

Outward Foreign Direct Investment from India: Analysis on the Impact of Various Macroeconomic Variables on Outward FDI

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Abstract: Outward Foreign direct investment from India has diversified and improved significantly in the last 10 years, since, opening up of its economy policies liberalization in early, 1990. Conversely in recent year India has been developing quickly as exporter of massive amount of FDI. Increase in outward Foreign direct investments driven by national policy changes, domestic and international macro-economic and keeping in mind the end goal to get to new advances, abilities, managerial skill and so forth. For the current study 16 years of time series data has been collected for the analysis from the period, 2000-2016. This study investigates the impact of outward FDI on various macro-economic variables like GDP, TW and CPI. The study has used Vector Auto Regression (VAR) method for estimating the impact of outward FDI on economic variables. The present study aims is to build a model to know the impact of macro-economic variables on outward Foreign direct investment.

Key words: Outward Foreign direct investment, macro-economic variables, GDP, VAR, present, collected

INTRODUCTION

In recent years, OFDI from developing business sector economies by developing nation firms has advanced into an essential constrain of economic globalization in the course of recent decades. Outward FDI by Indian companies is as of now been seen as noteworthy constrain in the proliferation of India. In the year, 2000, India has encountered a solid development in investing abroad. Firms such as Sundaram fasteners, Mittal Steel, TATA Birla, Airtel, TATA Reliance and others are part in driving India globalization. These firms from India in their journey to go worldwide and take an interest in an ever far reaching worldwide business movement have not only wandered into developing nations as well as interested in developed nations. Nevertheless, this observable fact is not a new thing. As of the historical perception, during the late, 1960 and 1980 it can be seen that many firm from developing economy have gone through overseas investment. In fact, Birla group of companies in 1956 set up their mill in Ethiopia was the first India's overseas investment. Incorporation of Indian market with the rest of the world has in recent years has strengthened Indian economy as it observed a rise in both outward and inward FDI (Pradhan, 2011). Outward FDI has given better access to innovation, information, natural resources and market to firm in India

and furthermore, helps the domestic corporate division to enhance their brand to esteem and empower them to be nearer to their key customers. Transferring of technology from developed nation to developing nation has also exposed in improvement of policy circle is an actual paradigm of South-South co-operation (Nayyar, 2007).

However these days, EMEs are gradually turning into a resource of overseas venture for many other countries. Overseas investment is not just an indication of expanding investment worldwide also to develop their growing competency. Essentially, all the more critically, a developing driving force for change in today's economy is originating from developing nations and economies on the move where various state and private owned ventures are progressively venturing outward extension through FDI. Organizations are extending their business by contributing abroad with a vision to acquire provincial and to reach worldwide. Solid economic development and dynamic liberalization has initiated Indian organizations to grow their nearness into new markets and USA is the biggest beneficiary of India's outward ventures (Kanungo, 2013).

In the study, 16 years of data has been collected for the analysis from the period, 2000-2016. The collected data have been presented and analysed in form of table and graph. For the collected data various analysis like regression analysis, correlation analysis and descriptive

analysis are done to understand the FDI outflows and their impact on the different macro economic variables. The current analysis has been conducted on EVIEW as it has range of advanced tools for data analysis. This software is used mainly for time series oriented econometric analysis. Having recognised the wide grounds for and trends in India's outward FDI investment, this study attempts to pin down the macro economic variables which influence the FDI outflows from India and estimating the best model using econometric view. To this end, we choose residual diagnostic test which argues whether US Dollars at current prices per capita, percentage of total world OFDI, percentage of GDP, consumer price index, annual average growth rate have short term or long term effect on outward FDI from India.

Literature review: India's OFDI is increasing rapidly in the current years, overseas investment by Indian firms is not a recent occurrence and establishment was laid quite long back. Indeed, the very first overseas venture by Indian companies occurred with the foundation of a textile mill by Birlas in Ethiopia year 1955. A number of overseas investments were undertaken in Uganda, Kenya, Malaysia, Nigeria, Ceylon and Thailand during the 1960. Overseas investment has been done by Indian firms, since 1970, the magnitude and amount of outward FDI were very little until 1990 and has extended hastily ever, since 2000. The development of India's outward FDI can be alienated into two different phase first wave from 1970's-1990 and second wave, 1991 onwards (Nayyar, 2007; Ahmad, 2016).

