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Outward FDI and its impact on the parent firm: A case of Indian manufacturing firms

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Abstract

Outward FDI (OFDI) has recently emerged as an important pathway for emerging market firms to access foreign markets, modern technology, know-how, natural resources and other strategic assets. The policy liberalization efforts of the 1990s and 2000s coupled with the positive global macroeconomic factors led to an increased outflow of FDI from India, with its share in global OFDI flows standing at around 1 per cent in 2021. This paper attempts to study the impact of overseas investment activities of Indian manufacturing firms on the parent firm in the home country. The study uses the RBI's firm-level overseas direct investment data in combination with the financial data sourced from Prowess database for the period 2008-2020. The impact of overseas investment activity on the parent firm's imports, wages, output and employment is analysed by employing the Propensity Score Matching (PSM) method combined with the Difference-in-Difference (DID) technique. Results indicate that overseas investment led to a mild improvement in employment, whereas, total import intensity witnessed a decline in the post-investment period. Output and import of capital goods witnessed improvement over time after investing abroad. Whereas, the impact on wages was insignificant. The analysis calls for policies to encourage Indian firms to venture abroad as it may allow them to access technological and strategic assets and help them in their efforts to move up the value chain

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1. INTRODUCTION

Outward FDI (OFDI) flows from developing countries have grown considerably over the past two decades. Their share in the global OFDI flows have risen from 7 percent in 2002 to 47 percent in 2020 (UNCTAD, 2021). India witnessed an increase in overseas investment activity due to the liberalisation policies of 1990s. Policy measures such as the introduction of the Foreign Exchange Management Act (FEMA) in 2000 and the easing of restrictions of overseas investment limits led to increased OFDI activity by Indian firms (Girma & Maemir, 2021). In 2008, rules on overseas investment limits were modified to allow firms to invest four times their net worth abroad under the automatic approval mode. This limit was earlier raised to 100 per cent of the firm's net worth in 2002. Reserve Bank of India's (RBI) firm-level overseas direct investments data reveals that India recorded a total outflow of around USD 317 billion between 2008 and 2020[1]. India's OFDI flow was around USD 44 million between 1980-89 (Pradhan, 2017). India's contribution to global OFDI flows has risen from 0.01 per cent in 1991 to around 1.5 per cent in 2020 (UNCTAD,2021).

The literature identifies that emerging market multi-national enterprises (EMNEs) venture abroad for a variety of reasons, such as: acquiring strategic assets, technology and management expertise, risk diversification, expand markets (Luo & Tung, 2007; Yamakwa et al.,2008; Gaur & Kumar, 2010). Indian firms have benefitted by investing overseas due to greater access to technology, natural resource, and markets, enhancing their brand value and gaining proximity to their strategic clients (Roy & Narayanan, 2019). The expansion of the firm's activities abroad can impact its domestic activities. Empirical literature concerning overseas investment activities and its impact on developed country firms is widely available. Whereas, the evidence concerning the impact of OFDI activity on the emerging market firms is limited (Cozza et al., 2015). OFDI's effect on the parent firm is dependent on factors such as the type of FDI, the location of investment and the mode of investment, to name a few. Resource-seeking FDI may have a short-term impact on the firm's domestic output and employment due to the relocation of production activities to overseas locations with an intent to exploit the cost advantages that these locations offer (Engel & Procher, 2013). On the other hand, market-seeking FDI may positively impact productivity at home (Engel & Procher, 2013).

Empirical evidence on OFDI's effect on output, employment, wages, exports, production etc. of the parent firm can be found in the literature (Navaretti & Castellani, 2008; Engel & Procher, 2013; Cozza et al., 2015). Evidence from developed countries suggests that firms investing overseas try to reduce costs and increase competitiveness by combining their home production with foreign production (Herzer, 2010). In a study of Italian firms, Navaretti & Castellani (2008) observed a complementary effect on the domestic output and productivity for firms investing abroad with insignificant effects on employment. Falzoni and Grasseni (2005), in another study of Italian firms, found evidence of overseas investment activities having a complementary effect on the average real wages of the parent firm regardless of the destination of the investment. Hijzen et al. (2007) found that the OFDI activities of Japanese firms positively impacted the output and employment of the parent firm. French firms undertaking OFDI exhibit higher value-addition and exports than domestic entities (Gazaniol, 2012). Braconier & Ekholm (2000) observed that the employment in parent Swedish firms and their subsidiaries operating in high-income countries have a substitutive relationship.

