Overseas Direct Investment- A study on Guarantee to the WOS and its Association with the Indian Macroeconomic Factors

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This research has been undertaken to analyze the Indian macroeconomic factors that have to be scrutinized before investing in an overseas establishment in the form of guarantee. The Reserve Bank of India has been publishing the data on Overseas Direct Investments from India in the form of Joint venture(JV)and Wholly Owned Subsidiary (WOS) since July 2007. The investments from India to the WOS are made in the form of equity, loan and guarantee. This study considers the guarantee investments only. The descriptive statistics has been employed to analyze the performance of the guarantee ODI. The Granger Causality Test and Johansen Cointegration test have been employed to estimate the short run and long run association between guarantee ODI and the Indian macroeconomic factors. The results of the study have shown that the investments in the form of the guarantee have a short run association with trade openness and inward FDI respectively. There is no long run association between guarantee and the macro economic factors of India.

Introduction

Globalization is multidimensional and it involves the movement of goods, services, human capital and technical knowhow across national borders. Individual economies across the globe strived to establish economic and financial integration through trading activities. In the bygone period where exports were the primary mode of trading among the economies, the concept of internationalisation of companies paved way for the movement of capital across borders. The history of foreign direct investment in India dates back to the pre liberalisation period where India ventured out to make the economy a self reliant one. During this period heavy restrictions were imposed on all kinds of cross border activities. A centralised system was implemented where the establishment of a firm, nature of activity, capital to be invested, sources of capital and selling and distribution activities relied completely on the decision taken by the Indian Government. The country lacked financial liberalisation which led to the Balance of Payment crisis in 1991. As per the statistics on foreign direct investment published by the United Nations Conference on Trade and Development (UNCTAD) the FDI inflow as a percentage of GDP varied between (-)0.03 per cent in 1977 to 0.08 in 1989. On the other hand the FDI outflows as a percentage of GDP were almost nil during the pre liberalisation period because the quantum of outflows were negligible. To overcome this critical situation, the Finance Ministry of India initiated the Economic Liberalization of 1991 which paved way to foreign participation in Indian markets and vice versa.

India took its' first major leap towards Economic Liberalisation through the annulment of the industrial licensing policy which was the major obstacle for the growth of the Indian economy. Subsequently the Foreign Investment Promotion Board (FIPB) was established to channelize the process of FDI inflow by fixation of certain approval standards. These standards were reconstituted and The Department for Promotion of Industry and Internal Trade (DPITT) was formed.

After the Economic Liberalisation of 1991, India not only acted as a favourable destination for investment but also attempted to enter the foreign markets by acting as the home country of investment. Within a decade, the FDI inflows as a percentage of GDP in the post liberalisation period increased from 0.03 per cent in 1991 to 1.12 per cent in 2001. Several fluctuations can be observed in the data where the highest percentage of 3.72 was recorded in the year 2008 after which it gradually fell to 1.65 per cent as on 2019. The FDI outflows as a percentage of GDP which was almost nil during 1991 increased within a decade to 0.28 per cent. The trend in FDI outflows as a percentage of GDP is similar to that of the FDI inflows where it reached a peak of 1.67 per cent in the year 2008 and gradually dropped to 0.40 in the year 2019. The global economic crisis that began in late 2007 seems to have impacted the FDI outflows from India.

The surge in FDI flows could also be attributed to the abolition of FIPB by the Government to support the Make in India initiative and ease the flow of capital to sectors that required prior approval from the Government (Economic Times, 2017). Over the years several initiatives have been taken to foster the growth of FDI inflows in the country. "Make in India" is one such initiative that has been introduced to improve the processes and government policies that streamline FDI inflows. However, amidst policies that have been introduced to enhance FDI inflows, the significance given to FDI outflows from India has been minimal. The Ministry of Commerce through several amendments has worked towards improving Indian investments abroad. There is however a certain oscillation and doubt on the part of the Indian party in investing abroad. The uncertain global economic changes and lack of international experience could be the reason for hesitation in investing abroad. In this context, it is important to analyze the factors that need to be considered at both the home country and host country level that would enable an increase in such investments from India. This study also aims at throwing light on the importance of novel policies and practices that would assist in magnifying the overseas direct investment from India.

