



THE EXCHANGE RATE REGIME AND INTERNATIONAL TRADE: EVIDENCE FROM GHANA

Adubofour Isaac

School of Finance and Economics, Jiangsu University, Zhenjiang, China

Article DOI: <https://doi.org/10.36713/epra8833>

DOI No: 10.36713/epra8833

ABSTRACT

The degree of fluctuation of a country's currency in relation to other currencies is an important factor in determining her foreign trade position. The study employed both theoretical and empirical approaches to examine Ghana's real exchange rate and the impact on her foreign trade. A time series data, spanning from 1991 to 2019 was analyzed in an attempt to establish the relationship between exchange rate and economic growth. It is argued in the study that exchange rate has impact on a country's export volumes. A verification on the relationship between labour force and international trade was also conducted. The study was also extended to examining the impact of a country's access to stable electric power on export volumes. Findings of the study revealed a statistically significant and inverse association existing between exchange rate and international trade. The study also found that, wide electricity coverage has statistically significant and direct effect on foreign trade, resulting from an increased production capacity due to the availability of electric power. The study however found no suggestive evidence to support the claim that, labour force has impact on her foreign trade. A test on granger causality found no causal linkage between the variables.

KEYWORDS: Exchange rate, international trade, labour force, exports.

1. INTRODUCTION

The current discussions on persistent trade imbalances, especially with regards to developing countries and the resurgence of protectionism in trade have led to a renewed interest, geared towards understanding the interaction between a country's exchange rate regime and her foreign trade. Notwithstanding the increasing number of studies on the topic, the real impact that exchange rate has on a country's trade internationally, is still an open discourse. Exchange Rate determines a currency's value in relation to other currency. International trade on the other hand refers to a situation where goods and services are exchanged across countries' borders. The growing concern about a currency's fluctuation rate is largely as a result of its impact on exports (Wang and Barrett, 2007).

The sensitivity of exchange rate movements is an important segment of every country's trade balance (Kurtovic, 2017). Adam Smith was the first to propose the absolute advantage theory in foreign trade activities

in his book "The Wealth of Nation". According to Smith, bilateral trade is based on the principle of absolute advantage. That is, when a country is more efficient (absolute advantage) in the production of a particular product than another country but has less productive acumen (absolute disadvantage) in the production of a second product, then mutual gains can be achieved by each country specializing in the production of the product that it has higher efficiency in its production and exchange part of their outputs.

The discussion on trade was further advanced by David Ricardo in his "comparative advantage theory". He also argued that, in a situation where one nation is less efficient (has absolute disadvantage) than the other in the production of both commodities, a mutually beneficial trade can still be achieved. He asserted that, it is prudent for the country to specialize in the production of the product that it has less absolute disadvantage and export that product, and import the product in which it has greater absolute disadvantage. Subsequently, a model was developed by two Swedish



economists, Eli Hecksher and Bertil Ohlin. The model is regarded as an extension of Ricardo's theory. Heckscher-Ohlin model is enhanced from the simple model of Ricardo by adding capital and land alongside labour and fundamental factors. This is seen as one of the leading theories about the determinants of trade pattern of a nation, Heckscher-Ohlin model predicts that a country would export products of which the production uses abundant factors intensively and import products of which the production uses scarce factors intensively.

Long-term exchange rate determination has its foundation on the Purchasing Power Parity (PPP) between different currencies that derives its essential validity from the law of the single price. The theory asserts that, there will be uniformity of price among identical products and services in different countries. This principle is grounded on the assumption that, exchange rates will adjust to eliminate the arbitrage opportunity of buying cheaper goods or services in one country and selling it in another country at a higher price. Factors such as the cost of transportation and transaction are not considered in this theory. All goods and services are assumed to be traded in competitive markets in all countries. The concept of fixed exchange rate can be traced to the Bretton Woods system, post-World War II era. Proponents of this system often argued about the uncertainty nature of flexible exchange rate (Rose and Andrew, 2000). The collapse of this system was largely attributed to large deficits in U.S. balance of payment, increased outflows of gold, and lack of corporation from major trading partners with respect to currency realignment.

