

Ph.D. Thesis

**Quality, Reputation and Export Performance:
A Study of Indian Corporate Sector**

*Thesis Submitted to the Jawaharlal Nehru University in
fulfilment of the Requirements for the Award of the Degree of*

Doctor of Philosophy

Arindam Bandyopadhyay



**International Trade and Development Division
Centre for Studies in Diplomacy International Law & Economics
School of International Studies
Jawaharlal Nehru University
New Delhi-110067
2004**




CENTRE FOR STUDIES IN DIPLOMACY, INTERNATIONAL LAW AND ECONOMICS
SCHOOL OF INTERNATIONAL STUDIES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI - 110 067


Dated: 31st August 2004

CERTIFICATE

This is to certify that the thesis entitled “**Quality, Reputation and Export Performance: A Study of Indian Corporate Sector**” is being submitted by **Arindam Bandyopadhyay** in partial fulfilment of the requirements for the award of the Degree of Doctor of Philosophy of this University. This thesis has not been submitted for any other degree of this University or any other University and this is his own work.

We recommend that the thesis be placed before the examiners for their consideration for the award of the Ph.D. degree.


Professor S. K. Das
(Supervisor)


Professor Manoj Pant
(Chairperson)

To My Father

CONTENTS

Acknowledgements.....	i-ii
Chapter 1. Introduction.....	1-10
Chapter 2 . Survey of Literature	11-38
Chapter 3. Financial Instruments, Real Market Signals and Competition in the Product market : A Theoretical Approach.....	39-48
Chapter 4. Linkage between Quality, Reputation, Financing Decisions and Firm Performance in the Product Market: An Empirical Study of Indian Corporate Sector	49-101
Chapter 5. The Effect of Capital Structure on Firm's Product Market Performance: Empirical Evidence from the Indian Manufacturing Firms	102-132
Chapter 6. Conclusions and Suggestions.....	133-139
Bibliography	140-151

ACKNOWLEDGEMENTS

It is hard to believe that I am through with my Ph.D. thesis; my life's most challenging mission. It feels thrilled after years of hard days and long nights. To all those who helped me to see light on the other side of the tunnel, I feel gratified. And at this moment of extreme joy I would like to thank them all.

First and foremost, I take this opportunity to thank my supervisor Prof. Sandwip Kumar Das who led me constantly through the alleys of my field of research, guiding me at every step. His constant encouragement, inspiration and assuring smile at my darkest moments have seen me through till date. Whenever I had any confusion about my results, model or the interpretation of certain variables, I was able to solve them after consulting with him. Throughout this research for a long period of five years I had lots of ups and downs, but his unending patience and invaluable suggestions have always been with me. Words cannot express my gratitude towards him. I feel myself lucky working under his supervision.

This thesis would not have been this way had I also not come across Prof. Sudipto Dasgupta. He has helped me to develop an active interest in my field of research. Though I missed his advice after he left this country, I still owe to him for helping me to have an idea of the literature, collect the firm level information and construct important variables for testing important hypotheses by applying quantitative techniques. I can never forget his help.

I would like to acknowledge an anonymous referee of Journal of Economics and Business (JEB) of the Temple University of USA (Elsevier Publication) for invaluable guidance, comments and suggestions. Very useful guidance and comments from Dr. Kenneth Kopecky, Dr. Robert Taggart, Prof. Sugato Dasgupta and another anonymous referee of the JEB are gratefully acknowledged. Interactions with Prof. A. L. Nagar, Dr. Tapas Sen and Prof. Rajat Acharya were also of immense help. I also owe greatly to late Dr. Krishna Raj, the former editor of Economic and Political Weekly (EPW) for his comments and support on my work. Comments from Dr. Arvind Virmani were also very helpful.

I also acknowledge financial support from University Grants Commission (UGC). Their Five years of financial assistance really helped me to sit down and fully concentrate on my Ph.D. I also owe to Prof. Manoj Pant, Prof. Alokesh Barua and Prof. V.S. Mani for granting me fifth year extension of my fellowship that helped me a lot to complete my thesis. Assistance from ISI and JNU library staff is also gratefully acknowledged.

I am very much indebted to Prof. Amaresh Bagchi for his affection and encouragement in my research. I was greatly inspired by his dedication to academics, his dynamism, contributions and his command over the subject. I owe a lot to him.

The association with the centre ITDD/CSDIL&E has also helped me a lot in developing my knowledge and overall perspective of economics. The centre remains the greatest source of inspiration for me. I am proud of this association and am deeply grateful to my centre.

I would also like to acknowledge the help and inspiration I got from Prof. Alokesh Baura, Prof. Manoj Pant, Prof. Gurbachan Singh, Prof. Manmohan Agarwal, and Prof. Amit Sovan Ray of our ITD Department.

Special thanks to Surinder, Mrs. Grover, Shambhuji, Sube Singh, Mohanlalji, Kishorilalji, of School of International Studies (SIS) and Sanjay Photostat for all their help.

Thanks are due to the person who nurtured my dream of higher studies in a premier institute like Jawaharlal Nehru University. Without “Didi” and her faith in me this thesis would never be possible. I am also indebted to my “Baro Jamaibabu” and his family for their cooperation.

This dissertation would not be possible had I not constantly inspired by my wife Mousumi. I also owe to her family members, Babu, Maa and Bhai for their patience and encouragement. I am lucky to find myself an integral part of their family. I acknowledge their tolerance and support during the final phase of my thesis.

I owe to my mother for her endurance throughout the duration of my research. I nurture the memory of my father and his blessings all the time. I also acknowledge my “Barda”, “Mejda”, “Chhorda”, “Chhordi” and “Jamaibabu” for their support. Special thanks to my friends Fiku, Surajit, Kajal, Malika, Soubarna, Arup, Swapnendu, my juniors Debashis, Manoranjan, Bishu, Shovan, Dibyendu and to my seniors Momo, Saumenda, Subratada, Dipankarda, Abhijitda and Jaduda who constantly encouraged my research.

The responsibility for remaining errors is of course mine.

Chapter 1: Introduction

There is an emerging area in corporate finance literature that tries to point out interlinkages between firm's financing and product market decisions. This literature came into the light since the pioneering work of Brander and Lewis (1986, 1988) who in their seminal work outlined the "limited liability" and "strategic bankruptcy" effects of debt on product market strategies. Maksimovic (1986) analyzed the limited liability effect of debt in the context of an infinite-horizon model of collusion. These papers demonstrated how capital structure pre-commitment could influence strategic behavior of firms in imperfectly competitive markets. They stress that a firm's decision to use debt signals a credible commitment to more aggressive behavior in its product market. The other line of argument given by Telser (1966) and extended by Bolton and Scharfstein (1990), suggests that too much dependence on outside financing hinders a firm's ability to compete and prompting industry rivals to pursue predatory market strategies.

Ravid (1988) surveyed many papers describing how investment decisions, product pricing, labor negotiations, and market power may be significantly related to the choice of firm's capital structure. Titman (1984) suggested one should not only take into account shareholders and bond holders as claimants to the firm's cash flows but also customers in the product market. If the firm liquidates (in states of nature when liquidation value exceeds the operating value), the customers, who can foresee this type of behavior, will pay less for the firm's products in the market (Maksimovic and Titman, 1991 and Dasgupta and Titman, 1998). Cornell and Shapiro (1987) extend Titman's argument to implicit claims of the firm. If a firm goes bankrupt, or dangerously increases its debt, customers will suspect that their implicit claims may not be paid. Implicit claims include customer's expectation about the quality of the product or the service, but are not directly specified contractually. In another survey on interactions, Dasgupta (2001) gave evidence of US airline industry from Rose (1988) as an example of the financial position of firms affecting their incentives to maintain product quality. Dasgupta mentioned the case of Breech-Nut, manufacturers of baby food, which sold adulterated apple juice when faced with financial distress, to provide additional evidence. Therefore, financial position may have a strong effect on firm's position in the product markets. Firms may

deliberately use financial instruments to convey information to customers as well as the marketing agents and distributors about its quality.

Recent empirical evidence on how financing decisions affect product market competition among firms has further stimulated interest in the area. This current empirical literature on interactions generally seeks to determine whether debt financing either boosts or hurts competitive performance. But this empirical literature investigating the links between capital structure and product market decisions mainly studies US industry. The information problem is much more severe for a developing country like India. Therefore, it would be a challenging exercise to study whether there is any impact of financial policy followed by Indian firms on strategic advantage they may have in product market. In this thesis, we look at how firms can use certain financial instruments (like commercial paper, debenture and DFIs borrowing) for strategic purpose to gain competitive advantage in the product market. In this context, we distinguish between short term securities like commercial paper and fixed interest carrying debentures and long term loan from Development Financial Institutions to derive their consequences on various real market variables like total sales, foreign and domestic sales, advertising, marketing, distribution and R&D expenditure.

One of the serious problems firms face in the product market is informational asymmetry about its quality. Under such uncertainty, firms as well as their potential exchange partners face transaction risk with regard to the actual quality of the product or service that is to be exchanged. In this context, firms need to invest in reputation to reduce the uncertainty among its exchange partners to prey on its rivals. Klein and Leffler (1981), Shapiro (1983) and Allen (1984) have mentioned firm reputation as an important uncertainty reducing mechanism in such environments for promoting its sales. Reputation is valuable because it serves as a signal of underlying quality when consumers value product or service quality, but can not make the appropriate observations prior to purchase (Shapiro, 1983). In product markets a firm's reputation (Fombrun, 1996) and its product brands (Aaker, 1992) enable customers to interpret, process, and store information about the firm. By doing so, they increase customers' confidence in their purchasing decisions (i.e. reducing risk) and, at the same time enhance, post-purchase or post-use satisfaction (Aaker, 1992). Importantly, such effects enhance the growth

possibilities of a firm. A firm's reputation summarizes its past strategic actions (Weigelt and Camerer, 1988) and enables other market participants to assess its strategic type, or identity (Fombrun, 1996). Based on these summary beliefs, market participants feel less uncertain about the future actions of the firms, and more likely to engage in resource exchanges with firms having established reputations.

Due to this effect of reputation on market behaviours, various researchers increasingly view reputation as a valuable asset (Barney, 1991; Fombrun, 1996; Shapiro and Varian, 1999). They point out that corporate reputation is among the few resources that can give firms sustainable competitive advantage. How do firms build reputations? Economists emphasize the importance of signals that seek to reveal to the market a firm's true strategic type (e.g., as a high quality producer or a tough competitor) (Shapiro, 1983; Milgrom and Roberts, 1986).

