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Exchange Rate Valuation and Indian Exports: An Empirical Investigation

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ABSTRACT

Exchange rate plays a very important role in a country's trade performance. In fact, the effects of undervalued currency on prices are similar to those of an export subsidy and import tax. A change in the exchange rates has two effects on the flow of trade – price effect and volume effect. Concerning the same, this paper is articulated to know the impact of undervalued currency of Indian export. The results shows that increasing undervaluation degree is lowering the Indian exports especially, capital goods and raw material exports- the sectors where India need to grow in world market. Therefore, this research article hereby draws the attention of international economic bodies towards the issue of currency valuation which causes the dramatically negative effects on export.. This paper thus suggest to policy practitioner that there should be framework or limits within which currencies could be depreciated so that price risk and uncertainty level would be minimized and developing nations could actively take participation in globalization process which is currently in danger zone because of de globalization waves.

Keywords : Degree of Undervaluation; Exports; Elasticity.

Introduction

Exchange rate plays a very important role in a country's trade performance. In fact, the effects of undervalued currency on prices are similar to those of an export subsidy and import tax. Standard theoretical models predict that currency changes pass through into consumer prices. A domestic depreciation reduces export prices in a foreign currency and increases import prices in the domestic currency, which leads to more exports and less imports. This is the expenditure switching effect of currency depreciation **(Obstfeld and Rogoff 2007).**Basing his analysis on the above reasoning, **Krugman (2015, 2016)** and **Kawadia, Neha(2017)** predicts that the recent exchange rate movements will have a strong effect on trade.

On the theoretical ground of International Economic, real devaluation of the domestic currency is a weapon to fight with trade balance. A change in the exchange rates has two effects on the flow of trade – price effect and volume effect. The price effect implies that currency depreciation will cause imports to be more expensive and exports to appear cheaper in the short run for the domestic buyers. The balance of trade may deteriorate in the short run due to the time required for the exports and imports to adjust to the new exchange rate. Once the economy setoff with new system, volume of trade begins to respond to the depreciation, so-called "volume effect" of currency devaluation will reverse the trade balance movement and eventually improve it. The domination of the volume effect over the price effect in the long run is

known as Marshall-Lerner Condition. (**Rustam Jamilov, 2011**). Although, this conceptually frameworks are not occurred barely through devaluation in pragmatic world effortlessly, rather depends upon the elasticity of export and import elasticity. This elasticity approach is also known as the "imperfect substitutes" model, is still widely and most commonly used in trade analysis.(**Derick Boyd & Caporale,2001).**

Pertaining the same issue in economic sense, **Hans Singer and RaúlPrebisch (1998)** during 1948–49,argues that the price of primarycommodities declines relative to the price of manufactured goods over the long term, which causes the terms of trade of primary-product-based economies to deteriorate. A common explanation for this supposed phenomenon is that manufactured goods have a greater income elasticity of demand than primary products. Therefore, as incomes rise, the demand for manufactured goods increases more rapidly than demand for primary products. In addition, primary products have a low price elasticity of demand, so a decline in their prices tends to reduce revenue rather than increase it therefore economies that time followed import substitution policies for developing the edge in technological production. Though, it is not effortless task for any economy to transform itself structurally in less competitive sector by mobilizing the resources from gainful to needful domain.

The smaller the country is in relation to other trading partner, the negligible is the foreign repercussion. India's overall trade openness ratio is significantly increased from 17 per cent to 55 per cent during liberalization period. India's leading trade partnership is with USA as its 16.5 per cent of total exports goes to USA while 7.6 per cent of total imports come from USA. Hence, it can be asserted that any distortion in the path of this trade process will have repercussion on Indian economy. Taking all things into considerations, this research work is articulated to know the income and price elasticity of India exports with rest of the World for assessing the Singer-Prebish Hypothesis in Indian context. The remainder of this paper is organized as follows. Section 2 presents the adopted methodology while section 3 presents some descriptive statistics and the econometric results. Section 4 concludes.

