Home Economy Trade Effect of Outward FDI: Evidence from India

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ABSTRACT

The surge in outward foreign direct investment (OFDI) flows from emerging economies has made it imperative to examine the impact of such flows on home country. An important area of enquiry is how the increased OFDI flows affect home country trade position- in terms of its causal relationship with both exports and imports. While the early theoretical literature posits OFDI and trade as substitutes, relatively later studies have argued that depending on the nature (vertical or horizontal FDI) and sector of investment, OFDI and trade could be complementary. India is not only the fastest growing emerging market but has recently become an important source of investment from emerging markets. The phenomenal rise in outward investment coupled with the importance of trade in India's economic structure raises concern about the impact of former on the latter. In this context, this study examines the impact of India's OFDI flows during 1997 to 2017 on its imports and exports. Using relatively recent time series econometric techniques that accounts for the existence of structural breaks in the underlying data, the results suggest while there does not exist long-run relationship between India's OFDI flows and its trade (exports and imports), OFDI flows granger causes India's imports in the short run. The observed short- run causality is found to be in line with the growing importance of resource seeking FDI from India and partially points out towards the role of India's involvement in the regional production networks. Managerial and policy implications are discussed.

Keywords: Foreign Direct Investment, Trade, India, Structural Breaks, ARDL Bounds Testing, Todo-Yamamoto Granger Causality.

JEL codes: F21, F23

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1. INTRODUCTION

A striking feature of the globalization process over the last decade has been the increasing involvement of emerging economies into the world economy. Outward FDI (OFDI) from emerging economies has risen phenomenally in both absolute as well as relative terms, thereby capturing the attention of scholars worldwide. While developed economies still dominate the global FDI outflows, the share of emerging economies has surged from an average of 11 percent in 1990s to 21 percent during the period 2000 to 2015. In 2015, emerging markets accounted for 27 percent (US $400 billion) of the global FDI flows, up from 5 percent (US $ 13 billion) in 1990. However, with the exception of Asia and Latin American region, other regions have generally lagged behind in their contribution to the outward FDI by emerging economies. On an average, emerging Asian economies have accounted for three-fourth of OFDI flows from emerging markets since 2000. A further disaggregation of data at country level reveals that more than half of the emerging markets OFDI is driven by just five nations- the BRICS, more notably by China, Russia and India in the order. The manifestation of the phenomenon is the growing number of global companies from BRICS nation- from just 17 in 2000 to 121 in 2016 [1]. It is also worth noting that emerging economy enterprises use international expansion as a springboard to acquire or access strategic assets not available at home and in doing so they overcome their latecomer disadvantages (Matthews, 2002; Luo and Tung, 2007). UNTCTAD (2006) also reported that the recent wave of South-North OFDI is mainly driven by market and strategic asset-seeking motive.

Although the EMNE phenomenon has generated a lot of theoretical debate and empirical studies, a large part of this literature focuses on the determinants of OFDI (Carstensen and Toubal, 2004; Du *et al.*, 2008; Williams, 2009; Bhaumik *et al.*, 2010; Gorynia *et al.*, 2010; Armutlulu *et al.*, 2011 and; Holtbrügge and Kreppel, 2012; Varma and Nayyar, 2013; Varma et al., 2015), ignoring an important aspect relating to the home country effect of increasing OFDI flows (Barba Navaretti and Venables, 2004; Vahter and Masso, 2006; Globerman and Shapiro, 2008; Kokko, 2006; Herzer, 2011; Amann and Virmani, 2014; Paul and Bhasin, 2016). The neglect is understandable owing to the negligible OFDI from emerging markets in the past but with the increasing OFDI flows it becomes

imperative to examine their impact on home country (Globerman and Shapiro, 2008). The impact of OFDI on home country's trade (exports and imports) is of great importance for policy makers and business firms alike (Paul and Bhasin, 2016). For policy makers, a matter of concern is if OFDI worsens the trade position of the country causing an adverse impact on the country's balance of payment. Accordingly, some scholars have examined the trade effect of OFDI for individual emerging markets such as Malaysia (Goh et al., 2012), China (Lin, 2016) and for the group of emerging markets (Globerman and Shapiro, 2008; Paul and Bhasin, 2016). However, with panel data analysis, question arises as to whether the results of the generic studies which apply to the average country in the sample, are also applicable to specific regions or nations. This is because outward FDI (OFDI), like any other macroeconomic variable, shows substantial cross country differences depending on the prevailing socioeconomic and political environment (Dasgupta, 2015) and the relationship between the OFDI and important economic variables is likely to be country specific (Lee, 2010). Accordingly, in this study has focussed on a single emerging economy, India, which is also a relatively understudied as compared to other emerging markets (Ramamurti, 2009). Moreover, although the trade effects of OFDI are likely to vary for a country depending on the industry or sector type, there is a need to explain this relationship on a macroeconomic level using aggregate data (Verma and Bernnan, 2011).

