects small and large firms differently in the sense that before financial liberalisation takes place, small firms are found to be more financially constrained than large firms, and thus financial liberalisation relaxes the external constraints of small firms but increases the financing constraints of large firms.

Galindo et al (2003) investigated whether financial liberalisation improves the allocation of investment; micro evidence from 12 developing countries. The study developed an index for financial liberalisation following Laeven (2003) index. The econometric results on the panel of country-years observations strongly supported a positive, significant and sizeable effect of financial liberalisation on the efficiency with which investment funds are allocated.

Jaewoon Koo et al (2005) studied the effect of financial liberalisation on firm's investment in Korea. The study estimated the cash-flow sensitivity of investment of 371 listed firms during 1981–2002 by applying the generalized methods of moments (GMM). The study revealed that financial liberalization significantly reduces the financial constraints confronted by firms by helping them to get wider access to external finance.

In 2005, Bhaduri Saumitra N, studied on "Investment, Financial constraints and Financial Liberalisation; Some Stylized facts from India" with a sample set consisting of a composite and heterogeneous mix of 362 firms whose annual accounts were reported without any gap for the financial years 1989–1990 to 1994–1995. Using the Generalised Method of Moments (GMM), the study revealed that the financial constraint had tightened up significantly for young and small firms. For large, non-group and middle aged firms the cash flow coefficients showed a decline in the post reform period. However, it was only significant for the middle firms. For matured and group-firms there had been an increase in the cash flow coefficient in the post reform period, but neither of them were statistically significant.

Fowowe (2011) investigated the empirical effect of financial sector reforms on private investment in some selected Sub-Saharan African countries by developing a financial index following Laeven (2000). Using the Generalised Method of Moments (GMM) of Blundell and Bond (1989), he found a positive effect of financial sector reforms on private investment in selected countries in South-Sahara Africa, thus confirming the financial liberalization hypothesis which advocates for financial reforms to stimulate investment.

For the case of Ghana, Ahiawodzi (2007) examined the impact of the financial liberalisation policy on financial savings in Ghana from 1988 to 2000. Using the elasticities approach, he concluded that the financial liberalisation policy modestly improved financial savings during the period. Specifically, financial savings went up by 14% to support private investment and other activities.

In their study on whether financial sector development causes growth and investment from 1970 - 2007, Siaw and Anokye (2009) found that financial sector development (proxied by private sector credit/GDP, bank liquid reserve asset ratio and liquid liability/GDP) impact positively on growth and investment. The study employed the Johansen cointegration method to test for the long run relationship. It must be noted that the investment used for their study was an addition of public and private investment.

Anokye (2009) also examined the effect of the financial liberalisation policy on economic growth of Ghana from 1970 to 2007. Using a time series and autoregressive distributed lag (ARDL) modelling approach, the found a positive and significant impact of financial liberalisation on per capita GDP of Ghana.

Frimpong and Marbuah (2010) investigated the determinants of private sector investment in Ghana using a time series data from 1970 to 2002. Employing the ARDL method of estimation, the study revealed that private investment is determined in the short-run by inflation, real interest rate, real exchange rate public investment, openness, and a regime of constitutional rule, while external debt, real interest rate, real output, inflation, openness and real exchange rate significantly influenced private investment response in the long-run.

Ahiawodzi studied on the effect of the financial liberalisation policy on private investment in Ghana from 1988 to 2010. By employing an Error-correction model technique based on Engel and Granger two-step estimation approach, both the long-run and short-run results revealed that the financial liberalization policy launched in Ghana in 1988 had significantly promoted private investment in the country. It must be noted that the study however used a dummy variable to proxy for the financial liberalisation policy and thus failed to measure the gradual reforms that took place in the financial sector.

## RESEARCH METHODOLOGY

### DATA TYPE AND SOURCES

Annual times series data from 1987 – 2010 was used for the study. Data sources include World Bank's World Development Indicators (2012), annual reports of Bank of Ghana, IMF Working Paper (A new Database of Financial Reforms (Abiad et al, 2010) and Ghana Statistical Service.

### MODEL SPECIFICATION

Five broad approaches are generally considered in modelling the determinants of investment. These include the simple accelerator model, the liquidity theory, the expected profits theory, the Tobin's Q Theory, and the neoclassical flexible accelerator theory. The flexible accelerator model appears to be the most popular of these theories used in applied work. However, in the context of developing countries, due to data limitations and structural constraints, a variant of the flexible accelerator model has often been used for empirical research. The model adopted here is a varied version of the flexible accelerator model designed to capture some of the key private investment behaviour in Ghana.

