KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF ECONOMIES

EFFECT OF FOREIGN DIRECT INVESTMENT ON EXCHANGE RATE AND PUBLIC DEBT IN GHANA

BY

ERNEST OPPONG

(BSC BUSINESS ADMINISTRATION ACCOUNTING, ICAG)

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DECLARATION

I hereby declare that, this submission is my own work and is to the best of my knowledge. It does not contain any material previously published by myself or another person except where there is due acknowledgement in the text.

Ernest Oppong (PG5464418)	……………...	…………………….
(Student)	Signature	Date

Certified by

John Bosco	………................	………………..….
(Supervisor)	Signature	Date

Certified by

Prof. K. O. Boateng	…………..........	…………………..….
(Director, IDL)	Signature	Date

ABSTRACT

The purpose of this study is to examine the effect of Foreign Direct Investment on Exchange Rate and Public Debt in Ghana. The study used data from 1975 to 2015 period from the World Development Indicators. The time series estimation techniques were adopted in order to analyze the data gathered. The study shows that Foreign Direct Investment, Interest Rate and Inflation significantly affect Exchange Rate in the long run in Ghana. The study further shows that FDI does not affect Exchange Rate in the short run. The finding also shows that, FDI affect Public debt in the short run. It is thus recommended that efforts should be made by policy makers, government as well as relevant authorities to frame policies aim at creating conducive investment environment so that both Ghanaian and non-Ghanaian Investors will get the encouragement to invest in Ghana.

Keywords: Foreign Direct Investment, Exchange rate, Public debt, Inflation.

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DEDICATION

This work is dedicated to the Almighty God for his care and protection in completing this study and to my family for their support and encouragement.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The 1980s and 1990s was a notable trend of internationalization of the world economy, sustained by the rising portfolio investment and mostly foreign direct investment movements. A growing share of flows concentrated towards unindustrialized countries (Calvo et al., 1996) mostly took the method of foreign direct investment (FDI) rather than portfolio or equity flows. Increasing global capital streams have given rise to global interdependency of the economies and have strengthened the globalization course. Following the piercing decline in capital flows worldwide caused by the global crisis of 2007-2008, FDI flows to developing countries rebounded more speedily than other mechanisms of global capital flows (Duttagupta et al., 2011) and remain high, at roughly 10 percent of gross fixed capital formation.The understanding of the course of causation and connection with FDI and other macro-economic parameters is therefore relevant as it guides economies in defining their policies on development.

Ghana, among less endowed countries, can tally foreign direct investment (FDI) as one of the focal influences to transform its macroeconomic stability. FDI is vital to countries that are less endowed if it can successfully engage its negative impacts. FDI is a major source of capital influxes with liberal impact on the economic activities of the host nation which embraces technology transmission, technological, expert human capital, development in international trade, and a viable business environment (OECD, 2002).

Exchange rate can be explained to mean the price of the local currency to overseas currency. Exchange rate can influence FDI (Golbderg et al., 2005). It was also proposed by (Morrissey et al., 2004) that, FDI inflows results to increase in real rate of exchange which will make FDI can have a direct impact on the exchange rate fluctuation in a country. Studies brought out findings that companies which are involved in trading internationally may face risk of conversion rate as may compare with local sales. Putting it in another way, nations involved in marketing worldwide may at times of currency fall, even outperform nations without such services. Nations which make use of exchange rate to stabilise the rate of inflation always experience a boom in activities in the economy like investment, consumption, investment, and GDP expanding. The significance with respects to exchange rate was highlighted by some scholars as Kiguel (1992) who stated that, normally unindustrialized and advanced nations which standardise suitable rate of exchange, sufficiently closer to the actual equilibrium rate of exchange. Some economists proclaimed that numerous macroeconomic occurrences especially in the emerging nations are from inadequate policies in exchange rate, instance is Africa (devaluation of the francs), Crunches in Asia in mid-1994, and Mexico currency crises in 1994. Likewise, some nations like; Brazil, Argentina and Columbia all kept strategies that seeks to extend their services and goods to foreign nations during the middle of 1960 like Mexico in 1990 and not import from any nation.

In every economy, government debt accumulation is a vital tool for a strong and sound financial sector, as such, increase in government debt should be well planned. The upsurge in government debt can be attributed to the constant need of government to borrow in other to finance national budget deficits. (Osinubi and Olaleru, 2006). The global financial crisis in recent years have resulted in a sharp increase in government debt in many economies. The quest of national governments to boost aggregate demand through the recapitalization of banks and increasing government expenditure as a response to the financial and economic crisis has worsened the debt situation of many economies.

On a more general base, a country's debt has adverse effect on every nation's progress, but on the other side, debt is one of the main sources of funding government budget shortfall. The proper use of public debt can lead to development in the economy and increase social well-being of the citizens. It is also seen that public debt functions like a two edged sword. The over reliance on a country's debt increases macroeconomic risk, impedes economic development and hinders growth in the economy (Azam and Asmatullah, 2008).

1.2 Statement of the problem

For strong macroeconomic performance indicators to be achieved, there is the need for adequate resources to sustain it. Investments forms an important aspect of several economic systems and do serve as major factor influencing higher level of macroeconomic performance in the economy of most countries. One of biggest economic problems facing developing countries of which Ghana to arrive at a sustained equitable growth is lack of domestic savings to finance its investment (UNCTAD, 2001). This makes several of the LDC's to depend heavily on external capitals. One of the consequences of this reliance on foreign capital is a high external debt.

Exchange rates can affect the entire volume of FDI that takes place and the distribution of this investment spending over a series of countries. When a currency depreciates, meaning its value drops compared to the value of another currency. This exchange rate movement has two potential consequences on FDI. First, it reduces that country's wages and production costs compared to those of its foreign counterparts. Through the "relative wage" channel, the depreciation of the exchange rate increases the rate of earnings to foreigners thinking of foreign investment project in a country. A country facing real currency depreciation has improved “locational advantage" or attractiveness as a location for receiving productive capacity investments (Linda S Goldberg,2006).

Numerous studies found adverse relationship between public debts and FDI. Nunnenkemp in 1991 concluded that debt encumbrances that are higher creates constrains not only for private lending but FDI inflows as well. Shamsudin (1994) also found per capita debt to be negatively significantly related with FDI. Khattak, Ijaz and Azam (2005) also found a substantial negative relationship between FDI and external debt. Yasmin et al., 2005 also found no significant relationship with external debt and FDI of countries that are developing.

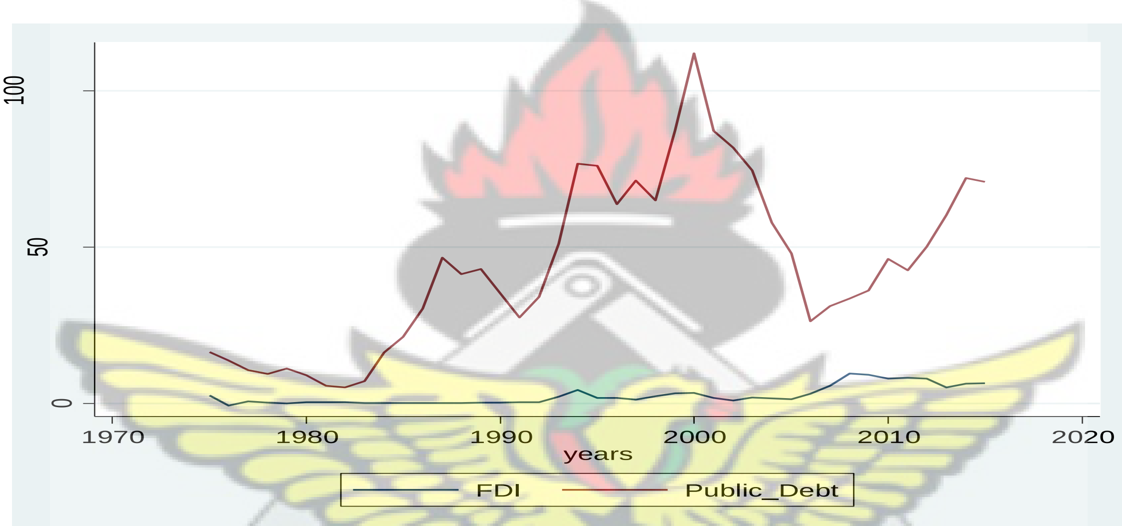
Fluctuation in exchange rate usually have two significant consequences for FDI. Thus when a country suffers depreciation in currency FDI becomes attractive to foreign investors in terms of location. On the other hand, depreciation of the exchange rate increases the potential rate of returns to foreign investors who engaged investments directly in foreign soil (Chen et al., 2006). Flein and Rosengren (1994) found that the depreciation of the home currency leads to increases in the foreign investor’s wealth relatively and can as well lead to multinational acquisitions among domestic and foreign firms.

For some time now, FDI in Ghana has been increasing. However, the level of public debt to GDP remains very high. The Periods from 1975 to 1980 in Ghana saw a decline in FDI as a percentage of GDP from 2.52 to 0.36 whiles at the same time public debt as a percentage of GDP fell from 16.47 to 9.05.

