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Determinants of Capital Flight In Ghana

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Abstract

The study investigated the short-run and long-run determinants of capital flight in Ghana using the autoregressive distributed lag (ARDL) estimation technique. The long-run and short-run results show that real GDP growth rate, higher domestic real interest rate over foreign interest rate, financial development, good governance and strong property rights reduce capital flight, while external debt to GDP leads to increase in capital flight in Ghana. However, lagged external debt to GDP and lagged financial development had negative and positive effect respectively in the short-run. The study recommends that government should adopt more pro-growth policies and resort to domestic borrowing to reduce external debt. The Central Bank of Ghana should improve on the development of the financial sector and ensure competitive domestic interest rates. It is also recommended that Public Accounts Committee (PAC) in Ghana should continue to ensure accountability and transparency to strengthen the interest of domestic investors.

Keywords: *Capital, Portfolio, Autoregressive, distributed, lag.*
JEL Classifications: C 32, F 21, F 40, G 11.

Introduction

Capital flight is one of the debated topics in development and financial economics. While most of the debates have centered on how capital flight affects economic growth (Cervena, 2006; Gusarova, 2009; Olawale & Ifedayo, 2016) , others have equally focused on what drives capital flight (Dim & Ezenekwe, 2014; Harrigan, Mavrotas, & Yusop, 2002; Raheem, 2015). Capital flight refers to part of domestic savings sent abroad. The ongoing debate on capital flight emanates from its numerous long-term adverse effects as scarce economic resources lost through capital flight do not contribute to enhance social welfare of residents (Škare & Sinković, 2013). The long-term adverse effects of capital flight include worsening capital scarcity and further reductions in resources available for domestic investment, leading to a fall in the rate of capital formation. Given the investment-growth nexus, capital flight has contributed to the sluggish growth in affected economies. It also reduces government tax revenue and its debt servicing capacity, since income earned abroad cannot be taxed. Moreover, capital flight has adverse implications on balance of payment, exchange rate, and it can compound the foreign finance problems of heavily indebted countries if creditors refuse to give further assistance as a result of capital outflows (Ajayi, 1995; Ndikumana & Boyce, 2008; Ng'eno, 2000).

Theoretically, the standard portfolio choice theory has been used to explain the reason behind capital flight and has served as a basis to unearth determinants of capital flight. The theory postulates that capital flight occurs due to agent desires to optimize yields on capital for a given level of risk (Collier, Hoeffler, & Pattillo, 2001a). Nevertheless, the motivation for capital flight is more specific, especially with regard to different economic settings.

A number of empirical studies have identified various factors responsible for outflows of capital in developing countries. These factors include exchange rate misalignment, interest rate differentials, fiscal deficit, increasing external debt, accelerating inflation, slowing economic growth rate, rising taxes, weak financial sector, political instability, weak property right and poor governance (Ajayi, 1995; Ali & Walters, 2011; Conesa, 1987; Dim & Ezenekwe, 2014; Fedderke & Liu, 2002; Harrigan et al., 2002; Lawanson, 2007; Le & Zak, 2006; Lensink, Hermes, & Murinde, 2000; Makochekanwa, 2007; Markowitz, 1952; Murinde, Hermes, & Lensink, 1996; Ndikumana & Boyce, 2003; Olopoenia, 2000; Onwioduokit, 2001; Raheem, 2015). In spite of the above factors, empirical studies have also produced mixed results for determinants of capital flight in developing countries (Ali & Walter 2011; Ndikumana & Boyce, 2012; Ng'eno, 2000; Nyoni, 2000; Olopoenia, 2000; Onwioduokit, 2001; Pastor, 1990; Raheem, 2015). The reason for mixed empirical results is that most of these empirical studies(Ali & Walters, 2011; Boyce & Ndikumana, 2012; Raheem, 2015) on the determinants of capital flight are mainly cross-country studies. While these studies have broadened

knowledge on determinants of capital flight phenomenon, the findings cannot adequately reflect country specific experience. This is because the effects of individual economic and political factors that determine capital flight vary from country to country due to heterogeneity in the macroeconomic and political environment among countries. Hence, it is difficult to provide country specific conclusions and policy recommendations. As a result, the determinants of capital flight is an empirical exercise. Besides, no study has been done for Ghana. This study, therefore, proposes to fill the lacuna, using Ghana as a case study.

Ghana presents an interesting case study because, like other African countries, she has carried economic reforms to correct most of the macroeconomic imbalances in the economy. Ghana has witnessed a concurrent inflow of foreign capital associated with simultaneous outflow of domestic capital**.** In fact, net foreign direct investment inflows to Ghana in 2012, 2013, 2014 and 2015, for instance were US$3,294,520,000, US$3,227,000,000, US$3,363,389,444.4 and US$3, 192, 320, 530.8 respectively according to International Monetary Fund. However, Boyce and Ndikumana (2012) estimated that Ghana lost $1184.0 million and $678.0 million in 2010 and 2009 respectively to capital flight.