Review of Literature

Pfaffermayr (**1994**) in his paper on "Foreign direct investment and exports: a time series approach" has investigated the relationship between FDI and exports of Austrian firms. The variables, such as, FDI and exports have been used in the study. The data have been collected from the Austrian trade statistics. Granger's causality test, cointegration test, variance decomposition and Impulse response analysis have been applied to analyse the data. He has found the existence of a bidirectional causal relationship exists between Austrian OFDI and exports. Exogenous shocks have been caused by both the variables and they have affected the other at a very slow pace.

***Munisamy Gopinath, Daniel Pick and Utpal Vasavada* (1998)** have conducted a study on "Exchange rate effects on the relationship between FDI and Trade in the U.S. food processing industry". They have analysed the impact of the real exchange rate and its volatility on outward FDI, exports and foreign affiliate sales by the food processing industry in the United States. The study has mainly focused on the U.S. outward investments in high income countries for the period from1982 to 1995. The high income countries that have been included in the study are Australia, Canada, Belgium, Japan, Netherlands, Germany, Spain, UK, Italy and France. The data for the study have been obtained from the U.S. Department of Commerce, Bureau of Economic Analysis and other secondary sources. Pooled regression model has been applied to analyze the data. The findings of the study have revealed that the real exchange rate has exhibited a negative impact on exports to Australia, Belgium, France, Italy and Spain. The impact of the real exchange rate volatility and exports to Belgium, Canada and UK have been negative and significant. Most of the countries have shown a positive effect of real exchange rate and negative effect of real exchange rate volatility on foreign affiliate sales. The impact of real exchange rate and its volatility on outward FDI has been positive and significant for the majority of the high income countries.

***Seungjin Kim* (2000)** in his research on "Effects of Outward Foreign Direct Investment on Home Country Performance- Evidence from Korea" has investigated the impact of Korean OFDI on its economic performance. The variables, namely, exports, GDP, GDP per capita, and OFDI have been used in the study. The regression analysis has been employed to analyze the data. The results of the study have exhibited a positive relationship between OFDI and exports. The outward FDI from Korea has not shown any significant impact on the Korean economy. This is because the quantum of investment has been small.

***Cosmas Simon Mbogela* (2015)** in his article on "The Influence of Exchange Rate Fluctuations on US Outward FDI" has examined the influence of fluctuations in the exchange rate and its volatility on the outward FDI of the United States. Long term interest rate of home country, level of income, level of technology, exchange rate, the openness of the economy and human capital have been considered in the study. The data have been taken for the year 2006 and have been drawn from the Energy Information Administration, OECD's Main Science and Technology indicators and other online sources. Descriptive statistics, Pearson's correlation, partial correlation analysis, and linear regression analysis have been applied in the study. The results of the study have indicated a significant relationship of change in OFDI with the change in currency value and change in volatility. The existence of a negative relationship between exchange rate volatility of the host country and change in U.S. OFDI has indicated that high volatility is one of the reasons for lower investments abroad.

***Charlotte Nielsen and Karin Hallas* (2015)** in their paper on "Macroeconomic Determinants of European FDI Outflows: An Empirical Approach" have examined the effect of macroeconomic factors of the home country on their OFDI. The study has considered 10 European countries, such as, United Kingdom, France, Finland, Germany, Italy, Poland, Portugal, Hungary, Spain and Denmark. The macroeconomic variables used in the study are income, current account balance, technology, exchange rate and openness of economy. The data for the study have been taken from the World Bank, UN, WIPO, IMF and UNCTAD for the period from 1980 to 2013. The time series regression model has been applied to analyze the data. The ADF test has been applied to test the stationarity of the data. The Durbin-Watson test has been used to test the presence of serial correlation and the Breusch- Pagan test has been applied to test the presence of heteroskedasticity. The countries taken for the study belong to the European Union, where the rules and regulations which pertain to international trade are similar. Despite this similarity, the influence of the macroeconomic determinants on the FDI outflow has varied across all ten countries. The results of the study have indicated that out of the 10 European countries, the OFDI of Denmark and France have been influenced the most by the macroeconomic determinants. They have concluded that these determinants do not completely explain the FDI outflows from Europe.

