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# Do Financing Constraints Matter for Outward Foreign Direct Investment Decisions? Evidence from India

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## **Abstract**

This study examines the role of financing constraints in explaining outward FDI decisions using unique firm level panel data on Indian manufacturing during the period 2007–2014. We consider the role of both internal finance and external finance in firm decisions on outward FDI and employ instrumental variable probit model to examine financing constraints in outward FDI decisions of firms. Further, using count data models, we examine financing constraints in determining strategies regarding number of affiliates abroad. The study shows that firms with higher cash flow and liquidity are likely to have more number of foreign affiliates.

**Key words:** *Financing constraints, outward FDI, total factor productivity*

*JEL Classifications: F14, F21, F23*

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## **Introduction**

Firm level internationalization decisions through foreign direct investment (FDI) have attracted the attention of the literature on international trade very recently. The theoretical models, which explain the process of internationalization, focus on the heterogeneity of the firms in terms of productivity (Melitz 2003; Helpman et al. 2004; Yeaple 2009). Productivity is highlighted as the determining factor relating to decisions to enter foreign markets either through FDI or exports. These models posit that exporting and FDI involves sunk costs and fixed costs. Firms above minimum threshold level of productivity engage in exporting while highly productive firms undertake FDI. Recent theoretical models extend this argument by emphasizing the role of financing constraints as a barrier to serve foreign markets (Chaney 2013; Manova 2013; Muuls 2015). These models incorporate financing constraints in well-known firm heterogeneity models following Melitz (2003). The problem of financing constraints assumes greater significance in setting up affiliates abroad since firms face bigger barrier in the form of huge upfront fixed costs (Helpman et al. 2004). During the previous two decades, firms from emerging economies like India are increasingly becoming a global phenomenon. Previously, firms from these economies were unable to expand beyond borders due to regulatory hurdles and resource constraints. Since the 1990s, reforms measures adopted by the policy makers in India encouraged firms to globally integrate and escape from the resource constraints at home (Gaur et al 2014). The rapid pace at which these firms have integrated with the global economy requires thorough empirical examination given that these set of firms operate in an underdeveloped institutional environment which inhibit them from accessing resources (Khanna and Palepu 1997). Outward FDI is considered as a means to escape from the 'institutional voids' encountered by emerging economy firms (Khanna and Palepu 2006; Aulakh 2007). Attempts have been made to study internationalization process of the emerging market multinationals. However, the focus of these studies is mainly from the entry mode choices, determinants of outward FDI using firm level and aggregate country level data (Chittoor and Ray 2007; Woodcock et al., 1994; Kumar 2007; Pradhan 2004; Pradhan 2009).

In the internationalization literature, what is less known is the impact of financing constraints on outward FDI. Buch *et al.* (2014) extended the theoretical models of internationalization strategy to the case of outward FDI in the presence of financing constraints. Since OFDI involves high fixed cost which has to be incurred upfront, firms depend on their own internal finance or external sources of funds for financing FDI. However, very few empirical studies have explored the role of financing constraints in determining OFDI decisions (Buch *et al.*, 2014; Duanmu, 2015). The standard empirical approach adopted is the use of cash flow sensitivity in identifying the existence of financing constraints. A recent strand of literature argues that firms which lack internal funds may be able to obtain external finance provided they have adequate collateral (Manova 2013)<sup>1</sup>. This proposition has been verified by the studies on firm specific decisions on outward FDI (Duanmu 2015)<sup>2</sup>.

Outward FDI from emerging economies like India is increasingly becoming an important component of the world's investment flows. Figure 1 shows the recent trends in the outflows of FDI from India. India's outward FDI stock registered a quantum jump during last one decade, from a negligible amount of \$ 25 million during the early nineties to \$241 billion in 2013. The momentum of these investment outflows picked up during the second half of the 2000s. One can attribute this increasing trend of outward FDI by Indian firms to market oriented reforms undertaken during the early nineties. Indian policy makers have recognized the importance of these investments and have undertaken several measures by easing the stringent regulatory rules regarding overseas investments<sup>3</sup>. The share of India in the total outward FDI from Asia recorded a significant increase from 0.4 per cent to 4.3 per cent over the period of 2001 to 2011 (EXIM bank report on Outward FDI from India, 2014). The bulk of outward FDI flows originate from the manufacturing

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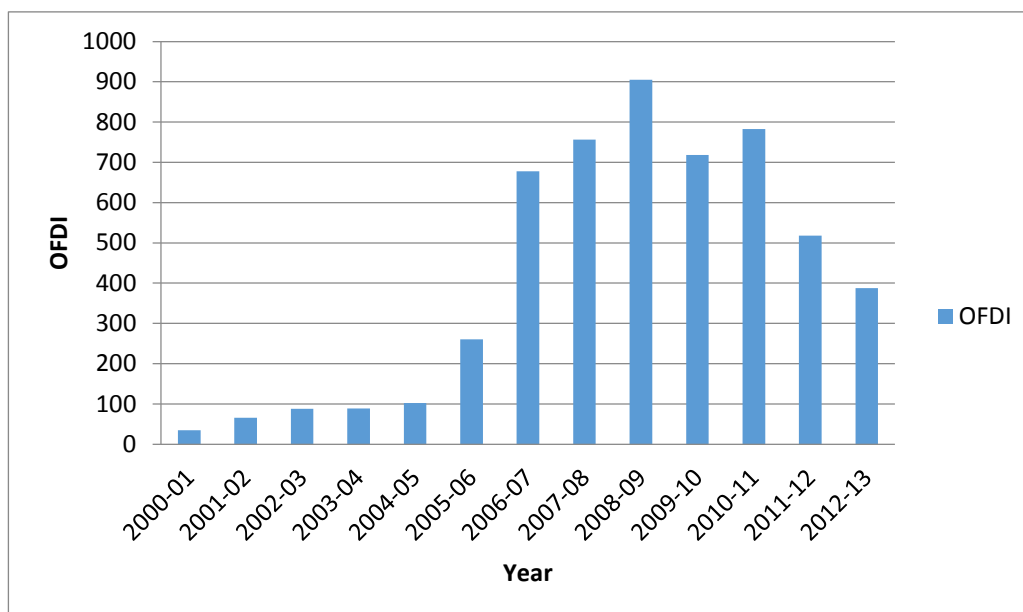
<sup>1</sup> In the empirical analysis, we test for the role of external finance following this line of argument.

