Do Financing Constraints Impact Outward Foreign Direct Investment? Evidence from India

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This study examines the role of financing constraints in explaining outward foreign direct investment (FDI) using unique firm-level panel data on Indian manufacturing during the period 2007–2014. We consider the role of both internal and external finance, and employ instrumental variable probit and Tobit models to examine financing constraints in outward FDI decisions and intensity. We find that internal finance impacts the likelihood of outward FDI. Further, using count data models, we examine financing constraints in determining strategies regarding a firm's number of affiliates abroad. Our findings reveal that firms with greater cash flows and liquidity are likely to have more foreign affiliates.

Keywords: financing constraints, outward FDI, total factor productivity
JEL codes: F14, F21, F23

I. Introduction

Firm-level internationalization decisions regarding foreign direct investment (FDI) have recently garnered attention in the literature on international trade. The theoretical models, which explain the process of internationalization, focus on firm heterogeneity in terms of productivity (Melitz 2003; Helpman, Melitz, and Yeaple 2004; Yeaple 2009). Productivity is highlighted as the determining factor in firm decisions to enter foreign markets, either through FDI or exports. These models posit that exporting and FDI involve sunk costs and fixed costs. Firms above a 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 entering foreign

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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 barriers in the form of huge upfront fixed costs (Helpman, Melitz, and Yeaple 2004). During the previous 2 decades, the entry of firms from emerging economies like India into foreign markets has increasingly become a global phenomenon. Previously, firms from these economies were unable to expand beyond their own borders due to regulatory hurdles and resource constraints. Since the 1990s, reform measures adopted by policy makers in India have enabled firms to escape domestic resource constraints and integrate with global markets (Gaur, Kumar, and Singh 2014). The rapid pace at which these firms have integrated with the global economy requires thorough empirical examination given that these firms operate in an underdeveloped institutional environment that inhibits them from accessing resources (Khanna and Palepu 1997).

The much-acclaimed OLI framework (Dunning 1993) and resource-based view of FDI (Barney 1991; Peng 2001; Westhead, Wright, and Ucbasaran 2001) consider resources as the key determinant of FDI. Resources constitute both technology and capital. On the other hand, firm heterogeneity theory is based on an economic approach with a focus on efficiency considerations. Firms in emerging economies are not technologically superior but their investment decisions can also be affected by financial constraints. Surprisingly, the role of financial factors is overlooked in the above-mentioned approaches since traditionally FDI has emerged from advanced economies where capital markets are developed and financial constraints may not pose serious obstacles in making outward FDI decisions. However, the recent proliferation of multinationals in emerging economies like India poses a puzzle since capital markets are not developed in these economies. Hence, the question of how multinationals arise in resource-poor economies like India assumes greater significance. Unlike the People's Republic of China, where outward FDI is mainly driven by state-owned enterprises (Morck, Yeung, and Zhao 2008), in India outward FDI is predominantly driven by private sector firms. Therefore, it is important to understand whether financing constraints play a major role in the outward FDI decisions of firms in emerging economies like India.

Outward FDI is considered a means to escape from the "institutional voids" encountered by firms in emerging economies (Khanna and Palepu 2006). Attempts have been made to study the internationalization process of emerging market multinationals. However, the focus of these studies is mainly on entry-mode choices and determinants of outward FDI identified by using firm-level and aggregate economy-level data (Chittoor and Ray 2007; Woodcock, Beamish, and Makino 1994; Kumar 2007; Pradhan 2004). Buch et al. (2014) extended the theoretical models of internationalization strategy to the case of outward FDI in the presence of financing constraints. Since outward FDI involves high fixed costs, which are incurred upfront, firms depend on their own internal financing and/or external

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sources for financing FDI. However, very few empirical studies have explored the role of financing constraints in determining outward FDI decisions (Buch et al. 2014, Duanmu 2015). Financing constraints are regarded as an important factor in determining firm-specific decisions such as capital investment, research and development (R&D) investment, and exports. However, financing constraints' role in determining outward FDI decisions has not received much empirical attention.

The present study attempts to bridge this gap in the literature by examining the role of financing constraints in determining outward FDI decisions as well as the extent of outward FDI undertaken by firms. The standard empirical approach is the use of cash flow sensitivity analysis in identifying the existence of financing constraints. A recent strand of literature argues that firms lacking internal funds may be able to obtain external finance provided they have adequate collateral (Manova 2013).[1] This proposition has been verified by studies on firm-specific decisions on outward FDI (Duanmu 2015).[2] Outward FDI from emerging economies like India is increasingly becoming an important component of the world's investment flows. India's outward FDI stock registered a quantum jump over the past 2 decades, rising from a negligible $25 million during the early 1990s 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 by the Government of India during the early 1990s. Indian policy makers have recognized the importance of these investments and take measures to ease the stringent regulatory rules on overseas investments.[3] India's share of total outward FDI from Asia recorded a significant increase from 0.4% to 4.3% between 2001 and 2011 (Export–Import Bank of India 2014). The bulk of outward FDI flows originate from the manufacturing sector, which accounted for 32% of the total outward FDI from India in 2011–2012 (Export–Import Bank of India 2014). Existing studies on outward FDI in the context of India have overlooked the role of financing constraints. Therefore, the 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 outward FDI decisions and the amount of outward FDI made by Indian manufacturing firms.[4] Further, we extend our analysis to examine the role of financing constraints in determining the number

[1] In our empirical analysis, we test for the role of external finance following this line of argument.

[2] Duanmu (2015) finds a significant role for external financing constraints in determining the outward FDI decisions of manufacturing firms in the People's Republic of China.

[3] The Reserve Bank of India (RBI) relaxed the guidelines for investing overseas by raising the annual overseas investment ceiling for Indians to establish joint ventures and wholly owned subsidiaries from $75,000 to $125,000.

[4] Recent studies on sources of financing in the context of Indian manufacturing firms point to the increasing role of internal funds as a major source of financing. External sources of funding, such as banks and the corporate bond market, play a meager role in India compared with other emerging economies, reflecting the underdevelopment of Indian financial markets (Allen et al. 2012).

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of a firm's foreign affiliates. This additional exercise is undertaken since establishing more foreign subsidiaries incurs higher fixed costs.

Our study contributes to the existing literature in the following ways. First, 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 effects of financing constraints on FDI—controlling for firm productivity, size, ownership, and export status—based on the experience of an emerging economy like India. Unlike previous studies that considered the significance of either internal or external finance, we focus on both aspects. Second, our study uses a novel firm-level data set of outward FDI from India, which allows us to comprehensively analyze the role of 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). Further, our data set contains information pertaining to the number of affiliates and the entry mode of these firms, which enables us to understand their complex business strategies. Finally, unlike previous studies that focus on the likelihood of engaging in outward FDI, our data set permits us to account for the total amount of foreign investments, which enables us to test the relationship between financing constraints and the probability of undertaking foreign investments, as well as the amount of outward FDI.

