The Impact of Foreign Trade on Economic Growth in Ghana (1980–2012)

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Abstract

The study examined the effect of foreign trade on economic growth in Ghana by using a Johansen cointegration analysis. It was found out that all the variables of interest; real gross domestic product, foreign direct investment exports, imports and foreign direct investment turned out to be non stationary at their levels but became stationary at their first difference. The results of Johansens's cointegration test indicated that there exist a long run and short run relationship among real gross domestic product, foreign direct investment, exports, imports and foreign direct investment in Ghana. The study found out that in the long run, exports had a positive effect on real gross domestic product and as a result, an increase in exports leads to an improvement in real gross domestic product. Imports and foreign direct investment had a negative effect on real gross domestic product, respectively. Therefore, a decline in both variables causes an improvement in real gross domestic product. In the long run all the variables were statistically significant at 5% significance level. The speed of adjustment was 4.57 percentage point taking place at each year towards the long run periods. Therefore, exports should be encouraged, diversified, processed raw materials before export to improve the real gross domestic product. Imports should be reduced by assisting our infant industries to produce more of our imported goods and services. Finally, foreign direct investment must be channeled to productive sectors of the economy (agriculture, education, health and housing) to improve the real gross domestic product of Ghana.

Keywords: Real Gross Domestic Product, Exports, Imports, Foreign Direct Investment, Cointegration

Introduction

Economic growth refers to increase in production. It is the steady process by which the productivity capacity of an economy is increased overtime to bring about rising levels of national output and income while, foreign trade is trade between different countries of the world. According to Patel (2013), foreign trade is the process of focusing on the resources of the globe and objectives of the organizations or global business opportunities and threats in order to produce, buy, sell or exchange of goods and services world – wide. Put differently, foreign trade is all commercial transactions (private and governmental, sales, investments, logistics, and transport) that take place between two or more regions, countries and nations

beyond their political boundary. It is also called international trade or external trade or inter-regional trade. It consists of imports, exports and entrepot. Import trade refers to purchase of goods by one country from another country or inflow of goods and services from foreign country to home country. Export trade refers to the sale of goods by one country to another country or outflow of goods from home country to foreign country. Entrepot trade is also called re-export. It refers to purchase of goods from one country and then selling them to another country after some processing operations (Wikipedia, the free encyclopedia). Foreign trade can be influenced by differences in natural factor endowments, preferences, technologies, exchange rate, distance and gross domestic product (GDP) (Andrew, 2004). Trade can be restricted by imposing tariff, import quota, special import license, foreign exchange controls and outright ban (Wikipedia, the free encyclopedia).

In a simple open economy model, the aggregate demand of an economy consists of private consumption expenditure, investment expenditure, government purchases and net export (exports minus imports). All thing being equal, if exports are greater than imports, then a positive net export will exist since export is an injection and causes an economic expansion. However, if imports include a greater volume of consumable goods and services instead of capital goods and technologies, all things being fixed, a negative balance of trade will be realized since import is a withdrawal. This causes an economy to shrink. Therefore, we can conclude that a positive foreign trade is an engine of economic growth (Dutta, 2006; Gordon et al., 1987; Kindleberger, 1961). If this simple economic analysis is true, then is foreign trade in Ghana an engine of economic growth? Are Ghana's imports healthy for her economic expansion? These are the issues that this study seeks to address or solve.

Ghana's International Merchandise Trade Experience
Ghana is an open economy which depends on external trade to achieve its economic growth. Ghana's main exports are gold, cocoa beans, timber products and Cola nuts. Others include tuna, aluminum, manganese ore, diamonds, bauxite, Veneer sheets and horticulture. Cocoa bean remains Ghana's major export commodity. Ghana's main export partners are Netherlands, Burkina Faso, South Africa and United Kingdom, Belgium, Switzerland, France, Italy, Turkey and German Federal Republic. On the other hand, Ghana's main import partners are Nigeria, United Kingdom, China, Federal Republic of Germany, the United States of America, Japan and Republic of Korea (The State of the Ghanaian Economy, 2009 – 2011). Between the periods 2005 to 2007, both imports value and exports value for Ghana increased continuously. This is shown in the chart below.

Value of Imports and exports and balance of trade (GHS million) 2004 - 2007

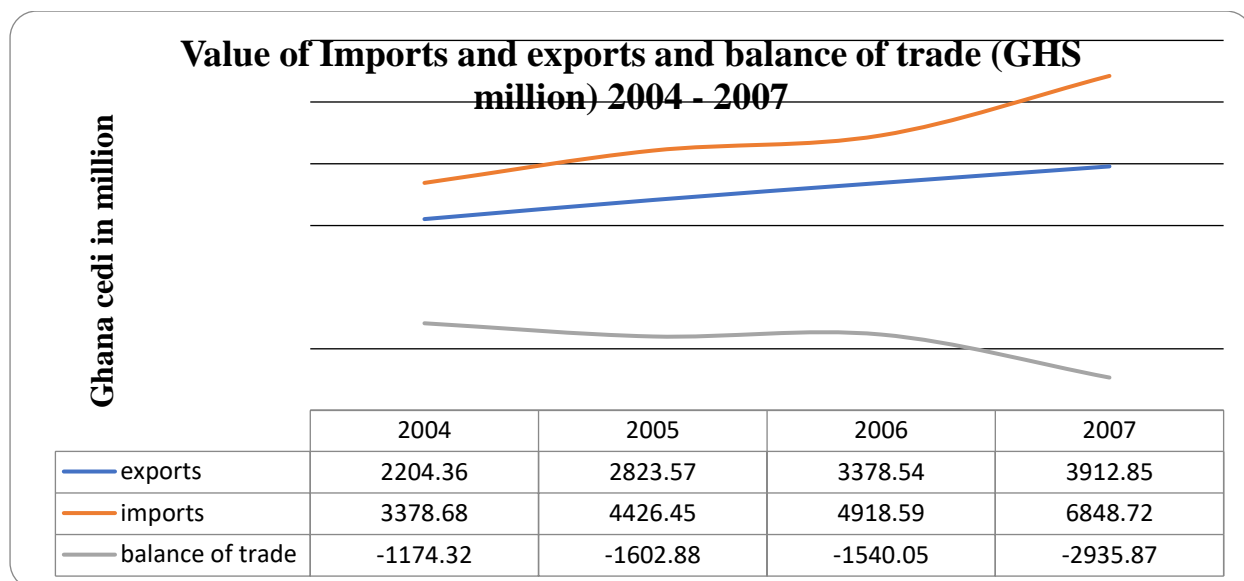|	2004	2005	2006	2007
exports	2204.36	2823.57	3378.54	3912.85
imports	3378.68	4426.45	4918.59	6848.72
balance of trade	-1174.32	-1602.88	-1540.05	-2935.87