India is not only the fastest growing emerging market but has recently become an important source of investment from emerging markets (Kumar and Chadha, 2009; Paul and Mas, 2016) [2] [3]. The absolute and relative amount of outward FDI from India has surged from a small amount of USD 6 million in 1990 to USD 7 billion in 2015 and from virtually 0 percent of emerging Asian economies OFDI in 1990s to an average of 4 percent during 2000 to 2015 respectively. The phenomenal rise in outward investment coupled with the importance of trade in India's economic structure raises concern about the impact of former on the latter. In this backdrop, the objective of present study is to examine the existence and nature of relationship of Outward Foreign Direct Investment (OFDI) flows from India with its exports and imports during the period 1997 to 2016.

The contribution of this paper is that it is, to the best of knowledge, the first study to examine the trade effect (both exports and imports) of OFDI flows

from India, as compared to extant studies that have focused only on exports. Secondly, the study has also taken into consideration the possibility of presence of structural breaks in the macroeconomic time series under consideration and the resultant drawback of standard unit root test which are likely to give misleading results in the presence of structural breaks (Nag and Mukherjee, 2012). Accordingly, this study uses recent econometric test for unit root developed by Lee and Strazicich (2003, 2004) that uses Lagrange Multiplier (LM) statistics and allow for at most two breaks under both null and alternate hypothesis. The rest of the paper is structured as follows: following the introduction, section 2 presents the literature review, section 3 describes research methodology, discussion of empirical results is presented in section 4 and the final section concludes.

2. THEORETICAL AND EMPIRICAL BACKGROUND

Outward FDI and International Trade

An important issue in the literature on international economics and business is nature of the relationship between outward FDI and home country's international trade (exports and imports), i.e., whether OFDI is a substitute for, or a complement to, trade (Pain and Wakelin, 1998; Verma and Brennan, 2011). In the early literature, Mundell (1957) used a theoretical model to demonstrate that in traditional Heckscher-Ohlin economy, international production and exports are substitute of each other. A firm is likely to undertake OFDI after the initial exploration of foreign markets through the least costly and least risky mode of entry- exports (Johanson and Vahlne, 1977; Johanson and Wiedersheim-Paul, 1975). Only when the demand in the host country is large enough to warrant high risk-cost entailing foreign production, does the firm undertake FDI as an alternate to exporting (Vernon, 1966). However, subsequent theoretical developments have shown that OFDI and trade are not necessarily substitute of each other. The theoretical model by Kojima (1982) and Ozawa (1991) proposed that instead of occurring in sectors where country has a comparative advantage, FDI occurs in a sector where the country has comparative disadvantage which implies that a complementary relationship can exist between OFDI and trade. The main limitation of these models is that their analysis in terms of factor mobility or movement of goods fails to take into account the existence of MNEs.

The industrial organization theory introduces important new elements to understand the relationship between trade and horizontal FDI. While entering the foreign market, a firm weighs various costs and benefit associated with different modes of entry- exporting, licensing and FDI. According to the OLI paradigm (Dunning, 1977), a firm's choice among the three strategies (exporting, licensing or FDI) depends on three types of advantages- ownership "O" advantages (unique and superior advantages proprietary to the firm); location "L" advantages (host country resource endowments and institutional advantages) and internalization "I" advantages (arising as a result of imperfect markets for intermediate goods). Foreign production or FDI takes place when firm can exploit all the three advantages, i.e., when it has ownership advantages that it wants to exploit in conjunction with the locational advantage of host country and which it cannot do more profitable other than internalization. Exporting is chosen over foreign production when the targeted foreign market does not have locational advantages in terms of resource endowments and favourable business environment. Lastly, if the firms benefit only from ownership specific advantages, it will choose to license abroad. Thus, the OLI paradigm, on the basis of its three advantages, confirms the substitutionary relationship between FDI and international trade. Another theory of MNE that holds implication for the FDI- trade relationship is "proximity-concentration" theory proposed by Brainard (1997). According to this theory, a firm's decision to export or engage in foreign production would depend on the relative advantage of proximity to consumers and economies of scale advantage of concentrating the production in one location. If the trade cost (transportation costs and tariffs) is high, then firms are more likely to locate their production abroad near to final consumers – implying that when gains from proximity are higher than gains related to concentration, OFDI will replace exports. Similarly when economies of scale advantage from locating production in one location are higher than gains from proximity, firms will prefer exports to OFDI. Hence, OFDI and trade are substitutes for each other. The MNE models assert that overseas investment replaces exports because they focus on trade in final goods. The relationship between trade and OFDI is likely to be complementary when we recognize the trade in intermediate goods and vertical FDI. For instance, Helpman (1984) and Helpman and Krugman (1985) showed that vertical outward direct investment undertaken

by firms to acquire raw materials and input (upstream) or to build trade supporting infrastructure abroad in the form of distribution networks, customer care centers, service centers etc. (downstream) may lead to complementary relationship between the OFDI and trade owing to the enhanced intra firm transfers. Helpman and Krugman (1985) provided the evidence of complementarity between trade and efficiency seeking OFDI from industrialized countries to the emerging countries.

