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## IMPACT OF EXCHANGE RATE VOLATILITY OF TOP TRADABLE CURRENCIES ON THE PERFORMANCE OF EXPORT ORIENTED UNITS, SEZs AND TOTAL EXPORT OF INDIA

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### ABSTRACT

*In International business, export and import are like blood circulation to any nation's economy. From the beginning of the flexible or pegged exchange rate environment, a nation has to keep itself active at every time in its international business and check whether there is an optimal balance in the quantity of export and import. If the import exceeds export, which will result in the purchase of the foreign currency of the importing country for the payment and there will be demand for the foreign currency. If export increases then the situation arises where the exporting nation's currency will increase in its value. All these processes happen because of demand and supply of the currency for international payment in the international business. Hence, a careful policy must be set up to retain the export quantities and increase the value of the currency. In most of the fast developing nations, their currencies have kept depreciated, have to make proper export promotion policies. India is also one such nation whose currency has been depreciated period by period, hence policies in export promotion have kept upgrading period by period to avoid huge amount of depreciation. In this paper, an attempt has been made on the evaluation of impact of top tradable currencies on the export promotion units such as Export Oriented Units' and SEZs' performance and Total export.*

### KEYWORDS

EOU, SEZ, exchange rate volatility.

### INTRODUCTION

In international business, export is one of the main criteria for a country's evaluation of its worth in maintaining flow of international transaction. Every country has its own foreign policy followed by bilateral to multilateral relation with other countries for the international trade and business. Also, every country has its own currency of which the worth is determined by its own efficiency in sustaining in business activities. Large amount of import will lead to depreciation in the currency, whereas increase in the export will lead to appreciation in the currency value. To increase the export, every country has its own export policies and promotional schemes such as in India export promotion councils with special economic zones and export oriented units etc., and also governmental subsidies on selected types of export.

A number of institutions have been set up by the government of India to promote exports. The export and import functions are looked after by the Ministry of Commerce. The Government formulates the export-import policies and programmes that give direction to the exports. EXIM policies aim at export assistance such as export credit, cash assistance, import replenishment, licensing, free trade zones, development of ports, quality control and pre-shipment inspection and guidance to Indian entrepreneurs to set up ventures abroad.

After the economic reforms of 1991-92, liberalization of external trade, elimination of duties on imports of information technology products, relaxation of controls on both inward and outward investments and foreign exchange and the fiscal measures taken by the Government of India and the individual State Governments specifically for IT and ITES have been major contributory factors for the sector to flourish in India and for the country to be able to acquire a dominant position in offshore services in the world. The major fiscal incentives provided by the Government of India have been for the Export Oriented Units (EOU), Software Technology Parks (STP), and Special Economic Zones (SEZ).

The *Export Oriented Unit* Scheme (EOU) was launched in December 1980, eighteen years after the first *export processing zone (EPZ)* was formed in Kandla and twenty years before SEZs came into being. Over the years the scheme has undergone various changes and its scope also expanded substantially. The scheme provides duty free import/procurement of indigenous capital goods, raw materials etc. These units have to operate under custom bond and to achieve the level of value addition as specified in the Letter of Permission (LoP). The administrative control of the scheme is under the DoC.

The scheme was introduced with the objective of boosting exports by generating additional production capacity. It allows the establishment of business units anywhere in the country (outside the SEZ) with the obligation to achieve a specified Export Obligation. It was primarily designed for the promotion and growth of manufacture and export of value added products. In order to make these units cost efficient, facilitate their free access to foreign technology and encourage them to venture into foreign markets on a large scale, wide range of incentives have been introduced for the unit's operating under the scheme.

With a view for providing an internationally competitive environment for exports, the Government of India announced the SEZ Policy in April 2000. The objectives of the SEZ Policy include making available goods and services free of taxes and duties supported by integrated infrastructure for export production, expeditious and single-window approval mechanism and a package of incentives to attract foreign and domestic investments for promoting export-led growth.

Initially, SEZs in India functioned from 1 November 2000 to 9 February 2006 under the provisions of the Exim Policy/Foreign Trade Policy and fiscal incentives were made available through the provisions of relevant statutes. This system did not lend enough confidence to the investors to commit substantial investment for development of infrastructure and for the setting up of units for export of goods and services.