The FDI as a percentage of GDP remained constant after 1980 to 1990. On the other hand, public debt as a percentage of GDP increased to from 1980 to 1989 and dropped to 27.43 in

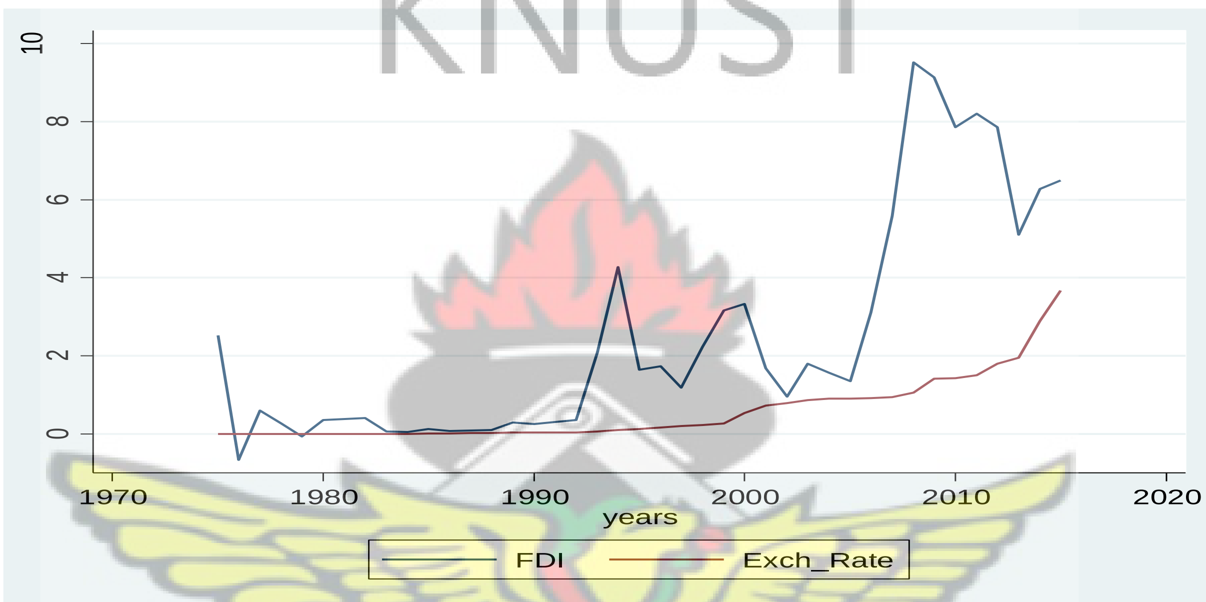
1991. From 1991, FDI increased with little fluctuations to 2000 while's public debt increased very widely from 1990 to 2000, with some fluctuations in between. FDI remained constant from 2000 and increased in between 2000 to 2010 while's public debt also declined from 3.33 to1.35 in 2005 and increased to 7.85. From 2010 FDI increased from 46.61 to 72.15 and declined to 70.82 in 2015.

Figure 1.1 Trends in FDI and Public Debt (source: IMF, World development indicators,2015)



The Periods from 1975 to 1980 in Ghana also saw a decline in FDI as a percentage of GDP from 2.52 to 0.36 with little fluctuations whiles at the same time exchange rate fell narrowly from 0.000115 to 0.00027. The FDI as a percentage of GDP remained constant after 1980 to 1990, on the other hand exchange rate increased from 1980 to 1989 and increased sharply to 0.1 in 1994. From 1991, FDI increased to increase with fluctuations to 2000 whiles exchange rate increased very from 1990 to 2000. FDI increased from 2000 and increased in between 2000 to 2010 whiles exchange rate also increased from 0.54 in 2000 to 1.43 in 2010 and persistently increased to 3.67 in 2015. From 2010 FDI increased from 46.61 to 72.15 and declined to 70.82 in 2015. This simply means that FDI, and exchange rate have been on the ascendancy but generally fluctuating.

Figure 1.2 Trends in FDI and Exchange Rate (source: IMF, World development Indicators, 2015)



From the chart above, there is no clear cut link between FDI and public debt. There is however a direct link between FDI and rate exchange. This takes us back to the question; what has been the empirical effect of FDI on rate of exchange and public debt. This study contributes to literature by adding empirically to the current literature on the effect of FDI on exchange rate and public debt in Ghana.

1.3 Research Objectives

1. To estimate the effect of foreign direct investment on exchange rate.
2. To estimate the effect of foreign direct investment on public debt.

1.4 Research Questions

1. What is the relationship between FDI and exchange rate in Ghana?
2. What is the relationship between FDI and public debt in Ghana?

1.5 Scope of the Study

The study looks at the evaluating the effect of FDI on exchange rate and public debt in Ghana. The study is intended to cover significant data from 1975 to 2015. This is well-thought-out as long enough to offer information that is suitable on the relationship being studied, and well considered due to data availability.

1.6 Significance of the Study

From 1990s, Ghana has seen a massive inflow of foreign direct investment spread across the various sectors of the economy. Most of the foreign investment in Ghana is concentrated in the mining and service sector (UNCTAD,2008). In 2015, Ghana received USD$ 3.2b (UNCTAD,2015). These inflows are expected to have a major impact on the macroeconomic performance indicators of Ghana.

The study aims at contributing to literature by investigating on the effect of FDI on exchange rate and public debt in Ghana. This will aid advance studies by researchers in this particular area in Ghana since there is little evidence on this relationship.

The study will be of prominence to the government particularly in line with the National Treasury for policy making decisions. Thus the findings of the study will inform the government to learn how to develop appropriate policies to attract the right volume of FDI in achieving its currency and debt management goals.

1.7 Organization of the Study

The work is being organized into five chapters including chapter one which contains the introductory aspect. Chapter two will cover the review of theoretical and empirical literature whiles the chapter three will look at the methodology of the study. Chapter four will highlight the data analysis, presentation and discussion whiles chapter five consist of summary, conclusion and recommendations.

CHAPTER TWO

LITEREATURE REVIEW

2.1 Introduction

This chapter seeks to discuss relevant explanations, existing theories and empirical literature on the impact of FDI on public debt and exchange rate.

2.2 The Concept of Government Debt

Debt is created through the act of borrowing. Debt refers to the amount of money borrowed by an entity from another entity with an obligation of paying it back. Governments have always been indebted to her citizenry from the ancient to the contemporary world. For a sustained development and growth, every economy requires capital stock which is important but relatively scarce. Government borrowing is basically government debt. The total debt of a country comprises of private debt and government debt. Government debt refers to the total value of debt securities issued by the government backed by commitment to make interest payments to holders. Government debt comprises of two components, namely; domestic public debt and external public debts. Domestic debt of a nation is the internal debt obligation of a country while external debt of a nation is the external debt obligation of a country. (Ntshakala, 2015). From the analysis of balance sheets, government debts are regarded as liabilities on the balance sheet of the government while debt issued by government are regarded as assets on the balance sheets of lenders. (Vosyliute, 2014).

From the perspective of Asley (2002), in developing countries the upsurge in external public debt levels negatively affect economic performance and their abilities to trade. Debt over-hang do not only affect monetary policies but also affects export promotion and reduction in trade barriers which will open up the economy and enhance the performance of trade. Debt servicing influences economic development negatively. (Muhtar, 2004). From the author's perspective, scarce resources needed for socio-economic development and reduction of poverty are used to service debts.

According to Okewale (2012), government debt can be classified into two components. Thus; productive public debt and dead weight debt. When nations borrow in other to purchase different sort of assets, the debt is termed to be a productive one but, those taken to support wars and expenses on current expenditure classified as dead weight debt. Eaton (1993), taking up government debt is not bad when the debt is used efficiently to increase assets which creates employment opportunities.

2.2.1 Trend of Government Debt in Ghana

Ghana's government debt in all categories increased substantially in the 1990's. Both in-house and foreign government debt rose by 30 percent and 7.6 percent yearly respectively. External government debt constituted a large chunk of government debt representing 85 percent of total public debt. (Fosu, 2001). An upsurge in domestic government debt began in the 1990's. Domestic government debt was very low in the 1980's. (Meng, 2004). Domestic government debt in issued bonds increased drastically from 3 percent of GDP at end of year in 1990 to 25 percent in the late 1990's. The huge leap can be attributed to two main reasons. First, an increase in government spending, troops were sent to Liberia to participate in the peacekeeping by ECOWAS Monitoring Group. Secondly, foreign aid was limited to Ghana in the 1990's (Ameyaw, 2015).

As domestic government debt rose in the 1990's, external government debt also increased drastically. The debt to GPD ratio of external government debt rose from 56 percent in 1990 to 97 percent at the close of 1994. In 1996, the debt to GDP ratio of external government debt reduced to 84 percent. (Fosu, 2001). Ghana's over-reliance on borrowing from both domestic and external sources to finance her development witnessed her debt to GPD ratio increase above 100 percent of GPD. Ghana's total debt stock ₵41.10 trillion representing 123.4 percent of her output. (Kwakye, 2012). This threshold was considered unsustainable. After the introduction of the HIPC initiative by the World Bank and IMF in 1996, Ghana was considered as HIPC because of her unsustainable level of debt. Ghana enjoyed debt reliefs as a result of subscribing to the HIPC initiative reducing her debt to GPD ratio from 124 percent in 2000 to 87 percent in 2002. (IMF World Economic Outlook, 2014). After a successful completion of the HIPC initiative in July, 2004, Ghana's debt to GPD ratio declined from 123.4 percent to 26.1 percent of GDP in 2004.