Ghana, a West African country, like many developing countries operate an import driven economy with countries such as, China, United States, India, Switzerland, South Africa and United Kingdom. The country placed 71st in the world's total exports and also placed 84th in total imports (OEC, 2018). The country exported USD20.5 billion and imported USD14.9 billion, resulting in a trade surplus of USD5.6 billion, in the year 2018. The country had not obtained a positive trade balance for a long period until 2018. Ghana's exports and imports per capita are USD689 million and USD499 million respectively. The country's top export products include, Gold (USD10 billion), Crude Petroleum (USD4.65 billion), Cocoa Beans (USD1.78 billion), Cocoa Paste (USD489 million), Coconuts, Brazil Nuts, and Cashews also amounting to (USD424 million). The country's major import products are, Refined Petroleum (USD738 million), Cars (USD466 million), Rice (USD425 million), Non-fillet Frozen Fish (USD303 million), and Delivery Trucks (USD274 million), (Ministry of Trade and Industry, 2020). This study aims at ascertaining the

impact of Ghana's exchange rate regime on her foreign trade patterns.

2. REVIEW OF LITERATURE

Economic theory postulates that, the appreciation of a country's currency will be beneficial to its imports but have a bad influence on exports (Yulu, 2008). This is consistent with previous study (Changjun and Ping, 2002). However, different countries have different economic conditions, therefore, the response to trade may vary. Marc and Michele (2012) argued that, there is no suggestive evidence of association between exchange rate and international trade. The study also revealed that, the short run effect of exchange rate on foreign trade is dependent on a number of factors such as pricing strategy of firms engaged in international trade. Nicita (2013) found that, exchange rate is not a major concern for international trade by a country. Khachatryan and Grigoryan (2020) assessed the effect of exchange rate on trade patterns in Armenia. The study revealed that, there exist a subdued impact of exchange rates on exports. These positions have however been disputed by other studies. Akorli and Edem (2017) found that, exchange rate has negative impact on the country's balance of trade after analyzing a time series data, spanning from 1980-2016. A research by Jong and Suzette (2018) concluded that, there exist a positive association between real exchange rate and export volume. Flavio and Ronald (2016) empirically investigated the impact of real effective exchange rate on export volume. The study revealed that, developing countries experience a decrease in export volume when the real effective exchange rate volatility increases.

A study by Kumar et al., (2020) showed that, countries are able to expand exports as their currency depreciates. They classified this phenomenon as the fruits of currency depreciation. Aly and Hosni (2018) found a suggestive evidence that, exchange rate volatility has a statistically significant and inverse relation on exports. Duc et al., (2019) concluded that, strategies that aim at depreciating currencies encourage the expansion of exports by manufacturing firms. Thuy and Duong (2019) analyzed the relationship between real effective exchange rate and trade in Vietnam. The study established a negative effect of exchange rate volatility on exports. A research by Remal and Mohd (2020) revealed that, the exchange rate regime in Jordan has statistically significant relationship with economic activities in the country. Barseghyan and Hayk (2017) argued that, exchange rate volatility has negative impact on exports, both in the short and long runs. A study by Genemo (2017) revealed that, currency depreciation in countries such as Egypt and Kenya lead to unfavorable trade balance unlike in



countries such as Rwanda and Tanzania where currency depreciation leads to better trade balance. Ahmad and Rana (2018) found that, real effective exchange rate has direct association with trade balance in Pakistan. It was however revealed that, an increase in real effective exchange rate volatility is only favourable in the short run. After employing the Johansen-Juselius cointegration approach, Samanta (2019) concluded that, there exist a long run relationship among elasticity of service trade, real exchange rate and income elasticity. This is consistent with previous study (Demir and Wu, 2017).

Kamugisha and Assoua (2020) found a statistically significant relationship between currency devaluation and international trade in the short run. Bleaney et al. (2018) argued that, exchange rate adjustment reduces the effect of a negative shock to an economy. The study also indicated that, countries with currency devaluations are most unlikely to experience growth collapse. Arize et al., (2017) after performing a cointegration analysis on the relationship between real effective exchange rate and trade balance concluded that, depreciation of currency improves trade balance. A research by Dada (2020) revealed a clustering volatility of exchange rate in Africa. The study found that, the high volatility of exchange rate in the region has statistically significant and negative effect on international trade. This is consistent with the conclusions of past study (Dada and Olomola, 2017; Mohsen and Aftab, 2017). Sharma and Pal (2018) argued that, the exchange rate regime in India has significant effect on her international trade. They also added that, the effect is not asymmetric and also differ in terms of the trade volume. Sugiharti et al. (2020) found suggestive evidence supporting a statistically significant relationship between exchange rate and export trade. Chien et al., (2019) found that, there exist a short run effect between exchange rate and international trade. By resorting to both theory and empiricism, the study would bridge the gap in knowledge identified in the study.