[1] Author's calculation based on the RBI's monthly firm-level data on Overseas Direct Investments published since 2007.

At a macro-economic level, Herzer (2011) finds evidence of OFDI having a long-run positive impact on the domestic output in developing countries. Cozza et al. (2015), in a study of Chinese firms, identify a positive impact of OFDI activities on employment and sales, with greenfield investments in advanced countries having a greater positive impact. Chow (2012) observes a similar complementary effect on the home country exports of Taiwan. Liu & Nunnenkamp (2011) observes that Taiwanese FDI directed to developed countries positively impacted domestic output, though not employment. Similarly, large Chinese firms aim to enhance domestic production through overseas investments by augmenting existing assets and securing the supply of resources and raw materials (Huang & Wang, 2013).

Previous studies on India provide mixed evidence on the impact on the parent firm. As with some emerging economies, Indian MNEs tend to locate the labour-intensive processes at home while relocating capital and technologically intensive activities to advanced economies (Kumar, 2008; Nagaraj, 2009). Chawla (2022) finds complementary effects on the parent firms' domestic sales and export. Short-run effects of OFDI of Indian firms were found to be insignificant, although, select financial parameters improved in the case of overseas investments made in non-Offshore Financial Centres (Roy & Narayanan, 2019). Whereas, domestic capital investment had a positive relation with the export intensity and OFDI intensity (Girma & Maemir, 2021).

This study analyses the effect of overseas investment activities by Indian manufacturing firms on four aspects: First, the impact on the domestic wages paid by the firm. OFDI's effect on the domestic wages of Indian firms has attracted very little attention in the literature. Theoretically, FDI's impact on wages may occur either through a change in skill intensity or skill upgradation (Hayakawa et al., 2013). The skill composition of a firm is likely to be affected as a result of FDI, with the average wage varying depending on the composition and wages of skilled and unskilled workers (Head & Ries, 2002; Davies & Desbordes, 2012). Horizontal FDI is unlikely to affect the average wage, whereas, vertical FDI is likely to cause an increase in average wages due to specialisation in skilled labour-intensive production at home (Hayakawa et al., 2013). For example, Japanese parent firms witnessed a rise in skill intensity at home due to overseas investment activities in low-income countries (Head & Ries, 2002). The lack of information on the FDI type and skill composition of Indian firms restricts us from analysing on this perspective.

Second, the impact on employment in the parent firm is analysed. Horizontal investments are likely to have a complementary effect on labour growth whereas vertical FDI may improve the capital-labour ratio due to the reorganisation of the production process (Hijzen et al., 2011). This is because developed country firms are likely to shift the low-skilled work to overseas locations and keep the high-skilled work in the parent firm itself (Borin & Mancini, 2016). An important factor that determines the labour demand in an MNE depends on the wage differential across locations (Muendler & Becker, 2010).

Thirdly, the impact on domestic output is analysed to understand if overseas investment substitutes domestic production. Herzer (2011) points out that as EMNEs are more likely to face financial constraints, overseas investments may come at the cost of domestic investment, which may have implications on domestic capital accumulation, leading to a reduction in domestic output.

Further, the effect on the imports by the parent firm is analysed. Imports have a critical role in the domestic production of a firm. Although previous studies have analysed the link between OFDI and exports, less attention has been given to the impact on imports. Previous studies on the impact of exports, such as Chawla (2022) and Roy & Narayanan (2019), found