Although empirical studies on the relationship between OFDI and trade have been conducted at various levels- Country (Grubert and Mutti, 1991; Clausing, 2000), industry (Lipsey and Weiss, 1981; Brainard, 1997; Kawai and Urata, 1998), firm (Lipsey and Weiss, 1984) as well as product level (Blonigen, 2001), these studies are largely restricted to developed countries and have fallen short of arriving at any general consensus on the trade effects of OFDI (Lipsey and Weiss, 1984; Kim and Rang, 1997; Head and Ries, 2001; Martin, 2010; Verma and Bernnan, 2011, 2013; Goh et al., 2012; Paul and Bhasin, 2016). While some studies have advocated the substitution trade effect of OFDI (Horst, 1972; Svensson, 1996; Bayoumi and Lipworth, 1997 and Ma *et al.,* 2000; Paul and Bhasin, 2016), others have pointed out the complementarity of this relationship (Lipsey and Weiss, 1981, 1984; Markusen, 1984; Brenton, Di Mauro, and Lücke, 1999 and Kawai and Urata, 1998). Literature has also shown that the nature of this relationship depends on the type of industries (Kawai and Urata 1998, Buch, Kleinert, and Toubal 2003) and the location of the host countries (Graham 1996, Brainard and Riker 1997a, 1997b). For instance, Lim and Moon (2001) argued that OFDI by Korean firms would have a positive effect on home country exports if foreign subsidiaries were located in less developed countries. While the empirical evidences supporting the existence of relationship show mixed results in terms of substitutionary or complementary relationship, some studies have defied the existence of any relationship between trade and OFDI. The evidence of no relationship is found for both advanced and emerging countries. For instance, Kim and Rang (1997) in their study on South Korea and Japan found that OFDI does not have any effect on exports in these countries. Similarly, in line with the results of Globerman and Shapiro (2008) for emerging economies, Goh et al. (2012), using gravity model, found that OFDI has no significant impact on Malaysia's bilateral imports and exports.

In context of India, scholars have explored the long run effect of international trade and investment related macroeconomic push factors on outward FDI and found that trade related factors are driving forces of Indian OFDI (Dagupta, 2009). However, the paper did not examine the trade effect of OFDI from India. Among the papers that have attempted to examine the home country trade effect of OFDI have focused only on exports. Verma and Bernnan (2011) examined the relationship between OFDI and exports over the period 1981 to 2006. Using vector error correction model (VECM), they concluded that in both short and long run it's the growth in exports that causes growth in OFDI rather than other way round, the results of their study could not provide a clear cut evidence on the substitution or complementary relationship between exports and OFDI. In contrast Pradhan (2007) asserted that OFDI from India positively influences exports. Using Maximum Likelihood Tobit estimation they concluded that an increase of Rupees one crore in OFDI stock (relative to net worth) in last year, on an average, leads to Rupees 0.133 crore increase in exports (relative to sales) in the current year. It is argued that taking exports as a proxy for home country's international trade may tell only half part of the story, as increased trade as a result of OFDI can take form of both increased exports and imports. It can be expected that OFDI will increase exports (imports) for goods for which home country has a location advantage (disadvantage) (Globerman and Shapiro, 2008). Therefore, this paper endeavors to determine the existence and nature of relationship of OFDI with both exports and imports.

Since the onset of economic reforms in India from 1991, it is seen that India has experienced phenomenal rise not only in OFDI but also in trade volumes (both exports and imports). According to World Development Indicators, exports and imports as percentage of GDP have doubled from their level in 1996 to be recorded at around 20 per cent and 22 per cent respectively in 2015. During the same period OFDI flows have grown at the CAGR of about 20 percent rising from USD 240 million (virtually 0 per cent of GDP) in 1996 to around USD 8 billion in 2015 (accounting for 0.4 per cent of GDP) [4]. Hence, a priori, a positive relationship can be expected between OFDI flows from India and its exports and imports-- leading to the following hypotheses:

Hypothesis 1: India's exports are positively associated with its OFDI flows.

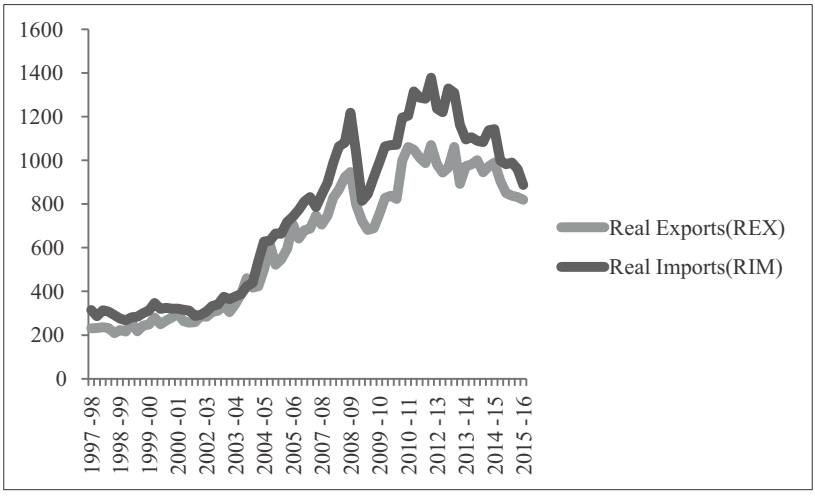
Hypothesis 2: India's imports are positively associated with its OFDI flows.