The remainder of the paper is organized as follows. Section II explains the data and descriptive statistics. Section III provides the methodology and empirical model. The findings are discussed in section IV. The final section concludes.

II. Theoretical Underpinnings and Literature Review

The standard industrial organization approach considers FDI arising out of product and technology market imperfections (Hymer 1976, Rugman 1981). Recent theoretical models attribute the decision of a domestic firm to export or undertake FDI to productivity effects (Melitz 2003; Helpman, Melitz, and Yeaple 2004). According to this set of models, the presence of fixed costs in entering foreign markets leads more productive firms to export, with the most productive firms engaging in FDI. Following these models, numerous studies investigated the findings of Helpman, Melitz, and Yeaple (2004) and their theoretical predictions. Yeaple (2009) provides strong empirical evidence to support the findings of Helpman, Melitz, and Yeaple (2004) based on the FDI experience in the United States. Similar findings were reported by Kimura and Kiyota (2006); Girma, Kneller, and Pisu (2005); Wagner (2006); and Lee (2010) for Japan, the United Kingdom, Germany, and the Republic of Korea, respectively.

As mentioned above, productivity is not the only decisive factor driving the decision to serve foreign markets. Some of the recent models extend the Melitz (2003) model to incorporate financing factors in explaining the decision to undertake FDI and exporting (Chaney 2013, Buch et al. 2014). However, such

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empirical studies on firms' internationalization process and financing constraints are confined mainly to export decisions. The inclusion in the literature of the relationship between financing constraints and outward FDI is very recent. Buch et al. (2014) develop a theoretical model similar to firm heterogeneity models that show outward FDI being more vulnerable to financing constraints than exports. Firms undertaking FDI use internal funds for their international investments rather than using external finance. Firms rely more on internal funds since banks or other creditors may be unwilling to lend due to the information asymmetry surrounding the uncertainty and riskiness of investments in foreign markets. Buch et al. (2014) provide empirical support for their theoretical predictions based on the experience of German firms.

Studies on financing constraints and firm decisions in the context of India focus mainly on capital investment, R&D, and exports (Athey and Laumas 1994; Ghosh 2006; Bhaduri 2005; Bhattacharyya 2008; Sasidharan, Lukose, and Komera 2015). Some recent empirical studies have extended this framework to explain the export decisions of Indian firms. Lancheros and Demirel (2012) examined the role of credit constraints in the export behavior of Indian service firms and found that financing factors have no major impact. Instead, nonfinancing variables such as size and total factor productivity were found to be significant. In a recent study, Nagaraj (2014) analyzed the role of financing constraints in the export participation decisions of manufacturing firms in India and found that financing constraints affect the probability of firm exports. Previous research on outward FDI by Indian firms has largely been descriptive in nature (Nayyar 2008). Among these studies, some focus on the push factors of outward FDI using firm-level data (Kumar 2007, Pradhan 2004). Others concentrate on the locational choices of Indian outward FDI and motivational factors using a gravity model (Hattari and Rajan 2010). Exceptions include the firm-level studies of Goldar (2013) and Thomas and Narayanan (2013) that investigated the relationship between outward FDI and productivity. However, as mentioned above, existing studies in the context of emerging economies have overlooked the role of financing factors in determining outward FDI.

II. 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, and ownership information are obtained from the Prowess database provided by the Center for Monitoring Indian Economy. The Prowess database is generated from the annual reports and balance sheets of over 27,000 firms belonging to the utilities, manufacturing, and service sectors. The database contains both listed and unlisted firms, and has previously been employed in many firm-level studies analyzing financing constraints related to fixed investments and R&D (Ghosh 2006; Sasidharan, Lukose, and Komera 2015). Second, outward FDI data were obtained

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from the RBI to compile a database containing information about the investments of around 3,600 Indian firms in the utilities, manufacturing, and service sectors. Further, this database provides information on FDI destinations and the number and nature of affiliates (e.g., joint venture versus wholly owned subsidiary).

In our empirical analysis, we restrict the sample to firms belonging to the manufacturing sector since the fixed costs of investing abroad (e.g., setting up foreign affiliates) are more significant and higher for manufacturing firms than service firms (Helpman, Melitz, and Yeaple 2004). Further, manufacturing firms were more likely to venture abroad, with manufacturing firms accounting for about 40% of India's total outward FDI during the review period (Goldar 2013). We matched the RBI data with the Prowess data on financing characteristics and other major firm-specific characteristics to yield a subset of 329 firms engaged in outward FDI.[5] The data comprises various industry sectors.[6] We use unbalanced panel data covering the period 2007–2014.[7] The sample firms were selected based on the following criteria.[8] First, we include only those firms with positive sales and fixed assets. Second, firms reporting a negative cash flow were excluded from the sample since they were considered to be financially distressed (Sasidharan, Lukose, and Komera 2015). Flow variables such as sales are deflated with the corresponding industry Wholesale Price Index obtained from the Central Statistical Organisation. To remove the effect of outliers, variables were winsorized at the upper and lower 0.5 percentiles.

III. Methodology

We estimate the following specification using the instrumental variable probit (ivprobit) regression to analyze the role of financing constraints in determining FDI decision:[9]

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

[5] We matched the RBI data on outward FDI at the firm level with firm-level data on financial statements and other major firm-specific characteristics provided by the Prowess database. We were able to match 628 outward FDI firms belonging to the manufacturing sector. We applied filters to the matched data to clean the data. After applying the first filter of positive sales and fixed assets, the number of firms was reduced to 596. Next, we excluded those firms with a negative cash flow, reducing our sample to 568 firms. Finally, we dropped those firms with missing values for the financing constraint variables, leaving us with 329 firms.

[6] It is evident from the data that the bulk of FDI stems from the machinery and electrical equipment (39%), transport equipment (29%), chemicals and chemical products (19%), and pharmaceutical (12%) industries.

[7] The RBI provides outward FDI information at the firm level from 2007 onward. The absence of information prior to 2007 restricts our study to the period 2007–2014.

[8] We compared the characteristics of the selected sample of firms with those firms engaged in outward FDI that were excluded from the sample. The comparison shows that the selected sample for the present study is not biased. The descriptive statistics of the excluded sample are reported in column 7 of Table 1.

[9] An ivprobit model is used since the endogenous regressors included are continuous variables and the dependent variable is of a binary nature.

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where i and t denote firm and year, respectively. To account for endogeneity and simultaneity among explanatory variables, we use lagged values of the time-varying explanatory variables. The dependent variable, $OFDI_{it}$, denotes whether firm i has undertaken outward direct investment or not. $OFDI_{it}$ is defined as a binary variable taking a value of 1 if a firm has reported outward FDI and 0 otherwise. Z_{it-1} and X_{it-1} represent one period lagged values of vector-of-financing constraint variables and firm-specific control variables, respectively. S_t denotes a set of time dummies to account for macroeconomic factors.

