Financial constraints and lender selection: An empirical analysis

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Abstract

Imperfections in the financial markets due to the presence of agency problems and significant informational asymmetries between borrowers and lenders gives rise to financial constraints which restrict the amount or quality of investment options by firms. The present study has a combined objective. It investigates the presence of financial constraints at firm level via investment cash-flow relation in the context of a developing country like India. Then it tries to determine the preferred choice of firms among the alternative sources of debt financing to alleviate the constraints. The major empirical findings suggest that firms from the Indian manufacturing sector face the problem of financial constraints. As firms seek external borrowing, intermediaries play a relatively more important role in the provision of debt finance to the highly constrained Indian firms than do capital market sources or direct borrowing. Among the intermediaries, bulk of the total borrowings is from the commercial banks.

Keywords: Financial constraints, Intermediaries, Direct borrowing, Liberalization, Capital expenditure, Investment, Cash flow

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1 Introduction

Investment is one of the key determinants of an economy's long-term growth and business cycle fluctuations. For firms to fund investment, access to finance is necessary. The Classical theory of firm investment assumes capital markets to be perfect and efficient. Conversely, in real corporate world capital markets are not efficient on their own. The existence of efficient capital markets makes firm's investment decisions independent of their financing decisions. The departure from the frictionless capital markets as conjectured by (Modigliani and Miller 1958) has important implications for firm financing. Imperfections in the financial markets due to the presence of agency problems and significant informational asymmetries between borrowers and lenders gives rise to financial constraints which restrict the amount or quality of investment options by firms. In the presence of capital market imperfections, financial constraints influence firm's investment decisions. The popular pecking order theory suggests that the prioritization of funding sources by each firm is based on the asymmetric information cost it incurs, and accordingly, the first choice is internal finance, essentially retained profits which is the most economical among the sources available (Myers and Majluf 1984). The next viable option is debt capital, followed by new equity issuance. Both debt and equity capital are accessed from sources outside the firm and are referred to as external funds. Internal and external finance are considered as perfect substitutes under perfect capital market assumptions (Modiglini and Miller, 1958). It also indicates symmetrical availability of financing sources for all the firms. However, financial constraints imply divergence between internal and external sources of finance which prohibits a firm from making an investment it would have chosen due to scarcity of internal funds[1]. Investments of the financially constrained firms are assumed to be more sensitive to cash flow fluctuations as compared to unconstrained firms. Thus, they rely more on retained earnings or internal liquidity to avoid raising external capital at higher costs[2].

[1] See Kaplan and Zingales (1995)
[2] See Campello , et. al (2010)

In developing countries firms depend heavily on external finance[3], where debt is more preferred to equity. Debt can be raised through floatation of corporate bonds or borrowing from bank and non-bank intermediaries. There is also clear indication that Indian firms depend more on external debt than equity.[4] But, to raise external capital, firms incur information costs due to the presence of information asymmetries[5]. Under such a market situation, where firms face financial constraints, investment decisions are dependent on firm-level factors. Financial constraints affect firm growth by restricting capital expenditure, hindering technological innovations and also by limiting acquisition of information important for risk management, resource mobilization, amelioration of transaction costs etc. Thus, to ensure growth, it is necessary for a firm to overcome the problem of financial constraints for which a firm has to depend on external finance. To this end, analyzing the sources of obtaining external debt finance for financially constrained firms seems appealing in the context of a developing country like India.

The basic interest of the study is to evaluate empirically the relative contribution of the alternative sources of debt financing viz. financial intermediaries vis-à-vis direct borrowing and commercial banks vis-à-vis other financial institutions towards financially constrained firms in a developing economy like India. India, with an emerging capital market, the role of financial constraints assumes special importance as there are sharp differences in interest rate at which external finance is obtained. Again, due to the presence of capital market frictions, debt market segmentation may put constraints on some firm's ability to borrow which results in a mismatch between the level of debt included in the capital structure of firms and the demand for debt. In this context the study analyzes how the choice of various sources of debt financing is related to financial constraints. Furthermore, the Indian framework provides an interesting environment to study the interaction between financial constraints and alternative sources of borrowing in the wake of financial sector reforms initiated in 1991. This has enabled the firms to have greater flexibility with respect to their choice of capital structure. Thus, the study also emphasizes on the extent to which the choice of lenders by

[3] See D' Souza (1999)

[4] Evidence can be found in Shah and Thomas, (1999)

[5] Theoretical work by Jensen and Meckling (1976) and Myers and Majluf (1984)

constrained firms is affected by the initiation of the reforms.