Review of Literature

On the same issue of currency devaluation, **Dr. B R Ambedakar(1923)** portrait more real and practical picture about the value of currency and its real impact on developing agrarian nation. He posited that trade no doubt is dependent on good money, but the growth of trade is not a conclusive proof that the money is good. It is possible to hold that if trade is good it may be *because* the currency is bad. Empirically he had shown that the trade of India between 1873 and 1893 flourished because it received a bounty. But the bounty was a mulcting of the Indian labourer, whose wages did not rise as fast as prices, so that the Indian prosperity of that period was founded not upon production, but upon depredation made possible by the inflation of currency. In same fashion, **M.A. Loto (2011)** by using Marshall Lerner Condition and ECM technique with reference to Nigerian economy and evidently found that M-L elasticity condition does not hold even though devaluation has an inflationary effect and increases import cost, he also suggested policy implication that if the nation involved is import dependent, the cost of production increase thereby the cost of servicing foreign debt increases.

In this connection **Taylor and von Arnim (2006)** using a simplified and structural model, clearly shows that Africa will not gain, on balance, from trade liberalisation and currency devaluation. Their exercise suggests that sub-Saharan Africa is likely to experience welfare losses, even assuming the absence of macroeconomic shocks. The region is likely to experience a worsening trade balance, debt problems are likely to increase, and any short-term gains in employment and GDP are could evaporate quickly under the pressure of such strained balances.**(K S Jomo, Rudiger Von Arnim 2008).**Hereby again supporting the view of Dr. Ambedkar that there is no doubt about money *"there cannot... be intrinsically a more*

significant thing than money, "which at best is only" a great wheel by means of which every individual in society has his subsistence, conveniences and amusements regularly distributed to him in their proper proportions." It is certain, that without the use of money this "distribution of subsistence, conveniences and amusements," far from being a matter of course.

Perceptibly, as being agrarian developing nation India needs export led growth and sufficiently large imports substitution but remember that more than two-thirds of the static gains to developing countries from trade accrue to Argentina, Brazil and India in the case of agriculture **(K S Jomo, Rudiger Von Arnim 2008),** especially in India more than 55 percent of population dependent on agriculture, whereas 70 percent of population lives in rural area.

Research Methodology

This particular study is completelybased on secondary data sources extracted from WITS_ http://wits.worldbank.org/WITS/WITS/Default-A.aspx?Page=Default**.** Useddatasets comprises GDP and classification of Exportsand Importsnamely **Raw Material; Intermediate Goods; Consumer Goods; Capital Goods.** The details description of the products under each group is available at WITS Reference Menu https://wits.worldbank.org/referencedata.html. Moreover, PPP Values are extracted from World Bank Data Group. By using these data necessitates parameters have been calculated the Degree of under valuation and Inflation differentials is computed by using following formulas:

$$\text{Degree of under valuation India} = \frac{USD_t – PPP_t \times 100}{PPP_t}$$

These all data series ranges from 2000 to 2016. For determining the trend, semi log regression function has been employed with taking 2009 as a shift period and interactive term of dummy and time.

$$\log Y = \beta_0 + \beta_1 D_{09} + \beta_2 Time + \beta_3 (D * T) + \mu_t$$

Natural logarithmic is applied on all selected variables for finding the elasticity signified by L prefix. Where Y is dependent variable, here all sorts of exports and imports have been taken as dependent variable in which Gr denotes gross; RM denotes Raw Material Goods; IG represents Intermediate Goods; CG signifies Consumer Goods and CT indicates Capital Goods while Ex is abbreviation of exports and Im of Imports.For assessing the impact of undervaluation over trade flows, double log Ordinary Least Square Regression Model is employed with detecting autocorrelation and heteroscedasticity.

$$\log Y = \beta_0 + \beta_1 \log(Degree\ of\ Undervaluation) + \beta_2 log(GDP)_i + \beta_3\ log(Inflation\ Differential)_{ij} + \mu_t$$

GDP is here reflecting the Income of the i^{th}country.As aforedocumented that depreciation is computed by using the formulae of percentage change hence the value is originally in per cent form and then regressed with log form so once per cent change after log would signify the change from 10 to 10.01 and 10.1 will be considered as 10 per cent change. After finding autocorrelation,Prais–Winsten andCochrane–Orcutt Transformation model is applied for removing the methodological fallacy. The model which was again found insignificant despite after transforming, the heteroscedasticity is checked, and then Newey-WestStandard Error model is employed.These all models are employed using Stata 11statistical software