Various theories has been endeavoured to clarify the explanations behind outward FDI choice of firms. For multiple reasons multinational enterprises extend out their activities to invest abroad for instance, utilization of economy of scale, make use of firm's specific advantage, frequently because of a products life cycle pattern, to evade associated business costs and contracting issues. The major motive at the back of OFDI choice by MNE'S are in search of market in search of resource in search of efficiency and in search of strategic assets which are absent in home nation (Pandey, 2016).

Over the past 15 years, there is a growth observed in the outward FDI performance. Because of the rapid growth of outward FDI, enterprises are taking calls to establish operations in Foreign countries. It has been seen that global FDI outflows is declined in FY2009 by 39% to \$1,171 billion. Due to which, the affect can be seen in the outflows from developing and transition economies. In FY2009, outward FDI flows for developed country were halved. Global outward FDI rose to 21% in the developing

countries in the FY2010. As a result the global position was strengthened further in developing and developed countries. It was clearly visible that the financial crisis and economy down fall have reduced the propensity and capability of the industry to invest. This crisis had created uncertainty and risk concern at global level.

MATERIALS AND METHODS

The main objective of the study is to build a model to know the impact of macro-economic variables on outward FDI. The current study has completely utilised secondary data for the analysis. The data has been taken from the RBI published records such as RBI website, RBI Bulletins, RBI publications, world investment report of UNCTAD, hand book of statistics of Indian economy, OECD, World Bank Report, publication from Ministry of Commerce:

- 16 years of data has been collected for the analysis from the period, 2000-2016. For the analysis considered variables are current price per capita, percentage of total world OFDI, GDP, annual growth rate
- Estimating equation-least square method is developed for the collected variables considering OFDI as dependent variable and other macro-economic variables as independent variable
- Unit root test to find out if time series variables are non-stationary and possess a unit root
- By estimating equation two different models has been developed to estimate a better model
- The variables which have probability <5% are impacting on outward FDI
- Johnson co-integration test is developed to check whether there is co-integration within the selected variables
- Least square unrestricted Vector Auto Regression (VAR) Model was developed to check the long run effect of variables on OFDI
- Wald test was generated to check the short run effect of variables on OFDI
- To check the selected model is a best model three different residual diagnostic tests such as Breusch-Godfrey serial correlation LM test, histogram and heteroskedasticity test are conducted

Specification of our estimated model is illustrated:

$$OFDI = \beta_0 + \beta_1 CPPI + \beta_2 TW + \beta_3 GDP + \beta_4 CPI + \beta_5 AGR + \mu \dots$$

Where:

OFDI = The flow of Outward FDI from India which is dependent variable

β_0 = Constant

CCPC = Current Price Per Capita

TW = Percentage of Total World OFDI

GDP = Gross Domestic Product

CPI = Consumer Price Index

AGR = Annual Growth Rate

Finally, best model will be developed for macro-economic variable which has impact on outward FDI.

RESULTS AND DISCUSSION

This study presents the results of the analysed secondary data collected for the study. This study has the salient features of the data set along with the statistical packages used for analysis.

In this analysis, VAR has been used to examine the flow of Outward Foreign Investment (OFDI) respond to different micro-economics variables. If there are concerns surrounding the endogeneity of the variables “EVIEW” provides a frame work to explore the iterations as well as variables that are considered endogenous and allowed to impact on the other system variables (Table 1).

From Table 1 results obtained is a descriptive statistics for the selected variables. In the above 16 years of data has been taken for the analysis for the period 2000-2015. The minimum outward FDI flow was 514.45 in 2000 and the maximum was 21142 in 2009. There has been continues increase in the outward investment from the stage of post liberalization. There has been a fall in outward FDI in the year, 2012-13, this is because of the financial crisis which happened in united nations where Indian multinationals borrowed heavy in terms of US\$ to finance outward FDI. The GDP is taken in terms of national currency.

For variables prospective regression model (Estimating equation-least square method) has been build to understand the impact of macro-economic variables on outward FDI. Here, dependent variable is OFDI and the independent variables are as follows: CPPC: US Dollars at Current Prices per Capita, TW: percentage of Total World, GDP: percentage of Gross Domestic Product, CPI: inflation rate (Consumer Price Index), AGR: Annual Average Growth Rate (Table 2).