The major empirical findings suggest that firms from the Indian manufacturing sector face the problem of financial constraint which explains investment inefficiency. The dependence of investment on cash flow is the strongest for those externally financially constrained firms that have a relatively high level of internal funds. In terms of external borrowing, intermediaries play a relatively more important role in the provision of debt finance to the highly constrained Indian firms than do capital market sources or direct borrowing. Among the intermediaries, bulk of the total borrowings is from the commercial banks. This reflects the continuing importance of banks as a major lending institution even in the post-reform period.

The remainder of the paper is laid down as follows. The literature survey is followed by a description of the methodology, sample, the variables used and the descriptive statistics of those variables. This section also depicts the trends in financing over the sample period. Section 2 develops the classification scheme. Section 3 discusses and examines the main empirical results and some robustness tests. It reviews elaborately the relative importance of borrowing directly from the capital market; bank borrowing and borrowing from financial institutions in the context of highly financially constrained firms. The concluding section summarizes the main findings.

2 Literature Survey

Major contributions directly related with the objective of this paper are limited in number. Several recent studies such as Almeida & Campello (2010) and Gracia & Mira (2014) have documented strong evidence on the role of financial frictions in determining the relationship between internally generated funds and the funds obtained from the external capital markets based on data from developed countries. The previous literature on the capital structure decisions of firms documented significant evidence regarding the role of financial constraints in firms' financing decisions. The seminal work in this area is by Fazzari et al. (1988) which was followed by Hubbard (1998), and Faulkender & Petersen

(2006).They conclude that financial constraints play a significant role in defining the direction and the extent of the relationship between investment and cash flow. They also argue that financially constrained firms include less leverage in their capital structure than their financially unconstrained peers. Rajan and Zingales (1998) suggest that industries which require more financing grow more slowly in countries with poorly developed capital markets, which is prima facie evidence that financial constraints are particularly likely to matter in underdeveloped or developing countries. Diverging from the large body of the existing literature of the sensitivity of investment to cash flow, Kaplan & Zingales (1997) show that the investment decisions of the least financially constrained firms are most sensitive to cash flow. Several other empirical papers including Kadapakkam et al., (1998) and Cleary (1999) supported these findings. However, Allayannis & Mozumdar (2004) examined the robustness of the results of Kaplan & Zingales (1997) and Cleary (1999) by arguing that the investment decisions of firms with cash losses cannot be sensitive to the availability of internal funds. Diamond (1984), Ramakrishnan and Thakor (1984) observed the significance of financial intermediaries in alleviating financial constraints imposed by informational asymmetries. Cantillo and Wright (1997) investigated the choice between borrowing directly from the capital market and raising finance through intermediaries. Their empirical results show that those factors that make a firm less likely to default, like large size, abundant cash, high profitability; ample collateral, low real interest rates will induce it to tap the credit markets directly. Again, Bhandari, Dasgupta and Gangopadhyay (2003) evaluated the role played by the development financial institutions in India, as an important source of long-term funds and examine how firms' investment decisions are affected by their ability to access development financial institutions. Studies like Mackie-Mason (1990), Hoshi, Kashyap and Scharfstein (1991)Calomiris (1994), Cantillo (1996), Anderson and Makhija (1999) have directly compared bank borrowings with direct borrowing and also tried to identify the factors that explain bank borrowing. A number of empirical studies like Miarka and Yang (1997), Anderson and Makhija (1999), Bhandari, Dasgupta and Gangopadhyay (2000), Lehmann and Neuberger (2000), Elston and Agarwal (2002) have brought out new evidences that relate financial intermediary relationships to firm performance and growth prospects.

The extant body of literature relevant to the present study either focuses on the role of financial constraints in determining cash-flow sensitivity of investment or how financial intermediaries help in reducing such financial constraints or association of financial intermediaries with firm level factors. Since, informational asymmetries between financiers and investors may create credit rationing and positive cost differentials between external and internal financing sources; the present study in the first stage investigates the presence of financial constraints at firm level via investment cash-flow relation. The investment-cash flow model is chosen as capital market imperfections leads to interdependence between the investment and financing decision of firms. In the second stage, it makes an attempt to determine empirically the preferred choice of firms among the alternative sources of debt financing to alleviate the constraints imposed by informational asymmetry and agency problem.

