EXCHANGE RATE, TRADE BALANCE, AND THE J-CURVE EFFECT IN VIETNAM

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ABSTRACT

The aim of this study is to analyse movements of exchange rate and trade balance during 2001-2015 and investigate whether a devaluation would improve the trade balance by a J-curve effect. The study uses quarterly data collected from reliable sources such as World Bank (WB), and General Statistic Office of Vietnam (GSO), and International Financial Statistics (IFS). The first part of the study shows the performance of the trade balance and exchange rate movements during the given period. The second part employs Impulse Response analysis to examine the pattern of the trade balance after a shock of exchange rate or a devaluation. The finding of the study is that following a devaluation, the trade balance deteriorates in the first two-quarters and then starting improving till the sixth quarter. After the six quarter, the trade balance again falls into deficit and followed by rises and declines unexpectedly. With responses illustrated from the analysis, the trade balance has a sign of the J curve in early quarters but this sign is fading in later quarters. The study also discovers that there is a possibility that after a shock of exchange rate, the trade balance will follow an S curve, instead of a J curve. In the end of the study, the author recommends some policy implications to improve trade balance and open further insights for subsequent researchers.

Contribution/ Originality: This study is one of very few studies which have investigated the relationship between exchange rate and trade balance in Vietnam from 2000 to 2015 according to the J-curve pattern analysis.

1. INTRODUCTION

Exchange rate and trade balance are always great concerns for the wellbeing of an economy. In an attempt to obtain the international competitiveness and improve the trade balance, devaluation of the home currency is considered as one of the effective measures in many countries. Theoretically, while a worsening of the trade balance following a devaluation of a currency may be temporary, the balance of trade will improve in the long term. This phenomenon follows a J-curve shape and widely entitled as the J-curve effect in trade balance analysis.

However, whether a devaluation helps the trade balance improve in the long run or not, the empirical results from different countries are very inconsistent and Vietnam may be no exception. Thus, the study for the specific

858

case of Vietnam is seen necessary to assist policymakers in having an objective view about the impact of devaluation on the trade balance. As a result, they can come up with the more appropriate exchange rate and trade policies to improve trade balance in the future.

There are many researchers around the world trying to refine or change approaches to lead to the most convincing conclusion. Specifically, early studies focused on explaining the price elasticities of imports and exports to infer the consequences of devaluation on the trade balance. Recently, new studies have started using quantitative methods to evaluate the impact of exchange rate on trade balance and then infer the effectiveness of devaluation. One of the popular methods is Impulse Response Functions (IRFs), that is widely employed to access the effects of a shock in exchange rate on the trade balance in both short run and long run, is used in this study.

Through quarterly data collected from reliable sources in fifteen years from 2001 to 2015, the study will: (i) perform movements in trade balance and exchange rate; (ii) show the pattern of the trade balance in Vietnam when devaluation is carried out. Besides; (iii) clarify whether the trade balance in Vietnam follows the J-curve shape or not; (iv) suggest policy recommendations can be implemented in the future.

2. LITERATURE REVIEW AND METHODOLOGY

2.1. Literature Review

The phenomenon of an initial worsening and subsequent improvement of the trade balance after depreciation is known as the J-curve effect (Levi, 2005).

In theory, a deterioration of the trade balance after a depreciation of a currency may be impermanent for two main reasons. Firstly, it takes time for people to switch their preferences for imported goods towards domestically produced substitutes. Thus, it is commonly believed that demand is more inelastic in the short term than in the long term. Secondly, the domestic substitutes have not yet been produced right after the depreciation of home currency (an inelastic domestic supply curve). Therefore, only after producers begin to supply what was previously imported and after consumers decide to buy import substitutes, can import demand fully decline after a depreciation. Similarly, exports expand only after suppliers can produce more for export and after foreign consumers adjust their references to these products.
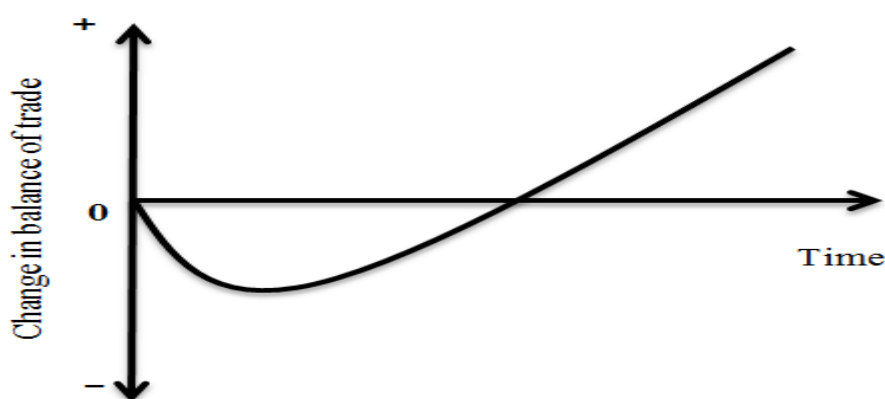