In the long-run steady state, private sector's capital stock $K_t^*$ is assumed to be proportional to expected output, $Y_t^e$.

$$K_t^* = a(Y_t^e). \qquad (3.1)$$

where; $a$ is the capital-output ratio (long-run accelerator)

According to Blejer and Khan (1984), there are two ways of deriving an investment function from the above equation. The first one specifies coefficient '$a$'as a function of different variables. Gradual adjustment of actual to desired capital stock is obtained in a standard way using a local quadratic approximation to adjustment costs, and gradual change in actual capital shock in the investment function.

The alternative which is adopted for this study keeps '$a$' as constant, but assumes that the parameters of the quadratic cost function are a function of different variables. This formulation start with a partial adjustment function derived from a quadratic adjustment cost model as follows:

$$\Delta I_t = \beta[I_t^* - I_{t-1}] \qquad (3.2)$$

Where; $I_t^*$ is the desired level of investment in the steady state, which is given by

$$I_t^* = [1-(1-\sigma)L]K_t^* \qquad (3.3)$$

Where; $L$ is the lag operator and $\sigma$ is the proportional rate of depreciation.

According to theory, net investment during any time period is defined as the change in capital stock over the period:

$$I^N = \Delta K_t = K_t - K_{t-1} \qquad (3.3a)$$

Where; $I^N$ is net investment.

The relationship between gross investment and capital stock from equation (3.3a) is defined conventionally as

$$I_t = \Delta K_t + \delta K_{t-1} \qquad (3.3b)$$

Where $I_t$ is gross private investment; $\delta$ is rate of depreciation

By expanding equation (b) and simplifying in a standard lag-operator notation:

$$I_t = K_t - K_{t-1} + \delta K_{t-1}$$
$$I_t = K_t - LK_t + \delta K_{t-1}$$
$$I_t = K_t - (1-\delta)LK_t$$
$$I_t = [1-(1-\delta)L]K_t \qquad (3.3c)$$

where $L$ is lag-operator

Thus in a steady state, desired private investment is given as shown in equation (3.3) as

$$I_t^* = [1-(1-\sigma)L]K_t^*$$

Given the fact that time is needed to plan and acquire the necessary capital goods and investment information, assumption is made of a lag between the period in which the investment decision is made and the time investment actually materializes (Blejer and Khan, 1984). Hence a gap is specified between current and desired investment as a partial adjustment process given in equation (3.2) as

$$\Delta I_t = \beta[I_t^* - I_{t-1}]$$

Where $\beta$ is coefficient of adjustment

The response of private investment to the gap between desired and actual investment, as measured by the coefficient $\beta$, is assumed to vary systematically depending on prevailing economic policies to achieve the desired level of investment. This paper adds to the coefficient of adjustment $\beta$, an index of the financial sector reforms. Other variables of importance include public investment, inflation rate and real interest rate (proxied by deposit interest rate). This

follows Frimpong and Marbuah (2010) and Fowowe (2011), whose study included other variables in the private investment equation based on the accelerator theory and uncertainty variables so as to avoid the problem of misspecification.

On the basis of the above arguments, the coefficient of adjustment in equation (3.2) can be expressed as;

$$\beta_t = b_0 + \frac{1}{I_t^* - I_{t-1}}[b_1 PUBINV + b_2 INFL + b_3 DIR + b_4 FINDEX] \qquad (3.4)$$

Where, PUBINV= public investment

INFL = inflation rate

DIR = deposit interest rate (proxy for real interest rate)

FINDEX = financial sector reform index

Substituting equation (4) into equation (2) yields

$$\Delta I_t = b_0(I_t^* - I_{t-1}) + b_1 PUBINV + b_2 INFL + b_3 DIR + b_4 FINDEX \qquad (3.5)$$