<sup>2</sup> Duanmu (2015) finds significant role of external financing constraints in determining the OFDI decisions of Chinese manufacturing firms.

<sup>3</sup> Reserve Bank of India relaxed the guidelines for investment overseas by raising the annual overseas investment ceiling for Indians to US\$ 125,000 from US\$ 75,000 to establish joint ventures (JV) and wholly owned subsidiaries.

sector. The manufacturing sector contributes 32 percent of the total outward FDI from India in 2011-12 (EXIM Bank 2014).

**Figure 1. Outward FDI from India: Recent Trends**



Source: RBI Data on OFDI

Existing studies on OFDI in the context of India have overlooked the role of financing constraints. Therefore, objective of the present study is to examine financing factors in determining outward FDI based on the experience of Indian firms. We analyze the role of both internal and external financing constraints in determining OFDI decisions of Indian manufacturing firms<sup>4</sup>. Further, we extend our analysis to examine the role of financing constraints in determining the number of foreign affiliates. This additional exercise is undertaken since establishing more foreign subsidiaries incurs fixed costs.

Based on the above discussion, present study contributes to existing literature in the following ways. *First*, the empirical studies on India's experience with outward FDI concentrate on its determinants. We add to the nascent but growing body of literature on the effect of financing constraints on FDI controlling for productivity, size, ownership and export status based on the

<sup>4</sup> Some of the recent studies on sources of financing in the context of Indian manufacturing firms point to an increasing role of internal funds as a major source of financing. External sources of funding such as banks, corporate bond market etc play very meager role compared to other emerging economies which shows the underdevelopment of Indian financial market (Allen et al. 2012)

experience of an emerging economy, India. *Second*, unlike previous studies, our study uses a novel firm level data set of outward FDI from India which allows us to comprehensively analyze financing factors in determining outward FDI. We combine data for the years 2007-2014 from the PROWESS firm level database with outward FDI data provided by the Reserve Bank of India (RBI). Moreover, we have information related to the number of affiliates owned and the entry mode by these firms which enables us to understand the complex strategy of these firms. *Third*, we explore the role of financing constraints in determining the number of affiliates.

Results of the present study show that consistent with the theoretical predictions, financing constraints have a significant effect on the firm's decision to invest abroad and owning foreign affiliates. Even though internal funds of the firm matter for outward FDI decisions, the link between external finance and outward FDI is found to be weaker. Further, we find that productivity and exporting have significant impact on outward FDI decision.

The remainder of the paper is organized as follows: Section 2 explains the data and descriptive statistics. Section 3 provides the methodology and empirical model. The findings are discussed in section 4. The final section concludes the study.

## **2. Data Sources**

To carry out the empirical analysis, we combine two different data sources. *First*, financing information and firm specific characteristics such as sales, assets, export status, ownership information are obtained from the PROWESS database provided by the Center for Monitoring Indian Economy. PROWESS database is based on the annual reports and balance sheets of over 27000 companies belonging to utilities, manufacturing and services. The database contains both listed and unlisted firms. This database was previously employed by many firm level studies for analyzing the financing constraints related to fixed investments and R&D (Ghosh, 2006; Sasidharan *et al.* 2015). *Second*, outward investments data is obtained from the Reserve Bank of India (RBI) dataset on outward investments. This database contains

information about the investments made by around 3600 Indian firms. The coverage of the database includes manufacturing, services and utilities. Further, the data provides information on FDI destinations, number and the nature of affiliates, i.e., joint venture (JV) vs wholly owned subsidiary (WOS).

In the empirical analysis, we restrict our sample to firms belonging to manufacturing sector. We matched the RBI data with the PROWESS data on financing characteristics and other major firm specific characteristics. The matching exercise yielded a subset of 329 outward FDI firms. We use unbalanced panel data covering the period 2007-2014<sup>5</sup>. The sample firms are selected based on the following criteria. *First*, we include only those firms with positive sales and fixed assets. *Second*, firms reporting with negative cash flow are excluded from the sample. We exclude them since firms with negative cash flow are financially distressed firms (Sasidharan et al., 2015). Flow variables such as sales are deflated with corresponding industry WPI obtained from Central Statistical Organization (CSO). To remove the effect of outliers, variables are winsorized at the upper and lower 0.5 percentiles.

### 3. Methodology

We estimate the following specification using the instrumental variable probit<sup>6</sup> (*ivprobit*) regression to analyze the role of financial constraints in determining FDI decision.

$$\Pr(OFDI)_{it} = \beta_0 + \beta_1 Z_{i,t-1} + \beta_2 X_{i,t-1} + S_t + \varepsilon_{i,t} \quad (1)$$

where  $i$  and  $t$  denote firm and year respectively. To account for endogeneity and simultaneity of explanatory variables, we use lagged values of the time varying explanatory variables. The dependent variable  $OFDI_{it}$  denote whether firm  $i$  is has undertaken outward direct investment or not.  $OFDI_{it}$  is defined as binary variable taking value '1' if firms have reported outward FDI and '0' otherwise.  $Z_{i,t-1}$  and  $X_{i,t-1}$  represent vector of financing constraint variables

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<sup>5</sup> RBI provides outward FDI information at the firm level data from 2007 onwards. The absence of information prior to 2007 restricts our study period from 2007- 2014.

<sup>6</sup> *ivprobit* model is used since the endogenous regressors included are continuous variables and the dependent variable is of binary nature.



and firm specific control variables.  $S_t$  denotes set of time dummies which accounts for macroeconomic factors. Further, we undertake another empirical exercise to test complex strategy of firms having multiple affiliates by including the number of affiliates as a count variable (Buch et al. 2014). This variable is used as proxy to determine outward investment decisions of the sample firms. In the second set of analysis, we employ count data models to analyze factors that determine the number of foreign affiliates.