These two combined aspects related to financial structure of firms remains largely unexplained in the existing literature. Herein, the paper makes the necessary contribution.

3 Methodology and Sample

The objective here is to analyze the decision of obtaining debt finance from alternative sources by using a binary choice model. As two different sources of debt finance are examined at a time, probit models are particularly suited for testing such a structure. So, a probit regression model is used in a balanced panel framework, assuming that the dependent dichotomous variable follows normal cumulative density function. The slope coefficients of the regression analysis is interpreted as the rate of change in the conditional probability of the event occurring for a given unit change in the value of the explanatory variable.

Initially, the data set was a very large one comprising of 65 different industries from the Indian manufacturing sector. As the study is based on a balanced panel analysis, in the process of designing a balanced panel with representative firms in each year for the entire period of study, the sample includes eight industries viz. breweries and distilleries, automobile vehicles, electrical machinery and appliances, metal products, chemical

fertilizers, drugs and pharmaceuticals, cement, and paper. The sample consists of 53 firms drawn from these eight different industries belonging to the Indian manufacturing sector. The data for the study is obtained from the secondary sources compiled by the Reserve Bank of India from accounts submitted to it by all companies quoted on the stock market.

The time period covers a span of 25 years which can be separated into two phases.

The period preceding the initiation of reforms: 1986–87 to 1990–91. This includes the crisis period of 1990–91. The post-liberalisation period stretches from 1991-92 to 2011-12.

Before concentrating on specific industries of the manufacturing sector included in the sample, the study quickly glances through the development in the alternative sources of finance for the manufacturing sector of India as a whole in the first few years of the post- liberalization period.

Table 1.1: Sources of Finance in the Indian Manufacturing Sector (percentage share to total)

	1991-1994	1995-2000	2001-2005	2006-2009
Retained profits	9.26	9.24	36.5	25.33
Depreciation	16.86	20.62	21.30	12.78
Internal Financing	26.12	30.16	57.8	37.68
External sources	73.88	69.84	38.6	62.5
Funds raised from capital market	24.68	16.9	-0.5	-
Fresh capital raised	6.38	4.88	1.5	10.3
Share Premium	11.14	6.48	1.5	9.05
Borrowings	26.96	26.44	15.4	28.45
Institutional Borrowings	8.28	6.9	-5.7	-
Current Liabilities and provisions	22.2	26.54	28.2	21.8
Sundry creditors	10.34	10.54	18.5	10.83

Source: CMIE, Various Issues.

The share of internal financing (comprising of retained profits and depreciation) for firms belonging to the Indian manufacturing sector has increased sharply during the post-liberalisation phase of 2001-2005. However, it declined during 2006-2009. The sharp growth in internal

financing can be attributed to the remarkable growth in retained profits from 9 percent to 36 % although it declined slightly between 2006-09. The depreciation allowance which was quite high in the initial years of the period under consideration decreased with time. External sources contribute as the major source of financing throughout the period, except for the phase 2001-05; though the trend was reversed in the last phase. Bank borrowing turns out to be the most important component of external finance atleast for the firms belonging to the manufacturing sector.

The variables used for the empirical analysis is described below in Table 1.2.

Table 1.2: Description of Variables

dtta	total debt to total assets
intermd	the ratio of intermediary borrowing to total borrowing
bfbint	the ratio of borrowing from commercial banks to borrowing from intermediaries
bfbo	the ratio of bank borrowing to total borrowing
ext finance	external finance defined as the ratio of capital expenditures minus cash from operations over capital expenditures. Capital expenditures is change in gross fixed assets and cash flow from operations is proxied by profit after interest and tax plus depreciation.
prof	the ratio of profits after tax (PAT) over total assets
size	the natural logarithm of net sales
dtcap	the debt capacity, defined as the ratio of EBIT to interest payment. EBIT is earnings before interest and tax
growth	the ratio of advertising expenditure plus selling commission plus R&D expenditure over total assets
tan	tangibility or the ratio of net fixed assets over total assets

Table 1.3 presents the descriptive statistics for the variables used in the regression equations.