From equations (3) and (1),

$$I_t^* = [1-(1-\sigma)L]K_t^* = [1-(1-\sigma)L]a(Y_t^e) \qquad (3.6)$$

Therefore equation (3.5) becomes

$$\Delta I_t = b_0\{[1-(1-\sigma)L]aY_t^e - I_{t-1}\} + b_1 PUBINV + b_2 INFL + b_3 RIR + b_4 FINDEX \qquad (3.7)$$

$$\Delta I_t = b_0[1-(1-\sigma)L]aY_t^e - b_0 I_{t-1} + b_1 PUBINV + b_2 INFL + b_3 DIR + b_4 FINDEX \qquad (3.8)$$

$$I_t - I_{t-1} = b_0[1-(1-\sigma)L]aY_t^e - b_0 I_{t-1} + b_1 PUBINV + b_2 INFL + b_3 DIR + b_4 FINDEX \qquad (3.9)$$

$$I_t = b_0[1-(1-\sigma)L]aY_t^e - b_0 I_{t-1} + I_{t-1}\, b_1 PUBINV + b_2 INFL + b_3 DIR + b_4 FINDEX \qquad (3.10)$$

Thus a dynamic reduced-form equation for gross private investment is obtained that includes expected demand, public investment, inflation, real interest rate and financial sector reforms index as explanatory variables as seen in equation (3.11)

$$I_t = b_0 a[1-(1-\sigma)L](Y_t^e) + (1-b_0)I_{t-1} + b_1 PUBINV + b_2 INFL + b_3 DIR + b_4 FINDEX \qquad (3.11)$$

Rational expectations are assumed and thus use observed $Y_t$ for the expected value, $Y_t^e$. Thus equation (3.11) becomes

$$I_t = b_0 a[1-(1-\sigma)L(Y_t)] + (1-b_0)\, I_{t-1} + b_1 PUBINV + b_2 INFL + b_3 DIR + b_4 FINDEX \qquad (3.12)$$

$$I_t = b_0 a[Y_t - (1-\sigma)Y_{t-1}] + (1-b_0)\, I_{t-1} + b_1 PUBINV + b_2 INFL + b_3 DIR + b_4 FINDEX \qquad (3.13)$$

$$I_t = b_0 aY_t - b_0 a(1-\sigma)Y_{t-1} + (1-b_0)\, I_{t-1} + b_1 PUBINV + b_2 INFL + b_3 DIR + b_4 FINDEX \qquad (3.14)$$

$$I_t = b_0 aY_t + b_0 a(\sigma-1)Y_{t-1} + (1-b_0)\, I_{t-1} + b_1 PUBINV + b_2 INFL + b_3 DIR + b_4 FINDEX \qquad (3.15)$$

$$I_t = \alpha_0 + \alpha_1 Y_t + \alpha_2 Y_{t-1} + \alpha_3 I_{t-1} + \alpha_4 PUBINV + \alpha_5 INFL + \alpha_6 DIR + \alpha_7 FINDEX \qquad (3.16)$$

Where; $\alpha_0 = \alpha_0$; $\alpha_1 = b_0 a$; $\alpha_2 = b_0 a(\sigma - 1)$; $\alpha_3 = (1-b_0)$; $\alpha_4 = b_1$; $\alpha_5 = b_2$; $\alpha_6 = b_3$; $\alpha_7 = b_4$

Also in the long run, $I_t = I_{t-1}$ and $Y_t = Y_{t-1}$, therefore, from equation (3.16)

$$I_t = \alpha_0 + \alpha_1 Y_t + \alpha_2 Y_t + \alpha_3 I_t + \alpha_4 PUBINV + \alpha_5 INFL + \alpha_6 DIR + \alpha_7 FINDEX \qquad (3.17)$$

$$I_t = \frac{\alpha_0}{1-\alpha_3} + \frac{(\alpha_1+\alpha_2)Y_t}{1-\alpha_3} + \frac{\alpha_4 PUBINV}{1-\alpha_3} + \frac{\alpha_5 INFL}{1-\alpha_3} + \frac{\alpha_6 DIR}{1-\alpha_3} + \frac{\alpha_7 FINDEX}{1-\alpha_3} \qquad (3.18)$$

Finally, the private investment equation is given as

$$I_t = \lambda_0 + \lambda_1 Y_t + \lambda_2 PUBINV + \lambda_3 INFL + \lambda_4 DIR + \lambda_5 FINDEX \qquad (3.19)$$

Where

$$\lambda_0 = \frac{\alpha_0}{1-\alpha_3};\ \lambda_1 = \frac{(\alpha_1+\alpha_2)}{1-\alpha_3};\ \lambda_2 = \frac{\alpha_4}{1-\alpha_3};\ \lambda_3 = \frac{\alpha_5}{1-\alpha_3};\ \lambda_4 = \frac{\alpha_6}{1-\alpha_3};\ \lambda_5 = \frac{\alpha_7}{1-\alpha_3}$$

and also $\lambda_1 > 0, \lambda_2 >/< 0, \lambda_3 < 0, \lambda_4 >/< 0, \lambda_5 > 0$. $Y_t$ is expected demand, which is proxied by GDP Per Capita growth and $I_t$ is private sector investment(PRINV). All other variables have been defined already.