### **Explanatory Variables**

Our main variable of interest is the measure of financing constraints. However, measurement of financing constraints is a complex issue. The standard approach is using cash-flow indicator<sup>7</sup> as a proxy. The expected sign of this variable is positive. Sensitivity of firm investment to cash flow is interpreted as evidence of financing constraints. Firms with higher availability of internal finance find it easier to meet investment costs even if they do not have access to external finance. In addition, we use an alternative measure of financing constraints which is widely used in literature namely, *liquidity*. Liquidity ratio is measured as current assets minus current liabilities scaled by total assets. We expect a positive effect of liquidity on the probability of firms investing abroad. The availability of higher liquidity enables firms to meet fixed costs. In addition to the possibility of using internal funds, firms can obtain financial resources from external sources. Following Manova (2015) and Duanmu (2015), to account for the role of external finance, we include two measures viz, capital expenditure not financed by cashflow, and access to finance - defined as a ratio of long term bank credit to total assets.

It is argued that firms, which are heavily indebted, will have very little collateral to offer which acts as a constraint on their expansion abroad (Buch et al 2014). Therefore, we control for firms' leverage (debt ratio) measured as the ratio of debt to total assets. Size of the firm is considered as one of the major firm specific factors affecting firm level decisions. It accounts for scale effects

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<sup>7</sup> The cashflow variable is the widely used proxy in literature on firm financing constraints (Fazzari et al., 1998; Bond and Meghir, 1994). There is some skepticism associated with the use of cashflow as the proper measure of financing constraints since it captures the future investment opportunity and is non-monotonic in nature as pointed out by Kaplan and Zingales (1997).

(Krugman, 1980) and larger firms always have advantage of lower average costs, better information and easy access to funds. Exporting is another means of serving the foreign market. *Size* is measured as the as ratio of firms total assets to the industry median value. Since exporting entails ample learning opportunities about international markets, it acts as a stimulant to the FDI. Therefore, we include export status as a control with a value '1' if it exports and '0' otherwise. Total factor productivity (TFP) is an important determinant of outward FDI (Helpman *et al* 2004). Since measurement of TFP using OLS does not provide consistent estimates due to the problem of simultaneity, care should be taken during the estimation of TFP. The two alternative methods to overcome this issue are: Levinsohn and Petrin (2003) and Olley and Pakes (1996) procedure<sup>8</sup>. For the purpose of the present study, we estimate TFP using Levinsohn and Petrin (2004) procedure. We measure productivity as the ratio of firm TFP to mean industry TFP. Business group affiliates are salient feature of Indian corporate sector. Since group affiliates have access to the headquarters, they may suffer less in terms of obtaining finance. Therefore, we control for the group association by assigning '1' for group affiliates and '0' otherwise. Regarding effect of *age* of the firm and the decision to invest abroad, the previous findings are inconclusive. Some studies report that older firms are more likely to undertake FDI (Blomstrom and Lipsey 1991), however, some other studies obtain mixed results (Asiedu and Esfahani 2001). We measure *age* of the firm the as number of years since incorporation. Higher fixed costs involved in establishing an affiliate abroad are expected to have a negative impact on the number of affiliates owned by investing firms. In order to account for fixed costs, we include asset tangibility measured as ratio of fixed assets to total book-value of assets (*fixed costs*) in the model on determinants of number of foreign affiliates. Further, higher fixed costs is a proxy for the amount of collateral or tangibility.

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<sup>8</sup> One of the major issue in estimating production function is the correlation between unobservable productivity shocks and level of inputs. Levinsohn-Petrin (L-P) method follows a Cobb-Douglas production function with three factors; labour, capital and intermediate goods and assumes intermediate goods as the proxy for the unobservable productivity shocks. In Olley-Pakes method, Investment is used as a proxy for the same. Since there is large number of firms with zero investments in our dataset, it cannot be used as a proxy to account for these shocks. Further, L-P method is widely used in literature for estimating TFP (Head and Ries, 2003; Lancheros and Demirel, 2012)

## Econometric Issues

We employ a binary model using instrumental variable probit model (*ivprobit*), and count data models to explain financing constraints in explaining OFDI decisions and number of foreign affiliates respectively. The endogeneity of financing constraints is a major concern in empirical models examining firm level OFDI decisions. Endogeneity arises due to the possibility that firm internationalization can enhance financing status of firms through access to international financing markets or through export receipts (Buch et al., 2014). In order to control for endogeneity, we use an instrumental variable probit (*ivprobit*) model. We control for endogeneity issue using financing constraints of competitors of particular firm as instruments (Buch et al., 2014). It is expected that financing constraints of competitors are exogenous and independent of investment decisions of a specific firm. Mean industry cash flow and mean industry liquidity where we exclude the values of these measures specific to the firm from mean values are employed as instruments<sup>9</sup>.

With regard to examining the strategies of owning affiliates, we rely on the count data models. Count variables are characterized by excessive zeros, but have non-negative values. The count models control for excess zeros in the data. The basic count model is the poisson model which is based on equi-dispersion assumption<sup>10</sup>. Since the assumption of equi-dispersion rarely holds, negative binomial and zero inflated negative binomial (ZINB) regression model is often used as alternatives since it allows for the case of over dispersion and unobserved heterogeneity (Hilbe, 2014). ZINB considers zero counts as 'good' and 'bad' counts. The method assumes two data generating mechanisms, one generating zero counts and second generating full range of counts. Since in our sample there are large number of zero counts, in addition to poisson and negative binomial models, we employ ZINB model to examine the role of financing constraints in determining the number

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<sup>9</sup> We test for the potential quality of instruments using OLS regressions. Appendix I reports the estimates of the first stage regressions using OLS. Column (1) and (2) reports the model with cash flow and liquidity as the dependent variables respectively. The results show that all major variables are significant. The major interest variable, sector mean of cash flow and sector mean debt ratio found to be positively correlated to the firm's financing condition which confirms the endogeneity problem

<sup>10</sup> Equi-dispersion assumption implies equality of mean and variance.

of foreign affiliates. We employ all three models to examine factors determining number of foreign affiliates. Our dependent variable in this case is a count variable (number of foreign affiliates owned by firm).