3. EMPIRICAL STRATEGY

The study aims at empirically assessing the impact of the Ghana's currency volatility on her trade, internationally. It employs both theoretical and empirical approaches in its analysis. This chapter describes the data and variables used for the study, as well as the presentation of a baseline model for the analysis.

3.1. Data

Data for this study was obtained from the Organization for Economic Cooperation (OEC), World Development Indicators of the World Bank,

International Monetary Fund (IMF), Ministry of Trade and Industry, and the Central Bank of Ghana with a span of 1991 to 2019. All variables are transformed using logarithms due to variation in the studied variables.

3.2. Description of Variables:

3.2.1. Key Variables

The real exchange rate was adopted as an indicator for assessing the exchange rate regime of Ghana. It determines the purchasing power of a currency in relation to other currency. It also reflects the actual value of a currency. It is denoted as (RER). The exports trade pattern of Ghana was also used as a proxy for measuring foreign trade. This is set as the dependent variable. It is also denoted as (EXP).

3.2.2. Control Variables

The study also considered other relevant variables that have the potential to influence Ghana's international trade, so as to reduce the threat of endogeneity (Wooldridge, 2010).

Labour Force (LF): Labour force affects a country's production capacity, which manifests in her exports. Labour force is therefore controlled in the model as an explanatory variable.

Foreign Direct Investment (FDI): FDI basically refers to foreign investments in a country. It increases a country's total production base. The study controlled for FDI in the model, as an explanatory variable.

Inflation (INF): Inflation determines pricing of products in a country and that goes a long way to influence the country's production capacity. High inflation increases the cost of borrowing in an economy and reduces the ability of firms to obtain financial support to expand their business. High inflation is detrimental to corporate activities. The study controlled for this variable in the model.

Imports (IMP): This refers to the inflow of goods and services from a country to another. Countries that import large amounts of raw materials may have higher export capacity. Imports is controlled in the model as explanatory variable.

Access to Electricity (ATE): Most developing countries, especially those in sub-Saharan Africa face electricity challenges in their daily activities. Electric power is a major factor in firm activities, especially in developing country like Ghana. Unstable electric power has negative impact on the production potentials of organizations in a country. This affects the country's total production output. This variable was included in the variable.

Gross Savings (GS): A country's ability to save a substantial amount of her revenue can affect her investment in the production sectors of the economy.



The study therefore controlled Ghana's gross savings in the model.

Government Consumption Expenditure (GCE): Government expenditure pattern affects its industrialization agenda. Expenditures of capital nature leads to improved GDP. For this reason, government consumption expenditure is included in the model as explanatory variable.

Gross Domestic Product (GDP): The gross domestic determines the rate of growth of an economy. Countries with high growth rate would have higher capacity to support their local industries so as to expand total output in the country. This will improve the country's trade potentials in the long run. The variable is controlled in the model.

3.3. Statement of Hypotheses

The study resorted to deducing hypotheses after critically examining past related literature that have direct bearing on the study area. The hypotheses are stated in conformity with the objectives of the study. The study's primary aim is to ascertain the impact of Ghana's exchange rate on her foreign trade. The search will also be advanced to examining how labour force affects international trade as well as assessing how the growth in GDP affects Ghana's foreign trade. The study would also consider the effect of other explanatory variables on international trade.

3.3.1. Main Hypothesis

Hypothesis 1: *exchange rate affects international trade*. This hypothesis is deduced after examining past literature that suggested a statistically significant and negative correlation between exchange rate and export trade (Chien et al., 2019; Kamugisha and Assoua,

$$\log(\text{Exp}) = \beta_0 + \beta_1 \log(\text{RER}) + \beta_2 \log(\text{LF}) + \beta_3 \log(\text{ATE}) + \beta_4 \log(\text{FDI}) + \beta_5 \log(\text{INF}) + \beta_6 \log(\text{IMP}) + \beta_7 \log(\text{GS}) + \beta_8 \log(\text{GCE}) + \beta_8 \log(\text{GDP}) + \epsilon$$

All variables are transformed using logarithms, β_0 refers to intercept whilst β_1 - β_8 refers to slope coefficient. An extensive set of variables are added in the model to cater for possible endogeneity, as indicated by Wooldridge, 2010.