From the above model obtained we can see R²-value is almost near to 1 in the model. In this model R²-value is 0.999859 and the probability is 0.0000 which represents the best part of the model. From the above model, we have removed the variable average growth rate because the

Table 1: Descriptive statistics

Variables	OFDI	CPI	AGR	CPPC	GDP	TW
Mean	8574.908	6.825564	7.1475	7.071875	0.66875	0.64125
Median	7993.565	6.257732	7.4	6.22	0.405	0.58
Maximum	21142.47	11.99224	10.26	17.66	1.67	1.46
Minimum	514.45	3.684762	3.77	0.49	0.09	0.04
SD	6981.291	2.843283	2.141836	5.768197	0.527824	0.431445

Table 2: Estimating equation least square method

Dependent variable-OFDI (Least square method)

Variables	Coefficients	SE	t-statistics	Prob.
C	226.49870	74.61695	3.035486	0.0113
GDP	-1879.49900	137.88590	-13.630820	0.0000
CPPC	1346.99100	18.12044	74.335440	0.0000
TW	510.74400	160.79600	3.176348	0.0088
CPI	-36.32568	14.43003	-2.517367	0.0286

R² = 0.999859, Akaike info criterion = 12.23424, F-statistic = 19487.59, Schwarz criterion = 12.47568, Prob. (F-statistic) = 0.00000

probability was showing more than 5% which says it has no impact on OFDI. The most important condition for selecting the best model is values of Akaike info criterion and Schwarz criterion should be less. So, here we can proceed with this model where all of the independent variable has p value <5%. From the above analysis, we came to know which economic variables are affecting outward FDI flows (Fig. 1).

From the above displayed graph, we can see that economic variables like CPI, CPPC, GDP, TW has impact on OFDI. The OFDI flow in the above graph shows a similar flow in CPI, CPPC, GDP and TW. After knowing the impact of economic variables the next step is to check the unit root test. The unit root test is done to know the variables are stationary and non stationary. With the help of unit root test probability obtained for the variables are like GDP = 0.0213, CPPC = 0.0192, TW = 0.0030, CPI = 0.0487. With the result obtained from the unit root test probability is <5% which means null hypothesis is accepted. Thus, it proves that the selected variables has unit root test which means the variables are non stationary.

Johanson co-integration test has been conducted to check whether there is co-integration within the selected variables. This test proved that there is no co-integration within the selected variables as probability was more than 5%. Hence, there is no con-integration within the selected variables, so, Vector Auto Regression (VAR) is conducted for the further analysis to check the long and run effect.

Vector Auto Regression (VAR): It is an econometric model used to identify the linear interdependencies among different time series. It helps to identify whether the impact of variable on another variable is in long run or in short run.

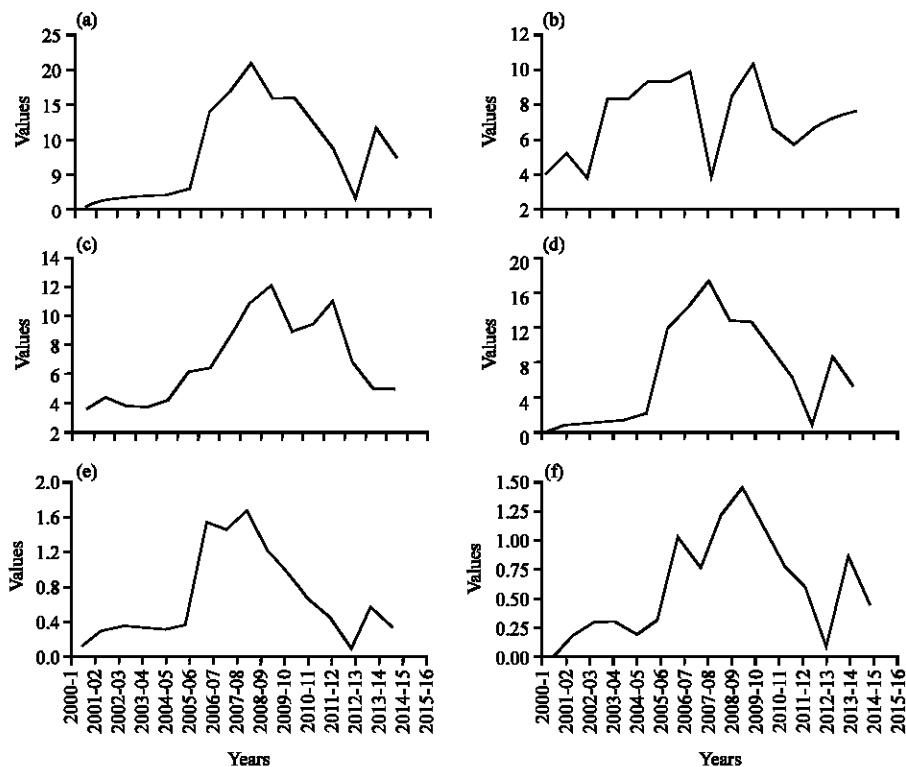


Fig. 1: Graphical representation of selected variables: a) OFDI; b) AGR; c) CPI; d) CPPC; e) GDP and f) TW