Table 1.3: Summary Statistics

	Mean	Median	StDev
dtta	0.2266	0.2086	0.1294
intermd	0.6943	0.7212	0.2138
bfbint	0.6639	0.6837	0.2754
bfbo	0.5936	0.5986	0.2440
ext finance	1.7995	0.7754	30.5684
prof	0.0257	0.0248	0.0798
size	12.7634	12.7261	1.5829
dtcap	2.0728	0.7520	7.5602
growth	0.0254	0.0044	0.0760
tan	0.6388	0.6243	0.2406

Trends in the four alternative sources of financing, 1987-2012

Table 1.4 documents the trends in financing for the four alternative sources of debt, for the representative sample over the sample period. The alternative sources include borrowing from banks (bfb), borrowing from financial institutions (bfi), borrowing from foreign institutional agencies (bfa) and direct borrowing (db)[6].

Table 1.4: Trends in the sources of debt as a proportion of Total borrowing

Sources of borrowing	Linear Trend	
	Coefficients	F-ratio
bfb	0.0116	0.04
bfi	0.2582	9.08**
bfa	-0.0012	0.12
db	0.1108	8.35*

As the workings are based on disaggregated firm-level data, to obtain the trends, the data on the four alternative sources of debt are aggregated at the industry level. To this end the arithmetic mean of outstanding borrowing by all individual firms present in the industry is calculated at a

[6] It is difficult to separate borrowing by issuing debenture and trade credit from the RBI data. So direct borrowing is supposed to include both.

particular point of time. The same technique is used to obtain aggregate industry level data in all the years for the alternative sources of borrowing.

Starting with bank borrowing as a proportion of total borrowing (bfb), it is found that for the sample firms, the proportion of bank borrowing does not reflect a systematic trend. Next, turning to the proportion of borrowing through other intermediaries, as per available data, the study concentrates on borrowing through financial institutions and also borrowing through foreign institutional agencies separately. It is interesting to note that borrowing through financial institutions (bfi) is showing a positive trend, which adds to the growing evidence on the role of financial institutions in promoting investment and growth for the Indian firms[7]. Again like borrowing through banks, the pattern of borrowing from the foreign institutional agencies (bfa) is random. Another noticeable thing is the simultaneous increase in the importance of capital markets, which is reflected in a significant and positive growth in directly placed debt. The trends of the four different sources of borrowing throw light on the relative importance of borrowing through financial institutions and direct borrowing among Indian firms over the years.

3.1 Classification scheme

The main interest of the study is to examine how borrowers, specifically the financially constrained firms choose their lenders. Thus, it is useful for the purpose, to classify firms a priori according to the extent of financial constraints they face. Since financial constraints are not directly observable, the existing literatures have used various proxies to determine the probability of a firm being financially constrained. Empirically the usual practice is to sort the sample of firms into groups based on their likelihood of being financially constrained using variables such as dividend pay-out ratio, business groups, ownership structure, size, age etc. to proxy firm's finance constraints[8]. (Rajan and Zingales 1998) argue that the proportion of capital expenditure not financed by internal funds is a measure of the intrinsic technological dependence on external finance for a firm. The magnitude of external dependence may act as a proxy for

[7] This result corroborates Gangopadhyay et al (2003)

[8] See Hubbard (1998) and Calcagnini and Saltari (2010) for a literature survey on financer constraints.

classifying firms with respect to their financial constraints.

Firm-level data based on ownership structure or membership of industrial group or pay-out ratios were not available. Therefore, two alternative proxies have been used to determine financial constraints faced by a firm. The first definition of financially constrained firms is based on a related idea that if raising external capital is costly as would certainly be the case for relatively less developed financial markets as in India, then firms that are more intrinsically externally dependent would be more financially constrained. Since, the study is interested in the amount of desired investment that cannot be financed through internal cash flows, therefore following Rajan and Zingales (1998) a firm's dependence on external finance is defined as capital expenditures minus cash flow from operations divided by capital expenditures. As data on capital expenditures is directly not available from the RBI data that has been used, change in gross fixed assets is used as a proxy for capital expenditures and cash flow from operations is calculated as net profit plus depreciation allowance. The higher degree of financially constrained firms has been identified by introducing a dummy variable. The dummy variable takes a value of one; if the firm's intrinsic external dependence in a given year is above the sample median. The second classification scheme is based on the size class of firms. It is often argued that large firms face less information problem as they tend to be more diversified and are able to provide better collateral. On the other hand small firms are likely to have more problems in conveying information to the potential creditors. Consequently these small firms are likely to face higher cost of external finance and may even be rationed out of the credit market. Thus, small firms are likely to face higher financial constraints as compared to large firms.