An inevitable question which arises is: why is the economy experiencing capital flights while such capital is needed for domestic investment? In an attempt to answer the pertinent question, this paper investigated determinants of capital flight in Ghana. Specifically, the paper sought to explore the long run and short-run determinants of capital flight in Ghana. The paper draws motivation from Sustainable Development Goals (SDGs), specifically goal number eight, which stresses on resource mobilization to promote inclusive and sustainable economic growth, employment and decent work for all. The rest of the paper is organized as follows: the next section presents a review of relevant literature and it is followed by the methodology. Next after the methodology is the results and discussion, and, finally, the conclusions.

Literature Review

This section presents a review of relevant literature regarding determinants of capital flight. It focused on theoretical issues and empirical literature that explained capital flight.

Definitional issues

Generally, there is no one accepted definition for capital flight, even though its activities have been identified for periods dating back to the late 1970s and 1980s. The definitions associated with the concept of capital flight are many with different meanings implied. From a wider perspective, it has been characterized to incorporate every private capital outflow from developing

countries (Khan, 1989), while, from a narrow perspective, it encapsulates only illegal capital exports (Lessard & Williamson, 1987). The broad extreme takes into account all private capital outflows from a developing economy. Based on this definition, every private capital outflow from developing countries, either long-term or short-term, portfolio or equity investments, could be termed capital flight. The reason is that developing countries, generally, are seen to be short of capital and, hence, should be net borrowers in the development process, supplementing domestic savings with external finance.

In consonance with the above difficulties in defining capital flight, Walter (1987) defined capital flight as all capital that "flees" regardless of the motive. Also, according to Cuddington (1986), the term "capital flight" typically refers to short-term speculative capital outflows and it includes "hot money" that responds to political or financial crises, heavier taxes, a prospective tightening of capital controls or major devaluation of the domestic currency, or actual or incipient hyperinflation. Alternatively, capital flight can be seen as the change in the private sector's net foreign assets (Chang & Cumby, 1991; Erbe, 1985; Morgan Guaranty Trust Company, 1986; World Bank, 1985). The above definitions justified the fact that there is no conventional definition of capital flight. However, this study defined capital flight as part of domestic private savings sent abroad.

Determinants of capital flight

Theoretically, the determinants of capital flight have been discussed by portfolio adjustment theory and debt driven capital flight thesis, among others. The portfolio adjustment theory argued that capital flight occurs due to unstable macroeconomic and political environment in developing countries and the concurrent existence of better investment opportunities in advanced countries, like high foreign interest rates (Dim & Ezenekwe, 2014). According to the Debt Driven Capital Flight Thesis, heavy external debt of a country, is the main cause of capital flight (*ibid*). It explains that increasing domestic debt discourages saving and investment in an economy based on the assumption that high foreign debt is an indication for exchange rate depreciation, fiscal crisis, and the likelihood of crowding out of domestic capital and expropriation of assets to pay for the debt. As a result, domestic investors transfer their funds to foreign countries where the risk of loss is low *(ibid)*.

Based on portfolio adjustment and debt driven theories of capital flight perspective, the main factors that determine capital flight can be summarized into endogenous "push" factors and exogenous "pull" factors, as presented in Table 1.

Table 1: Push and pull factors of capital flight

	(Internal) Push Factors	(External) Pull Factors
Political and Institutional Factors	Political upheaval; social instability; bad governance; corruption.	Opacity and loose banking regulatory framework; accommodative financial policies.
Macroeconomic Factors	Low or negative real interest rates, overvalued exchange rates; inflationary pressure; capital account liberalization; rising external indebtedness.	High external real interest rates, strong and stable exchange rates of hard currencies.
Microeconomic Factors	Banking undercapitalization; liquidity crisis; institutional weaknesses of the financial system; rise in corporate income taxes; unregulated financial system; stock market crisis.	Strong asset management competitive advantage; dynamic offshore financial systems; offshore tax havens; booming stock markets in foreign countries.

Source: Bouchet, 2012.

Numerous empirical studies have been undertaken in attempts to explain the significance of identified economic and institutional factors (push and pull factors) that cause capital flight. For instance, Nyoni (2000) and Alam and Quazi (2003) found that GDP-growth rate causes capital flight in Tanzania and Bangladesh respectively. However, Lawanson (2007), in his study on capital flight from Nigeria based on portfolio choice approach using data from 1970-2001, found that GDP growth rate has a negative significant effect on capital flight in the short-run. The results also revealed that higher external debt-GDP ratio, increase in real interest rate differential and increase in inflation rate drive capital flight in Nigeria. Also, Ndikumana and Boyce (2003), BejaJr et al. (2005), and Geda and Yimer (2015) established that increase in external debt stock drives capital flight in South Asia (Indonesia, Malaysia, The Philippines and Thailand), Ethiopia and Sub-Saharan Africa respectively. Moreover, Collier *et al.*(2001a), and Ndikumana and Boyce (2003) used M2/GDP and *M3/GDP* respectively as proxy to financial development and found that financial

