Real Effective Exchange Rates and Impact on Exports and Imports in Ghana

**Abstract**

This research aims to find out the connection between the Real Exchange Rate of Ghana with its Imports and Exports. The quantitative method with Secondary Data Collection method has been used in which 10 years of data covering a period from 2012 to 2021 is selected. Different Statistical measures such as Descriptive Statistics, Pearson Correlation and Regression were applied to evaluate the results through E-views. A significant connection is found between the Real Exchange Rate of Ghana and its imports, but the relationship is found insignificant when it is compared with Exports of the Country.

***Keywords:*** *Imports of Ghana, Exports of Ghana, Real Exchange Rate of Ghana and its imports/exports*

Contents

[Introduction 4](#_Toc90136983)

[Literature Review 7](#_Toc90136984)

[Description of the Dependent and Independent Variable 8](#_Toc90136985)

[Equation 9](#_Toc90136986)

[Empirical Evidence 10](#_Toc90136987)

[Data Section 10](#_Toc90136988)

[Result Section 12](#_Toc90136989)

[Regression 13](#_Toc90136990)

[Discussion 14](#_Toc90136991)

[Conclusion 15](#_Toc90136992)

[References 16](#_Toc90136993)

# Introduction

Exchange rate means the value of a nation’s currency when compared with the currency of another nation. It means the rate at which a currency may be exchanged for another. There tends to be a high volatility or instability in terms of the exchange rate. Some core elements impacting the exchange rate include inflation rates, geopolitical stability, monetary policy, economic performance, and tourism (Adeniran, Yusuf & Adeyemi, 2014). Volatility focuses on representation of the degree to which the variable transforms over time. The higher a variable fluctuates, or more quickly it tends to change, the more volatility it has. Volatile rates (exchange) enable making investment and business decisions difficult as volatility increases the risk of the exchange rate. The risk of an exchange rate involves the capability to lose money because of the major changes in the exchange rate (Reboredo et al., 2014). The volatility of the exchange rate is usually analyzed in terms of international trade. Various past research papers have a strong emphasis on assessing whether the risk of the exchange rate may affect international trade (Cheung & Sengupta, 2013). Interestingly, there is little empirical evidence that exchange rate fluctuations have a significant impact on trade and welfare, and interest rate fluctuations seem to be much more important than exchange rate fluctuations.

In addition, fluctuations in the exchange rate are not necessarily harmful. In a world of sticky prices, exchange rate fluctuations in response to changes in economic fundamentals can offset the adverse effects of inherent negative actual shocks. At the same time, the stability of the ratio between larger currency claims and major currencies is an important factor that affects the exchange rate, partly the flexibility created by the exchange rate market itself (Amiti, Itskhoki & Konings, 2014). If exchange rate fluctuations are caused by non-essential reasons, they can still be a good example of exchange rate stability. It feels that they are mainly driven by investor psychology. The degree of openness of a country is considered to be an important factor in determining the outcome of foreign direct investment in a floating exchange rate market (Forbes, Hjortsoe & Nenova, 2018). Several factors may impact foreign exchange rates. Some of the core elements include interest rates, inflation rates, government debt, and the current account of the country, recession, political stability, and speculation.

One of the main impacts associated with the exchange rate changes is on the imports and exports of a country. The main purpose of this assessment is to evaluate the impact of effective exchange rates on exports and imports in Ghana. Ghana with the official name of the Republic of Ghana is a country located in West Africa. Ghana is a multinational state and a variety of ethnic communities and religious groups are residing in it. The Health and Development Index (HDI) of the country is located on a medium scale and Gini Index of 43.5 which means that they can manage things properly. This research will explore the below-mentioned hypothesis:

*Ho: No significant relationship is found between real effective exchange rates and Imports/Exports in Ghana*

*HA: A significant relationship is found between real effective exchange rates and Imports/Exports in Ghana*

In this study, quantitative method was utilized to gain the results. A major advantage is that it assists in implementing the statistical analysis to attain a definite conclusion about the topic (Berman, Martin & Mayer, 2012). The advantages of using quantitative method includes the ability to get a larger sample in the shortest possible time, the predictability of the results and also cost effectiveness of using the method. In the qualitative research method, it is generally not possible to recruit a big number of respondents. Hence, the utilization of the quantitative method helped in evaluating the responses and achieving the desired outcomes. Furthermore, the quantitative method helped in understanding the phenomenon linked to the research topic.