Surprisingly, Ghana's public debt has been on an upward trajectory since 2007. Ghana's debt to GPD ratio rise from 26 percent in 2004 to 31 percent in 2007. At the close of 2008, total public debt consisted of 49 percent of external government debt and 51 percent of domestic government debt representing 33.3 percent of GDP. (Ameyaw, 2015). Government debt increased from GH₵13.26 billion in 2009 to GH₵ 21.30 billion in 2010 representing an increase of 60.6 percent. Total government debt increased from GH₵ 21.30 billion in 2010 to GH₵ 39.80 billion in 2012 representing 49.076 percent of GDP. As at the end of 2015, Ghana's public debt was GH₵ 97.2 billion representing 71.6 percent of GDP.

2.3 Theories of Government Debt

2.3.1 Debt Overhang Hypothesis.

This explains the adverse impact of debt in a nation on economic progress. From the hypothesis, government debt stock and debt servicing affects economic growth by impeding private investment and altering public expenditure. High interests on external public debt can increase budget deficits. The Debt Overhang Hypothesis explains that external public debt is an impediment to domestic investment and hinders economic growth because foreign exchange earned would be used to settle foreign creditors. Eventually, this may increase interest rate and lead to the crowding-out of investment thereby reducing growth. Also, the theory suggests a non-linear association with government debt and development. There is the possibility that in the future, public debt stock will increase and exceed the nation's ability to honor its debt obligations. As the State spends more on debt-servicing, it discourages both domestic and foreign investments.

Krugman (1988), a nation experienced debt overhang when national debt exceeds the current value of future resources. As a result, a surge in a nation's public debt stock creates uncertainty amongst investors regarding the actions and policies to be implemented by the government on meeting its debt obligations and bringing public debt to sustainable levels. Krugman (1988) asserts that investors will have the perception that the government will use distortionary tax policies to finance the debt. As a result, investors will adopt a wait and see posture which affects investment and growth.

External public debt can affect investment through two different ways. Thus, credit rationing and debt overhang. (Borenzstein, 1990). Using a stimulation technique, the author found that, the two-mutually exclusive were significant in determining the significant decrease in investment in highly indebted poor countries in the 1980's. Again, credit rationing as a result of high public debt was a disincentive to investment than debt overhang.

2.3.2 Dynamic Theory of Government Expenditure, Taxes and Debt

This theory was developed by Barro (1979) and was developed on the basis of a well-known tax smoothening method to fiscal policy. The theory predicts that deficits, as well as budget surpluses will be used by government as a cushion to stall drastic changes in tax rate. (Battaglini and Coate, 2008). Hence, government will experience deficits in times of more expenditure request and surpluses in times of low spending requirements. The underlying assumptions to this theory are that; government is benevolent, fluctuation of government spending overtime and the deadweight loss of income tax being a convex function of tax rate. (Battaglini and Coate, 2006). The economic intuition of this theory is similar to the tax smoothening literature. The difference between the two is that the government makes policy decisions instead of a benevolent planner. Bohn (1998) elaborates that through pork-barrel spending, policymakers can allocate revenues back to their localities. Revenue is raised by the legislature in two ways, thus; through a proportionate tax on income of labor and through borrowing from capital markets. Borrowing is done through the issuance of bonds. Bonds can be purchased by the legislature, with future spending financed by interest earnings. Public goods are financed by revenue from the public which will be beneficial to all citizenry and also aimed at providing district-specific transfers, which is commonly known as pork barrel spending. Policy decisions by the legislature takes the form of majority rule with legislative policy making modelled with the legislative negotiating tactic postulated by Baron and Ferejohn (1989). The extent of government debt shows as a state variable and create a dynamic relationship between policy-making periods which affects economic growth because debt accumulated is interest bearing which must be repaid whether the debt accumulated was used for public good or not.

2.3.3 Dual Gap Theory

From the dual gap theory developed by Chenery and Strout (1966), undeveloped economies are faced with two separate and independent obstacles in their quest to achieve economic growth namely; savings gap and foreign exchange gap. From the model, inflow of foreign resources and the attainment of targeted economic growth over time are the ways of filling up the gaps.

The theory specifies that economic growth is a function of investment and as such investment requires domestic savings. If there is a shortfall of domestic savings in other to attain the required growth rate, this results in savings gap. This creates the possibility of obtaining capital from abroad, which is identical to the shortfall in the form of public debt.

2.3.4 Ricardian Equivalence Public Debt Theory

The focal idea of the Ricardian Equivalence Public Debt Theory is that, government debt levels is not important and have no impact on progress of a nation. From the opinion of David Ricardo, debt of a nation is equal to future taxes. If government decide to reduce taxes, most economists will argue that consumption will increase thereby reducing savings and leading to accumulation of capital and slowed growth in the long-run. (Elmendorf and Mankiw, 1999). However, Ricardian theory elaborates that it affects neither consumption, accumulation of capital nor economic growth. Hence, a debt-financed tax cut do not result in aggregate wealth effects. Rationally, a user fronting present owing keeps for the future increase in taxes thereby not affecting all reserves in the economy. This theory is commonly used by economists against tax cuts, aimed at boosting aggregate demand.

2.4. Exchange rate Theories

2.4.1 The Traditional Approach Theory

This theory postulates that deprecation in currency will lead to high exports and corporate profit and this will adversely impact the prices of short period stock. As determined by this theory, the competitive capability of a company's transforms the worth of the company's benefits and liabilities ending in higher profit. This relationship is credited to Solnick (1987) who contended that an appreciation in currency will lessen Domestic Corporation's capacity to export, while currency depreciation will enhance their capacity to export.

2.4.2 Portfolio Adjustment Theory

According to Dornbusch and Fischer (1980, 2003), changes in the prices of stock will cause investors to adjust their portfolios. When the prices of stock increases, the wealth of shareholders increases and so does the wealth of country's because an increase in share prices increases the influx of foreign capital. Hitherto, when prices of stock decline, the wealth of shareholders deteriorates and the inflow of foreign capital decline. This causes a plunge in the need for money and as such a call for monetary authorities to come up with measures to curb this situation. In most cases, interest rate is lowered or reduced as a tool to mitigate this problem. A reduction in interest rate may compel investors to flow their capital outside to benefit from higher interest rate in other countries. Therefore, according to the theory of portfolio adjustment, lower stock prices may result in the depreciation of currency, hence a decrease in exchange rate.

2.4.3 The Flow-Oriented Model

Based on the link involving activities in a nation and rate of interest, there is a possibility of a connection between rate of interest and price of stock. Thus flow-oriented model of exchange rate Dornbusch and Fischer (1980) looks at the current account of the balance of payment and according to the model, changes in exchange rate affects trade position. Appreciation or depreciation of local currency affects international attractiveness of local goods, real income and output as well as the current account balance of the country. A decline in real exchange rate puts domestic or local firms ahead of their foreign contenders in the sense that in-house goods become more attractive relative to external goods and this in turn causes export of domestic goods to rise hence causing the inflow of foreign currency. Increase in foreign exchange inflow incomes have high probability of causing an increase in stock prices. This model therefore highlighted on positive link with price of stock and rate of exchange.

2.4.4 Portfolio Approach Model to Exchange rate

As stated by this model, actors allot their wealth or resources into various assets and as such, exchange rate is vital in neutralizing the demand for and supply of assets. Branson (1983) and Frankel (1983) argue that the portfolio balance model should reflect the call for domestic assets as against foreign assets. When there is an upward movement in the prices of local stock, individuals or agents demand more of domestic assets hence compelling local investors to sell their foreign assets which they deem as less profitable. Domestic investors dispose their foreign assets to acquire more national assets resulting in the weight of local currency. A rise in the value of domestic stocks directly and indirectly affect exchange rate. Investors are motivated to purchase domestic assets while disposing off foreign assets to acquire domestic currency required for purchasing up-and-coming domestic stocks. With this been said, a shift in the demand for and supply of currencies have the tendency of causing local currency to appreciate, hence leading to an increase in wealth of local investors. On the flip side, when domestic interest rate is high, the country shall experience foreign capital inflow since most investor would flow in their capital to cease the chance of the high interest rate and this will in the process cause the demand for domestic or local currency to rise and this may affect the prices of stock positively.

2.5 Relationship between FDI and exchange rate movements- Empirical literature.

In a study by Lily et al., 2014 on exchange rate movement and FDI in Asian Economies made use of yearly data on Asian economies, thus Philippines, Malaysia, Singapore, and Thailand. The study made use of time series analysis, specifically the Auto Regressive Distributed Lagged models. The results shown a high degree of significant long run cointegration with FDI and exchange rate in the situation of Malaysian ringgit, Singapore dollar and the Philippines peso. All countries showed a coefficient that is negative, and this indicates that the increases in Malaysian ringgit, Singapore dollar and the Philippines peso has a direct effect on foreign direct investment inflows. In terms of the causality test, both Philippines and Singapore showed a long run two-way causation between FDI and rate of exchange whiles a long run unilateral causality between FDI and exchange rate in Malaysia. The research also established a unidirectional causation among rate of exchange and FDI in the short run for Singapore.

In a study by Dusgupta, 2012 on the link between FDI and real exchange rate in India, found out that FDI and remittances of workers have an effect on real rate of exchange in India. This study made use of data in quarterly time series form and as well adopted the time series approach in analyzing it. The study was reliant on the idea that depreciation of domestic currency encourages inflow of FDI and result into the use of cheap intermediate goods of both traded and non-traded. Inflow of foreign capital causes current account shortfall and increase in real rate of exchange resulting to decreases in price of imports against the host country.