a complementary effect on the export intensity of the parent firm. Therefore, we restrict our analysis to the impact on the firm's import. This study analyses the impact on the total import intensity as well as the impact on the components of imports, such as capital goods, raw materials and finished goods. Acquiring capital goods and machinery from subsidiaries in advanced economies yield tangible capacity returns for firms investing abroad (Knoerich, 2017). The import of capital goods, machinery, and other intermediate inputs by developing country firms positively impact the parent firm's productivity (Coe et al., 1997). A firm can benefit in terms of productivity by importing from abroad either through the learning-by-doing phenomenon or by the quality embodied in the imported item, and this effect is expected to be higher in the case of import of capital goods (De & Nagaraj, 2014). The impact on imports can vary with the type of FDI undertaken by the firms. Vertical FDI is likely to have higher reverse imports than horizontal FDI (Liu & Huang, 2005). For example, resource-seeking vertical FDI can result in greater imports from the foreign affiliates to the parent firm, indicating a complementary relation between the two. On the other hand, horizontal FDI undertaking activities similar to that of the parent firm may result in the substitution of domestic production, thereby causing a fall in imports by the parent firm. The present study contributes to the literature by bringing greater clarity on the effect of overseas investments by Indian manufacturing firms on the imports, wages, and employment in the parent firm. Our analysis indicate that overseas investment led to a mild improvement in employment, whereas, total import intensity witnessed a decline in the post-investment period. Output and import of capital goods witnessed improvement over time after investing abroad. Whereas, the impact on wages was insignificant.

The remainder of the paper is organised as follows: Section 2 deals with the data and variables. Section 3 deals with methodology. Section 4 discusses the results of the empirical analysis. Section 5 deals with the robustness test. Section 6 summarises the study.

2. Data and Variables

The study combines firm-level data from two sources: Firstly, the data on OFDI was obtained from the RBI, which is available from 2007. Secondly, we use the firm-level financial data from the Prowess Database of the Centre for Monitoring Indian Economy (CMIE). The database includes the financial information of over 52000 companies, covering about 56 per cent of output value in the non-agriculture and non-government services sector during 2018-19[2]. Previous studies that used the database include (Girma & Maemir,2021; Roy & Narayanan, 2019; Lancheros, 2016), among others. The sample period of study is between 2008-2020 as OFDI data is unavailable for years prior to 2007.

The firms in the RBI database are matched manually with those in the Prowess database. An initial match of 2139 firms were obtained, including the service sector. Since this study focusses exclusively on manufacturing firms, we drop the services sector firms in the sample. Further, the sample was filtered based on the following criteria: First, firms with four or more consecutive years of missing observations were dropped. Second, only firms with positive sales and fixed assets are included. Thirdly, we follow Chawla (2022) and drop OFDI firms that have invested only once during the sample period, as these are likely to reflect short-term transactions. The filtering process yielded a sample of 218 OFDI firms and 1379 non-OFDI firms. Firms are classified into twelve industries based on the 2-Digit NIC industry classification. Table 1A presents the classification of firms in the sample based on the industry.

[2] CMIE PROWESS Database website: https://bit.ly/3PoiVTh

As the present study focusses on the OFDI's effect on wages, employment, and imports, we choose the following variables to measure the impact. First, the impact on domestic wages is captured using the Salaries and Wages data provided in the Prowess database. It is expressed in logarithmic form. Secondly, for the analysis of the impact on employment, the labour variable is constructed as the database does not consistently report the number of labourers. The labour variable is constructed using the data on average wage rate derived from the Annual Survey of Industries (ASI) data and salaries and wages information from the Prowess database[3]. The constructed variable is converted to logarithmic form. Some of the previous empirical works that adopted this method for the construction of the labour variable were Chawla (2022), Padmaja & Sasidharan (2020), Thomas & Narayanan (2017), and De & Nagaraj (2014). Thirdly, the measurement of domestic output used by De & Nagaraj (2014) in a study of Indian manufacturing firms is adopted for the present study. The domestic output is obtained as the sales adjusted for change in inventory and purchase of finished goods. A decrease in inventory is subtracted from the sales and an increase in inventory is added to the sales. 'Purchase of finished goods' is subtracted from sales because PROWESS defines the purchase of finished goods as goods purchased from other manufacturers solely for the purpose of resale. The output is expressed in per-worker terms and converted to logarithmic form.

Finally, the impact on imports is analysed using the Import Intensity variable, i.e., the ratio of total imports to sales. In addition, we also analyse the impact on the import of capital goods, finished goods, and raw materials, all expressed as a ratio of sales[4]. The definition of variables used for analysing imports is similar to De & Nagaraj (2014), although our study analyses the imports in the disaggregated form. Table 1 presents the summary statistics.

