Investigation of the Factors Affecting Real Exchange Rate in the Philippines

Review of Integrative Business & Economics Research

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ABSTRACT

This paper aims to investigate the factors affecting the real exchange rate in the Philippines from 1973 to 2014, namely gross domestic product, volume of money flow, net foreign assets, budget deficit, import restrictions, and oil prices. The study used the unrestricted vector autoregressive model in order to properly investigate the response of the real exchange rate to the different macroeconomic variables. The Johansen Cointegration test shows that there are no evidences of long-run cointegration between the dependent variable and the independent variables. Variance decomposition showed that GDP and volume of money flow accounted for most of the real exchange rate movement. All variables except oil prices has a positive relationship to real exchange rate in the Philippines. The results of the study may aid the government (including the central bank) to focus on what factor should they improve or balance in order to maintain a stable foreign exchange market.

Keywords: Real Exchange Rate, Vector Autoregression, Johansen cointegration, variance decomposition

1. INTRODUCTION

Economists know that poorly managed exchange rate can have a negative effect in economic growth (Rodrik, 2008). Exchange rate is determined by the demand and supply for foreign exchange from the households, firms, and financial institutions that buy and sell foreign currencies to make international payments. Since the value of real exchange rate is important especially in the international trade and in determining the competitiveness of a country, it should be important to maintain its equilibrium rate to create effective policies especially in a developing country.

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In the Philippines, exchange rates can be viewed in different ways. The most common view is the Philippines peso – US dollar exchange rate since the US dollars is the most important currency in the world and United States also has the biggest share of the Philippine international transactions. Another one is the Japanese Yen since it is the second most important contributor in the Philippines foreign international trade. In the last decade Japan accounted for about one-fourth of the country's merchandise trade. The total share of other trade partners was slightly above 40 percent, each of which contributed less than 10 percent. Another view is the Real Exchange Rate or the Real Effective Exchange Rate (REER) that plays an important role in the outward-oriented development strategy that the Philippines have apparently followed since the early 1970s. Real Effective Exchange Rate (REER) is a key macroeconomic relative price influencing the composition of production and absorption between tradable and non-tradable goods. Relative production incentives, including the incentive structure for export producers, are affected directly by the REER.

In 1973, developed countries adopted currency floating. The maintenance of exchange rate parities among International Monetary Fund (IMF) member-countries under the Bretton-Woods system was ended. In 1962, the Philippine peso was devalued—from P2.00 per dollar (the official exchange rate even before World War II) to P3.90 per dollar. On February 1970, the Philippines was already under "managed floating" in respect to the exchange rate of US dollars. By December, the exchange rate had settled to P6.40 per dollar, representing an effective devaluation of 61% during the year.

These changes in the exchange rates of major currencies added source of external economic disturbance to developing countries with strong links in trade and payments to developed countries. In the case of the Philippines, particular interest attaches understandably to the exchange rate between the US dollar and Philippine peso.

On the other hand, having a generalized currency floating gave an opportunity to undertake more active exchange rate management in pursuing external balance. Exchange rate under the new system rendered large adjustment that would facilitate the correction of currency overvaluation. (Romeo Bautista, 2002)

In this regard, this study aims to investigate the determinants of real exchange rate movements in the Philippines using the following macroeconomic factors: (i) Gross Domestic Product, (ii) Volume of Money Flows, (iii) Net Foreign Assets, (iv) Budget Deficit, (v) Import Restrictions and (vi) Oil Prices at the period of 1973 – 2014. This study is patterned after the paper of Goudarzi et.al. (2012) who investigated using the same variables in Iran.

2. LITERATURE REVIEW

2.1 Gross Domestic Product (Y)

Patosa and Cruz, 2013; Acosta et al, 2009; Goudarzi et al, 2012; and Rodrik, 2008 concluded that as GDP increases, real exchange rate appreciates. For example, Patosa and Cruz conducted a research about the factors affecting exchange rate movements

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in selected Asian countries namely China, Malaysia, Thailand, Philippines and Singapore using the data that came from the World Bank for the period 1977– 2010. The real interest differential (RID) model, supported by the Keynesian and Chicago price theories was used in the study. Results showed that Industrial production or GDP has a negative coefficient sign in the RID model, indicating that when the amount of industrial production increases, the currency appreciates. This is true for all five countries in the study. A rise in domestic industrial production or output level raises domestic money demand leading by the fall in the long-run domestic price level. In support to that, a study conducted by Acosta et al tackled the Dutch Disease phenomenon. The researcher mentioned that the real exchange rate tends to appreciate as the price of non-tradables increases. Exports decline contrary to the case of no remittances. The Dutch disease type resource reallocation process is clear in this instance: the employment in the non-tradable sector expands. When compared to the case with no remittances, the tradable sector experiences a relatively larger decline. Goudarzi et al studied about the factors affecting Real Exchange Rate in Iran using the period of 1978-2008 used Vector Autoregressive Model that is known as VAR to investigate the effect of proper variables on the real exchange rate. The study stated that GDP has a negative effect on real exchange rate in the short-run but it has increased real exchange rate in the long-run and the effect of this shock will disappear after about ten years.

Another model exist between Real Exchange Rate and the Gross Domestic Product which is called the Balassa-Samuelson effect (Harberger 2011; Rodrik 2008.) which means that when the process of growth real cost reduction comes faster in the tradable goods than in nontradables, hence prices of tradables tend to fall relative to nontradables, which implies that the real price of the dollar will also tend to fall through time. Harberger concluded that in Russia, it was hard to detect any systematic connection between economic growth on the one hand and real exchange rate changes on the other since the result show that there was no strong presumption that real cost reductions will be mainly concentrated in the tradables. It means that this evidence does not support Balassa's presumption. On the other hand, Rodrik performed another study about Real Exchange Rate and Gross Domestic Product (GDP) but the researcher measured the domestic price level adjusted and used Balassa-Samuelson effect which the researcher mentioned that the economic growth is expected to cause a real appreciation on standard Balassa-Samuelson grounds which the researcher controlled using UNDERVAL. The researcher also made an example which mentioned that the shocks that cause a real depreciation tend to be shocks that are bad for growth on conventional grounds—a reversal in capital inflows or a terms of trade deterioration. But the good thing about the growth prospects of an economy is likely to attract capital inflows and thus bring about a real appreciation. So, on balance, it is unlikely that the positive coefficients reported here result from the reverse effect of growth on the real exchange rate.

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Khan et al (2012) concluded using both the Trace Eigen value test and Maximum Eigen value test that there is a long-run relationship between exchange rate and GDP but causality does not run in either direction. The authors studied effectiveness of exchange rate in Pakistan using Causality Analysis. The study used an the annual time series data for the years 1980-2009 and apply unit root test for stationary, Johansen's co integration test for long-run equilibrium relationship between the variables for each model and Granger Causality test to check the causality between the variables applied.

The study of Abbas et al (2012) and Ramasamy and Abar (2015) concluded that GDP has a significant relationship with exchange rate. Abbas et tried to explore the relationship between, gross domestic product, inflation and real interest rate with the exchange rate. 10 African countries with 15 years of data from 1996 to 2010 were used for this study. It is found that GDP is only variable which shows a significant relationship with exchange rate while other two variables i.e. inflation and real interest has shown non-significant relationship. Ethiopia and Angola's data is not statistically sustainable for analysis because of the huge variations present in both countries. A similar conclusion was made by Ramasamy and Abar about the influence of macroeconomic variables on Exchange Rates and used three countries yearly exchange rates with their macroeconomic variables. The researchers stated that most of the macroeconomic variables showed opposite sign contrary to the expectations and concluded that the psychological factors like investor confidence dominate over economic variables in deciding exchange rate fluctuation. More importantly, the standardized coefficient GDP is reduced from 2.2% to less than 1% (0.9%). Meaning, all variables are significant except employment rate, which may be unconnected to exchange rate.