Figure-1. The J curve after depreciation/devaluation
Source: International Finance, Levi (2005)

The Figure 1 assumes that depreciation occurs at time 0, and that because people temporarily still spend for imports as well as because exports do not sufficiently increase, the balance of trade worsens immediately after the depreciation. Only later, when import and export elasticities increase, does the trade balance turn round and eventually improve.

For empirical studies, several researchers release analyses based on their country-specific situation. Specifically, Onafowora (2003) uses the Generalized IRFs to describe the short-run effects, and cointegration to investigate the

long-run effects, of bilateral trade between Thailand, Malaysia, and Indonesia with the USA and Japan. In his study, Onafowora finds at mixed results. While there is a long-run improvement in the trade balance, for the six-country pairs, Thailand shows evidence for a J-curve only with the USA. Indonesia and Malaysia demonstrate a J-curve pattern with both trading partners. In another study, Hsing (2005) employs generalised IRFs to re-evaluate an earlier paper by Hsing and Savvides (1996) that had used OLS methods to look for evidence of the J-curve. Both the aggregate trade balances of Korea, Japan, and Taiwan, as well as bilateral trade with the USA are modelled, but only Japan shows a J-curve pattern in its aggregate trade flows.

There are several studies focusing on Asian countries' aggregate trade. Akbostanci (2004) fails to find any evidence of a J-curve pattern for Turkey's trade balance during 1987-2000. Singh (2004) points out no J-curve effect for India from 1975 to 1996. De Silva and Zhu (2004) employ traditional orthogonalised impulse response functions (IRFs) to attempt various orderings of different combinations of variables (including interest rate, money supply, and government expenditures). They find that overall, the trade improves, but the GDP does not response positively to devaluation.

Further studies show a combination in methodology by using impulse-response functions and cointegration test to a single country's trade, but they also can not find evidence of the J-curve effect. For example, Rahman and Islam (2006) use the Engle-Granger cointegration approach and impulse-response functions to analyse the balance of trade of Bangladesh; Halicioglu (2007) studies Turley's trade with nine trading partners by using a Vector Error Correction model, the generalised IRFs, and the Johansen cointegration. Despite of their attempt, no evidence of the phenomenon is found.

Due to some disadvantages of methods used to study the J-curve effect such as cointegration and vector error correction analyses, the approach is developed by employing ARDL model in many later studies. Take the study of Rehman at el in Pakistan as an example, the effect is captured by using the short-run coefficients, they find that the coefficients' signs at a short lag are opposite to those at longer lags. Although the evidence of a J-curve for Pakistan is found, they suggest that readers should disaggregate the data as an additional practice. Another study of Arora *et al.* (2003) examines India's trade with seven industrial partners. He finds only the effects in the long run for four countries and thus no J-curve illustrated. However, Bahmani-Oskooee *et al.* (2006) discover stronger evidence of dynamic effects for trade between the UK and its top twenty trading partners over 1973-2001. Canada-US trade displays a pattern similar to a J-curve, while three other countries show oscillating effects described as a W-curve.

These studies, applying newer cointegration techniques to aggregate trade flows, nevertheless fail to overwhelming evidence of the J-curve phenomenon. This may be because different industries behave differently, and that aggregate data conceals significant movements within subsets of the date. As a result, further disaggregating a country's trade flow data might reveal the presence of an industry-specific J-curve Bahmani-Oskooee and Ratha (2010).

2.2. Methodology

In the first part, the performance of exchange rate movements and trade balance are illustrated under graphs to help readers have an overview the situation of Vietnam during 2001-2015. Data are collected quarterly from 2001(1) to 2015(4) with 60 observations, from various sources such as International Financial Statistics (IFS), General Statistic Office of Vietnam (GSO) and Bloomberg as in detail:

- Data on average-period nominal exchange rate of VND against USD from 2001(1) to 2015(4) is collected from IFS.
- Data on exports, imports of goods and services of Vietnam with trading partners is taken from IFS.
- Data on CPI of Vietnam and trading partners from 2001(1) to 2015(4) are obtained from IFS.
- Real GDP growth data for 10 trading partners from 2000(1) to 2015(4) is attained from IFS in percent form.

- Real GDP growth of Vietnam is taken from GSO in percent form.