3.5. Granger Causality Test

Regression analysis fails to show causality of variables but focuses on the dependence of one variable on other variables. The idea of Granger Causality test suggests that, assuming event A occurs before event B, then it is possible to state that A causes B. However, it

2020). Currency depreciation affects the expansion of export volumes (Kumar et al., 2020).

3.3.2. Other stated Hypotheses

Hypothesis 2: *labour force correlates positively with exports*. This hypothesis is stated on the grounds that, the country's labour force has direct impact on her foreign trade (Dennis and Diego, 2019; Osei et al., 2020). Labour force increases an economy's production capacity. A country with more active labour force would have higher propensity to improve her export of goods and services.

Hypothesis 3: *Access to electricity is statistically significant with a country's international trade*. This is stated on the premise that, large access as well as stable electric power supply in developing countries has positive impact on their production capacity which would affect their trade volumes in the long run.

3.4. Empirical Model

The study adopted an econometric model in an attempt to analyzing the data empirically. The country's export is used as a proxy for measuring her foreign trade. This is set as a dependent variable, with real exchange rate being the independent variable. A linear regression model will be employed as an econometric technique to analyze the data. The study's primary interest is to ascertain how the exchange rate regime of Ghana affects her foreign trade pattern. A further search would be extended to examining how the labour force of the country contributes to her trade, internationally, as well as assessing the impact of electricity coverage on the country's foreign trade. The model is specified as:

is not possible that B causes A. that is, events in the past cause present events, further events cannot (Gujarati and Sangeetha, 2007). By considering the EXP_t equation, a function of RER_t , in an attempt to identify whether RER_t causes EXP_t ($RER_t \rightarrow EXP_t$) or EXP_t causes RER_t ($EXP_t \rightarrow RER_t$). The arrow indicates to the direction of causality. The granger causality test assumes that, the information needed in order to predict the respective variables can be found only in the time series data. Considering the equations below:

$$EXP_t = \sum \alpha_1 RER_{t-i} + \sum \beta_1 EXP_{t-j} + \mu_1 t \quad (1)$$

$$RER_t = \sum \lambda_1 RER_{t-1} + \sum \delta_1 EXP_{t-j} + \mu_2 t \quad (2)$$



Where it is assumed that the disturbance terms μ_{1t} and μ_{2t} are uncorrelated. The two variables in the equation (EXP_t and RER_t), indicates bilateral causality.

The Vector Auto Regression (VAR) technique can be employed since the equation deals with bilateral causality. Equation (1) asserts that EXP_t is related to its previous values as well as that of RER_t , and (2) postulates similar behavior for RER_t . Unidirectional causality from RER_t to EXP_t is found if coefficient of estimates on the lagged EXP_t in (1) shows to be statistically different from zero as a group (i.e., $\sum \alpha_i \neq 0$) as well as its coefficients on the lagged RER_t in (2) is not statistically different from zero (i.e., $\sum \delta_j = 0$). However, causality that is unidirectional from EXP_t to RER_t can be found if the set of lagged RER_t coefficients in equation (1) has significant level that is equal to zero (i.e., $\sum \alpha_i = 0$) as well as its set of lag EXP_t coefficients in equation (2) is not equal to zero (i.e., $\sum \delta_j \neq 0$). Also, bilateral causality is suggested, when RER_t and EXP_t coefficients are statistically significant and different from zero. Finally, independence is shown when variables RER_t and EXP_t coefficients are statistically insignificant in both regressions.

4. RESULTS

Table 1 presents a statistical summary of the studied variables whilst table 2 gives information on the variables' bilateral correlations. Table 1 reports Labour Force (LF) as the variable with the highest mean value, which also has the lowest standard deviation, and also recorded FDI as the variable with the lowest mean value, as well as being the variable with the largest deviation from its mean. Results in table 2 suggests a low bivariate correlation between the

studied variables. Table 3 presents results of the regression analysis.

Results from the regression analysis suggested a statistically significant and inverse relationship between exchange rate and international trade ($\beta = -0.148$, $p < 0.05$). This means that, currency depreciation leads to an increase in exports. This supports hypothesis 1. The study found no statistically significant relationship between labour force and international trade. Results from the analysis revealed that, high electricity coverage has statistically significant and direct association with exports ($\beta = 0.060$, $p < 0.05$). This means that, larger electricity coverage in the country would foster the country's production capacity, which would then lead to higher exports. This is consistent with hypothesis 3.