In the study conducted by Shah & Bagram (2012), on the effect of real rate of exchange fluctuations on inflow of FDI. The study used fourteen countries base on country by country basis, and placed them into time series research approach. The study used the VAR c-integration test and as well the Vector Error Correction Model. The study found that there is a solid co-integration between the long run and the short run instability of exchange rate and foreign direct investment for seven countries among the 14 countries of sample. Nevertheless, for the seven other nations the relationship was not significant. Wang& Wong, 2007 also carried out a study on FDI and rate of exchange using the panel regression method and the ordinary least squares. The study found out that high business cycle instability among OECD countries decreases the activities of FDI.

Chaudhary et al. 2012 studied on the effect of FDI on exchange rate volatility. He made use of the vector autoregressive model and found out that there is a positive link between FDI and real rate of exchange in the long run. This was linked to the idea in the study by Busse et al 2010 that foreign direct investment is indeed a long run investment activity. Therefore, when investors want to take decisions they should do so in the long run currency movement than the short run.

Beak and Okawa, 1998 also found out that depreciation of Asian currency as against the dollar rate considerably increases the foreign direct investment in export based leading sectors, such as electrical machinery and chemical machinery areas. The study was conducted on the effect of rate of exchange on foreign direct investment among the Asian countries. Foreign direct investment concerning electrical machines particularly is the most export oriented sector. 70 percent and more of the total sales revenue are generated by subsidiaries in Asia, were for export in 1997 to 1998. The results also suggested that the depreciation in the currency of Asia in relation to the dollar, made competitive the products in the export oriented machinery sector in trade internationally. Hence increasing the foreign direct investment in those countries as the production site for exports.

2.6 Relationship between FDI and public debt in Ghana-Empirical literature.

In a study by Azam & Khan, 2011 on the impact of Public debt on FDI in Pakistan, found that total FDI inflows into Pakistan recorded US$ 3205.4 million during 2008-09 as compared to US$ 3719.1 million in the last year which shows a decline of 13.8%. Likewise, Pakistan's total public debt estimated US$ 39593 million during 2007-08 and such as during 2006-07 per capita debt in Pakistan was US$ 247 million. The study used the secondary data ranging from 1981 to 2007. A simple log linear regression model and as the OLS were used in analyzing the data. The study found empirically that public debt is statistically and significantly related with FDI inflows in Pakistan. Thus Public debt dampens FDI inflows in Pakistan. The study highlighted the need for public debt management through a proper and vigorous policy on management, so as to exploit the benefits derived from FDI in Pakistan to its maximum.

Udomkerdmongkol, Gorg and Morrissey (2013) conducted an empirical study on local investment, FDI and external debt. The study employed the model of Dalmazzo and Marini (2000) to make forecasts on the relative importance of three different sources of financing: local capital self-financing, foreign direct investment and external debt financing, for domestic investment under two types of political regimes: politically unstable and politically stable. Based on fixed-effects estimation, the estimation results excluding any political factors are giving positive effects of domestic capital self-financing and foreign direct investment financing on domestic investment. There is no indication for a relationship between external debt financing and domestic investment in both regimes. The results propose that foreign debt financing has no effect on the investment.

Azam and Ullah (2011) studied the effect of public debt on FDI in Pakistan. The result indicated that, FDI is adversely affected by the country's bad debt state and implies a relatively unfavorable atmosphere for foreign investment.

Abala (2014) conducted a study on the effect of FDI on economic growth in Kenya. The study concluded that FDI plays a crucial role in economic growth. It rises competition in host nations, results into much needed capital. It also helps local firms to become productive by the implementation of technological system that is efficient. It was further understood from his study that foreign direct investment in Kenya are mostly market seeking and therefore require a growing GDP, good infrastructure as well as reduction in corruption levels.

In a study by Sackey, Keyeke and Nsoh (2012) on FDI and economic growth in Ghana, made use of the Augmented Dickey fuller, Vector Auto Regressive, unit root and co-integration test in a time series analysis. It was found a long run link between variables under study. Precisely, the study found a positive link between FDI and economic growth in Ghana. They concluded that Ghana should continue to improve its foreign and economic policy in order to attract a lot of investors which will help boost up the economy.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This section looks at the resources and methods use to undertake the study. Thus this includes research design, relevant data, analysing the data using the relevant and appropriate statistical data and tools that will be used to provide accurate results.

3.2 Research Design

According to Creswell (2009), a research design depicts the general picture as well as other thought that cover how the objectives could be attained including data collection and analysis through to the methods. The descriptive survey is deemed appropriate for the current study and the researcher considered its application for the study. According to Pilot and Hurgler (1995), it is only flexible in a descriptive survey to describe and make observations and possibly document happenings at a time when the research is being carried out. The descriptive sample survey is considered reliable when samples need to be generalized from a population to assist in making inferences from certain attributes or behaviour from the population Babbie (1990). Considering the subject and research perspective, the study used a quantitative research approach.

3.3 Types and Sources of Data

The study made use of secondary data which is in annual time series form, sourced from published information as well as reports on the variables of study from the period of 1975 to

2015. To be more specific, data was drawn from the Indicators of global progress and Ghana Statistical service official documents.

3.4 Model Specification

To be able to arrive at the effect of FDI on exchange rate and public debt, the study specifies the following general model:

$ExchR_i = f(FDI_i, OPN_i, INF_i INR_i)$………….…………………………………….... (3.1)

$PDebt_i = f(FDI_i, OPN_i, INF_i INR_i)$……….…………………………………………... (3.2)

where: $ExchR_i$ represents exchange rate, $PDebt_i$ represent public debt, FDI_i stands for foreign direct investment, OPN_i represent trade openness, INF_i represents inflation and finally INR_i represent interest rate.

The linear forms of the model is presented in the log form as;

$\ln ExchR_i = \beta_0 + \beta_1 \ln FDI_i + \beta_2 \ln OPN + \beta_3 \ln INF_i + \beta_4 \ln INR_i + \mu_i$……………. (3.3)

$\ln PDebt_i = \beta_0 + \beta_1 \ln FDI_i + \beta_2 \ln OPN + \beta_3 INF_i + \beta_4 INR_i + \mu_i$……………………. (3.4)

where $\beta_{0,}$ $\beta_1$and β_2 are the parameter estimates, μ_i is the stochastic error term and *i* stands for different period of time. Log transformation in this sense helps to linearize the variables for the study. The last three variables (INR, OPN, and INF) are used in the study as controls.

3.5 Estimation Procedure

3.5.1 Unit Root Test

In avoiding spurious regression and *I(2)* order in the ARDL model, the study relied upon the Augmented Dickey-Fuller (ADF) test. This aims at testing the stationarity of the data. Time Stationarity arises in time series with a constant mean remain constant over time. Under the stated null hypothesis of the presence of unit root in data (non-stationarity) against the alternative of unit root absence in data (stationarity of data), the study compares test statistics with the Mackinnon t-critical to determine the stationary nature of data used. Given the ADF equation with intercept and trend below:

$$\Delta Y_t = \beta + \rho t + \delta Y_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta Y_{t-1} + \varepsilon_t \quad \text{...} \quad (3.5)$$

where Y_t is the variable tested, the time trend is represented by *t*, ε_t is the white noise, and *k* is the chosen lag length according to Schwarz Bayesian Criterion. The constant is represented by β, δ is the arbitrary parameter, Δ is the first-difference operator and the lagged difference coefficient denoted by γ_i. The null hypothesis tested for the existence of unit root is given as:

$$H_0: \delta = 0$$

$$H_1: \delta < 0$$

3.5.2 Cointegration Test

The study used the cointegration method to test the presences of equilibrium long-run link between these variables instead of applying OLS which will likely produce unreliable regression result. In achieving this, the study employed a model that expressed exchange rate and public debt as a function of its lag and all predictor variables in an ARDL equation form. ARDL was employed due to its ability to efficiently incorporate dynamic changes in the predictors into the outcome variable. As argued by Banerjee *et al.* (1993) cited by Twumasi (2012) ARDL approach is desired due to its ability to capture both short-run and long-run effects on the dependent variable resulting from the explanatory variables.