Figure 1: Value of Imports and Exports and Balance of Trade (GHS million) 2004 - 2005
Source: Economic Survey, Ghana Statistical Service, 2010

But, comparing year by year, it can be seen that imports value were more than exports value which has led to balance of trade deficit which is unhealthy for Ghana's economic growth and development. Again, exports in Ghana decreased to $3,407.70 million in the second quarter of 2012 from $4,040.10 million in the first quarter of 2012. From 2003 until 2012, Ghana exports averaged $1,506.50 million reaching an all time high of $4,040.10 million in February of 2012 and then recorded a low value of $565.06 million in February of 2003. These increases and decreases in Ghana's exports and imports have also affected the trade intensity of Ghana either positively or negatively (The State of the Ghanaian Economy, 2009 – 2011).
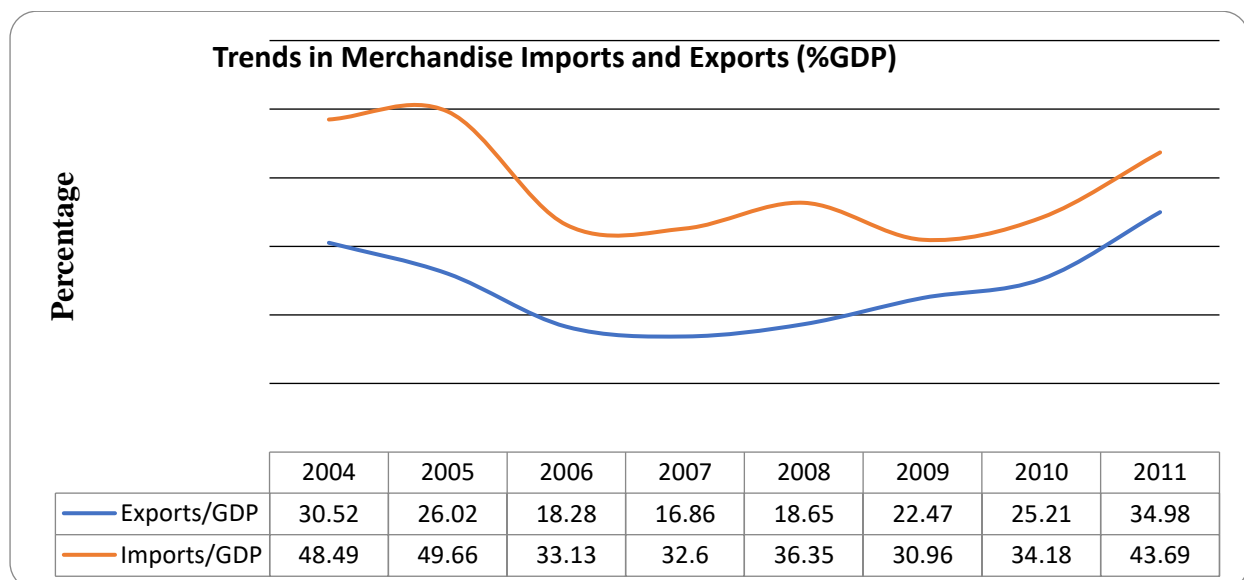

Trends in Merchandise Imports and Exports (%GDP)

	2004	2005	2006	2007	2008	2009	2010	2011
Exports/GDP	30.52	26.02	18.28	16.86	18.65	22.47	25.21	34.98
Imports/GDP	48.49	49.66	33.13	32.6	36.35	30.96	34.18	43.69

Figure 2: Trends in Merchandise Imports and Exports (%GDP)
Source: The State of the Ghanaian Economy 2009 to 2011

From figure 2 it could be seen that both exports and imports increased over the since 2006 but exports always lag behind imports. The question then is, to what extent do exports and imports impact on Ghana's economic expansion?

Ghana's exports always lag behind imports as can be seen in figure 2 above. This is a threat to Ghana's economic growth and development. The world market price for Ghana's traditional exports like cocoa and gold keep fluctuating in the world market. So there is the need to diversify. As a result, Ghana has tried very hard to widening her total exports to include non-traditional exports apart from her traditional exports. For instance the ministry of trade and industry in 2011 funded the planting of 12,000 acres of mango seedlings in the Northern, Upper East, Upper West, Brong-Ahafo and Northern Volta Regions, with the aim of developing mango as a major export crop in Ghana. The ministry with funding from the Export Development and Investment Fund (EDIF) funded the production of pineapples for export to increase production of non-tradition export crops. The ministry, through EDIF also funded the cultivation of pilot farms for melons, sweet potatoes and butternut to ensure that adequate agro-based raw materials were produced locally at competitive prices for local manufacturing (The State of the Ghanaian Economy, 2011). The aim is to ensure that Ghana's total exports become more than her total imports in order to generate more foreign exchange earnings for further economic growth and development.