Three matrices are commonly used to indicate the presence of financially constrained firms. They are investment –cash flow sensitivity, cash-cash flow sensitivity and investment asset-sale sensitivity. (Fazzari, et. al, 1988) argue that more constrained firms should have higher cash flow sensitivity of investment, reflecting the difference between the costs of external and internal funds. A recent study by (Kumar and Ranjani 2018) also provides evidence of cash flow sensitivity as a suitable measure of financial constraints which was earlier applied to developed countries and will have implications for developing economies as well. Although there is no consensus on the relative superiority of any of these measures over the

other; in an attempt to identify the financially constrained firms the study depends on the accepted measure of investment-cash flow sensitivity. It is examined whether the type of classification scheme adopted in this study to make a distinction between more and less financially constrained firms, based on Rajan and Zingales method of classification is consistent with the theory. The basic idea is that internal funds should matter for the investment decision if and only if the firm is financially constrained. Thus, the test for the presence of financial constraints reduces to merely testing if the coefficient of cash flow is significant or not. To this end, the sorting criterion as developed by Rajan and Zingales (1998) is used for identifying firms as financially constrained. Then, a slope dummy is introduced which is defined as

dp= dummy to identify highly financially constrained firms * cash flow.

The slope dummy captures the differential marginal impact of cash flow on investment for firms, which face higher financial constraints. The regression equation estimated is:

$$inv_{it} = \alpha + \beta_1 \text{ cash flow}_{it} + \beta_2 dp + \mu_{it}$$

dp= fc* cash flow,

fc is a dummy variable representing highly financially constrained firms. It takes a value 1 for firms whose external dependence is greater than the sample median[9].

Dependent variable: investment = ratio of change in gross fixed assets (gfa) over total assets (ta). $inv = (gfa_{t+1} - gfa_t) / ta_t$

Table 2.1 shows that the slope dummy is significant and positive. This suggests that firms that are above median in terms of the Rajan-Zingales criterion of intrinsic external dependence show higher investment-cash flow sensitivity. Since, the empirical findings confirm to the hypothesis, this sensitivity may be proposed as a supporting measure of identifying financing constraints.

[9] Given the lack of a priori knowledge to identify the threshold value to assess the effectiveness of the proposed measure that can moderate the need for conservatism, using sample median to partition the data appears reasonable. Median is also less affected by outliers.

Table 2.1 Test for the presence of financial constraints

Variables	Co-efficient and t-ratios in parentheses
cash flow1	0.0023 (0.17)
dp	0.0039 (3.13)**
const	0.1135 (14.48)**

$R^2 = 0.44$

** indicates significant at .01 level

The study also checks the robustness of the above findings by treating external dependence greater the first quartile instead of sample median as a classification mark to identify the financially constrained firms.

Here also dp= fc* cash flow, where fc is a dummy variable representing highly financially constrained firms. Only difference is change in the threshold limit. The dummy variable takes a value 1 for firms whose external dependence is greater than the 1st quartile of the sample.

Table 2.2 Test for the presence of financial constraints

Variables	Co-efficient and t-ratios in parentheses
cash flow1	0.0174 (0.86)
dp	0.0039 (4.09)**
const	0.1367 (10.54)**

$R^2 = 0.49$

** indicates significant at .01 level

It is observed that changing the threshold limit to identify financial constraints does not alter the basic result.

3.2 Empirical estimation framework

3.2.1 Borrowing through intermediaries Vs direct borrowing

This section examines the relative importance attached to the two major alternative sources of borrowing viz, borrowing through intermediaries vis-à-vis direct borrowing from the market. Here, θ_{it} is defined as a ratio,

$\theta_{it} = bfi_{it} / (db_{it} + bfi_{it})$, where bfi_{it} and db_{it} are respectively borrowing through financial intermediaries and direct borrowing outstanding. If the ratio is equal to one, then the firm is borrowing solely through intermediaries. Firms with θ_{it} greater than the sample median but less than one are identified as firms with high proportion of intermediary borrowing. Then, a probit model is used where the dependent variable takes a value 1 for high proportion of intermediary borrowing that is whenever θ_{it} > sample median, and 0 otherwise.

