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An Empirical Analysis of Determinants of Outward Foreign Direct Investment from India

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ABSTRACT: This study analysesthe home country drivers of Outward Foreign Direct Investment from India for the period 1985-2018.The study employs Autoregressive Distributed Lags (ARDL) bound testing approach suggested by Pesaran *et al.*(2001) to find the long run relationship among the variables. The causal linkages are investigated through block exogeneity test based on vector error correction model. The empirical results point to a significant role played by the home country factors in influencing the dynamics of outward foreign direct investment position of the country. We find a positive impact of export and innovation on outward FDI in the long run. On the other hand impact of market size and infrastructure are negative on OFDI. The results suggest that government must encourage export oriented policies in the long run. The capability drivers innovation, skills are expected to complement the government policies to promote OFDI from the country.

KEYWORDS: ARDL, India, Outward FDI.

I. INTRODUCTION

Over the past couple of decades, there has been a significant increase in outward foreign direct investment (OFDI) from developing countries (Al-Sadig, 2013; Das 2013). India has been one of the forerunners from developing countries in investing abroad.Strong inward and outward flow of direct investments indicates escalating incorporation of an economy with the global economies. Inward foreign direct investment indicates the nation's attractiveness for foreign investors, whereas outward foreign direct investment indicates the nation'seagerness and capability to explore beyond the international borders. India, a developing country has attracted global attention in both the cases, it not only ranks among the top countries in drawing foreign direct investment but has also attained global presence through its overseas investments.

The first Indian enterprise's investment in the overseas market was a textile mill establish in Ethiopia in 1956 by Birla group of companies. Indian Government policies like Monopolies and Restrictive Trade Policy Act (MRTP), 1969, Foreign Exchange Regulation Act (FERA), and Licensing Procedures, were the reason of restricted overseas investment. The Indian government approved a liberalized policy in October 1992. In this policy, cash remittance was introduced for the first time. Initially Indian firms were investing in manufacturing sector in developing countries. Later on direction of Indian oversees investment has been changed. Outward FDI of India shifted to other sectors like service sectors of developed countries.

The nature and pattern of Indian investment has been changed with the participation of multinational enterprises in international market in early 1990s. The government policy towards outward investment played important role to encourage investment in abroad. Over the last three decades the trends of inward FDI and outward FDI shows both flows were low during the early part of the decade and they gained power during the latter half.