development is insignificant in determining capital flight in Sub-Sahara Africa. However, Raheem (2015) re-examined determinants of capital flight using twenty eight Sub-Sahara Africa countries and found that M2/GDP has positive and significant coefficient. It can be explained that improvement in financial development reduces capital flight because financial development reduces information and transactional cost of economic activities (Demirgüç-Kunt, Levine, & Detragiache, 2008). Le and Zak (2006) presented a portfolio choice model that relates capital flight to return differentials, risk aversion, and three types of risk: economic risk, political instability, and policy variability. In their estimation of the equilibrium capital flight equation for a panel of forty-five developing countries over sixteen years, all three types of risk had a statistically significant impact on capital flight. Quantitatively, political instability was the most important factor associated with capital flight. In addition, Al-Fayoumi, Alzoubi and Abuzayed (2012)found that previous year capital flight have spillover effect. This implies that amount of capital flight in previous year influence capital flight in the current year. The reviewed literature shows that determinants of capital flight are numerous, however, their significance varies across countries and therefore this study proceeds to identify what determines capital flight in Ghana.

Methodology

This section presents the theoretical and empirical model used for the study. Specifically, the study adopted portfolio choice theory developed by Markowitz (1952) and the empirical model was developed based on the portfolio choice theory.

Theoretical Model

This empirical study draws from the theoretical explanation of causes of capital flight provided in the portfolio choice model developed by Markowitz (1952). Portfolio choice model was used, because we assumed that economic agents send their capital abroad to invest in a portfolio that maximizes the expected utility of their final wealth. Following Le and Zak (2006), and Ali and Walters (2011), the theoretical model for determinants of capital flight is specified as equation (1)

$$\ln\left(\frac{NKF_t}{Y_t}\right) = -\ln\left[E\left(r_t^d - r^f\right)\right] + \ln\left(Y_t\right) + \ln\left[Var\left(r_t^d\right)\right] \quad (1)$$

Where r_t^d , r^f , Y_t and NKF_t represent domestic interest rate at time 't', risk-free foreign interest rate, gross domestic product at time 't' and net capital flight at time 't' respectively. Also, $Var(r_t^d)$ denotes variance and it captures risk associated with domestic interest rate.

Assuming that risk associated with domestic interest rate emanates from economic and non-economic factors, $Var(r_t^d)$ can be decomposed into two (i.e., economic factors and non-economic factors). Let $\delta_{e,t}^2$ denote risk from economic source and $\delta_{o,t}^2$ denote risk from other sources. Also, assuming that each type of risk is independently distributed, the risk of domestic investment can be specified as:

$$Var(r_{t+1}^d) = \delta_{e,t+1}^2 + \delta_{o,t+1}^2 \quad (2)$$

Using equation (2) to substitute for $Var\left(r_t^d\right)$ in equation (1) yields the theoretical model for determinants of capital flight specified as equation (3a).

$$\ln\left(\frac{NKF_t}{Y_t}\right) = -\ln\left[E\left(r_t^d - r^f\right)\right] + \ln\left(Y_t\right) + \ln\left(\delta_{e,t}^2\right) + \ln\left(\delta_{o,t}^2\right) \quad (3a)$$

Let, $NKF_t / Y_t = CF_t$; $E(r_t^d - r^f) = ID_t$; $Y_t = GDP_t$

$$\ln\left(CF_t\right) = -\ln\left(ID_t\right) + \ln(GDP_t) + \ln(\delta_{e,t}^2) + \ln(\delta_{o,t}^2) \quad (3b)$$

Where CF_t , ID_t , GDP_t , $\delta_{e,t}^2$ and $\delta_{o,t}^2$ represent ratio of capital flight to gross domestic product , interest rate differential, gross domestic product , risk caused by macroeconomic factors and risk emanating from other sources (like governance and property right) respectively. Equation (3b) indicates that when estimating determinants of capital flight, one must control for the return differential, and gross domestic product (GDP). Besides these controls, the model predicts that capital flight will rise with increasing domestic economic risk $(\delta_{e,t}^2)$ and other non-economic risk $(\delta_{o,t}^2)$.

Empirical Model Specification

An empirical version of equation (3b) is a follows:

$$\ln(CF_t) = f(\ln GDP_t, \ln ID_t, \ln DBT_t, FD_t, GOV_t, PR_t) \quad (4a)$$

Where $\delta^2_{e,t} = f(\ln DBT_t, FD_t)$ and $\delta^2_{o,t} = f(GOV_t, PR_t)$.