3. Methodology

To evaluate the impact of OFDI on the parent firm's domestic wages, employment, and imports, we employ the Propensity Score Matching (PSM) combined with Difference-in-Difference (DID), also known as PSM-DID[5]. The firm's decision to undergo treatment (in this case, investing abroad) cannot be considered a random decision. Therefore, comparing the treatment effects with the average outcome of untreated firms (in this case, non-OFDI firms) would result in bias. One of the critical challenges while analysing the impact of OFDI is to construct an appropriate comparison group for observing the counterfactual performance. Rosenbaum & Rubin (1983) suggests the Propensity Score Matching (PSM) method to construct the counterfactual performance for comparison and corrects the selection bias that may arise otherwise. PSM helps in forming a counterfactual performance group or the control group, which is constructed using the propensity score (Heckman et al., 1998). This method rests on two important assumptions: (i) Conditional Independence Assumption, which states that controlling for the observable covariates, the potential outcomes are independent of treatment status; (ii) Common Support Condition, which ensures that there is a positive probability of being both treated and untreated (Heinrich et al., 2010). The analysis is restricted to the region of common support, i.e., treated firms with propensity scores higher (lower) than the maximum (minimum) are dropped. We employ the *psmatch2 (*Leuven & Sianesi, 2003) command in STATA to perform the matching of firms in a year-wise manner.

[3] Average wage rate & Number of Labor is calculated as follows: Average wage rate=Total emoluments/Total persons engaged; Number of labor=Salaries and wages/Average wage rate.

[4] All the variables have been deflated using the appropriate deflating indices.

[5] Few of the previous studies that employed PSM-DID in the context of analyzing the effect of overseas investments on the parent firm include Chawla (2022), Borin & Mancini (2016), Cozza (2015), Navaretti & Castellani (2004).

Table 1: Summary Statistics

VARIABLE	DESCRIPTION	OBSVN	MEAN	S. D	MIN VALUE	MAX VALUE	OFDI FIRMS (MEAN VALUE)	NON-OFDI FIRMS (MEAN VALUE)
Size	Log of Sales	20755	7.48	1.36	5.38	9.63	8.25	7.36
Age	No of Years since Incorporation	20755	33.26	19.62	1	141	31.59	36.524
Output	Log (Output/No of Labor)	19136	3.86	1.02	1.19	6.81	3.94	3.85
Wages	Log of Salaries & Wages	20755	4.63	1.48	1.92	7.367	5.42	4.5
Employment	Log of No of Workers	20755	3.623	1.559	1.386	9.887	4.379	3.503
Import Intensity	Total Imports/Sales	20755	0.092	0.141	0	0.705	0.107	0.09
Technological Investment Intensity	(Import of Capital Goods+ Royalties, Technical Know How fee)/Sales}	20755	0.011	0.06	0	3.33	0.013	0.011
R&D Intensity	(Total R&D Expenditure/ Total Sales)	20755	0.003	0.009	0	0.06	0.05	0.002
TFP	Log of TFP	20755	0.3788	0.6612	0.0001	28.341	0.485	0.362
Ownership Group	=1 if Firm associated with a group =0 Otherwise	20755	0.362	0.48	0	1	0.394	0.357
Foreign Ownership	=1 if Foreign Owned =0 otherwise	20755	0.0839	0.277	0	1	0.041	0.09
OFDI status	=1 if firm does OFDI =0 otherwise	20755	0.051	0.221	0	1	0.380	0
Export Status	=1 if firm exports =0 otherwise	20755	0.644	0.478	0	1	0.760	0.626

Source: Author's calculation

The estimation of the propensity scores is done using the probit model below:

$$\Pr(OFDI_{it} = 1) = \Phi\{(\beta_1 Age_{i,t} + \beta_2 Size_{i,t-1} + \beta_3 RDInt_{i,t-1} + \beta_4 TecInvstInt_{i,t-1} + \beta_5 TFP_{i,t-1} + \varphi D_{i,t} + \varepsilon_i + \gamma_{i,t})\} \quad (1)$$

Where OFDI is a binary variable that takes the value 1 if firm *i* starts investing in the period *t* and 0 otherwise. Φ is the normal cumulative distribution function.