But in contrast, Maskay (2001) studied the economic factors influencing the probability of adjustments in Nepal's exchange rate policy with the Indian currency for the period of 1976 – 1998. Since the researchers used annual frequency, Akaike Information Criteria (AIC) was used to determine the optimal lag length needed. The empirical results suggested that both relative Nepalese to Indian money and output growth does not have a significant effect on probability of exchange rate change and that relative Nepalese to Indian interest rate growth does. This is because the coefficients of relative Nepalese to Indian money and growth is not significant at even the 10% level of confidence with respective p-values of 0.1306 and 0.7588. In support to that, Nucu (2011) in Romania is about the relationship between Exchange Rate and key Macroeconomic indicators namely GDP, inflation rate, money supply, interest rate and balance of payments on Romanian leu against the most important currencies (EUR, USD) during 2000-2010.In Romania, the foreign exchange policy was an important lever in the framework of macroeconomic stabilization. In practice, analysis of the factors influencing the exchange rate must take into account their interdependence, the connection between them, which ultimately leads to currency appreciation or depreciation. One of the major findings in the study is a growth of

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GDP with a unit determines an increase of exchange rate, but on the average with 3.066 units in Romania there is a depreciation of RON against the single currency because of increased imports, the current balance account is poor so the currency depreciates. Hence the exchange rate USD/RON is not related to GDP, it has a connection with the other determinants not listed in the study.

Parveen et al (2012) made a study about the factors affecting exchange rate variability in Pakistan during the year 1975 – 2000. The stationarity of data is determined by using Augmented Dickey-Fuller (ADF) test and the study also used Simple Linear Regression model with ordinary least method (OLS) to analyze the results. The main factors determined in the study are economic growth, inflation, exports and imports. The researchers made findings that on the basis of the model, 98.20% variation in exchange rate is due to the four factors that is growth rate, Inflation, exports and imports and the economic growth is the second variable that brings more variation in exchange rate. The only thing the study failed mention was the relationship between the two variables.

But in contrast, previous studies also made a finding that as GDP increases, exchange rate depreciates. Mauro et al, 2008; Twarowska and Kakol, 2014; and Patel et al, 2014. Even though the authors have the same findings, they applied different kinds of methodology. For example, the study made by Mauro et.al suggest that the real exchange rate depreciates when the economic growth is strong using the evolution of the 30-quarter rolling correlation coefficient between the cyclical components of the real effective exchange rate and real GDP, obtained by using HP-filtered series. In support to that, another study was conducted by Twarowska and Kąkol about the factors affecting fluctuations in the exchange rate of polish zloty against euro from 2000-2013. Using a two-stage least square method, the findings of the study is the fluctuations were caused by six factors, that is GDP, HICP interest rate, current account balance, financial account balance and government deficit, whereas only 37,7% of the variation in exchange rate was dependent on other factors that have not been taken into account. More importantly, in the whole analyzed period, except 2001, economic growth in Poland was greater than in the euro zone. It can be concluded that the trends and direction of changes between the GDP and the exchange rate were similar. In most cases, faster GDP growth in Poland in comparison to the euro area was accompanied by depreciation of the zloty. That was in 2003, 2009 and 2011. Patel et al study was focused on economical formulas based on the economics theory to check health of the currency and useful prediction models for currency exchange rate. The researcher used Purchasing Power Parity as the model of the study. The study stated that foreign investors get attracted towards the countries with economically strong countries with good GDP. It leads to better valuation of the currency of the country because more and more money comes to the country.

H1: As GDP increases, US$ versus PHP also appreciates (Peso depreciates)

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2.2 Volume of Money Flows (M)

There are studies showing a positive relationship between the Stock Prices and the Real Exchange Rate. Lee 2012; and Kasma, 2003; Lee conducted a study about causal relationship between Real Exchange Rate of Renminbi (RMB) in terms of Hong Kong dollars (REX) and Hong Kong Stock Market Index in terms of the Hang Seng Index (HSI). The study used co integration and Granger causality tests on the monthly data and one of the major findings is that the researchers found a long run equilibrium relationship between REX and HSI. In conclusion, the movement of the real exchange rate of RMB will lead to a movement of Hang Seng Index to a certain extent. When RMB appreciates against HK dollars, Hang Seng Index will rise. It might imply that the positive effect of capital flows to goods and assets markets in Hong Kong stock market is dominant due to the revaluation of the RMB against the HKD. In support, Kasman also proved the existence of the long run relationship between Stock price and Exchange rate using high – frequently data of exchange rate and aggregate stock indices in Turkey involving time series techniques. That means, stock indices of ISE and exchange rate move together in the long run. On the other hand, there are two theories that relate the relationship between Stock Price and Exchange Rate. One is the Traditional Approach where Exchange rate affects Stock Price and the other theory is called the Portfolio Balance Model (Baharom et.al.2008). If stock prices are on the increase, they will attract more foreign capital. However, a decline in the stock prices will result in diminished corporate wealth leading to the reduction in the country's wealth. This may lead to a fall in the demand for money and monetary authorities reduce the interest rates to remove this situation. When interest rates are lower (relatively speaking), capital may flow out of the country to take advantage of higher interest rates in other part of the world resulting in currency depreciation. Therefore, according to this theory, lower stock prices may lead to currency depreciation. (Kutty, 2012; Granger et al, 2000; Ooi et al, 2009 and Kose, 2010)

Even though the following researchers have the same conclusion, different methodology and data's were used in their respective studies. Granger et al studied the bivariate causality between Stock Prices and Exchange Rate in 8 Asian countries namely Hong Kong, Malaysia, Singapore, Thailand, Taiwan, Indonesia, Japan and Philippines during the Asian flu. The result indicates markets were largely characterized by the phenomenon predicted under the portfolio approach. The data of the Philippines showed under the Portfolio approach but with a negative correlation. Most markets exhibit either changes in stock prices lead that in exchange rates or either market can take the lead (feedback interaction). Similarly, Ooi et. al. conducted a research about causality between Exchange Rates and Stock Prices in Thailand and Malaysia using daily data from 1993 to 2003 during pre and post financial crisis. The researchers proved the existence of a long run relationship between the above-mentioned variables using Johansen-Juselius cointegration test and short-run dynamic causal relationship by using Toda-Yamamoto procedure. The conclusion of the study states that the data from Thailand demonstrates the results predicted by the portfolio balance approach: stock prices lead exchange rates in both pre-crisis and post-crisis

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periods; however, Malaysian findings support portfolio approach in post-crisis only. On the other hand, Kose aimed to investigate the existence and direction of relationship between stock prices and exchange rates for Turkish financial market using the daily observations for the sample period, which runs from February 23, 2001 to November 4, 2009 including a total of five currencies namely US dollar, Euro, Japanese Yen, Pound Sterling, Swiss France and two baskets of currencies of Undersecretaries of Foreign Trade of Turkey. The findings provide evidence to indicate a uni-directional causality running from stock prices to exchange rates for the Turkish stock and currency markets which stated the one-way causality, which runs from stock prices to exchange rates, supports the rationale of portfolio approach. This evidence has implications for the policy makers and economic actors to perceive the movements in stock prices as a dynamic determinant, which may affect the success of their exchange rate policies.

On the other hand, Oyinlola et al., 2011; Gourdazi et. al, 2012; Nieh and Lee, 2001; Dimitrova 2005; concluded in their respective studies that as volume of money flow increases, the exchange rate will appreciate. Oyinlola et. al investigated the long-run and short-run dynamics between stock prices and exchange rates in Nigeria using the Johansen and Gregory-Hansen co integration analysis, causality test and Exponentional General Autoregressive Conditional Heteroskedasticity modeling on daily data from January 2, 2002 to August 11, 2011. The results showed that there is no long run relationship between stock prices and exchange rate in Nigeria although with a structural break date of mid April 2007, which coincides with the period when the stock prices plumped suddenly from the impact of global financial crisis in early 2007. More importantly, the researchers mentioned that there is a unidirectional relationship from stock prices to exchange rate and that the EGARCH modeling suggested that a 100% increase in stock prices would lead to a 1.66% appreciation of the exchange rate. Therefore, it is imperative for monetary authorities in Nigeria to take into account the role of stock market development in the conduct of its exchange rate policy. Another study conducted by Gourdazi et. al, stated that volume of money flow has positive impact in the short-run and negative impact in the long-run on real exchange rate respectively. These impacts have reduced over time and tend to zero at the end of period. This result show that the imposed shocks on the real exchange rate does not disappear in the short term and it takes at least ten years for the real exchange rate to reach its equilibrium level.