CF denotes ratio of capital flight to GDP, GDP is gross domestic product and it is proxied by real gross domestic product growth rate (RGDPG) in equation (5), ID is interest rate differential measured as difference between real domestic interest rate and foreign interest rate (domestic – foreign), DBT is external debt to GDP ratio, FD is financial development, GOV is governance and PR is property right. The economic model in equation (4a) above can be written as an econometric model specified as:

$$\ln(CF_t) = \beta_0 + \beta_1 RGDPG_t + \beta_2 \ln ID_t + \beta_3 \ln DBT_t$$

$$+\beta_4 FD_t + \beta_5 GOV_t + \beta_6 PR_t + \varepsilon_t \quad (5)$$

Where the co-efficient β_1, β_2, β_3, β_4, β_5 and β_6 are the parameters of the respective variables, β_0 is the constant term (drift), t denotes time, in denote natural log operator and ε is the error term. The following are expected.

$$\beta_1 < 0, \beta_2 < 0, \beta_3 > 0, \beta_4 < 0, \beta_5 < 0, \beta_6 < 0$$

3.3 Measurement of Variables

Capital flight refers to outflow of resident capital which is motivated by economic and political uncertainties in the home country. It is measured as a summation of change in external debt stock outstanding, adjusted for exchange rate fluctuations, net foreign direct investment, trade misinvoicing, remittance inflow discrepancy minus the sum of current account deficit and net additions to the stock of foreign reserves (Boyce & Ndikumana, 2012).

Real gross domestic product growth refers to the rate at which a nation's gross domestic product (GDP) changes from one year to another. It is measured as annual percentage growth rate of GDP at market prices based on constant local currency (World Bank, 2015). A negative relationship is expected between capital flight and domestic real GDP growth rate.

Interest rate differential is the differences between real domestic interest rate and real foreign interest rate. It is measured as the difference between average real deposit rate at time t in the country and US Treasury bill rate at time t (domestic real interest rates minus US 91 day Treasury bill rate), with 91 days US Treasury bill rate used as a proxy for foreign real interest rate, because it is risk-free. A negative relationship is expected between capital flight and interest rate differentials.

External debt, following Harrigan et al. (2002), is used with intention to measure the risk of private asset expropriation. The risk of expropriation, for example, in the form of expected higher future taxation is very likely when there is an increase in the debt–income ratio. A positive relationship between the external debt (including long-term public debt) and capital flight is expected. It was proxied by ratio of external debt to GDP (*ibid*).

Financial development measures the size of the financial system in the country. It was measured as M2 as a percentage of GDP where M2 is the sum of currency outside bank and demand deposits plus quasi-money of central bank and commercial banks. According to Demirguc-Kunt et al. (2008), financial development reduces information and transaction costs of economic activities and, hence, increases domestic investment. Therefore, a negative relationship is expected between financial development and capital flight.

Governance describes how public institutions conduct public affairs and manage public resources. In line with Ali and Walters (2011), the Polity2 score, which captures the constraints placed on the chief executive, the competitiveness of political participation, and the openness of executive recruitment, was used as a proxy for governance. Higher value for governance signifies good governance, indicating less likelihood of political instability and, consequently, reduces capital flight since a politically stable economy is favourable for domestic investment. Hence, a negative relationship is expected between capital flight and governance.

Property right is defined as a law created by governments with regard to how individuals can control, benefit from and transfer property. It is believed that government enforcement of strong property right encourages individuals to hold more assets in their domestic economy. Following Acemoglu *et al*. (2003), and Ali and Walters (2011), property right protection was proxied by Polity IV's 'constraint on the executive'. Polity IV's 'constraint on executive' is used as a proxy for property right protection, because it measures the limit placed on the powers of the executive or the State in confiscating or expropriating individuals' privately owned asset.

Sources of Data

The study employed annual time series data covering the period 1986 to 2015 to investigate the statistical significance of the variables that relate to capital flight. The brevity of the sample period was dictated by the availability of consistent

data, compiled on an annual basis. All data series, with the exception of CF, was taken from IMF International Financial Statistics (2015), World Bank World Development Indicators (2015), Centre for Systemic Peace Polity IV (2015) and FRED (2015). Capital flight data for 1986-2010 was sourced from Boyce and Ndikumana (2012). Due to data constraint on the variables used by Boyce and Ndikumana (2012) in their capital flight estimate, capital flight data was extrapolated to 2015 where the average values were used from 2011-2015.Capital flight, interest rate differential and external debt data were transformed into logs in order to reduce outliers.

Results and Discussion

The section presents the empirical results. The results discussed here include unit root test for order of integration of the variables, structural break test, long run results and short run results.

Unit root test

The empirical report commences with a report of the results of unit root test. The test was conducted to ensure that the variables are stationary and that none of them was of an order greater than I (I). The Augmented Dickey-Fuller and Philip Perron tests for unit root were used and the results are presented in Tables 6, 7, 8, and 9 in the appendix. From the tables, it shows that at 0.01, 0.05 and 0.1 alpha levels the null hypothesis of non-stationary is rejected for some variables at their levels and others at their first difference. This indicate that the series is made up of I(0) and I(1) variables.