***Chunlai Chen* (2015)** in his research paper on "Determinants and motives of outward foreign direct investment from China's provincial firms" has explored the determinants of OFDI in 30 provinces in China from 2003 to 2012. Here, OFDI has been considered as the dependent variable and per capita GDP, patent, inward FDI, export, import and GDP are taken as the independent variables. The data have been extracted from the Ministry of Commerce of China and the National Bureau of statistic of China. The fixed effects model has been applied to analyze the data. The results of the study have indicated that concerned province's economic development, innovation and technology and export have been the major determinants of OFDI. In addition to this, efficiency seeking and market seeking have been considered to be the major drivers of investments made abroad. The findings of the study have suggested that the implementation of policies to encourage OFDI would bring several benefits to the home country in terms of increased competitiveness, export, industrial restructuring, economic growth etc.

***Hai Yue Liu and Ivan Deseatnicov* (2016)** have published a paper on "Exchange rate and Chinese outward FDI". They have analyzed the effect of exchange rate, its volatility and its expectations on the outward FDI from China. The variables, such as, real exchange rate, wages, real interest rate, openness, natural resources

and political environment have been used in the study. The data have been collected from the Statistical Bulletin of China's Outward direct Investment, World Bank, International Monetary Fund, International Financial statistics, World integrated Trade Solution and International Country Risk Guide. The study has been conducted for the period of 10 years from 2003 to 2013. The SYS-GMM estimator and FGLS have been employed to analyze the data. The results of the study have indicated that an appreciation in the Chinese currency, RMB (Renminbi) is related to a decrease in FDI. Moreover, MNC's in China have preferred to invest in countries with higher financial uncertainty. China's outward FDI has decreased as a result of the appreciation in RMB which has caused exchange rate losses. As a result, the Chinese OFDI has been shifted to countries where RMB appreciation would be the least.

Statement of the Problem

Thorough scrutiny of both the foreign and Indian literature in the area of overseas direct investment has thrown light on the following aspects:

1. The foreign literature with respect to ODI is greater in terms of number when compared to the Indian studies.
2. Majority of the Indian studies have dealt with the trend in overseas direct investment over a period of time.
3. Few studies have thrown light on the impact of such investments on the Indian economy and vice versa.
4. Firm level analysis has also been undertaken in the same area.
5. Few studies have focussed on the factors that encourage overseas direct investment from India to a group of countries as a whole.

Indian studies in this area are limited and the studies that have been undertaken have focussed on the total overseas direct investment from India. This study concentrates on the overseas direct investment to the wholly owned subsidiaries established abroad in the form of guarantee. Investments assure a long term sustainable growth only when it is of a permanent nature. In the case of a joint venture, the investment made by the Indian party in the foreign entity need not be a long lasting one. The return from such investments would also be minimal. But a wholly owned subsidiary established overseas would not only give greater returns but also facilitate the growth of the home economy in the long run.

This study examines the trend in overseas direct investment to wholly owned subsidiaries and also aims at providing an insight into the home country factors that need to be looked into before taking a decision to establish a subsidiary in a foreign country.

Objectives

The following objectives have been framed for the study

1. To study the performance of the Overseas Direct Investment from India in the form of guarantee to the Wholly Owned Subsidiaries established abroad.

2. To analyze the short run and long run association between the home country macroeconomic variables and the Overseas Direct Investment from India in the form of guarantee to the wholly owned subsidiaries established abroad.