In addition to the role of financing constraints in the likelihood of engaging in outward FDI, we also examine the effect of financing constraints on the amount of outward FDI (defined as the ratio of outward FDI to total assets of the firm).[10] We employ a random-effects panel Tobit model to examine the effect of financing constraints in determining the outward FDI share (Bhaumik, Driffield, and Pal 2010).[11] Since a large number of firms in our data set report no FDI, left censoring has to be taken into account. The use of a Tobit model helps to account for the problem of left censoring. Equation (2) below shows the model specification for examining the role of financing constraints on the share of outward FDI:

$$OFDI_{it} = \max[0, \beta_0 + \beta_1 Z_{i,t-1} + \beta_2 X_{i,t-1} + S_t + \varepsilon_{i,t} \; if \; OFDI_{it} > 0] \tag{2}$$

where $OFDI_{it}$ is the share of outward FDI, which is the ratio of outward FDI to total assets of the firm. The explanatory variables and other control variables are similar to the basic specification. We also control for firm-specific characteristics such as size, age, export orientation, and ownership status. Further, we undertake another empirical exercise to test the complex strategies of firms having multiple affiliates by including the number of affiliates as a count variable. This variable is used as a proxy to determine the outward investment decisions of the sample firms. In this set of analysis, we employ count data models to analyze factors that determine the number of foreign affiliates.

A. Explanatory Variables

1. Measures of Financing Constraints

Our main variable of interest is the financing constraints. We have used both internal and external financing measures to examine the role of financing constraints in determining a firm's outward FDI. However, the measurement of financing constraints is a complex issue. Previous studies have employed various

[10] The RBI data report the value of outward FDI in dollar terms. We converted to rupees and took the ratio of these converted values to the total assets of a firm.

[11] We have also estimated the model using the generalized least squares method and the results were found to be consistent. Results of this estimation are available from the authors upon request.

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direct and indirect proxies of financing constraints based on firm characteristics (Farre-Mensa and Ljungqvist 2016).

2. Internal Finance Measures

Cash flow. The standard approach in measuring financing constraints in the literature is using a cash flow indicator. The cash flow sensitivity of an investment is considered to be evidence of the existence of financing constraints, following the pioneering work of Fazzari, Hubbard, and Petersen (1988). The sensitivity of a firm's investments to cash flow is interpreted as evidence of financing constraints.[12] Many subsequent empirical studies used cash flow as a measure of financing constraints (Bond and Meghir 1994; Carpenter, Fazzari, and Petersen 1998). Firms with a higher degree of internal finance find it easier to meet investment costs even if they do not have access to external finance. We define cash flow as the ratio to total assets, where cash flow is measured as profit after tax plus depreciation and amortization.

Liquidity. In addition, we use liquidity as an alternative measure of financing constraints, which is also widely used in literature. The 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 financing resources from external sources. Liquidity is a standard measure of financing constraints used by various empirical studies (Greenaway, Guariglia, and Kneller 2007; Stiebale 2011).

3. External Finance Measures

External finance is another important source of financing for firms. External finance becomes important because of the existence of upfront costs and the lag between the expenses incurred and receipts received (Manova 2015). Following Manova (2015) and Duanmu (2015), to account for the role of external finance, we include two measures: (i) capital expenditure not financed by cash flow, and (ii) access to finance (defined as a ratio of long-term bank credit to total assets). The first measure (capital expenditure not financed by cash flow) accounts for outside funding required by firms to undertake long-term investment projects and relates to fixed costs (Manova 2015). The second measure (access to finance) is an alternative

[12]Cash flow as a measure of financing constraint has been questioned by various researchers (Kaplan and Zingales 1997). They point out that it captures the future investment opportunity and is nonmonotonic in nature. While Fazzari, Hubbard, and Petersen (2000) point out certain limitations in the approach followed by Kaplan and Zingales (1997), arguing that their theoretical model fails to capture the approach used in the literature and pointing out that their empirical classification system is flawed in identifying whether firms are constrained and the degree of financing constraints across firm groups.

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measure of dependence on external finance and it accounts for a firm's access to bank credit. Both variables are expected to have a positive impact on a firm's outward FDI decisions.

4. Other Firm-Specific Characteristics

Firms that are heavily indebted have very little collateral to offer, which acts as a constraint on their expansion abroad (Buch et al. 2014). Therefore, we control for a firm's leverage (debt ratio) measured as the ratio of debt to total assets. The size of the firm is considered one of the major firm-specific factors affecting firm-level decisions. This accounts for scale effects (Krugman 1980), with larger firms always having the advantage of lower average costs, better information, and easier access to funds. Exporting is another means of serving the foreign market. Size is measured as the ratio of a firm's total assets to the industry median value. Since exporting entails ample learning opportunities about international markets, it acts as a stimulant to FDI. Therefore, we include export status as a control with a value of 1 if it exports and 0 otherwise. Total factor productivity (TFP) is an important determinant of outward FDI (Helpman, Melitz, and Yeaple 2004). We estimate TFP using the Levinsohn and Petrin (2003) procedure; we measure productivity as the ratio of a firm's TFP to mean industry TFP. Business group affiliates are a salient feature of the Indian corporate sector. Since group affiliates have access to the headquarters, they may face fewer constraints in terms of obtaining finance. Therefore, we control for group association by assigning a value of 1 for group affiliates and 0 otherwise. Regarding the effect of the age of the firm and the decision to invest abroad, previous findings in the literature are inconclusive. Some studies report that older firms are more likely to undertake FDI (Blomstrom and Lipsey 1991). However, other studies obtain mixed results (Asiedu and Esfahani 2001). We measure the age of the firm as the 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 the ratio of fixed assets to the total book value of assets (fixed costs) in the model on determinants of the number of foreign affiliates. Further, higher fixed costs are a proxy for the amount of collateral or tangibility.