Another issue with respect to count data models is the initial conditions problem of the data. Initial conditions bring in persistence in the nature of firm level decisions on these variables and determine the future values (Lemmon et al., 2008) in the context of firm decisions such as exports, number of foreign affiliates etc. Unlike the previous studies (Buch et al 2014), we control for the effect of initial conditions by dropping the initial year count of number of foreign affiliates in the count model specification.

### **Descriptive Statistics**

Table 1 provides the industry-wise distribution of average outward FDI during the period 2007-2014. It is evident that bulk of FDI stems mainly from machinery and electrical equipment (38.98%), transport equipment industry (28.59%), chemicals and chemical products (19.01%) and pharmaceutical (11.8%) industry. The industry wise distribution of the sample firms are given in Appendix II. Destination of FDI shows that bulk of the outward FDI is directed towards the developed markets (Appendix III). The highest share of OFDI during this period is mainly towards Europe (27.7%) followed by United States (13%).

**Table (1): Distribution of Outward FDI by Industry group over the period 2007- 2014**

Industry Group	Amount (US\$ Million)	Percentage (%)
Basic metals, Alloys and Metal products	845.73	2.85
Beverage and Tobacco Products	103.54	0.35
Chemical and Chemical products	5647.33	19.01
Leather and Leather products	15.22	0.05
Machinery and Electrical Equipment	11576.61	38.98
Miscellaneous manufacturing	329.96	1.11
Non- metallic mineral products	911.85	3.07
Pharmaceuticals and related products	3503.78	11.80
Rubber and Plastic products	298.182	1.00
Textiles	394.563	1.33
Transport Equipment and parts	6024.91	20.29
Wood and wood products	49.57	0.17

Source: Author's Calculation from RBI Data on OFDI

Table (2) provides the definition of major variables discussed above, the measurement and descriptive statistics. Column 6 provides the results of the equality of mean difference between outward FDI and domestic firms in terms of major financing indicators, productivity, size, age, export status using a two tail t-test. Results of the t-test for the difference between outward FDI and domestic firms indicate that on an average, outward FDI firms are larger in terms of size, have higher cash flow, maintain higher liquidity, and are less leveraged. We plot the major firm level variables to show the difference between outward FDI and domestic firms. Figure 2 (a), (b) and (c) confirms the hypothesis that the OFDI firms are larger, have higher cash flow and maintain higher liquidity compared to their counterparts. Figure 2(d) shows that in the case of TFP, the corresponding figures are overlapping. From the figure 2(d), it is evident that some of the sample firms with higher productivity

are not engaging in outward FDI. They are confined to the domestic market and do not prefer internationalization. Further, figure 2 (e) shows that there is no significant difference between two groups in terms of asset tangibility (proxy for fixed costs). Based on this exercise, the heterogeneity of outward FDI and non-FDI firms with regard to financing status is evident, but there seems to be no clear difference in the case of asset tangibility and TFP.

**Table (2): Descriptive Statistics**

Variables	(1) Definition	(2) Observations	(3) Mean (Median)	(4) FDI firms	(5) Non- FDI firms	(6) P value
OFDI Decision	=1 if firm has OFDI =0 otherwise	5645	0.058	-	-	-
Cashflow	Log of cashflow	5645	2.731 (2.590)	4.276 (4.439)	2.635 (2.494)	0.000
Liquidity	Current assets- current liabilities/total assets	5645	3.692 (3.594)	5.037 (5.102)	3.609 (3.519)	0.000
Debt Ratio/Collateral Capital	Borrowings/Total assets Capital	5645  4137	0.309 (0.301)	0.293 (0.315)	0.310 (0.300)	0.195
Expenditure	Expenditure not financed by cashflow/ total assets		0.015 (0.001)	0.028 (0.014)	0.014 (0.003)	0.0029
Access to finance	Long-term bank credit / total assets	4137	0.114 (0.079)	0.115 (0.074)	0.1144 (0.078)	0.951
Asset Tangibility	Gross Fixed Assets/ total assets	5645	0.631 (0.586)	0.499 (0.491)	0.639 (0.597)	0.000
Size	Log of Total Assets/ Median Industry log of	5645	1.041 (1.023)	1.317 (1.318)	1.024 (1.002)	0.000

		total assets				
		5645	35.42	35.158	41.78	
Age	Number of years since incorporation		(29)	(29)	(35)	0.201
		5645	0.982	1.025	0.978	
Total Factor Productivity (TFP)	Log of TFP/Mean Industry TFP		(0.725)	(0.912)	(0.711)	0.442
Export status	=1 if firm has exporter =0 otherwise	5645	0.825	0.960	0.816	0.000
Business Group Association	=1 if firm is associated with a group =0 otherwise	5645	0.386	0.465	0.381	0.0025

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TFP is estimated using Levinsohn and Petrin (2003) method. The method involves estimating TFP using a Cobb-Douglas form of production including capital stock, labour and energy as inputs and is measured as ratio of firm TFP to its mean industry TFP. We measure capital stock using widely used Perpetual Inventory method. Since the prowess database does not include information on labour, we calculated the labour variable using Annual Survey of Industries (ASI) data and PROWESS database. Labour is constructed using data on average wage rate from ASI and salaries and wages information from Prowess database (i.e., Average wage rate=total emoluments/total persons engaged; Number of labour=salaries and wages/Average wage rate). Power and fuel expenses are used as a proxy for energy expenses. We use revenue method since the value added information is not available

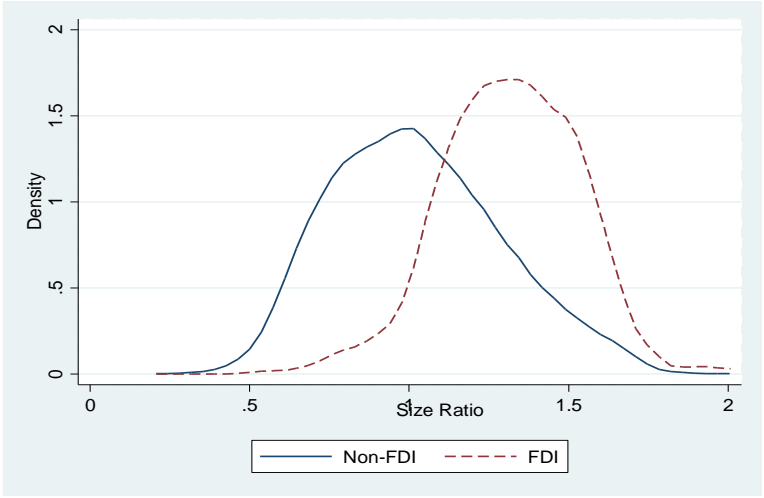


Fig 2 (a)