As a result, the non-traditional export subsector grew by 34% in value in 2010, from a figure of US$1,215. 0 million in 2009 to US$1,629.2 million. The increment was due to processed and semi-processed exports, which grew by 37% from US$1,062 million in 2009 to US$1,461 million in 2010 (The State of the Ghanaian Economy, 2010). Trend in total non-traditional exports is shown below.
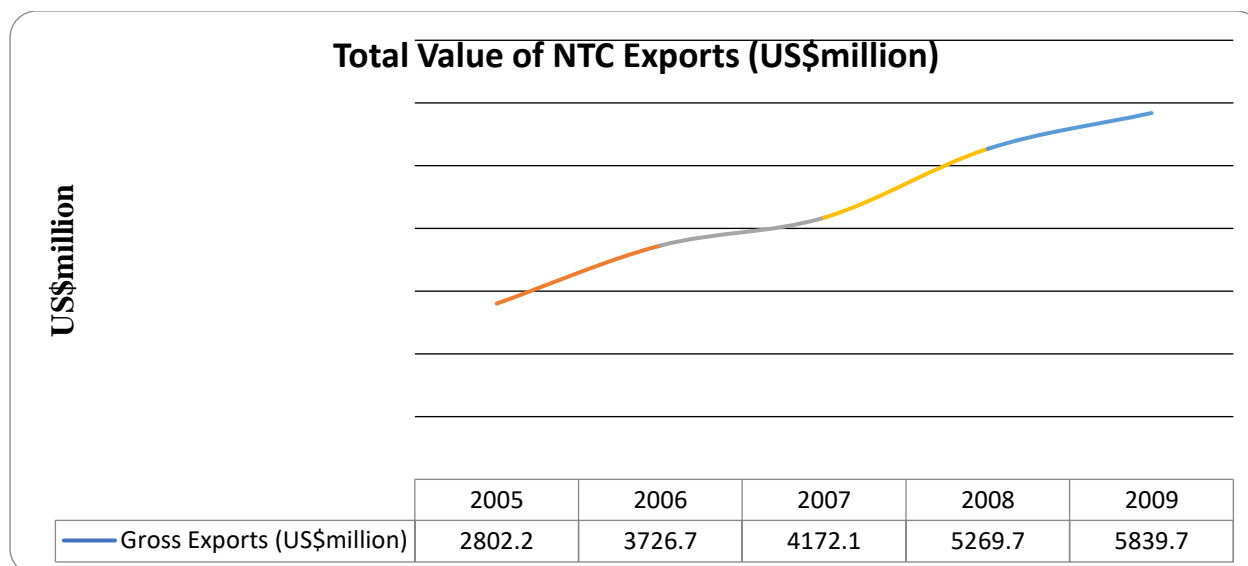

Total Value of NTC Exports (US$million)

	2005	2006	2007	2008	2009
Gross Exports (US$million)	2802.2	3726.7	4172.1	5269.7	5839.7

Figure 3: Trends in Non Traditional Exports
Source: GEPC, NTE Performance Report 2011

Overall, the addition of the non-traditional export commodities such as coffee/tea, fish and seafood, oil seeds and nut, handicrafts, cocoa products, textile and garments, wood products and horticulture to the traditional exports commodities has significantly impacted positively on Ghana's total exports as well as her total foreign exchange earnings, more especially the tradition exports. For instance, cocoa, gold and timber contributed about 79% of Ghana's total export earnings. The export revenue was helped by a relatively positive performance by

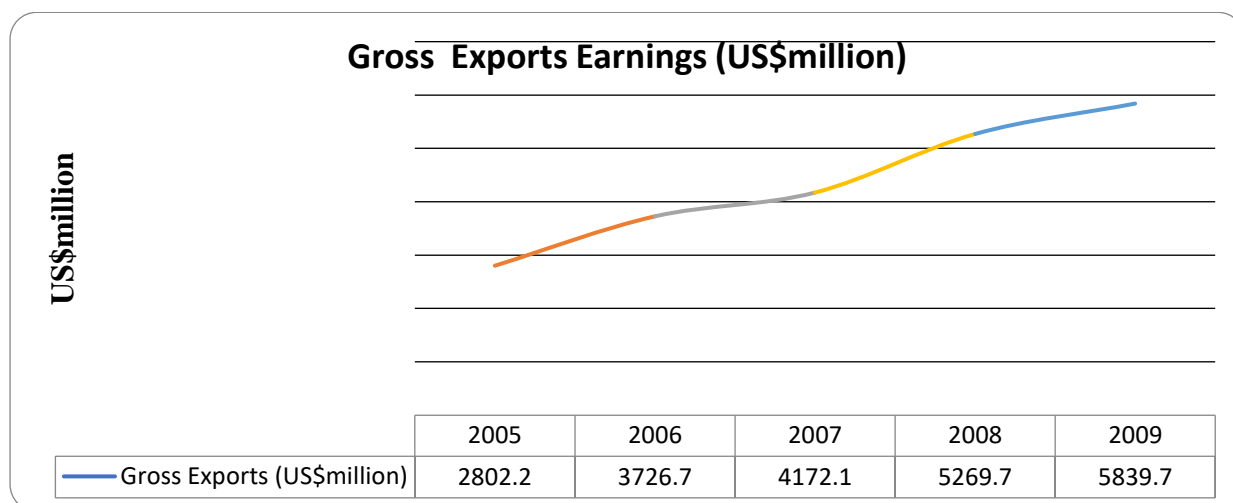the cocoa and gold sub-sectors. Merchandise export earnings for the periods 2005 – 2008 is shown below.

