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Impact of Devaluation on Foreign Trade in Saudi Arabia

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Abstract

International policy is always aims at the balance trade improvement of any country. This paper specifically investigate the influence of devaluation policy on the trade balance in Saudi Arabia by using data of 1970-2015 through non-linear ARDL approach suggested by Shin et al. (2014). The findings suggest that world income is improving trade balance of Saudi Arabia. While, appreciation has expected impacts at large and devaluation is not found effective in for improvement in trade balance in long run. Further, short run results prove the existence of inverted J-curve in appreciation policy and S-curve in devaluation policy. This paper suggest to maintain exchange rate instead of a devaluation based on findings.

Key Words: J-Curve, Devaluation, Trade Balance

1. Introduction

Trade is the engine of economic growth that not only give the income/economic growth to any country. But, it also helps in increasing foreign reserves, correcting balance of payment problems and to maintain stronger exchange rate for any country. Trade of Saudi Arabia is majorly oil-dependending but it is very important to test its further determinants to foster the export growth and to help in achieving balanced trade and to gain advantages of high economic growth rates. The Saudi economy is trying in maintaining its exchange rate high by using foreign currency reserves. That is creating a problem for future balance of payment sustainability in its portfolio. The exchange rate should be maintained by higher value of exports and lower value of imports in trade balance. Further a sharp decline in oil prices are creating problems in collecting sufficient foreign reserve to maintain its imports and to maintain balanced trade. On the other hand, demand for Saudi imports are rising with rising income level of economy. That could be problematic in maintaining balanced trade. Therefore, there is need to access the demand side and supply side conditions of Saudi trade and to check the impact of devaluation policy/ revaluation policy on the trade balance in testing the determinants of balance of trade. Therefore, the present study will adopt a balance of trade model with the positive and negative changes in exchange rate as determinants by applying latest non-linear ARDL cointegration test introduced by Shin et al. (2014). This will be helpful for the policy makers in achieving high exports', correcting balance of trade problems and economic growth by tracing different trade policies for Saudi Arabia. It is our very first attempt to concentrate this important issue of Saudi economy by using modern econometric techniques.

While it is also important to see the economic effect of exchange rate i.e. response of balance of payment account to devaluation. Theoretically and empirically notion of J-curve "*temporary deterioration and later improvement in balance of payment account due to devaluation*" in literature on international trade and finance achieved great significance. This definition is extended by including and combining short and long run coefficients with their opposite signs yield J-curve. This study also incorporates whether impacts of exchange rate movements are asymmetric or symmetric. Following Shin et al. (2014) NARDL technique, present study extends its investigation to see positive and negative effects separately to find symmetric evidence and their comparative magnitude too.

The bilateral trade between countries helps in achieving the local targets of any country. Trade of one country is not always beneficial with other trading partners. But, it depends on trading policy. In case of Saudi Arabia, most of trade is done within the Gulf Cooperation Council (GCC) countries. On the other hand, the countries other than GCC are actively involved in trade due to other reasons i.e. oil-dependence on Saudi oil exports. In particular, exchange rate policy as KSA is adopting the fixed exchange rate (keeping rate high with using foreign reserves) is very important to test that either this policy helping in correcting balance of trade or it has some bad impacts. Further, in case of present sharp decline in oil price, it may have strong negative effects on trade balance that need some empirical exercise to be done.

The present study tries to estimate the determinants of Saudi sectorial trade. Our estimates and elasticities could be used by policy maker in framing international trade

policy in the Kingdom and particularly exchange rate policy that could be helpful in correcting balance of trade issue and further that could be helpful in maintaining a true better exchange rate and in turn would be helpful in saving foreign currency reserves and maintain a sustainable trade balances and economic growth. The contribution of present study would improve the country's trade performance and the gained foreign reserve can be utilized for the maximum welfare of community in importing missing product in the kingdom and to improve the imported technology in working industry and provide scale effect in increasing export sector's total value of production and in turn raise the overall income and economic growth in Kingdom. That could be consume for better consumption and increasing standard of living of community. The most important effect on trade is the effect of exchange rate devaluation/revaluation. The estimated elasticity will be demonstrate the feasibility of current exchange rate policy and suggest the changes to make trade more favourable for Saudi economy. All estimates have a great policy relevance and contribute in a great extent for policy making mechanism in the kingdom. Furthermore, these kind of analyses have never been done in case of Saudi Arabia that will contribute uniquely to the existing body of literature. Therefore, our study will generate very useful outcome for enhancing Saudi exports, correcting balance of payment and in turn provoking the economic growth.