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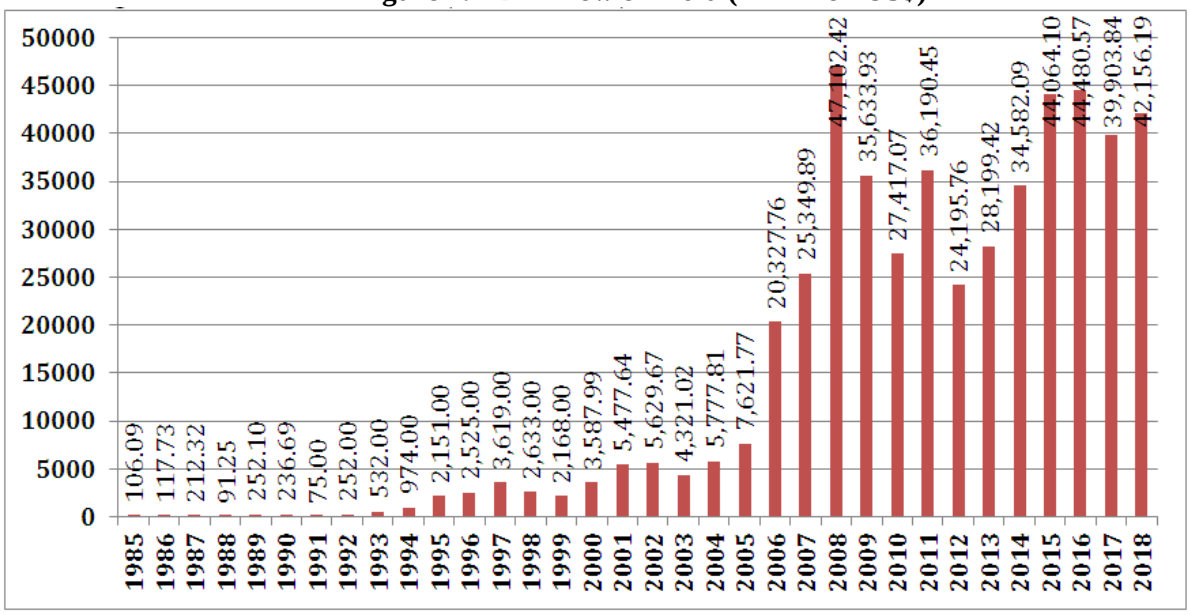
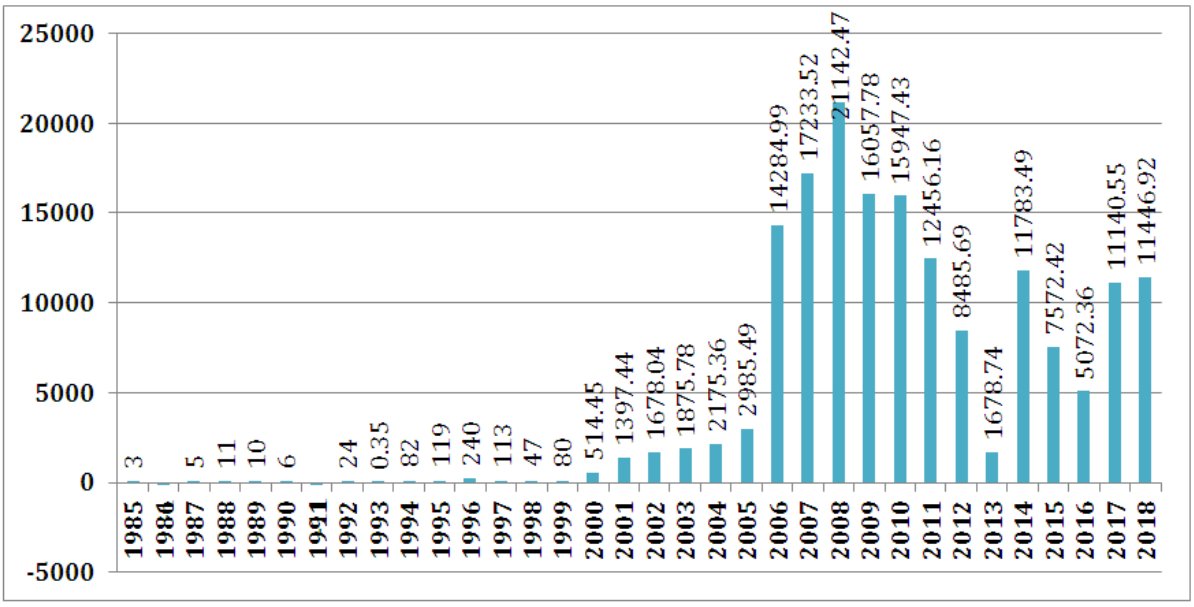
Figure 1: FDI inflow of India (in million US$)



Source: UNCTAD

When restrictions and barriers removed from foreign investment, inward FDI started to increase. India had not received FDI inflows till 1980. After 1981, it started receiving FDI inflow. In Figure 1 shows that the FDI inflows into India rose to 252 millions of US Dollars in 1989 from 106 millions of US Dollars in 1981. In 1991 it declined to 75 USD million. Inward FDI was increasing very slowly at starting point but after 19991 it was increasing on and off till 2005. In 2006 it increased in speed by 20,327 USD million and reaches to the highest point in 2008 which was 47,102 USD million.

Figure 2: FDI outflow of India (in million US$)



Source: UNCTAD

Figure 2 represents the statistics of outward FDI of India during 1985-2018. Starting of 1990s there was slow growth in foreign investment. During 1991, as part of economic reforms, India improved its OFDI policy. It was mainly based on stability of economy which was related to fiscal and current account imbalances and exchange rate regime. In 2000 it increases to 514 USD million. In 2008 OFDI flow increased by 40 times from 2000. Outflow from India has also taken a huge hit after the economic recession of 2008. Investment in foreign highly increased in 2007-08 and it reached to the highest point in 2008 which was 21142 USD million. In 2008 global crisis influenced the country's economy. Indian firms are generally cautious of further expansion in abroad. Consequently, outflow started to decline and its impact can be seen in 2013 which was 1678 USD million.