In support to that a study examined by Nieh and Lee is about the dynamic relationship between stock prices and exchange rates in G-7 countries failed to found any long-run significant relationship between stock prices and exchange rates but rather short run relationship for only one day for certain G-7 countries. Based on the results from the VECM estimation, the two lead-lagged length of one financial variable has little power in predicting the other. This complies with the conclusion that these two financial variables do not predictive capabilities for more than two consecutive trading days. It means that currency depreciation often dragged down stock returns in

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the German financial market, but it stimulated Canadian and the UK markets on the following day. However, an increase in stock price often caused currency depreciation the next day in Italy and Japan. Another study failed to conclude a relationship between these variables in a long run respective. Also, Dimitrova studied the relationship between Exchange Rates and Stock Prices of United States and the United Kingdom over the period January 1990 through August 2004 and used the Multivariate model to explain the fluctuations in either market. The null hypothesis of the study states that in the short run, an upward trend in the stock market may cause the local currency depreciation, whereas weak currency may cause decline in the stock market. But the empirical findings are weak even though some literatures supported the null hypothesis of the study. The stock market will react with a less than one percent decline to a one percent depreciation of the exchange rate. This also implies that an appreciating exchange rate boosts the stock market. The researcher made a proposition and stated that multinational companies interested in exchange rate forecasting may consider the stock market as a forecasting indicator—when it rises, the local currency is expected to depreciate. If the exchange rate collapses sharply, it will trigger a milder fall of the stock market. Because of the joint causality, a collapse in the stock market will trigger exchange rate appreciation. Similarly, if there is a stock market collapse, the exchange rate will appreciate and cause a rebound in the stock market.

In contrast, Rahman and Uddin (2009) stated that a rise in prices encourages investors to buy more domestic assets simultaneously selling foreign assets to obtain domestic currency indispensable for buying new domestic stocks. More foreign capital will be attracted in this situation, which will increase the foreign demand for domestic currency and ultimate result will be the appreciation of domestic currency.

There are some existing studies that show no relationship between the Stock Prices and Real Exchange Rate. (Abidin et al., 2013; Muhammad & Rasheed 2002; and Saini et al.,2006) The research of Abidin et al conducted their research and used a sample set of seven Australasian countries. Using the unit root test followed by Engle and Granger's two-step methodology, the researchers concluded that there is no significant long-run co integration relationship between stock markets and exchange rates was found. The result influenced by not only the observed financial factors, but also factors such as each country's differences in economic stage, government policy, expectation patterns, differences in the degree of internationalization and liberalization and the degree of capital control. These influences can contribute to different predicting power of stock market prices and exchange rates. On the other hand, Muhammad and Rasheed stated there is no empirical or theoretical consensus on the issue of whether stock prices and exchange rates are related and the direction of causation if they are related. The researchers used monthly data from four South Asian countries namely Pakistan, India, Bangladesh and Sri Lanka, and employed cointegration and error correction modeling approach to examine these issues. Result shows that there is no long-run and short-run associations between stock prices and

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exchange rates for Pakistan and India. No short-run association was also found for Bangladesh and Sri Lanka. However, there seems to be a bi-directional long-run causality between these variables for Bangladesh and Sri Lanka. The results suggest that in South Asian countries stock prices and exchange rates are unrelated (at least in the short run); therefore, investors cannot use information obtained from one market (say stock market) to predict the behavior of the other market.

H2: As stock price increases it will trigger an appreciation of US$ versus PHP (Peso depreciates)

2.3 Net Foreign Assets (NFA)

Previous studies have shown that an accumulation of net foreign assets leads to an appreciation of the real exchange rate. Lane and Milessi-Ferretti (2004), whose study focused on the "transfer effect", have empirical results that show a strong cross-sectional relation between changes in real exchange rates and changes in net foreign assets, in both developing and industrial countries. The sample size of the study consists of 64 industrial and mostly middle-income developing countries. Cross-sectional approach was applied in the study and to solve for it involves calculating the averages of the variables (net external position, relative GDP per capita, and terms of trade) for the periods 1975-1985 and 1986-1996, and then take the difference between the two periods. The approach consists of the bivariate correlations and the multivariate correlations. The findings of the bivariate correlations state that CPI-based real exchange rate is strongly correlated for industrial countries. The multivariate regressions state that in industrial countries, net foreign assets are significantly positively correlated with the CPI-based real exchange rate only if terms of trade are included. For developing countries, changes in net foreign assets are strongly correlated with changes in the CPI-based real exchange rate. Panel evidence was applied as well, and countries were pooled according to various criteria and present panel data analysis. One result from the panel regressions found that there is a positive and strongly significant long-run relation between the real exchange rate and net foreign assets, for the full sample in both developing and industrial countries, providing support for the existence of a powerful transfer effect. Christopoulos et.al. (2008) mentioned the transfer effect as well. Two kinds of states were evaluated: a constrained state and an unconstrained state. The findings of the unconstrained steady state states that the relationship between net foreign assets and real exchange rate is univariate because in an unconstrained economy, there is no transfer effect and net foreign assets do not cause the real exchange rate. Meanwhile, in the constrained steady state, there is a bilateral relationship between net foreign assets and real exchange rate because first, a rise in real exchange rate causes a decrease in net foreign assets. Second, there is a positive transfer effect between net foreign assets and real exchange rate.

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In contrast, Dumitrescu and Dedu (2009) used the BEER approach to estimate the equilibrium of the real exchange rate in Romania. First, there should be a check to see if the series used is stationary by using Augmented Dickey-Fuller and Phillips Perron tests. Second, determine a long-term relation between variables by using cointegration tests. Third, there is an estimation of a VAR with 3 lags. The tests performed on the residuals revealed a normal distribution, no autocorrelation, and the absence of heteroskedasticity. Fourth, a Johansen cointegration test was performed. The test showed the presence of two cointegration vectors at both 1% and 5% level. These steps led to the effect of net foreign assets to the real exchange rate. A higher value of net foreign assets will lead to higher yield of domestic savings, higher levels of foreign currency entering the country, and an appreciation of the real exchange rate. The study of Dénes Kucsera (2007) mentioned that in external balance, the equilibrium level of net foreign assets is defined by savings, demographics and stage of development. If the country's net foreign assets position is below its equilibrium value, the country will start to accumulate assets. One econometric equation used in the study states that the current stock of net foreign assets positively influences the exchange rate, which means that if the amount of assets accumulates, the exchange rate will appreciate.

On the other hand, Chia et.al. (2014) analyzed the co-movements of net foreign asset accumulation, consumption, real exchange rate, and real interest rate in a cross section of countries. One finding states that the accumulation of net foreign assets is associated with increasing consumption and real exchange rate appreciation. The study's sample covered both industrial and developing economies, spanning 1981–2010 period. GDP and global real economic shocks were included as measurements. Another finding states that there is an accumulation of net foreign assets to GDP by a further one-standard deviation is associated with 1.2 percent annual real appreciation for the creditor country, whereas it is only 0.2 percent for the debtor country. In the presence of positive global real economic shocks, if a country raises its accumulation of net foreign assets to GDP by a one-standard deviation, this is associated with a higher level of consumption to GDP by 0.02% per year and an appreciation of real exchange rate by 2% per year in the whole sample of countries. The study of Bleaney and Tian (2014) found that as long as the interest rate exceeds the growth rate, accumulation of net foreign assets as a proportion of GDP should be associated with an appreciation in the real exchange rate. Lommatzsch and Tober (2004) stated that an equilibrium real appreciation will occur if foreign GDP, net foreign assets, and autonomous exports increase. Philip R. Lane (2001) mentioned that a slow price adjustment will lead to a larger accumulation of net foreign assets and this will lead to a bigger long-run impact on the real exchange rate. The study of Cavallo and Ghironi (2002) mentioned that with sticky prices, the exchange rate depends on the past GDP differential, along with net foreign assets. Sticky prices introduce persistence in the GDP process beyond its dependence on assets accumulated in the previous period. As a consequence of GDP persistence, a positive GDP differential yesterday translates into a higher interest rate differential today and, hence, into appreciation. Lee and Chinn (2006) state that when price rigidity is introduced, the long-run effect of

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monetary shocks on net foreign assets is small, and that the long-run exchange rate effect of monetary shocks is even smaller. However, due to a country's economic condition, there are some instances wherein the accumulation of net foreign assets does not lead to the appreciation of the real exchange rate.