3. RESEARCH METHODOLOGY AND EMPIRICAL ANALYSIS

Data- To examine the proposed relationship, time series data on exports, imports and OFDI flows is required. Data on outward FDI is available in the form of stock as well as flows. This study uses flow measure because the OFDI behaviour can be more comprehensively measured for flows than for stocks (Dasgupta, 2009).

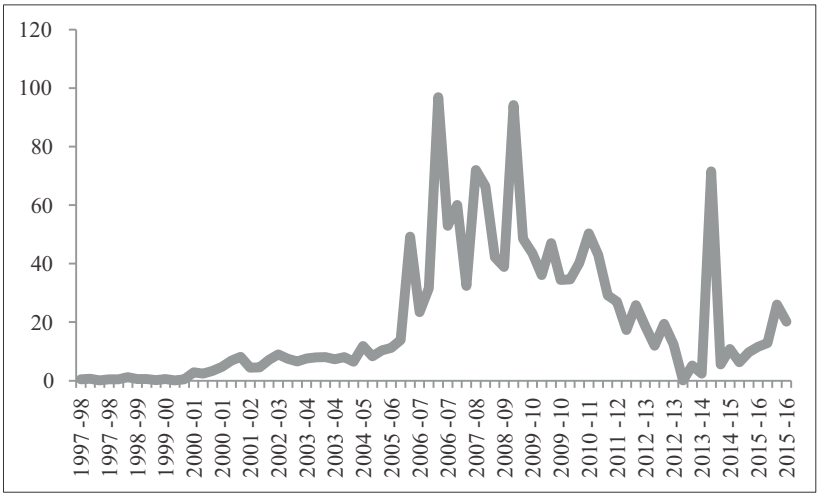
The quarterly data on nominal OFDI flows, exports and imports over the time period 1997-98 (Q1) to 2016-17 (Q4) is obtained from Handbook of Statistics on Indian Economy published by Reserve Bank of India. The variables are measured in USD million and converted in real terms using the GDP deflator (Base=2010) obtained from International financial statistics of International Monetary Fund. Hence the data on real OFDI flows (ROFDI), real exports (REX) and real imports (RIM) is measured at constant prices (base year- 2010). The graphs of all the series are depicted in figure 1 and 2. While exports and imports have been on upward trend since the late 1990s (Fig 1), OFDI from India gained momentum only after 2003-04 but were hit severely since 2009-10 owing to the global recession caused by US sub-prime crisis of 2008 and euro-zone crisis of 2010 (Fig 2).

Figure 1 : India's Real Exports and Imports for the period 1997-2016.



Source: Handbook of Statistics on Indian Economy, Reserve Bank of India.

Figure 2: India's Real Outward FDI flows for the period 1997-2016



Source: Handbook of Statistics on Indian Economy, Reserve Bankof India.

Methodology

Unit Root Test

The analysis of time series data requires examining the stationarity property of the underlying time series, i.e., whether the series is trend or difference stationary. The stationarity properties can be examined using alternate unit root tests such as Augment Dickey-Fuller (ADF, 1979), Phillip-Perron (PP, 1988) or Kwiatkowski, Phillips, Schmidt, and Shin (KPSS 1992). However, Perron (1989) argued that these standard unit root tests are likely to produce unreliable results in the presence of structural breaks in the economy. Given that Indian economy has undergone various structural changes in the period of this study (1996 to 2015), it is expected that the macroeconomic variables under consideration would exhibit structural breaks in their behaviour over a period of time- rendering the result of standard unit root test as misleading (Nag and Mukherjee, 2012). Zivot and Andrews (1992) pioneered the "endogenously determined" single break unit root test which was subsequently extended to examining the unit root under two break stationarity alternative (Lumsdaine and Papell, 1997) and later up to five breaks (Kapetanios, 2005). These test endogenously determine the break point where the unit root t-test statistic is the most negative. Alternative

"endogenous break" unit root tests are proposed by Perron (1997) and Vogelsang and Perron (1998) that examines the significance of dummy variables in testing the regression that captures structural breaks. An important limitation of these tests is that they omit the possibility of break under the null of unit root (Bec and Bassil, 2009). If a break exists under the null of unit root, they will exhibit size distortions- i.e., over rejects the null hypothesis of unit root and also tend to identify the break point incorrectly- one period prior to the actual break point (Nunes et al., 1997; Lee and Strazicich, 2003, 2004; Altinay, 2005). This problem is overcome by the unit root test developed by Lee and Strazicich (2003, 2004). The unit root test by Lee and Strazicich (2003, 2004) uses the Lagrange Multiplier (LM) test statistics and allows for the (at most two) breaks under the both null and alternative hypothesis. Thus, any conclusion on the rejection of unit root null based on this LM test provides relatively stronger evidence of stationarity.