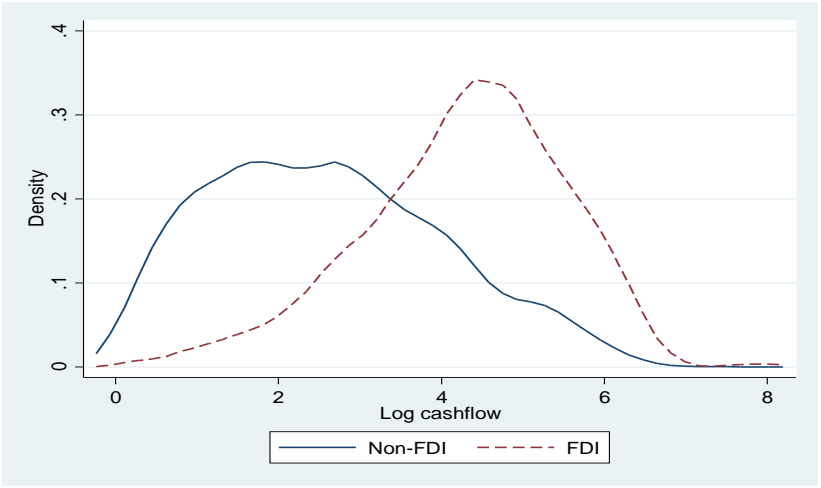


Fig 2 (b)



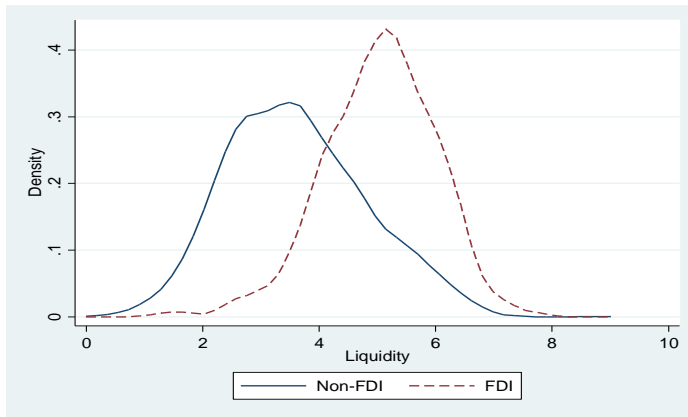


Fig 2 (c)

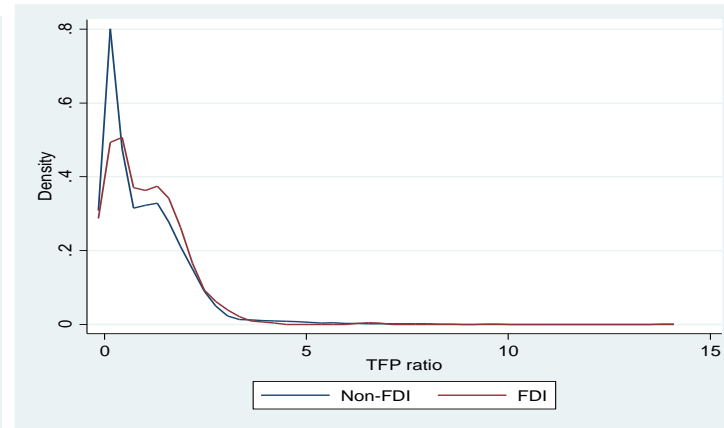


Fig 2 (d)

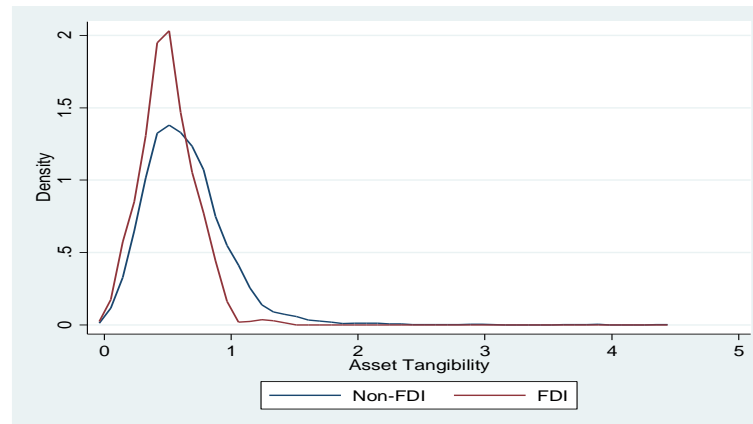


Fig.2(e)

#### 4. Results and Discussion:

The following section discusses the findings of the models on the probability of firm investing abroad and the factors determining the number of affiliates. The results confirm our hypothesis that financing constraints matter for the probability of firms investing abroad.

Table (3) reports results of the model on relationship between internal finance and probability of firms investing abroad using the instrumental variable probit model (*ivprobit*). The dependent variable is the binary variable defined as '1' if firm invests and '0' otherwise. Column (1) reports the estimates using cash flow as the major indicator of financing constraints. Column (2) reports the estimates of liquidity as the major financing indicator. Consistent with theoretical predictions (Buch et al 2014), our results confirm that the financing constraints (internal finance) measured by cash flow and liquidity matter for the OFDI decision.