In order to provide a long-term and stable policy framework with minimum regulatory regime and to provide expeditious and single-window clearance mechanism in line with the international best business practices, a Central Act for Special Economic Zones was therefore found to be necessary. The *Special Economic Zones Act, 2005* (SEZ Act) was enacted by the Government in 2005. Subsequently, the *Special Economic Zones Rules, 2006* (SEZ Rules) were notified on 10 February 2006. Consequently, the SEZ Act came into operation w.e.f. 10 February 2006.

**LITERATURE REVIEW**

The literature pertaining to the export is very large. But the literature on SEZ and EOU was not large because of their work. Many works have been under taken considering the export as major criteria where exports are regarded major lifeline in the business. Hence, its impact with exchange rate volatility has been checked through an econometric analysis, resulting in the biased results, which support both the positive and negative.

The empirical studies that have found a negative relationship between exchange rate volatility and exports include Thursby and Thursby (1985), Kenen and Rodrik (1986), Koray and Lastrapes (1989), Kumar and Dhawan (1991), Pritchett (1991), Pozo (1992), Savvides (1992), Chowdhury (1993), Arize (1995), Dell' Ariccia (1998), Virgil (2000), Doganlar (2002), Esquivel and Felipe (2002) and Onafowora and Owoye (2007). On the other hand, Asseery and Peel (1991) and Todani and Munyama (2005) have reported a positive relationship between exchange rate volatility and exports. Whereas, Gotur (1985), Solakoglu (1998), De Vita and Abbott (2004), Hondroyannis et al. (2006), Rey (2006), and Boug and Andreas (2007) could not find any significant relationship between these two time series. The conclusion drawn from empirical literature is that earlier studies tended to find insignificant relationship between export and exchange rate volatility. Cases where significant relations were found, it was both negative and positive.

Hooper and Kohlhagen (1978) examined the effects of exchange rate uncertainty on the volume of trade among developed countries. They did not find any significant impact of exchange rate volatility on the volume of trade. Cushman (1983) found negative relation between exchange rate volatility and volume of trade in the developed countries. Akhtar and Hilton (1984) examined the bilateral trade between West Germany and US and found that the exchange rate volatility has a significant negative impact on the exports and imports of two countries. Bailey et al. (1986) investigated the effect of exchange rate volatility on export of leading OECD countries (Canada, France, Germany, Italy, Japan, UK and US). The study revealed that exchange rate volatility has positive effect both in long run and short run. The studies by Virmani (1991), Joshi and Little (1994) and Srinivasan (1998) observed a negative and significant relationship between the real exchange rate and merchandise aggregate exports in India. Chowdhury (1993) investigated the impact of exchange rate volatility on the trade flows of the G-7 countries in context of a multivariate error-correction model. They found that the exchange rate volatility has a significant negative impact on the volume of exports in each of the G-7 countries. Besides, Frankel and Wei (1993) observed negative effects of volatility on trade flows with selected Asian countries.

Qian and Virangis (1994) examined the impact of exchange rate volatility on trade in six countries using ARCH model. The empirical results showed a negative link between exchange rate volatility and export volumes for Australia, Canada, and Japan and positive for United Kingdom, Sweden, and Netherlands. Fountas and Bredin (1998) showed that exchange rate volatility had short-run negative impact on real exports of Ireland to United Kingdom. Arize et al. (2000) investigated real exchange rate volatility on the exports of 13 less developed countries using Johansen's multivariate procedure and error correction model. Their study revealed a significant negative impact of volatility on export flows. Aristotelous (2001) also reported an insignificant relationship between exchange rate volatility on the UK-US exports. Using error correction model and cointegration approach, Vergil (2002) investigated the impact of real exchange rate volatility on export flows of Turkey to the US and three major trading partners in the European Union. The study showed that real exchange rate volatility was found to have negative relationship with exports both in long run and short run. Wang and Barrett (2002) found no significant relationship between expected exchange rate volatility and trade volumes in their investigation of Taiwan's exports to the United States. Besides, Baak et al. (2002) investigated the impact of exchange rate volatility on exports of four East Asian countries (Hong Kong, South Korea, Singapore and Thailand). Their results indicated that exchange rate volatility has negative impacts on exports in both the short run and long run. Srinivasan and Wallack (2003) and Veeramani (2008) found a negative and significant relationship between the real exchange rate and merchandise aggregate exports in India.