Accordingly, the following data generating process (DGP) is considered for this study

$$Y_t = \delta' Z_t + e_t, \;\; e_t = \beta e_{t-1} + \varepsilon_t \qquad (1)$$

where Z_t is a vector of exogenous variables, δ' is a vector of parameters and ε_t is a white noise process, such that $\varepsilon_t \sim$ NIID $(0, \sigma^2)$. Let us first elaborate on the case that considers only one structural break (Lee and Strazicich, 2004). The crash model that allows shift in level only is described by $Z_t = [1, t, D_t]'$, and the break model that allows for changes in both level and trend is described as $Z_t = [1, t, D_t DT_t]'$, where D_t *and* DT_t are the two dummies defined as

$$D_t = 1, \text{ if } t \geq T_B + 1;$$
$$= 0, \textit{otherwise}$$

and

$$D_t = t\text{-}T_B, \textit{ if } t \geq T_B + 1;$$
$$= 0, \textit{otherwise}$$

where T_B is the time period of the break date.

The main advantage of Lee and Strazicich (2004) approach to unit root test is that it allows for breaks under the null ($\beta = 1$) and the alternative ($\beta < 1$) in

the DGP given in (4). This method uses the following regression to obtain the LM unit root test statistics

$$\Delta y_t = \delta' \Delta Z_t + \phi \tilde{S}_{t-1} + \sum_{j=1}^{k} \gamma_j \Delta \tilde{S}_{t-j} + u_t \quad (2)$$

Where $\tilde{S}_t = y_t - \tilde{Y}_t - Z_t \tilde{\delta}$, $t=2,\ldots\ldots, T$; $\tilde{\delta}$ denotes the regression coefficients of Δy_t on ΔZ and $\tilde{Y}_t = y_1 - Z_1 \tilde{\delta}$, y_1 and Z_1 being the first observations of y_t and Z_t respectively. The lagged terms $\Delta \tilde{S}_{t-1}$ are included to correct for likely serial correlation in errors. Using equation (2), the null hypothesis of unit root ($\phi = 0$) is tested by the LM t-statistic. The lag length k is selected by employing the general to specific (GTS) approach in all of the a priori unknown break unit root tests and counterchecked using different lag selection criteria, like AIC, BIC etc. The critical values are tabulated in Lee and Strazicich (2003, 2004) for the two- and single-break cases, respectively.

Table 1 contains the results of unit root tests- Augmented Dickey Fuller (1979) and Phillips-Perron (1988)- that do not consider the presence of structural breaks.

Table 1: Unit Root Tests (Without Structural Break)

Variables	ADF[1]		PP[2]	
	Level	First Difference	Level	First Difference
ROFDI	-1.27	-8.71*	-4.14*	--------
REX	-1.65	-9.08*	-1.54	-9.24*
RIM	-0.75	-7.23*	-0.97	-7.17*

Note: 1. Augmented Dickey-Fuller test. 2. Philips-Perron test. 3. Asterisks (*), (**) and (***) denote statistically significant at 1%, 5% and 10% levels respectively. 4. Results reported are those with drift and trend. 5. First differences of I(1) series are reported stationary.

While the results of Augmented Dickey Fuller (ADF, 1979) suggests that all variables are non-stationary in levels, results of Phillip Perron test which is considered to be more powerful than ADF test (Cheung and Lai, 1997) reveals that real OFDI flows (ROFDI) is stationary at level. Real exports and real imports (REX and RIM) are found to be stationary at their first difference, i.e., they are integrated of order 1: I (1). Results are significant at 1% level of significance. However, as pointed out earlier, these results of the standard unit root are likely to be misleading in the likely presence of structural breaks in the macroeconomic time series under consideration.

The result of Lee and Strazicich (2003) unit root test is presented in table 2. In contrast to the results obtained from ADF and P-P test, it is found that null hypothesis of unit root is rejected for both ROFDI and REX at 1% and 5% level of significance respectively. Real imports (RIM) are stationary only in their first difference, i.e., they are integrated of order 1: I (1). It is observed that break points are roughly concentrated around two periods: (a) 2004-2006- the period when Indian economy embarked onto the path of high growth rate, registering an average annual GDP growth rate of approximately 9 per cent [5]. The buoyancy of Indian economy and the adoption of liberal policy regime towards foreign direct investment resulted into rising share of India in the global trade, massive inflows of foreign direct investment and the real take off of outward direct investment from India [6]; and (b) 2009 to 2013- period characterized by slowdown of Indian economy as a result of global turmoil emanating from two major events-global financial crisis (2008) and the Eurozone crisis (2009).