In the export market, products supplied by Indian manufacturing firms often lack internationally well established brand names. Foreign consumers often use 'country of origin' as an index of quality of the firm due to information asymmetry (Scheerer, 1995; Raff and Kim, 1999). Then good quality firms should give strong signals and try to establish their good reputation with the buyers to overcome such informational barriers to entry and also for long term survival in the export market (Akerlof, 1970). ISO 9000 quality certification may provide evidence to the customers that the firm follows quality system in its production and pursues continuous improvement in quality.

Therefore, in situation of uncertainty about its quality in the product market as well as financial market, reputed firms need to give signals about its good quality. The signals may come from real market as well as the financial market. Firms spend on advertising, research and development and marketing as investment in reputation to have strategic advantage over its rivals in the product market. Similarly investment in distribution gives firm economies of scale advantage. There is a big literature on it which we discuss in detail in the Chapter on literature survey. ISO quality certification from a third party underwriter also may act as a signaling device that gives firms an edge over its competitors in the product market. Issuance of certain financial instruments may also act as additional signals of firm quality.

In a developing country like India, the presence of information asymmetry prevents the financial market to operate efficiently. Facing informational problem about its quality, newly public firms as well as the established firms may borrow reputation from their underwriters by issuing short term securities like commercial paper and fixed interest carrying debentures to have better credibility in the product market. India has historically followed a financial intermediary based system, where banks and financial intermediaries played a dominant role. Financial intermediaries (commercial banks and development financial institutions) have a comparative advantage in monitoring borrowers because bankers have economies of scale in obtaining information (Diamond, 1984). We argue that since issuance of commercial paper and debenture requires that the firm passes scrutiny of credit rating agencies and a bank guarantee, they act as signals of firm quality. Banks will agree to guarantee on commercial paper and debenture loan of only very reputed companies with sound financial health. Because of mandatory credit rating by banks or credit rating agencies like Credit Rating Information Services of India (CRISIL), these instruments are like certificates of good financial health of a company. Asymmetric information theory of corporate finance (Flanery, 1986; Kale and Noe, 1990; Barclay and Smith, 1995) claims that financial instruments may be deliberately used to convey information to investors about the quality of firms. Barclay and Smith (1995) find empirical evidence that firms use maturity structure of debt to signal information to the market. Our claim which is line with Titman (1984), Maksimovic and Titman (1991) and Dasgupta and Titman (1998) is that financial instruments may not only convey a firm's commitment to its investors, but also to its customers in the local product market, import dealers in the foreign market, its distributors and marketing agents who are assured that the firm would abstain from opportunism.

The association with business groups may act as an intermediate between firms and markets. In the presence of asymmetric information, group membership can act as a signal of relative stability in the firm's cash flow and reduce the harmful effects of adverse selection (Gangopadhyay, Lensink and Molen, 2001). Therefore, business group affiliation can act as a good signal of firm quality in the product market due to the existence of financial ties between affiliated firms. Berglof and Perotti (1994) talk about how these financial inter linkages may serve to mitigate moral hazard problems within

the group and can restrict cheating through risk sharing. Khanna and Palepu (2000) find that membership in a large business group in India makes a company more likely to be able issue Global Depository Receipts (GDRs), enter into foreign collaborations and be scrutinized by the equity analysts.

A major role of financial institutions is to alleviate the constraints imposed by information asymmetries (Diamond, 1984; Ramakrishnan and Thakor, 1984). Financial intermediaries can mitigate information asymmetries between the borrower firms and individual investors by helping the investors in collecting information on projects undertaken by firms. Improving the supply of long term credit to financially constrained industrial firms is considered a priority task for Development Financial Institutions in India. We have evaluated the role of long term loan from DFIs on firm performance.

Recent development in the literature on maturity structure of firm financing (Jensen, 1986; Kale and Noe, 1990; Diamond, 1993; Hart and Moore, 1995; Caprio and Demigruç-Kunt, 1998) stresses the different roles played by long- and short-term finance. This literature emphasizes that short-term debt increases efficiency by allowing uneconomic projects to be terminated and gives managers and owners strong incentives to avoid bad outcomes. In contrast, long term debt protects the firm from liquidation by imperfectly informed creditors and prevents opportunistic creditors from using the threat of liquidation to seize the profits of healthy firms. Good quality firms use long term debt to adopt more productive technologies, build up its R&D infrastructure, marketing channels and distribution networks where the returns accrue in the distant future.

The capital structure of a firm may alter a firm's ability to compete in the product market. In theory, there are two schools of thought in examining the interaction between the two. One believes that firm's debt issue can lead to stiffer competition in the product market by raising its output in a strategic way. This line of thinking is guided by seminal papers of Brander and Léwis (1986 and 1988) and Maksimovic (1988) who analyze how debt financing commits a firm to a more aggressive output stance in the product market. They are supported by Rotemberg and Scharfstein (1990) who predicted that increased debt will lead to increased output at the firm level; and at the industry level and thereby make the competition stiffer. The other line of argument put forth by Telser (1966) and extended by Bolton and Scharfstein (1990) suggests that too much dependence on outside

financing hinders a firm's ability to compete, prompting industry rivals to pursue predatory market strategies. Chavelier and Scharfstein (1996) propose that externally financed firms invest less in market share building during recessions, raising price cost margins to boost short term profits at the expense of locked-in customers. The other recent papers by Showalter (1995), Dasgupta and Titman (1998) and Grimaud (2000) have shown that debt leads to weaker competition in the output market by helping the firms to collude and increase price while cutting output. Recent empirical evidences have further motivated the area of debate. Chavelier (1995) in studying supermarket industry in the US during the late 1980s finds higher leverage softens product market competition. Opler and Titman (1994) find that during industry downturns highly levered firms are most vulnerable. They uncover that firms with higher levels of debt lose more sales and market share than their more conservatively financed competitors. Camepello (2003) analyzed a contracting model in which debt financing can credibly commit a firm to overinvest in market share. The model emphasizes that while debt financing can potentially provide for the kinds of strategic commitment described in the previous theoretical literature, its ability to do so much is limited, implying a non monotonic relationship between debt taking and competitive performance, i.e., debt can boost and hurt performance. He then studies intra-industry patterns in the empirical relationship between a firm's financial structure and its product market performance. In doing so, he uses firm level data from a panel of 200 industries over two decades and examines the impact of corporate debt on sales growth. His empirical evidence suggests that moderate debt taking by a firm is associated with market share gains. After some point, however, higher indebtedness leads to significant (relative to industry) sales underperformance. We empirically study the competitive performance of Indian firms following capital structure changes. In doing so, we distinguish between the effect of short term debt and long term debt on firm's product market performance.

In chapter 2, we review the literature that emphasizes the importance of reputations in markets, both product and financial. There we highlight the current research in corporate finance that examines the relationship between firm strategy and its capital structure. This literature delineates how firm financing decisions are influenced by

the responses of its product market agents like industry rivals, customers and input suppliers.

In chapter 3, we propose a theoretical model in which a firm's choice of capital structure (debt instruments vs. equity) may influence firm's ability to maintain reputation among its customers and distributors in the product market. The model can be viewed as part of recent body of literature that relates the firm's mode of financing to characteristics of its product market outcome. There we analyze a two-country-two-firm Cournot model in which a low quality firm may either issue equity or debt for financing its expenditure to improve quality. The model shows that financial policy choice can impact firm's product market sales if the consumers are aware of the firm's financial position. Under certain condition, debt financing will increase product market sales of the low quality firm that invests in reputation if it attracts better quality perception among customers compared to equity financing. The testable hypothesis we propose is that certain debt instruments may have real market impacts as they may reveal information about firm quality to product market agents like customers, import dealers, marketing or distributing agents. Therefore, firms may strategically use debt instruments to gain market share in the product market.

The main purpose of this thesis is to present empirical evidence on the interaction of financing decisions and product market behavior. In chapter 4, we empirically examine the relationship between quality and reputation signals and firm's product market performance. Using a balanced panel of 533 Indian listed manufacturing firms over the period 1989 to 2000, we compare the behavior of top fifty business group firms with the small group and private standalone firms. The empirical results suggest that real market signals like advertisement, marketing, distribution and research and development, ISO third party quality certifications significantly affect firm's performance. The extent of competition a firm faces in the export market may be different from those in the domestic market as foreign customers are more quality conscious and also rivalry among firms are mostly on quality front. In this context, we compare firm behavior in foreign and domestic markets. We split total sales of a firm between domestic and foreign sales to test the significance of real and financial signals separately. We also analyze the relationship between the issuance of short term credit instruments and the product market

performance of firms. Our results show that issuance of commercial papers or debentures by firms leads to better performance in the product market; while it directly impacts domestic sales of the firms, it also acts as a signal and stimulates its foreign sales.

Chapter 4 also looks at long-term DFI loans and shows that it positively affects long-term sales of firms. Through parametric univariate t-test and non parametric Wilcoxon signed rank and Man Whitney rank sum tests, we examine changes in firm's product market activities (total sales, foreign sales, domestic sales, R&D intensity, advertising and marketing intensity) in the year following the issuance of securities like debentures and commercial papers with the year prior to the issuance of securities. From these tests, we find that firms issuing commercial paper and debentures strategically use them to increase marketing efforts and promote their products through increased advertising to ease capacity constraints to expand its sales opportunities. This is true for both top fifty group and non top group firms. We also see that firms issuing commercial paper and debentures on average spend more on advertising, marketing, distribution and innovation in proportion of their total sales compared to those not issuing these financial instruments. Therefore, CP and debenture issuing firms are generally of high quality firms. Similarly, to understand how DFIs borrowing affect product market performance, we look at the time series table of total sales, domestic sales, foreign sales, R&D expense and advertising expense for all the firms that took DFI loans from two years prior till five years after the loan was taken.

In multivariate analysis, we have performed panel logit and tobit models on firm's total sales, export and domestic sales to capture the effect of real and financial signals on firm performance. We have taken change in sales in the following year ($\Delta S_{t+1} = S_{t+1} - S_t$) and growth of sales in the current year ($g_t = \frac{S_t - S_{t-1}}{S_{t-1}}$) as two measures of firm's product market performance in general. Firm's export share as a percentage of total sales measures its foreign market performance. Firm's domestic market performance is measured by change in firm sales in the home market in the following year. From regression results and various univariate parametric and non parametric tests, we find strong empirical evidence that financial market decisions (issuance of commercial paper,

debentures, and obtaining DFI loans); by Indian firms drive their product market performance.