B. Econometric Issues

We employ limited dependent variable models like an ivprobit model, a random-effects Tobit model, and a count data model to identify financing constraints in explaining outward FDI decisions, the amount of outward FDI, and number of foreign affiliates, respectively. The endogeneity of financing constraints is a major concern in empirical models that examine firm-level outward FDI

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decisions. Endogeneity arises due to the possibility that firm internationalization can enhance the financing status of firms through access to international financial markets or through export receipts (Buch et al. 2014). To control for endogeneity, we use an ivprobit model. Specifically, we control for endogeneity issues using the financing constraints of competitors of a particular firm as instruments (Buch et al. 2014). It is expected that the financing constraints of competitors are exogenous and independent of the 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.[13]

We use another measure, credit rating, as an alternative instrument for financing constraints.[14] Empirical evidence shows that a credit rating can be taken as a measure of financing constraints for the following reasons: (i) unrated firms are assumed to have no access to public debt markets and therefore are dependent on other intermediaries such as banks; and (ii) a credit rating reduces the information asymmetries between investors and firms, and thus implies that unrated firms are more opaque and more likely to be rationed by lenders (Farre-Mensa and Ljungqvist 2016). The reason behind employing a credit rating as an alternative instrument is that we expect firms with a credit rating to have a better financial status than unrated firms (Adam 2009, Wagner 2014, Muuls 2015). We define credit rating as a binary variable taking a value of 1 if a firm is rated by Credit Rating Information Services of India Limited (CRISIL) or 0 otherwise. However, such a measure may be inadequate since rating status may not reflect whether firms are financially constrained or not since unrated firms may not be financially constrained in a true sense (Farre-Mensa and Ljungqvist 2016). To overcome this problem, we consider firms that are rated and have been downgraded from their initial rating as financially constrained firms. Downgrading has been considered in some studies that use credit rating as a measure of financing constraints (Kisgen 2009, Tsoukas and Spaliara 2014).

To examine firm strategies for owning affiliates, we rely on the count data models. Count variables are characterized by excessive zeros, but have nonnegative values. The count models control for excess zeros in the data. The basic count model is the Poisson model, which is based on an equidispersion assumption. Since the assumption of equidispersion rarely holds, negative binomial and zero-inflated negative binomial (ZINB) regression models are often used as alternatives because they allow for overdispersion and unobserved heterogeneity (Hilbe 2014). Since in our sample there are many zero counts, in addition to the Poisson and negative

[13] We test for the potential quality of instruments using an ordinary least squares regression. The results show that all major variables are significant. The major interest variables—sector mean cash flow, sector mean liquidity, and credit rating—were found to be positively correlated to a firm's financing condition, which confirms the endogeneity problem. The results are not reported here for brevity and are available from the authors upon request.

[14] We have taken credit ratings assigned by the Credit Rating Information Services of India Limited (CRISIL) from the Prowess database.

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binomial models, we employ a ZINB model to examine the role of financing constraints in determining the number of foreign affiliates. Another econometric issue with respect to count data models is the initial conditions problem associated with the data. Initial conditions account for persistence in the nature of firm-level decisions on these variables and determine the future values (Lemmon, Roberts, and Zender 2008) in the context of firm decisions like exporting and the number of foreign affiliates. Therefore, we control for the effect of initial conditions by dropping the initial year count of number of foreign affiliates in the count data model specification.

C. Descriptive Statistics

Table 1 provides the definition of the variables discussed above, their measurement, and descriptive statistics. Column 6 provides the results of the equality of mean difference between outward FDI and domestic firms using a two-tail t-test. The results of the t-test for the difference between outward FDI and domestic firms indicate that, on average, outward FDI firms are larger in terms of size and cash flow, maintain more liquidity, and are less leveraged. Column 7 reports the descriptive statistics of firms engaging in FDI that were excluded from the sample after the matching process. The average values of the firm-specific characteristics are similar to those of firms that are included in the sample. We reported this to provide evidence of our sample's unbiasedness. Figures 1(a), 1(b), and 1(c) confirm the hypothesis that the outward FDI firms are larger, have greater cash flow, and maintain more liquidity compared to their counterparts. Figure 1(d) shows that in the case of TFP, the corresponding figures are overlapping, which provides evidence that some firms with higher productivity are not engaging in outward FDI. Figure 1(e) shows no significant difference between the 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 their financing status is evident. However, there seems to be no clear difference in the case of asset tangibility and TFP.

IV. Results and Discussion

Table 2 presents the relationship between internal finance and the probability of firms investing abroad using an ivprobit model. Columns 1 and 2 report the estimates using cash flow and liquidity as financing indicators. Consistent with theoretical predictions, our results confirm that financing constraints (internal finance) measured by cash flow and liquidity matter for outward FDI decisions. We include size, age, productivity (TFP), export status, leverage (debt ratio), and business group association as additional control variables. The size of the firm is expected to have a positive impact on the firm's investment. On the other hand,

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Table 1. **Descriptive Statistics**

Variable	Definition (1)	Observations (2)	Mean (Median) (3)	FDI Firms (4)	Non-FDI Firms (5)	p-value (6)	Mean[a] (Median) (7)
Outward FDI share	Outward FDI/Total assets	5,645	0.059	0.994	NA	NA	NA
			(0.059)	(0.193)			
Cash flow	Log of cash flow	5,645	2.731	4.276	2.635	0.000	4.776
			(2.590)	(4.439)	(2.494)		(4.708)
Liquidity	Current assets–current liabilities/Total assets	5,645	3.692	5.037	3.609	0.000	5.461
			(3.594)	(5.102)	(3.519)		(5.388)
Debt ratio/Collateral	Borrowings/Total assets	5,645	0.309	0.293	0.310	0.195	0.241
			(0.301)	(0.315)	(0.300)		(0.204)
Capital expenditure	Capital expenditure not financed by cash flow/Total assets	4,137	0.015	0.028	0.014	0.0029	0.046
			(0.001)	(0.014)	(0.003)		(0.019)
Access to finance	Long-term bank credit/Total assets	4,137	0.114	0.115	0.1144	0.951	0.114
			(0.079)	(0.074)	(0.078)		(0.063)
Asset tangibility	Gross fixed assets/ Total assets	5,645	0.631	0.499	0.639	0.000	0.468
			(0.586)	(0.491)	(0.597)		(0.451)
Size	Log of total assets/ Median industry log of total assets	5,645	1.041	1.317	1.024	0.000	7.258
			(1.023)	(1.318)	(1.002)		(7.144)
Age	Number of years since incorporation	5,645	35.420	35.158	41.780	0.201	35.930
			(29)	(29)	(35)		(30)
Total factor productivity	Log of TFP/Mean industry TFP	5,645	0.982	1.025	0.978	0.442	2.598
			(0.725)	(0.912)	(0.711)		(2.247)
Export status	= 1 if firm exports = 0 otherwise	5,645	0.825	0.960	0.816	0.000	0.955
Business group association	= 1 if firm is associated with a group = 0 otherwise	5,645	0.386	0.465	0.381	0.0025	0.548

FDI = foreign direct investment, NA = not applicable, TFP = total factor productivity.

[a]Column 7 reports the mean (median) of firms excluded from the sample.

Notes: TFP is estimated using the Levinsohn and Petrin (2003) method, which involves estimating TFP using a Cobb–Douglas form of production that includes capital stock, labor, and energy as inputs, and is measured as the ratio of firm TFP to mean industry TFP. We measure capital stock via the widely used perpetual inventory method. Since the Prowess database does not include information on labor, we calculated the labor variable using Annual Survey of Industries data and the Prowess database. Labor is constructed using data on the average wage rate from the Annual Survey of Industries and salary and wage information from the Prowess database (average wage rate = total emoluments/total persons engaged; labor = salaries and wages/average wage rate). Power and fuel expenses are used as a proxy for energy expenses. We use the revenue method since value-added information is not available.