The study of Olivier Jeanne (2011) used a model with no money or monetary policy and it considers a small economy that consumes a tradable and non-tradable good. The government accumulates foreign assets and imposes controls on inflows. The government controls the current account balance (since it is the change in net foreign assets) and therefore the trade balance.The real exchange rate, then, has to be consistent with the trade balance. Other things equal, accumulating more net foreign assets will depreciate the real exchange rate. Harald Hau (2000) stated that a price adjustment implies a slow real appreciation after a relative monetary expansion. A real appreciation decreases the return on net foreign assets and increases the relative short-run consumption in the expending country. The study of Egert et.al. (2005) investigated the determinants of equilibrium real exchange rates for the new EU member states and candidate countries. It showed that in transition countries, a decrease in net foreign assets leads to an appreciation of the real exchange rate. Cantor and Driskill (2000) analyzed how a lower domestic interest rate could be consistent with an instantaneous appreciation. The researchers state that if a country is a net debtor, instantaneous appreciation is possible because it is consistent with further expected appreciation. This finding is caused by the increase in national saving, which generates a lower interest rate leading to a long-run appreciation. The breakdown of the finding is that higher savings leads to a higher level of net foreign assets, causing higher net factor payments from abroad. The net factor payments from abroad must be balanced by a large trade deficit. In the long-run, the exchange rate must depreciate to produce the large trade deficit.

Edward E. Ghartey (2005) found that Ghana absorbs exchange pressure depreciation and loss of net foreign assets. An EMP model was applied and two econometric equations were used to find whether the coefficient of Z is insignificant. The first equation indicated that that an increase in domestic credit and prices (foreign prices), all other things being equal, will lead to either an outflow (inflow) of net foreign reserves and/or depreciation (appreciation) of the cedi. The researcher mentioned that under perfectly flexible exchange rate regimes, an external imbalance which leads to exchange pressure is absorbed by changes in exchange rates (depreciation), whereas under fixed exchange rate regimes, similar exchange pressure is absorbed by loss of net international assets (or reserves).If the coefficient a of Z is significant and positive, then the exchange pressure is absorbed only by depreciation of the cedi (unit of currency of Ghana). However, if it is insignificant and negative, it is absorbed by only loss of net foreign assets or reserves, all other things being held equal.

H3: The accumulation of net foreign assets lead to an appreciation of US$ versus PHP (Peso depreciates)

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2.4 Budget Deficit (BD)

Sayosombath and Kyophilavong (2013) focused on the relationship of budget deficit and real exchange rate in Laos from 1980 to 2010. The empirical analysis applied was ARDL Cointegration methodology with VAR and SVAR and also Granger causality to determine both the long run and short relationship between the two. The findings show that there is no long run relationship between budget deficit and real exchange rate. However, Sayosombath and Kyophilavong found in SVAR that budget deficit has both a positive and negative relationship, but concluded that budget deficit did not directly cause the real exchange rate to appreciate in Laos. This can lead to Dutch disease and in order to prevent that from happening, there must be a budget deficit reduction. Uddin et.al. (2013) also mentioned that there should be a budget deficit reduction to possibly keep a stable exchange rate. The researchers examined the behavior of BDT/USD exchange rate and relationship of exchange rate behavior with relative monetary variables using monthly time series data from January 1984 to April 2012. Augmented Dickey Fuller (ADF) test was applied to see if the variables (the stock of money, foreign exchange reserves and total debt of Bangladesh relative to United States) are stationary. Autoregressive distributive lag (ARDL) approach to co-integration has been applied to estimate the long run relationship between the nominal BDT/USD exchange rate and explanatory variables. To estimate short run dynamics relating to the macro economic variables and nominal exchange rate, error correction mechanism (ECM) has also been employed. The study concluded that borrowing of the government from domestic and foreign sources has been one of the major causes of depreciation in the Bangladesh Taka against US Dollar.

The study of Khan et.al (2002) focused in Pakistan and wants to determine whether there is a direct or indirect relationship between budget deficit and the real exchange rate. Ordinary Least Squares (OLS) and simple mathematical techniques and techniques were applied. The researchers concluded that there is both a direct and indirect relationship. However, the study of Kahnim Farajova (2011) investigated the relationship between budget deficit and macroeconomic fundamentals using data from Azerbaijan. ARDL Cointegration methodology in conjunction with Granger causality tests were applied in the study. Empirical results show that Augmented Dickey Fuller (ADF) was applied for the variables' stationarity properties while the optimal ADF specification is determined by means of Akaike Information Criterion (AIC), the Schwarz Bayesian Criterion (SBC). The researchers concluded that there is no short-run causal relationship between budget deficit and the real exchange rate. Vuyyuri and Seshaiah (2004) applied Unit Root Test, Cointegration Test, and Granger causality. The results for the variables suggest that all the variables have been found to be non-stationary in levels but stationary in first difference form at 5% level of significance, that is, all variables are integrated of order 1. From the Granger causality results (VECM), it is evident that there is a bi-directional Granger-causality budget deficit and exchange rates. Hence, it is suggested that policy makers adopt optimal

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monetary and fiscal policies that stabilize exchange rate as well as control budget deficits. The study concluded that there is an uncertainty in the relationship between budget deficit and real exchange rate.

Supporting the outcome of the previously discussed papers, the studies of (Brima and Mansaray-Pearce, 2015; Robert D. Korsu, 2009) both focused in Sierra Leone. Brima and Mansaray-Pearce state that there is an inverse relationship between budget deficit and real exchange rate in Sierra Leone. Korsu investigated the effects of budget deficit on external sector performance of Sierra Leone, using the real exchange rate and overall balance of payments as the external sector indicators. The researcher applied equations for money supply, price level, real exchange rate and the overall balance of payments were estimated simulataneously, using Three Stage Least Squares (3SLS). Models of money supply, price level, real exchange rate and the balance of payments were estimated by using aggregate annual data from the International Financial Statistics CD-ROM 2007 for the period 1971-2005. The study concludes that a reduction in budget deficits in Sierra Leone depreciates the real exchange rate and improves the balance of payments by reducing money supply and the general price level.

On the other hand, Waqas and Awan (2012) conducted a study that investigates the validity of the Ricardian Equivalence Hypothesis (REH) in Pakistan by using annual data from 1973-2010. The researchers investigated the hypothesis in terms of interest rate and exchange rate. Ricardian Equivalence is an economic theory that states that when a government tries to stimulate demand by increasing debt-financed government spending, demand remains unchanged. The study states that in the view of the REH, government budget deficit and government debt has no effect on the exchange rate and interest rate. Data was gathered from IFS CD-ROM 2010 and two restrictions must be fulfilled. The first restriction states that government debt has no impact on the exchange rate, while the second restriction states that government budget deficit has no impact on the exchange rate. Various tests such as Augmented Dickey Fuller Unit Root Test, Phillips-Perron Unit Root Test, and Augmented Distributed Lag Cointegration Approach were applied. Ordinary Least Squares (OLS) were applied to two equations which had restrictions. For the first equation, the restrictions are that the government debt and government budget deficit has no impact on exchange rate. Wald test was performed and it showed that these restrictions are rejected. For the second equation, the restrictions are that the government debt and government budget deficit has no impact on interest rate. Wald test was performed as well and it showed that these restrictions are also rejected. Since both restrictions had been rejected, the study concluded that there is no favor of the Ricardian Equivalence Hypothesis with reference to Pakistan.

In contrast, Twarowska and Kakol (2014) who studied the analysis of factors affecting fluctuations in the exchange rate of Polish zloty against euro, higher budget deficit in Poland causes the government to borrow more from the money market and

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will cause high currency inflow in the domestic market that supports the fiscal expansion. It increases demand of the zloty and its appreciation. Several studies showed the effect of budget deficits on exchange rates which in turn, affects the inflation rate. Petraq Milo (2012) conducted a study entitled "The Impact of the Budget Deficit on the Currency and Inflation in Transition Economies".Here, the study concluded that "financially repressed" economies tend to apply monetary financing to budget deficits which leads to a depreciation in the exchange rate and an appreciation on the inflation rate. Georgantopoulos and Tsamis (2011) found that budget deficit reduces the supply of loanable funds, driving up the interest rates and crowds out investment. Higher interest rates also attract foreign investors, who want to earn higher returns. Then, budget deficits will raise interest rates (both domestic and foreign) causing net foreign investment to fall. Since net foreign investment has decreased, people need less foreign currency to buy foreign assets and hence the real exchange rates rise. The studies of (Omoniyi et.al., 2012; Osuka&Chioma, 2014; Asrafuzzaman et.al., 2013) mentioned the Mundell-Fleming model, which states that an increase in budget deficit will pull upward pressure on interest rates, causing capital inflows leading to an appreciation of the exchange rate. The study of Mohammad Ali Asgari (2012) investigated the impact of reducing of budget deficit on the foreign exchange rate. The study applied ARDL to find contingency effects of reduction of reducing of budget deficits and the exchange rate for Iran from 1978 to 2006. The findings state that a balanced budget has an important role in keeping the exchange rate stable, and that there is a long-term relationship between budget deficit and foreign exchange.