Akbostanci (2004) examined the short-run and long-run behaviors of the trade balance and real exchange rate using Turkish data. The study found that a real depreciation of the Turkish lira improved the Turkish trade balance in the long-run. Calderon (2004) investigated the impact of exchange rate variability on trade openness in a sample containing 79 countries and concluded that impact of volatility of real exchange rates was found to be meager. Using the ARDL bounds testing method to cointegration, De Vitta and Abbott (2004) observed that short-term volatility in exchange rate does not affect UK exports to the EU. However, there are significant and negative effects of volatility on UK exports to EU in the long-run. Mustafa and Nishat (2004) employed error correction model and cointegration approach to investigate the effect of exchange rate volatility on export growth between Pakistan and other leading trade partners such as SAARC, ASEAN, European and Asia Pacific regions. They found that exchange rate volatility had negative impact on export flows of Pakistan with United Kingdom, United States, Australia, Bangladesh and Singapore. While in the case of India and Pakistan, there exists only long-run impact and no short run relationship. In the case of New Zealand and Malaysia, no relationship was found. Kikuchi (2004) examined the impact of exchange rate volatility on exports in five East Asian Countries (Indonesia, Philippines, Singapore, South Korea and Thailand). The empirical results revealed negative relationship in Indonesia and positive relationship in Philippines, Singapore and Thailand. Besides, there is no relationship found in the case of Singapore and Thailand. Cameron et al (2005) further provided evidence for negative effects of exchange rate variability on Uganda's coffee exports.

Exchange rate volatility is a crucial element that needs to be considered for developing countries that depend extensively on trade, for example the case of India. It has traditionally been argued that exchange rate volatility may hinder the flow of international trade centred on the notion that exchange rate volatility represents uncertainty and will impose costs on risk-averse commodity traders. Exchange rate volatility is often treated as a risk and an increase in volatility would raise cost for risk-averse traders and depress trade (Ethier, 1973).

Todani and Munyama (2005) examined the relationship between exports and exchange rate volatility in South Africa. The study revealed a positive relationship between South African exports and exchange rate volatility in the both long-run and short-run. Rey (2006) investigated the impacts of nominal and real effective exchange rate volatility on exports of 6 Middle Eastern and North Africa (MENA) Countries to 15 member countries of the European countries (EU). The empirical results showed that MENA exports and exchange rate volatility are positively related in the case of Algeria, Egypt, Tunisia and Turkey in the long-run but negatively related with Israel and Morocco. Further, the MENA exports and exchange rate volatility is positively related in the short-run for Morocco, Algeria, Tunisia and Turkey but negatively related for Egypt and Israel. Fang et al (2006) investigated the effect of exchange rate movement on exports of Eight Asian countries. The study revealed that real exchange rate depreciation has significant impact on exports for all countries except Singapore whereas exchange rate risk proves positive for Malaysia and Philippines but negative for Indonesia, Japan, Singapore, Taiwan and no effect for Korea and Thailand. Mocero and Winograd (2007) analyzed the link between real exchange volatility and exports in the case of Argentina. The study showed that decrease in real exchange volatility has a positive impact on exports to Brazil but a negative impact for the rest of world. Aliyu (2008) examined the impact of exchange rate volatility on non-oil export trade in Nigeria. The study observed that exchange rate volatility was found to have an adverse effect on non-oil exports in the long-run while in the short run, there is positive relationship. Chit, Rizov and Willenbockel (2008) examined the impact of real exchange rate volatility on real export of five emerging East Asian countries among themselves. The empirical results showed that real exchange rate volatility has negative impact on exports among emerging East Asian countries. Musonda (2008) showed negative short-run and long-run impacts of exchange rate volatility on non-traditional exports performance in Zambia. Sekantsi (2008) employed Autoregressive Distributed Lag (ARDL) approach and provided evidence that real exchange rate volatility exerts a significant and negative impact on South Africa's exports to the United States.