The data collection method used for this paper is secondary data collection in which the official websites of Ghana has been referenced for collection of data on imports and exports of the country, together with the data on their effective exchange rates. The sample size which has been considered for the completion of this research is 10 years covering a period from 2012 to 2021. The data is collected from the website of Federal Reserve Economic Data (FRED). It includes both the pre and post Pandemic period to give insight into the impact of exchange rates on the imports and exports of the country.

# Literature Review

The subject of exchange rate risk is ubiquitous in the international economy, and the continuous discussion on the extent of its destructive impact is the best understanding and example (Lartey, Mandelman & Acosta, 2012). Interestingly, there is little empirical evidence that exchange rate fluctuations have a significant impact on trade and welfare, and interest rate fluctuations seem to be much more important to G-3 activities than exchange rate fluctuations (Bouraoui & Phisuthtiwatcharavong, 2015). In addition, fluctuations in the exchange rate are not necessarily harmful. In a world of sticky prices, exchange rate fluctuations in response to changes in economic fundamentals can offset the adverse effects of inherent negative actual shocks (Li, Ma & Xu, 2015).

Researchers have found several fundamental and technical factors that cause exchange rate fluctuations in the literature. The exchange rate is very complicated by many highly interrelated and interacting economic, political, and psychological factors. The impact is very complex (Ahmed, Appendino & Ruta, 2017). Volatility is usually caused by government financial and currency intervention, economic fundamentals, financial markets, and financial development. Researchers who study exchange rate fluctuations, currency interest rates, domestic stock markets and industrial production in EU countries have found through possible predictions that the forces behind exchange rate fluctuations are macroeconomic factors (Bussière, Delle Chiaie & Peltonen, T2014). These countries adopt a managed floating exchange rate system, rather than rigid exchange rates.

At the same time, the stability of the ratio between larger currency claims and major currencies is an important factor that affects the exchange rate, partly the flexibility created by the exchange rate market itself (Bal & Rath, 2015). If exchange rate fluctuations are caused by non-essential reasons, they can still be a good example of exchange rate stability. It feels that they are mainly driven by investor psychology (Khan, Sattar & Rehman, 2012). The degree of openness of a country is considered to be an important factor in determining the outcome of foreign direct investment in a floating exchange rate.

## Description of the Dependent and Independent Variable

The impact of the real exchange rate and its impact on the imports/exports is essential, and the topic has been analyzed in different places of the world. According to the research conducted by Glüzmann, Levy-Yeyati & Sturzenegger (2012), the exchange rate affects trade deficit/surplus. The research covered the analysis on the weak economy of Kenya, in which the relationship was analyzed from different perspectives. The researcher covered the analysis through different statistical measures and proper quantification was applied to it. With the application of sophisticated statistical measures and techniques, a significant relationship was found between the variables (Feng, Li & Swenson, 2016). According to the researcher, a country with a weak domestic currency tends to increase its exports, because the price of their products become cheaper whiles their imports become expensive.

This particular research was also endorsed completely by An & Wang (2012), as they have analyzed exports/important mechanisms in different European countries, and found that the countries with the weak economy tend to have higher exports than other countries and their imports tend to be relatively expensive. Hence, this factor needs to be analyzed accordingly in the case of Ghana as well.