Assuming a log-linear functional specification, the long-run equilibrium relationship of equation (3.19) above is given by

$$lnPRINV = \lambda_0 + \lambda_1 lnGDPC + \lambda_2 lnPUBINV + \lambda_3 lnINFL + \lambda_4 lnDIR + \lambda_5 FINDEX + \varepsilon_t \qquad (3.20)$$

Where all variables are as previously defined except $\varepsilon_t$, which represents the usual error term and *ln* denotes natural logarithm.

Additionally, as the study seeks to identify the impact of the various individual reforms on private sector investment, the financial sector reform (FINDEX) is categorized into three types as Behavioural reforms (BR), Privatization reforms (PR) and Competitive Reforms. This results in the second estimable equation, which replaces the FINDEX from equation (3.20) with the various types of reforms as

$$lnPRINV = \lambda_0 + \lambda_1 lnGDPC + \lambda_2 lnPUBINV + \lambda_3 lnINFL + \lambda_4 lnDIR + \lambda_5 lnBR + \lambda_6 PR + \lambda_7 lnCR + \varepsilon_t \qquad (3.21)$$

Where;

BR = Behavioural reforms

PR = Privatization reforms

CR = Competitive reforms

**DEFINITION OF VARIABLES**

- **FINANCIAL SECTOR REFORM INDEX (FINDEX)**

The financial sector reform index was adopted from Abiad et al (2010). They had constructed a database that recognizes the multifaceted nature of financial reform and records financial policy changes along seven different dimensions: credit controls and reserve requirements, interest rate controls, entry barriers, state ownership, policies on securities markets, banking regulations, and restrictions on the financial account. Liberalization scores for each category are then combined in a graded index.

Along each dimension was given a final score on a graded scale from zero to three, with zero(0) corresponding to the highest degree of repression, one (1) corresponding to partial repression, two (2) corresponding to partial liberalization and three (3) indicating full liberalization. In answering these questions and in assigning scores, it is inevitable that some degree of judgment is exercised. To minimize the degree of discretion, a set of coding rules was used. Policy changes, then, denote shifts in a score on this scale in a given year. In some cases, such as when all state-owned banks are privatized all at once, or when controls on all interest rates are simultaneously abolished, policy changes corresponded to jumps of more than one unit along that dimension. Reversals, such as the imposition of capital controls or interest rate controls, are recorded as shifts from a higher to a lower score. Given its detailed construction, the database thus allows a much more precise determination of the magnitude and timing of various events in the financial reforms process (Abiad et al, 2010).

This contrasts with most existing measures (Bandiera et al (2000) and Laeven (2003), which code financial liberalization using binary dummy variables. Hence, the database provides a much better measure of the magnitude and timing of financial policy changes than was previously possible.

Also, in order to assess the impacts of the various types of financial sector reforms on private sector investment, the reforms index developed was grouped into three main types following Apanard et al (2010) as behavioural reforms (credit and interest rate liberalisation), competitive reforms (banking sector entry, financial account transactions and security market reforms) and privatization.

Apanard et al (2010) argue that interest rate and credit controls are nearly equivalent since freedom to allocate credit without freedom to set interest rates on loans implies that the allocation will be determined by the interest rate structure. To enjoy faster growth, many governments have initiated reforms by allowing banks to set interest rates or to allocate credit more freely or both. Credit and interest rate controls of all kinds can be viewed as restrictions on banks actions and behaviour. Thus, eliminations of credit and interest controls are combined into one type denoted "Behavioural Reforms (BR)". Other types of reforms include restrictions in equity markets and on international capital transactions implying restrictions on the set of available sources and uses of bank funds, as well as on competition from non-bank financial institutions and foreign entry. Restrictions on the range of activities of banks and restrictions on entry have similar effects on the competitive situation in financial markets. Thus the scores for banking sector entry, financial account transactions and securities market

are added to create a score for "Competitive Reforms (CR)". Government ownership is considered the third separate type of restriction. Reforms in this dimension is denoted Privatization (PR).