Covariates chosen in the above model are firm age, size, R&D intensity, technological investment intensity, Total Factor Productivity (TFP), and dummy variables represented by D_{it} showing the industry the firm belongs to, the foreign ownership status, export status and whether it is associated with a group and the time dummies. The firm-level TFP is estimated using the semi-parametric technique proposed by Levinsohn & Petrin (2003), in which

intermediate material inputs are used as a proxy for unobservable productivity shocks. The estimation involves the use of capital stock, power and fuel expenses, and labour as input variables. The expense on power and fuel is considered a proxy for intermediate material inputs. We follow the methodology in Srivastava (1996) and Balakrishnan et al. (2000) for the construction of capital stock using Perpetual Inventory Method (PIM). The covariates in (1) are included with a lag of one year to avoid potential endogeneity from OFDI entry. ε_i is the unobserved time-invariant firm heterogeneity and γ_{it} is the idiosyncratic error. The study implements the Nearest Neighbour (NN) matching technique on common support with a calliper radius of 0.01 to match the OFDI and non-OFDI firms. We adopted the 1:1 nearest neighbour matching technique, where each treated unit (OFDI firm) is matched with an untreated unit (non-OFDI firm) having the closest propensity score. Denoted by C(i), the set of control units matched to the treated unit i with an estimated value of the propensity score of p_i. NN matching sets $C(i) = \underset{j}{min.} \|p_i - p_j\|$. The equation implies that the absolute difference between the estimated propensity scores for the control and treated groups is minimized, and the members of the control group are matched to the treated members based on the closest propensity score. Therefore, the next neighbor's weight is set to 1 (Becker & Ichino, 2002 A caliper range of 0.01 ensures that the propensity score between the matched units does not exceed this range. Following Arnold & Javorcik (2009) and Chawla (2022), we ensure that the treated and non-treated firms from the same sector and year are matched to control for sector specific influences and any macroeconomic changes.

Table 2: Test for equality of Means of OFDI and Non-OFDI firms (Unmatched Sample)

Variable	Non-OFDI Firms (N=17927)		OFDI Firms (N=2834)		Test for Equality of Means (t-test)
	Mean	Std Dev	Mean	Std Dev	
R&D Intensity	0.0036	0.0197	0.0102	0.114	7.09***
Technological Investment Intensity	0.0126	0.106	0.0475	1.714	2.692***
Size	7.326	1.717	8.379	1.536	29.347***
Age	33.524	19.394	31.591	20.954	-4.874***
TFP	0.362	0.465	0.485	1.349	9.225***

Note: ***, **, * denotes significance at 1 %, 5% and 10 % level respectively.

Table 2 presents the results of the test for equality of means of the investing and non-investing firms in the unmatched sample. Thereafter, the balancing tests, namely, Hotelling's T-squared generalized means test and the *pstest* in Stata, are performed to confirm the robustness of the matching procedure. The results, presented in Table 3, reveal that the covariates of the treated group (OFDI firms) and the control group (non-OFDI firms) do not significantly differ from each other, implying that the matching procedure performed was robust.

The selection bias caused by the unobservable variables remain even after implementing the matching procedure. Therefore, we implement the DID estimator (Heckman et al., 1998), which eliminates the bias caused by time-invariant unobservable variables. DID compares the difference in outcome variables before and after the treatment (i.e., investing abroad) to the same differences computed in the case of the control groups. The impact of the treatment or

in other words, the Average Treatment Effect on the Treated (ATT), is evaluated using the PSM-DID estimator. The quality of non-experimental valuation is improved by combining matching estimators with the DID approach (Blundell & Costa Dias, 2009). The firm is defined as treated if the firm does OFDI in period *t*. The pre- and post-years are defined with respect to the corresponding first year of investment, *t.* The estimator is applied every year after the investment entry is made with respect to the year prior to the entry (*t-1)* until *t+4*. PSM-DID estimator is written as:

$$M_{ATT}{}^{PSM-DID} = \frac{1}{n_1}\sum_{D_i=1}\left[\left(Y_{i,post} - Y_{i,pre}\right) - \sum_{D_j=0} w(i,j)\left(Y_{j,post} - Y_{j,pre}\right)\right] \quad (2)$$