From the review of empirical literature on exports and exchange rate volatility, it is clear that the majority of the studies mainly focused on emerging economies like India. However, the studies pertaining to Indian context reveal mixed results. Hence, the effect of exchange rate variability on exports is still a debatable issue. But at the same instance studies have also been conducted on the impact of exchange rate volatility on the policy making. These criteria also found the biased reports. It has been found that the policies of the government have never got impacted from the exchange rate volatility. Satyandra(2001), Kernal (1997), Henson (1989), Preg and kertel (2005), Sarback (2005), Mitun(2009), Victor and christan (2008), satyananda (2005) etc have extensively worked on the developing economy and found that the results of exchange rate volatility on the policy making had never a positive which indicated that exchange rate are not impacting the policy. But at the same time the literatures have been found that there, exchange rates not only influence the export but also influence the policy making and its sub organisations which are established for the promotion of export. Peterbag (1998), Anand (2003), Seemer kaur (2006), Biraj and Verma (2003), Denis (2003) and many more working on the impact of external shocks on policy formulation has clearly indicated that there is an impact of exchange rate volatility on the export policies and also export promotion councils.

**OBJECTIVES**

1. To evaluate the impact of exchange rate volatility on Export Oriented Units
2. To evaluate the impact of Exchange rate volatility on SEZs
3. To Evaluate the impact of Exchange rate volatility on Total Export

**HYPOTHESIS**

H0: there is no impact of USD/IND on EOUs, SEZs

H1: there is impact of USD/IND on EOUs, SEZs

H0: there is no impact of USD/IND on total export

H2: there is impact of USD/IND on total export

H0: change in the value of pound, euro, yen and Franc will impact on EOUs and SEZs

H3: change in the value of pound, euro, yen and Franc will not impact on EOUs and SEZs

H0: change in the value of pound, euro, yen and Franc will impact on Total export

H4: change in the value of pound, euro, yen and Franc will not impact on Total export

**METHODOLOGY**

The study has been conducted on top tradable currencies of the world. These top tradable currencies have been considered from the BIS - Bank of International Settlement which is published for triennial (once in three years). The study is both qualitative and quantitative in nature. Top currencies taken for the study are as follows.

1. USD
2. British Pound
3. European EURO
4. Japanese yen
5. Swiss franc

To estimate the impact of top tradable currencies, an Econometric technique has been applied. Since the study is on time series data, analysis a non-parametric test has been conducted. The data analysis has been done through applying the Unit root test to check the stationarity, followed by Johansen cointegration test to check the long run cointegration and GARCH Test to check the direct impact. The Fifteen year data has been considered for the study which is from 2000-01 to 2015-16. Eviews software was used for the analysis. EOUs - Export oriented Units, SEZs - Special Economic Zones and Total Export of India considered as dependent variables and all the top tradable currencies viz. US dollar, Briton Pound, European EURO, Japanese Yen and Swiss Franc are considered as independent variables.

**Unit Root Test (Stationarity Test)**

Empirical work based on time series data assumes that the underlying time series is stationary. Broadly speaking a data series is said to be stationary if its mean and variance are constant (non-changing) over time and the value of covariance between two time periods depends only on the distance or lag between the two time periods and not on the actual time at which the covariance is computed [Gujrati (2003)]. A unit root test has been applied to check whether a series is stationary or not. Stationarity condition has been tested using Augmented Dickey Fuller (ADF) [Dickey and Fuller (1979, 1981), Gujarati (2003), Enders (1995)].

**Augmented Dickey-Fuller (ADF) Test**

Augmented Dickey-Fuller (ADF) test has been carried out which is the modified version of Dickey-Fuller (DF) test. ADF makes a parametric correction in the original DF test for higher-order correlation by assuming that the series follows an AR (p) process. The ADF approach controls for higher-order correlation by adding lagged difference terms of the dependent variable to the right-hand side of the regression.