Structural break test

Between the periods 1986 to 2015, Ghana has witness a lot of economic crises (domestic and international) and policy interventions including: the adoption of highly indebted poor country initiative in 2001, currency re-denomination that led to an illusion or artificial improvement in the exchange rate in 2007 and the global economic crisis that started to emerge in 2007 and led to the turmoil in 2008. Against this background, conducting structural breaks test is very crucial. Therefore, the study implemented the Zivot and Andrews (ZA) (1992) unit root test, which considers single unknown structural break within the series. The results of the ZA unit root test, presented in Table 2, show that there was a structural break in economic growth in 2010, which could be attributed to a number of factors, including the rebasing of the economy (Kwakye, 2010; Ministry of Finance and Economic Planning, 2010). For instance, changing the base year of the national accounts from 1993 to 2006 pushed the country into a lower-middle income country status. The promulgation of a consumer protection law in the same period led to souring consumer confidence in the economy and forced an impressive improvement in private household consumption, and inflow of foreign financial resources for

various infrastructural projects (Bank of Ghana, 2006). Also, a structural break appeared in capital flight and this could be attributed to the year 2000 general elections, which led domestic investors to secure their funds by sending it abroad. Furthermore, structural break occurred in financial development in the year 2006, and this could be also attributed to the paper works on redenomination of the Ghana cedi in 2006.

Table 2: Results of the Zivot and Andrews (1992) unit root test.

Variable	**T-Statistic**	**Break Year**	**Decision**(break in variable)
*ln*CF	-14.017***	2000	Accept
RGDP	-5.880***	2010	Accept
*ln*ID	-3.599	2010	Reject
*ln*DBT	-3.809	1990	Reject
FD	-4.992**	2006	Accept
GOV	-2.600	1991	Reject
PR	-3.156	1992	Reject

*** p<0.01, ** p<0.05

Result of the bounds test for

Due to the small sample size as a result of data constraints and order of integration of variables in the equation (5), the study employed autoregressive distributed lag model and the model is estimated based on maximum likelihood estimation technique. Table 3 presents the results of the bounds test for co-integration between capital flight and its determinants. The result depicts that the joint null hypothesis of no co-integration is rejected at 0.01 alpha level as the calculated F-statistic value of 6.8537 exceeds the upper bound critical value of 4.540 at 99% level. This implies that there is an existence of long-run relationship between capital flight and the determinants used in this paper.

Table 3: Results of Bounds Test for the Existence of Co-integration

	90 % Level		95% Level		99% Level	
Intercept with no trend	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
K=6	2.141	3.250	2.476	3.646	3.267	4.540
Dependent Variable					F-Statistics	
$F_{\ln CF}\left(\ln CF \mid RGDP, \ln ID, \ln DBT, FD, GOV, PR\right)$					6.8537 [.007]***	

Note: Critical values were obtained from Pesaran and Pesaran (2010), Apendix B, Case II, Statistical Table; *** denotes statistical significance at 1% level and K is the number of regressors.
Source: Computed by the authors.

Short run results

After establishing long-run relationship between capital flight and the independent variables by estimating the long-run model, the next step in the ARDL approach to is to model the short-run dynamic relationship among the variables within the ARDL framework. The short run model includes the level as well as lagged of each variable. The estimated model is selected based on SBC. Table 4 reports the results of the estimated error-correction model of capital flight in Ghana using the ARDL approach.

From Table 4, the results showed that the effect of lag of capital flight on current values of capital flight in the short-run is positive and statistically significant at 0.01 level. This finding suggests a tendency for capital flight to persist overtime (habit formation hypothesis) and it stresses the spillover effects of previous capital flight on to the current period's capital flight. This result is in line with those of empirical studies by Al-Fayoumi, AlZoubi, and Abuzayed, (2012); Geda and Yimer, (2015); Ndikumana and Boyce, (2008); and Nyoni (2000).

Except lag of external debt to GDP and lag of financial development, the signs of the short run co-efficient concur with long-run estimates. The negative coefficient of external debt to GDP indicates that a dollar increase in last year's external debt to GDP will lead to approximately 0.09 percent reduction in capital flight in the country in the short-run, holding all other variables constant. This negative effect of last year's external debt to GDP on capital flight in the short-run can be explained that previous year's borrowed funds served as inflows of external capital. Also, borrowed funds do not mature in the short-run and, hence, investors do not form expectations about possible inflationary tax by the government, since loan repayment occurs after the loan is matured in the long-run. Also, lag of financial development had unexpected positive coefficient and is statistically significant at 0.01 alpha level. This means that previous year's financial development will increase capital flight by about 0.17 percent in Ghana in the short-run. This positive effect of the previous year's financial development on capital flight in the short-run can be explained that in the previous year financial development was in its early stage, where information cost and other costs of undertaken investment activities in the country were still be high. Therefore, domestic investors took refuge in foreign investment leading to capital flight. The results also show that there is short-run relationship between capital flight, real GDP growth, interest rate differential, external debt to GDP ratio, financial development, governance and property rights.