Period of the Study

The study covers a period of 12 years from 1st January 2008 to 31st December 2019. Based on the objectives framed, the data have been taken on a yearly and quarterly basis for the same study period.

Data Sources

The data have been collected from the Reserve Bank of India, United Nations Conference on Trade and Development (UNCTAD), World Trade Organisation, International Financial Statistics, Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry and several other journals, books, reports and websites.

Sampling Design

Since July 2007, The Reserve Bank of India has been publishing data on Overseas Direct Investments from India in the form of Joint venture and Wholly Owned Subsidiary. The purposive sampling technique has

been adopted in the study. The yearly and quarterly observations for a period of 12 years from January 1st 2008 to December 31st 2019 have been taken for the study. The investments from India to the WOS are made in the form of equity, loan and guarantee. This study considers equity investments only.

Analysis and interpretation

    a. **Year-Wise Analysis and Descriptive Statistics of Overseas Direct Investments in the form of guarantee from India to the Wholly Owned Subsidiaries for the 12 Year Period from 2008-2019**

Table 4.2(a)
Year-wise analysis of Overseas Direct Investments from India to the Wholly Owned Subsidiaries for the period 2008 to 2019

Year	Guarantee (USD Million)	Descriptive statistics	
2008	2,769.96	Mean	10241.18
2009	3,915.94	Median	12014.03
2010	16,072.16	Maximum	16072.16
2011	13,758.03	Minimum	2769.96
2012	12,224.98	Std. Dev.	4562.55
2013	13,632.07	Skewness	-0.38
2014	14,783.88	Kurtosis	1.66
2015	13,552.16	Jarque-Bera test value	1.19
2016	11,803.08	Probability value of Jarque Bera test	0.55
2017	7,800.22		
2018	6,563.00		
2019	6,018.57		
TOTAL	1,22,894.11		

Source: Compiled from RBI database

The **guarantee** issued has increased from 2,769.96 USD Million in 2008 to 16,072.16 USD Million in 2010. The investment in 2010 has been the highest during the 12 year study period. In the year 2012, it decreased to 12,224.98 USD Million. The total guarantee issued has been 1,22,894.11 USD Million during the study period. The maximum investment to the wholly owned subsidiaries has been made in the form of guarantee where the firms have invested up to 16,072.16 USD Million in the year 2010.The deviation from the mean value has been seen in the case of guarantee with an amount of 4,562.55 USD Million. The skewness value of (-) 0.38 lies between (-) 0.5 and 0.5, which shows that the yearly data of overseas investment to the wholly owned subsidiaries during the past 12 years are approximately symmetrical. The kurtosis value is less than 3 which depicts that the distribution is platykurtic and the values are not extreme. The probability value of the Jarque-Bera test is 0.55, which shows that the data are normally distributed. Since all the values are greater than 0.05.

Analysis of the Short Run and Long Run Association between the Home Country Macroeconomic Variables and the Overseas Direct Investments from India to the Wholly Owned Subsidiaries

The unit root test shows that the data taken for the study are stationary at first difference. The optimum lag has been chosen as 1 for the entire study.

Granger Causality Test

The Granger Causality Test has been applied to test if two way causation or bidirectional relationship exists between the variables. The main focus is on the association between ODI to the WOS in the form of guarantee and the macroeconomic variables. The results of the test are given in Table 1.

Table 1

Results of the Granger Causality Test for Guarantee

Null Hypothesis	p-value
LOG_GUAR does not Granger Cause LOG_INWFDI	0.0063

Source: Computed using EViews 8

Here the null hypothesis which states that guarantee does not Granger cause inward FDI has not been accepted. Since its p-value of 0.0063 is less than the 5 per cent significance level, which shows that short run causation exists between guarantee and inward FDI. In other words, overseas direct investment to the WOS in the form of guarantee has an impact on the inward FDI in the short run. The null hypothesis is rejected. The other short run causation results are presented in Appendix 6.