- **Private Sector investment**

Private sector investment covers gross outlays by the private sector (including private non-profit agencies) on additions to its fixed domestic assets.

- **GDP Per Capita**

GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2000 U.S. dollars.

- **Deposit Interest Rate**

Deposit interest rate is the rate paid by commercial or similar banks for demand, time, or savings deposits.

- **Inflation Rate**

Inflation rate as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.

- **Public Investment**

Public investment covers gross outlays by the public sector on additions to its fixed domestic assets.

## ESTIMATION TECHNIQUE

### FULLY MODIFIED LEAST SQUARES (FMOLS)

This study adopted the Fully Modified Least Squares (FMOLS) developed by Phillips and Hansen (1990) ahead of other popular approaches to cointegration method to derive the long-run equilibrium implied by equations (3.20) and (3.21).

The Fully Modified Least Square employs a semi-parametric correction to eliminate the problems caused by the long run correlation between the cointegrating equation and stochastic regressors innovations. Phillips (1995) proves that the FMOLS procedure is reliable in the case of full rank or cointegrated *I*(1) regressors as well as with *I*(0) regressors. In such cases the limit theory of the *fully modified* (FM) estimates of the stationary components of the regressors is equivalent to that of OLS, while the FM estimates of the non-stationary components retain their optimality properties (i.e. they are asymptotically equivalent to the maximum likelihood estimates of cointegrating matrix). Hargreaves (1994) runs a Monte Carlo Simulation and points out that single estimators in general are robust if more than one cointegrating relation exists with the FMOLS estimator doing best. He concludes that the FMOLS estimator should be preferred, even in advance to multivariate methods, if one wants to examine one cointegrating vector and is unsure about the cointegrating dimensionality. This is of particular interest for the aim of this paper as the paper is primarily interested in the long-run effect of financial sector reforms on private sector investment. That is whether financial sector reforms promote private sector investment in the long-run. Furthermore, Phillips and Hansen (1990), Hargreaves (1994) and Cappucio and Lubian (2001), report good finite samples properties of the FMOLS estimator.

## DATA ANALYSIS

### UNIT ROOT TEST

The study employed Augmented Dickey- Fuller, or ADF, (*p*) test (Dickey and Fuller 1979; 1981) and Dickey-Fuller generalised least square (DF-GLS) detrending test proposed by Elliot et al (1996) to test for unit root in the variables.

### COINTEGRATION TEST

The study employs the Autoregressive Distributed Lag (ARDL) Bounds test by Pesaran, Shin and smith, (2001) to examine the long-run relationship between the variables

### EMPIRICAL RESULTS AND DISCUSSIONS

### UNIT ROOT AND COINTEGRATION TEST

Results of the unit root and cointegration test are shown in tables 4.1 and 4.2 below

**TABLE 4.1: UNIT ROOT RESULTS**

| | LEVEL | | | | FIRST DIFFERENCE | | | |
|---|---|---|---|---|---|---|---|---|
| Variable | ADF | | DF-GLS | | ADF | | DF-GLS | |
| | Constant | Constant + trend | Constant | Constant + trend | Constant | Constant + trend | Constant | Constant + trend |
| *ln*PRINV | -1.604 | -2.028 | -0.009 | -2.530 | -5.998*** | -5.722*** | -4.426*** | -6.007*** |
| *ln*GDPC | 4.373 | 1.567 | 0.768 | -2.366 | -0.878 | -5.150*** | -2.766*** | -5.149*** |
| *ln*PUBINV | -2.009 | -0.699 | -0.474 | -0.874 | -3.095** | -4.138*** | -3.032*** | -3.725*** |
| *ln*INFL | -2.479 | -3.282 | -0.508 | -2.357 | -3.915*** | -3.779*** | -2.566** | -3.894*** |
| *ln*DIR | -1.012 | -1.849 | -1.200 | -1.789 | -3.615** | -3.823** | -4.396*** | -4.735*** |
| *ln*FINDEX | -0.995 | -2.993 | 0.208 | -2.524 | -3.304** | -3.279** | -2.575** | -3.219** |

The null hypothesis is that the series is non-stationary, or contains a unit root.
***, **, denotes the rejection of null hypothesis of unit root at the 1% and 5% and significance levels respectively. Test statistics for ADF are compared with simulated critical values from MacKinnon (1996, Table 1). That of ADF-GLS is Elliott, Rothenberg and Stock (1996) The lag length in the ADF test is based on Schwarz Information Criterion. Δ is first difference operator.