The study further identified other explanatory variables to have significant impact on international trade. The study identified a statistically significant impact existing between FDI and exports. It was also found that, inflation has impact on the country's export capacity. Findings of the study also suggested a statistically significant and positive relation between imports and exports. This means that, the type of goods imported into the country has direct bearing on the country's export volumes. The regression results also provided suggestive evidence that, the country's GDP growth rate has significant impact on her foreign trade.

Table 4 captures result of the Granger Causality Test. The test found neither bidirectional nor unidirectional causality among the studied variables. This means that, the variables may have associations but not causal relations.

Table 1. Descriptive Statistics. The table below presents a summary statistic of the studied variables (1991-2019).

Variable	Median	Mean	Std. Dev.	Min.	25 th	75 th	Max
EXP	1.505	1.466	0.141	1.230	1.398	1.562	1.688
RER	-0.043	-0.160	0.622	-1.432	-0.636	0.254	0.691
LF	1.873	1.860	0.045	1.756	1.849	1.884	1.903
ATE	1.738	1.721	0.127	1.486	1.629	1.808	1.899
FDI	-1.554	-1.310	0.856	-2.975	-1.727	-0.745	0.325
INF	1.190	1.222	0.214	0.853	1.067	1.396	1.774
IMP	0.409	0.378	0.099	0.207	0.335	0.446	0.524
GS	1.255	1.143	0.246	0.598	1.026	1.330	1.405
GCE	0.099	0.046	0.108	-0.223	0.011	0.124	0.148
GDP	-0.895	-0.957	0.458	-1.577	-1.093	-0.810	0.826

**Table 2. Correlation between variables**

Variable	EXP	RER	LF	ATE	FDI	INF	IMP	GS	GCE	GDP
EXP	1.000									
RER	-0.145***	1.000								
LF	0.364	-0.732***	1.000							
ATE	-0.117**	0.996**	-0.683	1.000						
FDI	-0.241***	-0.830**	0.269	-0.858***	1.000					
INF	-0.888	0.107**	-0.468	0.064**	0.266	1.000				
IMP	1.000***	-0.154***	0.363	-0.127***	-0.230	-0.884***	1.000			
GS	-0.638***	0.216***	-0.566	0.210***	0.152***	0.766	-0.632***	1.000		
GCE	-0.691***	0.157	-0.530***	0.148	0.217***	0.811	-0.684	0.996	1.000	
GDP	0.999***	-0.175***	0.359	-0.149***	-0.200	-0.873	0.999	-0.618***	-0.669	1.000

Table 3. Regression Analysis

Variable	Coefficient	standard error	t-statistic	P-values
RER	-0.148	0.058	1.410	0.068**
LF	-0.004	0.015	-0.240	0.813
ATE	0.060	0.021	-2.810	0.011**
FDI	-0.004	0.001	-3.360	0.003***
INF	0.009	0.005	1.850	0.081**
IMP	1.475	0.014	1.230	0.000***
GS	0.043	0.039	1.100	0.283
GCE	-0.095	0.086	-1.100	0.284
GDP	0.001	0.066	0.550	0.041**
Cons	0.961	0.066	14.550	0.000

 $R^2 = 0.999$ Adj $R^2 = 0.998$

F-stat (9,19) = 4403.91

Source: Author's calculation. *** and ** indicate significance at 1% and 5% levels respectively.

Table 4. Granger Causality Test

Null hypotheses	F-statistics	P-values	Decision
Lagged RER_t does not cause EXP_t	0.172	0.843	Do not reject
Lagged EXP_t does not cause RER_t	0.988	0.388	Do not reject
Lagged LF_t does not cause EXP_t	0.047	0.954	Do not reject
Lagged EXP_t does not cause LF_t	0.293	0.749	Do not reject
Lagged ATE_t does not cause EXP_t	0.701	0.507	Do not reject
Lagged EXP_t does not cause ATE_t	0.068	0.935	Do not reject
Lagged FDI_t does not cause EXP_t	1.565	0.231	Do not reject
Lagged EXP_t does not cause FDI_t	1.277	0.299	Do not reject
Lagged INF_t does not cause EXP_t	1.215	0.316	Do not reject
Lagged EXP_t does not cause INF_t	2.353	0.119	Do not reject
Lagged IMP_t does not cause EXP_t	0.504	0.611	Do not reject
Lagged EXP_t does not cause IMP_t	0.466	0.633	Do not reject
Lagged GS_t does not cause EXP_t	0.652	0.531	Do not reject
Lagged EXP_t does not cause GS_t	0.838	0.446	Do not reject
Lagged GCE_t does not cause EXP_t	0.853	0.440	Do not reject
Lagged EXP_t does not cause GCE_t	0.656	0.529	Do not reject
Lagged GDP_t does not cause EXP_t	0.532	0.595	Do not reject
Lagged EXP_t does not cause GDP_t	0.116	0.891	Do not reject

Source: Author's calculation. The level of significance of the variables is shown by their respective F-statistic and Probability values.