Thus, here the latent variable is $Y1_{it}^{*} = \theta_{it}$ – sample median, which is explained in terms of a number of independent variables. The two major independent variables include an intercept dummy to separate out the highly financially constrained firms and a structural break dummy. The dummy variable introduced to identify the highly financially constrained firms (fc) takes a value one if the firm's external dependence in a given year is above the sample median. The sample medians are specific to an industry and calculated for each year. As the time period under consideration includes the phase during which new liberalisation policies were introduced in the Indian economy, a time dummy (*lib*) is included that takes a value one if year is greater than 1995; to identify the impact of the reforms on the choice of borrowing by firms[10]. As has been already discussed in the empirical literature, there are few firm-specific variables like large size, better performance, firm growth, ample collateral, high R&D and advertising expenditures, high leverage or paying dividends that influence the choice of borrowing by firms. Therefore, these variables are controlled for in the regression equation to be estimated.

According to (Rajan and Zingales 1998), demand for external funds is technology-driven and specific to an industry. Thus, here the industry-specific effect is automatically taken care of to a large extent by incorporating the dummy variable that distinguishes the more financially constrained firms from that of the less constrained ones within each industry group. Research and development is a capital intensive activity having a long gestation period and uncertainty in terms of results to a large extent. It is true that developing countries like India is often struggling to strike a balance between research expenditure and basic necessities. At the same time there are studies which have favoured

[10] other years like 1993, 1994 were tried, but 1995 turned out to be significant

R&D expenditure for the growth of firms. (Capasso, et. al, 2015) argued that in the short term, the average effect of R&D intensity was not significant. Instead, over a medium term (4-year growth rate) the positive influence of R&D on good performers is very strong. (Freihat and Kanakriyah 2017) have also observed a positive relation between R&D investment and firm performance. Unlike the previous studies which have used market-to- book ratio as a proxy for growth prospects, here R&D and advertising expenditures has been used as a proxy of future growth prospects.

The probit model is fully described by:

$$Y1_{it}^{*} = \alpha + \beta_1 fc + \beta_2 lib + \beta_3 size_{it} + \beta_4 prof_{it} + \beta_5 tan_{it} + \beta_6 growth_{it} + \beta_7 divd_{it} + \mu_{it}$$

$$\text{With } Y1_{it} = 1 \text{ if } Y1_{it}^{*} > 0$$
$$Y1_{it} = 0 \text{ if } Y1_{it}^{*} \leq 0,$$
$$\text{where } Y1_{it}^{*} = \theta_{it} - \text{sample median}$$

The results are presented in Table 3.1

Table 3.1 Intermediary borrowing –Vs- Direct borrowing
(financial constraints defined in terms of external dependence)

Variables	Co-efficients and z-values in parentheses
fc	0.2561 (2.51)*
lib	0.5860 (4.52)**
size	-0.2071 (5.54)**
prof	-0.4816 (0.64)
tan	-0.1488 (-0.72)
growth	-1.6463 (1.62)*
divd	-0.8443 (5.66)**
McFadden R^2 = 0.13	

** indicates significant at .01 level
* indicates significant at .05 level

The dummy variable representing the highly financially constrained firms is positive and significant. The positive influence indicates that the chance that the financially constrained firms in an industry are more dependent on intermediary borrowing than direct borrowing is higher in comparison to other unconstrained firms in that industry. The structural break dummy is turning out to be significant and positive. This suggests that in the post- liberalisation period, in spite of considerable development and increased participation in the capital market, there is continued reliance on borrowing through intermediaries. Firm size, growth opportunities and dividend payments have a significant and negative coefficient, consistent with the theoretical predictions and also confirms to the previous empirical results based on the data of the developed countries. The negative coefficients suggest that large firms in an industry tend to be more diversified or firms in an industry which are currently profitable can generate sufficient retained earnings and are less prone to bankruptcy and have increased chances of tapping the bond market directly in comparison to other firms in the industry. Similarly, firms in an industry paying dividend may in case of crisis reduce chances of default by curtailing dividends. Hence, are capable of borrowing directly from the market in relation to other firms in the industry. Again, firms with higher growth potential in an industry may be interested in signaling their conduct by incurring high R&D and advertising expenditures. Such firms choose directly placed debt to borrowing through intermediaries. In other words, the negative dependence reflects the fact that firms that are safe, having less chances of default rely relatively less on financial intermediaries for external finance. Performance of firms and collaterals possessed by a firm fails to influence firms' choice of borrowing.