Results were obtained from EViews 7.0

**TABLE 4.2: COINTEGRATION RESULTS**

| Critical value bounds of F-statistic: Intercept and Trend | | | | |
|---|---|---|---|---|
| | 95% | | 90% | |
| F-Statistic | Lower Bound | Upper Bound | Lower Bound | Upper Bound |
| **11.8844** | 4.1847 | 5.7854 | 3.4131 | 4.7454 |

$F_{PRINV}$(PRINV|FINDEX, GDP, DIR, PUBINV, INFL); Results were obtained from Microfit 5.1

From table 4.2, the calculated F-Statistic that the joint hypothesis that the lagged level variables of the coefficients is zero equals 11.8844. This figure is greater than the upper bound of the critical values of all the conventional levels 10% (4.7454) and 5% (5.7854). This means that joint null hypothesis of all the lagged level variables of the coefficients being zero is rejected even at 5%. This suggests that there is cointegration between private sector investment and the independent variables and hence a long run relationship between private sector investment and the independent variables.

### RESULTS OF THE ESTIMATED PRIVATE INVESTMENT EQUATIONS

Results of the first estimable equation (3.20) which captures the full reform index is shown in table 4.3. Also table 4.4 shows the result from the second estimable equation (3.21), which decomposes the reform index into types.

**TABLE 4.3: RESULTS OF THE FMOLS FOR EQUATION 3.20**

| Dependent Variable: LNPRINV | | | | |
|---|---|---|---|---|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| LNGDPC | 1.480618 | 0.624590 | 2.370542 | 0.0299** |
| LNPUBINV | 0.276525 | 0.082311 | 3.359506 | 0.0037*** |
| LNINFL | 0.135450 | 0.060829 | 2.226748 | 0.0398** |
| LNDIR | 0.321126 | 0.077539 | 4.141487 | 0.0007*** |
| LNFINDEX | 1.593891 | 0.276642 | 5.761555 | 0.0000*** |
| C | 1.336655 | 3.554575 | 0.376038 | 0.7115 |

| | |
|---|---|
| R-Squared | 0.822174 |
| Adjusted R-Squared | 0.769872 |
| Durbin-Watson stat | 2.102149 |

*****,(**)** represents significance at 1% and (5%) respectively; Results were obtained from Eviews 7.0

The coefficient of the financial sector reform developed (FINDEX), is positive and statistically significant at 1% level of significance. This is an indication that the financial sector reforms which had taken place in the country has had a positive impact on private sector investment in Ghana. Specifically, 1% increase in FINDEX increases private sector investment by 1.59%. The positive and significant coefficient is as a result of interest rate deregulation which has resulted in increased savings mobilization as well as increase in the number of banks and non-banks with increased private sector participation. The reforms have also resulted in the shift in the composition of bank assets. Banks asset lending to the private sector increased at the expense of lending to government during the study period. Moreover, Privatization as part of the financial sector reforms has increased competition among financial institutions during the study period. The result is also in agreement with Fowowe (2011), Ahiawodzi (2012), Guncavdi et al (1998), Laeven (2003) and Siaw and Anokye (2009).

Consistent with theory, GDP per capita has a positive and significant impact on private sector investment in Ghana. This confirms the accelerator principle in Ghana. With a coefficient of 1.480618, a 1% increase in GDP Per Capita increases private sector investment by 1.48%. This result agrees with findings from Ibrahim (2000), Fowowe (2011) and Ayentimi et al (2012).

Public Investment being positive and significant indicates that private sector investment and public investment are complementary. It is found that a 1% increase in public investment increases private sector investment by 0.28%. This means that public sector is found to act as a crowding-in catalyst to private investment growth. This may be as a result of major key infrastructural development undertaken by the government during the study period. These include transportation (roads and bridges), energy, communication, hospitals among others. The finding concurs with Blejar and Khan (1984), Aschauer (1989), Greene and Villanueva (1991) and Frimpong and Marbuah (2010).