2. Literature Review

There is a vast literature on testing the gravity model by using exchange rate as control variable but definitely GDP of importing and exporting countries are major part of gravity model like our focus is also towards these variable in our model. But, most of gravity literature ignore that important exchange rate variable. In the relationship of Exchange rate and trade, Magee (1973) for the first time introduced idea of J-curve. He is of the view depreciation/devaluation in the short run deteriorates trade balance and in the long run improves it, eventually characterized j-curve shape instead of generating linear relationship. He explained that short run effect is due to price changes and long run response is due to both price and volume effects which encourage producers and foreign consumers, ultimately yields positive impact on trade balance. Deeper (1974) observed the effects of exchange rate on balance of trade by using trend and seasonal changes in the quarterly data of Uk, France, Netherland and Germany. He observed profound changes in the volume of trade due to exchange rate and governments have been reluctant to devalue their currencies due to inflation pressure. Miles (1979) strongly rejected the preposition of J-curve, however found positive effects of devaluation on balance of trade. His case study was from the sample of Europe, Sri Lanka, Israel, and Phillipine. Boylan, Cuddy and Muirheartaigh (1980) determined those factors may have effects on trade balance by using Box-Cox methodology for Denmark, Belgium and Ireland. Among many, study found exchange rate is one of the important factors to affect trade balance. Study also suggested appropriate exchange rate policy may correct trade balance. Kapoor and Ramakrishnan (1999) investigated long run relationship between exchange rate and trade balance and found existence of J-curve through ECM (Error Correction Model) and impulse response function. This study also found negative effects of exchange rate in first five quarters and later improves balance of trade for 13 quarters.

Bahmani-Oskooee (1991) also checked J-curve for selected developing countries by using quarterly data. The lags of real effective exchange rate were taken to trace J-curve. Interesting fact is that most of the past studies investigated aggregated trade data, thereby contradictory findings were obtained regarding impact of exchange rate on trade. The reason is that aggregated data erroneously, unnecessarily and implicitly assumes that estimate elasticities of price, income and exchange rate are almost equal across sectors. This is implausible thinking, so it is better to assume different elasticities across sectors regarding impact of exchange rate. Noland (1989) investigated economic performance of Japan and existence of J-curve phenomena. Results revealed that proper management policies and devaluation enhance exports and clear evidence of J-curve phenomena was observed that in short run devaluation deteriorates and in long run improves it.

Marwah and Klein (1996) found existence of S-Curve instead of J-curve by investigating impact of real exchange rate on bilateral trade of US-Canada. Study found initially existence of j-curve and later again worsening balance of trade due to continuous depreciation. Bahmani-Oskooee and Kantipong (2001) found existence of J-curve in the bilateral trade of Thailand with US and Japan but not in bilateral trade with Singapore, UK and Germany. **Bahmani-Oskooee and Nirooman (1988)** argued that devaluation might yield positive effects on the trade balance. Historically proven fact that devaluation have a painful exercise in underdeveloped nations due to facing political turmoil, even due to higher intensity politician have sacrificed their government. However a substitute of this policy is give subsidy on exports and tariff on imports, from which similar results may obtain but it needs robust fiscal balances. On the other hand devaluation has wider effects, it may affect all sectors. Bhagwat and Onitsuka (1974) found that short effects of devaluation is relatively strong if there is reserve capacity in underlying sector. However, if devaluation is target then exports prices must be higher before devaluation to sustain export process so that industrialists keep on momentum of putting resources in the export sector. They also argued for noticing pre macroeconomic conditions and the possible effects of devaluation. They are of the view that nominal devaluation is fairly helpful in case of disequilibrium because it may promptly realign the real exchange rate.

3. Methodology

For estimation of influence of devaluation on trade balance in Saudi Arabia, we are caring for the major variables, GDP of importing and exporting countries as it has been taken care mostly in gravity literature and other than gravity literature as well. Further, we are exploiting the benefits of development of time series econometrics i.e. we are using positive and negative separate variables for exchange rate as this methodology is very recently suggested by Shin et al. (2014) in the non-linear ARDL framework. By caring these things, our model is of following shape:

$$\Delta BT_t = \alpha + \beta BT_{t-1} + \phi GDPW_{t-1} + \phi GDPS_{t-1} + \kappa^+ PRER_{t-1} + \kappa^- NRER_{t-1} + \sum_{i=1}^p l_i \Delta BT_{t-i} + \sum_{i=0}^q v_i \Delta GDPW_{t-1} + \sum_{i=0}^q g_i \Delta GDPS_{t-1} + \sum_{i=0}^r (\tau_i^+ \Delta PRER_{t-i} + \tau_i^- \Delta NRER_{t-i}) + \zeta_t$$

(1)