Where *post, pre* denotes the variable in the post-entry and pre-entry period; $n_1$denotes the number of treated observations; D_i=1 denotes the OFDI firms, and D_j=0 denotes non-OFDI firms; *w(i,j)* represents the weight of the j^{th} observation of controls in constructing the counterfactual to the i^{th} treated firm. We consider four years from the entry period and calculate the ATT from *t* to *t+4.* Existing studies choose a time frame anywhere between *t+2* to *t+6* (Serti & Tomasi, 2008; Arnold & Javorcik, 2009; Borin & Mancini,2016; Chawla, 2022).

Table 3: Balancing Test Results (Matched Sample)

Variable	Mean		t-test for the difference in means	p-value
	Treated	Control		
Size (t-1)	8.62	8.71	-1.37	0.16
Age (t)	32.76	33.93	-1.34	0.18
TFP (t-1)	0.36	0.30	1.43	0.15
R&D Intensity (t-1)	0.0066	0.0073	-0.69	0.49
Techn Invst Intensity (t-1)	0.015	0.0128	0.47	0.63
Export Status (t-1)	0.716	0.736	-1.03	0.30
Ownership Group	0.47	0.48	-0.70	0.48
Foreign Ownership	0.044	0.047	-0.31	0.75
Industry Dummies	0.13	0.1	-0.05	0.23
N	1037	1037	-	-
Results of Hotelling's T squared Test for Balancing: **F- Value= 0.7581 Prob>F=0.7591.**				

4. Results & Interpretation

Table 4 presents the ATT results. The impact of OFDI on our variables of interest of the parent firm is discussed below.

4.1 *Wages, Employment and Output*

The analysis in the case of employment in the parent firm does not exhibit significant effects except in the first year after investing abroad. The employment in OFDI firms in the initial year after the investment is higher by 6.9 per cent. No significant effects on employment

were observed in the subsequent years. In the case of output intensity, OFDI firms exhibit a lower output intensity by 5.2 per cent in the initial year after investment. The output intensity of OFDI firms further drops to 9.8 per cent by the second year after investment, and thereafter rises in subsequent periods. OFDI firms exhibit a significantly higher output intensity by 13.08 per cent by the end of the fourth year after investment. The output intensity ratio can either be affected by a change in output or a change in labour employed. Considering this possibility, we analysed the impact on output by choosing the logarithm of output as a dependent variable. The results confirmed that the output witnessed a negative impact in t+1 and t+2 and later witnessed a positive impact in t+4[6]. Further, the analysis in the case of employment reveals only a mild positive impact and is statistically insignificant from t+2 to t+4 time periods. The analysis shows that the impact on wages is insignificant in all the years post-investment.

The above results indicate that, as time proceeds, overseas investment activity does not result in the substitution of domestic production of the parent firm, even though short-term negative effects are observed. The initial negative effects observed in the case of output may be due to the elevated costs linked to overseas investments and the lack of competitive advantages, in addition to the resource constraints, especially for emerging market firms (Cozza et al., 2015).

Table 4: PSM-DID results

Variable	t+1	t+2	t+3	t+4
Imports/Sales	**0.0209*** (0.0086)**	0.0131 (0.012)	0.0071 (0.014)	**-0.0625** (0.025)**
Import of Capital goods/Sales	0.0004 (0.0024)	-0.001 (0.003)	**0.0045*** (0.0027)**	**0.0096* (0.006)**
Import of finished goods/Sales	0.0012 (0.0018)	-0.003 (0.002)	0.0008 (0.002)	-0.005 (0.004)
Import of Rawmat/Sales	**0.0186*** (0.008)**	0.0146 (0.116)	0.0023 (0.012)	**-0.063*** (0.021)**
Salaries and Wages	0.0101 (0.067)	-0.0166 (0.0986)	-0.0635 (0.0899)	-0.0665 (0.082)
Output/Employee	**-0.052** (0.0308)**	**-0.098** (0.043)**	0.0051 (0.0485)	**0.1308* (0.080)**
No.of workers	**0.069*** (0.0262)**	0.0324 (0.036)	-0.0326 (0.0572)	0.0293 (0.0627)
No. of Obsvns	1089	926	775	636

Note: ***, **, * denotes significance at 1 %, 5% and 10 % level respectively. Standard errors are reported in parenthesis. Number of workers is expressed in logarithmic form.