Source: Authors' calculations.

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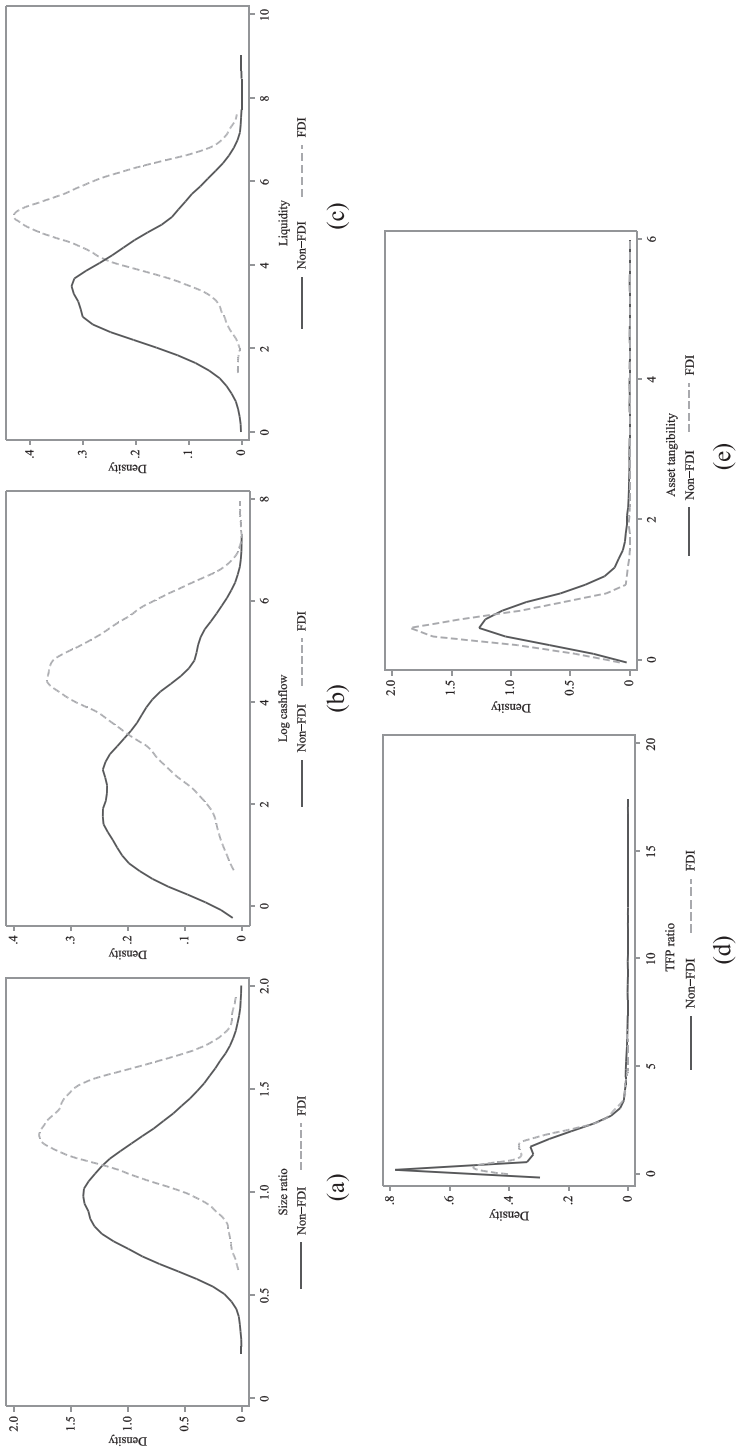
Figure 1. **Foreign Direct Investment versus Nonforeign Direct Investment Firms**



FDI = foreign direct investment, TFP = total factor productivity.
Source: Authors' calculation based on Prowess database.

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Table 2. **Financing Constraints and Outward Foreign Direct Investment Decisions**

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cash flow$_{t-1}$	0.758***		0.896***		0.789***		0.864***	
	(0.111)		(0.129)		(0.120)		(0.285)	
Liquidity$_{t-1}$		0.890***		0.966***		1.063***		1.856***
		(0.141)		(0.159)		(0.170)		(0.430)
Size$_{t-1}$	−1.198**	−1.523**	−1.354**	−1.579**	−1.217**	−2.236***	−1.940	−6.136***
	(0.531)	(0.629)	(0.539)	(0.640)	(0.569)	(0.763)	(1.573)	(2.362)
Capex$_{t-1}$					−0.00024	−0.746***		
					(0.00026)	(0.283)		
Long-term borrowings$_{t-1}$					0.109	0.961*		
					(0.517)	(0.533)		
Age	−0.156**	−0.142*	−0.141*	−0.136*	−0.122	−0.153*	−0.121	−0.158**
	(0.0776)	(0.0787)	(0.0767)	(0.0785)	(0.0783)	(0.0793)	(0.0748)	(0.0641)
TFP$_{t-1}$	0.0613*	0.0545*	0.331***	0.278***	0.0725**	0.0662**	0.0556*	0.00650
	(0.0322)	(0.0320)	(0.0740)	(0.107)	(0.0324)	(0.0333)	(0.0299)	(0.0364)
Exporter	0.477***	0.449***	0.471***	0.451***	0.380**	0.326**	0.285	0.128
	(0.143)	(0.157)	(0.140)	(0.156)	(0.149)	(0.160)	(0.178)	(0.217)
Business group	−0.319***	−0.177*	−0.308***	−0.172	−0.461***	−0.276**	−0.336***	−0.113
	(0.0985)	(0.105)	(0.0968)	(0.105)	(0.114)	(0.120)	(0.093)	(0.115)
Debt ratio$_{t-1}$	0.0180	−0.209	0.0335	−0.208	0.0586	−0.459	0.0109	0.0467
	(0.208)	(0.213)	(0.206)	(0.213)	(0.344)	(0.285)	(0.198)	(0.236)
(Cash flow × TFP)$_{t-1}$			−0.123***					
			(0.0301)					
(Liquidity × TFP)$_{t-1}$				−0.068**				
				(0.0305)				
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald Chi^2	343.59	303.63	373.73	306.81	285.67	260.16	405.18	703.73
Prob. > Chi^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	5,645	5,645	5,645	5,645	4,297	4,297	5,645	5,645

TFP = total factor productivity.