Long run association between variables

The long run association between the variables has been ascertained by applying Johansen's Test for Cointegration.

Johansen's Test for Cointegration

Johansen's test of cointegration has been applied to check if a long run association exists among the variables. Since all the variables are integrated of the same order this test has been applied. The results are given in Table 2.

Table 2

Results of the Johansen's Test for Cointegration for Guarantee

No. of co integration equations	Trace Test			Maximum Eigen value Test		
H_0: There is no cointegration equation **H_a: There is at least one cointegration equation**						
	Trace Statistic	**Critical Value at 0.05**	**p-value**	**Max-Eigen Statistic**	**Critical Value at 0.05**	**p-value**
None	121.19	95.75	0.00*	50.86	40.07	0.00*
At most 1	70.32	69.81	0.04*	25.79	33.87	0.33
At most 2	44.53	47.85	0.09	20.15	27.58	0.33
At most 3	24.37	29.79	0.18	17.10	21.13	0.16
At most 4	7.26	15.49	0.54	6.62	14.26	0.53
At most 5	0.64	3.84	0.42	0.64	3.84	0.42

Significant at 5 per cent level

Source: Computed using EViews 8

The number of cointegration variables is given by both the Trace test and the Maximum Eigenvalue test. In most cases, the results given by both the tests are the same. In rare cases, the size of the sample has an impact on the results given by the Trace test and the Maximum Eigenvalue Test. In this case, the results of both the tests differ.

Trace test results:

In the case of the Trace test, the first p-value that is given is less than 0.05 (i.e.) 0.00. Hence, the null hypothesis that there is no cointegration equation is not accepted. The next step is to test if at least one cointegration equation exists or not.

H$_0$: There is at least one cointegration equation

H$_a$: There are at least two cointegration equations

The p-value in this case is 0.04 which is less than 0.05, which indicates that there are at least two cointegration equations and the null hypothesis has not been accepted. The next step is to test whether at least 3 cointegration equations exist.

H$_0$: There are at least two cointegration equations

H$_a$: There are at least three cointegration equations

Here the p-value is 0.09 as a result of which the null hypothesis that at least two cointegration equations exist is accepted.

Maximum Eigen value Test

The first p-value of 0.00 is significant, which shows that there is at least one cointegration equation. The next step is to check whether more than one cointegration equation exists. However, the second p-value of 0.33 indicates that there is only one long run cointegration equation.

The trace test suggests that there are at least two cointegration equations and the Maximum Eigenvalue test shows the existence of only one cointegration equation. Whenever there is a difference in the results, the Trace test is preferred when compared to the Maximum Eigenvalue test **(Luutkepohl et al., 2000).** Hence, it is concluded that there are at least two cointegration equations.

It is also important to analyze the normalized cointegration coefficients which are generated by Johansen's Cointegration test. Table 3 shows the results of the normalized cointegration coefficients.

Table 3

Results of the Normalised Cointegration Coefficients for Guarantee

Variables	Normalized Cointegration coefficients	Standard Errors	t statistics
LOG_GUAR	1.00		
LOG_GDP	85.07	17.90	4.75
LOG_INTEREST	57.60	11.74	4.90
LOG_INWFDI	(-)40.59	4.84	(-)8.38
LOG_REER	60.01	26.48	2.26
LOG_TRADE_OPENNESS	(-)37.02	8.38	(-)4.41

Source: Computed using EViews 8

In this case GDP, interest, and REER show a negative association with loan, which means that as GDP, interest and REER increases, the overseas direct investment to the WOS in the form of guarantee decreases. On the other hand, inward FDI and trade openness depict a positive association with the guarantee. An increase in these two macroeconomic variables results in a corresponding increase in the guarantee.

Though these macroeconomic variables indicate either a positive or negative association, its significance has been estimated only by finding the t statistic. The t statistic is found by dividing the coefficient by the standard errors. From Table 3, it is seen that for all the variables, the absolute value of the t statistic is greater than 1.96 proving that the association between the ODI to the WOS in the form of guarantee and the home country macroeconomic variables is significant.