The trade balance is defined as the ratio of value of exports to value of imports (EM/IM). The ratio is widely employed in many empirical studies investigating the relationship between exchange rate and trade balance in other countries. It is more preferable than net trade balance because it solves the problem of negative value when applying log form for net trade balance. Real effective exchange rate (REER) is computed based on Nominal Effective Exchange Rate (NEER) after being adjusted by CPI of Vietnam and that of top trading partners.

In the second part, to test whether the effect of devaluation in Vietnam dong on trade balance, the impulse response function is employed. The impulse response function shows the effects of shocks on the adjustment path of the variables (Hill *et al.*, 2011). In the study, the impulse response function analysis with two time series (trade balance and exchange rate) based on a bivariate VAR system of stationary variables is considered as follows:

$$\Delta LNTB_t = \delta_{10} + \delta_{11}\Delta LNTB_{t-1} + \delta_{12}\Delta LNREER_{t-1} + v_t^{lntb} \qquad (4.18)$$

$$\Delta LNREER_t = \delta_{20} + \delta_{21}\Delta LNREER_{t-1} + \delta_{22}\Delta LNTB_{t-1} + v_t^{lnreer} \qquad (4.19)$$

where:

$LNTB_t =$ trade balance in logarithm form

$LNREER_t =$ real effective exchange rate in logarithm form

Δ denotes the first difference

V_t is the error term

Impulse responses identify the responsiveness of the dependent variables (endogenous variable) in the VAR when a shock is put to the error such as v_t^{lntb} and v_t^{lnreer} in the equations given above.

There are two possible shocks to the system- one to LNTB and the other to LNREER. Thus, we have four impulse response functions – the effect of a shock to LNTB on the time paths of LNTB and LNREER, and the effect of a shock to REER on the time –paths of LNTB and REER.

3. RESULTS AND DISCUSSION

3.1. Performance of Trade Balance and Exchange Rate

Figure 2 illustrates the performance of this indicator over the period of 2000-2015. The trade balance shows the highest deficit up to over 15 percent of GDP in 2007. However, the trade balance improved in later years. Especially, the trade balance showed continuous surpluses of 4.7% of GDP, 3.3% of GDP, 4.6% of GDP, and 1.6% of GDP in 2012, 2013, 2014, and 2015 respectively.
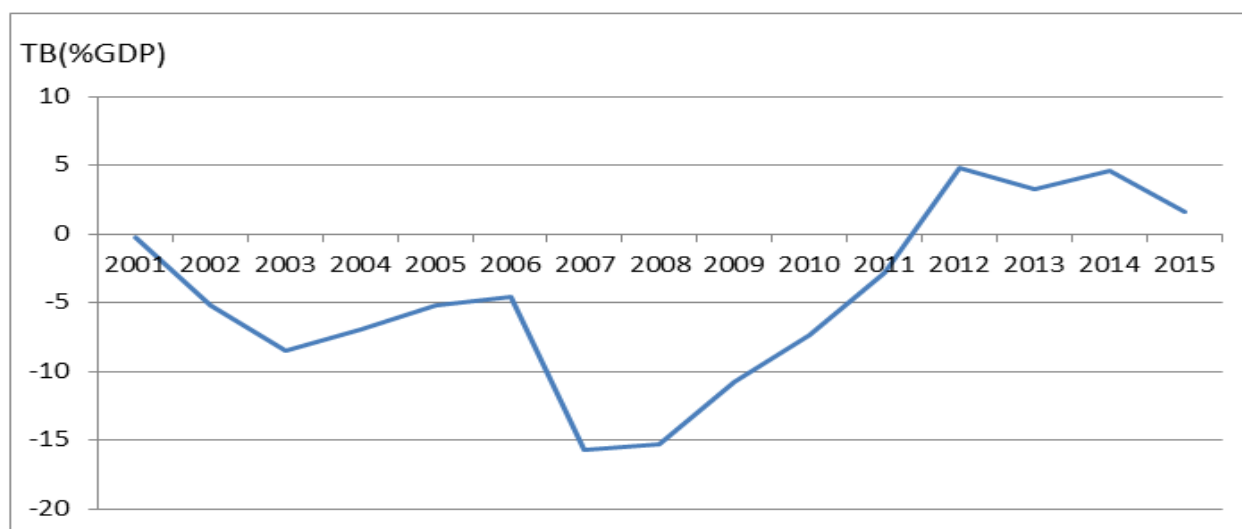
Figure-2. Vietnam's Trade Balance as Percent of GDP over 2001-2015

Source: Author's computation based on Trade Balance and GDP data

There are several reasons explaining the consecutive deficit of the Trade Balance in eleven years from 2001 to 2006. The fundamental reason is the unbalance of export commodity and import commodity structures. The export production mostly relies on imported inputs; an increase in export would lead to a higher demand for import materials. As a result, the value added in exports that were generated in Vietnam remained low, and the Trade Balance was very hard to achieve a surplus in this stage. Besides, in 2001-2006, FDI inflows focused on manufacturing industry to meet the export need that leads to the increase in both exports and imports (import raw materials and export finished machinery products). Therefore, although Trade Balance suffered a deficit in this period, it was not as considerable as the deficit in 2007-2008.