Table 4: Estimated Short- Run Coefficient Using the ARDL Approach

ARDL (2,0,0,2,2,0,0) selected based on SBC Dependent Variable: lnCF

Regressors	Coefficient	Standard Error	T-Ratio	[P-Values]
Constant	-.0079	.0207	-0.3816	[.706]
ΔlnCF(-1)	.4565	.0194	23.5309	[.000]***
ΔRGDPG	-.0016	.0007	-2.2857	[.044] **
ΔlnLID	-.0493	.0089	- 5.5393	[.000] ***
lnDBT	.0451	.0109	4.1376	[.001]***
lnDBT(-1)	-.0889	.0109	-8.1560	[.000]***
ΔFD	-.0020	.0005	-4.000	[.001]***
ΔFD(-1)	.0017	.0005	3.4000	[.008]***
ΔGOV	-.0060	.0020	-3.0000	[.008]***
ΔPR	-.0156	.0055	-2.8364	[.011]***
ECM(-1)	-.8208	.0188	-43.6596	[.000]***

R-Squared .9955 R-Bar-Squared .9923
DW-statistic 2.0142 F-stat. F(10, 19) 374.3202 [.000] ***

Note: ***, **, denote significance level at 1% and 5% respectively.

Source: Computed by the authors.

Long-run results

Table 5 presents long-run estimates of determinants of capital flight in Ghana. The results in the table show that all the co-efficient have their apriori expected signs in the long-run. From the results, the coefficient of real gross domestic product growth is negative and statistically significant at 0.05 alpha level. The result indicates that, holding all other variables constant, if real gross domestic product in Ghana grew by one percent capital flight will reduce by approximately 0.2 percent. This means that increasing real gross domestic product has the potential of reducing capital flight in Ghana. It can be argued that higher real GDP growth rates signal the presence of attractive investment opportunities at home. Such opportunities encourage investors to undertake more domestic investments, thereby reducing capital flight. This empirical

finding provides some support for the hypothesis that capital flight is higher when a country's rate of economic growth is low. This implies that low economic growth is an indication of low profitability of domestic investment and, therefore, capital will thus tend to flee the country. The negative effect of real gross domestic product growth rate on capital flight concurs with the findings of Lawanson (2007), and Alam and Quazi (2003) in their study for Nigeria and Bangladesh respectively. Lawanson concluded that deterioration in the performance of an economy increases the proportion of private wealth portfolio held abroad. However, it contradicts the findings of Ng'eno (2000), who found the coefficient to be positive and significant.

Table 5: Estimated Long- Run Coefficient Using the ARDL Approach

ARDL (2,0,0,2,2,0,0) selected based on SBC Dependent Variable: CF

Regressors	Coefficient	Standard Error	T-Ratio	[P-Values]
Constant	-.0097	.0252	-0.3849	[.706]
RGDPG	-.0020	.0009	-2.2222	[.048]**
LID	-.0600	.0108	-5.5556	[.000]***
LDBT	.0678	.0128	5.2969	[.000]***
FD	-.0019	.0008	-2.3750	[.022]**
GOV	-.0073	.0024	- 3.0417	[.008]***
PR	-.0190	.0067	- 2.8358	[.011]**

Note: ***, **, denote significance level at 1%, and 5% respectively
Source: Computed by the authors.

The coefficient of interest rate differential had the expected negative sign and is statistically significant at 0.01 alpha level. Thus, if the country's interest rate differential increases by one percent, capital flight will reduce by approximately 0.06 percent in the long-run, all other things being equal. This indicates that a higher domestic interest rate as compared to foreign interest rates has a significant reduction effect on capital flight in Ghana. It also implies that higher domestic interest rates, as against foreign interest rates, will attract inflows of capital from abroad and also encourage domestic investors to undertake more investments locally, thereby reducing capital flight. The result is in line with portfolio choice theory, which was pioneered by Markowitz (1952). The result also confirms most findings of the empirical studies in the literature. Specifically, it is consistent with findings by Le and Rishi (2006) and Raheem (2015) that interest rate differential negatively and significantly impacts capital flight.

Moreover, in line with expectation, the coefficient on external debt to gross domestic product is positive in sign and it is statistically significant at 0.01

alpha level. The coefficient of external debt stock to gross domestic product indicates that holding all other variables constant, one percent increase in external debt stock to gross domestic product will lead to increase in capital flight by approximately 0.07 percent in the long-run. It can be argued that growing foreign debt in the country may increase expectations about exchange rate depreciation and increase in taxation, which provides a stimulus to hold foreign assets and, hence, capital flight in the long-run. The result supports the empirical findings of Makochekanwa (2007). He concluded that external debt in Zimbabwe determines capital flight in the long-run. The result also concurs with those of Ndikumana and Boyce (2003), Beja Jr et al., (2005), and Geda and Yimer (2015), who found a positive relationship between capital flight and external debt stock.