One may be concerned about the reverse causality issue. That is, there may be the case that firms are able to issue commercial paper and debenture because they acquire reputation in export markets. To resolve the causality issue, we apply a two step regression method that is being explained in section 4.5 of chapter 4. In the first step we regress following year's export share on this year's export share and on debenture over assets or commercial paper asset ratio or DFIs loans over assets. We apply Tobit model to predict amounts receivable from exports for all firms combined and also separately for top 50 and non top 50 sub groups. From these regressions, we obtain the predicted values of export share in the following year. In the second step, we use these predicted values to explain the issuance of securities. We also look at the effect of firm value (captured by market to book ratio), wage share and firm size (proxied by natural log of total sales) on financing decisions. We find that there is no reverse causality in case of commercial paper. Firms are less likely to issue debenture further if they already have higher share in the export market. This is also true for long term DFIs loans.

While in chapter 4, we look at the effect of specific type of securities on firm performance, in chapter 5, we examine the effect of firm's capital structure on its product market performance to bolster out claim regarding the interaction. For this, we separately study the relationship between short term and long term debt and sales performance (export as well as total sales) using Indian firm level data from a balanced panel of 538 firms over 12 years. We compare the top group affiliated firms with their smaller group or unaffiliated counterparts. The distinction between short term debt and long term debt has been done on the basis of their maturity. Loans of maturity of less than a year constitute short term debt. This mainly comprises short term bank borrowings and commercial paper loan. We also include current portion of long term loan due for repayment within twelve months as part of total short term debt of firms. Then we obtain the long term debt by subtracting short term debt from total borrowings of firms.

In India, debt finance constitutes an important portion of corporate external finance. Firms go for short term financing for working capital purpose of which short term commercial bank borrowings as a mix of cash credit and bills discounting facilities

comprise the significant part. However, there is a growing demand for commercial paper in the recent years mainly by the large corporations. Similarly, the main source of long term debt are development finance by the all India and state financial institutions (DFIs), who lend mainly for investment in priority sector, and debentures. Firms also take long term loans from commercial banks. The corporate financing pattern and trends in financing during our sample period 1989 to 2000 have been discussed in sections 5.2 and 5.3.5 as background of our study.

In assessing the effect of short term and long term capital structure on firm's competitive performance in the product market, the potential endogeneity problem may arise. To mitigate the simultaneity problem, we use longer period of lags to analyze the impact of long term leverage on firm's growth of sales. Similarly, we apply a two step Generalized Methods of Moments (GMM) in studying the significance of short term leverage on firm's export performance. We find that short term debt induces the firms to do well in export. Through univariate t-test and Wilcoxon signed rank and Rank sum tests, we find that firm expenditure on advertising, marketing, distribution and research and development increases with short term debt taking. In case of long term debt, firms take time to build infrastructure through increased marketing efforts and promotions and R&D to achieve higher growth of sales five or ten years down the road. Considering a longer time horizon of 2 years and 7 years of taking the loan, we find that long term debt boosts total sales growth for top 50 and large business group affiliated firms. However, long term debt is inconsequential on total growth of sales for unaffiliated and smaller group firms. Thus our empirical results suggest that the strategic consideration in the output market induce higher debt to gain strategic advantage and thus establishes a link between debt and firm competition in the product market. Thus, the empirical analysis of this chapter adds to the evidence on the interplay between financial structure and product markets presented in the pioneering work of Chavelier (1995), Phillips (1995), Chavelier and Scharfstein (1996) and Campello (2002 and 2003).

In concluding chapter 6, we discuss the major findings of our study in this thesis and policy implications from the results of this study are presented.

Chapter 2: Survey of Literature

The relationship between quality, reputation and firm performance has been a new research area. The challenge faced by the Indian industry is not only on account of globalization of markets but also due to emerging dominant regional markets such as European Union (EU), North American Free Trade Agreement (NAFTA), etc. EU has particularly committed its major resources towards creation of a harmonious system of standards, certification and testing among member countries as a prelude to a free and open market. These developments impose their own compulsions for the need to upgrade the quality of goods and services as also the infrastructure for quality up-gradation and development in the country. The Indian manufacturing sector has now recognized quality and reputation are necessary requirements for long-term survival in today's competitive market with heterogeneous products. Price factor no longer being crucial, the emphasis is now entirely on quality encompassing safety, reliability, guarantee, performance, maintainability, durability and acceptability by the customers. The focus of this work is to find the empirical relationship between quality and reputation signals and firm performance in the product market. Beside the real market quality parameters, financial soundness can give a firm competitive advantage in the product market. Firm may acquire reputation from financial intermediaries like Banks, Financial Institutions that enables them to have strategic advantage to gain greater market share. Accordingly, we looked at how financial policies taken by corporate managers influence their product market behavior. In this context, we compare the role of short term debt instruments with long term debt to find their impact on firm performance in the real market. It would be interesting to briefly look at the supporting literature (both theoretical and empirical) in this context to discuss the main issues we address in this dissertation.

There is a small but growing literature on reputations in markets. This literature starts with Klein and Lefler (1981) and Shapiro (1983), who introduce the idea that a moral hazard problem may be overcome if market interaction is repeated. In that case a firm that invests in its product quality and delivers high quality products, establishes a good track record or a good reputation for itself, and is rewarded by consumers in the

sense that the products it sells in the future carry a premium.¹ Another modeling approach, also based on repeated interaction but introducing firm types, is found in Diamond's (1989) credit market model, which in turn builds on Kreps and Wilson (1983). Borrowers (who have not previously defaulted) in this model have a lower posterior probability of default, and consequently pay lower interest charges, the longer their credit history. Other aspects of reputation building, for instance the notion that a good reputation is beneficial when this reputation, or "name," is sold (to another firm) has been studied in papers by Tadelis (1999). A similar theme is explored in Mailath and Samuelson (2001), except that they introduce heterogeneity over firms' types and are thereby able to establish a link between a firm's reputation and the type of firm that is likely to acquire that reputation. Horner (2002) introduces competition and consumer switching and shows that competition is an extra instrument (or 'threat') to induce firms to exert high effort.

The financing decision—mix of debt and equity—represents a fundamental issue faced by financial managers of a firm. The study of capital structure has traditionally been carried out by finance researchers. Modigliani and Miller (1958) were the first to raise the question of the relevance of capital structure for a firm. They argued that, under certain conditions, the choice between debt and equity does not affect firm value, and, hence, the capital structure decision is "irrelevant." The conditions under which the irrelevance proposition holds includes, among others, assumptions such as no taxes, no transaction costs in the capital market, and no information asymmetries among various market players. Financial theorists have since provided several possible explanations for the financing decision. Major hypotheses include tax effects, signaling effects, bankruptcy effects, agency issues, and industry effects. The focus of most of the capital structure explanations is on the factors that lead to the determination of the financing mix for a firm, given a certain expected stream of cash flows. No attempt is made, however, to explain how a firm can gain an advantage from its capital structure decision.

Current research in corporate finance has begun to examine the relationship between firm strategy and its capital structure (Ravid, 1988). In finance, work by Brander and Lewis (1986), Gertner, Gibbons, and Scharfstein (1988), and Williamson (1988)

¹ See also Rogerson (1983) and Allen (1984).

suggests that the two aspects of a firm may be closely linked with each other. Balakrishnan and Fox (1993, p. 3) state that a “firm’s ability to manage its relationships with lenders becomes a key source of competitive advantage”. This recent strand of the theoretical literature on capital structure proposes that firm financing decisions are influenced not only by contracting problems among agents within the firm but also by the responses of agents outside of the firm, such as industry rivals and consumers. One line of argument, proposed by Brander and Lewis (1986) and Maksimovic (1986), stresses that a firm’s decision to use debt signals a credible commitment to more aggressive behavior in its product market. Another argument, put forth by Telser (1966) and extended by Bolton and Scharfstein (1990), suggests that too much dependence on outside financing hinders a firm’s ability to compete, prompting industry rivals to pursue predatory market strategies. While theories focusing on capital structure-product market interactions have received considerable attention, only a small number of their implications have been documented mainly for studying the behavior of firms in developing economies where financial markets are highly imperfect.

In this chapter, we review the existing literature on the relationship between quality and reputation signals and firm performance in the product market. Since the pioneering work of Brander and Lewis (1986), however, we know that the choice of the financial structure interacts with other strategic decisions of the firm. In this background, we explore the relationship between the mode of financing adopted by a firm and its subsequent product market outcomes by surveying some of the recent literatures dealing with this issue. In section 2.1 we first discuss the importance of quality and reputation for firms in achieving greater credibility in the product market. In the next section 2.2 we discuss the quality problem in the export market and the role of real market signals in overcoming the informational barriers. After this, we relate firm’s financing decisions with product quality in section 2.3. Accordingly, we review papers that discuss the role of financial instruments as signals of firm quality in section 2.4. In this context it is also necessary to recognize the importance of business groups that we discuss in section 2.5. Section 2.6 offers an overview of the growing literature on interactions between corporate financing decisions and product market competition. In this section, we highlight the different channels through which firm’s financial decisions and product

market strategies interact. But our main focus is to pinpoint the informational content of firm's financial policies and how they shake the competition in the output market.

2.1. Quality, Reputation and Corporate Performance

One of the primary problems for buyers and sellers relationship is to ascertain the underlying quality of the product or service. Since it is impossible to ascertain product quality before the use, buyers seek, and sellers send credible signals of quality. Concern for reputation is believed to be an effective deterrent for sellers of "lemons" in markets where product quality is observable only after purchase. If sellers value their continued operation in the market, buyers' boycott of sellers who cheat is expected to create incentives for honesty and quality maintenance. Reputation is a crucial mechanism by which the potential problems arising from consumers' inability to observe perfectly product quality prior to purchase become ameliorated. Thus, firm may use its reputation to profit from the sale of the new product. Then how do firm build reputation in the market? Economists at this juncture emphasize the importance of signals –actions or statements that seek to reveal to the market a firm's true strategic type (e.g., as a high quality producer or as a tough competitor) (Shapiro, 1983; Milgrom and Roberts, 1986). Advertising is one such a costly signal that can be viewed as an investment in reputation building by the firms (Nelson, 1974; Shapiro, 1983; Allen, 1984).

There is ample theoretical work (Akerlof, 1970; Brozen, 1974; Grossman and Shapiro, 1984) suggesting that good quality firms signal their quality by advertising. Advertising signals producing firm's commitment to his product as import dealers as well as real market agents, before placing bulk orders, are likely to check the balance sheet and other financial information of the firm. Advertising is important when consumers lack information about the quality of the firm. Firms use advertising through television or radio to inform the potential customers about the existence, characteristics and prices of the commodities they offer. Shapiro (1983), in his classic article, argued that high quality producers have more incentives to incur the costs of investing in reputation building through advertising because they are more likely to generate repeated purchases.