In 2007-2008, there are changes in the usage of capital inflows. Specifically, FDI inflows altered to concentrate on construction and property market rather than manufacturing industry. This changing direction caused the increase in import demand of building materials and machinery for heavy industry. However, the increase in building and real estate products did not result in export products and this worsened the Trade Balance status in this stage. Also, the significant deficit occurs in 2007-2008 was also explained by the negative impact of the global crisis on exports which are seen very sensitive to changes in global economies. The United States, Japan, Europe are known as the main markets for exporting goods from Vietnam but they are directly affected by economic recession; therefore, the demand for goods and services from Vietnam decreased significantly during this time, leading to a decline in the values of exports of Vietnam.

Following five times of dong devaluation in 2008-2011 (VND devalued 2% in 11 June 2008; 2.9% in 25 December 2008; 5.16% in 25 November 2009; 3.25% in 11 February 2010; 2.05% in 18 August 2010; and 8.5% in 11 February 2011), the trade balance showed positive movements in reducing imports and therefore improved the trade balance in later years. Since 2012, Vietnam has been reporting trade surpluses more regularly since exports growth has been greater than imports. In 2011-2015, while the export growth rate got new achievements, especially in agricultural commodities sector; the proportion of imports also declined. The two new trends of imports and exports contributed significantly to the surplus of Trade Balance in this stage. However, the improvement of Trade Balance in 2001-2015 is not considered sustainable for some reasons. Firstly, exports of the FDI sector are increasingly growing in the export structure that implies the weakness of domestic economic activities. Secondly, the export commodity structure is still mainly based on low-added-value categories and the export market structure is slowly extended. The main partners of Vietnam are ASEAN, the United States, Japan and China in which the trade dependence on China is significant. This dependence implies that if there is any slowdown in the economy of these partners, it will intensively affect the trade activities of Vietnam.

The Figure 3 shows that the United States is the most important partner of Vietnam where consume a big amount of exports from Vietnam. Following the United States are Euro Area, Japan and China. According to the graph, it is obvious that in 2008-2009, the values of exports simultaneously decreased due to the demand decrease from main economies that are affected severely by the global economic crisis.
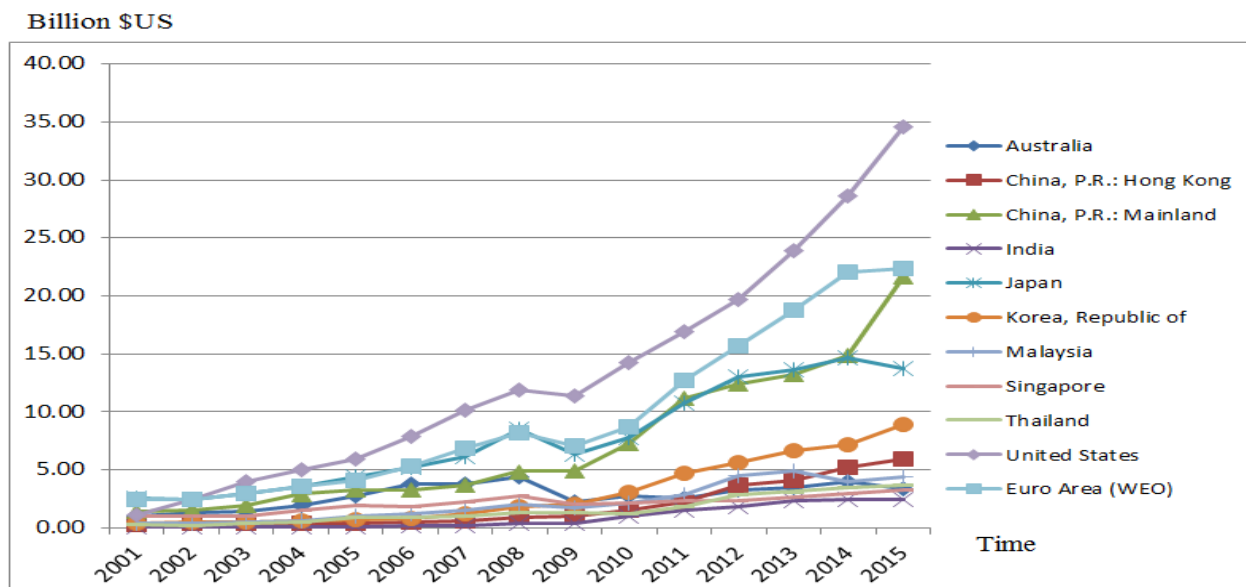