Robustness

The study also checks the robustness of the above findings that intermediaries play relatively more important role in alleviating financial constraints faced by firms, by using an alternative proxy for identifying financial constraints. It is our conventional wisdom that small firms with more asymmetric information problem face more severe financial constraints. Banerjee and Duflo (2014) argue that there is little evidence on the existence of credit constraints on large firms in developing countries.

Thus, to identify highly financially constrained firms a dummy variable is introduced that takes a value one if firm size in a given year is less than the first quartile of the respective sample. In Table 3.2 the results of the alternative specification is presented.

Table 3.2 Intermediary borrowing –Vs- Direct borrowing
(financial constraints defined in terms of size class)

Variables	Co-efficients and z-values in parentheses
fc	0.5281 (2.84) **
lib	0.4222 (3.36) **
size	-0.1705 (4.12) **
prof	-0.5139 (0.62)
tan	-1.4605 (6.32) **
growth	-0.5370 (0.44)
divd	-0.6513 (2.81) **
McFadden R^2 = 0.16	

** indicates significant at .01 level
* indicates significant at .05 level

As can be seen, this alternative classification used to identify financial constraints does not alter the basic result. Only thing is that the growth opportunities variable becomes insignificant having no impact on the choice between borrowing through intermediaries and direct borrowing.

3.2.2 Bank borrowing Vs Other Financial Intermediaries

This section examines empirically the role played by the commercial banks in relation to the other financial institutions in India in alleviating financial constraints, using the same probit regression analysis. To identify the most preferred among intermediaries $\delta_{it} = bb_{it}/ (bb_{it} + bia_{it})$, is computed, where bb_{it} is borrowing from commercial banks by individual firms over time and bia_{it} is borrowing from other financial institutions and foreign institutional agencies. If the ratio, δ_{it} is equal to one, then the firm is borrowing solely through banks. δ_{it} > the sample median, is considered as an indicator of high proportion of bank borrowing. The independent

variables remain unaltered. The dependent variable is a binary dependent variable that takes a value one; for high proportion of bank borrowing; 0 otherwise. The latent variable is $Y2_{it}^{*} = \delta_{it}$ – sample median. The probit model is fully described by:

$$Y2_{it}=\alpha+\beta_1 fc + \beta_2 lib + \beta_3 size_{it} + \beta_4 prof_{it} + \beta_5 tan_{it} + \beta_6 growth_{it} + \beta_7 divd_{it} + \mu_{it}$$

with $Y2_{it} = 1$ if $Y2_{it}^{*} > 0$

$Y2_{it} = 0$ if $Y2_{it}^{*} \leq 0$,

where $Y2_{it}^{*} = \delta_{it}$ – sample median

The results are presented in Table 3.3

Table 3.3 Bank borrowing Vs borrowing from financial institutions (financial constraints defined in terms of external dependence)

Variables	Co-efficients and z-values in parentheses
fc	0.1565 (3.53) **
lib	-0.0831 (1.78) *
size	-0.0360 (2.26) **
prof	1.02694 (2.69) **
tan	-0.86711 (9.23) **
growth	-3.23241 (4.89) **
divd	-0.10743 (1.77) *
McFadden R^2 = 0.22	

** indicates significant at .01 level
* indicates significant at .05 level

The dummy variable identifying the highly financially constrained firms is strongly significant and positive. This reveals that among the financial intermediaries existing in the Indian economy, the chance of the commercial banks is relatively higher in alleviating financial constraints faced by firms in an industry compared to other firms in that industry. The time dummy identifying the structural break is again significant but this time negative, suggesting that in the early years of the post-liberalisation

period, Indian firms were relatively more dependent on financial institutions rather than banks. This result seems to reflect an underlying supply side story. There is evidence of a sudden cut-off of access to banks in the early nineties, when the banking sector was undergoing major changes with the publication of the Narasimham Committee Report. Interest rates and directed credit had been deregulated, and new prudential norms and capital adequacy standards were being adopted[11]. Moreover the financial institutions, mainly the Development Financial Institutions have been in a phase of transition since the early nineties. The DFIs have been getting more involved in working capital finance and have been permitted access to short-term finance. They have also combined traditional investment activities along with their primary term- lending activities. All these reforms may have shifted the focus of Indian firms from bank borrowing to borrowing from other financial institutions immediately after the initiation of the liberalisation policies. The other variables remain significant and maintain their previous directions of influence.