We include size, age, productivity (TFP), export status, leverage (debt ratio) and ownership group association as additional control variables. *Size* of the firm is expected to have a positive impact on the firm's investment. On the other hand, in presence of financing constraints, the size of the firm may have a negative impact on the probability of firms investing abroad<sup>11</sup>. In the present case, we observe that larger firms have higher probability of undertaking outward FDI. TFP of firms has a positive effect on outward FDI decisions. Our results are consistent with other studies which report significant effect of TFP on the outward FDI (Duanmu, 2015). Similarly firms with international market experience through *exports* have significantly higher probability of investing abroad. Firms which are exposed to international markets through exports are more likely to invest abroad. However, debt ratio fails to have a significant impact on the outward FDI decisions. Firm *age* is found to have a negative effect, which implies that young firms tend to invest in comparison with their counterparts. The coefficient of business group affiliation is negative and

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<sup>11</sup> Buch et al (2014) argue that this result further depends on the instrumentation strategy.

significant. Even though a bit surprising, the slightly unexpected result may be due to the fact that firms affiliated to business groups prefer to focus predominantly on the domestic market. Perhaps this results is due to the fact that family owned and business group affiliated firms find the institutional context in home country optimal and that of overseas as detrimental. This is mainly due to risk involved, unwillingness towards dilution of ownership and lack of strategic relationships with foreign investors (Bhaumik et al., 2010).

**Table (3): Financing Constraints and OFDI Decisions**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	0.758***				0.789***	
Cashflow t-1	(0.111)		0.896***		(0.120)	
			(0.129)			
Liquidity t-1						1.063***
		0.890*		0.966***		(0.170)
		**		(0.159)		
		(0.141)				
Size t-1	-1.198**	-	-1.354**	-1.579**	-1.217**	-2.236***
	(0.531)	1.523*	(0.539)	(0.640)	(0.569)	(0.763)
		*				
		(0.629)				
Capex t-1					-	-0.746***
					0.000241	(0.283)
					(0.00026	
					0)	
Long term borrowings t-1					0.109	0.961*
					(0.517)	(0.533)
Age	-0.156**	-	-0.141*	-0.136*	-0.122	-0.153*
	(0.0776)	0.142*	(0.0767)	(0.0785)	(0.0783)	(0.0793)
		(0.078				
		7)				

TFP t-1	0.0613*	0.0545	0.331***		0.0725**	0.0662**
	(0.0322)	*	(0.0740)	0.278***	(0.0324)	(0.0333)
		(0.032		(0.107)		
		0)				
Exporter	0.477***	0.449*	0.471***		0.380**	0.326**
	(0.143)	**	(0.140)	0.451***	(0.149)	(0.160)
		(0.157)		(0.156)		
Business	-0.319***	-	-0.308***	-0.172	-0.461***	-0.276**
Group	(0.0985)	0.177*	(0.0968)	(0.105)	(0.114)	(0.120)
		(0.105)				
Debt ratio t-1	0.0180	-0.209	0.0335	-0.208	0.0586	-0.459
	(0.208)	(0.213)	(0.206)	(0.213)	(0.344)	(0.285)
(Cashflow			-0.123***			
*TFP) t-1			(0.0301)			
(Liquidity*				-		
TFP) t-1				0.0689*		
				*		
				(0.0305)		
Time	YES	YES	YES	YES	YES	YES
Dummies						
Wald Chi <sup>2</sup>	343.59	303.63	373.73	306.81	285.67	260.16
Prob> Chi <sup>2</sup>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	5,645	5,645	5,645	5,645	4297	4297

This table reports the results of ivprobit model on the probability of firm investing abroad. Cashflow, Size, age and TFP are measured in logs. Exporter is a dummy for export status. Standard errors are reported in the parentheses. \*\*\*, \*\*, \* denotes Significant at the level of 1, 5, and 10 % respectively. The mismatch of observations is due to missing values in case of external finance variables.

Columns 5-6 reports the results of the model with two external finance measures - capital expenditure not financed by cashflow to the total assets (Manova, 2015) and long term bank credit to total assets (Duanmu, 2015) which is a proxy for firm's access to finance. We expect positive effect of these two

measures which implies that firms with the access to external funds will have a higher probability of investing abroad. We retain all other explanatory variables including the internal finance measures. Contrary to the expectation, the evidence of external finance in ameliorating financing constraints is weak. Rather, the present findings confirm the hypothesis that firm's foreign investment decisions rely more on the availability of internal funds. As expected, the sign and significance of other control variables size, TFP, exports are found to be consistent with the previous specifications.

Table (3) also reports the results of interaction term between financing constraints and productivity. The objective of including these variables is to examine whether higher productivity helps the firms to compensate for undertaking FDI. We control for the mitigating effect of productivity by including an interaction term of the financing indicators with productivity. A significant negative impact of the variable implies that higher productivity fails to compensate the firm financing constraints and reduces the probability of firm investing abroad. We expect a negative effect of the interaction term in our model. Column 3 and 4 reports the results of the empirical model controlling for mitigating effect of productivity. Column 3 reports the estimates using cash flow as the interaction term while column 4 reports the estimates of model using liquidity as measure of internal funds. The negative and significant impact of interaction terms indicates that productive firms which are financially constrained are less likely to invest abroad.

### **Determinants of number of foreign affiliates**

We extend our first set of analysis to examine factors which determine number of foreign affiliates. The decision on investing abroad as well as number of foreign affiliates varies across firms. Firms differ in their number of foreign affiliates. Therefore, we try to explore the factors which drive the differences across firms. For this purpose, we rely on count data models; poisson, negative binomial models and zero inflated negative binomial (ZINB) regression models as mentioned in the previous section. The dependent variable; count of number of foreign affiliates is modeled as function of major financing constraint

indicators and other firm-specific characteristics. We introduce an additional control variable, fixed costs (proxy for fixed costs) which is found to have a significant impact on the number of foreign affiliates by various studies (Buch et al., 2014; Duanmu, 2015).

Table (4) reports the estimates of the analysis on the role of financing constraints on number of foreign affiliates using count data models. Column (1-3) reports the results of poisson, negative binomial models and zero inflated beta regression models using cash flow measure. Column (3-6) reports the results with liquidity measure. The financing constraints are found to have a significant impact on number of foreign affiliates. The coefficient of cash flow suggests that higher the availability of cash flow, higher the probability that the firm will have many foreign affiliates. Similarly higher liquidity is associated with more number of foreign affiliates. The asset tangibility measure which is the proxy for the amount of fixed costs is found to have the expected negative sign. This finding shows that the fixed costs involved in foreign investment and setting up affiliates reduces the number of foreign affiliates that an investing firm will own. Regarding the role of external finance dependence, we do not obtain any clear evidence.