The value of reputations to observers derives from the summary and synthesis of the past behavior of firms. Thus, observers need time to arrive at such synthesis, and firms have incentives to compress this time. So, they may engage in activities that enable them to borrow reputations from others. Newly public firms borrow reputation from their underwriters (Beatty and Ritter, 1986); and established firms enhance their reputations through strategic partner selection. Thus, associations with highly regarded actors can also help firms build reputations.

Models of reputation focus on goods, which the individual purchases repeatedly. Nelson (1974) has called these “experience goods”. There is a vast literature on the economics of reputation. Similar models have been used to analyze reputations in a variety of settings. The basic result that reputation equilibria require price to exceed marginal costs is perhaps due to Klein and Leffler (1981), Allen (1984) and Shapiro (1982 and 1983), though similar results can be found elsewhere in the literature [e.g. Becker and Stigler (1974)]. Reputation as a perfect equilibrium was perhaps first analyzed by Eaton and Gersovitz (1981) in the context of credit markets and Dybrig and Spatt (1983), in the context of production markets. More formal developments can be found in Kreps and Wilson (1982) and Kreps, Milgrom, Roberts and Wilson (1982).

Since Kreps and Wilson (1982), economists have examined the extent to which firm reputations have implications for equilibrium configurations of conduct and performance in markets characterized by uncertainty (Weigelt and Camerer, 1988). While some analyses focus on a firm’s reputation for toughness or aggression (Milgrom and Roberts, 1982), others have developed models wherein firms may earn a financial return or indeed a premium on their reputations for quality when consumers value product or service quality, but can not make the appropriate observations in advance of purchase (Shapiro, 1983). Here, a reputation is valuable because it serves as a signal of underlying quality.

The problems of reputation equilibrium in firms with finite lives have been analysed by Eaton (1986) in the context of banking. The game theoretic approach to reputations, in which individuals, in effect by introspection, come to figure out what they might reasonably expect as rational behaviour from the firms with which they deal, is markedly different from the approaches taken, for instance, by Shapiro (1982 and 1983),

who assumes that individuals extrapolate past behaviour to make inferences about likely future behaviour.

The primary function of reputation is to reduce the risk of transacting parties. In product markets a firm's reputation (Fombrun, 1996) and its product brands (Aaker, 1992) enable customers to interpret, process, and store information about the firm. By doing so, they increase customers' confidence in their purchasing power decisions (i.e. reducing risk) and, at the same time enhance, post-purchase or post-use satisfaction (Aaker, 1992). Importantly, such effects enhance the growth possibilities of a firm. Yoon, Guffey and Kijewski (1992), for example, found that firms with favourable reputations enjoyed faster adoption of their new product introductions than firms without such reputations. Thus, investments in marketing are likely to lead to higher sales growth rates.

The above discussion confirms that reputation and quality play crucial roles in firm's product market performance. When the true quality of a product is not known before purchase, consumers may rely on a firm's reputation or group reputation to form expectations of the product's quality. In this case, product prices and sales performance will depend on firm reputation. There is a series of papers by Klein and Leffler (1981), Shapiro (1983), and Allen (1984) who mainly talk about individual firm reputation as an indicator of quality of the goods produced by individual firms.

The collective reputation is similar to a concept suggested by Tirole (1996) and is defined as the average quality produced by a group of firms with which an individual firm can be identified. In a market with a large number of firms, such as the export market for a particular drug, it may be very costly for customers to acquire information on the past quality of the goods produced by all firms. It is typically less costly for consumers to acquire information on collective or group quality that can be used as an indicator of the quality of the goods produced by the individual firms in the group. Jarrell and Peltzman (1985) and Borenstein and Zimmerman (1988) empirically examine issues that are very similar to collective reputation. Jarrell and Peltzman (1985) find that a recall by one U.S. automobile or drug firm has an "externality effect," in that it reduces its U.S. competitors' share value. In contrast, Borenstein and Zimmerman (1988) find that the demand faced by one airline is not affected when another airline has an accident.

If the consumers in the product market (mainly export market) have high awareness and expectation regarding the quality of the product or service being produced, the firms face a tougher competition to provide quality products or services at a lower cost. In such situations, companies need to show evidence to provide confidence to the customer about its quality. Quality certification is one of the major forms of such evidence. ISO 9000 provides measures of an organization's ability to pursue continuous improvement in quality and to consistently deliver a product or service that meets the requirements of its customers. Today it is recognized as benchmark for measuring quality. A number of scholars have investigated the influence of ISO 9000 on different dimensions of business performance. Some studies find that ISO 9000 certified facilities have higher profitability (Simmons and White, 1999). Other studies have focused on the effect of ISO 9000 on operational performance. Operational performance is a multi-dimensional concept that refers to the measurable aspects of an organization's processes. It most commonly encompasses production reliability and defect rates, production cycle time and on-time delivery, cost of quality and scrap minimization, productivity, and inventory turns (Naveh and Marcus, 2000; Samson and Terziovski, 1999). Focusing on a selection or combination of the different dimensions of operational performance, some studies find that certification reduces the cost of quality (Naveh et al, 1999) and improves overall operational performance (e.g., Wenmoth and Dobbin, 1994).

2.2. Quality Constraint on Export due to Information Barrier: Role of Signals and Reputations

The main problem in the export market is that there are information imperfections that cause consumers to practise statistical discrimination² against imports from developing countries. Products from such countries often lack internationally well established brand names. Foreign consumers often use 'country of origin' as an index of quality of the firm. This information asymmetry is due to the fact that foreign buyers do not know about the quality of the firms unless purchase has been made and also due to

² The theory of 'statistical discrimination' of Arrow (1973) and Phelps (1972) says that groupings of potential employees by race, sex or creed may discourage a disadvantaged group's investments in human capital and thereby perpetuate the practice of discrimination in a vicious circle.

the fact that these exporting countries (like India) often lack internationally established brand names. One of the key problems that exporting companies must overcome are informational barriers to entry (Scheerer, 1995; Raff and Kim, 1999). Since experimenting with different products is costly, consumers who learn the benefit of consuming a product from experience typically buy only one or at most a few brands. If consumers find the locally produced brands to be of satisfactory quality, they may not try an imported product unless it is considerably cheaper, but of same quality or the firm offering it can credibly demonstrate that it is of superior quality. This puts exporters, at least initially, at a considerable disadvantage vis-à-vis local incumbents.

A major recent concern of policymakers of those LDCs adopting outward-oriented development strategies is the frequent poor quality of their exports. With foreign buyers becoming increasingly sensitive to this issue, poor qualities are limiting the extent to which these countries can enter export markets. The major explanation of this low-quality phenomenon that has been put forward in the literature emphasises informational externality. When product quality is not directly observable, foreign buyers associate quality of any import item with its country of origin and are willing to pay a price equal to their perceptions, based on some exogenous information, about average quality of that country of origin. Such informational asymmetry about importing firm's quality causes "Lemons problem." Firms who pay full cost for quality improvement will receive only diluted benefits in return, while all competitors gain by free riding, as buyers are willing to pay on the basis of average quality. This creates adverse selection problem in the product market, as product quality is endogenously determined (Akerlof, 1970). Moreover, there would seem to be an incentive for firms to take advantage of imperfect information concerning product characteristics by selling shoddy commodities, which cost less to produce than high quality commodities. Dishonest dealings tend to drive honest dealings out of the market. There may be potential buyers of good quality products who want to buy and there may be potential sellers who want to sell such products in the appropriate price range. However, the presence of people who want to pawn bad wares as good wares tends to drive out the legitimate business. The cost of dishonesty, therefore, lies not only in the amount by which the purchaser is cheated; the cost also must include the loss incurred from driving legitimate business out of existence.

Then good quality firms should give strong signals and try to establish their good reputation with the buyers for long term survival in the market.

Dishonesty in business is a serious problem in an underdeveloped country like India. Many suppliers try to make fast buck by supplying inferior products.³ Rashid (1988) and Esfahani (1989) provide a possible reason for low quality phenomenon in India which is mainly the multiplicity of sellers having easy entry into the market destroying incentives for the maintenance of high qualities. Akerlof (1970) was puzzled by his observations of quality problems in India. He suggested that the scarcity of entrepreneurial skills may prevent LDC producers from building up reputation and capitalizing on honesty. However, the more plausible reason is due to the lack of awareness among the domestic consumers which better explains quality problem in India. It seems natural that consumers should punish dishonest sellers by not buying from them and reward the honest ones by showing a willingness to pay for the quality they offer. Such buyer behaviour should instinctively teach the value of reputation to sellers. However, such mechanism may not work for where consumers cannot identify sellers or they are very much price sensitive. In this context, it is the task of the corporate sector to increase the quality consciousness among the domestic consumers to encourage quality production.

The good companies may be able to restrict these cheaters by providing good quality signals to establish their reputations or by internalising the information externality through industrial consolidation. In this context, the idea of group reputation emerges. These groups, consisting of legally independent firms, are affiliated under a common group name and are centrally controlled through direct family ownership and mutual shareholding among member firms. Feenstra, Yang and Hamilton (1999) in analysing the impact of market structures on the trade performance of South Korea, Taiwan and Japan have empirically shown that presence of business groups leads to less product variety but higher product quality, using data on export from these countries to the United States.

³ Suri (1988) reports a case where small, labor intensive producers of laundry soap in India use "fillers" that have no detergency value and only add to the size and weight of soap bars. Rashid (1988) made an empirical study on Bangladesh and Baltimore to find that if entry is easy then fierce competition between large suppliers produce large number of cheaters because cutting price becomes more important than improving quality. He gave example of Bangladesh where pure milk is hard to find as adulteration is widespread because of easy entry and exit in the milk market. He found a similar picture in India also where rice is sold mixed with pebbles.

In order to enter the foreign market, companies need to establish their marketing and distribution networks to fit with the local market conditions as well as enhancing sales operation. Firms which invest in marketing, either by building in-house capabilities or by engaging various types of marketing services, manage to follow changes in the export markets and to make adjustments in response to the signals which come from the market (Aneja, 1996). Investments in marketing take the form of building in-house capabilities by strengthening marketing departments. Firms chose one or more of the following channels for marketing their products in export markets: using overseas agents, making direct contacts with some chain stores, posting their own agents in export markets and relying on the assistance of national external trade institutions. Larger companies are more likely to be able to afford to set up their own agents in marketing offices in the export market. Nigel, Katsikeas and Cravens (1997) mention that suppliers need to focus more attention on buyer-seller relationship building in export marketing as compared to more conventional export support activities. In explaining the importer-exporter relationship between US and Great Britain, they emphasized the role of marketing and distribution as an effective tool for the sustained export growth.