The extant literature on macroeconomic drivers in the country of origin is limited and mostly confined to developed countries. Studies focusing on home country macroeconomic drivers of outward FDI from developing countries are very less and majority of them focus on trends of OFDI and utilize panel data analysis that conceals country specific determinants of OFDI flows. Furthermore, the impact of short run and long run impact of macroeconomic drivers on OFDI is seldom analyzed.

In view of the above, the purpose of the present study is to identify the macroeconomic drivers of OFDI from India. Our time series analysis includes most up-to date information related to these macro factors covering time period 1985 to 2018.

II. LITERATURE REVIEW

In this section we discuss about existing literature on outward FDI from developing countries specially from Asian region. From the perspective of determinants of outward FDI from developing countries significant studies have been done by Banga (2005). The study provides a theoretical structure with the help of panel data analysis for describing outward FDI from Asian region. The author found that trade-related drivers, capability-related drivers and domestic drivers are significant to outward FDI. Das (2013) who explained that trade encourage outward FDI which give opportunity to domestic firms to acquire market skills and knowledge form foreign market. As a result GDP per capita, trade openness, political risk and technology expenditure are significant to OFDI.

Tracing the evolution of outward FDI, it is revealed that it has its origin from the developed countries. Earlier studies on FDI were based on international trade theory. The theory regarding MNCs was first developed by Hymer (1960) who explained that imperfect market across different countries marks the decision for repositioning of production facilities leading to 'traffic jumping'. Further Rugman(1986), developed the theory of internalization which demonstrate FDI as means to replace markets by internalizing the operations, especially in intermediate product markets across affiliates in various host countries. This is called 'efficiency- seeking FDI. This theory is failed to explain why FDI have tendency to exploit the relevant assets in some countries but not in others. In this standpoint Dunning, (1993) OLI approach specifically combined the locational factors with firm-specific advantages and transaction costs elements for explaining international production. Dunning's eclectic theory on international production emerged as the most comprehensive approach among the existing theories that explain the occurrence of FDI.

The above earlier theories are mainly focused on FDI from developed countries to developing countries. These theories could not explain the rise of outward FDI from developing countries like Asian counties to developed countries.

Pradhan (2004) analyzed the determinants of outward FDI of Indian manufacturing enterprises. Age, size, R&D intensity, skill intensity and export orientation were taken as independent variables. The Tobit model had been used for testing the

hypothesis. The result explained the positive impact of firm age on outward investment. Technological activities of knowledge base industries played an important role to increase the foreign investment activity. Several industries improved the managerial skills of firm. Firms encouraged the export to push FDI related activity. Overall the paper elaborates the significant participation of Indian industries on overseas investments.

Banga (2007) conducted an empirical analysis to study the factors that drive the OFDI for the 13 developing economies from 1980 to 2002. The empirical results based on panel data analysis indicate that both the import and export have positive impact on OFDI. Moreover, the increase in free trade agreements opened up larger markets for OFDI. Also, the inward FDI flows the education level and low cost of production positively influence OFDI.

Das (2013) dealt with the determinants of OFDI in the 56 developing countries using panel data analysis for the period 1996-2010. The result showed GDP per capita, trade openness, political risk and technology expenditure have positive effect on OFDI. Bhasin (2013) dealt with examining the determinants of outward FDI of ten countries from South, East and South-East Asian regions. The result based on fixed effect panel regression indicted a significant impact of real GDP and government policies on OFDI. Bano and Tabbada (2015) studied the determinants of OFDI of six Asian developing countries between 1980 and 2011. Ordinary least square regression results pointed to the significant role of foreign reserve and GDP proved to be most significant factors for all the six countries. Kakoti (2019) found the role of real GDP, exchange rate and real interest rate in driving OFDI from India for the period 1980-2016. Saikia et al. (2020) studied the factors that drive the boom in OFDI of Indian Firms. The study applied two stage models those influenced decision to internationalization and amount to be invested. The study used probit model and ordinary least squares model. The result found that prior experience and institutional advantage as significant drivers of OFDI.