H4: An increase in budget deficit will lead to an appreciation US$ versus PHP (Peso depreciates)

2.5 Import Restrictions (MR)

Import Restriction in Goudarzi et.al (2012)'s paper which this paper is patterned after, defined import restriction as tax on import divided by total imports. Based on the result from the study, using the VAR model and variance decomposition, it was discovered that import restriction shocks contributed 2.5% of the movement of the real exchange rate in Iran from the period of 1978-2008. One of the earliest study about import restriction affecting exchange rate is by Dornbush (1974) where a model of a small country that also consumes three goods: exportable, importable and nontraded goods was formulated. From the model it was derived that upon the imposition of tariffs, it raises domestic prices of importable goods where it leads to exchange rate appreciation. Fender & Yip (2000) conducted a study which formulated a model where it examined, this time, the macroeconomic effect of tariffs with imperfect competition. It was derived from the main model about analyzing the effect in the short run. From the equation, the effect was also negative in the imposition of tariffs on output where the exchange rate appreciates making it expensive for the international market. Kemar & Qadir (2005)'s study focusing on real exchange rate, imports and exports using VAR model and cointegration, real exchange rate is

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positively associated with the imports in the long run. In another study about import protection, business cycles and exchange rate from the Great Recession. Brown & Crowley (2012) used data from five industrial economies: United States, European Union, Australia, Canada and South Korea, the authors created a model which the trade barrier variable was introduced. The result showed that a real appreciation of the bilateral exchange rate defined in terms of the domestic currency is associated with increases to bilateral import restrictions.

Also, in other studies, like in Bogoev et.al. (2008) where it analyzed the real exchange rate dynamics in Macedonia, using various cointegration techniques like the Engle and Granger method, Dynamic OLS, Autoregressive Distributive Lags model, and the VAR-based cointegration technique. Describing trade liberalization as openness variable, it was shown that as the country was more open to trade (means lesser tariff on imports), the value of currency depreciates. Adding more support to the previous conclusions, Saidatulakmal et.al (2012) studied the cross sectional data of the South Asians Association of Regional Cooperation, using Pedroni's panel co-integration test. It showed that trade openness clearly depreciates real effective exchange rate. In another study by Chao et.al. (2013) using a dynamic monetary model to analyze the short-run and the long-run impacts of a tariff-tax reform on the economy. From the results derived from the model, it was shown that when the tariff reform is announced and if the public believe it will decrease excess demand, the domestic currency will depreciate now to reflect future depreciation. On the contrary, the domestic currency will appreciate immediately if the public believe it will raise excess demand. However, if there is a relatively small increase in excess demand, the public may mis-react in the exchange rate market by observing currency depreciation first and only then the currency's appreciation toward the steady-state rate. Jimmoh (2006)'s paper also offered support to the previously mentioned studies, empirical data suggested that trade liberalization led to about 13% depreciation in the Nigerian real exchange rate. The study employed Johansen's co-integration test and the data used was the recoded degrees of trade liberalization in Nigeria from 1960-2006.

Yielding the same result but in different approach, Montiel (2007) also studied the equilibrium real exchange rate in the Southern Cone (South America). The author included commercial policy, which included the trade liberalization as a determinant of the equilibrium real exchange rate. The author expected the said variable to be associated with the long-run real depreciation of the real exchange rate. It was empirical result aligned with the author's assumptions. In a study by Bautista (2013) in the case of the Philippines, the author analyzed the exchange rate policy to the development of the Philippines. From the equilibrium model created by the author, the result showed that trade liberalization contributes to the real exchange rate of the Philippine Peso. In another study, Li (2004) studied Trade Liberalization and Real Exchange Rate movement in 45 countries including the Philippines using the official nominal exchange rate and consumer price indices (CPI's), as a proxy for domestic price levels. Unlike existing studies that use either indirect tests or unreliable

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openness measures. The result partly yielded the same result where the real exchange rate depreciates after countries open their economies to trade. But in other countries with multiple liberalization, real exchange rates appreciate during early episodes, suggesting that partial or noncredible trade liberalizations are associated with real appreciation.

But Samara (2009) describe and investigate the factors which determine the equilibrium real exchange rate (ERER) and affect its volatility in the Syrian economy over the period 1980-2008, using two estimation techniques, the Vector Error Correction Mode (VECM) and ARCH Model. The study stated that there is a negative correlation between the trade openness and the real exchange rate volatility and the result show that there is no insignificance relationship between both the real exchange rate and trade openness. However, Tien (2009) using Long-Run Restrictions to investigate the sources of Exchange Rate Fluctuations in US, UK, Canada, Japan and Germany. Results for the U.S. and the U.K. show that monetary shocks account for only a small fraction of the variance of the real exchange rate. Instead, real exchange rate shocks appear to be the key factor driving the U.S.-U.K. real exchange rate. Another conclusion was stated by the authors and mentioned that the real exchange rate shocks are associated with the degree of trade openness, terms of trade, and current account. In this study, where the main focus of the study is trade openness and exchange rate volatility, Cociu (2007) using pooled OLS for panel of countries, it was shown that trade openness decreases the volatility of real exchange rate.

H5: A higher import restriction contributes to the US$ appreciates versus PHP (Peso depreciates).

2.6 Oil Prices (OP)

Studies about oil prices and real exchange rate have been conducted in different countries with different methodology but still, there is no consistent answer if oil prices really affect the movement of the real exchange rate in general. In a study conducted by Bouoiyour & Selmi (2014) on three GCC (Gulf Cooperation Council) countries namely Qatar, Saudi Arabia and United Arab of Emirates in determining the relationship between exchange rate and oil price through wavelet decomposition revealed that for Saudi Arabia oil prices does not affect the real exchange rate movement while it is different for the case of Qatar and UAE where oil prices and real exchange rate has significant relationship, it was concluded that nonlinear causal relationship between changes in oil prices and real exchange rate varies from different GCC country to others and varies over different time scale. It is also the same for the research study of Coleman et.al. (2011) in investigating the oil price-exchange rate relationship from evidences of African Countries, where in Morocco and South Africa revealed that a rise in oil prices lead to a depreciation in their real currency value, but in other African countries like Kenya, Madagascar, Mauritius and the Seychelles showed that an increase in oil prices leads to appreciation in their real currency values, which led to the conclusion – using Johansen cointegration technique,

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allowing for nonlinear dynamics and applying Smooth Transition Regression – that oil prices and real exchange rates in some African countries are cointegrated but in others it is not due to different structures of their economies. In another study (Behnmad, 2012) focused in the US dollar exchange rate and oil price, using a combination of nonlinear causality tests and wavelet analysis, it showed that the relationship of the two variables is very complex, it also depends on the time scale or frequency ranges.

But in a study by Aziz et.al (2013) involving 5 ASEAN countries: Indonesia, Malaysia, the Philippines, Singapore and Thailand using a Panel Study Approach. The paper showed that there is a significant impact of real oil prices on exchange rate when using PMG estimator. It indicates that if oil prices increases it will cause a real appreciation of exchange rates. That is also the case in the study by Al-mulali & Sab (2009) focusing on the impact of oil prices on the real exchange rate of the Dirham of the UAE, it was revealed that for every one percent increase in the oil price from 1977-2007, the exchange rate will increase by 0.16%. In another research, Tiwari et.al (2013) using the Discrete Wavelet Transform, they were able to find a strong influence of the oil price on the real exchange rate in both the short and long run in Romania where and increase in oil prices leads to a real appreciation of the national currency. In another study Goudarzi et.al (2012) using VAR model suggested that oil price accounted 29% of the real exchange movement in Iran from 1978-2008 through variance decomposition, it also showed that oil price has a positive impact on real exchange rate. In Ahmad & Hernandez (2013)'s paper which aimed at investigating long-run relationship and asymmetric adjustment between the real oil prices and the real bilateral exchange rates of twelve major oil producers and consumers in the world. The researchers used a monthly data set and implemented threshold autoregressive (TAR) and momentum threshold autoregressive (M-TAR) models. It was revealed that in six countries namely: Brazil, Eurozone, South Korea, Mexico, Nigeria and the UK, there is an evidence of cointegration between oil price and exchange rate. Another study where Basher et.al (2011) examined the relationships between oil prices, exchange rate and emerging stock markets, offered support that exchange rates respond to movement in oil prices and most of the dynamic interaction takes place in the short run using a VAR model.