Gross Exports Earnings (US$million)

	2005	2006	2007	2008	2009
Gross Exports (US$million)	2802.2	3726.7	4172.1	5269.7	5839.7

Figure 4: Trends in Gross Export Earnings
Source: Bank of Ghana

Ghana's Trade openness measured by the trade intensity index is calculated as $\dfrac{Exports + Imports}{Gross\ Domestic\ Product}$. It is a measure of the size of Ghana's trade with the rest of the world in comparison to its national economy. The trend in Ghana's trade openness is shown below.
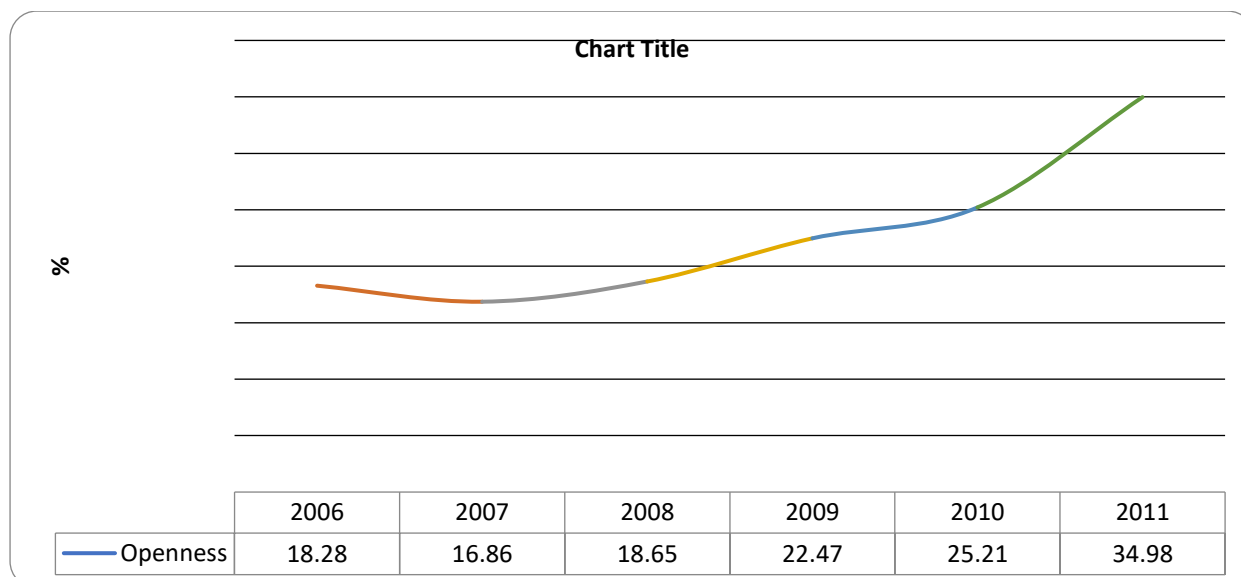

Chart Title

	2006	2007	2008	2009	2010	2011
Openness	18.28	16.86	18.65	22.47	25.21	34.98

Figure 5: Ghana's Trade openness
Source: The State of the Ghanaian Economy, 2009 – 2011

The increase in the trade intensity index since 2007 is due to both the increases in exports and imports sides of the balance of payments account. The problem now is, to what extent do exports and imports influence Ghana's economy growth?

Therefore, the goal of this study is to examine how and to what extent exports, imports and FDI influence economic growth in Ghana.

Theoretical Literature Review
Mercantilist Trade Theory
Some of the finders are Jean Baptise Colbert and Thomas Hobbes. According to the mercantilist trade theory the key way for a nation to become rich and powerful is to export more than it import. That is the most key way in which a country could be prosperous was to acquire more precious metals such as gold. The country should ensure that the volume of exports was better than the volume of imports. Exports may be enhanced through domestic production. Controls should exist over working hours, wage rates, and prices. The mercantilist believe that trade has to be controlled, regulated and restricted. The control, regulation and restriction can be in the form of increase tariffs, quotas and other commercial policies (example import licensing, embargo, foreign exchange control, devaluation and import monopoly) that will minimise imports in order to protect a nation's trade position. The country can aggregate wealth from gold and silver. This will lead to surplus exports that will add to the economic strength and riches of the country. However, mercantilism did not favour free trade and the need for regulation to maintain order in human affairs and economic affairs were taking for granted. In addition, the key mistake in mercantilist thinking was the belief that trade was a zero sum activity. That is, one nation's gain is another nation's loss (Ray, 2011; Kalra, 1997; Shim et al., 1995; Akeem, 2011; Gerber, 2007).

Absolute Advantage Trade Theory
Absolute advantage trade theory was propounded by Adam Smith in his famous book "Wealth of Nation" 1776. Smith advocated free trade as the best policy for nations of the world. According to Adam Smith with free trade each nation could specialise in the production of those commodities in which it could produce more efficiently than the other nations, and then import those commodities in which it could produces less efficiently. That is according to the absolute advantage trade theory, a nation should specialise in the production of export of commodities in which it has lower cost or absolute cost advantages over others. This international specialisation of factors in production would result in increase in world output, which would be shared by trading nations. Thus, a nation need not gain at the expense of other nations, all nations could gain simultaneously. On the other hand, the same country should import a commodity in which it has higher or absolute cost disadvantage granted (Ray, 2011; Kalra, 1997; Shim et al., 1995; Akeem, 2011).