The equation is non-linear form of ARDL model by including positive and negative exchange rate variables (PRER & NRER). GDPW is for world GDP, GDPS id for Saudi Arabia's GDP, BT is trade balance define by log of ratio of exports to imports. Therefore, its increment will represent the improvement in BT and a fall will be symbol of worsening the BT. Further, this equation can be tested for cointegration at first. Then, long run influences can be captured and then short run influences can also be drawn. The reliability of our estimated equation further be tested by different diagnostic and stability tests. All data for the purpose of estimation is taken from SAMA for a period 1970-2015. The short term relationship can also be derived from the following equation:

$$\Delta BT_t = \sum_{i=1}^p \iota_i \Delta BT_{t-i} + \sum_{i=0}^q \nu_i \Delta GDPW_{t-1} + \sum_{i=0}^q \vartheta_i \Delta GDPS_{t-1} + \sum_{i=0}^r (\tau_i^+ \Delta PRER_{t-i} + \tau_i^- \Delta NRER_{t-i}) + \omega ECT_{t-1} + \zeta_t \quad (2)$$

Here, coefficient of ECT, ECT is lag of residual from equation (1), will direct us toward short relationship and the estimated parameters of (2) will be estimated for short run influences.

4. Data Analysis

Table 1 presents the all estimation from equation 1. This estimation is carried forward without testing integration level as ARDL is sufficiently robust even in the presence of mix integration. At first, we will focus on the reliability of our estimated model. The F-value is showing the presence of cointegration as it is beyond the upper value at 10%. The cointegration can be seconded by the evidence of negative and significant ECT's coefficient and it is also evidence for short run relationship. Further, F-value of diagnostic's tests are sufficiently high and their p-values are less than 0.1. These are indications for econometrically sufficiency of our estimated model and reliability of our estimates as well.

Table 1: Shin et al. Non-Linear ARDL

Variable	Co-Efficient	S.E.	t-score	p-score
Long Run				
GDPW	5.4157	3.1055	1.7438	0.0945
GDPS	-1.5649	1.7528	-0.8928	0.3812
PER	-3.4334	1.9554	-1.7559	0.0924
NER	0.4747	2.0823	0.2280	0.8216
Intercept	-53.7487	23.7268	-2.2653	0.0332

Short Run				
D(GDPW)	1.9399	1.3530	1.4338	0.1651
D(GDPW(-1))	-3.9148	1.1744	-3.3331	0.0029
D(GDPS)	-3.1648	0.6826	-4.6362	0.0001
D(GDPS(-1))	1.0890	0.6248	1.7428	0.0947
D(GDPS(-2))	2.0592	0.5479	3.7579	0.0010
D(PRER)	-3.5773	1.6434	-2.1767	0.0400
D(PRER(-1))	-2.0045	1.9307	-1.0382	0.3100
D(PRER(-2))	4.8687	1.8149	2.6826	0.0133
D(NRER)	0.8390	0.9969	0.8416	0.4087
D(NRER(-1))	-4.4092	1.1175	-3.9454	0.0006
D(NRER(-2))	5.1101	1.1283	4.5288	0.0002
D(NRER(-3))	-3.3309	0.8476	-3.9294	0.0007
ECT(-1)	-0.5456	0.1114	-4.8969	0.0001
F-Value (Bound Test)	3.2830 Critical Bounds: 10%(2.2-3.09), 5%(2.56-3.49), 1%(3.29-4.37)			
Diagnostics				
Heteroscedasticity Test	0.6221		0.8406	
Serial Correlation Test	1.0823		0.3569	
Normality Test	1.1255		0.5696	
Functional Form Test	2.5834		0.1170	

Table 1 shows that world GDP is helping in improving the TB as it has pleasant influence on export' demand and in turn it is improving the TB as export is numeral of TB in the long run. On the other hand, GDPS is insignificantly influence the TB though sign of its coefficient is correctly negative. It means improving economic growth in Saudi Arabia is not increasing imports significantly and resultantly it does not have unfavorable influence in TB. PRER has expected influence on TB and its influence is significant as well. It is showing that an appreciation of riyal in Saudi economy has worsening effects on TB by diverting its movement towards deficit. Further, NER is not showing significant influence on TB and it is showing that at least in the long run analysis, a depreciation is not helping in improving TB.

Table 1 is also showing the short run results. In short run, GDPW is not supporting TB even its lag is negatively influence the TB. GDPS is positively influencing the TB as per our expectations but its lags are positively influencing that is opposite of our expectations. It also means that a rising economic growth in Saudi Arabia is more helpful in raising supply of exports in the proceeding periods instead of putting pressure on imports in those years. PRER is has expected negative sign and its second lag is positive. This is augmented the inverted J-curve phenomena in our short run analysis

of appreciation. On the other hand, negative variable, NRER, is showing the S-curve phenomena instead of J-curve in case of Saudi Arabia.