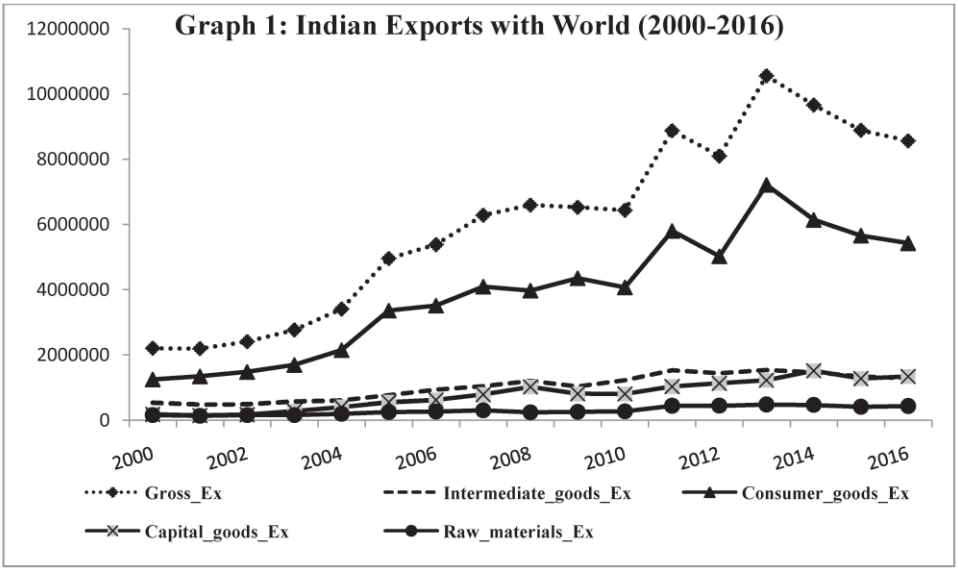
Indian Exports Trendwith rest of the World during 2000-16

Table 1 : Top Products India Exports to the rest of the World during 2000-16

Articles	Products	Average Value
Stone and Glass	Art of Stone; Glass Ware	275.81
Fuels	Mineral Fuels; Oil etc.	273.31
Textiles and Clothing	Silk; Cotton; Carpet; Ready Made	238.79
Chemicals	Pharma Products; Photographic Goods etc.	184.97
Metals	Iron and Steel; Copper; Nikel; Aluminium	146.88
Trade Value in 100000000 USD		
Author's Calculation		

Table 1 reports the India's cardinal five exports products and their average values during 2000-2016. As it can be seen that India's major exports basket comprises Stone and Glass; Fuels; Textile and Clothing; Chemical and pharmaceutical products and metals. Though the average values of art of stone and glass ware and fuels categories is pretty much same and stayed on first and second rank followed by textile and readymade garments.

Graphical illustration 1 presents the historigram of Indian total exports and its classification lasts from 2000 to 2016 while table 2 demonstrates the technical trend values of the same. By screening the graph and table, it is clear that total exports of India are growing with the pace of 11 per cent per annum; though, the exports during 2014 to 2016 fell down due to global sluggish demand. In India's total exports, consumer goods are comprised major share and growing up by 12 per cent per annum, while the proportion of intermediate goods and capital goods are more or less same. The share of raw material exports is very less which is also a good reflection that rather than exporting raw materials, economy transforming those goods into finished goods and then exports to outer world.



One more noteworthy point is that growing velocity of capital goods is found 23 per cent per annum and after global financial crisis of 2008-09 the mean level of its exports enhanced by 1.73 per cent significantly as shown in table 2 that value of intercept is 1.73 with positive sign. In technical analysis, It has also found that raw material goods exports are consistent and there is no significant change found during 200-16.

Table 2 : ANCOVA Regression Outputs

Independent Variables	Dependent Variable				
	L G_Ex	L RM_Ex	L IG_Ex	L CG_Ex	L CT_Ex
Dummy_2010	0.42	0.57	0.48	0.02	1.73*
Time (Trend)	0.11*	0.01	0.09*	0.12*	0.23*
Interaction Term (D*T)	-0.03	0.04	-0.03	0.00	(-0.18)*
Constant	15.86*	13.47*	14.87*	15.08*	12.86*
R-squared	0.96	0.79	0.95	0.96	0.97
Prob(F-statistic)	0	0	0	0	0
; **; * significant at 1 %, 5 %,10% level of significance respectively.*					
Author's Calculation					

Concerning the same,dense analysis is employed to know the impact of degree of undervaluation over exports. Table 3 displays the income and price elasticities obtained through OLS regression; in which all sorts of exports including gross exports are taken as dependent variable and regressed over set of independent variables includes degree of undervaluation; Indian GDP and World GDP. It can be evidently seen in table 3 that all the models are good fit as the power of determination is ranging from 96 per cent to 98 per cent and also free from the problems of autocorrelation and heteroscedasticity since the all calculated values for detecting autocorrelation and heteroscedasticity are lesser than critical chi square values at respective degrees of freedom confirming the acceptance of null hypothesis inferring that Models are homoscedastic and not having serial correlation.