Table 2: Unit Root Tests with Two Structural Breaks (at Level)

Series	Break Points	Optimal Lags	T- Statistic	Result
ROFDI	2005-06:Q1 2009-10:Q2	0	-7.62*	Reject null hypothesis of unit root, i.e., I (0)
REX	2004-05:Q1 2012-13:Q2	4	-5.78**	Reject null hypothesis of unit root, i.e., I (0)
RIM	2004-05:Q1 2011-12:Q2	1	-4.72	Do not reject null hypothesis of unit root, i.e., I (1)

Note: 1. Method applied is Lee and Strazicich's (2003) 2. Critical value range at 1% and 5% levels are (-6.16 to -6.45) and (-5.59 to -5.74) respectively. 3. Asterisks (*) and (**) denote statistically significant at 1% and 5% levels respectively. 4. Results reported are those for Break Model (Intercept & Trend). 5. The first difference of RIM is reported stationary at 1% level of significance, t-statistics: -9.26.

Cointegration test

Once the order of integration of each variable is determined, cointegration test is conducted to find out whether any long-run relationship exists between- (I) India's OFDI flows (ROFDI) and exports (REX) as well as (ii) OFDI flows (ROFDI) and imports (RIM) and if so, the nature of such

relationship. The variables ROFDI and REX as well as ROFDI and RIM are cointegrated if the individual series in itself in non-stationary but a linear combination of them is stationary (Engle and Granger, 1987). Since it is found that the variables of interest are integrated of different orders, commonly used method of cointegration- residual based Engle and Granger test (1987) cannot be employed. Accordingly, this study uses Autoregressive Distributed Lag (ARDL) bounds test of cointegration developed by Pesaran and Shin (1999) and Pesaran et al., (2001). The advantage of using ARDL bound testing approach to cointegration is that it can be applied irrespective of whether the underlying regressors are integrated of same or different order, i.e., all variables are either I (0) or I (1) or the combination of I (1) and I (0). Moreover, being based on Monte Carlo Studies, the bounds test performs better than traditional cointegration test in small samples.

The error correction version of the ARDL model for EXPORT (REX)-OFDI (ROFDI) and IMPORT (RIM) –OFDI (ROFDI) are represented by equation 3 and 4 below:

$$DREX_t = a_0 + S_{i=1}^{p} b_i DREX_{t-i} + S_{i=0}^{q} d_i DROFD_{t-i} + g_1 REX_{t-1} + g_2 ROFDI_{t-1} + ?m_t \quad (3)$$

$$DRIM_t = a_0 + S_{i=1}^{p} b_i DRIM_{t-i} + S_{i=0}^{q} d_i DROFD_{t-i} + g_1 RIM_{t-1} + g_2 ROFDI_{t-1} + ?m_t \quad (4)$$

The coefficients b_i and d in equation (3) and (4) represent the short-run dynamics of the model whereas the g_s show the long-run association. If $l_1 = l_2 = 0$, it implies that there is no long-run relationship between the variables. The ARDL bounds test involves calcultation of F-statistics and comparing it with the pair of critical values- representing an upper and lower bound- tabulated by Pesaran et al. (2001). If the calculated F-statistics exceeds the upper bound, the null hypothesis of no cointegration is rejected. If the calculated statistics is smaller than the lower bound, the null cannot be rejected implying the absence of log-run relatioship between the variables. The result is inconclusive, if the calaculated statistic falls between the two bounds.

The ARDL (4, 4) specification and ARDL (2,3) specification is selected for REX- ROFDI and RIM - ROFDI relationship respectively, based on the Akaike Information Criterion and setting the maximum lag length equal to 8. We set the lag length equal to 8 as we consider it to be fairly long period to

examine the said relationship.

The results of ARDL bounds testing approach to cointegration are presented in Table 3. The calculated value of F-statistics for model 1 (1.082) as well as model 2 (2.224) is less than the lower bound at 5% and 10% level of significance. Hence the null hypothesis of no cointegration cannot be rejected implying that there is no long run relationship between exports and OFDI as well as imports and OFDI in Indian context.

Table 3: Results from ARDL Bounds Test for Cointegration

Test Statistic	95% critical value		90% critical value		Computed Value	
	Lower Bound I(0)	Upper Bound I(1)	Lower Bound I(0)	Upper Bound I (1)	Model 1: REX – ROFDI ARDL (4,4)	Model 2: RIM – OFDI ARDL (2,3)
F statistic	3.62	4.16	3.02	3.51	1.082	2.224
Result*	Reject the null if calculated F statistics exceeds the critical value at upper bound.				Null hypothesis cannot be rejected	Null hypothesis cannot be rejected

Note: 1. Dependent Variable is REX and RIM in Model 1 and Model 2 respectively. 2. ARDL model selected is (4,4) for Model 1 and (2,3) for Model 2. *The null hypothesis being no cointegration between REX and ROFDI and RIM and ROFDI.