Comparative Advantage Theory (Comparative Cost Principle)
The theory of comparative advantage was demonstrated by David Ricardo (1772 – 1823). According to Ricardo a country should specialise in producing and exporting only those goods and services which it can produce more efficiently, that is, at lower opportunity cost than other goods and services which it should import. Comparative advantage results from different endowments of the factors of production, that is, capital, land, labour, entrepreneurial skill, power, resources, technology and so on. It therefore follows that free trade is beneficial to all countries, because each can gain if it specializes according to its comparative advantage. Alternatively, the principle states that trade is beneficial even if a country does not have an absolute advantage in the production of a good, but does have a cost benefit of producing the good relative to its trading partner. This principle explains why

countries specialise in producing and exporting products based on their endowment of resources. The concept is especially important in international trade, suggesting that countries should specialise in areas in which they have a comparative advantage. Differently argued, in the domain of international trade, each nation takes to the production of only those products in the manufacturer of which, she is at an advantage in terms of skill, equipment, machinery or tradition, as compared to the other nations. Thus, with international specialisation that has become order of the day, each nation concentrates on the making of only such products in which it has the maximum comparative advantage and the least comparative cost (Akeem 2011; Ray, 2011; Shim et al., 1995; Kalra, 1997).

Heckscher – Ohlin Trade Theory (factor endowment theory)
This is an explanation of trade patterns, offered by the Swedish economist Bertil Heckscher and subsequently developed by his pupil, Eli Ohlin, that contend that international trade is based on differences in comparative costs and attempts to explain the factors that make for differences in comparative costs. Different goods require different factor proportions, and different countries have different relative factor endowments; countries will tend to have comparative advantages in producing the goods that use their abundant factors more intensively; for this reason each country will end up exporting its abundant factor goods in exchange for imported goods that use its scarce factors more intensively. That is, the model takes up the case of two trading countries with different endowment facilities. A nation that has a factor available in plenty would have it at a lower cost as well. The other country likewise would have relatively cheaper, the other factor that it has in abundance. The model works on the presumption of two goods and two factors. Such a proposition is known as factor – abundance hypothesis. Thus, according to the theory, a nation should produce and export a product for which the large amount of the relative abundance resources is used. Such countries should import the commodity in which a great deal of its relative scarce and expensive factors is used (Shim et al. 1995; Kalra, 1997; Akkem, 2011; Ray, 2011). The Heckscher-Ohlin model and Ricardian trade theory both predict that trade promotes the specialisation of a country so that it can realize trading gains (Osterfeld, 2007).
From the above discussions, it could be seen that trade is an engine of economic growth. This is because; (1) there is efficient allocation of resources; (2) it encourages investment; (3) it leads to division of labour and specialisation; (4) it increases resource productivity; (5) total world output of commodities seems to increase (6) increase in the world output will increase the variety of goods available to consumers; (7) there is an increase in competition which bring prices down; (8) there is technological transfer; (9) there is also job creation; (10) generation of income and relaxation of foreign exchange restraints; (11) maintains balance of payment position and promotes world peace. However, sometimes, foreign trade may come with some challenges like language barriers and currency differentials (Akeem, 2011; Nnadozie, 2003).
Despite all these strong theoretical foundations, there is still not much convincing empirical evidence on the impact of trade on economic growth in Ghana, hence, the need for this study.

Empirical Literature Review
Tong (1995) explored the relationship between economic growth and import. He recognized that import at different times contributed to economy differently, but on the whole, there was a positive correlation between import and economic growth. The reasons might be due

to the fact that imports encourage domestic enterprises to improve product quality and production efficiency and also promote the upgrading of traditional industrial structure.

Summers (1997) analysed the relationship between external trade and growth in Australia and Canada, concluding that imports and exports play different roles in economic growth of Canada and Austrialia. Import plays a significant role in Canada but no evidence was found to support the export-led growth in Australia.

Lin (2000) explored the relationship between trade and economic growth based on China's national data for the period of 1952 to 1997. He found that the growth rate of exports, the growth rate of imports, and the growth rate of the volume of trade are positively related to growth rate of per capita GDP. He also found that the labour force growth was positively related to economic growth. He suggested that to keep the economy at a high level of growth, China should actively engage in the world economy and continue its trade promotion policy.

Aurangzeb (2006) examined the link between exports, productivity and economic growth in Pakistan: a time series analysis from the period 1973 to 2005. The main focus of the study was to analyze the direct and indirect impacts of exports on Pakistan's economic growth during 1973 to 2005 using the analytical framework developed by Feder (1983). The estimation results indicated that marginal factor productivities are significantly higher in the export sector and thus the results of his study are supportive of the export oriented outward-looking approach to trade relations adopted by policy makers over the past decade.

Narayan et al. (2007), researched on the topic "export-led growth hypothesis: evidence from Papua New Guinea and Fiji. The main purpose of the study was to examine the export – led growth hypothesis for Fiji and Papua Guinea. They employed the bound test for cointegration. They found that for Fiji there is evidence of export – led growth in the long run, while for Papua New Guinea there was evidence of export – led growth in the short run.

Akeem (2011) did a study on the topic "Performance evaluation of foreign trade and economic growth in Nigeria (1970 - 2005". He found out that a 1% increase in export will cause economic growth to decrease by 19%. He suggested that conscious efforts should be made by the government to fine-tune the various macroeconomic variables in order to provide an enabling environment to stimulate foreign trade.

Ezike et al. (2012) studied on the topic 'Macroeconomic impact of trade on Nigerian growth: An empirical evaluation'.They found out that exports and foreign direct investment inflows were positive and are significant determinants of economic growth in Nigeria. They suggested that Nigeria needs to diversify its export base away from oil and add value to its exports by emphasizing on non-oil production and exportation. Again, primary products should be processed into semi-finished and finished industrial products before they are exported.

Atoyebi et al. (2012) empirically examined the impact of international trade on economic growth in Nigeria from 1970 – 2010. Their empirical investigations revealed that three of the variables were statistically significant at 5% and those variables were export, foreign direct investment and exchange rate. They were positively related to real GDP while the other variables such as import, inflation rate and openness had a negative impact on real GDP. They recommended that the government should design appropriate strategy by diversifying the economy through export promotion, stimulating foreign direct investment and ensuring exchange rate stability in order to boost productivity of Nigeria economy by raising the standard of living of the citizens.