Firm size, tangibility or the asset structure of firms, growth opportunities and dividend payments are all significant and have a negative influence on the choice between borrowing from commercial banks and other financial institutions. This suggests that those firms in an industry which are large or posses ample collateral, or have high growth opportunities or pay high dividends in relation to other firms in that industry have higher chances of borrowing from the financial institutions than banks. This can be explained from the perspective of the financial intuitions and the firms as well. The financial institutions in India were initially developed with the objective of providing long-term finance. Thus, the better-off firms might require more of long-term finance than short or medium –term finance and had a better access to the financial institutions. Firm performance is also significant but positive suggesting that firms with better performance or higher profitability have increased chances of obtaining credit from the commercial banks in relation to the other financial intermediaries.

[11] Bhandari, Dasgupta and Gangopadhyay (2003).

Robustness

The robustness of the results in this model is checked by classifying firms as more or less financially constrained with respect to their size class. The results are given in Table 3.4.

Table 3.4: Bank borrowing Vs borrowing from financial institutions (financial constraints defined in terms of size class)

Variables	Co-efficients and z-values in parentheses
fc	-1.0932 (4.83) **
lib	-0.3827 (2.13) *
size	-0.1080 (1.58) **
prof	0.1360 (1.39)
tan	-1.5214 (5.98) **
growth	-8.9921 (4.43) **
divd	0.1402 (0.83)
McFadden R^2 = 0.17	

** indicates significant at .01 level
* indicates significant at .05 level

It is surprising to find that changing the proxy for financial constraints alters the basic result. The dummy variable identifying highly financially constrained firms turn out to be highly significant and negative. When financial constraints are defined in terms of external dependence, firms that have higher external dependence prefer bank borrowing to borrowing from financial institutions. There is a complete shift in result with smaller firms preferring borrowing from financial institutions to banks, if financial constraints are defined in terms of size class. This shows that results are sensitive to the proxies used to identify financially constrained firms. The fact that smaller firms borrow relatively more from the financial institutions can be explained in the following way. One of the challenges for banks is to acquire information about the credit risk of the borrower, as borrowers have more information than the lender about the projects. This informational asymmetry becomes more pronounced for

loans to the small firms as they are considered to be more opaque. Moreover, small firms are considered as high risk borrowers because of their low capitalization and insufficient assets. In the presence for informational asymmetry in the market and costly monitoring, banks could ration credit to the small firms. Thus, the small constrained firms with restricted access to banks turn to financial intuitions for finance. Another possible explanation could be that the financial institutions did really help the needy firms thereby contributing to economic development.

4 Conclusion

India is one of the largest and fastest growing economies in the world which acquires a special place among countries studied in finance. The presence of finance constraints at the firm level is widely established in the Indian context. To tackle the problem of external constraints firms turn to various sources of debt financing. In an attempt to analyze the relative contributions of alternative sources of external debt financing, it is evident that borrowing through intermediaries get more weightage in the provision of debt finance to the highly constrained Indian firms than do capital market sources or direct borrowing. The results also reflect that in spite of commendable developments in the stock market due to the initiation of financial liberalisation policies, which has helped to reduce existing informational asymmetries; their importance has not changed much over the post reform years. Among the intermediaries, borrowings from the commercial banks get relatively more importance.

However, it is noteworthy that during the period when the financial sector was undergoing significant reforms and, equity markets in particular had seen unprecedented activity, there seems to be a reduction in bank debt to industry. Probably, during this period the firms, especially the ones that were reliant on bank debt found alternative sources of financing, like the development financial institutions. Gradually there was a recovery. The heavy reliance on bank borrowings reflect the fact that financial structure in the Indian economy still continues to be bank-based, with no discernible improvement as yet in the overall financial structure. Among the other variables that determine the importance of lenders

financial constraint, performance and tangibility, mainly determine supply side positions, whereas growth and dividend payments determine demand side positions. Thus, the overall observations suggest that the Indian economy did not witness any large scale disintermediation even after the liberalization of the capital market. While the equity market in India has been quite active, the size of the corporate debt market is very small in comparison not only to developed markets, but also to some of the emerging market economies in Asia such as Malaysia, Thailand and China. A liquid corporate debt market can play a critical role by supplementing the banking system to meet the requirements of the corporate sector for long-term capital investment and asset creation.

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