There was another research conducted by Auboin & Ruta (2013) in the jurisdiction of Turkey. The research analyzed the relationship between prevailing exchange rate of the country and their net exports. The researchers used a mixed approach (quantitative and qualitative methods) for their analysis. It means that apart from quantification of relevant data, the researcher gathered data from some of the major individuals of the country regarding the same relationship. The researcher found a negative connection with the variables, which means that the higher the exchange rate of the Turkish Lira against the U.S. Dollar, the lower the exported because it is makes exports quite expensive. On the other hand, imports become cheaper and that is the time when surplus can be attained by the Turkish authorities (Jongwanich, & Kohpaiboon, 2013). This study was also endorsed by Alagidede & Ibrahim (2017) , when they mentioned the same relationship with other economies such as Indonesia, in which a lower exchange rate means exports are increasing aggressively.

## Equation

The mathematical equation that has been considered for this assessment is as follows;

Y = A + B1 (Exports of Ghana) + B2 (Imports of Ghana)

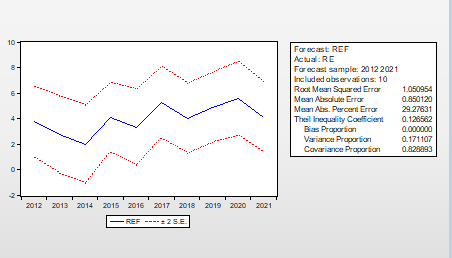
The equation is a regression equation, in which the relationship between the Real Effective Exchange Rate and Imports and Exports of Ghana are examined

# Empirical Evidence

## Data Section

Data is one of the most important factors for every successful research paper. In this paper, data was collected from the website of FRED, and the data covered a period of 10 years .The analysis is based on the summary statistics table, and the summary statistical table is as follows;

|  |  |  |  |
| --- | --- | --- | --- |
| **DESCRIPTIVE STATISTICS** |  |  |  |
|  |  |  |  |
|  | Real Exchange Rate in % | EXPORTS in Million $ | IMPORT in Million $ |
| Mean | 3.947400 | 1177.700 | 1221.000 |
| Median | 4.185000 | 1250.000 | 1200.000 |
| Maximum | 6.010000 | 1450.000 | 1700.000 |
| Minimum | 1.655000 | 720.0000 | 830.0000 |
| Std. Dev. | 1.568178 | 270.6404 | 268.5124 |
| Skewness | -0.230026 | -0.366169 | 0.205007 |
| Kurtosis | 1.668272 | 1.615020 | 2.282753 |
|  |  |  |  |
| Jarque-Bera | 0.827145 | 1.022703 | 0.284397 |
| Probability | 0.661283 | 0.599685 | 0.867449 |
|  |  |  |  |
| Sum | 39.47400 | 11777.00 | 12210.00 |
| Sum Sq. Dev. | 22.13263 | 659216.1 | 648890.0 |
|  |  |  |  |
| Observations | 10 | 10 | 10 |



Firstly, Real Effective Exchange Rate is analyzed. The Ghana cedi is analyzed against the U.S. Dollar. The average Exchange Rate of Ghana against the U.S. Dollar is 3.94, which means that for every one 1 dollar, an individual can exchange it for 3.94 Ghanaian Cedi. The standard error found is on a lower level as well, which is 0.49%. The median exchange rate is quite near to the mean factor, which is also endorsing the same idea. The standard deviation here is 1.56%, showing that the mean value is expected to change with specific consideration. There is a definite difference found between the maximum and minimum values, showing that the exchange rate of Ghana tends to change rapidly against the U.S. Dollar from 2012 to 2021 (Currency Ghana, 2021).

Secondly, Exports of Ghana are analyzed. The average Exports of Ghana is $1,177.7 Million. The standard error found is on a lower level as well, which is 85%. The median exchange rate is quite near to the mean factor, which is also endorsing the same idea. The standard deviation here is 270, showing that the mean value is expected to change with specific consideration. There is a definitely a difference found between the maximum and minimum values, showing that the exports of the country have shown a definite difference from 2012 to 2021.