Notes: This table reports the results of the ivprobit model on the probability of a firm investing abroad. Cash flow, size, age, and TFP are measured in logs. Exporter is a dummy for export status. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. The mismatch of observations is due to missing values for the external finance variable. Columns (1) and (2) report the ivprobit results using cash flow and liquidity as measures of financing constraints and mean values of cash flow and liquidity as instruments, respectively. Columns (3) and (4) report ivprobit results controlling for interaction variables between cash flow and TFP, and liquidity and TFP, respectively. Columns (5) and (6) report ivprobit results using cash flow and liquidity controlling for external finance dependence. Columns (7) and (8) report ivprobit results using credit rating as the instrument for cash flow and liquidity instead of mean values of cash flow and liquidity.

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in the presence of financing constraints, the size of the firm may have a negative impact on the probability of firms investing abroad.[15] We observe that larger firms have a higher probability of undertaking outward FDI. The TFP of firms has a positive effect on outward FDI decisions. Our results are consistent with other studies that report the significant effect of TFP on outward FDI (Duanmu 2015). Similarly, firms with international market experience in exporting have a significantly higher probability of investing abroad. Firms that are exposed to international markets through exports are more likely to invest abroad. However, debt ratio fails to have a significant impact on outward FDI decisions. Firm age is found to have a negative effect, which implies that young firms tend to invest more in comparison with their counterparts. The coefficient of business group affiliation is negative and significant. Even though a bit surprising, the slightly unexpected result may be because firms affiliated with business groups prefer to focus predominantly on the domestic market. Perhaps this is because family-owned and business-group-affiliated firms find the institutional context in their home economy optimal in comparison with the overseas environment. This is mainly due to the risks involved, an unwillingness to allow dilution of ownership, and a lack of strategic relationships with foreign investors (Bhaumik, Driffield, and Pal 2010).

Columns 5 and 6 report the results of the model with two external finance measures: (i) the ratio of capital expenditure not financed by cash flow to total assets, and (ii) the ratio of long-term bank credit to total assets as a proxy for a firm's access to finance. We expect a positive effect for these two measures, which implies that firms with 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, evidence of external finance ameliorating financing constraints is weak. Rather, the present findings confirm the hypothesis that a firm's foreign investment decisions rely more on the availability of internal funds. As expected, the sign and significance of other control variables such as size, TFP, and exports are found to be consistent with the previous specifications. Columns 7 and 8 report the results using credit rating as an instrument for internal financing constraints instead of the mean industry values of cash flow and liquidity.[16] The result shows that the use of alternative instruments does not change our results.

Table 2 also reports the results of the interaction term between financing constraints and productivity. The objective of including these variables is to examine whether higher productivity helps firms compensate for undertaking FDI. We control for the mitigating effect of productivity by including an interaction term

[15] Buch et al. (2014) argue that this result further depends on the instrumentation strategy.

[16] We have also carried out an ivprobit estimation using credit rating as an instrument where credit rating is defined as 1 or 0 based on credit rating status without considering changes in grading. The results were found to be consistent with the results reported in columns 7 and 8 of Table 3. We have not reported these results in Table 2 for brevity, however, they are available from the authors upon request.

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Table 3. **Financing Constraints and Outward Foreign Direct Investment Share**

Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Cash flow$_{t-1}$	0.028**		0.018*		0.017*	
	(0.008)		(0.009)		(0.009)	
Liquidity$_{t-1}$		0.038**		0.031*		0.037*
		(0.012)		(0.013)		(0.015)
Size$_{t-1}$	0.016	−0.027	0.019	−0.022	0.081	0.027
	(0.041)	(0.057)	(0.041)	(0.057)	(0.111)	(0.069)
Capex$_{t-1}$					−0.107	
					(0.124)	
Long-term borrowings$_{t-1}$						−0.003
						(0.038)
Age	−0.029*	−0.028	−0.029*	−0.029*	−0.040**	−0.018
	(0.012)	(0.012)	(0.012)	(0.012)	(0.0148	(0.234)
TFP$_{t-1}$	0.010*	0.009*	−0.007	−0.011	0.012*	0.104*
	(0.004)	(0.004)	(0.009)	(0.013)	(0.006)	(0.006)
Exporter	0.012	0.009	0.011	0.009	0.019	0.011
	(0.015)	(0.015)	(0.015)	(0.016)	(0.019)	(0.018)
Business group	−0.006	−0.004	−0.007	−0.0007	−0.005	−0.043**
	(0.013)	(0.013)	(0.013)	(0.013)	(0.015)	(0.017)
Debt ratio$_{t-1}$	−0.023	−0.023	−0.024	−0.027	−0.064	−0.050
	(0.017)	(0.017)	(0.017)	(0.017)	(0.032)	(0.032)
(Cash flow × TFP)$_{t-1}$			0.008*			
			(0.004)			
(Liquidity × TFP)$_{t-1}$				0.007*		
				(0.004)		
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Wald Chi^2	63.66	61.15	69.48	64.08	51.01	57.21
Rho	0.110	0.113	0.109	0.113	0.143	0.191
Prob. > Chi^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	5,645	5,645	5,645	5,645	4,297	4,297

TFP = total factor productivity.
Notes: This table reports the marginal effects of a random-effects Tobit model where the dependent variable is a share of outward foreign direct investment defined as the ratio of outward foreign direct investment to total assets. Cash flow, size, age, and TFP are measured in logs. Exporter is a dummy for export status. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. The mismatch of observations is due to missing values for the external finance variable.
Source: Authors' calculations.

of the financing indicators with productivity. A significant negative impact of the variable implies that higher productivity fails to compensate a firm's financing constraints and reduces the probability of a firm investing abroad. Columns 3 and 4 report the results of the empirical model controlling for the mitigating effect of productivity. The negative and significant impact of the interaction term indicates that productive firms that are financially constrained are less likely to invest abroad.

Table 3 presents the results of the role of financing constraints in determining the share of outward FDI. Columns 1 and 2 report the marginal effects of the Tobit model on the role of financing constraints in determining the share of outward FDI, while columns 3 and 4 report the estimation results of the Tobit model, including

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the interaction term between cash flow, liquidity, and productivity, which indicates the mitigation effect of productivity.[17] The results indicate that unlike the mitigating effect of productivity on the likelihood of investing abroad, the mitigating effect of productivity impacts the amount of outward FDI made by a firm. Our results show that internal financing constraints, measured in terms of cash flow and liquidity, are the most important determinants of outward FDI intensity. However, the results based on external finance measures—capital expenditure not financed by cash flow and access to finance—are not statistically significant (columns 5 and 6). The effects of other control variables such as TFP, age, and ownership mode are found to be similar to the specification using the likelihood of firms engaging in outward FDI.