In a study conducted by Beckmann & Czudaj (2012) regarding oil prices and effective dollar exchange rate using data of Trade-weighted and real effective exchange rates from the Federal Reserve in the US. The authors were able to find a relationship between oil prices and real exchange where real dollar value appreciates after a rise in oil prices. However, in a study conducted by Lizardo & Mollick (2009) they discovered that an increase in real oil price leads to a depreciation of US dollar relative to net oil exporter countries and a decrease in the currency value to importer countries. In Al-mulali (2010)'s paper, using a VAR model in studying the impact of oil prices on the exchange rate and economic growth in Norway, the result also yielded that an increase in oil prices leads to a real exchange rate depreciation. This is

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also the case in a study focused in South Africa, Fowowe (2014) analyzed the relationship of oil prices and exchange rate, using GARCH-type models, the results showed that oil price increase lead to a depreciation of the South African rand versus the US Dollar.

Jahan-Parvar & Mohammadi (2008) conducted a study in determining the relationship between oil prices and real exchange rates in oil-exporting countries using a Bounds Testing Approach, to test the validity of their Dutch disease hypothesis. The authors used the "autoregressive distributive lag" (ARDL) model. The results revealed that in fourteen oil exporting countries there is a stable long run relationship between real oil prices and real exchange rate. There is evidence of unidirectional causality from oil prices to exchange rates in four countries of Angola, Colombia, Norway, and Venezuela, from exchange rates to oil prices in two countries of Bolivia and Russia, and bidirectional causality in four countries of Gabon, Indonesia, Nigeria and Saudi Arabia. There is no evidence of short-run causality in the remaining four countries of Algeria, Bahrain, Kuwait and Mexico. But in India, Tiwari et.al (2012) examined the relationship between oil price and exchange rate using several causality test and time domain test, results showed that oil prices also have no significant effect on exchange rates and vice versa.

H6: An increase in oil prices leads to a real appreciation of US Dollar versus PHP of exchange rate (Peso depreciates).

3. RESEARCH METHOD

In order to empirically prove or disprove the hypotheses presented in the first section of this paper, the study will follow the model formulated by Goudarzi et.al (2012), where the study will analyze six economic factors that affects real exchange rate. The equation will be as follows:

$$RER = \beta_0 + \beta_1 Y + \beta_2 M + \beta_3 NFA + \beta_4 BD + \beta_5 MR + \beta_6 OP + \varepsilon_0 \quad (1)$$

Where RE is defined as the real exchange rate; Y is gross domestic product; M is volume of money flows; BD is budget deficit; MR is import restriction; NFA is net foreign assets; OP is oil prices. β_0 and ε_0 are a constant and a normally distributed error term, respectively.

Real Exchange Rate is defined as:

$$RER_t = (ER_t * CPI_F / CPI_{PH}) \quad (2)$$

Where CPI_F is the consumer price index of the United States and CPI_{PH} is the consumer price index of the Philippines, and lastly, ER is the exchange in the open market (nominal).

In this model, import restriction is defined as follows:

$$MR = (TIM/IM) \quad (3)$$

Where TIM is tax on import and IM is total import.

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In calculating the volume of money flows, the study will use the Chaikin Money Flow method, where:

$$1.\ Money\ Flow\ mulitplier = \frac{[(Close-Low)-(High-Close)]}{High-Low}$$

$$2.\ Money\ Flow\ Volume = Money\ Flow\ multiplier \times Volume\ for\ the\ Period \quad (4)$$

This study will use annual data from 1973-2014. The data are sourced from the World Development Indicators (WDI) published by the World Bank (www.databank.worldbank.org), Tariff Commission Annual Report 2013, Aduana Bureau of Customs Annual Report and Philippine Stock Exchange Database of the Philippine Stock Exchange Library.

4. EMPIRICAL EVIDENCES

The main objective of this paper is to investigate the factors affecting real exchange rate in the Philippines. This study will follow the methodology of *Goudarzi et.al* (2012) where they will use an unrestricted vector autoregressive model (VAR) as it is one of the most flexible and easy to use model in a multivariate time series analysis and the VAR model has proven to be especially useful for describing the dynamic behavior of economic and financial time series and for forecasting. Aside from data description and forecasting, according to *Goudarzi et.al* (2012) the VAR model is also used for structural inference and policy analysis.

Table 1: ADF and PP test on the variables of the Model

	ADF test			PP test	
Variables	Level	First Difference	Second Difference	Level	First Difference
RER	-1.450329	-5.75779*	-8.341334***	-1.839121	-5.844741***
Y	6.432698	-2.384012**	-8.30695***	6.432698	-2.230843**
M	-7.799315***	-8.390583***	-12.23835***	-7.658972***	-14.30408***
NFA	2.043979	-1.540856	-9.985982***	4.181793	-2.936942**
BD	-2.61437**	-4.99504***	-7.740678***	-2.198077	-4.456201***
MR	-2.843621**	-8.756028***	-7.212683***	-2.822688*	-8.634587***
OP	-0.833919	-7.052133***	-7.791166***	-0.789749	-7.04515***

Legend: *, **, *** denotes 10%, 5%, 1% level of significance

In order to properly specify the VAR, test for unit roots are conducted (Table 1). It shows that on the levels of the variables: RER, Y, NFA, OP the null hypothesis of a unit root cannot be rejected. Only NFA in the first difference of ADF test the hypothesis of unit root test cannot be rejected. In the second difference all variables are stationary. While in the PP test all variables in the model are stationary in the first difference. This shows that variables are I(1) series since they are not stationary at level.

For the cointegration test, testing for the optimal lag length is necessary, for the AIC it is shown (Table 2) that the optimal lag is 3. The result of the Johansen Cointegration test (Table

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3), which shows that there are no evidence of any cointegrating equation between the dependent variable and the independent variables, therefore it is acceptable to use the unrestricted VAR model.

Table 2: VAR Lag Order

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-4078.535	NA	2.05e+83	211.6685	213.7586*	212.4184*
2	-4021.029	73.72624*	1.63e+83*	211.2323	215.4125	212.7321
3	-3962.195	54.30876	1.89e+83	210.7279*	216.9983	212.9777

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

Table 3: Johansen Cointegration Test (Trace Statistic)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.982238	395.7233	125.6154	0.0000
At most 1 *	0.952355	242.5579	95.75366	0.0000
At most 2 *	0.779781	126.8871	69.81889	0.0000
At most 3 *	0.555297	69.38810	47.85613	0.0002
At most 4 *	0.441265	38.59485	29.79707	0.0038
At most 5 *	0.218432	16.47582	15.49471	0.0355
At most 6 *	0.170657	7.110599	3.841466	0.0077

Trace test indicates 7 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

After the VAR has been specified, in order to know the contribution of each variable to the movement of the real exchange rate, variance decomposition is calculated. Based on the results (Table 4) it was shown that variance decomposition in the real exchange rate that gross domestic product (Y) is responsible to the most of the movement in real exchange rate, it accounted for 29.22% of the variation in the real exchange rate. Volume of money flows (M) contributed 22.98% of the movement and net foreign assets (NFA) is responsible for 6.64% of the movement in the real exchange rate. Import restrictions (MR), oil prices (OP), and budget deficit (BD) only accounted 3.92%, 2.87% and 2.11%, respectively.

Table 4: Result of variance decomposition of real exchange rate in the period of 1973-2014

Period	S.E.	RER	Y	M	NFA	BD	MR	OP
1	3.254432	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	5.307566	73.77091	4.952826	12.55576	6.653025	1.373019	0.592573	0.101887