Usman et al. (2012) investigated the relationship of export and economic growth: an empirical study of Pakistan from 1980 to 2009. The mean aim of their study was to study the impact of export on the economy of Pakistan. They employed the log linear growth model and

determined the values of the parameters of the model specified by using the least squares estimation technique. Their dependent variable was economic growth and the independent variables were export, inflation, and real exchange rate. Their results showed that there is a significant positive relationship between export and economic growth of Pakistan.

Faridi (2012) studied the contribution of agricultural exports to economic growth in Pakistan from the period 1972 to 2008. The main goal of the study was to explore and quantify the contribution of agricultural export to economic growth in Pakistan. He specified his model in the form of the Cobb – Douglas form of neoclassical production function and also used the Johansen Co-integration technique. His dependent variable was economic growth proxy by GDP in million rupees at market price and the independent variables were labour force measured as total labour force in million people, capital measured as fixed capital formation in million rupees, inflation measured as consumer price index, agricultural export in million rupees at market price and non agricultural export in million rupees at market price. He found that agricultural export had a negative significance effect on economic growth. He suggested that non agricultural exports should be promoted.

Edoumiekumo et al., (2013) researched on the topic "Economic Growth in Nigeria: The Role of Global Trade". They found out that there is a positive relationship between real gross domestic product and export and import, but the export coefficient was insignificant. Their result showed that international trade had contributed to economic growth in Nigeria. They suggested that Nigeria has to increase or diversify her export goods to enjoy more of the benefits of trade.

Azam (nd) did a study on exports and economic growth in Pakistan: an empirical analysis for the period 1971 to 2009. The main purpose of the paper was to understand the importance of exports in the process of economic growth and also to examine empirically the impact of exports and FDI on economic growth in Pakistan. Azam (nd) employed a simple log linear regression model. In Azam's model specification his dependent variable was economic growth measured as GNP at factor cost in Pak rupees million in log form. The explanatory variables were exports measured as exports of Pakistan in Pak rupees million in log form and foreign direct investment (FDI) Pak. Rupees million in log form. Azam found that exports impacted positively on growth. Also, FDI impacted positively on economic growth. Azam concluded that the positive impact of exports on economic growth demonstrates that expansion of exports is highly important for accelerating economic growth of the economy of Pakistan.

From the above empirical literature review, it could be concluded that, mostly, foreign trade impact positively on economic growth. But, despite all these strong empirical foundations, there is still not much convincing empirical evidence on the impact of foreign trade on economic growth in Ghana. Therefore, the need for this study.

Methodology
Model specification/ Economic Criteria
This study borrows the idea of the Cobb-Douglas production function specification where real gross domestic product is related to the inputs of exports, imporst and foreign direct investment in a multiplicative fashion of the form:

$$RGDP_t = EXP_t^{\beta_1} IMP_t^{\beta_2} FDI_t^{\beta_3} e^U \text{ ...... (1)}$$

Where; EXP_t = exports of goods and services % of GDP; IMP_t = imports of goods and services % of GDP; FDI_t = foreign direct investment % of GDP; U = error term, normally distributed with zero mean and constant variance. It captures the other factors excluded from the model; t =

time factor; β_1 , β_2 and β_3 are constant values of each explanatory variable's relative share (that is the partial elasticities).

The non-linear function specified above can be easily estimated by converting equation 1 into a linear regression after taking the logarithm of both sides of the function as stated in equation 1. We obtain: $\log(RGDP_t) = \beta_0 + \beta_1\log(EXP_t) + \beta_2\log(IMP_t) + \beta_3\log(FDI_t) + U_t$

.... (2) and we expect:

$\dfrac{\partial \log RGDP_t}{\partial \log EX_t} > 0$ Since export is an injection.

$\dfrac{\partial \log RGDP_t}{\partial \log IMP_t} < 0$ Since import is a withdrawal.

$\dfrac{\partial \log RGDP}{\partial \log FDI} > \alpha < 0$ Since FDI brings positive externalities.

The error correction term lagged one period, which integrates short-run dynamics in the long-run growth function is shown below through the error correction model (ECM):

$$\Delta \log RGDP_t = \alpha_1 + \sum_{i=1}\alpha_{2i}\Delta \log RGD_{t-i} + \sum_{i=0}\alpha_{3i}\Delta \log EXP_{t-i} + \sum_{i=0}\alpha_{4i}\Delta \log IMP_{t-i} + \sum_{i=0}\alpha_{5i}\Delta \log FDI_{t-i} + \alpha_6 ECM_{t-i} + \varepsilon_{2t} \quad ....(3)$$

where, ECM_{t-1} is the error correction term (the residuals that are obtained from the estimated cointegrating model of equation (3)). The ECM is the feedback and adjustment effect which indicates how much of the disequilibrium is being corrected. It further proves the stability of the long-run relationship when it is highly statistically significant (Bannerjee, et al., 1998). The composition of ε_{2t} is similar to that of u_{1t} as observed in equation (3). The symbol Δ represents the first-differenced form of the variables in the model. The coefficient of the various explanatory variables, α_{2i} , α_{3i} , α_{4i} , and α_{5i} are the impact multipliers that measure the immediate impact that a change in the explanatory variable has on a change in the dependent variable. α_6 represents the speed of the adjustment parameter. The value of α must be between the range $-1 \le \alpha_6 \le 0$ and must be statistically significant.

The directions of the relationships between the variables are tested using Granger causality test, Granger (1996). This is used to examine the linear causation between the concerned variables. The test is based on the model specified below as;

$$Y_i = \alpha_0 + \sum_{j=1}^{m}\beta Y_{t-j} + \sum_{i=1}^{n}\delta X_{t-i} + \mu,$$

If X_t Granger cause Y_t, then the current values of Y_t are determined by past values of X_{t-1}. The test of H_0: $\delta_i = 0$, is carried out using the F- test.