In the export marketing literature, strategy has been generally defined in terms of the extent to which the firm adapts the product, distribution, promotion and pricing to the requirements of individual export markets (Cavusgil and Zou, 1994; Kaynak and Kuan, 1993). More recently, Styles and Ambler (2000) have applied the relationship marketing paradigm to modeling export performance. The relationship between export marketing strategy and performance is mediated by managerial and operational implementation tasks.

Studies by Bernard and Jensen (1999), Wakelin (1998), Kumar and Siddharthan (1994) and Sterlacchini (1999) mainly focus on factors determining the capability of a firm to become an exporter and in some cases attention have been paid to the influence from innovation, especially the factors acting as barriers for the incentive to export and innovate in firms. In markets where firm faces quality competition, investment in R&D can reduce its cost of quality improvement and thereby confer on him a strategic advantage. As discussed in Kumar and Siddharthan (1993), technology factor is important in explaining inter-firm variation in export behavior in the case of developing

countries such as India in low and medium industries. These enterprises are unlikely to achieve competitive advantage on the basis of their own technological effort in high technology industries because of their inability to compete through product innovations. In high technology industries, competitive advantage is determined by product innovations through research and development (Kumar and Siddharthan, 1993). There is, however, only sparse recent evidence on the interaction between the R&D decisions of the firm and its export performance intensity, in most cases probably due to the lack of suitable micro level data.

2.3. Product Quality and Financing Decisions

The relationship between financial structure and product quality was first discussed informally in Titman (1984). The idea is that a firm's liquidation decision may impose costs on other stake holders, especially the customers, workers or input suppliers who make specific investments in the relationship. Customers may be reluctant to do business with firms that are threatened with bankruptcy. Therefore, firms facing financial difficulties, or highly leveraged firms in declining industries, will lose market share to their rivals and in the process will lower prices of their products.

Maksimovic and Titman (1991) and Dasgupta and Titman (1998) extended this idea to show how capital structure can affect a firm's choice of product quality and the viability of its products' quality. The consumers of non durable products are aware of the financial status of the producer. If the firm is in financial difficulties, he will not be able to maintain its favorable reputation and that may costs the consumers who are brand loyal. Evidence from the U.S. airline industry suggests that the financial position of firms may affect their incentives to maintain quality. A firm will have greater incentive to provide air safety (good quality) if it is financially sound.⁴ The case of Beech-Nut (manufactures body food) provides additional evidence of the relationship between financial health and product quality. Beech-Nut, facing financial difficulties, sold adulterated apple juice to reduce its cost (Dasgupta, 2001).

⁴ Rose (1988) finds evidence that safety record of the airlines decline after they fall into financial difficulties.

Thesis
338.740954
B2233 Qu



Th11875

TH-11875.



Dasgupta and Titman (1998), in a model of price competition among duopolists, have shown that firms tend to compete more aggressively for market share when the quality of their products is not directly observable prior to their purchase. The reason is that a firm can credibly provide a high quality product (e.g. through spending in R&D) if it attracts higher market share since it gains more from a favorable reputation when its future customer base is larger. The ability to provide high quality product is related to firm's financial structure. The highly levered firms with outstanding senior debt become more short sighted and have more incentive to cut quality. This way, they become less credible when they claim that their products have high quality. Thus, highly levered firm may have to attract higher market share by cutting its price to maintain their customer's perception that the firm is a quality producer. By doing so, it also keeps its competing rivals from credibly offering a high quality product.

Titman (1984) and Titman and Wessels (1988) also argue that firms should use debt conservatively if it produces unique products (e.g. Chemical, Computer or Air Craft). If a unique product market liquidates, it imposes relatively large costs on its customers because of the unique servicing requirements of its product and also on its suppliers and employees as they have product specific skills and capital. Therefore, as Titman suggests, the firm should avoid debt to keep the probability of liquidation low.

2.4. Role of Financial Instruments as Signals of Firm Quality

The signaling hypotheses implies that good firms are willing to prefer short-term financing with positive transaction cost because there is pooling equilibrium between good and bad firms with asymmetric information. As good firms are underestimated by investors, they try to make separate-equilibrium, which distinguishes between the quality of good firms and that of bad firms, by preference to short-term debt with transaction cost.

The issue of debt maturity structure is whether the firms increase short-term debt financing (for example, short loan from banks or floatation of commercial papers in the capital markets) or long-term debt financing (for example floatation of corporate bonds). Then, it has been said that the debt maturity structure is determined by three hypotheses:

agency cost hypotheses, signaling hypotheses, and tax hypotheses. In our thesis, we will summarize signaling hypotheses to examine our empirical data and results.

Flannery (1986) argues that debt maturity structure can be signaled by insider's information about firm quality when insiders are better informed about one's firm quality than outside investors. If the firms raise debts with no transaction cost, there is pooling equilibrium, because bad firms can costlessly mimic the behavior of good firms. In such a situation, the market undervalues good firms and overvalues bad firms. Although, with positive transaction cost, there can be a separate equilibrium. If bad firms can not afford the additional cost of refinancing short-term debt, they will have only to choose long-term debt. As the result, there is separate equilibrium, and good firms can signal their quality of firm by issuing short-term debt.

Diamond (1991) advances Flannery's model by focusing on the liquidity risk of issuing short-term debt. Diamond argues that short term borrowing exposes firms to the risk of excessive liquidations. Lenders are reluctant to refinance the debt if bad news arrives. The high credit rating firms with favorable private information about future profitability will prefer to issue short term debt because this refinancing risk is small. On the other hand, firms with lower credit ratings prefer long term debt to reduce this refinancing risk.

Kale and Noe (1990, Barclay and Smith (1995) explain that financial instruments may be deliberately used to convey information to investors about the quality of firms. If the bond market cannot distinguish between high-quality and low-quality firms, high quality undervalued firms will want to issue less under-priced short term debt. Low quality or overvalued firms will want to issue the more over priced long-term debt. Barclay and Smith (1995) find empirical evidence that firms use maturity structure of debt to signal information to the market. Interestingly, their study finds firms with greater information asymmetry (in terms of fluctuations in growth of sales) issuing more short-term debt.

Signaling theories explain the importance that firms attach to dividend policy and the inflexibility of dividends in the face of fluctuating corporate performance (Bhattacharya, 1979; Miller and Rock, 1985). Because a high-dividend-payout will be costly to firms that do not have the cash flow to support it, dividend increases signal of

company's good fortune and its manager's confidence in future cash flow. Low quality firms are unable to mimic the dividend policy of high quality firms because they don't generate sufficient earnings to service their dividend payments. Dividends can not be cut when corporate performance deteriorates because negative signals are thereby conveyed and penalties imposed on management.

In Poitevin (1989a), the asymmetry between a new and established firm with respect to credit capacity is motivated by the latter having a past track record that reduces uncertainty about its quality.⁵ As the entrant has no past track record, its financial decisions are constrained by asymmetric information vis a vis the investors to signal its quality to the capital market. In such a situation, a high value entrant must issue debt as in Fudenberg and Tirole (1986); debt financing makes the entrant vulnerable to predation.

A standard result in financial signaling models (Ross, 1977; Diamond, 1991 and 1993) is that a good borrower may signal its quality to lenders by issuing debt. For example, if a project is likely to yield a high or low return (succeed or fail) and if the probability of the project yielding a high return is private information of the borrower, the latter may signal that this probability is high by writing a contract that pays out the whole profit to the lender in case of failure, i.e. a debt contract. By doing this, he shows that he is sufficiently confident that project will succeed.

In its attempt to study how capital market imperfections can affect competition in the product market, the "long purse" literature has established an important principle: *when firms have limited access to credit, "financial muscles" are a source of competitive advantage*. If a firm's financial structure can affect its interaction with competitors, a profit maximizing firm will take this into account when taking its corporate financing decisions.

⁵ The idea that an established reputation helps raise external finance is stressed by Diamond (1991). If lenders have a borrower's track record at their disposal, they can use it to update their beliefs about the borrower's reliability, which increases their willingness to provide funds. It is then likely that firms with a longer track record are also less credit-constrained than new firms. Peterson and Rajan (1994), in their empirical study, find that the availability of finance significantly increases with both a firm's age and the length of its credit relationships.

2.5. The Concept of Group Reputation and Firm Performance

Singular among the common distinct features of the business environment in most emerging markets in general, and India in particular, is that companies tend to naturally structure themselves into business-groups. The evolution of the business group structure in emerging markets serves to mitigate information problems and other market imperfections that characterize these markets. In general, various explanations for the business group phenomenon in emerging markets have been suggested by various studies.

The literature suggests that, given the particularly wide gap between external and internal finance in emerging markets due to information asymmetry and other market imperfections, the group structure can narrow the gap between the cost of using external and internal finance. This may be the case when, for example, costly external finance is the result of an underdeveloped financial sector, which is unable to fulfill its traditional monitoring role. In this case, the group's headquarters may be well positioned to monitor member firms and to generate information thus substituting for inadequate financial intermediaries. In markets rendered by asymmetric information on firm quality, group affiliation can act as signal on relative stability in cash flow (Gangopadhyay, Lensink and Molen, 2001) and therefore can ameliorate the adverse selection problem in the credit market. Cross shareholding among firms within a group provides incentive to monitor the cheaters and the threat of removal induces the group members to do well in the market.

Existing studies of business groups in industrial as well as emerging markets have mainly focused on the effects of group affiliation on firm's performance and value. Studies covering various countries find that firms associated with business groups show better financial performance and productivity as well as risk sharing than unaffiliated firms. Khanna and Palepu (1998) find that membership in a large business group in India makes a company more likely to be able to issue Global Depository Receipts (GDRs), enter into foreign collaborations and be scrutinized by the equity analysts. Moreover, business group affiliation may serve as a quality sign and may induce a creditor to be more willing to lend to the firm by which firm can finance more export growth. A company that belongs to a business group is likely to have better credibility in

both financial and product markets. Feenstra, Yang and Hamilton (1999) have shown that business groups play an important role in determining product variety as well as product quality in exports from South Korea, Taiwan and Japan.

Studying the association between group-affiliation and firm's profitability in fourteen emerging markets, Khanna and Rivkin (2001) find that in most markets group-affiliated firms tend to be more profitable compared with non-affiliated firms. Further, it is concluded that due to member firms sharing the cost and benefits of being affiliated with a particular group, the profit rates within groups are more similar than profit rates between groups. The authors, however, find it difficult to explain these results in terms of either groups as responses to capital market imperfections or groups as rent-seeking devices.