Since there is a long run association that exists between the variables, the next step is to find the error correction term or the equilibrium error that brings the variables back to the equilibrium when it deviates in the short run.

Vector Error Correction Model

a) VECM equation

$$\Delta Y_t = \beta_0 + \sum_{i=1}^{n} \beta_i \, \Delta Y_{t-i} + \sum_{i=0}^{n} \delta_i \, \Delta X_{t-i} + \varphi_i Z_{t-1} + \mu_t \text{--------Equation 1}$$

      The result obtained from the application of VECM has been applied in this equation to interpret the results. Table 4 explains the terms given in the equation with the corresponding value that has been generated by the VECM model.

Table 4

Explanation of the VECM Model for Guarantee

Terms as per standard equation	Explanation	Values as per the model generated
ΔY_t	Change in the Target variable	$\Delta Guarantee$
β_0	Constant term	0.005
β_i	Co-efficient of the lagged value of the target variable	-0.22
ΔY_{t-i}	Target variable in the past period	$\Delta Guarantee_{(t-1)}$
δ_i	Co-efficient of the lagged value of the other variables	0.39 -0.30 0.05 1.54 2.36
ΔX_{t-i}	Other variables in the past period	ΔGDP_{t-1} $\Delta Interest_{t-1}$ $\Delta Inwfdi_{t-1}$ $\Delta REER_{t-1}$ $\Delta Trade\ Openness_{t-1}$
φ_i	Speed of adjustment or the Co-efficient of the Error Correction term	-0.23
Z_{t-1}	Lagged value of the Error Correction Term	ect_{t-1}
μ_t	Residuals	

Source: Computed using EViews 8

When these values are substituted in the standard equation, the equation is as follows:

$\Delta Guarantee = 0.005 - 0.22\Delta Guarantee_{t-1} + 0.39\Delta GDP_{t-1} - 0.30\Delta Interest_{t-1} + 0.05\Delta Inwfdi_{t-1} + 1.54\Delta REER_{t-1} + 2.36\Delta Tradeopenness_{t-1} - 0.23ect_{t-1} + \mu_t$

      The previous period's deviation from the long run equilibrium is corrected in the current period at a speed of 23 per cent (-0.23). The error correction term should be negative indicates that if there is a deviation in one direction, the correction must take place in the opposite direction to pull back the variables to its equilibrium in the long run.

      The coefficients of the macroeconomic variables indicate that other than interest all the other variables show a positive association with the guarantee. A percentage change in GDP, inward FDI, REER, and trade openness results in a 0.39, 0.05, 1.54, and 2.36 per cent increase in overseas direct investment in the form of guarantee to the WOS.

    b) Cointegration equation

$Z_{t-1} = ECT_{t-1} = Y_{t-1} - \beta_0 - \beta_1 X_{t-1}$------------------ Equation 2

      Table 5 explains the terms given in the equation with the corresponding value that has been generated by the VECM model.

Table 5

Explanation of the Cointegration equation for Guarantee

Terms as per standard equation	Explanation	Values as per the model generated
Z_{t-1}	Lagged value of the Error Correction Term	ECT_{t-1}
Y_{t-1}	Lagged value of the target variable	$1.00 Guarantee_{t-1}$
$ß_0$	Constant term	-32.29
$ß_1$	Co-efficient of the lagged value of the explanatory variable	-0.64 6.09 -13.62 6.45
X_{t-1}	Other variables in the past period	$Interest_{t-1}$ $Inwfdi_{t-1}$ $REER_{t-1}$ $Trade\ Openness_{t-1}$

Source: Computed using EViews 8

The Cointegration equation or the Long Run Model is represented as follows:

Z_{t-1}= ect_{t-1}= 1.00 $Guarantee_{t-1}$ - 32.29 -0.64 $Interest_{t-1}$ + 6.09$Inwfdi_{t-1}$ -13.62$REER_{t1}$+6.45$Tradeopenness_{t-1}$