**Generalized Autoregressive Conditional Heteroscedastic (GARCH) model**

The generalized autoregressive conditional heteroscedastic (GARCH) model is used in this paper to investigate the volatility impact on the dependent variables. The GARCH model was introduced by Bollerslev (1986) as a generalized version of Engle's (1982) Auto Regressive Conditional Heteroscedasticity (ARCH). The GARCH (p,q) model suggests the conditional variance of returns is a linear function of lagged conditional variance terms and past squared error terms. The standard GARCH (p,q) model specification is as follows:

$$y_t = x_t\theta + \varepsilon_t \quad \varepsilon_t \sim N(0; \sigma_t^2)$$

$$\sigma_t^2 = \omega + \sum_{i=1}^p \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^q \beta_j \sigma_{t-j}^2$$

Where  $\omega$  is constant,  $\varepsilon_{t-i}^2$  is an ARCH term and  $\sigma_{t-j}^2$  is a GARCH term. This model is widely used especially in financial time series analysis.

**FINDING AND ANALYSIS**

To analyse the impact of Indian and top tradable currencies on the SEZs, EOUs and Export of India a *Unit Root Test* has been conducted followed by *Johansen Cointegration Test* to check long run cointegration and when the data is fit enough, to check the impact, the GARCH model/ test is applied.

**RESULTS OF UNIT ROOT TEST**

In time series analysis, stationarity of the series is examined by unit root tests. Most commonly used tests in literature to ascertain the stationarity level of series are ADF test developed by Dickey and Fuller in (1979) and ADF-GLS unit root test developed by Elliott, Rothenberg and Stock in (1996) which is an improvement of the original ADF test. These two tests were used in this study for determining the stationarity level of series. A unit root test has been conducted by taking the entire variables like EOUs, SEZs, total export from India, Indian exchange rate volatility and exchange rate volatility of top tradable currencies (Table 1). It has been found from Table 1 that the variables are stationary at the constant but not at first difference and hence it can be interpreted as I (0).

**RESULTS OF JOHNSON COINTEGRATION TEST**

Johansen cointegration test has been applied to check the long run cointegration among the variables. table 2, table 3 and table 4 exhibit the result of long run cointegration of exchange rate volatility of India and exchange rate volatility of top tradable currencies over the export oriented units, special economic zone and total export of India.

- From Table 2, it has been shown that British pound and Japanese yen show long run cointegration over export oriented units and rest of the variables such as Exchange rate volatility of India and Exchange rate volatility of EURO and Swiss Franc do not exhibit long run cointegration
- From the Table 3, it has been found that only Exchange rate volatility of Indian rupee exhibit long run relation with Special Economic Zones. Rest of the variables such as British pound, Chinese yen, European Euro and Swiss Franc do not Exhibit the long run relation.
- From the Table 4, it has been found that only yen shows the long run cointegration with the total export of India and rest such as exchange rate volatility of Indian rupee, euro, British pound, and Swiss franc do not exhibit the long run cointegration.

**RESULTS OF THE GARCH TEST**

From the Johansen cointegration test it has been found mixed results of cointegration hence a separate GARCH test has been conducted on each variable. The results obtained are shown in table 5. According to the results shown in table 5

**Impact of Top tradable currencies on EOUs:** From the GARCH test analysis all the variables shown are above 5% hence EOUs- Export Oriented Units have no impact from Top tradable currencies, hence  $H_0$  is accepted.

**Impact of Top Tradable Currencies on SEZs:** From the GARCH test analysis all the variables shown are above 5% hence SEZs- Special Economic Zones have no impact from top tradable currencies, Hence  $H_0$  is accepted.

**Impact of Top tradable Currencies on total export of India:** From the GARCH test analysis all the variables shown are above 5% hence total export of India has no impact from the top tradable currencies.

**CONCLUSION**

In many developing countries where their worth of the currencies are not better than the developed countries and often they suffer in the economic shocks. Any fluctuation of the exchange rate volatility of native as well as foreign currencies will adversely affects other macroeconomic variables, which again influence the internal business environment and policy making. But there are many empirical results which clearly indicate that the fluctuation in the exchange rate volatility will not be going to influence the export or any policy making or on export oriented units, hence upholding the economic theories on the exchange rate and export saying that exports increase when currency value decreases. In this research work, the results are clearly indicating the negative impact of exchange rate volatility of top tradable currencies in export and export oriented units and SEZs. A GARCH Test has been conducted to analyse the impact which has shown more than 5% indicating that exchange rate volatility of top tradable currencies have negative impact on export oriented units, SEZs and total export of India