Chang and Hong (2000) try to understand precisely how business groups add value. In particular they assess how the sharing and transferring of resources within Korean business groups impact the performance of member firms. They find that both firm-level and group-level resources are important determinants of firm performance. But further evidence is also presented showing that groups use internal transactions for the purpose of cross subsidization. In particular the study illustrates that debt guarantees, equity investments and internal trade, tend to be used to support poorly performing affiliates at the expense of profitable members. The study concludes that although Korean business groups create value by sharing financial and intangible resources such as technology, advertising and reputation, there is also a drawback to group-affiliation. The drawback relates to the creation of internal markets that facilitate support across member firms for the purpose of achieving group-wide goals but often at a cost to some individual members.

2.6. The Linkage between Corporate Financing Decisions and Product Market Performance

Current empirical research on corporate finance has begun to pointing to a direct interrelation between the financial and real decisions of firms and new models have been suggested to reconcile theory and facts. These models depart from the Modigliani and

Miller's (1958) classic result that under some 'ideal' conditions (e.g. if there are no corporate taxes and bankruptcy costs), financial structure is irrelevant for its sales in the product market. The interrelation comes from the role of financial instruments in conveying information (on the firm's profitability) to investors as well as the product market rivals and consumers.

2.6.1. Theoretical Models

In theory there are two schools of thought in examining the interaction between firm's product market strategy and its financing choice. One believes that firm's debt issue can lead to stiffer competition in the product market by raising its output in a strategic way. On the contrary, the other more recent papers by Showalter (1995), Dasgupta and Titman (1998) and Grimaud (2000) have shown that debt leads to weaker competition in the output market by helping the firms to collude and increase its price while cutting output. Here we will try to summarize the two contrasting views set by the relevant theoretical models of interaction.

2.6.1a. Output and the Limited Liability Effect

Brander and Lewis (1986) and Maksimovic (1988) in their pioneering work analyze the use of debt as a credible signal for a more aggressive position in the product market competition. Brander and Lewis refer to this effect of risky debt, which may confer a strategic advantage (call "strategic investment effect") on the issuing firm in the product market, as "the limited liability effect." This effect of risky debt can be thought of as a special form of asset substitution effect. In the asset substitution effect the firm also adopts aggressive investment behavior.

To establish the limited liability effect, Brander and Lewis add to the traditional Cournot model two features. First, they assume that there is some random shock that affects the operating profits of the two firms either due to demand uncertainty or through the cost function. Second, they assume that each firm may issue debt before it decides

how much it wants to produce, and that each firm is run by equity holders who care only about their own payoff and ignore the payoff of debt holders.

Let us elaborate the BL model. In the presence of random shock, due to the uncertainty about the state of demand, if a firm has debt in its capital structure then it will be bankrupt in the low states of demand. Therefore, the firm has an incentive to shift profits from the low states of demand to high states. Then the firm will be producing an output that is more appropriate for better states, i.e., for any given output of its rival, the firm now optimally produces more. Here, debt makes the payoff of the firm a convex function of its profits, since the payoff is zero if profits are lower than the fixed payment obligations for taking debt. Intuitively, issuing debt means that firm ignores low states of nature in which the firm goes bankrupt and chooses its competitive strategy, output, by taking into account only those states in which it remains solvent.⁶ Thus the convexity of the payoff induces a preference for riskier outcomes, and the effect is similar to choosing a riskier project similar to the asset substitution problem. Therefore, debt has the effect of shifting the firm's reaction function outwards, and the firm gains market share at the expense of the rival and moves closer to its optimal (Stackelberg) point on the rival's reaction function. Therefore, firm becomes more aggressive as its debt level increases. Of course, firm 2 will retaliate to firm 1's aggressive output strategy since the rival has exactly the same incentive, so that in equilibrium, both the firms end up with higher outputs and lower prices and profits compared to the case in which they are equity financed.

Maksimovic (1988) extends the Brander and Lewis model by focusing on the strategic effects of the limited liability of equity and by considering multiple periods of interaction. In a repeated oligopoly model, he shows that debt reduces firms' ability to collude and thus toughens product market competition. His prediction is that as the proportion of debt increases, stock holders have an increasing incentive to produce more

⁶ In accounting sense, solvency means the condition of a business when liabilities (excluding any ownership equity) are less than assets. On the contrary, insolvency denotes negative net worth that is excess of liabilities over assets and insolvency leads to liquidation. However, theoretical models (BL and other models) take a simplified assumption that the asset value of firm is zero and firm is solvent if it can pay debt from its profit.

than the Cournot equilibrium output level without debt.⁷ This is due to the fact that they receive the residual cash flow after debt payments today.

2.6.1b. What do the Relevant Empirical Studies predict about the Interaction?

Recent empirical studies of Phillips (1995), Chevalier (1995), Kovenock and Phillips (1997) etc. seem to be at odds with the predictions of the theoretical models by indicating that a high level of debt does not appear to make firms aggressive in general rather it makes the competition weaker. Firms that are highly levered are not only in financial trouble but are also in trouble in the product markets. Phillips (1995) studies four oligopolistic industries of USA-fiberglass, tractor-trailer, polyethylene and gypsum industries. These industries are relatively concentrated and have multiple firms that had sharply substantially increased their debt ratios following leveraged recapitalization. In three of these industries, his study finds firms that increased their debt levels experience a decrease in sales subsequent to recapitalization. Industry output levels contract and prices increase. All three industries are characterized by relatively leveraged rival firms. In contrast, in the Gypsum industry, the largest unleveraged firms significantly increased market share. Industry output increased and product prices dropped.

Kovenock and Phillips (1997) examine recapitalization decisions in ten commodity industries. They use a logistic regression to test whether firm productivity, industry demand factors and industry concentration affects the decision to recapitalize. They find that decision to recapitalize is negatively related to the total factor productivity of the least productive plant, positively related to industry concentration, and negatively related to increase in demand. Their empirical results from the data contradicts the Brander Lewis model by indicating that debt commits leveraged firms to behave less aggressively in product markets.

All these studies discussed above show that product market competition becomes “softer” following dramatic increase in leverage buy-outs (LBO). However, there are

⁷ The model assumes that marginal profit is influenced by a random shock that increases profits with good realizations of the shock and decreases profits with bad realizations of the shock.

certain limitations of these studies should be noted. First, since LBOs are pure capital restructurings and the proceeds of the debt issue are used to buy back outstanding shares rather than to finance investment, aggressive output expansion by firms, as implied by Brander and Lewis (1986), is limited by existing production capacity. If firms have to finance new investment to grow, then the presence of the newly acquired debt is likely to fit in a model such as Dasgupta and Titman (1998) or Chevalier and Scharfstein (1994). In other words, these studies are unsuited to test the validity of a class of models of product market behavior and financing choice. A second limitation is that the decision to do an LBO may itself be endogenous to the particular product market outcome that is anticipated in a given market.

Chevalier and Scharfstein (1996), by looking at the interactions during periods when competitive environment is affected by exogenous events (e.g., oil shocks and deregulation), empirically show that leveraged firms reduce output relative to non-leveraged ones. Firms which rely more heavily on external financing are more likely to reduce their investment in market share building during downturns, and that competitive outcomes resulting from such actions are jointly determined by the firm's and the rival's capital structure. On the contrary, if firms in an industry are internally financed, then industry markup will be more pro cyclical. This evidence helps to answer the question of whether leveraging leads firms to sustain higher or lower prices, but it does not shed light on whether the competitive conditions that firm face in the product markets affect their financial decisions.

2.6.2. The Informational Links between the Product and Capital Markets: the Role of Financial Signaling

There is a growing literature studying how a firm's financial structure may convey information about the firm's profitability to both the capital market and the product market. Standard models of financial signaling (Ross, 1977; Myers and Majluf, 1984) analyze how informed managers attempt to signal private information to the capital market through financial decisions, but abstract from other markets in which the firms operate. Bhattacharya and Ritter (1983) are the first to argue that private information

disclosed to the capital market are also observed and exploited by a firm's competitors in the product market. In their model, a firm engaged in R&D activity possesses private information that enhances its research as well as that of competitors. Therefore, when choosing the amount of information disclosure for investors in the financial market, the firm faces a trade off between raising funds at better terms and reducing the value of its informational advantage (since product development is costly) as its product market competitors extract information from the same signal. They have shown that there exists a separating equilibrium in which the better the firm's technology, the more of its technology it chooses to reveal.

Glazer and Israel (1987) also consider the effect of financial signaling on product market competition. They show that the choice of alternative compensation schemes by an informed manager of an incumbent monopolist can affect the entry decision of a potential entrant.

Gertner, Gibbons and Scharfstein (1988) thus focus on "indirect" information revelation through capital structure, which is much cheaper, rather than direct and verifiable information disclosure. Their paper builds on Myers and Majluf (1984) financial signaling game, where high profit firms may separate from low profit firms by issuing more debt, and introduces the product market as second audience to the firm's signaling.⁸

2.6.3. Theoretical Models that have questioned the Robustness of Brander Lewis Model

Several papers have questioned the robustness of the implications of the BL model regarding the impact of financial structure on product market outcomes. Dasgupta and Titman (1996) have pointed out the weakness of BL model as it is sensitive to whether the decision variables are strategic substitutes or complements and the nature of uncertainty. If the firm competes in prices, instead of quantities, as assumed in the BL model, then in the same framework, it can be shown that the effect of an increase in debt

⁸ As returns are either R or 0 , the investor's repayment $(R-R_b)$ can be implemented both through debt $D=(R-R_b)$ and an equity share $s=\frac{(R-R_b)}{R}$.

is to raise product prices, which contradicts the BL model. Hence, the firms will optimally choose debt. The models of Showalter (1995), Damania (1997), Dasgupta and Titman (1998) and Grimaud (2000) show that leveraging allows firms to coordinate towards more collusive equilibria and have questioned the BL results.

2.6.4. The Product Market Approach: Interaction with Customers and Suppliers

Ravid (1988), in an interesting survey on interactions of production and financial decisions, discusses the effect of capital structure on interaction with customers and suppliers. In Ravid, chronologically, Titman (March 1984) was the first to formalize the notion that capital structure may have a strong effect on firm's position in the product markets. He suggested that one should take into account not only shareholders and bondholders as claimants to the firm's cash flow but also customers of durable goods (such as cars, TV's and refrigerators etc.). The optimal liquidation policy of a firm should be such that the aggregate wealth of all the firm's associates is maximized. In other words, the firm should liquidate only in states of nature in which the liquidating value exceeds the operating value by an amount greater than the costs imposed on customers as a result of the continuing support for the firm's products. However, shareholders would liquidate as soon as the liquidating value exceeds the operating value. Customers, who can anticipate firm's behavior from their knowledge on its financial status, will pay less for the firm's products in the market.