The above review of literature suggests the factors of developing countries to promote the OFDI trends. The identified factors differ across studies due to differences in countries analyzed, methodologies and time period. Amongst the studies focusing on developing countries, a good number of studies are based on firm level factors driving OFDI (Pradhan, 2007; Baskaran, et al. 2011; Saad et al., 2011). Considering that the environmental factors associated with a firm's country of origin play a crucial role in the development of a firm's competitive advantages, the analysis of home country macroeconomic drivers is important. However, the macroeconomic drivers of OFDI from developing countries mostly use panel data analysis for a group of countries which fail to unearth country specific factors (see e.g., Banga, 2004; Banga 2007; Das, 2013; Bhasin, 2013). Pesaran and Smith (1995) and Pesaran et al. (2000) raise the issue of parameter heterogeneity across countries and suggest that panel regressions mask important cross-country differences. As a result, policy inferences drawn from panel estimates may be misleading. The present study based on time series data of India in tends to fill this gap.

III. MODEL SPECIFICATION AND ESTIMATION STRATEGY

Our study categorizes the home country macroeconomic drivers on the basis of study of Banga (2004) into a) Trade related b) Capability related and c) Domestic factors. Our model is defined as:

OFDI = f(GDPP,EXPO,INFRA, REER, INT, PAT, EDU)

Where, OFDI is the ratio of outward FDI stock to the GDP. The trade related drivers of OFDI include exports measured as proportion of GDP and represents the impact of trade on OFDI. Higher level of exports ensures access to foreign markets and promotes OFDI by lowering uncertainties related to external markets. The trade related

drivers of course provide opportunities for undertaking OFDI but may not be sufficient for materialization of OFDI. The OFDI also requires capabilities in form of information of the host country, managerial and technical knowledge etc.

The higher the number of educated people in a country the better is the skill and quality of the labor. The enrollment ratio at the secondary education level (EDU) is taken as a proxy for the skilled labor in the home country. We expect a positive relationship between education and OFDI. Another capability related factor is cost of capital proxies by lending rate (INT). A low interest rate in the home country indicates capital abundance. The lower the interest rate, the more profitable would be outward investment.

With rapid expansion of the modern sector, factor endowment in the country begins to shift from low-skilled labor to relatively more physical and human capital abundance, paving the way for investment-driven industrialization and OFDI. The shift in factor abundance prompts firms to transplant their existing operations to other countries where they can produce cheaper. Outward FDI could take place to exploit various firm-specific and country-specific advantages. Other domestic push factors include domestic infrastructure. The deficiency and high cost of domestic infrastructure has a direct bearing on cost of operation and thus may trigger OFDI (Banga,2007). We proxy the availability of infrastructure (INFRA) with the availability of transportation and communication as a share of GDP. Finally, the effect of currency strength is captured through real effective exchange rate (REER).Increase in currency strength tends to favor outward investment, as a strong currency can buy more in real terms. The appreciation of home country currency lowers the capital requirements of foreign investments in domestic currency units, making it easier to raise capital than in the case of a depreciating currency (Das, 2013). The data for the OFDI, GDP, GDP per capita and inward FDI are taken from UNCTAD and the data for the remaining variables are obtained from World Development Indicators, World Bank.

The empirical method begins with Augmented Dickey Fuller (ADF) unit root test to check for their stationarity properties. The study adopt Autoregressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran et al. (2001). This approach has some econometric advantages over the Engle and Granger (1987) cointegration test and maximum likelihood based approach proposed by Johansen and Juselius (1990) cointegration techniques. First, endogeniety problem and inability to test hypotheses on the estimated coefficients in the long run associated with the Engle and Granger (1987) method are avoided. In the ARDL method all the variables are supposed to be endogenous and parameters are estimated simultaneously in long run and short run (Khan et al., 2005). According to Pesaran and Shin (1999), modeling the ARDL with the appropriate lags takes care of both serial correlation and endogeneity problem. Second, the econometric methodology does not require establishing the order of integration amongst the variables and of pre-testing for unit roots which means that the test on the existing relationship between variables in levels is applicable irrespective of whether the underlying regressors are purely I (0), purely I (1) or a mixture of both. Most importantly, as argued by Narayan (2004), the small sample properties of the bounds testing approach are far superior to those of multivariate Cointegration. The model could be used with limited sample data (as is the case with the present study) in which the set of critical values were developed originally by Narayan (2004) using GAUSS.