A. Determinants of Number of Foreign Affiliates

We extend our first set of analysis to examine factors that determine the number of foreign affiliates. Decisions to invest abroad and the number of foreign affiliates vary across firms. Therefore, we try to explore the factors that drive differences across firms. For this purpose, we rely on count data models: Poisson models, negative binomial models, and zero-inflated negative binomial regression models as mentioned in the previous section. The dependent variable (number of foreign affiliates) is modeled as a function of major financing constraint indicators and other firm-specific characteristics. We introduce an additional control variable (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 the number of foreign affiliates using count data models. Columns 1–3 report the results of the Poisson models, negative binomial models, and zero-inflated beta regression models using a cash flow measure. Columns 3–6 report the results with a liquidity measure. The financing constraints are found to have a significant impact on the number of foreign affiliates. The coefficient of cash flow suggests that the greater the availability of cash flow, the higher the probability that a firm will have many foreign affiliates. Similarly, greater liquidity is associated with more foreign affiliates. The asset tangibility measure, which is the proxy for fixed costs, has the expected negative sign. This finding shows that the fixed costs involved in establishing affiliates reduce the number of foreign affiliates.

B. Robustness Checks

To check the robustness of our findings, we classify the sample firms in terms of size and drop the outward FDI firms that are concentrated in tax havens such as

[17] We carried out a panel generalized least squares estimation in addition to the Tobit model and the results were found to be consistent.

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Table 4. **Financing Constraints and Determinants of Number of Foreign Affiliates**

Variable	Poisson (1)	Negative Binomial (2)	Zero-Inflated Model (3)	Poisson (4)	Negative Binomial (5)	Zero-Inflated Model (6)	Zero-Inflated Model (7)	Zero-Inflated Model (8)
Cash flow$_{t-1}$	0.674***	0.687***	0.390***				0.357**	
	(0.0678)	(0.0861)	(0.120)				(0.149)	
Liquidity $_{t-1}$				0.595***	0.770***	0.197		0.362**
				(0.0996)	(0.136)	(0.156)		(0.162)
Debt ratio $_{t-1}$	0.525***	0.506**	0.554**	−0.250	−0.462	−0.295	−0.0383	−0.303
	(0.136)	(0.224)	(0.280)	(0.279)	(0.372)	(0.364)	(0.400)	(0.400)
Capex $_{t-1}$							−1.097**	−1.414***
							(0.548)	(0.543)
Long-term borrowings $_{t-1}$							0.707	
							(0.639)	
Asset tangibility $_{t-1}$	−1.506***	−1.679***	−1.696***	−0.785***	−0.941***	−0.295	−1.872***	−1.613***
	(0.212)	(0.272)	(0.273)	(0.225)	(0.287)	(0.364)	(0.332)	(0.344)
Size $_{t-1}$	0.953***	1.116**	0.884*	1.558***	1.292**	0.830	1.037*	0.598
	(0.367)	(0.470)	(0.474)	(0.452)	(0.593)	(0.569)	(0.564)	(0.687)
Age	−0.174*	−0.189	−0.179	−0.164*	−0.248*	−0.236*	−0.124	−0.158
	(0.0906)	(0.122)	(0.122)	(0.0922)	(0.129)	(0.126)	(0.157)	(0.159)
Export dummy	0.486**	0.674***	0.521**	0.568***	0.631***	0.449*	0.246	0.159
	(0.207)	(0.245)	(0.248)	(0.205)	(0.244)	(0.247)	(0.263)	(0.260)
TFP $_{t-1}$	0.139***	0.141**	0.154**	0.128***	0.133**	0.140**	0.161**	0.149**
	(0.0444)	(0.0573)	(0.0631)	(0.0420)	(0.0579)	(0.0654)	(0.0727)	(0.0743)
Business group	−0.571***	−0.546***	−0.525***	−0.557***	−0.504***	−0.480***	−0.717***	−0.691***
	(0.105)	(0.130)	(0.127)	(0.107)	(0.133)	(0.128)	(0.158)	(0.157)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.212	0.167		0.193	0.157			
LR Chi^2	708.19	499.50	126.38	645.96	468.97	71.43	118.22	117.00
Prob. > Chi^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	5,645	5,645	5,645	5,645	5,645	5,645	4,297	4,297

LR = likelihood ratio, TFP = total factor productivity.

Notes: This table reports the results of count models, where the number of foreign affiliates is used as the dependent variable. Cash flow, size, age, and TFP are measured in logs. Exporter is a dummy for export status. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Source: Authors' calculations.

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Mauritius and Cyprus. The results of these robustness checks are reported in Tables 5 and 6. Further, to take account of differences in terms of entry mode choice, we rerun our basic specification by classifying outward FDI firms into joint ventures and wholly owned subsidiaries. Columns 5–8 report the results for joint ventures and wholly owned subsidiaries using cash flow and liquidity measures. Since the setting up of wholly owned subsidiaries involves higher fixed costs, the coefficients of the financing constraint variables show a higher value compared to the joint venture specification.

These results are found to be consistent with the basic results. The effects of financing constraints can vary by firm size. Large firms are expected to be more productive and more likely to invest abroad compared with small firms. Therefore, we expect financing constraints to matter more for the large firms. We divide the sample firms below and above mean size (total assets) and rerun our main specification. In Table 5, columns 1–4 present 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 FDI decisions. Unlike small firms, we find a significant role for financing constraints in a 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 levels of significance across small and large firms. Our data contain firms that channel their outward investments through tax havens with the final destination being unknown.[18] Therefore, we reestimate the main model to check the sensitivity of the results by dropping such firms from the sample since they may contaminate our findings. However, there is no significant change in the results when we reestimate the model by removing firms investing in tax havens (columns 9 and 10).

Table 6 reports the marginal effects of a random-effects Tobit model on the role of financing constriants in determining the amount of foreign investment across subsamples in terms of size, ownership mode (joint venture versus wholly owned subsidiary), and use of tax havens. The results show that financing constraints do not have any significant impact on the amount of outward FDI in the context of small firms, while both cash flow and liquidity have a positive and significant impact on the amount of outward FDI for large firms. Columns 5–8 report the marginal effects for joint ventures and wholly owned subsidiaries using two financing constriant measures (cash flow and liquidity). Financing constraints are found to be more significant in the case of wholly owned subsidiaries in determining the share of outward FDI. The results are similar even after excluding firms investing in tax havens such as Mauritius and Cyprus.

[18] Some of the sample firms report investments in Mauritius, Cyprus, and the Cayman Islands. We thank the anonymous referee for pointing this out.