Cornell and Shapiro (1987) extend Titman's argument to implicit claims on the firm. Implicit claims include what customers understand should be provided, but is not directly specified contractually. Ravid (1995) has elaborated the idea of implicit contract with an example. When Apple computers introduced the Macintosh, it claimed that a file server would be available in the near future. No binding contract was signed. However, if it turned out that the file server were not available, the value of the Apple computer would decline. Cornell and Shapiro show that price of the product that firm charges in the market should include the value of future service contracts as well as that of implicit customer's claims. If firm goes bankrupt, or dangerously increases its debt, customers

will suspect that their implicit claims may not be paid even if no binding contract was signed. Accordingly, they will be willing to pay less for the firm's product.

Sarig (1987) shows how the capital structure of corporations can affect their bargaining power. His idea is that if a firm is loaded with debt, due to limited liability shareholders lose much less if all negotiations between the firm's associates (in Titman's terminology) fail and the firm is declared bankrupt. In such circumstances, most of the loss is borne by the debt holders. For this reason, shareholders may threaten to breakdown negotiations and can extract greater concessions from their bargaining partners like employees who will try to protect their job since they have great amount of their human capital tied up in the failing firm. Sarig's analysis thus formalizes the notion that when a firm is on the brink of bankruptcy due to high debt indebtedness, it can effectively reduce labor cost.

These studies thus stress the importance to all firm "associates" of monitoring all existing contracts. Namely, debt holders must look into the firm's position in product and input market, including the labor market, and customers and workers must pay attention to the leverage of the firm with which they sign agreements.

2.6.5. Determinants of Firm's Capital Structure: The Effect of Product Market Competition

Several factors determine the optimal mix of long-term and short-term debt. These include the firm's credit rating, its growth opportunities, the profitability of the project, the ability to fund the project from retained earnings or internal funds, the liquidation value of assets, the firm's size or age, managerial quality etc.

There is dearth of both theoretical and empirical literature on the product market effect on capital structure of firms. In theory, Gertner, Gibbons and Scharfstein (1988) consider a two audience signaling with signaling to capital and products markets. There is an informed firm, who first issues debt and then competes with its product market rival who is not aware of the level of demand. The choice of the debt level by the informed party may not only reveal information to the capital market but also to its uninformed rival, who adjusts his behavior depending on the transactions it observes between the

informed firm and the capital market. By doing so, the uninformed firm affects the profits of the informed firm. The character of the capital market equilibrium is thus determined by the structure of the product market. There is very little empirical evidence on whether the competitive conditions that firms face in the product markets affect their financial decisions. But why does such an important question lack empirical analysis? An extensive body of literature has identified stylized facts on the determinants of capital structure, i.e., the relative proportions of debt and equity financing. Several firm characteristics like firm size, growth opportunities, profitability, non-debt tax shields, or the proportion of fixed assets, for example have been shown to affect the capital structure.

However, the empirical evidence on the effect of product market characteristics on firms' capital structure is very small. Titman and Wessels (1988) study the effect of product uniqueness on its financing decisions, Kovenock and Phillips (1995 and 1997) analyzes the recapitalizing decisions, and Showalter (1999) studies the effect of cost and demand uncertainty that firms face in the product markets on their capital structure. Schargrodsky (2002) in his unpublished Ph.D. thesis studies the US news paper industry to find the effect of product market competition (oligopoly or monopoly) on capital structure of the firms.

A possible explanation for this lack of empirical analysis is potential endogeneity between financial policies and product market outcomes. So the empirical researchers need to alleviate the endogeneity concern by looking at the major determinants of capital structure before looking at the effect of capital structure on firm performance in the product market.

2.6.6. The Role of Financial Intermediaries

The popular view holds that financial market in developing economy like India is highly imperfect and, in particular, that the alleged scarcity of long-term finance is a key impediment to greater investment and growth. A major role of financial institutions is to alleviate the constraints imposed by information asymmetries (Diamond, 1984; Ramakrishnan and Thakor, 1984). Financial intermediaries can mitigate information

asymmetries between the borrower firms and individual investors by helping the investors in collecting information on projects undertaken by firms. As Poitevin (1989b) points out, "*the identity of the lender becomes a relevant choice of the firms in imperfect output markets*".

Financial intermediaries can directly influence an enterprise's choice of financial structure. Financial intermediaries have a comparative advantage in monitoring borrowers because, as Diamond (1984) argues, bankers have economies of scale in obtaining information. They may also have greater incentives to use the information to discipline borrowers than do small investors. By collecting information, monitoring borrowers, and exerting corporate control, a developed banking sector can facilitate access to external finance-especially long-term finance-by small firms who have limited access to alternative means of financing due to information costs.

Recent developments in the literature on corporate finance and product market competition have assigned a more active role to the lender and investigated various ways in which he can affect the market game. Recent works have suggested that a common lender, acting as a common contracting party, may help competing firms coordinate their production and investment decisions.

Investment bankers can play many roles in the underwriting of security issues including production and certification of information, provision of interim capital, and/or supplying distribution and marketing skills. McLaughlin, Safieddine and Vasudevan (2000) have empirically examined the role of underwriter reputation in reducing information asymmetries for firms conducting seasoned equity offerings (SEOs). Their results provide support for a certification role for investment bankers in seasoned equity offerings. The investment banker's information or certification role can be important, both in practice and in theoretical models of financial intermediation (see, for example, Campbell and Kracaw, 1980; Titman and Trueman, 1986; and Carter and Manaster, 1990). High-prestige Investment bankers, with valuable reputation capital at risk and access to superior information regarding the issuing firm's prospects, can credibly certify the value of issues they underwrite (Chemmanur and Fulghieri, 1994).

2.6.7. The Effect of Debt Maturity on Corporate Performance

In recent years theorists have been studying the forces that determine the maturity structure of a firm's debt (Brick and Ravid, 1985; Diamond, 1993; Kale and Noe, 1990). This literature provides an interesting perspective on how this choice affects the enterprise's performance by emphasizing the different control and incentive properties of long-term and short-term debt. In most of these models, long-term debt is not a necessity, but rather one of a number of financial claims that a firm may issue.

Relying much on long-term debt may lead to greater distortions in the risk preferences of owners and managers by providing them with incentives to invest in projects that benefit themselves at the expense of outside investors (Myers, 1977). This conflict can be mitigated, however, by reducing the overall degree of leverage, or the maturity of debt, since the short maturity limits the period during which an opportunistic firm can exploit its creditors without being in default (Diamond, 1991 and 1993). Moreover, short-term debt (like commercial paper, debenture etc.) may also increase firm efficiency because of its role in disciplining management (Jensen, 1986). This occurs because an increase in leverage increases the chance of bankruptcy, which is likely to lead to managers losing their job. In this situation the discipline imposed by debt helps in aligning managers' and shareholders' objectives. More specifically it may keep managers from over-investing and lead to greater efficiency in the way the company operates.

The benefit of debt may also differ according to the type of debt (long term versus short term, market versus bank debt; see Diamond (1991) and Hart and Moore (1994) on the choice of debt maturity. Because of the more continuous scrutiny of a firm's operations and the threat of liquidation, short-term debt (compared to long term debt) may in fact constrain wasteful activities. Further, the debt maturity is also correlated with credit quality and the profitability of existing projects. In the presence of asymmetric information about borrowers, firms of higher quality should choose short-term debt because they will be able to take advantage of the revelation of future good news (Diamond, 1991). This positive information effect outweighs the liquidity risk of not being able to refinance oneself and running the risk of being liquidated by the lender. The opposite is true for firms with lower credit rating. The favorable effects of a shorter

maturity, however, may be counterbalanced by the fact that the fear of liquidation may induce firms not to choose investment projects characterized by greater returns, but accruing further into the future. Similarly, more productive technologies might not be adopted, unless they provide an immediate payoff.

The results on the effect of the maturity structure of debt on firm performance do not suggest that a shorter maturity composition increases firms' productivity (see Schiantarelli and Srivastava (1997) for India, Jaramillo and Schiantarelli (1997) for Ecuador, and Schiantarelli and Sembenelli (1997) for the UK and Italy, and Demirguc-Kunt, A. (1998) for cross country evidence. Actually longer maturity is associated with greater productivity. If what is classified in balance sheet as short term debt is routinely renewed, then there is no reason to expect an increase in productivity due to greater monitoring and control, and yet lack of availability of long term debt may make it more difficult to access more productive technologies. However, Schiantarelli and Srivastava's (1997) study covered the period 1980-81 to 1989-90 and failed to capture the post financial sector reform period when debt instruments become very popular in corporate financing in a less regulated system (or in a more competitive environment) and also the new short term debt instruments (like commercial paper) became popular.⁹ Furthermore, some believe (already we discussed the literature) that short-term finance may offer better incentives because it allows suppliers of finance to monitor and control firms more effectively, thus improving the firms' performance. Our study does not compare the effect of short and long maturity on firm's productivity. Rather, using data from the Indian corporate sector, we investigate the immediate impact of particular types of short term debt instruments on firm's real market variables and product market performance in the

⁹ It is worthwhile to note that since the early nineties, the Indian Financial Sector had undergone important changes to improve the transparency and efficiency of the markets. There were important changes in the Indian banking sector with the publication of the Narasimham Committee report. Interest rates and directed credit had been deregulated, and new prudential norms and capital adequacy standards (to cope with the high risk and uncertainty) were being adopted. Credit rating agencies had been set up, mostly promoted by Indian and foreign institutional investors, who were users of ratings services as fixed income investors. After major stock market scam that shook the markets, the Security and Exchange Board of India (SEBI) was given the regulatory powers in 1992 to shape the financial markets. Norms for new equity issues were substantially liberalized. Foreign Institutional Investors were ushered in by 1992, and a new stock exchange was set up in 1994 (The National Stock Exchange). The DFIs were also undergoing reform. Some had gone public by 1993, and the confidential access to funds had been removed. Commercial Paper (CP) was introduced as a money market instrument in January 1990 with a view to enabling corporate firms to diversify their sourcing of short-term borrowings as well as for investment.

post reform period (1989 to 2000). At the same time, we evaluate the role of DFIs in India for the period 1989-2000 by examining how DFIs loan affect product market performance in the long run since our purpose is to establish a linkage between firm's financial market decision and its product market outcomes.

Chapter 3: Financial Instruments, Real Market Signals and Competition in the Product Market: A Theoretical Approach

The basic idea that a firm's capital structure may affect its product market operations can be extended to issues related to firm quality. In this section we propose a theoretical model in which a firm's choice of financial instruments (debt instruments vs. equity) may influence firm's ability to maintain reputation among its customers and distributors in the product market. The model can thus be viewed as part of the recent body of literature that relates the firm's capital structure choice to characteristics of its product market.