Thirdly, the Imports of Ghana are analyzed. The average Imports of Ghana is $1,221 Million. The standard error found is on a lower level as well, which is 85%. The median exchange rate is quite near to the mean factor, which is also endorsing the same idea. The standard deviation here is 268, showing that the mean value is expected to change with specific consideration. There is a definite difference found between the maximum and minimum values, showing that the imports of the country have shown a definite difference from 2012 to 2021. It is also found that there is a difference in the mean exports and imports, but the imports are higher than exports, showing a trade deficit found in the region.

## Result Section

Two different tools have been associated with the same outcome which is correlation and regression. Correlation is a statistical tool that analyzes the relationship between dependent and independent variables in particular. The correlation result is as follows:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Real Exchange Rate | EXPORTS | IMPORTS |
| Real Exchange Rate | 1.000000 | 0.296346 | -0.707188 |
| EXPORTS | 0.296346 | 1.000000 | -0.455661 |
| IMPORTS | -0.707188 | -0.455661 | 1.000000 |

From the analysis of correlation, it is found that a positive but low-intensity relationship is found between the Real Effective Exchange Rate of Ghana with the Exports of Ghana. The Pearson Correlation Value that is associated with the same outcome is 0.296 or approximately 0.3. This particular analysis is insignificant because of the power between the variables. It means that with the increase or decrease in the exchange rate in Ghana, its exports are not increasing and decreasing significantly (Ghana Imports, 2021).

On the other hand, the relationship between the exchange rate of Ghana and its Imports is in a negative node, showing a Pearson Correlation Factor of -0.707, which is equal to -0.71. This value is quite high and shows a high intensity in the analysis. Based on the same evaluation, it can be said that when the exchange rate of Ghana increased against the U.S. Dollar, its import decreased, and when the exchange rate of Ghana decreased, the imports of the country increased, which is consistent with the analysis of other authors mentioned in the literature review part of this paper.

## Regression

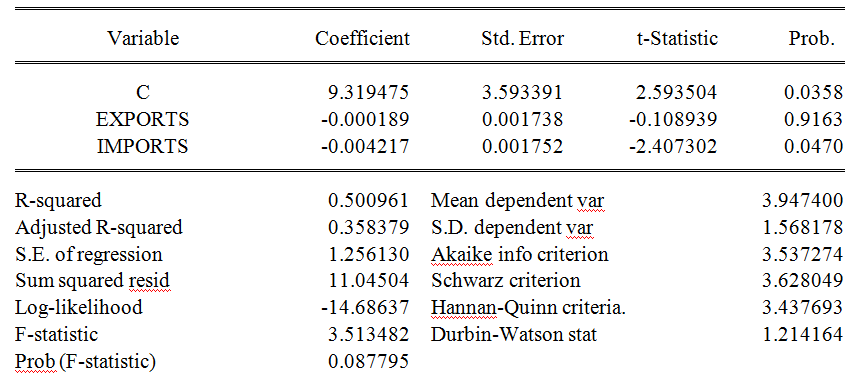
The hypothesis is as follows, along with the regression output:

*Ho: No significant relationship is found between real effective exchange rate and Imports/Exports in Ghana*

*HA: A significant relationship is found between real effective exchange rate and Imports/Exports in Ghana*

**REGRESSION**

|  |  |  |
| --- | --- | --- |
| Dependent Variable: Real Exchange Rate |  |  |
| Method: Least Squares |  |  |
| Date: 12/11/21 Time: 16:30 |  |  |
| Sample: 2012 2021 |  |  |
| Included observations: 10 |  |  |



The most important element covered in the same outcome is F-statistics, which is enough to find out the results accordingly. The R-Square and Adjusted R-Square values are in the positive node, which is enough to identify that the application model is effective and viable as far as evaluating the main research is concerned. The F-Statistics is higher than 0.05, which means that the value is in the acceptance region and the null hypothesis need to be selected here. It means that *no significant relationship is found between real effective exchange rate and Imports/Exports in Ghana.*