Figure-3. Exports from Vietnam to trading partners
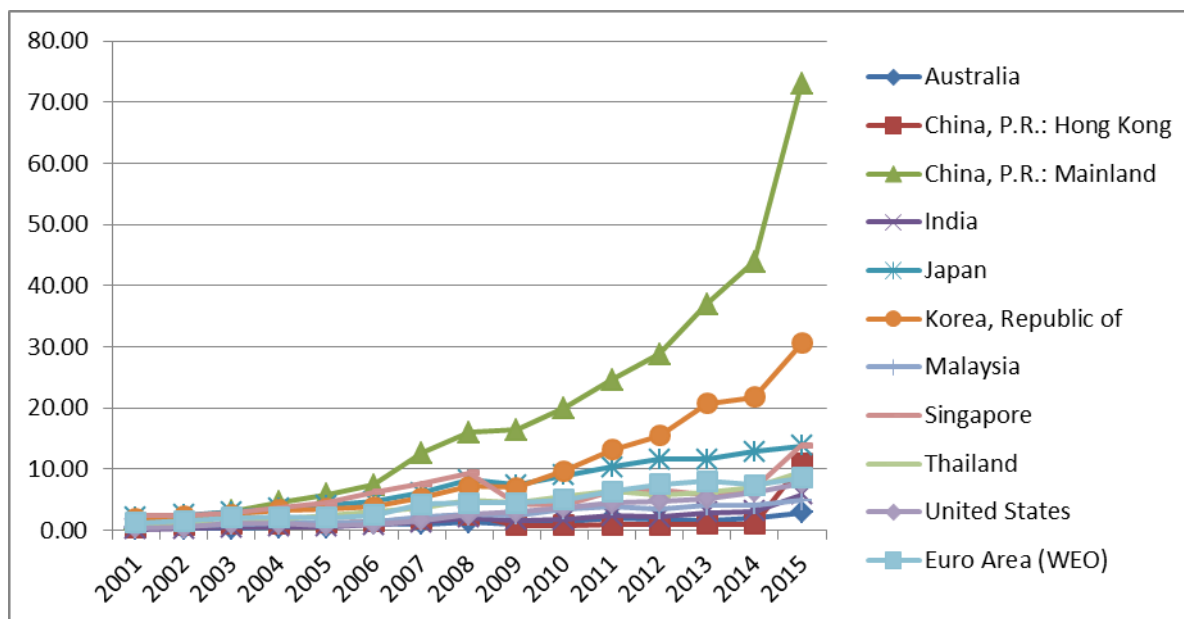
Source: World Bank Indicators

Figure-4. Imports of Vietnam from trading partners

Source: World Bank Indicators

Figure 4 shows the values of imports of Vietnam from top trading partners. It is clear that China's produced products play the most significant role in the total amount of import value, followed by the Korea Republic and Japan. Regarding import structure, the importation of means of production accounts for roughly 90% of the total import value while that of consumer goods forms about 8%, (General Statistics Organisation of Vietnam, 2008). The high production of means of production in Vietnam's import structure can be explained by the high demand for this category for the country's industrialisation process and the operation of the foreign-invested sector, which focus on manufacturing and increasing investment in construction and real estate in recent years. As mentioned above, the

increase of the country's export activities results in the expansion of imports since Vietnam's export still depends heavily on imported materials. Also, higher income level and the reduction of tariffs owing to the country's integration process into the world economy through bilateral, regional and multilateral trade agreements also lead to higher demand for imported consumer goods, including luxury items.
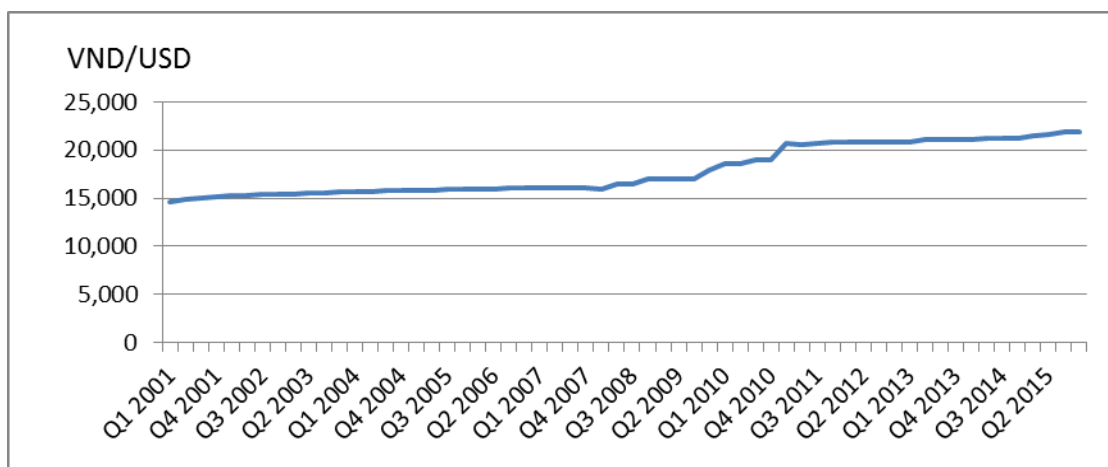