The undervalued elasticity values of Indian exports are found negative denoting that increasing one per cent degree of undervaluation leads reduction in exports. However, the foreign income elasticity of Indian exports values are coming up positive showing that demand of Indian products increases with growing World income. The highly demanded Indian product across the world is Capital goods as increase in one per cent world income leads 10.5 per cent more demand of Indian capital exports. Moreover, the world income elasticity of intermediate goods is 3.2 per cent; 4.2 per cent of consumer goods and 5.7 per cent for raw material goods signifies that Indian raw materials are highly demanded throughout the world. At the same time, growing Indian GDP checks the raw material goods exports by 1 per cent. However, the world income elasticity of gross Indian exports is barely 3.8 per cent.

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Table 3: Regression Results

	Dependent Variable				
	L G Ex	**L RM Ex**	**L IG Ex**	**L CG Ex**	**L CT Ex**
L Undervaluation	(-5.60)*	(-6.5)*	(-4.9)*	(-5.4)*	(-6.33)*
L GDP_World	3.78*	5.7**	3.2**	4.15*	10.47*
L GDP_ India		(-.93)	0.006		(-2.38)**
C	(-77.3)*	(-111.7)***	(-63.3)***	(-90.5)*	(-221.5)*
R-squared	**0.98**	**0.96**	**0.98**	**0.97**	**0.96**
Prob(F-statistic)	0	0	0	0	0
Durbin-Watson stat	1.62	1.34	1.7	1.54	1.7
Breusch-Godfrey LM*	0.22	1	0.03	0.35	0.27
Df^	1	1	1	1	1
Durbin's alternative*	0.17	1.31	0.05	0.45	0.19
Df^	1	1	1	1	1
Breusch-Pegan#	3.1	2.44	1.61	4.25	0.31
Df^	1	1	1	1	1
White Test#	6.44	10.18	4.52	9.76	13.55
Df^	5	9	9	5	9
^degree of freedom for Chi-Square distribution					
*** H0 : No Serial Corelation**					
#H0 : Constant Variance/ Homoscedasticity					
; **; * significant at 1 %, 5 %,10% level of significance respectively.*					
Author's Calculation					

Referring to undervalued elasticity of Indian exports, it has been found that misaligned rupee against USD reduces the highly demanded Indian capital goods exports by 6.3 per cent significantly; secondly , it hurts raw material goods exports by 6.5 per cent. Thirdly, it hits India's leading exports product i.e. consumer goods exports by 5.5 per cent and lessen the Intermediate goods exports by around 5 per cent. All in all, increasing degree of undervaluation lowers the total exports by 5.6 per cent which is really a bothersome issue for developing nation like India. Notionally, devalued currency supports the exports and hinders the imports, while results of this research work contradict the theoretical expectation signifying that continuous currency volatility causes risk and uncertainty which hinders the exports.

Conclusion

From our ongoing analysis, it can be concluded that Indian exports are being increase with the pace of 11 per cent, while capital goods exports outperforms and increases with the pace of 23 per cent per annum.It

has also seen that Indian exports are highly elastic and vastly demanded across the world as the income elasticity of all sorts of Indian exports are found positive. Lastly, in regression analysis, it is found that increasing undervaluation degree is lowering the Indian exports especially, capital goods and raw material exports- the sectors where India need to grow in world market since Indian revealed comparative advantage is low in both the areas comparatively. Therefore, this research article hereby draws the attention of international economic bodies towards the issue of currency valuation which causes the dramatically negative effects on trade thereby overall economic growth of developing nations like India get worse. This paper thus suggest to policy practitioner that there should be framework or limits within which max to max and least to least currencies depreciates so that price risk and uncertainty level would be minimized which is being persistent due to lots of market fluctuations and developing nations could actively take participation in globalization process which is currently in danger zone because of de globalization waves.

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