The existence of long run relationship between the underlying variables is detected through the F-statistic (Wald test). The long run relationship is said to exist if the F-statistic value exceeds the upper critical value bound. In the presence of long run relationship, the long run coefficients of the selected ARDL model are estimated. The third step involves reparameterization of ARDL Model into Error Correction Model (ECM) form. ECM is used to test for the speed of adjustment towards the

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equilibrium in the long run. Once the ECM model has been estimated, the cumulative sum of recursive residuals (CUSUM) and the CUSUM of square (CUSUMSQ) tests are applied to assess the parameter stability.

The Granger Representation Theorem (Engle and Granger, 1987) states that if a set of variables is cointegrated, then there exists a valid error correction representation of the data, in which the short-term dynamics of the variables in the system are influenced by the deviation from long-term equilibrium. In a VECM, short-term causal effects are indicated by changes in other differenced explanatory variables. The long-term relationship is implied by the level of disequilibrium in the cointegration relationship, i.e., the lagged error correction term (ECT). The Vector Error Correction model is thus useful for detecting both short- and long-term Granger causality tests. The VEC Model can be formulated as follows:

$$\Delta y_{1t} = \mu_1 + \gamma_1 z_{t-1} + \sum_{i=1}^{p-1} \theta_{1i} \Delta y_{1t-i} + \sum_{i=1}^{p-1} \delta_{1i} \Delta y_{2t-i} + \varepsilon_{1t} \quad (2)$$

$$\Delta y_{2t} = \mu_2 + \gamma_2 z_{t-1} + \sum_{i=1}^{p-1} \delta_{2i} \Delta y_{2t-i} + \sum_{i=1}^{p-1} \theta_{2i} \Delta y_{1t-i} + + \varepsilon_{2t} \quad (3)$$

where z_{t-1} is the error correction term derived from the cointegrating vector. θ and δ are the short-run parameters to be estimated, p is the lag length, and εt are assumed to be stationary random processes with a mean of zero and constant variance. For each equation in the VEC Model, short-term Granger causality to assess whether endogenous variables can be treated as exogenous may be tested by the joint significance of the coefficients of each of the other lagged endogenous variables in that equation. The short term significance of sum of the each lagged explanatory variables (θ's and δ's) can be exposed either through joint F or Wald $\chi 2$ test. Besides, the long-term causality is implied by the significance of the t –tests of the lagged error correction term. However, the non significance of both the t-statistics and joint F or Wald $\chi 2$ tests in the VECM indicates econometric exogeneity of the dependent variable.

IV. EMPIRICAL RESULTS

Before applying the ARDL bound test we first investigate the unit root test. We have applied both Augmented Dickey-Fuller (ADF) test and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test to check the order of integration of the variables. Following are the result of Unit root test:

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Table I: Result of ADF unit root test

Variable	Lag (based on SIC)	t-statistic	Critical values at 1%	Critical values at 5 %	Critical values at 10%
OFDI	1	-0.445753 (0.8891)	-3.653730	-2.957110	-2.617434
ΔOFDI	0	-3.429473 (0.0172)	-3.653730	-2.957110	-2.617434
GDP	0	-5.054905 (0.0002)	-3.646342	-2.954021	-2.615817
ΔGDP	1	-5.801110 (0.0000)	-3.661661	-2.960411	-2.619160
EXPO	0	-1.275247 (0.6292)	-3.646342	-2.954021	-2.615817
ΔEXPO	0	-5.854769 (0.0000)	-3.653730	-2.957110	-2.617434
INFRA	0	-1.409745 (0.5656)	-3.646342	-2.954021	-2.615817
ΔINFRA	0	-4.576629 (0.0009)	-3.653730	-2.957110	-2.617434
REER	0	-1.493309 (0.5245)	-3.646342	-2.954021	-2.615817
ΔREER	0	-5.509707 (0.0001)	-3.653730	-2.957110	-2.617434
INT	0	-3.218414 (0.0278)	-3.646342	-2.954021	-2.615817
ΔINT	0	-7.874303 (0.0000)	-3.653730	-2.957110	-2.617434
PAT	2	1.444911 (1.0000)	-4.284580	-3.562882	-3.215267
ΔPAT	1	-6.514169 (0.0000)	-4.284580	-3.562882	-3.215267
EDU	7	-1.121961 (0.6914)	-3.711457	-2.981038	-2.629906
ΔEDU	6	-7.306381 (0.0000)	-3.711457	-2.981038	-2.629906