Causality test

When the variables under consideration are not cointegrated, Granger Causality test (Granger, 1969) produces spurious results (Toda and Phillips, 1993). In such cases, the short run causality between the variables is determined using the causality test proposed by Todo and Yamamoto in 1995. The Todo Yamamoto (1995) causality test is similar to Granger Causality test (Granger, 1969) but requires the estimation of "augmented" vector autoregressive model (VAR), i.e., it includes extra lags depending on the maximum order of integration of the series under consideration. Hence, the total number of lagged variables included in the VAR model is (k + dmax), where k is the optimal number of lags as determined by AIC/SIC and dmax is the maximum order of integration of underlying regressors. The test uses MWald statistic that is asymptotically distributed as Chi-square, with degrees of freedom equal to the number of 'zero restrictions', irrespective of the series' order of integration.

Since the underlying variables- REX, RIM and ROFDI are integrated of different order (Table 2) and are also not cointegrated (Table 3), this study

applies Todo Yamamoto (1995) approach to Granger causality test to examine short run causality between exports (REX) and OFDI flows (ROFDI) as well as imports (RIM) and OFDI flows (ROFDI). The optimal number of lagged variables to be included determined using Akaike Information Criterion (AIC)/ Schwarz Information Criterion (SC) which turns out to be 2 (Table 4). As seen from table 2, maximum order of integration is 1. Therefore, the augmented VAR model is constructed in levels, with the total of $(k + d_{max})$ equaling 3 lags. The result of Todo Yamamoto approach to Granger Causality test is reported in Table 5. The null hypothesis that OFDI does not granger cause imports can be rejected at 5% level of significance. This implies that in short run OFDI flows from India leads to higher imports. On the other hand, OFDI flows do not granger cause exports from India.

Table 4: Results for Optimal Lag Length Selection Criteria

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-1223.816	NA	1.27e+11	34.07823	34.17309	34.11600
1	-1073.395	284.1289	2.49e+09	30.14987	30.52931*	30.30092
2	-1056.885	29.81067*	2.03e+09*	29.94124*	30.60527	30.20559*
3	-1050.449	11.08440	2.18e+09	30.01246	30.96107	30.39010
4	-1042.337	13.29447	2.25e+09	30.03713	31.27032	30.52807

Note: 1. Asterisk (*) denotes the optimal lag length selected by the criterion. 2. The criterion are Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Information Criterion (HQ).

Table 5: Results for Toda-Yamamoto Approach to Granger Causality Test

Null Hypothesis	MWALD-Statistic	p-Values
REX does not Granger Cause ROFDI	0.55576	0.6461
ROFDI does not Granger Cause REX	0.49166	0.6893
RIM does not Granger Cause ROFDI	1.38426	0.2553
ROFDI does not Granger Cause RIM	4.07868**	0.0102
RIM does not Granger Cause REX	3.66882**	0.0165
REX does not Granger Cause RIM	0.68290	0.5656

Note: 1. Asterisks (**) denote statistically significant at 5% level. 2. Total number of observations= 73.

Discussion of the empirical results- ARDL bounds test and Todo-Yamamoto approach to granger causality

The result of ARDL bounds testing approach to cointegration suggest that there is no long relationship between the India's exports (REX) and OFDI flows (ROFDI) as well as between Imports (RIM) and OFDI flows (ROFDI)- the findings in contrast with the results of existing studies (e.g. Verma and Bernnan, 2011; Paul and Bhasin, 2016). The contrasting findings of this study could be attributed to two probable reasons: (i) Unlike in previous studies, the empirical analysis in this paper has accounted for the presence of structural breaks in the underlying macroeconomic time series- the ignorance of which can produce misleading results (Nag and Mukherjee, 2012); (ii) India has become an active overseas investor over the last decade only. The time period considered may not be long enough to allow the manifestation of cointegrating relationship between exports and OFDI as well as import and OFDI. The results are likely to change over time with the availability of longer time series data (Dasgupta, 2009). In the light of these results, study proceeds to determining the short-run causation between the India's exports, imports and OFDI flows using Todo-Yamamoto (1995) approach to Granger Causality. In line with Tolentino (2010), Verma and Bernnan (2011) and Paul and Bhasin (2016), the empirical results suggest no short-run causality from OFDI to exports implying that Indian MNEs are not connecting with home country firms through forward and backward linkages (Paul and Bhasin, 2016). However, it is interesting to note that OFDI from India granger causes imports into India in the short run. The reason for the observed short run causality can be attributed to the increasing OFDI by Indian firms in energy and natural resource sector especially 2008 onwards when the RBI allowed the energy firms to invest more than 400% of their net worth as per last audited balanced sheet [7]. The number of cross border acquisition deals in energy and natural resource sector has more than doubled during the last decade-from 15 during 2000 to 2007 to 36 in the period thereafter till 2015 [8]. The investments in the sector include acquisition of oil and gas fields by the Oil and Natural Gas Corporation (ONGC) limited and Gas Authority of India limited (GAIL) in Africa, Latin America, Australia and the United Kingdom, active overseas investment in the form of setting of wholly owned subsidiaries and acquisition by Suzlon Energy limited- India based