Pesaran *et al.* (2001) argued that, following construction of ARDL model lag order the OLS estimation method can be used to measure the relationship among the variables. Also, with ARDL framework stationary and non-stationary variables combine of order zero *I(0)* and one *I(1)* can both make up the model's independent variables. Subsequently, the sample size for this study is best analysed within ARDL framework. The study therefore specified an ARDL conditional error correction model following Pesaran *et al* (2001) general model to test the long-run link between the dependent and explanatory variables using the F-statistics.

$$\begin{aligned} \mathrm{Dln}\, ExchR_t = {} & C + \alpha \ln FDI_{t-1} + \beta_0 \ln INR_{t-1} + \psi_2 \ln OPN_{t-1} \\ & + \delta_3 \ln INF_{t-1} \\ & + \eta_4 \ln INR_{t-1} + \sum_{i=1} \mathrm{OPN} + \sum_{j=1}^{b} \mu_j \ln DFDI_{t-j} + \sum_{m=1}^{e} \rho_m \ln DINF_{t-m} \\ & + \sum_{n=1}^{f} \phi_n \ln DINR_{t-n} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.6) \end{aligned}$$

$$\text{Dln}\,PDebt_t = C + \alpha \ln FDI_{t-1} + \beta_0 \ln INR_{t-1} + \psi_2 \ln OPN_{t-1} + \delta_3 \ln INF_{t-1} + \sum_{i=1}^{a} \lambda_i \ln DFDI_{t-i} + \sum_{j=1}^{b} \mu_j \ln DOPN_{t-j} + \sum_{m=1}^{e} \rho_m \ln DINF_{t-m} + \sum_{n=1}^{f} \phi_n \ln DINR_{t-n} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.7)$$

With the long-run multipliers been α, β, γ, ψ, δ, η, and θ, where the first difference is denoted by the letter *D* and the coefficient measuring the short-term dynamics are represented by λ, μ, π, ϖ, ρ, τ, ϕ and error term ε. Following the estimation of the ARDL model above, the generated F-statistics of this model was compared to Pesaran's *et al*. (2001) computed critical value bounds to confirm the joint long-run link with the lag explanatory variables and the dependent variable. Prior to this, the study assumes a null hypothesis of no cointegration (no long-run effect) against an alternative of existing integration with the dependent and the explanatory variables. Thus,

$$H_0: \alpha = \beta_0 = \gamma_0 = \psi_0 = \delta_0 = \eta_0 = \theta_0 = 0$$

$$H_1: \alpha \neq \beta_0 \neq \gamma_0 \neq \psi_0 \neq \delta_0 \neq \eta_0 \neq \theta_0 \neq 0$$

As Pesaran *et al*. (2001) suggested, due to the lower critical bounds association with predictors integrated of order zero *I(0)* and its upper bound integrated of order one *I(1)*, the study therefore makes the educated decision to reject the stated null hypothesis of no long-effect when the calculated F-statistics is found to be greater and above the upper bound critical value. However, this study fails to accept the alternative of long-run effects existence when the F-statistics calculated is found to be lower than the upper bound but above the lower bound critical values.

Furthermore, following the rejection of the null hypothesis the study considered predictors to be long-run variables having long-run effects on the outcome variable. The study therefore formulated a long-run model to test for the long-run effects between the explanatory variables and the dependent variable and further proceed to analysed it short-run effects. The long-run model is specified below:

$$\ln ExchR_t = C' + \sum_{i=1}^{a} \lambda_i' \ln DFDI_{t-i} + \sum_{j=1}^{b} \mu_j' \ln DOPN_{t-j} +$$

$$\sum_{m=1}^{e} \rho_m' \ln DINF_{t-m} + \sum_{n=1}^{f} \phi_n' \ln DINR_{t-n} + \varepsilon_t \qquad (3.8)$$

$$\ln Pdebt_t = C' + \sum_{i=1}^{a} \lambda_i' \ln DFDI_{t-i} + \sum_{j=1}^{b} \mu_j' \ln DOPN_{t-j} +$$

$$+ \sum_{m=1}^{e} \rho_m' \ln DINF_{t-m} + \sum_{n=1}^{f} \phi_n' \ln DINR_{t-n} + \varepsilon_t \qquad (3.9)$$

The study also used the ECM model specified below to explain the short-run relationships.

$$\mathrm{Dln}\, ExchR_t = C'' + \sum_{i=1}^{a} \lambda_i'' \mathrm{Dln}\, DFDI_{t-i} + \sum_{j=1}^{b} \mu_j'' \mathrm{Dln}\, DOPN_{t-j} + \sum_{k=1}^{c} \pi_k'' \mathrm{Dln}\, DINF_{t-k} +$$

$$\sum_{l=1}^{d} \varpi_l'' \mathrm{Dln}\, DINR_{t-l} +$$

$$+\varphi ECM_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots .. (3.10)$$

$$\text{Dln}\, Pdebt_t = C^{"} + \sum_{i=1}^{a} \lambda_i^{"} \text{Dln}\, DFDI_{t-i} +$$

$$+ \sum_{m=1}^{e} \rho_m^{"} \ln DOPN_{t-m} + \sum_{n=1}^{f} \phi_n^{"} \ln DINF_{t-n} + \sum_{p=1}^{g} \tau_p^{"} \ln DINR_{t-p}$$

$$+ \varphi ECM_{t-1}$$

$$+ \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots . (3.11)$$

With all the parameters already explained, the short-run ECM model distinguished itself from the long-run model by regressing the variables at their first difference. Where the parameter φ measures the adjustment speed towards equilibrium in the long-run, the term *ECM*$_{t-1}$ denotes short-run disequilibrium adjustments of long-run error term estimates as argued by Twumasi (2012) citing Banerjee et al. (1993).

3.5.3 Post Estimation Diagnostic Test

In ascertaining the stability of the post estimation model within the specified period, the study tested for Serial Correlation, Heteroscedasticity and Functional Form using Breusch-Godfrey, Breusch-Pagan-Godfrey, and Ramsey Test respectively. The computed F-statistics from all test were compared to the standard 5% probability level in deciding whether to accept the null hypothesis of non-existence of heteroskadasticity or autocorrelation against the alternative of heteroskadasticity present in the model.

Thus, the null hypothesis was accepted when the F-statistics was found to be insignificant at the chosen level of significance. Also, the stability of the model parameters and the constant parameters were tested at the 5 percent critical bounds using the cumulative sums of squares of recursive residual and the cumulative sum of recursive residuals respectively.

3.6 Variables, Description and Source

This section looks at the variables under study, their explanation and source. This is labelled in table 3.1.

Table 3.1 Variable, Description and Source.

Variable	Description	Source
Public debt	It refers to the amount of money the government owe both foreign and internal which is backed by an obligation to settle in future period. Governments have always been indebted to her citizenry from the ancient to the contemporary world. For a sustained development and growth, every economy requires capital stock which is important but relatively scarce. Government borrowing is basically government debt. The total debt of a country comprises of private debt and government debt.	World Development Indicators / Bank of Ghana Website
Exchange rate	It is the price of one currency for the purpose of conversion to another currency. The variable reflects the changes in the interest rate and inflation rate in countries with free floating exchange rate. Increases in exchange rate volatility that induces the macroeconomic instability heightens the exchange risks faced by commercial banks and other financial intermediaries. The official exchange rate (cedis per rate of US dollar) is used to proxy this variable.	World Development Indicators
Foreign direct investment	Shim & Siegel (1995) defined FDI as a longer operation of source countries control, extension of technology, joint function and as well expertise in to host countries. FDIs play a significant role through productivity level increases. Foreign direct investment is	World Development Indicators

	acknowledged as a factor that is most crucial in enhancing development in an economy as well as the lining standards for economies that are emerging. The study makes use of the Foreign Direct Net flows measured by constant 2010 US$ as a measure of FDI.	
Inflation Rate	Inflation refers to the continuous increase in price levels of goods and services over a period of time. In this study the CPI (Consumer Price Index) is used as a measure of Inflation. Several studies (Examples are Alfaro, 2003, Carkovic and Levine, 2002 & Djurovic, 2011) made use of CPI as a measure of Inflation in their studies. In theory a rise in levels of prices causes purchasing power of consumers to fall, thereby causing a reduction in production leading to a negative impact on Gross Domestic Product.	Ghana Statistical Services Website
Interest Rate	The part of loan that is charged as interest to the borrowers, usually expressed as an annual percentage of the loan outstanding. It can also be defined as the proportion of a loan that is charged as interest to the borrower, typically expressed as an annual percentage of the loan outstanding.	Ghana Statistical Service
Trade Openness	This refers to the movement of goods and services across global borders (Krugman & Obstfeld, 2008). In this study it is measured as exports plus imports as a percentage of GDP. Several economist attributes the studies in the field of trade liberalisation to the classic Adam Smith book of 1776, that is The Wealth of Nations (Lee, 1993b; Myint, 1977; Syrquin & Chenery, 1989). Trade openness encourages the shift of resources from production of import substitutes to production of export oriented goods, hence leading to increases in economic growth in the short run.	Researchers computation

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSION

4.1 Introduction

The analysis instruments and also the knowledge assortment procedures were explained within the previous chapter. Within the 1st sections of this chapter, an outline of the analysis protocol is given. This chapter presents the outcome of the analysis in a much tabulated manner. Observation of tables' careful highlights is during this chapter and an in depth discussion of the results This chapter comprises of Augmented Dickey Fuller test, Johanson Cointegration test, and the Autoregressive Distributed Lagged Models.

4.2 Stationarity Test of Variables

In investigating the stationarity property of variables to avoid spurious results, the study performed the Augmented Dickey Fuller (ADF) test. ADF test is used to test for unit root among variables to get the stationarity properties of series of variables used for the study. The null hypothesis of non-stationarity with the implication that the presence of unit root is tested as against the alternative of stationarity, which also implies that there is absence of unit root. The result of the ADF test is presented in table 4.1. This test is made up of models with constant only and constant with trend at levels.