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APPENDIX

**TABLE 1: UNIT ROOT TEST OF THE SELECT VARIABLES**

			Constant			First Difference			Result
			Level	level and intercept	none	Level	level and intercept	none	
USD/IND	<b>Augmented Dickey-Fuller test</b>		-2.69382	-2.42017	-1.71672	-3.26665	-4.77223	-3.18523	variables are not
	<b>Test critical values:</b>	1% level	-4.00443	-5.124875	-2.74061	-4.05791	-5.12488	-2.75499	stationary at
		5% level	-3.0989	-3.933364	-1.96843	-3.11991	-3.93336	-1.97098	constant
		10% level	-2.69044	-3.42003	-1.60439	-2.7011	-3.42003	-1.60369	
<b>Probability</b>		0.0994	0.352	0.0812	0.039	0.0625	0.004	I(0)	
USD/GBR	<b>Augmented Dickey-Fuller test</b>		-1.35771	-0.634808	-0.25503	-2.76684	-4.00293	-2.88563	variables are not
	<b>Test critical values:</b>	1% level	-4.00443	-4.80008	-2.74061	-4.05791	-4.88643	-2.75499	stationary at
		5% level	-3.0989	-3.791172	-1.96843	-3.11991	-3.82898	-1.97098	constant
		10% level	-2.69044	-3.342253	-1.60439	-2.7011	-3.36298	-1.60369	
<b>Probability</b>		0.5717	0.9575	0.576	0.0899	0.1679	0.0076	I(0)	
USD/EURO	<b>Augmented Dickey-Fuller test</b>		-1.53904	-2.539166	-0.13499	-3.87762	-4.34548	-3.98669	variables are not
	<b>Test critical values:</b>	1% level	-4.00443	-4.80008	-2.74061	-4.05791	-4.99228	-2.75499	stationary at
		5% level	-3.0989	-3.791172	-1.96843	-3.11991	-3.8753	-1.97098	constant
		10% level	-2.69044	-3.342253	-1.60439	-2.7011	-3.38833	-1.60369	
<b>Probability</b>		0.4854	0.3077	0.6194	0.0136	0.0254	0.0008	I(0)	
USD/JYP	<b>Augmented Dickey-Fuller test</b>		-2.3617	-3.82	0.229229	-2.36427	-2.06596	-2.46701	variables are not
	<b>Test critical values:</b>	1% level	-4.05791	-4.886426	-2.77193	-4.12199	-4.99228	-2.77193	stationary at
		5% level	-3.11991	-3.828975	-1.97403	-3.14492	-3.8753	-1.97403	constant
		10% level	-2.7011	-3.362984	-1.60292	-2.71375	-3.38833	-1.60292	
<b>Probability</b>		0.1695	0.0507	0.7354	0.17	0.5114	0.0187	I(0)	
USD/CHF	<b>Augmented Dickey-Fuller test</b>		0.191122	-2.990029	1.807068	-3.38686	-3.58	-3.0317	variables are not
	<b>Test critical values:</b>	1% level	-4.00443	-4.886426	-2.74061	-4.12199	-4.99228	-2.75499	stationary at
		5% level	-3.0989	-3.828975	-1.96843	-3.14492	-3.8753	-1.97098	constant
		10% level	-2.69044	-3.362984	-1.60439	-2.71375	-3.38833	-1.60369	
<b>Probability</b>		0.9611	0.1709	0.9765	0.0337	0.0766	0.0056	I(0)	
EOU	<b>Augmented Dickey-Fuller test</b>		-1.46809	-2.396932	-1.08365	-3.28101	-3.29029	-3.37956	variables are not
	<b>Test critical values:</b>	1% level	-4.00443	-4.886426	-2.74061	-4.12199	-4.99228	-2.77193	stationary at
		5% level	-3.0989	-3.828975	-1.96843	-3.14492	-3.8753	-1.97403	constant
		10% level	-2.69044	-3.362984	-1.60439	-2.71375	-3.38833	-1.60292	
<b>Probability</b>		0.5194	0.3637	0.2382	0.04	0.1152	0.0029	I(0)	
SEZ	<b>Augmented Dickey-Fuller test</b>		-2.41748	-3.460641	-2.43119	-1.97238	-1.76634	-2.31758	variables are not
	<b>Test critical values:</b>	1% level	-4.20006	-5.124875	-2.74061	-4.29707	-5.29538	-2.81674	stationary at
		5% level	-3.17535	-3.933364	-3.96843	-1.2127	-1.00816	-1.98234	constant
		10% level	-2.72899	-3.42003	-1.60439	-2.74768	-3.46079	-1.60114	
<b>Probability</b>		0.1245	0.0947	0.0193	0.0019	0.0068	0.0063	I(0)	
SEZ and EOU	<b>Augmented Dickey-Fuller test</b>		-0.59474	-1.381016	-2.67361	-2.74254	-2.68902	-1.87245	variables are not
	<b>Test critical values:</b>	1% level	-4.00443	-4.80008	-2.74061	-4.05791	-4.88643	-2.75499	stationary at
		5% level	-3.0989	-3.791172	-1.96843	-1.11991	-1.82898	-1.97098	constant
		10% level	-2.69044	-3.342253	-1.60439	-2.7011	-3.36298	-1.60369	
<b>Probability</b>		0.8424	0.8197	0.0115	0.0035	0.0003	0.0005	I(0)	
Total Export	<b>Augmented Dickey-Fuller test</b>		-1.60837	-0.422008	-4.83798	-2.76956	-6.06264	-0.75166	variables are not
	<b>Test critical values:</b>	1% level	-4.00443	-4.80008	-2.74061	-4.05791	-5.29538	-2.77193	stationary at
		5% level	-3.0989	-3.791172	-1.96843	-3.11991	-4.00816	-1.97403	constant
		10% level	-2.69044	-3.342253	-1.60439	-2.7011	-3.46079	-1.60292	
<b>Probability</b>		0.4525	0.9738	0.0001	0.0895	0.0043	0.3695	I(0)	