5. DISCUSSION AND CONCLUSION

The study aimed at ascertaining the interplay between Ghana's exchange rate and her international trade position. The study also conducted a verification on other variables that may have the potential to cause changes in Ghana's foreign trade. The country's annual exports were used as an indicator for measuring her foreign trade. The country's real exchange rate was also considered as the independent variable. Results from the study suggested a statistically significant and inverse relationship between exchange rate and international trade. This means that, a depreciation of Ghana's currency (Ghanaian cedi) would result in an increased export. The study also identified a statistically significant and positive association between the country's access to electricity and foreign trade. The study however found no causal relation between the variables.

5.1. Theoretical contribution of the study

The study contributes to the knowledge in the few existing literatures that explore the interplay between exchange rate regime and international trade (Akorli and Edem, 2017; Dada, 2020). This will keep policy makers well informed as far as the impact of exchange rate on exports is concerned. The study was also extended to examining the impacts of labour force and electric power coverage on international trade, as stated in hypothesis 2 and 3 respectively.

Results of the analysis revealed that, a higher coverage of electric power in the country would lead to an expansion of export volumes. The study found no statistically significant relationship between Ghana's labour force and her foreign trade. The study makes significant theoretical contribution to the area of study, thereby bridging the knowledge gap. Findings of the study would serve as an important information to government's macroeconomic policy decisions.

5.2. Limitations and Future Research

The difficulty in obtaining full dataset on all the variables used for the study acted as a challenge to the study, despite the attempt to empirically ascertain the interplay between the currency's exchange rate and Ghana's foreign. Future research is therefore admonished to consider the full dataset, if available.

The lack of data on some other relevant variables which may have impact on exports served as a limitation to the study. Future study is encouraged to include all other relevant variables if data is available.

REFERENCES

1. Ahmad, M. & Rana, E.A.K. (2018). *Do Real Effective Exchange Rate and its Volatility Really Matter for Trade Balance in Pakistan? An Empirical Investigation by Dynamic Causal Connection*. *Economic Review*.
2. Akorli & Edem (2017). *The Effects of Exchange Rates on Trade Balance in Ghana*. MPRA.
3. Aly, H. & Hosni, R. (2018). *Examining the Nexus between Exchange Rate Volatility and Export Performance: Empirical Evidence from the Egyptian Experience*. *ResearchGate*.
4. Arize, C.A., Malindretos, J. & Igwe, E.U. (2017). *Do Exchange Rate Changes Improve Trade Balance: An Asymmetric Nonlinear Cointegration Approach*. *International Review of Economics and Finance*.
5. Barseghyan, G. & Hayk, H. (2017). *The Effects of Exchange Rate Volatility on Exports: Evidence from Armenia*.
6. B.O.G. (2019). *The Bank of Ghana*.
7. Bleaney, M., Saxena, S., & Yin, L. (2018). *Exchange Rate Regimes Devaluations and Growth Collapses*. *Journal of Macroeconomics*.
8. Chien, M.S., Nur, S. & Cheng, C.Y. (2019). *Asymmetric Effects of Exchange Rate Volatility on Bilateral Trade between Taiwan and Indonesia*. *The Singapore Economic Review*.
9. Dada, J. (2020). *Asymmetric Effect of Exchange Rate Volatility on Trade in Sub-Saharan African Countries*. *Journal of Economic and Administrative Sciences*. 10.1108/JEAS-09-2019-0101.
10. Dada, J. & Olomola, P. (2017). *Exchange Rate Volatility and Trade Balance from Nigeria*. *International Journal of Humanities and Social Science Research*.
11. Demir, F. & Wu, C. (2017). *Exchange Rate Adjustments and US Trade with China: What does a State Level Analysis Tells Us?* *Global Economy Journal*.
12. Dennis W. Jansen, Diego E. V. (2019). *Remittances, Output, and Exchange Rate Regimes: Theory with an Application to Latin America*. *Southern Economic Journal*.
13. Duc, V., Vo, T.H. & Zhang, Z. (2019). *Exchange Rate Volatility and Disaggregated Manufacturing Exports: Evidence from an Emerging Country*. *Journal of Risk and Financial Management*, 12(1):12.
14. Flavio and Ronald (2016). *Exchange Rate Volatility and Exports: a panel data analysis*. *Journal of Economic Studies*.
15. Genemo, K.B. (2017). *Effects of Exchange Rates on Trade Balance in Major East African Countries: Evidence from Panel Cointegration*. *European Business & Management*.
16. *International Monetary Fund* (2018). *I.M.F. database*.