Table II: Result of KPSS unit root test

variable	Bandwith (based on Bartlett Kernal)	LM statistic
OFDI	5	0.575761
ΔOFDI	4	0.170733
GDP	6	0.465381
ΔGDP	14	0.246227
EXPO	5	0.606700
Δ EXPO	2	0.189905
INFRA	4	0.664597

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ΔINFRA	2	0.067338
REER	4	0.518026
ΔREER	1	0.264970
INT	4	0.329820
ΔINT	24	0.368020
PAT	5	0.620847
ΔPAT	4	0.726783
EDU	4	0.736508
ΔEDU	18	0.340058

Note: Critical values at 1%, 5% and 10% are 0.739, 0.463 and 0.347 respectively

Table I presents the result of ADF unit root test. All the variables are stationary at the first difference except real GDP and INT which are stationary at level. The results of the KPSS test (table II) are in conformity with those of ADF test in the sense that none of the series is I(2).

From the results of Unit Root Test, it may be concluded that none of the series under consideration is I(2) and hence, the ARDL bounds testing approach could be proceeded with.

Table III: Results of ARDL Bound Test

	Critical values					
F Statistics = 3.757800 **(**N=32)	α = 0.01		α =0.05		α =0.10	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	2.73	3.9	2.17	3.21	1.92	2.89

Table III represents the result of ARDL bound test for cointegration. We apply bound test to confirm whether cointegration exists or not. The result shows F-stats value is 3.757800 which is the greater than the value of 1(I) 2.08 at 5% level of significance. The results thus confirm the existence of long run relationship among the variables.

Table IV: Result of long-run coefficients from ARDL Model

Regressor	Coefficient	t-statistics	Probability
GDP	-0.213886	-2.406583	0.0331
EXPO	0.271984	6.211439	0.0000
INFRA	-0.851111	-6.310132	0.0000
REER	-0.002732	-0.952040	0.3599
INT	-0.003491	-0.061520	0.9520
PAT	0.000709	10.47002	0.0000
EDU	-0.001298	-0.170037	0.8678
R-squared	0.996119	Durbin-Watson	1.867069
Adjusted R-squared	0.989973	Heteroskedasticity	F= 0.793490 (p val = 0.6841)
F-statistic	10.32356	Ramsey's Reset	F = 0.002402 (p value = 0.9618)

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Table IV, represents the long run coefficient of the ARDL model. In the long run GDP, INFRA and PAT turn out to be the significant drivers of OFDI.

Our result shows that there is negative long run relationship between GDP and OFDI in India. The estimated coefficient of real GDP has a negative sign and but it has significant value. It shows when real GDP increases by one percent, FDI outflows decreases by 0.213886 per cent. Our findings are similar to result found by Singh (2017). Singh found the negative relationship between GDP and OFDI in long run in India. The lower GDP helps to domestic economy grow with a healthy growth rate.Therefore India prefers to operate from the home country which reduces FDI outflows.

The long run result shows that export and patent have positive and significant impact on the FDI outflows from India.In particular, with one percentage point increase in export, 0.271984 percentage point increase is there in FDI outflows. The increased export shows the increasing competitiveness of the Indian economy. The result tallies with the study of Liu et.al (2015) who found complementary relationship between export and OFDI. Our result is different than Mat Saad (2013) who found patent is negatively significant to OFDI. Technology and innovation are found to be important factors of outward FDI in India.

Table V: Result of short-run coefficients from ARDL Model

Regressors	Coefficients	t-statistics	Probability
GDP	-0.030322	-0.705024	0.4943
EXPO	-0.054618	-0.880079	0.3961
INFRA	-0.275516	-1.774092	0.1014
REER	-0.004822	-1.535421	0.1506
INT	-0.003331	-0.061631	0.9519
PAT	-0.000376	-1.284243	0.2233
EDU	-0.014965	-1.926733	0.0780
ECT	**-0.954036**	**-7.507796**	**0.0000**

The negative and significant error correction term in Table V reaffirms that the variables are co-integrated. The speed of adjustment towards long run equilibrium is 95% annually. In other words, the system corrects its previous period disequilibrium at a speed of 95% annually. The adequacy of the dynamic specification of the models is judged on the basis of various diagnostic statistics. The Durbin Watson (DW) test statistics indicate the absence of autocorrelation in the model. The Ramsay Reset test suggests the appropriateness of the functional form of the models.