Table 4.1 Test Result of Augmented Dickey Fuller

	ADF TEST		
Variable	**Constant only**	**Constant and Trend**	**Decision**
FDI	-1.102	-3.038	?
Exch	-1.682	-1.704	?
PDebt	-1.345	-1.579	?
OPN	-2.428	-2.853	?
INTR	-2.451	-3.337	?
INF	-3.074	-3.188	?
	FIRST DIFFERENCE		
FDI	-6.309 **	-6.186 **	I(1)
Exch	-5.736**	-5.890**	I(1)
PDebt	-4.740 **	-4.675**	I(1)
OPN	-8.736**	-8.789**	I(1)
INT	-9.560**	-9.458**	I(1)
INF	-5.930**	-5.849**	I(1)

*Output from Stata:13, ** and * represents the rejection of null hypothesis at 1% and 5% levels of significance respectively.*

From table 4.1 foreign direct investment (***FDI***), exchange rate (***Exch***) and public debt (***Pdebt***) are not stationary at level with constant and as well constant with trend. Openness (***OPN***), interest rate (***INR)*** and inflation (***INF***) are also not stationary at both constant and constant with trend. Therefore, we fail to reject the null hypothesis that FDI, Exch and Pdebt are not stationary. OPN, INTR and INF are also not stationary at constant and constant with trend. The null hypothesis is rejected that, OPN, INTR and INF are not stationary.

For the model at first difference with constant and constant with trend, *FDI, Exch, Pdebt, OPN, INR* and *INF* are significant at one percent level. The implication is that we reject the null hypothesis that *LNFDI, LNDI* and *LNTLB* are not stationary. Hence the variables are joined of order one, *I (1).*

4.3 Cointegration Test Results

Since the variables used in this study were integrated, study of co-integration was conducted to evaluate the long-run and short run link amongst the variables. Co-integration analysis proposes that the linear grouping of the variables should be stationary**.** ARDL bound test was undertaken in this study and this is given in table 4.2.

From Table 4.2 the F-statistics for the variables were all significant at 1 %, this is because the F-Statistics are beyond the upper bound. This simply means that there is a confirmation of a long run link among public debt, FDI, openness, and inflation, interest rate, and exchange rate. The null hypothesis with no cointegration amongst the variables is not accepted. Thus in the long run there exist at least some form of economic relationship between the variables.

Table 4.2 Cointegration Test Results

Models	**F-Statistics**	**Critical Values** 95% bound		99% bound	
		I(0)	**I(1)**	**I(0)**	**I(1)**
Fy(Pdebt, FDI, OPN,INF, INTR)	5.848872	2.15	2.36	3.79	4.85
Fy(Pdebt, FDI, OPN,INF, INTR)	6.776718	3.51	4.78	2.62	3.79

Output from Stata:1.

4.4 Results and Analysis of Long Run Model

The study assessed the long run estimates of the model since there was an establishment of cointegration among the variables under study. The results for the long run estimates of the effect of rate of Exchange and FDI is presented in table 4.3.

Table 4.3 Long run Results Coefficients

ExchR	**Coefficient**	**Std. Error**	**T**	$p > (t)$
Constant	-0.0399***	0.0329	-4.40	0.000
FDI	-0.0201**	0.0088	-2.26	0.050
INR	-0.1535*	0.0791	-1.94	0.088
OPN	0.0242	0.1142	0.874	0.874
INF	0.0336**	0.0129	2.60	0.019
ARDL based on SBC				

*, ** and ***represents the rejection of null hypothesis at 10%, 5% and 1% levels of significance respectively.

From table 4.3 it is evident that there is an adverse significant effect of FDI on exchange rate in the long run. The Coefficient of 0.0201 means that there is an inelastic response of FDI to exchange rate. Therefore, a percentage rise in FDI inflows brings to 0.02 % fall in exchange rate. This is consistent with the findings by Lily et al., 2014 who studied on rate of exchange movement and FDI in Asian economies and concluded that all countries showed a coefficient that is negative. The finding is varies with the results of Chaudhary et al. 2012 who got a positive relationship between FDI and real exchange rate in the long run.

The results also show a significant negative effect of rate of interest on conversion rate in the long run. The coefficient of 0.1535 means that there is inelastic response of exchange rate to changes in interest rate in the long run. Therefore, a percentage rise in interest rate leads to 0.15 percent decrease in exchange rate.

The results further show a positive and insignificant effect of openness in the economy to exchange rate. The Coefficient of 0.0242 simply means that there is an inelastic response of openness on exchange rate. Thus there is a less response of exchange rate to changes in openness. However, since the relationship is insignificant, it means that in Ghana openness in the long run does not necessarily influence exchange rate.

Inflation on the other hand also has a positive and significant effect on rate exchange. The coefficient of 0.0336 means that, there is an inelastic response of rate of exchange to changes in inflation. Therefore, a percentage increase in inflation leads to 0.033 percent increases in rate of exchange. The significant effect on exchange rate means that, in Ghana changes in inflation necessarily affect exchange rate in the long run.

4.4.1 Effect of FDI on Public Debt

This section focuses on the effect of foreign direct investment on public debt, and this is presented in table 4.4.

Table 4.4 Long run Results Coefficients

Pdebt	Coefficient	Std. Error	T	$p > (t)$
Constant	-0.0399***	0.0329	-4.40	0.000
FDI	-1.3171***	0.2672	-2.95	0.008
INR	0.2022***	0.0350	5.78	0.000
OPN	-0.0119	0.0404	-0.30	0.775
INF	0.1307	0.1471	0.89	0.386
ARDL based on SBC				

*, **, *** represents the rejection of null hypothesis at 10%, 5% and 1% levels of significance respectively.

From table 4.4 it shows a negative significant effect of FDI on public debt in the long run. The Coefficient of 1.3171 means that there is an elastic reaction of public debt to changes in FDI. Thus there is more than proportionate response of public debt to changes in FDI. Therefore, all other things being equal, a percentage rise in FDI inflows brings to 1.31 % decrease in public debt. This agrees with the findings of Azam & Khan, 2011 who studied on the effect of public debt on FDI in Pakistan and established that there is a need for public debt management through a proper and active policy so as to utilize the benefits derived from FDI. This is also consistent with the finding of Azam and Ullah (2011) who found that FDI relates to country's bad debt negatively.

The results also show a positive effect of interest rate (IR) on public debt in the long run. The coefficient of 0.2022 means that, there is inelastic response of public debt to changes in IR in the long run. Thus there is less than proportionate response of public debt to Changes in IR. Therefore, a percentage increase in IR leads to 0.20 percent increase in public debt.

The result further shows a positive and insignificant effect of openness in the economy to public debt. The Coefficient of 0.0119 simply means that there is an inelastic response of openness on public debt. Thus there is a less response of public debt to changes in openness. However, since the relationship is insignificant, it means that in Ghana openness in the long run does not necessarily influence public debt.

Inflation has a positive and insignificant effect on public debt. The coefficient of 0.1307 means that there is an inelastic response of public debt to changes in inflation. Thus there is a less than proportionate response of public debt to changes in inflation. Therefore, a percentage rise in inflation brings to 0.13 % increases in public debt. The insignificant effect on public debt means that, in Ghana changes in inflation does not necessarily affect public debt in the long run.

4.5 Results and Analysis of Short Run Model

The study assessed the short run dynamics with regards to the variables using the Error Correction Model (ECM). The R squared of 0.73 means that, the model clarifies up to 73% of the variations in Exchange Rate. The F-Statistics of 25.2752 confirms a joint statistics of the variables under study are significant at 1% level. It shows negative and positive coefficient of the error term at one percent significant level. The statistical significance as well as the size of the coefficient with regards to the error term shows the extent at which foreign direct investment, interest rate, openness and inflation has the tendency after a short run shock to return to the long run equilibrium. The results show an intense adjustment speed in the long equilibrium to short run shocks every year. Thus the long run equilibrium adjusts by 73 percent after a short run shock every year. Table 4.5 presents the estimated short run results based on the Error Correction Model.

Table 4.5 Short run Results Coefficients

ExchR	**Coefficient**	**Std. Error**	**T**	$p > (t)$
$\Delta LnFDI$	0.0674	0.0774	0.87	0.396
$\Delta LINR$	-0.8600*	0.3107	-2.77	0.012
$\Delta LnINR_{-1}$	-0.4782*	0.19149	-2.50	0.022
$\Delta LnOPN$	0.8345**	0.2603	3.21	0.005
$\Delta LnINF$	-0.1063	0.0909	-1.17	0.257
$\Delta LnINF_{-1}$	0.0169	0.0197	0.86	0.415
ECM(-1)	-0.7068**	0.2098	-3.37	0.003
R-Squared	**0.7342**			
F-Statistics	**25.2752**			
ARDL based on SBC				

*, **, *** represents the rejection of null hypothesis at 5% and 1% levels of significance respectively.

It is evident that, FDI in the short run has a positive effect on exchange rate. The coefficient of 0.0674 shows that there is an inelastic response of rate of exchange to changes in FDI in the short run. However, this relationship is not significant, meaning that in Ghana FDI in the short run does not necessarily have an effect on rate of exchange.

In the short run openness is found to have a significant positive effect on exchange rate. The coefficient of 0.8345 means that there is an inelastic response of exchange rate to changes in openness. Thus a one percent change in openness of the economy leads to 0.83 percent increases in rate of exchange. The long run effect also shows a positive effect on exchange rate. Since there is an insignificant effect in the short term and an insignificant relationship in the long term, it implies that openness in the economy has an effect on exchange rate in the short term as compared to the long run period.

Current inflation has a positive but insignificant influence on rate of exchange. However, its lag value has a negative but insignificant effect on rate of exchange. The long run results also showed a significant positive effect of inflation on exchange rate, meaning that in Ghana inflation in the long run influences exchange rate and not the short run.

4.5.2 Effect of FDI on Public Debt

This section looks at the effect of foreign direct investment on public debt in Ghana.