**Table 2: Johansen cointegration test on Export Oriented Units**

variables	Hypothesis	Eigenvalue	Unrestricted Cointegration Rank Test (Trace)			Unrestricted Cointegration Rank Test (Maximum Eigenvalue)			result
			Trace	0.05		Max-Eigen	0.05		
				Prob.	Prob.		Prob.	Prob.	
USD/IND	None	0.438873	10.77499	15.49471	0.2257	7.511504	14.2646	0.4305	no long run cointegration
	At most 1	0.222007	3.26349	3.841466	0.0708	3.26349	3.841466	0.0708	
USD/GBR	None	0.67007	16.77561	15.49471	0.0319	14.41539	14.2646	0.0473	there is long run cointegration
	At most 1	0.166028	2.360225	3.841466	0.1245	2.360225	3.841466	0.1245	
USD/EURO	None	0.603145	13.37269	15.49471	0.1018	12.01438	14.2646	0.1101	no long run cointegration
	At most 1	0.099212	1.358312	3.841466	0.2438	1.358312	3.841466	0.2438	
USD/YEN	None	0.633022	13.98124	15.49471	0.0835	13.03189	14.2646	0.0776	there is long run cointegration
	At most 1	0.070424	0.949347	3.841466	0.3299	0.949347	3.841466	0.3299	
USD/CHF	None	0.455265	7.949885	15.49471	0.4708	7.896932	14.2646	0.3892	no long run cointegration
	At most 1	0.004065	0.052953	3.841466	0.818	0.052953	3.841466	0.818	