Figure-5. Exchange rate VND/USD.

Source: World Bank

In February 1999, Vietnam made a great change in exchange rate regime by introducing two important regulations: namely 64/1999/QD/NHNN and 65/1999/QD/NHNN. According to these regulations, the State Banks of Vietnam (SBV) began to announce the daily inter-banking average exchange rate and its fluctuation band, and commercial banks decided their trading of exchange based on this inter-banking rate. It was seen as an attempt by the government to transform a fixed exchange rate regime into a managed floating exchange rate system. However, Anh (2010) investigated that although the exchange rate regime of Vietnam is claimed not to be the fixed exchange rate system, the flexibility of exchange rate is quite little. By measuring and analysing the Exchange Market Pressure – EMP, she concluded that the real exchange rate regime in Vietnam is still categorised in the simple US dollar peg exchange rate; and therefore we can use the concept of devaluation when mentioning times the State Bank of Vietnam intervened in the FOREX by depreciating the value of VND.

During 2000 -2015, the exchange rate between USD and VND where VND is Terms currency and USD is Commodity currency is continuously increasing. For example, in 2000, the official exchange rate (USD/VND) was only 14,200, but this figure escalated to 21,700 in 2015, in other words, VND depreciated more than 50% in the period.
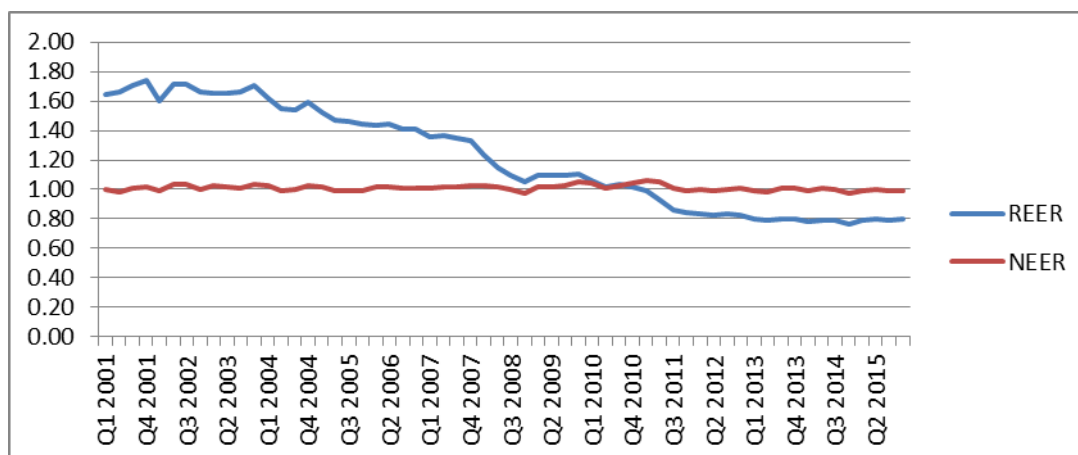

Figure-6. NEER and REER in 2001-2015

Source: World Bank

Figure 5 illustrates that although the official bilateral exchange rate of VND against USD is increasing over time, the nominal effective exchange rate of VND against a basket of currencies in Figure 6 seems to remain stable with very little fluctuation around 1.0. Noticeably, the real effective exchange rate shows a different trend compared to NEER. The REER tends to decrease from roughly 1.6 to 0.80 at the end of the period, implying that CPI in Vietnam increases with higher speed than that of other countries. When the real effective exchange rate abates, it implies that the volume of exports will decrease and that of imports will increase due to relative price effects. As a result, the balance of trade tends to be deficit before 2011. From 2011 onwards, the REER stops dropping and remains stable at 0.80, seen as a reason contributing to the improvement of trade balance in this period. A reason behind the stable status of REER after 2011 is because of devaluation of dong in this time. To reduce import growth as well as credit growth, the dong was devalued 8.5% from 1USD = 18,932 VND to 1USD = 20,693 VND in February 2011. As a result, from nearly -5% of GDP in 2010, the trade balance improved to -0.4% of GDP in 2011 and entered a modest surplus of 0.2% of GDP in 2012 (Anh, 2012).