Method of Estimation
Stationarity properties
The Augmented Dickey-Fuller (ADF) test of the variables being considered is shown in table 1 below. From the table, all the variables are stationary at 5 percent level of significance with constant and trend. Therefore, all the variables, real gross domestic product, export, import and foreign direct investment are integrated at first order, I(1). Hence, the Johanson's cointegration approach will be used to determine the number of cointegrating equations.

Table 1:

The results of augmented dickey-fuller test (adf) for unit root.

Variable	None			Constant			Constant and Trend		
	Level	1st difference	Conclusion	Level	1st diff	Conclusion	Level	1st diff	Conclusion
	t-obs	t-obs		t-obs	t-obs		t-obs	t-obs	
RGDP	1.030157	1.632519		3.257265	-0.94261		-0.62255	-6.5996	I(1)
p-value	0.917	0.9721		1	0.7602		0.9703	0	
expo	1.703346	-1.41407		1.252002	-2.70781		-3.65061	-2.2923	I(1)
p-value	0.9761	0.1434		0.9977	0.0834	I(1)	0.0393	0.4242	
imp	2.135986	-1.64684	I(1)	-0.02624	-2.9819		-3.70116	-2.96077	I(1)
p-value	0.9906	0.0932		0.9491	0.0474	I(1)	0.0378	0.1583	
fdi	-0.87302	-5.16905		-0.82349	-5.17925		-3.06052	-5.12898	I(1)
p-value	0.3303	0	I(1)	0.7992	0.0002	I(1)	0.1321	0.0013	

Cointegration

Vector Autoregressive, VAR, is used to the optimal lag length for the Johanson cointegration test is determined using Vector Autoregressive, VAR, which is based on the AIC as shown in table 2 below. From the result, the optimal lag length is 2. Using the selected optimal lag length, the number of cointegrating vectors was obtained using the likelihood ratio test which depends on the maximum Eigen values of the stochastic matrix of the Johanson (1991) procedure.

Table 2:
Selection of Optimal Lag Length
 VAR Lag Order Selection Criteria
 Endogenous variables: LOGRGDP LOGEXP
 LOGIMP LOGFDI
 Exogenous variables: C
 Date: 10/17/13 Time: 19:38
 Sample: 1975 2012
 Included observations: 31

Lag	LogL	LR	FPE	AIC	SC	HQ

0	68.16281	NA	1.87e-07	-4.139536	-3.954506	-4.079221
1	204.7157	229.0564	7.93e-11	-11.91714	-10.99199*	-11.61556
2	231.6380	38.21227*	4.15e-11*	-12.62180*	-10.95653	-12.07897*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 3 shows the results for the cointegrating test. From the table, the Rank Test (Trace) statistics showed that there are four (4) cointegrating vectors at 5 percent level of significance. The null hypothesis of zero cointegrating vectors is rejected against the alternative of one cointegrating vector. Similarly the null hypotheses of at most 1, at most 2 and at most three cointegrating vectors are also rejected against the alternative hypothesis. Therefore, it is concluded that there are four cointegrating vectors specified in the model.

Table 3:
Unrestricted Cointegration Rank Test (Trace)

Date: 10/17/13   Time: 19:36
Sample (adjusted): 1983 2012
Included observations: 30 after adjustments
Trend assumption: Linear deterministic trend
Series: LOGRGDP LOGEXP LOGIMP LOGFDI
Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.912289	119.0815	47.85613	0.0000
At most 1 *	0.549837	46.07035	29.79707	0.0003
At most 2 *	0.376290	22.12597	15.49471	0.0043
At most 3 *	0.233149	7.963901	3.841466	0.0048

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The results of the coefficient of β matrices in terms of normalised cointegrating coefficient of first equation are shown in table 4 below. This result shows the long run relationship among the variables. All the variables turn out to be statistically significant and have their respective expected signs.

Table 4:

Normalised Cointegrating Coefficients: 1 Cointegrating Equation(s)

Variables	Coefficients	Standard Errors	T - Statistic
LOGEXP	2.748359	0.41898	6.5596
LOGIMP	-1.489057	0.37298	- 3.8847
LOGFDI	-0.289035	0.03536	- 8.1741

From table 4, the effect of export on real gross domestic product is positive and elastic; this shows that a percentage increase in exports leads to about 3 percent increase in real gross domestic product. On the other hand, 1% decrease in exports leads to about 3% decrease in economic growth. The coefficient of exports is statistically significant at 5% significance level. This result is consistent with the findings of Edoumiekumo et al. (2013), Usman et al. (2012) and Atoyebi et al. (2012) while contradictory to the findings of Akeem (2011).

Also, the impact of import on real gross domestic product is negative and elastic; this shows that a percentage increase in imports leads to about 1.5 percent decrease in real gross domestic product. However, a 1% decrease in imports leads to about 1.5% increase in real gross domestic product. This might mean that Ghana imports more of consumable goods instead of capital goods. That is the imports do not encourage domestic enterprises to improve product quality and production efficiency. This coefficient is statistically significant at the 5% level of significance. This result is not in line with the findings of Tong (1995) and Lin (2000).

Finally, the impact of foreign direct investment on real gross domestic product is negative and inelastic; this shows that a percentage increase in foreign direct investment leads to about 0.3 percent decrease in real gross domestic product. But a 1% decrease in foreign direct investment leads to a 0.3 increase in real gross domestic product. This coefficient is statistically significant at 5% level of significance. This result is contradicts with the findings of Ezike et al. (2012) and Atoyebi et al. (2012).