## Discussion

From the entire statistical analysis performed through E-Views, an insignificant connection is found between the Real Exchange Rate of Ghana with their Exports and Imports. This particular analysis is inconsistent with the outcomes and literature found earlier, in which a negative connection was found between Exchange rates and other variables. However, the values are somewhat connected. The exports of Ghana have an insignificant connection with the real exchange rate of the country, and this point is consistent with the one mentioned by Razmi Rapetti & Skott (2012) in their research. However, the imports have shown a negative relationship with the exchange rates whose implications have already been covered earlier. This analysis is consistent as found by Delatte & López-Villavicencio (2012) in their research, in which imports tend to decrease with the increase in the exchange rate of the respective country and vice versa.

# Conclusion

This research aims to find out the connection between the Real Exchange Rate of Ghana with its Imports and Exports. The researcher used a quantitative method for the assessment, and the Secondary Data Collection method was used in the same outcome. This data collection method allows the researcher to collect the data through FRED. Data of 10 years have been selected and analyzed through the different statistical measures. The researcher has found an insignificant relationship between the exchange rate of Ghana and Exports, but a significant negative connection is found between the Exchange Rate and Imports of the country. This research can be improved further if a mixed methodology is applied, in which semi-structured interviews can be conducted with key individuals who are knowledgeable and have experience in the area of Imports and Exports of Ghana as well using extensive FRED data covering a period of about 25 years.

# References

Adeniran, J. O., Yusuf, S. A., & Adeyemi, O. A. (2014). The impact of exchange rate fluctuation on the Nigerian economic growth: An empirical investigation. *International Journal of Academic Research in Business and Social sciences*, *4*(8), 224.

Ahmed, S., Appendino, M., & Ruta, M. (2017). Global value chains and the exchange rate elasticity of exports. *The BE Journal of Macroeconomics*, *17*(1).

Alagidede, P., & Ibrahim, M. (2017). On the causes and effects of exchange rate volatility on economic growth: Evidence from Ghana. *Journal of African Business*, *18*(2), 169-193.

Amighini, A., & Sanfilippo, M. (2014). Impact of South-South FDI and trade on the export upgrading of African economies. *World Development*, *64*, 1-17.

Amiti, M., Itskhoki, O., & Konings, J. (2014). Importers, exporters, and exchange rate disconnect. *American Economic Review*, *104*(7), 1942-78.

An, L., & Wang, J. (2012). Exchange rate pass-through: Evidence-based on vector autoregression with sign restrictions. *Open Economies Review*, *23*(2), 359-380.

Auboin, M., & Ruta, M. (2013). The relationship between exchange rates and international trade: a literature review. *World Trade Review*, *12*(3), 577-605.

Bahmani-Oskooee, M., & Saha, S. (2016). Do exchange rate changes have symmetric or asymmetric effects on stock prices?. *Global finance journal*, *31*, 57-72.

Bal, D. P., & Rath, B. N. (2015). Nonlinear causality between crude oil price and exchange rate: A comparative study of China and India. *Energy Economics*, *51*, 149-156.

Bartram, S. M., & Bodnar, G. M. (2012). Crossing the lines: The conditional relation between exchange rate exposure and stock returns in emerging and developed markets. *Journal of International Money and Finance*, *31*(4), 766-792.

Basher, S. A., Haug, A. A., & Sadorsky, P. (2016). The impact of oil shocks on exchange rates: A Markov-switching approach. *Energy Economics*, *54*, 11-23.

Becken, S., & Lennox, J. (2012). Implications of a long-term increase in oil prices for tourism. *Tourism Management*, *33*(1), 133-142.

Berkmen, S. P., Gelos, G., Rennhack, R., & Walsh, J. P. (2012). The global financial crisis: Explaining cross-country differences in the output impact. *Journal of International Money and Finance*, *31*(1), 42-59.