Results of the study revealed an interesting result when inflation rate was found to enhance private sector investment. That is 1% increase in inflation increases private sector investment by 0.14%. The positive relationship between inflation and GDP growth obtained in this study is consistent with the structuralist believe that inflation is essential for economic growth. Khan and Senhadji (2001) have argued that inflation per se is not harmful to growth. Their study suggested that there is a threshold beyond which inflation is harmful to growth (i.e. inflation negatively affects economic growth). According to Frimpong and Oteng-Abayie (2010), above an inflation threshold of 11%, inflation has a very high negative effect on growth in Ghana. The import of this result is that, when prices are going up, Ghanaian businesses find it an opportunity to enjoy abnormal profit by increasing their investment. The finding is in line with Frimpong and Marbuah (2010) and Ayentimi et al (2012) for Ghana, Acosta (2005) for Argentina, Atesoglu (2005) and Crosby and Otoo (2000) for U.S.A

Contrary to the neoclassical theory of user cost of capital, the study supported the McKinnon-Shaw (1973) "complementarity" hypothesis for the case of Ghana. That is deposit interest rate has a positive impact on private sector investment in Ghana. With a coefficient of 0.321126, it means that 1% increase in deposit interest rate improves private sector investment by 0.32%. The result is consistent with Asante (2000), Ajide1 & Lawanson (2012) for Nigeria as well as Frimpong and Marbuah (2010) for the case of Ghana. This is because prior to financial liberalization, interest rates were repressed (that is controlled) with resultant low lending rates. Liberalisation, which has resulted in higher interest rates have impelled private investment through higher domestic savings resulting in increased investible funds for the private sector.

**TABLE 4.4: RESULTS OF THE FMOLS FOR EQUATION 3.21**

| Dependent Variable: LNPRINV | | | | |
|---|---|---|---|---|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| LNGDP | 2.040820 | 0.908607 | 2.246097 | 0.0402** |
| LNPUBINV | 0.445048 | 0.078486 | 5.670388 | 0.0000*** |
| LNINFL | 0.133942 | 0.066595 | 2.011295 | 0.0626* |
| LNDIR | 0.157158 | 0.120435 | 1.304923 | 0.2116 |
| LNBR | 0.106347 | 0.315644 | 0.336919 | 0.7408 |
| PR | 0.245554 | 0.106897 | 2.297111 | 0.0364** |
| LNCR | 0.631816 | 0.285317 | 2.214432 | 0.0427** |
| C | -2.295718 | 4.756969 | -0.482601 | 0.6363 |

| | |
|---|---|
| R-Squared | 0.823511 |
| Adjusted R-Squared | 0.741150 |
| Durbin-Watson stat | 2.113559 |

***(**)* indicates rejection of null hypothesis at 1%, 5% and 10% level of significance; Results were obtained from Eviews 7.0

Results from table 4.4 indicates that GDP per capita, public investment, inflation and deposit interest rate are all positive and significant except deposit interest rate which is positive but insignificant. This agrees with results in our first estimable equation shown in table 4.3 when total financial sector reform index developed was used with other control variables. When financial sector reforms were grouped into types, they are all positive, confirming the earlier finding that financial sector reform impact positively on private sector investment. Privatization and competitive reforms were significant in impacting positively on private sector investment. This means that reforms in the area of privatization, banking sector entry, financial account transactions and security market reforms have been effective in promoting private sector investment in Ghana. However, behavioural reforms was not significant at any of the conventional levels; meaning that reforms in the area of interest rate and credit reforms have not been effective in promoting private sector investment for the study period. This insignificant impact concurs with 2011 IMF Country Report's finding that there is scarcity of long-term finance, limited access to financial services and high cost of intermediation in Ghana. Also, Bawumia (2010) reveals that post reform did not result in positive real interest rates on bank products. The FINSAP period from 1984 – 2000 saw real interest rates spreads at an average of -20.0%. While real interest rate spreads during the FINSSP period (2001-2008) were marginally positive, they averaged -0.9%. These might have accounted for the insignificant nature of the behavioural reforms on private sector investment in Ghana.

## SUMMARY, FINDINGS AND RECOMMENDATIONS

Result of the paper suggests that financial sector reforms have a positive and significant effect on private sector investment in Ghana. In addition, privatization, competitive and behavioural reforms as types of reforms was known to have positive and significant impact on private sector investment with the exception of behavioural reforms, which was not significant. The study also revealed that GDP per capita, deposit interest rate, public investment and inflation all have positive and significant impact on private sector investment in Ghana.