The stationarity of the residuals obtained from the cointegration regression of the dependent variable (real gross domestic product) on the independent variables (export, import and foreign direct investment) has been tested using the ADF test. The result shown in table 6 revealed that the residual is stationary at 1% level of significance.

Table 5:

Testing For The Stationarity Of The Residuals/Error

Variable	None	Constant	Constant and Trend	Conclusion
	t-obs	t-obs	t-obs	
residuals/error term	-6.13206	-6.06769	-6.04873	I(0)
	0	0.0001	0.0001	

The short run dynamics among the variables are explored by employing vector error correction model (VECM). Error correction model allows the introduction of previous disequilibrium as independent variables in the dynamic behaviour of existing variables. Table 6 presents the short run dynamic relationship and the set of short run coefficients in the vector error correction model. VECM associates the changes in real gross domestic product to the change with the other lagged variables and the disturbance term of lagged periods. The coefficient of the speed of adjustment is negative and significant at 5 percent. This shows

that there is 4.57 percentage point adjustment taking place each year towards the long run periods. From table 6, the past two years of real gross domestic product impacted negatively on the current real gross domestic product however, it is the previous two year's record which is significant. The relationship between past two years of real gross domestic product and the current real gross domestic product is inelastic, therefore, an increase in the past two years of real gross domestic product causes current real gross domestic product to decrease by 0.52 units. Considering exports, the immediate past record of export had a negative impact on real gross domestic product while the past two years had a positive; however, they are all not statistically significant. Also, the immediate past record of import had a positive impact on real gross domestic product while the past two years had a negative; however, both of them are not statistically significant. Finally, both past record of foreign direct investment had a positive impact on the real gross domestic product but they are not statistically significant. Therefore, in the short run, the relation between the past two years of real gross domestic product and the current real gross domestic product is inelastic and statistically significant in explaining the variation in real gross domestic product.

Table 6:
The Result of Error Correction Model for Short Run Dynamics

Error Correction: D(GDP)			
	Coefficients	**Standard errors**	**t-statistics**
The speed of adjustment	-0.04569	(0.01261)	[-3.62409]
D(LOGRGDP(-1))	-0.1505	(0.20815)	[-0.72305]
D(LOGRGDP(-2))	-0.52046	(0.19653)	[-2.64822]
D(LOGEXP(-1))	-0.00367	(0.04085)	[-0.08976]
D(LOGEXP(-2))	0.044404	(0.04462)	[0.99509]
D(LOGIMP(-1))	0.001565	(0.03684)	[0.04247]
D(LOGIMP(-2))	-0.03871	(0.03627)	[-1.06711]
D(LOGFDI(-1))	0.010367	(0.00798)	[1.29900]
D(LOGFDI(-2))	0.006623	(0.00581)	[1.14067]
C	0.034342	(0.00654)	[5.24999]
R-squared: 0.711666 Adj. R-squared: 0.5819160.581916F-statistic: 5.484889			

From the table 7, the result shows that there is unilateral directional causality between export and import, export and foreign direct investment, import and foreign direct investment Also, there is bidirectional causality between export and real gross domestic product, import and real gross domestic product, foreign direct investment and real gross domestic product.

Table 7:
The Results of Granger Causality Test

Pairwise Granger Causality Tests
Date: 10/17/13   Time: 20:07
Sample: 1975 2012
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LOGEXP does not Granger Cause LOGRGDP	36	5.57850	0.0085
LOGRGDP does not Granger Cause LOGEXP		7.36114	0.0024
LOGIMP does not Granger Cause LOGRGDP	36	6.34784	0.0049
LOGRGDP does not Granger Cause LOGIMP		6.20870	0.0054
LOGFDI does not Granger Cause LOGRGDP	31	6.53532	0.0050
LOGRGDP does not Granger Cause LOGFDI		5.63287	0.0093
LOGIMP does not Granger Cause LOGEXP	36	0.80332	0.4569
LOGEXP does not Granger Cause LOGIMP		3.00663	0.0641
LOGFDI does not Granger Cause LOGEXP	31	1.23186	0.3082
LOGEXP does not Granger Cause LOGFDI		6.33821	0.0057
LOGFDI does not Granger Cause LOGIMP	31	0.65609	0.5273
LOGIMP does not Granger Cause LOGFDI		7.89498	0.0021

Conclusion and Policy Recommendations

The study examined the effect of foreign trade on economic growth in Ghana using a cointegration analysis. The empirical analysis was based on time series econometrics. It was found out that all the variables of interest; real gross domestic product, foreign direct investment export, import and foreign direct investment turned out to be non stationary at their levels but became stationary at their first difference. The results of Johansens's cointegration test indicated that there exist a long run and short run relationship among real gross domestic product, foreign direct investment, export, import and foreign direct investment in Ghana. The study found out that in the long run export had a positive effect on real gross domestic product and as a result, an increase in exports leads to an improvement in real gross domestic product. Imports and foreign direct investment had a negative effect on real gross domestic product, respectively. Therefore, a decline in both variables causes an improvement in real gross domestic product. The speed of adjustment is 4.57 percentage point taking place at each year towards the long run periods. Also, in the short run, past two years of record of real gross domestic product and the current real gross domestic product were inelastic. The Granger Causality test showed that there is unilateral directional causality between export and import, export and foreign direct investment, import and foreign direct investment. However, bidirectional causality between export and real gross domestic product, import and real gross domestic product, foreign direct investment and real gross domestic product.

Therefore, the following policy recommendations are made based on the findings: export should still be encouraged, diversified and processed from their raw state to either semi finished or finished products to improve the real gross domestic product of Ghana. Imports should be reduced by assisting the local industries to produce products that would have been imported into Ghana. Finally, foreign direct investment must be channeled to productive sectors of the economy such as agriculture, education, health and housing to improve the real gross domestic product of Ghana.

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