Figure 3: stability test (CUSUM)

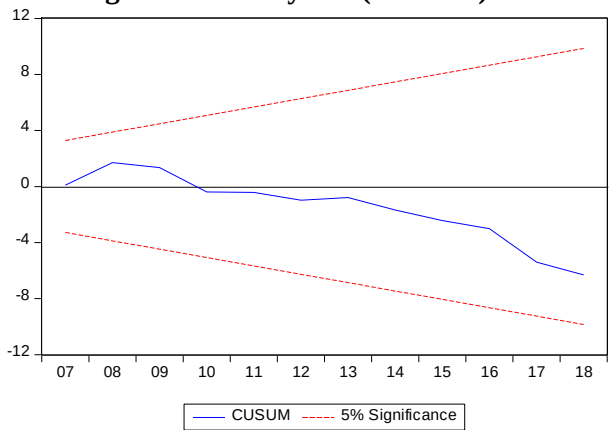

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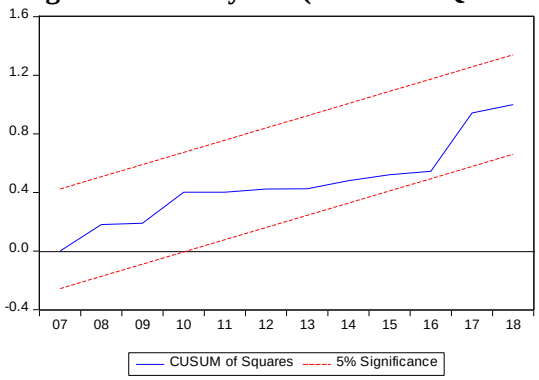
Figure 4: stability test (CUSUM SQUARE)



For checking structural break is present or not in our model we applied cumulative sum (CUSUM) and cumulative sum of square (CUSUMSQ) test. Figure 3 and 4 represents the plots of CUSUM and CUSUMSQ, respectively. It shows that CUSUM and CUSUMSQ test statistics fall inside lower and upper critical bound of 5% is significance. The variables are stable over the taken time period.

Table VI: Result of Block Exogeneity Wald Test

Hypothesis	Chi-sq	df	Prob.
GDP does not cause OFDI	3.678538	2	0.1589
OFDI does not cause GDP	3.149925	2	0.2070
EXPO does not cause OFDI	10.80712	2	0.0045
OFDI does not cause EXPO	3.124653	2	0.2096
INFRA does not cause OFDI	17.75826	2	0.0001
OFDI does not cause INFRA	11.92987	2	0.0026
REER does not cause OFDI	1.959544	2	0.3754
OFDI does not cause REER	0.189880	2	0.9094
INT does not cause OFDI	2.169968	2	0.3379
OFDI does not cause INT	1.968562	2	0.3737
PAT does not cause OFDI	17.35915	2	0.0002
OFDI does not cause PAT	0.472538	2	0.7896
EDU does not cause OFDI	0.997941	2	0.6072
OFDI does not cause EDU	4.507840	2	0.1050

We test the causal relationship among our variables. For the direction of causality among the variables we conduct VEC Granger causality or block exogeneity Wald Test (Table VI). The results of the test reveal a unidirectional causality from REER to OFDI and PAT to OFDI.

V. CONCLUSION AND POLICY IMPLICATIONS

The present study analyses the macroeconomic drivers of outward foreign direct investment in India for the time period of 1985-2018. Towards this end ARDL bound testing approach and block exogeneity test have been applied. The ADF and KPSS result found all the variables were stationary at the first difference except real GDP and INT which are stationary at level. In the long run GDP, INFRA and PAT turn out to be the significant drivers of OFDI. The coefficient of infrastructure variable is found to be negative and significant which means infrastructural deficiency is not a push factor that drive the OFDI. The capability drivers including innovation and skills found to be significant which means acquisition of greater strategic assets with innovation motivates overseas investment decisions. In short run none of the

determinants affect the OFDI from India. The causality analysis revealed a unidirectional causality from REER to OFDI and PAT to OFDI.

Findings suggest exports from India is significant to OFDI in long run. Government must encourage outward oriented policies. Innovation and skills are the important drivers of OFDI. India must increase its investment in innovation and skills as a component of policies promoting OFDI.

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