The above equation has been framed based on the standard form that is set for a cointegration equation. However, the significance of these coefficients has been estimated only by deriving the system generated equation and running a regression model. The equation generated by the system is given below:

D(LOG_GUAR) = C(1)*(LOG_GUAR(-1) - 0.64*LOG_INTEREST(-1) + 6.09*LOG_INWFDI(-1) - 13.62*LOG_REER(-1) + 6.45*LOG_TRADE_OPENNESS(-1) - 32.29) + C(2)*(LOG_GDP(-1) + 0.68*LOG_INTEREST(-1) - 0.54*LOG_INWFDI(-1) + 0.86*LOG_REER(-1) - 0.51*LOG_TRADE_OPENNESS(-1) - 4.96) + C(3)*D(LOG_GUAR(-1)) + C(4)*D(LOG_GDP(-1)) + C(5)*D(LOG_INTEREST(-1)) + C(6)*D(LOG_INWFDI(-1)) + C(7)*D(LOG_REER(-1)) + C(8)*D(LOG_TRADE_OPENNESS(-1)) + C(9)

The portion highlighted in the equation is the cointegration equation or the long run model. This regression estimate of this equation has been given in Table 6.

Table 6

Results of the regression equation for Guarantee

C(1) = φ_i = Speed of adjustment= Coefficient of error correction term	-0.23
Probability value of C(1)	0.21
R^2	0.26
Adjusted R^2	0.11
F statistic	1.70
Probability value of F statistic	0.13

Source: Computed using EViews 8

The existence of a long run association is proved only if the two basic conditions are satisfied. In this case, the primary requirement of a negative error correction term is satisfied but it is not found to be significant. The R^2 value of 0.26 indicates that the independent variables account for 26 per cent change in the dependent variable.

The adjusted R^2 is 0.11. The p-value of the F statistic is also not significant.

The reliability of the model developed has been tested by performing the diagnostic checks.

Diagnostic checking

1. Normality Test

H$_o$: The residuals are normally distributed.

H$_a$: The residuals are not normally distributed.

The test of normality is used to check if the residuals follow a normal distribution. The probability value of the Jarque-Bera test is 0.99 indicates that the residuals are normally distributed. The null hypothesis cannot be rejected.

2. **Serial Correlation test**

H$_o$: There is no serial correlation in the residuals.

H$_a$: There is serial correlation in the residuals.

The serial correlation test is used to test if the error terms or the residuals are correlated or not. The Breusch Godfrey serial correlation has been applied and the probability value of the serial correlation is 0.36, which is greater than 0.05. In this case, the null hypothesis cannot be rejected. The residuals of our model are not correlated.

3. **Heteroskedasticity Test:**

H$_o$: The variances of the errors are equal (no heteroskedasticity).

H$_a$: The variances of the errors are unequal (heteroskedasticity).

The test of heteroskedasticity is used to find if the residuals have unequal variance. The p-value of 0.36 indicates that the null hypothesis cannot be rejected.

4. **CUSUM test of stability:**

The Cumulative Sum (CUSUM) charts helps in detecting small deviations from the mean within a specific significance level, which combines both current and previous values. The model is said to be stable only if these deviations fall within the specified range.

Chart 1

CUSUM test of stability (Guarantee)
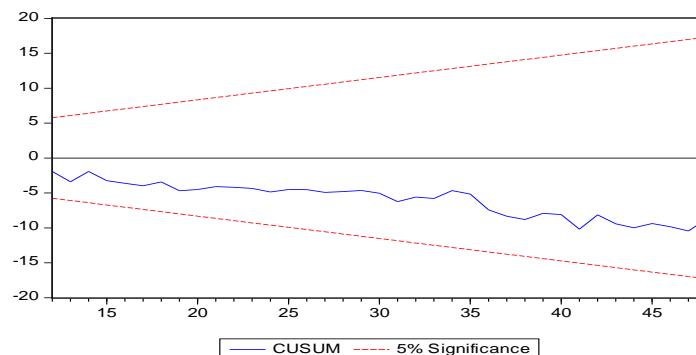
Source: Computed using EViews 8

The specified range includes the red lines and the blue line or the deviations must fall between these red lines. In Chart 1, the blue line falls between the specified ranges. Hence, the model is said to be stable.