**Table 3: Johanson cointegration test on Special Economic Zone**

variables	Hypothesis	Eigenvalue	Unrestricted Cointegration Rank Test (Trace)			Unrestricted Cointegration Rank Test (Maximum Eigenvalue)			result
			Trace	0.05	Prob.	Max-Eigen	0.05	Prob.	
			USD/IND	None	0.665632	23.69594	15.49471	0.0023	
	At most 1	0.516765	9.45428	3.841466	0.0021	9.45428	3.841466	0.0021	
USD/GBR	None	0.2822	4.73649	15.49471	0.8361	4.310338	14.2646	0.8252	no long run cointegration
	At most 1	0.032249	0.426152	3.841466	0.5139	0.426152	3.841466	0.5139	
USD/EURO	None	0.510097	15.13538	15.49471	0.0566	9.276123	14.2646	0.2639	no long run cointegration
	At most 1	0.362825	5.859252	3.841466	0.0155	5.859252	3.841466	0.0155	
USD/YEN	None	0.710623	21.8029	15.49471	0.0049	16.12032	14.2646	0.0252	no long run cointegration
	At most 1	0.354107	5.682576	3.841466	0.0171	5.682576	3.841466	0.0171	
USD/CHF	None	0.408984	9.811467	15.49471	0.2955	6.83685	14.2646	0.5086	no long run cointegration
	At most 1	0.204526	2.974617	3.841466	0.0846	2.974617	3.841466	0.0846	

**Table 4: Johanson cointegration test on total Export**

variables	Hypothesis	Eigenvalue	Unrestricted Cointegration Rank Test (Trace)			Unrestricted Cointegration Rank Test (Maximum Eigenvalue)			result
			Trace	0.05	Prob.	Max-Eigen	0.05	Prob.	
			USD/IND	None	0.526825	16.15767	15.49471	0.0397	
	At most 1	0.39019	6.429895	3.841466	0.0112	6.429895	3.841466	0.0112	
USD/GBR	None	0.239092	5.875248	15.49471	0.7102	3.552161	14.2646	0.9033	no long run cointegration
	At most 1	0.163642	2.323087	3.841466	0.1275	2.323087	3.841466	0.1275	
USD/EURO	None	0.493298	14.11505	15.49471	0.0798	8.837813	14.2646	0.2999	no long run cointegration
	At most 1	0.333651	5.277242	3.841466	0.0216	5.277242	3.841466	0.0216	
USD/YEN	None	0.843524	28.69916	15.49471	0.0003	24.11308	14.2646	0.001	there is long run cointegration
	At most 1	0.297265	4.586082	3.841466	0.0322	4.586082	3.841466	0.0322	
USD/CHF	None	0.566813	17.25218	15.49471	0.0269	10.87561	14.2646	0.1605	no long run cointegration
	At most 1	0.387683	6.376573	3.841466	0.0116	6.376573	3.841466	0.0116	

**Table 5 - GARCH test Results**

	GARCH Test results	Checking for Serial correlation, Arch Effect and Residuals normally distributed			
		Checking for Serial Correlation	ARCH Effect	Residuals of normal distribution	
				Jarque Bera	P value is
Impact of USD/IND on EOU	92.90%	All p-Value is above 5%	0.9688	7.093942	0.028812
Impact of USD/GBR on EOU	99.62%	All p-Value is above 5%	0.9098	4.009856	0.134673
Impact of USD/EURO on EOU	52.71%	All p-Value is above 5%	0.8096	1.531638	0.464953
Impact of USD/YEN on EOU	97.00%	All p-Value is above 5%	0.7446	5.360037	0.068562
Impact of USD/CHF on EOU	82.83%	All p-Value is above 5%	0.9456	24.49512	0.000003
Impact of USD/IND on SEZ	75.05%	All p-Value is above 5%	0.6653	1.258826	0.532904
Impact of USD/GBR on SEZ	30.57%	All p-Value is above 5%	0.0394	1.664169	0.435141
Impact of USD/EURO on SEZ	54.05%	All p-Value is above 5%	0.2702	1.384333	0.500516
Impact of USD/YEN on SEZ	16.33%	All p-Value is above 5%	0.2485	0.796717	0.671421
Impact of USD/CHF on SEZ	40.63%	All p-Value is above 5%	0.8515	1.820576	0.402408
Impact of USD/IND on EXPORT	11.14%	All p-Value is above 5%	0.4142	1.230914	0.540126
Impact of USD/GBR on EXPORT	53.30%	All p-Value is above 5%	0.3837	1.563903	0.457506
Impact of USD/EURO on EXPORT	55.53%	All p-Value is above 5%	0.4566	1.5793	0.454004
Impact of USD/YEN on EXPORT	58.62%	All p-Value is above 5%	0.3633	1.166715	0.558022
Impact of USD/CHF on EXPORT	55.05%	All p-Value is above 5%	0.1483	0.785524	0.675189

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