Again, the proxy used to measure financial development, that is, M2 to GDP ratio, had its expected negative sign, and it was also statistically significant at 0.01 level. The results implied that financial development in the country can reduce capital by approximately 0.19 percent in the long-run. It can be argued here also that, in the long-run, financial development reduces information and transaction costs of economic activity (Demirgüç-Kunt et al., 2008) and, hence, economic agents will be motivated to undertake domestic investment due to low investment cost and consequently reduce capital flight. This result supports the findings of Raheem (2015) in his study involving twenty eight Sub-Sahara Africa countries. It also concurs with the findings of Kipyegon (2004) on determinants of capital flight in Kenya. However, Collier *et al* (2001b), and Boyce and Ndikumana (2003), using M2/GDP and *M3/GDP* respectively as proxy to financial development, found the coefficient to be negative and insignificant. This contradiction may be due to the fact that these other studies used cross country data set. The empirical finding in this study suggests that financial development in Ghana can reduce capital flight.

Governance, which was used to explore the effect of how public institutions conduct public affairs and manage public resources on capital flight, is also statistically significant at 0.01 level and carried the expected negative sign. The results explain that improvement in governance in Ghana can reduce capital flight by approximately 0.73 percent in the long-run. This is because good governance is a pre-requisite for politically stable environment which is friendly for domestic investment. Therefore, this finding suggests that poor governance in Ghana is a driver of capital flight in the long-run since poor governance gives indication for possible political upheaval. However, Ali and Walters (2011), in their study on the 'Causes of Capital Flight from Sub-Saharan Africa', found governance to be insignificant in causing capital flight.

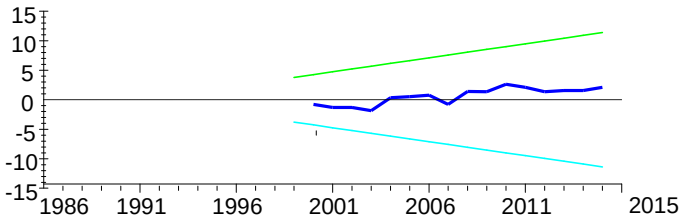
Finally, the coefficient of property right had its expected negative sign and is significant at 0.05 level. This indicates that there is a negative relationship between capital flight and stronger property rights. It suggests that if the country constrains arbitrary state action in confiscating privately owned assets, it tends

to have lower shares of capital flight in gross domestic product. This finding is in line with that of Ali and Walter (2011), in their study on causes of capital flight from Sub-Saharan Africa.

The results suggest that there is long-run relationship between capital flight, real GDP growth rate, interest rate differential, financial development, ratio of external debt to GDP, governance and property right.

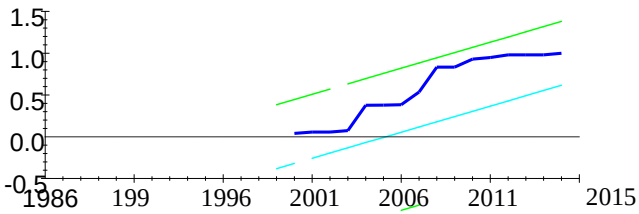
Model Stability Test

Model stability test was conducted to justify the credibility of the results of the estimated model. The cumulative sum of recursive residuals and cumulative sum of squares of recursive residuals plots are depicted in Figures 1 and 2 respectively. The null hypothesis is that the coefficient vector is the same in every period and the alternative is that it is not. The cumulative sum of recursive residuals and cumulative sum of squares of recursive residuals statistics are plotted against the critical bound of 5 percent significance level. The decision rule is that if the plot of these statistics remains within the critical bound of 5 percent significance level, the null hypothesis cannot be rejected. Based on Figures 1 and 2, the plot suggests the absence of instability of the coefficient, since the plots of all co-efficient fall within the critical bounds at 5 percent significance level. Thus, all the co-efficient of the estimated model are stable over the entire period used for the study.



The straight lines represent critical bounds at 5% Sisignificance level

Figure 1: Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Figure 2: Plot of Cumulative Sum of Squares of Recursive Residuals