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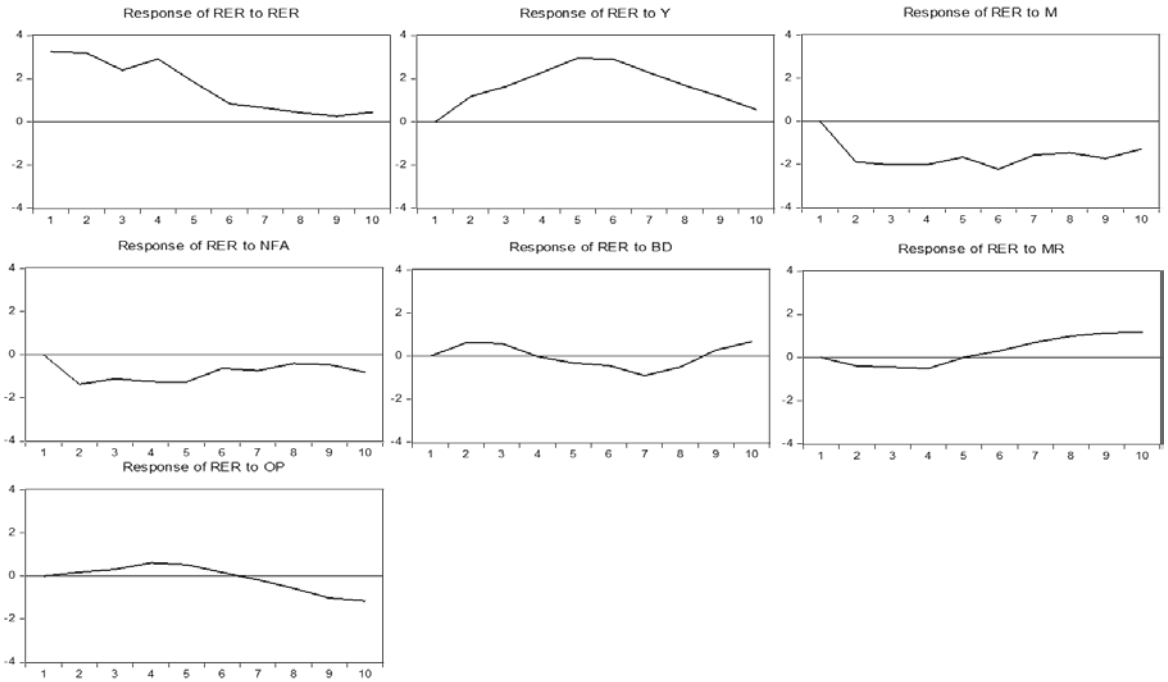
3	6.525875	62.22546	9.631185	17.93498	7.329084	1.706208	0.892159	0.280928
4	7.909878	55.96603	14.93584	18.65194	7.479057	1.162407	1.034683	0.770046
5	8.913928	48.35336	22.80234	18.13274	7.906259	1.043618	0.814775	0.946906
6	9.705574	41.54339	28.14080	20.53557	7.084614	1.082921	0.786606	0.826099
7	10.20388	37.98148	30.45701	20.90419	6.928704	1.763657	1.183632	0.781328
8	10.53633	35.78315	31.14859	21.52348	6.647688	1.884933	1.977730	1.034433
9	10.86474	33.71309	30.42920	22.74971	6.428173	1.839464	2.958578	1.881794
10	11.13683	32.24861	29.22272	22.98412	6.641424	2.110684	3.922721	2.869731

In addition to the variance decomposition, to have a better view of the effect of a single shock in each variable to the real exchange rate, measuring the impulse response function shows the gravity of each shock to the real exchange rate (Graph 1). For the response of RER to Y (GDP) the impact is positive, but decreasing towards the end of the period. For the RER to M response, it shows a negative impact all throughout the periods same with the NFA's impact on RER. For the impact of BD and M, it is shown that the impact is positive in the short-run but negative in the medium-run and positive in the long-run. For MR the initial impact is negative but positive in the long to medium-run. For OP, the effect is initially positive but negative towards the end period.



Graph 1: Response of the real exchange rate due to the shocks of the variables in the Philippines

Based on the result of the cointegration coefficients (Table 5), it shows that for every additional increase of US$ in GDP (Y), the real exchange rate (RER) increases by 1.79E-10, which supports the hypothesis. (Patosa and Cruz, 2013; Acosta et al, 2009; Goudarzi et al, 2012; and Rodrik, 2008). On the other hand, for every additional gain million of PHP in the volume of money flow (M), the real exchange rate (RER) increased by 8.37E-11, which accepts the null hypothesis. (Granger et al 2000; Oyinlola et al., 2011; Gourdazi et. al, 2012;

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Nieh and Lee, 2001; Dimitrova 2005;) According to Gourdarzi et.al, the relationship between the Real Exchange Rate and the Volume of Money Flows is consistent with theoretical principles but the study also stated that it has positive impact in the short-run and negative impact in the long-run on real exchange rate respectively. This result does not disappear in the short term and it takes at least ten years to reach its equilibrium level.

Table 5: Normalized Cointegration

	RER	Y	M	NFA	BD	MR	OP	C
Coefficient	1	1.79E-10	8.37E-11	1.38E-11	2.97E-10	94.15091	-0.092083	4.192846
Standard Error		-4.70E-11	-8.20E-12	-1.50E-12	-8.70E-12	-15.5997	-0.02359	

An additional million of PHP of NFA, RER increases by 1.38E-11 which supports the null hypothesis. (Dumitrescu & Dedu, 2009; Kucsera, 2007). The more assets a country owns abroad less its foreign liability, and if the value of those assets are high, it will lead to an appreciation of the real exchange rate. For Budget Deficit, for every additional million of PHP, RER increases by 2.97E-10 which also supports the null hypothesis. (Omoniyi et.al, 2012; Osuka & Chioma, 2014; Asrafuzzaman et.al, 2013). As the Law of Supply dictates, as Price increases, Quantity Supplied increases, ceteris paribus. As a country increases its borrowing of funds, prices will increase and there will be an increase in money supply and an increase in interest rates, therefore leading to an appreciation of the real exchange rate.

For every increase in MR (TIM/IM), RER increases by 94.15 which is consistent with the null hypothesis of the study, that as import restriction increases, real exchange rate of pesos versus US$ depreciates, since importers will need more dollars to import goods (goods will be expensive), so demand for dollars will increase, and as demand for dollar increases, price of the dollar also increases. This outcome is also consistent with other theoretical and empirical studies cited in this study (*Dornbusch, 1974; Kemar & Qadir, 2005; Brown & Crowley, 2012; Bogoev et al., 2008; Saidatulakmal et.al, 2012; Jimmoh, 2006; Li, 2004; Montiel, 2007*).

In the case of oil prices, for every increase in $/barrel, RER decreases by 0.092 shows that there is an appreciation in RER for every increase in oil prices which indicates the rejection of the null hypothesis of an depreciation of US$ versus PhP, that as oil prices increases, real exchange rate increases, where oil importers need more dollars to buy a barrel of oil in the international market (Dubai or Middle East, for the case of the Philippines), so they will demand for more dollars, and this will lead to appreciation of the price/value of dollar versus the peso. The study yielded the same results with Al-mulali (2010) and Coleman et.al (2011). Also, this situation might suggest, as the researchers implied in the literature review, that there is no consistent response of real exchange rate to changes oil prices and the response varies from country to country due to the different structures of their economies (Bouoiyour & Selmi, 2014; Coleman et.al., 2011; Behnmad, 2012;).

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5. CONCLUSION AND RECOMMENDATION

The result of this study shows with per increase in GDP in millions of US$, the US$ increases by 1.79E-10, for every increase in VFM, there is an 8.37E-11 increase in US$ versus PH₱ and for every increase of NFA in millions of dollar, real exchange rate decreases by 1.38E-11, also, for every million of peso deficit in the national budget, US$ versus PH₱ increases by 2.97E-10. For every increase in MR, real exchange rate depreciates by 94.15 and for every increase in OP per barrel, real exchange rate appreciates by 0.092. Also, from the result of the variance decomposition, it was shown that Y (GDP) is responsible for most of the real exchange rate movement, contributing 29.22%, NFA accounted for 6.64% of the variations of real exchange rate and MR, OP and BD only accounted 3.92%, 2.87% and 2.11%, respectively.

Based on the results of research, since GDP is the largest contributor of the movement of real exchange rate, from a central bank point of view, the BSP stay focused on other measures to maintain the stability and order of the foreign exchange market like 1) participation in the foreign exchange market; 2) monetary policy measure; 3) foreign exchange regulation, as there are other factors that may contribute to the movement of the exchange rate that is not included in this research study. In relation to the government, fiscal policies to be implemented should be harmonized with the monetary policies, like for example, the government has this coordinating body called the Development Budget Coordination Committee (DBCC) which is the right avenue for collaboration of government bodies including the central bank in properly harmonizing the fiscal and monetary policies.

The Bangko Sentral ng Pilipinas (BSP) has three (3) general tools in stabilizing the exchange rate. First, Participating in the foreign exchange market involves the BSP participating in buying and selling foreign exchange to smooth out the volatility in exchange rate. Second, BSP utilizes monetary policy measures when it foresees inflation rate moving beyond its target range. Third, in preventing major exchange rate volatility, the BSP combines foreign exchange intervention and monetary measures with market-based foreign exchange regulations. Also, reforms on foreign exchange liberalization programs have been approved by the BSP which focuses on being responsive to current economic conditions and to liberalize rules on foreign borrowings of private banks and the registration of inward portfolio investments.