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Table 5. **Financing Constraints and Outward Foreign Direct Investment Decisions: Sample Splits**

Variable	Small (1)	Small (2)	Large (3)	Large (4)	Joint Venture (5)	Joint Venture (6)	Wholly Owned Subsidiary (7)	Wholly Owned Subsidiary (8)	Excluding Tax Havens (9)	Excluding Tax Havens (10)
Cash flow $_{t-1}$	0.374		0.723***		0.692***		0.737***		0.699***	
	(0.262)		(0.108)		(0.172)		(0.123)		(0.117)	
Liquidity $_{t-1}$		0.264		0.873***		0.662***		0.871***		0.854***
		(0.306)		(0.136)		(0.169)		(0.151)		(0.146)
Size $_{t-1}$					0.213	0.0842	−0.0747	−0.296	−1.064*	−1.527**
					(0.145)	(0.196)	(0.231)	(0.231)	(0.546)	(0.641)
Debt ratio $_{t-1}$	−0.566	−0.833*	0.616**	−0.136	−0.228**	−0.204*	−0.130	−0.111	−0.174**	−0.163**
	(0.482)	(0.500)	(0.283)	(0.247)	(0.108)	(0.114)	(0.0824)	(0.0831)	(0.0767)	(0.0764)
Age	−0.0391	−0.0500	−0.184**	−0.219**	−1.685**	−1.386*	−1.009*	−1.381**	0.0530	0.0437
	(0.141)	(0.140)	(0.0923)	(0.0925)	(0.761)	(0.740)	(0.590)	(0.675)	(0.0346)	(0.0345)
TFP $_{t-1}$	0.107**	0.0971**	0.0790**	0.0654*	−0.00731	−0.0106	0.0754**	0.0685**	0.427***	0.395**
	(0.0460)	(0.0467)	(0.0399)	(0.0390)	(0.0649)	(0.0670)	(0.0320)	(0.0314)	(0.142)	(0.154)
Exporter	0.444*	0.460	0.271	0.284	0.598**	0.598**	0.398**	0.365**	−0.271***	−0.135
	(0.248)	(0.294)	(0.184)	(0.199)	(0.235)	(0.249)	(0.157)	(0.171)	(0.0984)	(0.104)
Business group	−0.296	−0.230	−0.427***	−0.322***	−0.197	−0.0947	−0.344***	−0.196*	−0.0744	−0.289
	(0.211)	(0.186)	(0.115)	(0.111)	(0.144)	(0.155)	(0.106)	(0.115)	(0.219)	(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^2	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

TFP = total factor productivity.

Notes: This table reports the results of an ivprobit model for the probability of a firm investing abroad based on firm size, excluding firms investing in tax havens such as Mauritius and Cyprus in columns (9) and (10). Cash flow, size, age, and TFP are measured in logs. Exporter is a dummy for export status. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Source: Authors' calculations.

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Table 6. **Financing Constraints and Outward Foreign Direct Investment Share: Sample Splits**

Variable	Small (1)	Small (2)	Large (3)	Large (4)	Joint Venture (5)	Joint Venture (6)	Wholly Owned Subsidiary (7)	Wholly Owned Subsidiary (8)	Excluding Tax Havens (9)	Excluding Tax Havens (10)
Cash flow$_{t-1}$	0.005		0.022**		0.006		0.028***		0.021*	
	(0.009)		(0.008)		(0.008)		(0.008)		(0.008)	
Liquidity $_{t-1}$		0.015		0.028**		0.034*		0.032*		
		(0.011)		(0.010)		(0.0113)		(0.012)		0.033*
										(0.013)
Size $_{t-1}$					0.066	−0.049	0.011	−0.011	0.044	−0.006
					(0.043)	(0.059)	(0.042)	(0.057)	(0.043)	(0.916)
Age	0.002	0.002	−0.044*	−0.046**	−0.027*	−0.028*	−0.022*	−0.022*	−0.028*	−0.028*
	(0.016)	(0.016)	(0.017)	(0.017)	(0.012)	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)
TFP $_{t-1}$	0.032***	0.032***	0.014*	0.013	0.003	0.002	0.010*	0.010*	0.014**	0.013**
	(0.006)	(0.006)	(0.008)	(0.008)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Exporter	0.015	0.011	0.029	0.029	0.014	0.010	0.008	0.007	0.017	0.015
	(0.017)	(0.018)	(0.028)	(0.028)	(0.016)	(0.016)	(0.015)	(0.016)	(0.016)	(0.016)
Business group	0.014	0.013	−0.007	−0.005	0.0007	0.003	−0.008	−0.002	−0.003	0.002
	(0.017)	(0.017)	(0.018)	(0.018)	(0.014)	(0.014)	(0.013)	(0.013)	(0.014)	(0.014)
Debt ratio $_{t-1}$	−0.006	−0.006	−0.011*	−0.013**	−0.014	−0.011	−0.020	−0.025	−0.026	−0.028
	(0.018)	(0.018)	(0.045)	(0.044)	(0.018)	(0.018)	(0.017)	(0.017)	(0.150)	(0.018)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald Chi	47.93	49.53	30.76	31.25	34.92	41.16	52.68	46.45	61.22	61.14
Rho					.1186	.1197	0.102	0.105	0.190	0.193
Prob. > Chi^2	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

TFP = total factor productivity.

Notes: This table reports the marginal effects of a random-effects Tobit model based on firm size, excluding firms investing in tax havens such as Mauritius and Cyprus in columns (9) and (10). Cashflow, size, age, and TFP are measured in logs. The dependent variable is the share of outward foreign direct investment to total capital assets. Exporter is a dummy for export status. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Source: Authors' calculations.

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V. Conclusions

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 unique data on firm-level outward FDI. Our empirical findings support the hypothesis that financing constraints matter for outward FDI decisions. The findings also suggest that large firms and firms with a bigger cash flow, greater liquidity, higher productivity, and lower fixed costs are more likely to invest abroad. Further, we do not observe a mitigating effect for productivity in the case of outward FDI, nor do we find evidence of external finance dependence. The latter finding confirms the importance of internal funds in a firm's investment decisions.

Using a random-effects Tobit model in determining the share of outward FDI, we observe that financing constraints play a significant role in determining the share of outward FDI. Financing constraint measures (cash flow and liquidity) are found to have a positive and significant impact on outward FDI. The effects of other control variables are also found to be similar to the specifications for the likelihood of firms making outward FDI decisions.

The study also finds that financing constraints impact not only the probability and amount of FDI, but also play a significant role in determining the number of foreign affiliates of firms investing abroad. Using count models, the study shows that firms with a bigger cash flow and more liquidity are more likely to have more foreign affiliates. One of the major implications of these findings is that the export orientation of firms is a major factor in determining their foreign investment decisions. This finding suggests the need for policies that strengthen firms' export orientation to further enhance their internationalization through outward FDI. The results also provide evidence that improving access to finance would help firms from emerging markets overcome barriers to entering foreign markets.

In spite of the robust findings, a shortcoming of the present study pertains to identifying sources of finance among sample firms. It is possible for firms engaging in outward FDI to finance resources from the host country. However, the data set we employ does not provide such detailed information about funding sources. Therefore, we are unable to undertake an exercise to explore the sources of finance.

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*The Asian Development Bank recognizes "China" as the People's Republic of China.

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