Findings, Suggestions and Conclusion

The investments in the form of the guarantee have shown a short run association with trade openness and inward FDI respectively. Guarantee is less risky compared to equity investments. These investments assist in enhancing the other cross border activities like import, export, and inward FDI. The short run causation between inward FDI and overseas direct investment has been proved by *Lan Gao* **(2008)** where he has analysed the determinants of China's OFDI. The performance of overseas direct investments from India to the WOS established abroad has been analysed and the results have shown that during the study period maximum investments have been in the form of guarantee. The risk involved in equity and loan investments has been higher. The overseas direct investment has exhibited several fluctuations and a minimum number of Indian entities have contributed the maximum amount. Though

the amount invested in the form of guarantee is the highest, there seems to be no long run association with the macro economic factors of India. Hence, an investor must consider a combination of equity, loan and guarantee to ensure better sustainability in the long run.

References

Journals

1. Pfaffermayr,M. (1994). Foreign direct investment and exports: a time series approach. *Applied Economics, 26*(4), 337-351.

2. Gopinath, M., Pick, D., & Vasavada, U. (1998). Exchange Rate Effects on the Relationship between FDI and Trade in the U.S. Food Processing Industry. *American Journal of Agricultural Economics*, *80*(5), 1073–1079. https://doi.org/10.2307/1244207

3. Kim,S. (2000). Effects of Outward Foreign Direct Investment on Home Country Performance-Evidence from Korea. http://citeseerx.ist.psu.edu/viewdoc/ download? doi=10.1.1.455.7293&rep=rep1&type=pdf

4. Mbogela, C. S. (2015). The Influence of Exchange Rate Fluctuations on US Outward FDI. *International Journal of Research in Business Studies and Management, 2*(4), 38–49. http://www.ijrbsm.org/pdf/v2-i4/5.pdf

5. Hallas, K., & Nielsen, C. (2015). *Macroeconomic Determinants of European FDI Outflows-An Empirical Approach*. http://hdl.handle.net/2077/40588

6. Chen, C. (2015). Determinants and motives of outward foreign direct investment from China's provincial firms. *Transnational Corporations*, *23*(1), 1–28. https://doi.org/10.18356/6ba5ab37-en

7. Liu, H. Y., & Deseatnicov, I. (2016). Exchange rate and Chinese outward FDI. *Applied Economics*, *48*(51), 4961–4976. https://doi.org/10.1080/ 00036846. 2016.1167831

8. Luutkepohl, H., Saikkonen, P., & Trenkler, C. (2000). Maximum eigenvalue versus trace tests for the cointegrating rank of a VAR process. *The Econometrics Journal*, *4*(2), 287-310.

9. Gao, L. (2008).Determinants of China's Outward Foreign Direct Investment. https://ceauk.org.uk/2008-conference-papers/Lan-Gao-Determinants-China-OFDI-1.doc#

10.

Reports

1. Department of Economic Affairs.(March,2021). *Overseas Direct Investment Data from April 2000 To March 2021* [Monthly Factsheet]. https://dea.gov.in/ sites/ default/files/February_2021%2BODI%2BFactSheet.pdf

2. Reserve Bank of India. (2021). Master Direction – Direct Investment by Residents in Joint Venture (JV) / Wholly Owned Subsidiary (WOS) Abroad. https://rbi.org.in/Scripts/BS_ViewMasDirections.aspx?id=10637

Websites

1. http://unctadstat.unctad.org
2. https://commerce.gov.in/trade-statistics/
3. https://dea.gov.in
4. https://www.imf.org