The BSP issued Circular No. 794 which amended the following measures: (1) Allowing foreign exchange corporations to sell foreign exchange not exceeding 120,000 USD to residents; (2) Expand the list of allowable forms of outward investments without prior BSP approval; and (3) Allow banks to sell the equivalent foreign exchange of the excess peso proceeds of the foreign exchange funding. The BSP also issued Circular No. 815 and Circular No. 818 which amended the following: (1) Allow the prepayment of BSP-registered short-term loans without prior BSP approval. (2) Expand the list of allowable funding for onshore peso accounts of nonresidents (3) Allow AABs to convert to foreign exchange the peso proceeds from the onshore sale by non-resident issuers of their PSE-listed securities, without prior BSP approval. Circular No. 874 was issued as well, which further liberalized the provisions of the Manual of Regulations on Foreign Exchange Transactions: (1) Allowing the

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sale of foreign exchange to residents to settle obligations pertaining to trade and credit card transactions; (2) Requiring better long-term debt-to-equity ratio for private sector non-bank borrowers of foreign exchange; and (3) Expanding the coverage of short-term interbank loans that do not require prior BSP approval.

On the other hand, by improving the exchange rate, the government must limit the deficit in the budget. It is recommended that the government must strengthen the revenue base by improving tax administration and that will lead to a lesser deficit and help pay for the projects that must be prioritized. Another one is that the government must practice expenditure control in order to improve the deficit. Lastly, the authorities also plan to narrow down the list of tax and duty exemptions to rationalize the investment incentive structure.

During the duration of writing this paper, we faced several constraints, namely, retrieving only a limited number of empirical studies on import restrictions, since most of the study available are theoretical studies. The researchers suggests that researchers can use alternate variables on measuring the volume of money flows (M).

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APPENDIX

Appendix 1: Data Set

OBS	RER	Y	M	NFA	BD	MR	OP
1973	43.3121	35,804,833,860.79	30,125.01	4,796,546,418.73	(2,265,000,000.00)	0.261273895	9.089702394
1974	36.0175	37,078,811,053.84	-2,361,782.89	6,648,641,279.78	(5,190,700,000.00)	0.154189745	29.15785585
1975	39.3073	39,142,162,951.54	-38,673,181.36	2,802,603,404.01	(2,265,000,000.00)	0.172949155	24.956436
1976	39.0713	42,589,268,638.78	-57,621,106,321.14	234,796,185.44	(4,173,000,000.00)	0.165242967	27.48371654
1977	37.6677	44,975,143,137.88	-28,444,330,526.40	1,031,478.57	(2,852,000,000.00)	0.159601466	27.46910849
1978	37.5883	47,301,303,994.39	22,535,998,528.85	(6,652,051,883.77)	(2,167,000,000.00)	0.188449169	24.29875737
1979	35.6409	49,968,944,163.22	-49,946,261,062.41	(14,085,928,023.80)	(342,000,000.00)	0.184473074	50.28221813
1980	34.8474	52,541,800,772.91	-4,315,855,054.53	(20,833,368,250.22)	(3,487,000,000.00)	0.157499775	54.95774212
1981	35.7516	54,340,448,043.92	-1,196,522,104.36	(26,303,186,782.45)	(4,511,000,000.00)	0.138572944	52.51879826
1982	37.2259	56,307,206,881.22	-374,535,799.91	(47,893,825,262.96)	(14,343,000,000.00)	0.146432476	50.12579249
1983	45.4391	57,362,751,054.24	-2,522,265,242.79	(81,097,238,466.43)	(6,420,000,000.00)	0.152730011	46.58238462
1984	47.3780	53,161,685,245.39	-2,023,967,347.07	(107,768,679,660.62)	(9,995,000,000.00)	0.141007118	45.58170521
1985	44.4126	49,277,368,853.92	2,067,236,662.00	(127,605,564,754.62)	(11,187,000,000.00)	0.168068368	44.32801661
1986	49.1920	50,961,069,519.93	11,471,063,702.00	(129,472,664,151.52)	(31,252,000,000.00)	0.203046207	19.22170756
1987	49.6073	53,158,324,738.13	-4,990,321,748.69	(121,117,961,420.16)	(16,693,000,000.00)	0.181181925	22.51422279
1988	48.6550	56,747,864,261.63	10,135,904,989.38	(100,177,984,851.01)	(23,206,000,000.00)	0.165714472	16.49749912
1989	47.5251	60,269,245,791.10	1,848,165,400.44	(77,704,978,431.81)	(19,568,000,000.00)	0.137320701	19.72064329
1990	49.7175	62,099,602,471.41	-16,487,107,133.66	(102,190,677,469.60)	(37,194,000,000.00)	0.128150206	24.75132057
1991	49.4349	61,740,458,952.04	33,198,281,893.34	(22,247,525,144.75)	(26,349,000,000.00)	0.158326326	20.21983864
1992	43.5454	61,948,896,612.32	-23,100,128,461.18	30,679,725,180.00	(15,966,000,000.00)	0.158443699	20.59785731
1993	44.5869	63,259,925,558.73	267,220,884,744.00	104,225,214,295.28	(21,891,000,000.00)	0.139659417	17.30909979

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1994	41.1252	66,035,532,818.18	-234,267.24	121,701,595,616.75	16,286,000,000.00	0.1201138	17.5166389
1995	38.5681	69,125,132,154.07	44,601.33	113,376,134,430.07	11,074,000,000.00	0.115905628	17.53154213
1996	37.6440	73,166,099,917.29	1,108,427.90	65,820,854,594.69	(6,256,000,000.00)	0.09766937	20.56147652
1997	41.0141	76,960,027,260.88	-1,633,154.17	(55,217,051,795.09)	(1,564,000,000.00)	0.065883249	21.06219101
1998	52.8930	76,516,181,706.44	127,352.50	86,095,155,385.33	(49,981,000,000.00)	0.047757432	14.75897054
1999	48.7657	78,874,354,389.15	-296,101.84	271,839,290,299.70	(111,656,000,000.00)	0.053949786	21.2988018
2000	54.8302	82,353,669,774.14	-303,710.10	294,770,142,903.76	(134,212,000,000.00)	0.049723416	32.78562021
2001	61.7524	84,736,978,727.49	-79,721.50	560,332,600,765.38	(147,025,000,000.00)	0.048626794	29.66276663
2002	61.8005	87,826,402,659.74	-48,407.22	680,681,123,354.96	(210,741,000,000.00)	0.042482015	31.34212429
2003	64.9019	92,191,694,324.10	82,792.09	788,614,657,253.61	(199,863,000,000.00)	0.044573975	33.58304775
2004	65.7236	98,366,358,824.08	249,038,993,340.30	873,285,565,325.16	(187,057,000,000.00)	0.045968509	39.34777232
2005	62.7094	103,065,972,408.03	278,203,907,015.86	1,100,796,253,790.81	(147,778,000,000.00)	0.052613617	56.20493577
2006	57.1651	108,469,672,942.45	601,170.00	1,405,633,348,135.36	(64,791,000,000.00)	0.065337019	68.31250807
2007	51.3865	115,646,751,629.09	568,122,807,057.75	1,656,939,469,172.82	(12,441,000,000.00)	0.070079578	71.64336
2008	47.5002	120,449,280,370.90	-307,316,456,921.51	2,027,856,218,280.30	(68,117,000,000.00)	0.0856153	91.19281629
2009	48.6448	121,832,436,083.85	16,602,132.02	2,425,532,878,432.26	(298,532,000,000.00)	0.082285059	64.01987374
2010	45.1097	131,131,009,141.33	9,132,873.37	2,865,080,334,968.32	(314,758,000,000.00)	0.07863544	78.0611548
2011	42.6962	135,930,082,987.05	697,901.32	3,242,541,750,525.34	(197,754,000,000.00)	0.076561849	97.33172427
2012	41.1824	145,175,137,368.87	4,419,545.80	3,248,547,644,959.77	(242,827,000,000.00)	0.080960488	101.2170973
2013	40.7784	155,600,340,894.53	-6,423,717.21	3,575,053,790,350.37	(164,062,000,000.00)	0.082573398	99.41135458
2014	41.62385	164,935,397,824.00	1,331,833.41	3,752,064,000,000.00	(53,974,000,000.00)	0.092922118	91.28878958
	$ to ₱	GDP (constant 2005 US$)		NFA (current PhP)	Nominal (PhP)	TIM/IM	Dubai, $/bbl, (real 2010)

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