4.2 *Imports*

The total import intensity of the OFDI firms increases in the first year post-investment by around 2 per cent. The difference in total import intensity between the two groups is not statistically significant in *t+2* and *t+3*. By the end of the fourth year, OFDI firms have a lower import intensity than non-OFDI firms by 6.25 per cent. A similar pattern is observed in the case of the import intensity of raw materials. In the initial period post-investment, the import of raw materials of OFDI firms increase by 1.8 per cent. This advantage of OFDI

[6] The results are available on request.

firms decreases in the subsequent years, although statistically insignificant. By the end of the fourth year, OFDI firms have a significantly lower import intensity of raw materials by 6.3 per cent. In the case of the import of capital goods, no significant effect is observed upto two years after investing abroad. In *t+3*, the import of capital goods by OFDI firms is higher by 0.45 per cent. This advantage exhibited by OFDI firms further rises to 0.96 per cent by the end of the fourth year after investing abroad. The analysis further reveals that overseas investments do not have any significant impact on the import of finished goods.

Overall, the results indicate that the total import intensity of the parent OFDI firm declines over time in the post-investment period. The decline in import intensity cannot be interpreted as a substitution of domestic production activity since our results indicate that domestic output per worker of OFDI firms improves as time proceeds. On the other hand, the capital goods import intensity of OFDI firms increases with time after undertaking overseas investments. The decline in the import of raw materials and a rise in the import of capital goods in the post-investment period may be a pointer to the strategic asset-seeking OFDI of Indian firms (Kumar, 2008). The positive impact on the import of capital goods may be attributed to the EMNE firms' preference for competitive advantages such as technological advantages and other intangible assets in their efforts to catch up with firms from advanced countries (Munjal et al., 2022). Mudambi (2008) points out that EMNEs may focus on 'catching up' with their developed country peers by acquiring technological and marketing capabilities that enable them to have greater value-addition instead of developing production capabilities. Munjal et al. (2022) point out that cross-border acquisitions by Indian firms focussing on augmenting technology-specific capabilities tend to exhibit lower production capabilities at home as firms shift to high value adding activities. This may affect the domestic production-related activities of the firm investing abroad, at least in the short run.

5. Robustness Check

The robustness of the results was examined by altering the caliper width used in PSM. Table 5 presents the ATT values obtained after matching using the caliper widths of 0.05, 0.1 and 0.2. The results are very similar to those obtained using a caliper range of 0.01, implying the robustness of the matching technique implemented and the results that follow it. Considering that ATT is independent of the size of investment, we test the robustness of the results by dropping insignificant incidents of OFDI. Firms with OFDI intensity (as a percentage of sales) less than 0.05 percent were dropped and found that the results are similar to those presented in Table 4. The threshold was kept at 0.05 percent considering that OFDI intensity of nearly 45 percent of the OFDI firms in the sample was less than 1 percent[7]. Further, we test the robustness using an alternate method of matching namely Kernel method. This method uses more observations from the data (Chawla, 2022). We implement the procedure using the Epancehnikov kernel method with a bandwidth of 0.005. The results obtained are very similar in statistical significance and the degree of impact compared to those obtained using the nearest-neighbour matching technique[8].

[7]Author's calculation based on the sample.

[8] The results are not presented here for brevity and are available on request.