3.2. J-Curve Effect

The Figure 7b shows that right after a shock in real devaluation, the trade balance would worsen in two first quarters. After that, the trade balance starts improving to get the peak in the 6th quarter. As observed, from the 5th quarter the trade balance obtains surplus but it does not last for long until quarter 6th. During later quarters, the trade balance experiences fluctuation in both surplus and deficit. Eventually, the trade balance will get the new equilibrium from quarter 13th based new market conditions. It also means that after three years from the shock in a real depreciation, the trade balance is able to get the new balance where exports and imports are seemly equal. The impulse response result also implies that the existence of J-curve effect in the relationship between exchange rate and trade balance. However, the J-curve pattern is still not really clear. In particular, the J curve only last for 6 quarters, equivalent to 18 months in which there are 12 months is in deficit and only 6 months in surplus after that, followed by ambiguous patterns.
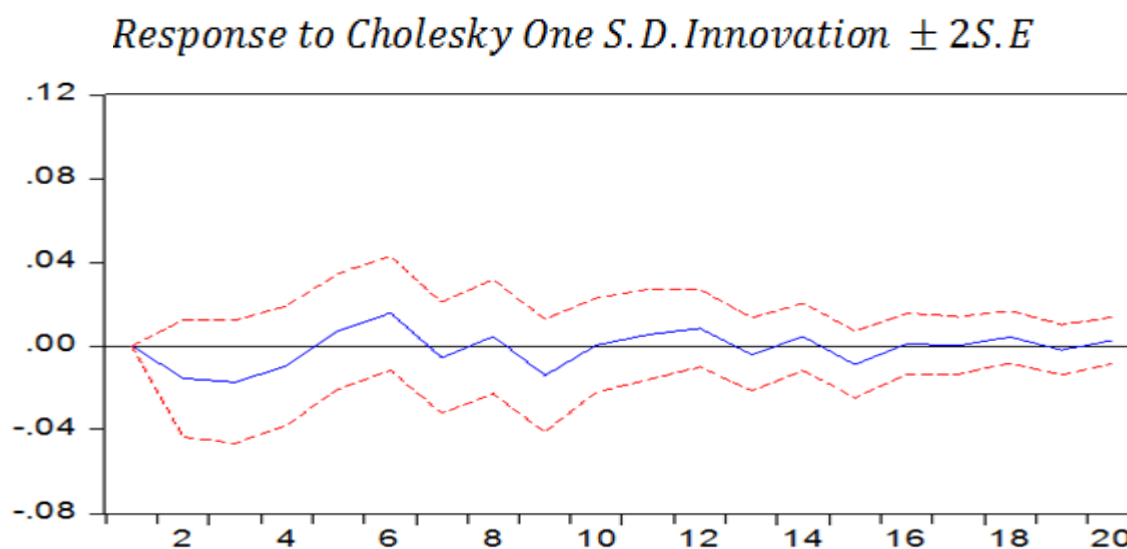

Figure-7. Evolution of trade balance following real depreciation/devaluation
Source: Author's computation based on the data

The pattern observed in the Figure 7 reminds of the findings of Marwah and Klein (1996) for the U.S. and Canadian data, where they found that there is a tendency for the trade balance to worsen right after a depreciation and then to improve, but the improvement does not last long. It appears to be a tendency of worsening again for both the United States and Canada. Backus et al. (1994) also talked about the S-shaped response of the trade balance

865

to changes in terms of trade. Also, Roberts (1995) talked about the possibility of an S-curve to emerge in terms-of-trade account dynamics. Therefore, the study put forward a consideration for subsequent researchers to go further by making clear the characteristics of an S curve and then testing the S-curve effect for the case of Vietnam.