The study assessed the short run dynamics among the variables using the Error Correction Model (ECM). The R squared of 0.6963 means that the model explains up to 69% of the variations in public debt. The F-Statistics of 25.2752 confirms a joint statistics of the variables under study are significant at 1% level. The coefficient of the error term is negative and significant at one percent level. The statistical significance as well as the size of the coefficient with regards to the error term shows the extent at which foreign direct investment, interest rate, openness and inflation has the tendency after a short run shock to return to the long run equilibrium. The results show a high speed of adjustment in the long equilibrium to short run shocks every year. Thus the long run equilibrium adjusts by 86 percent after a short run shock every year. Table 4.6 presents the estimated short run results based on the Error Correction Model.

Table 4.6 Short run Results Coefficients

PDebt	**Coefficient**	**Std. Error**	**T**	$p > (t)$
$\Delta LnFDI$	0.4496	0.2479	1.81	0.070
$\Delta LINR$	0.2754	0.4886	2.37	0.018
$\Delta LnINR_{-1}$	0.2569	0.0902	0.28	0.776
$\Delta LnOPN$	0.064	0.1642	0.39	0.694
$\Delta LnINF$	0.3281	0.510	2.83	0.005
ECM(-1)	-0.8601**	0.1841	-6.18	0.000
R-Squared	**0.6963**			
F-Statistics	**28.2752**			
ARDL based on SBC				

*, **, *** represents the rejection of null hypothesis at 5% and 1% levels of significance respectively.

It is evident that, FDI in the short run has a significant positive effect on exchange rate in the short run. The coefficient of 0.4496 shows that there is an inelastic response of public debt to changes in FDI in the short run. Thus there is a less than proportionate response of public debt to changes in FDI. In the long run however, there is a significant but negative effect of FDI on public debt, and this means that FDI influences public debt in the short and as well the long run.

It is also evident from table 4.6 that there is a positive effect of interest rate and its immediate lagged period on exchange rate in the short run. However, the immediate lag variable of interest rate is not significant. Thus there is an inelastic response of public debt to changes in the current values of interest rate to changes in public debt in the short run. This simply means that a percentage increases in the current values of interest rate leads to 0.018 percent increases in public debt. The long run results indicates a positive and also significant effect of interest rate on public debt. This indicates that interest rate influences long and short term public debt positively.

Openness is found in the short run to have a positive insignificant effect on public debt. The coefficient of 0.064 means that there is an inelastic response of public debt to changes in openness. The long run effect on shows an insignificant negative effect on public debt. Since there is an insignificant effect in the short term and an insignificant relationship in the long term, it implies that, openness in the economy has no short and long run effect on public debt.

Inflation on the other hand has a positive significant influence on public debt. The coefficient of 0.3281 implies that there is an inelastic response of public debt to changes in inflation. Thus a change in inflation leads to 0.32 percent increases in the short run of national debt. The results in the long run also showed a positive and insignificant effect of inflation on public debt, meaning that in Ghana inflation in the short run influences public debt.

4.6 Diagnostic Analysis

From table 4.7 it is realised that the probability value of test on heteroskadasticity is 0.056 and 0.058, which implies the non-rejection of the null hypothesis that there is no heteroskadasticity. Hence a heteroskadasticity is not a problem in this model.

The study performed a normality test to also ascertain the normal distribution of variables under study. Thus the study employed the Jarque-Bera Normality Test. The results show a Jarque-Bera normality test results of 0.441 and 1.552 with a probability of 0.330 and 0.060 respectively. This means that the null hypothesis that the data is not distributed normally, is rejected and hence a conclusion that the data is normally distributed.

Finally, it is evident in the Breusch-Godfrey test that the computed F-Statistics of 0.967 and 6.635 is insignificant since it has a probability values of 0.325 and 0.101 respectively. This implies no existence of Autocorrelation in the model. Thus there is a constant variance of the residuals.

To test if the model estimate is stable over the period sample, the CUSUM in figure 4.2 and the CUSUMQ in figure 4.3 which was suggested by Brown et al., 1995 and as well suggested by Pesaran et al., 2001 were performed within the framework of the ARDL. Both the CUSUM and the CUSUMQ residual lines were within the 5% critical value bounds, which means that estimated mode is stable throughout the periods sampled.

Table 4.7 Diagnostic and Stability Test for Exchange Rate and Public Debt Models

			F-Statistics	Probability
Heteroskadasticity	Exch	Breusch-Pagan-Godfrey	3.961	0.056
Heteroskadasticity	PDebt	Breusch-Pagan-Godfrey	3.591	0.058
Normality Test	Exch	Jarque-Bera Normality Test	0.441	0.330
Normality Test	PDebt	Jarque-Bera Normality Test	1.552	0.060
Autocorrelation	Exch	Breusch-Godfrey LM-Test	0.967	0.325
Autocorrelation	PDebt	Breusch-Godfrey LM-Test	6.635	0.101

Output from Stata:13

Functional Form Test

Figure 4.1 CUSUM (Cumulative Sum Control Chart)

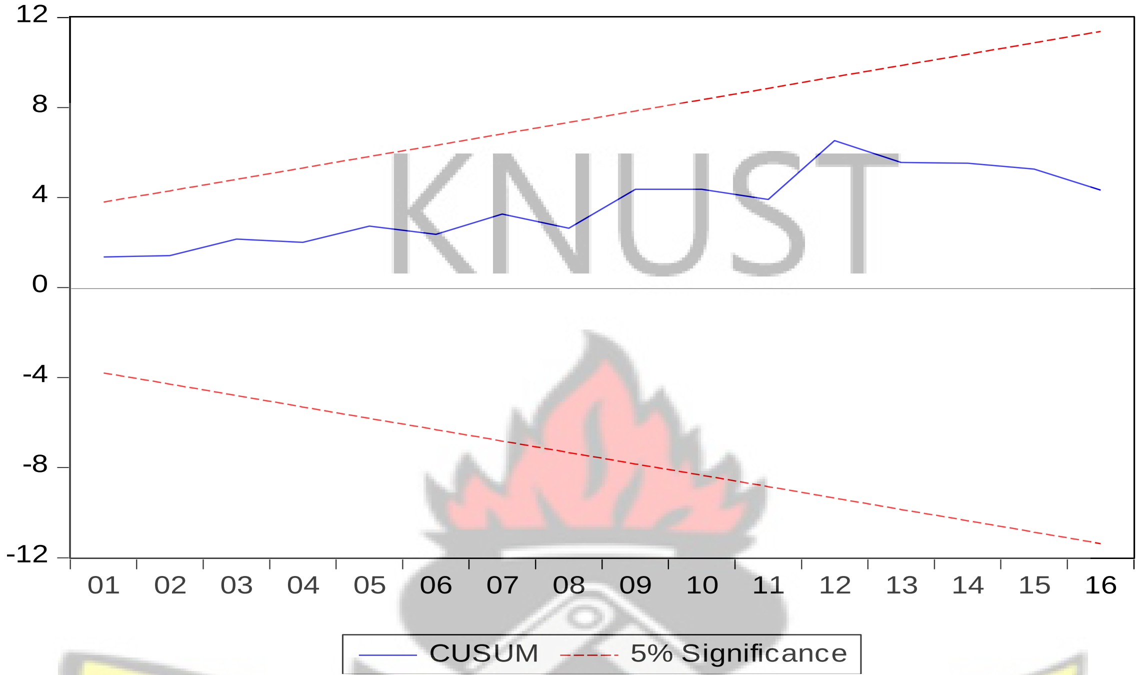
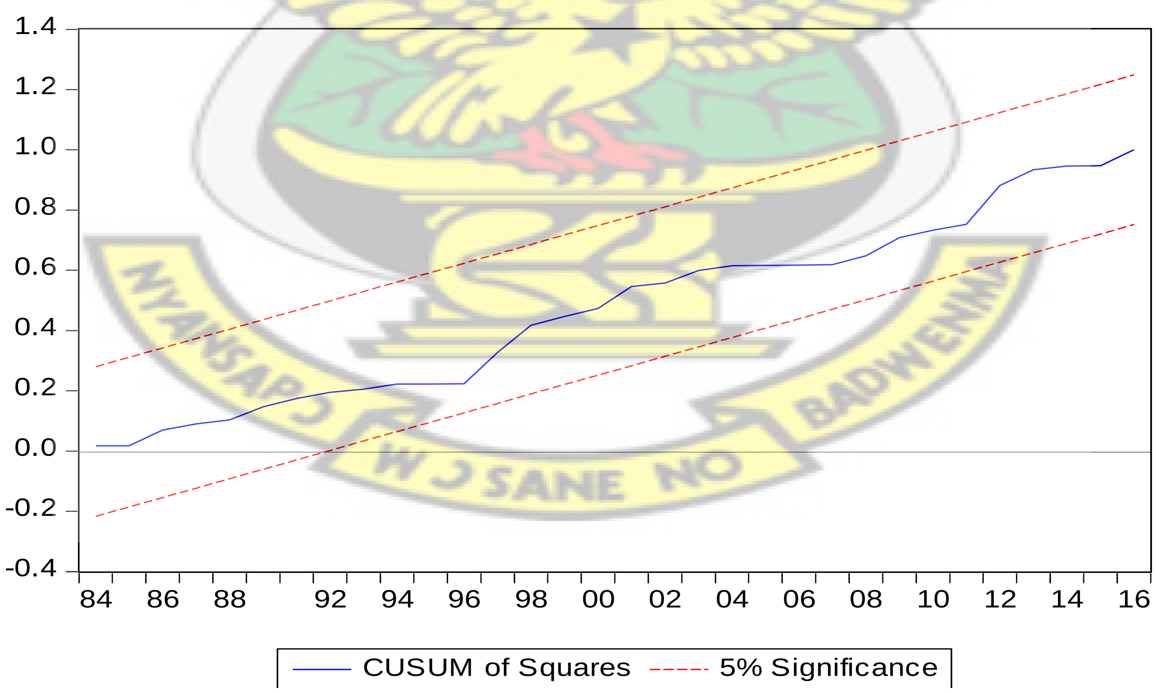


Figure 4.2 CUSUMQ (Cumulative Sum Control Chart)



CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This section presents the summary of findings from the study, the conclusions and recommendations.