Table 5: Robustness Test Results

Caliper Width/Variable	t+1	t+2	t+3	t+4
Imports/Sales				
0.05	**0.0188**** **(0.009)**	0.015 (0.012)	0.0072 (0.014)	**-0.059**** **(0.025)**
0.1	**0.0195**** **(0.0093)**	**0.017*** **(0.0123)**	0.009 (0.014)	**-0.055**** **(0.024)**
0.2	**0.02**** **(0.009)**	**0.016*** **(0.012)**	0.009 (0.014)	**-0.055**** **(0.024)**
Salaries & Wages				
0.05	0.0561 (0.0659)	-0.0128 (0.0987)	-0.0191 (0.093)	-0.0338 (0.0886)
0.1	0.0552 (0.066)	-0.0126 (0.0987)	-0.0145 (0.093)	-0.0338 (0.0886)
0.2	0.004 (0.0655)	-0.0088 (0.0979)	-0.0138 (0.0922)	-0.0866 (0.0985)
Output/Employee				
0.05	**-0.046*** **(0.031)**	**-0.104**** **(0.042)**	-0.005 (0.047)	**0.116*** **(0.08)**
0.1	**-0.053*** **(0.03)**	**-0.107**** **(0.042)**	-0.005 (0.04)	**0.116*** **(0.079)**
0.2	**-0.052*** **(0.03)**	**-0.106**** **(0.042)**	-0.006 (0.047)	**0.116*** **(0.07)**
No.of workers				
0.05	**0.0705***** **(0.025)**	0.037 (0.03)	-0.026 (0.056)	0.028 (0.062)
0.1	**0.07***** **(0.025)**	0.037 (0.03)	-0.025 (0.05)	0.031 (0.061)
0.2	**0.07***** **(0.02)**	0.039 (0.03)	-0.028 (0.05)	0.0008 (0.05)

Note: ***, ****, *** denotes significance at 1 %, 5% and 10 % level respectively. Standard errors are reported in parenthesis. Number of workers is expressed in logarithmic form.

6. Conclusion

The study using the PSM-DID technique examined OFDI and its impact on the parent firm. Firms that invested overseas witnessed a slight positive impact on employment in the post-investment period. On the other hand, no significant impact on wages were found. It was found that OFDI firms improved their output per worker over time, although negative effects are visible in the immediate years after investing abroad. Further, OFDI firms witnessed an improvement in the import of capital goods, underlining their efforts to improve their technological capabilities. Whereas, overall import intensity and the import intensity of raw materials by OFDI firms declined.

Above results signify that policies must be framed to encourage Indian firms to invest abroad and internationalize further, as it may allow them to access technological and strategic assets and move up the value chain without implications on output and employment in the parent firm. Further, as our results reveal a short-run lowering of output, policy measures that enhances the access to cheaper finance for investing abroad may allow firms to generate returns from OFDI activity in a shorter time horizon. This assumes importance given that nearly 72 per cent of India's OFDI flows between 2008 and 2020 were either through the

loan or guarantees issued route, indicating the leveraged nature of India's OFDI[9]. In spite of the robust findings, the study suffers from certain limitations. Primarily, the dataset is available only after 2007. Secondly, we could not incorporate the host country factors in the analysis which may have implications on the parent firm, due to data unavailability. The study can be extended further to incorporate analysis based on the ownership mode and destination of investment.

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APPENDIX

TABLE 1A: INDUSTRY-WISE DISTRIBUTION OF FIRMS

Sl.No	CLASSIFICATION	No. of Firms	% Of Total Firms
1	FOOD PRODUCTS	109	6.83
2	BEVERAGES & TOBACCO	29	1.82
3	TEXTILE & RELATED PRODUCTS	49	3.07
4	WOOD & WOOD PRODUCTS, PAPER & PAPER PRODUCTS, PRINTING	76	4.76
5	REFINED PETROLEUM PRODUCTS, CHEMICAL & CHEMICAL PRODUCTS	267	16.72
6	PHARMACEUTICAL & RELATED PRODUCTS	121	7.58
7	RUBBER, PLASTIC & OTHER NON-METALLIC PRODUCTS	218	13.65
8	BASIC METALS & FABRICATED METAL PRODUCTS (EXCEPT MACHINERY & EQUIPMENT)	299	18.72
9	COMPUTER, ELECTRONIC AND OPTICAL PRODUCTS	42	2.63
10	ELECTRICAL EQUIPMENT	104	6.51
11	MOTOR VEHICLES, MACHINERY & EQUIPMENT, OTHER TRANSPORT EQUIPMENT	273	17.09
12	MISCELLANEOUS MANUFACUTRING	10	0.63
	TOTAL	**1597**	**100**