Berman, N., Martin, P., & Mayer, T. (2012). How do different exporters react to exchange rate changes?. *The Quarterly Journal of Economics*, *127*(1), 437-492.

Bouraoui, T., & Phisuthtiwatcharavong, A. (2015). On the determinants of the THB/USD exchange rate. *Procedia Economics and Finance*, *30*, 137-145.

Brahmasrene, T., Huang, J. C., & Sissoko, Y. (2014). Crude oil prices and exchange rates: Causality, variance decomposition and impulse response. *Energy Economics*, *44*, 407-412.

Bricongne, J. C., Fontagné, L., Gaulier, G., Taglioni, D., & Vicard, V. (2012). Firms and the global crisis: French exports in the turmoil. *Journal of International Economics*, *87*(1), 134-146.

Brun‐Aguerre, R., Fuertes, A. M., & Greenwood‐Nimmo, M. (2017). Heads I win; tails you lose: asymmetry in exchange rate pass‐through into import prices. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *180*(2), 587-612.

Bussière, M., Delle Chiaie, S., & Peltonen, T. A. (2014). Exchange rate pass-through in the global economy: the role of emerging market economies. *IMF Economic Review*, *62*(1), 146-178.

Cheung, Y. W., & Sengupta, R. (2013). Impact of exchange rate movements on exports: an analysis of Indian non-financial sector firms. *Journal of International Money and Finance*, *39*, 231-245.

Currency Ghana, (2021), [Online], Accessed from <https://tradingeconomics.com/ghana/currency> Accessed on 12th December 2021

Chinn, M. D., & Wei, S. J. (2013). A faith-based initiative meets the evidence: does a flexible exchange rate regime facilitate current account adjustment?. *Review of Economics and Statistics*, *95*(1), 168-184.

Combes, J. L., Kinda, T., & Plane, P. (2012). Capital flows, exchange rate flexibility, and the real exchange rate. *Journal of Macroeconomics*, *34*(4), 1034-1043.

Corden, W. M. (2012). Dutch disease in Australia: policy options for a three‐speed economy. *Australian Economic Review*, *45*(3), 290-304.

Delatte, A. L., & López-Villavicencio, A. (2012). Asymmetric exchange rate pass-through: Evidence from major countries. *Journal of Macroeconomics*, *34*(3), 833-844.

Downes, P. M., Hanslow, K., & Tulip, P. (2014). The effect of the mining boom on the Australian economy. *Reserve Bank of Australia research discussion paper*, (2014-08).

Dreger, C., Kholodilin, K. A., Ulbricht, D., & Fidrmuc, J. (2016). Between the hammer and the anvil: The impact of economic sanctions and oil prices on Russia’s ruble. *Journal of Comparative Economics*, *44*(2), 295-308.

Eaton, J., Eslava, M., Jinkins, D., Krizan, C. J., & Tybout, J. R. (2021). *A search and learning model of export dynamics* (No. w29100). National Bureau of Economic Research.

Elbadawi, I. A., Kaltani, L., & Soto, R. (2012). Aid, real exchange rate misalignment, and economic growth in Sub-Saharan Africa. *World Development*, *40*(4), 681-700.

Feng, L., Li, Z., & Swenson, D. L. (2016). The connection between imported intermediate inputs and exports: Evidence from Chinese firms. *Journal of International Economics*, *101*, 86-101.

Forbes, K., Hjortsoe, I., & Nenova, T. (2018). The shocks matter: improving our estimates of exchange rate pass-through. *Journal of international economics*, *114*, 255-275.

Ghosh, A. (2013). Exchange rate pass-through, macro fundamentals and regime choice in Latin America. *Journal of Macroeconomics*, *35*, 163-171.

Glüzmann, P. A., Levy-Yeyati, E., & Sturzenegger, F. (2012). Exchange rate undervaluation and economic growth: Díaz Alejandro (1965) revisited. *Economics Letters*, *117*(3), 666-672.