Conclusion The estimated long-run and short run results shows that increase in real gross domestic product, higher domestic interest rates over foreign interest rates, improvement in financial development, good governance and strong property rights reduce capital flight. However, in the long-run these variables will reduce capital flight more as compare to short-run. Also, lag of external debt to GDP ratio was found to reduce capital flight in the short-run. The results indicated that accumulation of external debt cause capital flight in the long run while lag of financial development and lag of capital flight causes capital flight in the short run. Based on the findings, the policy implications are that: Governments in developing countries should adopt pro-growth economic policies. Precisely, the government of Ghana should implement strategies (such as, strengthening export promotion measures) to support the private sector for more growth. It is recommended that Bank of Ghana (BoG) needs not only to ensure positive real domestic interest rates, which guarantee interest on capital without being eroded by inflation tax, but also to reduce the differential with foreign interest rates to provide a competitive ground to attract capital into the country and, hence, reduce capital flight. Also, external borrowing needs to be reduced by government and that government should use more domestic debt instruments (example, government bonds) to take advantage of domestic borrowing to finance government expenditure where necessary. Moreover, Bank of Ghana (BoG) should improve on developing the financial sector in order to reduce information and transactional cost of doing business in Ghana to stem capital flight and also to attract inflow of capital. Furthermore, there is the need for accountability, transparency, and participation from government to ensure good governance. Lastly, National Civil Commission should educate the populace on laws covering property right and also such laws need to be strengthened by government to safeguard domestic investors from fear of property confiscation.

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APPENDICE

Table 6: Results of Unit Root Test with constant only: ADF Test

At Levels			At First Difference			
Variable	ADF-Statistic	Prob. Value	Variables	ADF-Statistic	Prob. Value	I(O)
lnCF	-18.9198	.0001***	ΔlnCF			I(0)
RGDPG	-0.3344	.9070	ΔRGDPG	-7.7875	.000***	I(1)
lnID	1.0220	.9957	ΔlnID	-10.6263	.0001***	I(1)
lnDBT	-1.3761	.5799	ΔlnDBT	-5.4137	.0001***	I(1)
FD	-1.7258	.4082	ΔFD	-5.7125	.0001***	I(1)
GOV	-1.5389	.5001	ΔGOV	-4.9744	.0004***	I(1)
PR	-5.0418	.0003***				I(0)

Note: *** indicate the rejection of the null hypothesis of non-stationary at 1% level of significance, Δ denote first difference, and I(0) is the order of integration. The values in parenthesis are the P-values.
Source: Computed by the authors.

Table 7: Results of Unit Root Test with intercept and Trend: ADF Test

At Levels			At First Difference			
Variable	ADF-Statistic	Prob. Value	Variables	ADF-Statistic	Prob. Value	I(O)
lnCF	-13.4971	.0000***	ΔlnCF			I(0)
RGDPG	-4.1648	.0139**	ΔRGDPG			I(0)
lnID	-1.0595	.9189	ΔlnID	-6.1816	.0001***	I(1)
lnDBT	-2.4689	.3397	ΔlnDBT	-5.3311	.0009***	I(1)
FD	-2.0094	.5720	ΔFD	-5.7415	.0003***	I(1)
GOV	-1.0445	.9214	ΔGOV	-5.2686	.0011***	I(1)
PR	--5.5157	.0006***				I(0)

Note: *** and ** indicate the rejection of the null hypothesis of non-stationary at 1% and 5% level of significance respectively, Δ denote first difference, and I(0) is the order of integration. The values in parenthesis are the P-values.

Source: Computed by the authors.

Table 8: Results of Unit Root Test with intercept only: PP Test

At Levels			At First Difference			
Variable	PP-Statistic	Prob. Value	Variables	PP-Statistic	Prob. Value	I(O)
lnCF	-3.3136	.0235**	ΔlnCF			I(0)
RGDPG	-2.6701	.0914*	ΔRGDPG			I(0)
lnID	1.1283	.9968	ΔlnID	-5.5942	.0001***	I(1)
lnDBT	-1.1128	.6970	ΔlnDBT	-5.6279	.0001***	I(1)
FD	-1.6912	.4250	ΔFD	-5.7504	.0001***	I(1)
GOV	-1.7022	.4196	ΔGOV	-4.9651	.0004***	I(1)
PR	-5.0488	.0003***				I(0)

Note: ***, ** and * indicate the rejection of the null hypothesis of non-stationary at 1% , 5% and 10% level of significance respectively, Δ denote first difference, and I(0) is the order of integration. The values in parenthesis are the P-values.

Table 9: Results of Unit Root Test with intercept and trend: PP Test

At Levels			At First Difference			
Variable	PP-Statistic	Prob. Value	Variables	PP-Statistic	Prob. Value	I(O)
lnCF	-3.2059	.1030	ΔlnCF	-12.3014	.0000***	I(1)
RGDPG	-4.2295	.0120**	ΔRGDPG			I(0)
lnID	-1.0190	.9255	ΔlnID	-6.1886	.0001***	I(1)
lnDBT	-2.5493	.3042	ΔlnDBT	-5.5691	.0005***	I(1)
FD	-2.0628	.5439	ΔFD	-5.7415	.0003***	I(1)
GOV	-0.8209	.4196	ΔGOV	-5.5894	.0004***	I(1)
PR	-5.5644	.0005***				I(0)

Note: *** and ** indicate the rejection of the null hypothesis of non-stationary at 1% and 5% level of significance respectively, Δ denote first difference, and I(0) is the order of integration. The values in parenthesis are the P-values. Source: Computed by the authors.