4. CONCLUSION AND POLICY IMPLICATION

4.1. Conclusion

On the whole, the trade deficit is considered as a chronic concern in Vietnam during the given period, especially in 2001-2011. From 2012, the trade balance shows positive signs of continuous surpluses until 2015. However, these improvements are deemed not sustainable for several reasons. The fundamental reason is the inadequacy of export commodity and import commodity structures. Since export production mostly relies on imported inputs; the value added in exports remains low and makes trade balance very hard to improve as well as to achieve a long-lasting surplus. Another reason worth mentioning is the impact of FDI inflows on exports and imports demand. This is explained particularly in 2007-2008 when FDI changes the direction from manufacturing industry to property market; this change contributes to worsening heavily the trade balance at this time. Also, the global crisis in 2008-2009 has a tremendous effect on exports of Vietnam as the importing need from top-trading partners declines severely. Last but not least, the attempt of the government to devalue the dong in 2008-2011 is seen as a great effort to the improvements of the trade balance from 2009 onwards.

With regard to exchange rate policy, although the exchange rate regime of Vietnam is claimed not a fixed exchange rate system, the flexibility of exchange rate is still restricted due to the government's intervention. For exchange rate movements, there are three different directions among official bilateral exchange rate, nominal effective exchange rate, and real effective exchange rate. While the official bilateral exchange rate of VND against USD is increasing over time, the nominal effective exchange rate of VND against a basket of currencies seems to remain stable with very little fluctuation around 1.0. Noticeably, the real effective exchange rate tends to decrease from roughly 1.6 to 0.80 at the end of the period, implying that CPI in Vietnam increases with higher speed than that of other countries.

Regarding the J-curve effect, in response to the shock from an increase in REER (VND depreciates), trade balance deteriorates in first two-quarters and then start improving till the 6th quarters. After the 6th quarter, the trade balance again falls into deficit and followed by rises and falls unexpectedly. According to economic theories, the J-curve effect suggests that after a devaluation or depreciation of the home currency (exchange rate increases), it takes a while from two to eight quarters for the trade deficit; and then followed by a long-term surplus of trade account. Therefore, with responses observed from the analysis, trade balance has a sign of J-curve but the time of impact does not last long enough to assure that it follows a proper J-curve pattern. There is a likelihood that the trade balance shape follows an S curve instead of a J curve.

4.2. Policy Implications

Firstly, regarding export-commodity structure, it is necessary to promote the transformation from low value-added products to high value-added products. As mentioned, the export production still relies largely on imported inputs. If there is an increase in export of import-based products, it would lead to an increase in import for raw materials as a matter of course. Thus, the value added in exported products remains low and hardly improve the trade balance. In order to cut down importation of raw materials, the authorities should encourage investors to engage more in manufacturing and processing industry to produce raw materials itself instead of importing from abroad.

Secondly, the export market should be extended and diversified not to be affected by some economies when there are shocks in such economies. As known that the United States, Japan, Europe are the main markets for exporting goods from Vietnam. Thus, when they are directly affected by economic recession, the demand for goods

and services from Vietnam will decrease correspondingly, leading to a significant decline in the values of exports of Vietnam. Exploring new markets for exports are seen as the new target in the upcoming years to contribute to improving the trade balance.

Thirdly, policy makers should take into account inflation rate of Vietnam and other trading partners before deciding to adjust nominal exchange rate. One of the main purposes of adjusting nominal exchange rate is to improve trade balance through relative price channel. However, the relative price channel depends on real exchange rate rather than the nominal exchange rate. Considering inflation and the nominal exchange rate of various countries and currency will help to estimate the trend of the real effective exchange rate and avoid unanticipated trends that may worsen the trade balance.

Fourthly, the J-curve analysis indicates that a devaluation of the dong would not help to improve trade balance for long. If the policymakers want to sacrifice other targets to obtain trade-surplus target by generating a devaluation of the dong, they should be aware of the time length that a surplus can maintain following the real depreciation. If the surplus can offset the loss from sacrificing other targets, it is worthwhile to do so; otherwise, it is better to look for other solutions.

Finally, there is a need to limit the intervention of the government on foreign exchange market to make the exchange rate more flexible. A more flexible exchange rate regime would also help improve the country's relatively-low foreign exchange reserves. Sandeep – the lead economist of the Word Bank office in Vietnam explained that "If you try to fix the exchange rate, which means you will have to spend your foreign reserves to keep the rate at certain level" (as cited in Anh (2016)). Since April 2016, Vietnam decided to adopt a more flexible exchange rate mechanism compared with the previous one. Specifically, while in the previous system, the dong was allowed to trade around a fixed rate that the State Bank only adjusted a few times each year, in new mechanism the State Bank of Vietnam sets the official mid-point rate of the dong against US dollar on a daily basis. The current mechanism calculates the daily exchange rate based on the basket of eight foreign currencies including USD, CNY, EUR, JPY, TWD, KRW, THB, and SGD. Vietnam should keep refining the exchange rate system in a more flexible and transparent way towards a floating freely system to reduce the pressure on foreign reserves as well as to reflect more accurately the supply of and demand for foreign currencies.

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