fifth largest wind turbine manufacturer having global footprint in almost 31 developed and developing countries, aluminum manufacturing company, Hindalco's acquisition of copper mines in Australia and Atlanta based Novelis which made Hindalco the world's largest aluminum rolling company. Indian firms have to been relatively more resource seeking in their investment abroad than their counterparts from other countries, so as to ensure the secure and stable supply of resources to fuel the country's energy intensive growth (Hattari and Rajan, 2010). Secondly, the short run causation from outward FDI to imports could be an indication of India's involvement in the regional production networks. An example in case is the acquisition of Korea based Daewoo Heavy Vehicles by Tata Motors. The acquisition has led to regional production strategy whereby small and medium sized vehicles are manufactured in Indian plants and sold through Daewoo outlets and brand, while simultaneously heavy trucks built at the Daewoo plant are sold by Tata outlets in India (Kumar, 2006). However more evidence is needed to draw any concrete conclusion on the effect of India's involvement in regional production networks on relationship between FDI and trade.

4. CONCLUSION

The paper empirically examined the impact of Outward FDI flows from India on its exports and imports using quartetly data from 1997-98 (Q1) to 2015-16 (Q4). Keping into consideration the possibility of presence of structual breaks in the underlying macroeconomic time series, the study employs unit root testing method by Lee and Strazicich (2004) that allows for the presence of (at most) two structural breaks in unit root hypothesis and recent time series econometric techniques such as auto regressive distributed lag (ARDL) bounds testing approach to cointegration (Pesaran and Shin, 1999) and Todo-Yamamoto (1995) approach to granger causality test for examining the short run causal relationship between OFDI flows, exports and imports. In contrast to the a priori expectation, the empirical results indicate the non-existence of long relationship between OFDI and exports as well as OFDI and imports. While the result on OFDI-export non-causation in short run is consistent with other studies in the literature, an interesting finding of this study is the short-run causation from OFDI flows to imports into India- indicating the growing importance of resource

seeking FDI and partially pointing towards the role of India's involvement in the regional production networks and the resulting impact on relationship between FDI and trade.

The results present important implications corporate managers as well as policy makers. The non-existence of any causal relationship between OFDI and exports (i.e. the substitution) suggests increasing demand in foreign markets that makes it viable to undertake production in the same location and also benefit from the economies of scale (Paul and Bhasin, 2016). The increasing demand along with the relatively liberalized OFDI policy of Indian Government present an opportunity for Indian firms to expand abroad and improve their international competitiveness (Das, 2016). For policy makers, the results suggest an adverse balance of payment situation which can be countered by encouraging OFDI from relevant sectors- such as automobile industry- that increase India's integration in the international production networks leading to increase not only in imports but also exports.

While previous studies have examined the impact of rising OFDI flows from emerging economies on the exports from the country, it is argued that this reveals only half of the story as increased trade as a result of OFDI can take form of both increased exports and imports (Globerman and Shapiro, 2008). To the best of the knowledge, this is the first study to examine the impact of OFDI from India on both exports as well as imports into the country and therefore adds to the scantly literature on the home country impact of rising OFDI flows from India. However, due to the inherent limitations of the macroeconomic time series data, the results of the study are admittedly tentative. Moreover, the finding on short-run causation from outward FDI to imports provides an important direction for the future research. It would be worthwhile to disaggregate OFDI flows and trade (exports and imports) to the sectoral level in order to draw more evidence on the India's participation in the regional production networks and the resultant impact on OFDI-trade nexus.

Notes:

[1] Fortune Global 500 ranking- http://beta.fortune.com/global500/ (last accessed: 12 July 2017)

[2] http://www.ibef.org/economy/indian-investments-abroad (last accessed: 12 July 2017)

[3] http://www.oecd.org/india/launchofindiasinvestmentpolicyreview.htm (last accessed: 12 July 2017)

[4] Author's own calculation based on data from UNCTAD FDI STATISTICS http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx (last accessed: 12 July 2017)

[5] Author's own calculation on the basis of data on Annual GDP Growth rate from World Development Indicators, World Bank http://data.worldbank.org/data-catalog (last accessed: 12 July 2017)

[6] Reserve Bank of India Speeches- https://rbi.org.in/scripts/BS_SpeechesView.aspx?Id=674 (last accessed: 12 July 2017)

[7] https://rbi.org.in/Scripts/NotificationUser.aspx?Id=10199&Mode=0 (last accessed: 12 July 2017)

[8] Author's own calculation on the basis of cross border acquisition deals data sourced from Bloomberg Terminal.

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