Ghana Imports, (2021), [Online], Accessed from <https://fred.stlouisfed.org/tags/series?t=ghana%3Bimports%3Bmonthly&ob=pv&od=desc> Accessed on 12th December 2021

Ghana Exports, (2021), [Online], Accessed from <https://fred.stlouisfed.org/tags/series?t=exports%3Bghana%3Bva> Accessed on 12th December 2021

Hochman, G., Rajagopal, D., Timilsina, G., & Zilberman, D. (2014). Quantifying the causes of the global food commodity price crisis. *Biomass and Bioenergy*, *68*, 106-114.

Itskhoki, O., & Mukhin, D. (2021). Exchange rate disconnect in general equilibrium. *Journal of Political Economy*, *129*(8), 2183-2232.

Jain, A., & Biswal, P. C. (2016). Dynamic linkages among oil price, gold price, exchange rate, and the stock market in India. *Resources Policy*, *49*, 179-185.

Johnson, R. C. (2014). Five facts about value-added exports and implications for macroeconomics and trade research. *Journal of Economic Perspectives*, *28*(2), 119-42.

Jongwanich, J., & Kohpaiboon, A. (2013). Capital flows and real exchange rates in emerging Asian countries. *Journal of Asian Economics*, *24*, 138-146.

Kee, H. L., & Tang, H. (2016). Domestic value added in exports: Theory and firm evidence from China. *American Economic Review*, *106*(6), 1402-36.

Khan, R. E. A., Sattar, R., & Rehman, H. (2012). Effectiveness of exchange rate in Pakistan: Causality analysis. *Pak. J. Commer. Soc. Sci*, *6*(1), 83-96.

Lartey, E. K., Mandelman, F. S., & Acosta, P. A. (2012). Remittances, exchange rate regimes and the Dutch disease: A panel data analysis. *Review of International Economics*, *20*(2), 377-395.

Li, H., Ma, H., & Xu, Y. (2015). How do exchange rate movements affect Chinese exports?—A firm-level investigation. *Journal of International Economics*, *97*(1), 148-161.

Neaime, S., & Gaysset, I. (2017). Sustainability of macroeconomic policies in selected MENA countries: Post financial and debt crises. *Research in International Business and Finance*, *40*, 129-140.

Oriakhi, D. E., & Osaze, I. D. (2013). Oil price volatility and its consequences on the growth of the Nigerian economy: An examination (1970-2010). *Asian economic and financial review*, *3*(5), 683-702.

Razmi, A., Rapetti, M., & Skott, P. (2012). The real exchange rate and economic development. *Structural Change and Economic Dynamics*, *23*(2), 151-169.

Reboredo, J. C., & Rivera-Castro, M. A. (2013). A wavelet decomposition approach to crude oil price and exchange rate dependence. *Economic Modelling*, *32*, 42-57.

Reboredo, J. C., Rivera-Castro, M. A., & Zebende, G. F. (2014). Oil and US dollar exchange rate dependence: A detrended cross-correlation approach. *Energy Economics*, *42*, 132-139.

Towbin, P., & Weber, S. (2013). Limits of floating exchange rates: The role of foreign currency debt and import structure. *Journal of Development Economics*, *101*, 179-194.

Tsagkanos, A., & Siriopoulos, C. (2013). A long-run relationship between the stock price index and exchange rate: A structural nonparametric cointegrating regression approach. *Journal of International Financial Markets, Institutions and Money*, *25*, 106-118.

Turhan, I., Hacihasanoglu, E., & Soytas, U. (2013). Oil prices and emerging market exchange rates. *Emerging Markets Finance and Trade*, *49*(sup1), 21-36.

Wang, Y., Wu, C., & Yang, L. (2013). Oil price shocks and stock market activities: Evidence from oil-importing and oil-exporting countries. *Journal of Comparative Economics*, *41*(4), 1220-1239.