17. Jong, W.K. & Suzatte, D. (2018). *International Trade and Exchange Rates*. *Journal of Applied Economics*.
18. Kamugisha, G. & Assoua, J.E. (2020). *Effects of a Devaluation on Trade Balance in Uganda: An ARDL Cointegration Approach*. *International Journal of Economics and Finance*. 10.5539/ijef.v12n7p42.
19. Khachatryan, G.A. & Grigoryan, A. (2020). *Export Growth Dynamics and Real Exchange Rate: Evidence from Armenia*. *International Economic Journal*.
20. Kumar, M., Begam, A. & Noman, N. (2020). *The Impact of Currency Depreciation on Exports of SAARC Countries*. *ResearchGate*.
21. Kurtovic, S. (2017). *The Effect of Depreciation of the Exchange Rate on the Trade Balance of Albania*. *Review of Economic Perspectives*.
22. Marc, A. & Michele, R. (2012). *The Relationship between Exchange Rates and International Trade: A Literature Review*. *CESifo Working Paper Series*.
23. Ministry of Trade and Industry (2020). *Ghana's Exports, Imports and Trade Partners*, In Press.
24. Mohsen, B.O. & Aftab, M. (2017). *On the Asymmetric Effects of Exchange Rate Volatility on Trade Flows: New Evidence from US-Malaysia Trade at the Industry Level*. *Economic Modelling*. 10.1016/j.econmod.2017.02.004.
25. Nicita, A. (2013). *Exchange Rates, International Trade and Trade Policies*. *International Economics*. <https://doi.org/10.1016/j.inteco.2013.10.003>.
26. OEC (2018). *Ghana Trade Patterns*. *Organization of Economic Cooperation*.
27. Osei, E.K., Adubofour, I., Adamu, S., & Dadzie, B.M. (2020). *The Exchange Rate Regime and Economic Growth in Ghana*. *European Scientific Journal*.
28. Remal, A-G. & Mohd, T.I. (2020). *Forecasting the Exchange Rate of the Jordanian Dinar versus the US Dollar Using a Box-Jenkins Seasonal ARIMA Model*. *International Journal of Mathematics and Computer Science*.
29. Rose, Andrew, (2000). *One Money, One Market: The Effect of Common Currencies on Trade*. *Economic Policy* 15 (30): 8–45.
30. Samanta, I. (2019). *Impact of Exchange Rate Elasticity and Income Elasticity on service exports-imports of Bangladesh*. *United International Symposium*.
31. Sharma, C. & Pal, D. (2018). *Exchange Rate Volatility and India's Cross-border Trade: A Pooled Mean Group and Nonlinear Cointegration Approach*. *Economic Modelling*. 10.1016/j.econmod.2018.05.016.
32. Sugiharti, L., Miguel, A.P.E. & Bektı, S. (2020). *The Impact of Exchange Rate Volatility on Indonesia's Top Exports to the Five Main Export Markets*. *Heliyon*. 10.1016/j.heliyon.2019.e03141.
33. Thuy, V. & Duong, T. (2019). *The Impact of Exchange Rate Volatility on Exports in Vietnam: A Bounds Testing Approach*. *Journal of Risk and Financial Management*.
34. Wang, K-L., and Barrett, C. (2007). *Estimating the Effects of Exchange Rate Volatility on Export Volumes*. *Journal of Agricultural and Resource Economics*, 32(2), pp 225-255.
35. World Bank (2020). *World Development Indicators*. <http://data.worldbank.org/data catalog/world development-indicators>
36. Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.
37. Yulu C., (2008). *International Finance*. Beijing. China Renmin University Press.