5.1 Summary of Findings

The study sought to investigate the effect of FDI on exchange rate and public debt in Ghana. The researcher used the time series analysis approach in analysing the data. The Augmented Dickey Fuller, the bound test, and the ARDL approach was used to analyse the data. The findings are presented below;

The study shows that FDI significantly affect exchange rate negatively in the long run. Interest rate also negatively and significantly affect rate of exchange in the long run. The study also reveals that inflation affects exchange rate in the long run. In the long run therefore, FDI have major effect on exchange rate.

The study has revealed that FDI in the short run insignificantly and positively affects rate of exchange. Interest rate and its immediate lag is also found to affect exchange rate negatively. Openness is also seen to have a positive and insignificant effect one exchange rate in the short run. Inflation and its immediate lag significantly affect rate of exchange in the short run. The error term of the error correction model has also shown the tendency of the economy to automatically adjust to equilibrium in the long run with regards to occurrence of short run shocks.

The study shows that FDI significantly affect public debt negatively in the long run. Interest Rate also positively and significantly affect national debt in the long run. Openness and inflation did not affect public debt in the long run. In the long run therefore, FDI have significant effect on public debt.

The study has revealed that FDI in the short run insignificantly and positively affects public debt. Inflation also affect public debt positively and significantly. Openness and inflation however did not affect public debt in the short Run. The error term of the error correction model has also shown the tendency of the economy to automatically adjust to equilibrium in the long run with regards to occurrence of short run shocks.

5.2 Conclusions

It is evident that FDI, rate of interest and inflation significantly affect rate of exchange in the long run. Openness did not affect exchange rate in the long run significantly. The study has also revealed that FDI, rate of interest and inflation affect public debt in the long run. Openness and inflation did not significantly affect public debt in the long run.

The study also concludes that FDI does not affect rate of exchange in the short run. Rate of Interest and its immediate lag values and economic openness on the other hand affected exchange rate in the short run. Inflation also have has no effect on rate of exchange in the short run. The study further concludes that FDI affect public debt in the short run. Current values of interest rate and inflation also affect public debt in the short run. Openness of the economy on the other hand has no effect on public debt in the short run. The models have the tendency of the economy to automatically adjust to equilibrium in the long run with regards to occurrence of short run shocks.

5.3 Recommendations

Since the study found out that FDI has a negative effect on public debt in the long run. The study recommends that efforts should be made by policy makers, government as well as relevant authorities to use several incentives such as subsidies, infrastructure improvement and tax cut to aim at creating conducive investment environment so that Ghanaian and non-Ghanaian investors will get the encouragement to invest in Ghana.

The study also unveiled a positive significant link between openness and exchange rate in the short run. Therefore, Policy makers must also aim at putting up polices to limit trade liberalisation in the short run (Openness of the economy) as an attempt to have the rate of exchange stabilized.

The study also highlighted the effect of FDI on rate of exchange and public debt in Ghana, therefore further studies can be done in Ghana taking into consideration other control factors and as well in African countries, so as to found the impacts of FDI on Exchange rate and Public debt in Ghana and Africa as well.

REFERENCES

Bohle,H.G, T.E Downing. (1994 and 2007). Global Environmental Change. In M. Watt, *Climate Change and Social Vulnerability* (pp. 4:37-48). A landowner's guide to carbon sequestrations credits.

Abala, D. O. (2014). Foreign direct investment and economic growth: an empirical analysis of Kenyan data. *DBA Africa Management Review*, *4*(1), 62-83.

Asley, B. (2002). Debt burden is not a problem of freely resource to debt services payment. *Principle of International Finance*, *1*, 142-147.

Azam, Muhammad, and Asmatullah Khan. "Workers' remittances and economic growth: evidence from Azerbaijan and Armenia." *Global Journal of Human Social Science* 11.7 (2011): 40-46.

Azam and Asmatullah, 2008

Bagliano, F. C., Dalmazzo, A., & Marini, G. (2000). Bank competition and ECB's monetary policy. *Journal of banking & finance*, *24*(6), 967-983.

Baron, D. P., & Ferejohn, J. A. (1989). Bargaining in legislatures. *American political science review*, *83*(4), 1181-1206.

Barro, R. J. (1979). On the determination of the public debt. *Journal of political Economy*, *87*(5, Part 1), 940-971.

Battaglini, M., & Coate, S. (2006). A dynamic theory of public spending, taxation and debt (No. w12100).

Battaglini, M., & Coate, S. (2008). A dynamic theory of public spending, taxation, and debt. *American Economic Review*, *98*(1), 201-36.

Borensztein, E. (1990). Debt overhang, credit rationing and investment. *Journal of Development Economics*, *32*(2), 315-335.

Branson, W. H. (1983). A model of exchange-rate determination with policy reaction: evidence from monthly data.

Busse, M., Hefeker, C., & Nelgen, S. (2010). Foreign direct investment and exchange rate regimes. *Available at SSRN 1593002*.

Calvo, G. A., Leiderman, L., & Reinhart, C. M. (1996). Inflows of Capital to Developing Countries in the 1990s. *Journal of economic perspectives*, *10*(2), 123-139.

Carter, D. E., & Porter, S. (2000). Validity and reliability. *The research process in nursing*, *4*, 29-42.

Chaudhary, G. M., Shah, S. Z. A., & Bagram, M. M. M. (2012). Do Exchange RateVolatility Effects Foreign Direct Investment? Evidence from Selected Asian Economies. *Journal of Basic and Applied Scientific Research*, *2*(4), 3670-3681.

Chenery, H.B. and Strout, A. (1966) 'Foreign assistance and economic development', American Economic Review, 56:679-733.

Dasgupta, D. (Ed.). (2012). *Artificial immune systems and their applications*. Springer Science & Business Media.

Dornbusch, R., & Fischer, S. (1980). Exchange rates and the current account. *The American Economic Review*, *70*(5), 960-971.

Dornbusch, R., Fischer, S., & Startz, R. (2003). *Macroeconomics* . Oldenbourg publishing house.

Duttagupta, R., & Cashin, P. (2011). Anatomy of banking crises in developing and emerging market countries. *Journal of International Money and Finance*, *30*(2), 354-376.

Eaton, M. (1993). *Women after prison*. Open University Press.Eaton, 1993

Elmendorf, D. W., & Mankiw, N. G. (1999). Government debt. *Handbook of macroeconomics*, *1*, 1615-1669.

Fosu, A. K. (2001). Political instability and economic growth in developing economies: some specification empirics. *Economics letters*, *70*(2), 289-294.

Goldberg, R. J., Spencer, F. A., Gore, J. M., Lessard, D., & Yarzebski, J. (2009). Thirty year trends (1975-2005) in the magnitude, management, and hospital death rates associated with cardiogenic shock in patients with acute myocardial infarction: A population-based perspective. *Circulation*, *119*(9), 1211.

Kiguel, M. A. (1992). *Exchange rate policy, the real exchange rate and inflation: Lessons from Latin America* (Vol. 880). World Bank Publications.

Klein, M. W., & Rosengren, E. (1994). The real exchange rate and foreign direct investment in the United States: relative wealth vs. relative wage effects. *Journal of international Economics*, *36*(3-4), 373-389.

Krugman, P. (1988). Financing vs. forgiving a debt overhang. *Journal of development Economics*, *29*(3), 253-268.

Muhtar (2004): Weak External Demand for Philippine Export is Dampening Growth

Ntshakala, P. L. (2015). Effects of public debt on economic growth of Swaziland. *International Journal of Business and Commerce*, *5*(1), 1-24.

Osinubi, T. S., & Dauda, R. O. S and Olaleru, OE (2006). Budget Deficit, External Debt and Economic Growth in Nigeria. *Journal of Banking and Finance*, *8*(2), 40-64.

Sawin, J. L., Sverrisson, F., Chawla, K., Lins, C., Adib, R., Hullin, M., ... & Wright, G. (2014). Renewables 2014. Global status report 2014.

Shakir, M., Azam, M., Ullah, M. F., & Hadi, S. M. (2011). Synthesis, spectroscopic and electrochemical studies of N, N-bis [(E)-2-thienylmethylidene]-1, 8-naphthalenediamine and its Cu (II) complex: DNA cleavage and generation of superoxide anion. *Journal of Photochemistry and Photobiology B: Biology*, *104*(3), 449-456.

Solnick, D. A. V. I. D., & Lee, S. I. (1987). Amount of RNA secondary structure required to induce an alternative splice. *Molecular and cellular biology*, *7*(9), 3194-3198.