**Table (4) Financing Constraints and Determinants of Number of Foreign Affiliates**

VARIABLES	(1) Poisson	(2) Negative Binomial	(3) Zero Inflated Model	(4) Poisson	(5) Negative Binomial	(6) Zero Inflated Model	(7) Zero Inflated Model	(8) Zero Inflated Model
Cash flow t-1	0.674*** (0.0678)	0.687*** (0.0861)	0.390*** (0.120)				0.357** (0.149)	
Liquidity t-1				0.595*** (0.0996)	0.770*** (0.136)	0.197 (0.156)		0.362** (0.162)
Debt ratio t-1	0.525*** (0.136)	0.506** (0.224)	0.554** (0.280)	-0.250 (0.279)	-0.462 (0.372)	-0.295 (0.364)	-0.0383 (0.400)	-0.303 (0.400)
Capex t-1							-1.097** (0.548)	-1.414*** (0.543)
Long term Borrowings							0.707 (0.639)	0.858 (0.635)

t-1

Asset tangibility t-1	-1.506*** (0.212)	-1.679*** (0.272)	-1.696*** (0.273)	-0.785*** (0.225)	-0.941*** (0.287)	-0.295 (0.364)	-1.872*** (0.332)	-1.613*** (0.344)
Size t-1	0.953*** (0.367)	1.116** (0.470)	0.884* (0.474)	1.558*** (0.452)	1.292** (0.593)	0.830 (0.569)	1.037* (0.564)	0.598 (0.687)
Age	-0.174* (0.0906)	-0.189 (0.122)	-0.179 (0.122)	-0.164* (0.0922)	-0.248* (0.129)	-0.236* (0.126)	-0.124 (0.157)	-0.158 (0.159)
Export dummy	0.486** (0.207)	0.674*** (0.245)	0.521** (0.248)	0.568*** (0.205)	0.631*** (0.244)	0.449* (0.247)	0.246 (0.263)	0.159 (0.260)
TFP t-1	0.139*** (0.0444)	0.141** (0.0573)	0.154** (0.0631)	0.128*** (0.0420)	0.133** (0.0579)	0.140** (0.0654)	0.161** (0.0727)	0.149** (0.0743)
Business Group	-0.571*** (0.105)	-0.546*** (0.130)	-0.525*** (0.127)	-0.557*** (0.107)	-0.504*** (0.133)	-0.480*** (0.128)	-0.717*** (0.158)	-0.691*** (0.157)
Time Dummies	YES	YES	YES	YES	YES	YES	YES	YES
Pseudo R <sup>2</sup>	0.212	0.167		0.193	0.157			
LR Chi <sup>2</sup>	708.19	499.50	126.38	645.96	468.97	71.43	118.22	117.00
Prob>Chi <sup>2</sup>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	5645	5645	5645	5645	5645	5645	4,297	4,297

This table reports the results of count models, where the number of foreign affiliates is used as the dependent variable. Cashflow, Size, age and TFP are measured in logs. Exporter is a dummy for export status. Standard errors are reported in the parentheses. \*\*\*, \*\*, \* denotes Significant at the level of 1, 5, and 10 % respectively.

### Robustness Tests:

To check the robustness of our findings, we classify the sample firms in terms of size and drop the OFDI firms which are concentrated in tax havens such as Mauritius and Cyprus. The results of these robustness checks are reported in Table (5).

In order to take account difference in terms of entry mode choice, we re-run our basic specification by classifying OFDI firm into Joint Venture (JV) and Wholly Owned Subsidiaries (WOS). Column 5-8 reports the results for JV and WOS firms using cash flow and liquidity measures. Since setting up of WOS involve higher fixed cost, the coefficients of the financing constraints variables show

higher value compared to the JV specification. The results found to be consistent with the basic results.

The effects of financial constraints could vary by size. Large firms are expected to be more productive and they are more likely to invest abroad compared to the small firms. Small firms are less likely to be affected since they are less productive (Chaney 2013) while large firms are able to meet the fixed costs and is more likely to invest abroad (Helpman et al., 2004). Therefore, we expect financing constraints matter more for the large firms. We divide the sample firms below and above mean size (total assets) and re-run our main specification. Columns (1-4) show the coefficients for the small and large firms using cash flow and liquidity measures. The results show that in the context of small firms, financing constraints do not play a significant role in determining the foreign investment decision. Unlike small firms, we find significant role of financing constraints in large firm's decision to invest abroad. The other firm specific variables such as age, productivity and business group affiliation have the expected sign with varying level of significance across small and large firms.

Our data contains firms which channel their outward investments through tax heavens and their final destination is unknown<sup>12</sup>. Therefore, we re-estimate the main model to check the sensitivity of the results by dropping such firms from the sample which may contaminate our findings. However, there is no significant change in the results when re-estimate the model using by deleting sub-sample of firms investing in tax heavens (Column 9-10).

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<sup>12</sup> Some of the sample firms report investments in Mauritius, Cyprus, Cayman Islands. We thank the anonymous referee for pointing this out.