Table 2: Parameters' Stability Tests

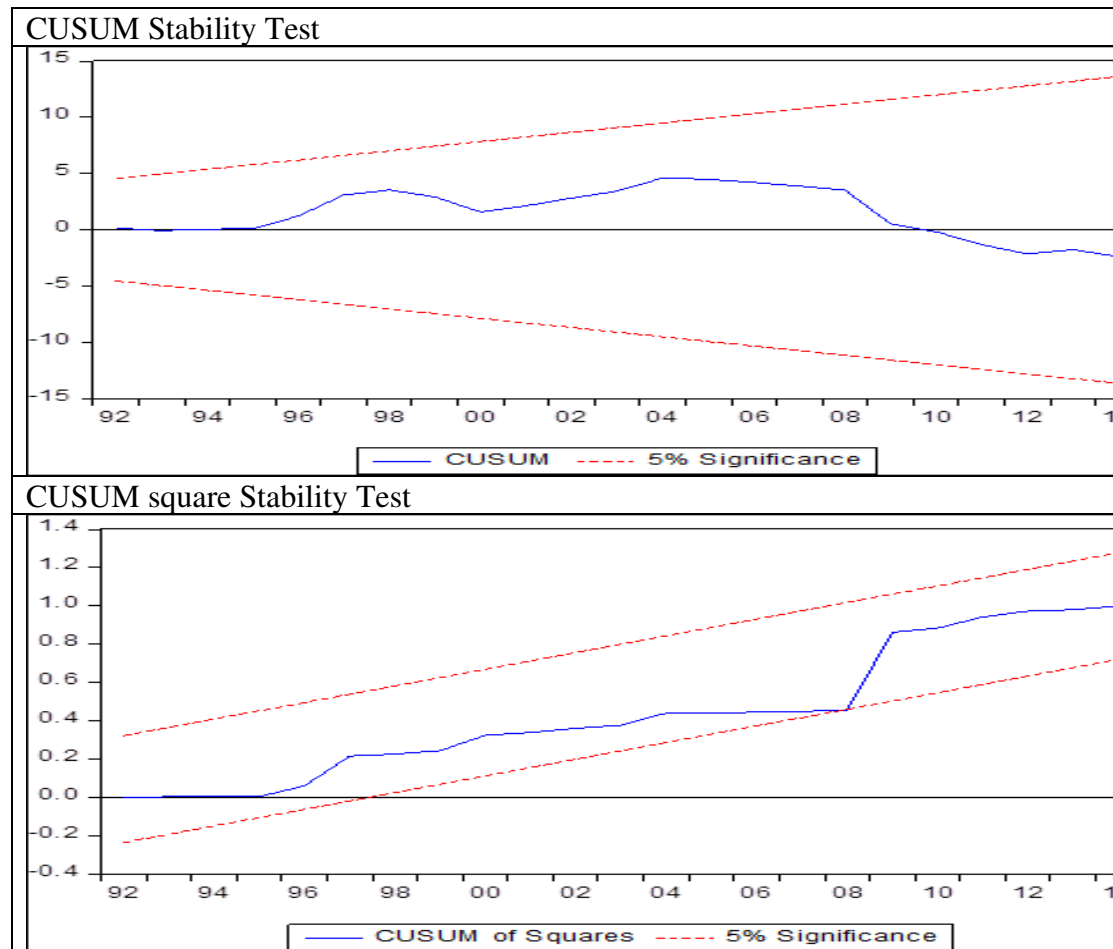


Table 2 is showing the tests of parameters' stability of our estimated non-linear ARDL. Both tests in table are presented in the graphs and proving the stability of our estimates. Therefore, our stated results in table 1 are reliable and consistent for interpretation, conclusion and generalization.

5. Conclusion

This paper investigate an important issue of influence of devaluation on trade balance in Saudi Arabia for a period 1970-2015 by using a recently developed technique of non-linear ARDL. We have found the evidence for cointegration in our model an short run relation has also been found. In long run, appreciation is found to negatively influence the trade balance but a depreciation is found ineffective. World income is found positive contributor in improving trade balance in Saudi Arabia but impact of Saudi income is found insignificant in long run. In the short run estimations, incomes of world and Saudi

Arabia are impacting in the different way with different lag effects. Further, the periodical impact of positive exchange rate is found inverted J-curve and influence of negative exchange rate is found S-curve. Therefore, we can conclude that appreciation of riyal has been found responsible for worsening the trade balance but a devaluation is only helpful in improving trade balance in short run but not in long run. Therefore, our finding are supporting the fixed pegged concept of exchange rate in Saudi Arabia and further suggest to maintain this exchange rate for longer time period.

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