Lag test, Lag 1 and 2 test has been conducted. For selecting the either model the main condition is that Akaike info criterion should be less. In the Lag 1 test the Akaike info criterion value was 20.06294 and in the Lag 2 the Akaike info criterion was 20.99905 where Lag 1 has less Akaike info criterion value than Lag 2. So, we have to select Lag 1 for creating the VAR Model.

$$OFDI = C(1)*OFDI(-1)+C(2)*GDP(-1)+C(3)*CPPC(-1)+C(4)*TW(-1) C(5)*CPI(-1)$$

Table 3 is the result obtained through vector auto regression model. This model is formed from the above stated equation in order to see whether these variables have long term effect on the dependent variable. In the above table C1 is the dependent variable which is OFDI. We can see that none of the probability value is <0.05% which says that there is no long term effect of independent variables on dependent variable.

In order to cross verify the analysis whether there is any short run effect of independent variable on dependent variable “Wald Test” method is used. The result of the test is as follows:

- H_0 : GDP C(2) cannot influence the dependent variable OFDI

Table 3: Estimating vector auto regression

Dependent variable-OFDI (Least square method (Unrestricted VAR))

Variables	Coefficients	SE	t-statistics	Prob.
C1	-3.774904	13.64106	-0.27673	0.7876
C2	5033.598	23314.78	0.215897	0.8334
C3	5036.563	17946.66	0.280641	0.7847
C4	-2915.672	11097.4	-0.26274	0.7981
C5	566.1947	453.2622	1.249155	0.2401

- H_1 : GDPC(2) can influence the dependent variable OFDI

In Table 4, we can see that probability value is more than 5%, hence, we have to accept null hypothesis which says there is no short term effect where GDP cannot influence the dependent variable OFDI.

- H_0 : current price per capita C(3) cannot influence the dependent variable OFDI
- H_1 : current price per capita C(3) can influence the dependent variable OFDI

In Table 5, we can see that probability value is more than 0.05%, hence, we have to accept null hypothesis which says that there is no short term effect where current price per capita cannot influence the dependent variable OFDI:

Table 4: Wald test 1

Test statistics	Values	df	Probability
F-statistic	0.046612	(1,10)	0.8334
χ^2	0.046612	1	0.8291

Null hypothesis: C(2) = 0

Table 5: Wald test 2

Test statistics	Values	df	Probability
F-statistic	0.078759	(1,10)	0.7847
χ^2	0.078759	1	0.7790

Null hypothesis: C(3) = 0

Table 6: Wald test 3

Test statistics	Values	df	Probability
F-statistic	0.069029	(1,10)	0.7981
χ^2	0.069029	1	0.7928

Null hypothesis: C(4) = 0

Table 7: Wald test 4

Test statistics	Values	df	Probability
F-statistic	1.560388	(1,10)	0.2401
χ^2	1.560388	1	0.2116

Null hypothesis: C(5) = 0

- H_0 : percentage of total world OFDI C(4) cannot influence the dependent variable OFDI
- H_1 : percentage of total world OFDI C(4) can influence the dependent variable OFDI

In Table 6, we can see that probability value is more than 0.05%, hence, we have to accept null hypothesis which says that there is no short term effect where Percentage of total world OFDI cannot influence the dependent variable OFDI.

- H_0 : consumer price index C(5) cannot influence the dependent variable OFDI
- H_1 : consumer price index C(5) can influence the dependent variable OFDI

In Table 7, we can see that probability value is more than 5%, hence, we have to accept null hypothesis which says there is no short term effect where consumer price index cannot influence the dependent variable OFDI.

Residual diagnostic test: Residual diagnostics tests are done in order to see whether the above models and test conducted are significant and to check whether, it is acceptable. Hence, 3 types of tests are done that is histogram, heteroskedasticity test (ARCH effect), Breusch-Godfrey serial correlation LM test have been carried out, this tests have their own guidelines to prove the above model is best fit model.