**Table (5): Internal Finance and OFDI Decisions: Sample Splits**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Small	Small	Large	Large	JV	JV	WOS	WOS	Excluding Tax Havens	
VARIABLES										
Cashflow t-1	0.374 (0.262)		0.723*** (0.108)		0.692*** (0.172)		0.737*** (0.123)		0.699*** (0.117)	
Liquidity t-1		0.264 (0.306)		0.873*** (0.136)		0.662*** (0.169)		0.871*** (0.151)		0.854*** (0.146)
Size t-1					0.213 (0.145)	0.0842 (0.196)	-0.0747 (0.231)	-0.296 (0.231)	-1.064* (0.546)	-1.527** (0.641)
Debt ratio t-1	-0.566 (0.482)	-0.833* (0.500)	0.616** (0.283)	-0.136 (0.247)	-0.228** (0.108)	-0.204* (0.114)	-0.130 (0.0824)	-0.111 (0.0831)	-0.174** (0.0767)	-0.163** (0.0764)
Age	-0.0391 (0.141)	-0.0500 (0.140)	-0.184** (0.0923)	-0.219** (0.0925)	-1.685** (0.761)-	-1.386* (0.740)	-1.009* (0.590)	-1.381** (0.675)	0.0530 (0.0346)	0.0437 (0.0345)
TFP t-1	0.107** (0.0460)	0.0971** (0.0467)	0.0790** (0.0399)	0.0654* (0.0390)	- 0.00731 (0.0649)	-0.0106 (0.0670)	0.0754** (0.0320)	0.0685** (0.0314)	0.427*** (0.142)	0.395** (0.154)
Exporter	0.444* (0.248)	0.460 (0.294)	0.271 (0.184)	0.284 (0.199)	0.598** (0.235)	0.598** (0.249)	0.398** (0.157)	0.365** (0.171)	- 0.271*** (0.0984)	-0.135 (0.104)
Business Group	-0.296 (0.211)	-0.230 (0.186)	- 0.427*** (0.115)	- 0.322*** (0.111)	-0.197 (0.144)	-0.0947 (0.155)	- 0.344*** (0.106)	-0.196* (0.115)	-0.0744 (0.219)	-0.289 (0.222)
Time Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Wald Chi	28.84	26.45	134.71	133.62	82.44	74.29	301.70	278.73		
Prob>Chi <sup>2</sup>	0.0042	0.0093	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	2,991	2,991	2,654	2,654	5,378	5,378	5,578	5,578	5,600	5,600

This table reports the results of ivprobit model for the probability of firm investing abroad across size categories small and large firms and the results of ivprobit model for the probability of firm investing abroad for the sample excluding firms investing in tax havens such as Mauritius, Cyprus. Cashflow, Size, age and TFP are measured in logs. Exporter is a dummy for export status. Standard errors are reported in the parentheses. \*\*\*, \*\*, \* denotes Significant at the level of 1, 5, and 10 % respectively.

## **6. Conclusions:**

The rise of emerging economies based firms is a recent a recent feature of the internationalization process witnessed in the global economy. However, very little is known about the intriguing phenomenon of emerging economy firms. The present study is an attempt to examine the role of financing constraints in determining the outward FDI decisions of Indian manufacturing firms during the period 2007-2014. For the empirical exercise, we combine a rich firm level data set with a unique data on firm level outward FDI. Our empirical findings support that financing constraints matter for outward FDI decision. The findings suggest that firms with high cashflow and liquidity, large size, high productivity and lower fixed costs are more likely to invest abroad. Further, we do not observe mitigating effect of productivity in the case of outward FDI. However, we do not find evidence of external finance dependence. The findings confirm the importance of internal funds in firm investment decisions.

The study also finds that financing constraints matters not only for the probability of firm foreign investment, but also plays a significant role in determining the number of foreign affiliates of firms investing abroad. Using count models, the study shows that firms with higher cash flow and liquidity are more likely to have more number of foreign affiliates. One of the major implications of the findings is that export orientation of firms is a major factor in determining firm foreign investment decisions. This finding suggests the need of policies, which improves export orientation which can further enhance internationalization through outward FDI. The results also provide evidence that improving access to finance will help firms from emerging markets in getting rid of entry barriers to foreign markets.

In spite of the robust findings, there is a shortcoming in the present study which pertains to sourcing of finance by the sample firms. There exists a possibility for firms to finance OFDI from the host country. However, the dataset we use does not provide such detailed information about funding sources. Therefore, we were unable to undertake such an exercise by exploring the source of finance.

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## Appendix I. First Stage Regressions

VARIABLES	(1)	(2)
	Dependent variable: Cash flow	Dependent variable: Liquidity
Size t-1	4.451*** (0.0379)	4.240*** (0.0237)
TFP t-1	0.0144* (0.00757)	0.0255*** (0.00484)
Debt ratio t-1	-0.00523 (0.149)	-0.0873*** (0.0294)
Age	0.0426** (0.0206)	0.0463*** (0.0119)
Exporter	0.0533** (0.0246)	0.0235 (0.0170)
Business Group	0.0482** (0.0199)	-0.0829*** (0.0124)
Mean industry cashflow	1.091*** (0.0495)	0.271*** (0.0346)
Mean industry liquidity	-0.0233 (0.0685)	0.770*** (0.0518)
Time Dummies	YES	YES
Observations	5,645	5,645
R <sup>2</sup>	0.786	0.887

Note: This table reports the results of regressions testing for the potential quality of instruments of financing constraint measures; cashflow and liquidity. Cashflow is measured as the sum of profit after tax and depreciation and liquidity is defined as current assets minus current liabilities to total assets. We use mean cashflow and liquidity are the industry means excluding the specific

firm as the respective instruments. Cashflow, size, age and TFP are measured in logs. Exporter is a dummy for export status. Standard errors are reported in the parentheses. \*\*\*, \*\*, \* denotes Significance at the level of 1, 5, and 10 % respectively.

## Appendix II: Distribution of Firms by Industry

Industry	Observations
Basic metals, Alloys and Metal products	538 (9.53)
Beverage and Tobacco Products	240 (4.25)
Chemical and Chemical products	895 (15.85)
Leather and Leather products	68 (1.20)
Miscellaneous manufacturing	45 (0.80)
Non- metallic mineral products	322 (5.70)
Pharmaceuticals and related products	510 (9.03)
Rubber and Plastic products	521 (9.23)
Textiles	817 (14.47)
Transport Equipment and parts	764 (13.53)
Wood and Wood products	59 (1.05)
Machinery and Electrical Equipment	866 (15.34)
Total	5,645

**Note:** Figures in parentheses are the percentage share of each industry group.

Source: Author's calculation from PROWESS Database

**Appendix. III. List of Top Ten Countries: OFDI Destinations (2007-2014)**

<b>Country</b>	<b>Percentage share of OFDI</b>
Mauritius	36.10
Singapore	16.59
China	5.18
Cyprus	3.05
Netherlands	2.66
United Arab Emirates	2.39
United States of America	1.57
Switzerland	1.35
Brazil	1.26
United Kingdom	0.64

Source: RBI data on OFDI



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