Based on the findings from the study, it is proposed that the government deepens its financial sector reforms. This is because there is still the scarcity of long-term finance, limited access to finance and high cost of intermediation. The Financial Sector Strategic Plan (FINSSP), which was implemented in 2003, has a lot of regulations and laws passed under it which are yet to realize its potential. Some of them include the Banking Act 2004, Payments Systems Act 2003, Long Term Savings Act 2004, Venture Capital Trust Fund Act 2004, Foreign Exchange Act 2006, Credit Reporting Act 2007, Borrowers and Lenders Act 2008, Non-Bank Financial Institutions Act 2008 and Home Mortgage Finance Act 2008, among others. As a recommendation, the onus falls on the Central Bank to strengthen its supervisory work in the adherence to these policies so as to deepen the sector reforms and its resultant impact on private sector investment in Ghana.

The study recommends fiscal discipline on the part of government. This may include reducing the size of government expenditure with regards to ministerial appointments, committees, end-of-service benefits (ex-gracia), allowances paid, among others. It is expected that, with a reduction in expenditure in these areas, government would have more funds to improve upon infrastructure development to create the enabling environment for private sector investment to thrive since the study revealed a positive relationship between public and private sector investment.

The Central Bank must continue on its inflation targeting policy. To achieve this policy, the conditions attached to its success must be strengthened and adhered to very well. Some of these pre-requisites include the independence of the Central Bank, well-developed financial and money markets, the absence of fiscal dominance and a clearly defined objective of achieving price stability with the absence other nominal objectives.

High deposit interest rates have proven to affect private sector investment positively. It is therefore recommended that Central Bank must deepen measures to enhance competition by increasing operating license to financial operators.

## LIMITATION OF THE STUDY AND SUGGESTION FOR FURTHER RESEARCH

The reform index was development by considering seven reform areas. This may be a limitation because there may be other reform areas that are not covered. It is also known that investment policies are implemented with the ultimate goal of enhancing economic growth. This study is thus limited in the sense that it focused primarily on impact of financial sector reforms on private sector investment at the expense of economic growth.

It is recommended from the forgoing that future research be looked into how financial sector reforms interact with private sector investment to affect economic growth in Ghana by developing an index to cover new reform area.

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## APPENDIX

### CODING RULES FOR THE FINANCIAL SECTOR REFORM INDEX

To construct an index of financial liberalization, codes were assigned along the seven dimensions below (Abiad et al 2010). Each dimension has various sub-dimensions. Based on the score for each sub-dimension, each dimension receives a ‘‘raw score.’’ The explanations for each sub-dimension below indicate how to assign the raw score. After a raw score is assigned, it is normalized to a 0–3 scale. The normalization is done on the basis of the classifications listed below for each dimension. That is, fully liberalized = 3; partially liberalized = 2; partially repressed = 1; fully repressed = 0.

The final scores are used to compute an aggregate index for each country/year by assigning equal weight to each dimension. For example, if the raw score on credit controls and reserve requirements totals 4 (by assigning a code of 2 for liberal reserve requirements, 1 for lack of directed credit and 1 for lack of subsidized directed credit), this is equivalent to the definition of fully liberalized. So, the normalization would assign a score of 3 on the 0–3 scale

### CREDIT CONTROLS AND RESERVE REQUIREMENTS

1. Are reserve requirements restrictive?

- Coded as 0 if reserve requirement is more than 20 percent.
- Coded as 1 if reserve requirements are reduced to 10 to 20 percent or complicated regulations to set reserve requirements are simplified as a step toward reducing reserve requirements.
- Coded as 2 if reserve requirements are less than 10 percent.

2. Are there minimum amounts of credit that must be channeled to certain sectors?

- Coded as 0 if credit allocations are determined by the central bank or mandatory credit allocations to certain sectors exist.
- Coded as 1 if mandatory credit allocations to certain sectors are eliminated or do not exist.

3. Are there any credits supplied to certain sectors at subsidized rates?

- Coded as 0 when banks have to supply credits at subsidized rates to certain sectors.
- Coded as 1 when the mandatory requirement of credit allocation at subsidized rates is eliminated or banks do not have to supply credits at subsidized rates.

These three questions’ scores are summed as follows: fully liberalized = 4, largely
Liberalized = 3, partially repressed = 1 or 2, and fully repressed = 0.
For the rest of the coding for the other reform measures, see Abiad et al (2010).

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