Breusch-Godfrey serial correlation LM test: This test has been analysed to check whether there is serial

Table 8: Breusch-Godfrey serial correlation LM test

Breusch-Godfrey serial correlation LM test				
Variables	Coefficient	SE	t-statistic	Prob.
C1	5.712511	20.84893	0.273995	0.791
C2	10258.14	34397.31	0.298225	0.7731
C3	-6853.74	27206.14	-0.251919	0.8075
C4	-7096.13	14279.06	-0.496961	0.6326
C5	-421.497	791.3748	-0.532614	0.6088
RESID(-1)	-0.61764	0.795189	-0.776725	0.4597
RESID(-2)	-0.43765	0.629615000	-0.695109	0.5067

F-statistic = 0.408953, Prob. F(2, 8) = 0.6775, Obs.*R² = 1.391325 Prob. χ^2 (2) = 0.4987

Table 9: Heteroskedasticity test

Heteroskedasticity test: ARCH				
Variables	Coefficient	SE	t-statistic	Prob.
C	16132812	7787033	2.071753	0.0605
RESID^2(-1)	0.019641	0.285693	0.068749	0.9463

F-statistic = 0.004726, Prob. F (1, 13) = 0.9463, Obs.*R² = 0.005512, Prob. χ^2 (1) = 0.9408

Table 10: Series of residuals sampler

Series: Residuals sample 2000-2015 observations 16		Values
Mean		16209355
Median		-1070.874
Maximum		8167.472
Minimum		-6680.257
SD		4075.862
Skewness		0.568695
Kurtosis		2.80535
Jarque-Bera		0.832216
Probability		0.659609

correlation within the selected variables. This test is essential to check when the study is based on the time series data. The results have been enclosed in Table 8. From the results obtained it has been clear that probability value is 0.4987 which is more than 5%, we can strongly say there is no serial correlation in the time series.

Heteroskedasticity test: In this heteroskedasticity test, it has its own guideline that probability value should be <5% to prove model is a best fit. The results have been enclosed in Table 9. From the results obtained it is clear that probability value is 0.9408 which strongly indicates that there is no heteroscedasticity.

Histogram: This test is done to check whether the residuals are normally distributed or not. The result of the test has been enclosed in Table 10. The obtained result shows that probability value is 0.659609 which is more than 0.05%, this shows that residuals are normally distributed. From the all the three residual diagnostic test done so far, we got positive results. Above stated model 2 is said to be a best model.

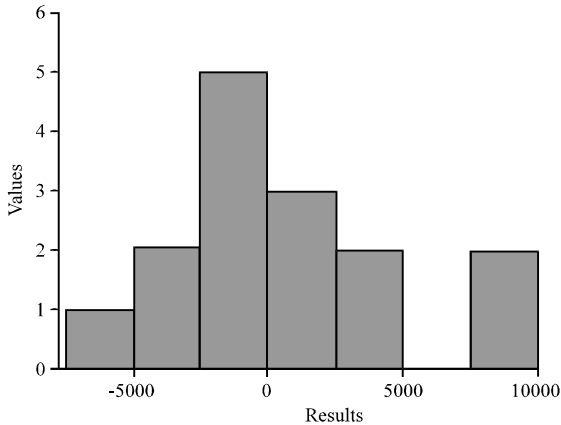


Fig. 2: Histogram

- The research found that all the economic variables taken for analysis does not impact on OFDI. Variables like US Dollars at current prices per capita, percentage of total world OFDI, percentage of gross domestic product, consumer price index has impact on outward FDI
- Annual average growth rate has no impact on outward FDI as it had a probability value more than 5%
- There is no co-integration between the selected variables
- There is no short term or long term effect of variables on outward FDI
- Unit root test proved that there is unit root for the selected variable. Probability was <5%, so, selected variable are non stationary
- Positive results have been obtained from the tests like Breusch-Godfrey serial correlation LM test, heteroskedasticity test and histogram (Fig. 2)

CONCLUSION

Growth of the Indian outward FDI is expected to continue. The regional and sector distribution of Indian OFDI is widening. Liberalization of the policies is helping Indian firms to explore overseas acquisition to put up both global presence and domestic strength. Indian

investors started to invest abroad as a strategy of acquiring skills, technology and proficiency from the developed countries. Indian multinationals are increasingly becoming more competitive, these multinationals may insistently explore into globalisation as their part of future growth plan and can even be close to their client. India should not only give more attention to FDI inflows in the way FDI outflows should also be facilitated. According to the latest reports India may be a leading source of multinational enterprises by the year, 2024 and over, 2000 plus Indian companies are likely to invest abroad and India might rank 20% more than China in terms of overseas investment.

Therefore, it is very necessary that all the collaborators including the government, RBI and Indian commercial should together bring their mutual practice to continuously re-examine the procedures and policies to make possible globalization through OFDI for macro-economic stability and gigantic domestic economy. The benefits from OFDI are not visible in the short run but will have generous positive benefit on global competitiveness in the long run.

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