Bhattacharya and Ritter (1983) are the first to argue that private information disclosed to the capital market may be observed and exploited by a firm's competitors. In their model, a firm engaged in Research and Development activity possesses private information that enhances its research as well as that of competitors. Therefore, a company giving signals to both the financial and product markets may have to face a paradoxical situation, as its product market competitors extract information from the signals meant for investors in the financial markets. Gertner, Gibbons and Scharfstein (1988) focus on the possibility of preferring debt over equity by high profit firms to separate themselves from low profit ones and introduce the product market as a second audience to the firm's signalling.

The model presented in Maksimovic and Titman (1991) suggests that consumers of nondurable goods and services (such as hospitals, pharmaceuticals, and air travel) might also be concerned with the financial status of the producer. Dasgupta and Titman (1998) show how, in a model of price competition among duopolists, financing decisions, pricing decisions, and product quality choices interact. For example, following an increase in leverage, a firm may need to drop prices and increase its market share in order to convince consumers that it will maintain product quality. Allen (1986), Brander and Lewis (1986), and Maksimovic (1986) consider models in which a firm's capital structure affects its probability of bankruptcy, and therefore also its strategic incentives in the product market. In their pioneering work, they analyze the use of debt as credible signal for a more aggressive position in the product market competition.

When true quality of a product is not known before purchase, consumers may rely on a firm's reputation to form expectations of the product's quality. Since it is impossible to

ascertain firm quality before the use of the product due to the presence of information asymmetry, buyers seek, and good quality sellers send credible signals of quality. Under conditions of such uncertainty, potential exchange partners experience greater transaction risk with regard to the actual quality of the product or service that is being exchanged (Akerlof, 1970). Firm reputation is an important uncertainty reducing mechanism in such environments for promoting its sales (Klein & Leffler, 1981; Shapiro, 1983 and Allen, 1984). A firm's reputation summarizes its past strategic actions (Weigelt & Camerer, 1988), and enables other market participants to assess its strategic type (Weigelt & Camerer, 1988), or identity (Fombrun, 1996). Based on these summary beliefs, market participants (like customers, distributors, marketing agents as well as lenders in the financial market) feel less uncertain about the future actions of the firm, and are more likely to engage in resource exchanges with firms with established reputation.

Firms may deliberately use short term financial instruments to convey its commitment not only to its investors, but also to its consumers in the local product market, import dealers in the foreign market, its distributors and marketing agents that the firm would abstain from opportunism. For exporting firms also the import dealers check the financial statement of the firms before placing bulk orders. Accordingly, they will under rate firms with weak financial conditions and will not be willing to do business with them. In this case short term debt instruments like commercial paper can indirectly act as signals of firm quality. The problems of adverse selection and moral hazard are less for short-term financiers like banks, as they can extract discipline on borrowers through frequent refinancing (Diamond, 1991). Therefore these kinds of debt instruments are likely to affect firm performance in the product market.

In this section we present a theoretical model to show how financial signals like short term debt as well as real market signals like R&D and Advertising and Marketing may bring about stiffer competition in the output market. Our purpose is to get a hypothetical relationship between financial instruments and real market performance which can be tested empirically. In order to accomplish that, we work out the following simple Cournot model.

3.1. The Cournot Model

There are two firms F_1 and F_2 belonging to two different countries who are rivals in the world market. The first firm (F_1) is located in the first country which is a developed country possessing the technology to produce the best possible quality. The second firm (F_2) is located in the second country which is a developing country (e.g., India) and the quality of its product (or quality perception) needs improvement since there is information asymmetry about its quality between customers and suppliers. Quality improvement is costly, though a better quality product can be sold at a higher price. Firm 2 can finance the cost of quality improvement either by issuing debt or equity.

The world demand function is assumed to be linear and it has the following form:

$$(1) \quad \begin{aligned} p &= a - Q, \quad Q = q_1 + q_2 \leq a \\ &= 0, \text{ for } Q > a \end{aligned}$$

a = market size and it is positive. q_1 and q_2 are the quantities sold by the two sellers F_1 and F_2 . The world demand function as represented by equation (1) will hold provided both firms sell homogeneous goods. But since we have already assumed that the second firm does not possess full quality, therefore two firms face different demand functions that are given as follows:

$$(2) \quad p_1 = a - q_1 - q_2$$

$$(3) \quad p_2 = a - \gamma(e)q_2 - q_1$$

where p_1 and p_2 are the prices the two firm charge for selling their products in the world market. The quality index for the 2nd firm (F_2) is $\gamma(e)$ and $\gamma(e) \geq 1$. $\gamma(e) = 1$ indicates that F_2 has full quality in which case $p_1 = p_2$ and equation (1) holds. Of course, prices will differ since $\gamma(e)$ is greater than one and the second firm gets a lower price for its product. Quality improvement is costly and the second firm has to spend 'e' in order to improve quality, i.e., reduce $\gamma(e)$. The quality index $\gamma(e)$ is also dependent on consumer's perception about firm's quality and market reputation which is defined by a parameter β .

Therefore, the quality production function can be written as:

$$(4) \quad \gamma(e) = 1 + \frac{\beta}{e}; \quad 0 \leq \gamma(e) \leq \infty$$

$\gamma(e) \rightarrow 1$ as $e \rightarrow \infty$. Firm 2 can improve quality by spending on Research and Development (R&D) which is captured by an increase in e . For a given value of β , an increase in R&D (i.e., increase in 'e') improves p_2 (i.e., $\frac{\delta p_2}{\delta e} > 0$). A decrease in β stands for improvements in quality perception and market reputation. We assume that $c > 0$ is the constant average cost of production for both the firms. This indicates that F_2 is technologically inferior to F_1 , as for any given β , the former produces a lower quality product at the same average cost as F_1 .

3.2. All Equity Case

Now consider the case when firm 2 finances its expenditure on R&D (as denoted by "e") by issuing equity only. Consumers perceive $\beta = \beta^e$ about the quality of equity financed firm. If firms play a Cournot game, their profit functions are:

$$(5) \quad \text{Max}_{q_1} \Pi_1(q_1, q_2) = (a - q_1 - q_2)q_1 - cq_1$$

$$(6) \quad \text{Max}_{q_2, e} \Pi_2(q_1, q_2, e) = \left[a - \left(1 + \frac{\beta^e}{e}\right)q_2 - q_1 \right] q_2 - cq_2 - e$$

From the first order condition of profit maximization, we can get the best response functions of the two firms as

$$(7) \quad 2q_1 + q_2 = a - c$$

$$(8) \quad q_1 + 2 \left(1 + \frac{\beta^e}{e} \right) q_2 = a - c$$

The optimum value of e is determined

$$(9) \quad e = q_2 \sqrt{\beta^e}$$

We assume that market size allows two firms to exist in the market and $a - c > 0$. The second order condition for maximizing profit is satisfied for each firm. Solving (7), (8) and (9) we get the solutions of static Cournot game

$$(10) \quad \begin{aligned} q_1 &= \frac{a - c + 2\sqrt{\beta^e}}{3} \\ q_2 &= \frac{a - c - 4\sqrt{\beta^e}}{3} \\ e &= \frac{a - c - 4\sqrt{\beta^e}}{3} \cdot \sqrt{\beta^e} \\ \Pi_1 &= \frac{(a - c + 2\sqrt{\beta^e})^2}{9} \\ \Pi_2 &= \frac{(a - c - 4\sqrt{\beta^e})^2}{9} \\ p_1 &= \frac{a + 2c + 2\sqrt{\beta^e}}{3} \\ p_2 &= \frac{a + 2c - \sqrt{\beta^e}}{3} \\ E_2 &= p_2 q_2 = \frac{(a + 2c - \sqrt{\beta^e})(a - c - 4\sqrt{\beta^e})}{9} \end{aligned}$$

E_2 represents the total sales of the second firm and a proportion of E_2 (say λ fraction) it exports in the foreign market.

One can make the following observations: $p_2 < p_1, q_2 < q_1, \Pi_2 < \Pi_1$. A reduction in β brought about by various policies such as product guarantees in terms of quality certification,

better quality perception or market reputation (like group reputation or bank underwriting) would result in higher revenue as well as higher profit earning of the second firm. As to be expected, an improvement in quality perception brings higher profit to the second firm at the expense of the first firm.

3.3. All Debt Case

Now assume that firm 2 issues debt (say by selling debenture bonds or commercial papers issued on its own corporate credit standing) in order to secure the needed capital for expenditure on quality improvement. When F_2 issues debt with the face value d , it has to pay interest payment $1+r$ after one period. We assume that debt is short term and for this firm 2 bears the cost: $(1+r)d$. Consumers assume $\beta = \beta^d$ as the quality of debt issuing firm. The demand condition for the 2nd firm is

$$(11) \quad p_2 = a - \left(1 + \frac{\beta^d}{d}\right)q_2 - q_1$$

The profit function for F_2 is

$$(12) \quad \text{Max}_{q_2, d} \Pi_2(q_1, q_2, d) = \left[a - \left(1 + \frac{\beta^d}{d}\right)q_2 - q_1 \right] q_2 - cq_2 - d(1+r)$$

Both the firms again play a Cournot game. From the first order conditions of profit maximization, we get the reaction functions for two firms

$$(15) \quad 2q_1 + q_2 = a - c$$

$$(16) \quad q_1 + 2\left(1 + \frac{\beta^d}{d}\right)q_2 = a - c$$

We will get the solution of d from the equation

$$(17) \quad d = q_2 \frac{\sqrt{\beta^d}}{\sqrt{1+r}}$$

Solving (15), (16) and (17), we get the solutions of Cournot competition

$$q_1^* = \frac{a-c+2\sqrt{\beta^d(1+r)}}{3}$$

$$q_2^* = \frac{a-c-4\sqrt{\beta^d(1+r)}}{3}$$

$$d^* = \frac{\sqrt{\beta^d}}{\sqrt{1+r}} \cdot \frac{a-c-4\sqrt{\beta^d(1+r)}}{3}$$

Cournot Profits are:

$$\Pi_1^* = \frac{(a-c+2\sqrt{\beta^d(1+r)})^2}{9}$$

$$\Pi_2^* = \frac{(a-c-4\sqrt{\beta^d(1+r)})^2}{9}$$

Both the firms make positive profits. There is no threat of liquidation for the second firm since it is earning positive profit after paying interest.

The equilibrium prices are

$$p_1^* = \frac{a+2c+2\sqrt{\beta^d(1+r)}}{3}$$

$$p_2^* = \frac{a+2c-\sqrt{\beta^d(1+r)}}{3}$$

$$E_2^* = p_2^* q_2^* = \frac{(a + 2c - \sqrt{\beta^d(1+r)})(a - c - 4\sqrt{\beta^d(1+r)})}{9}$$

E_2^* is the total sales of firm 2 under debt finance.

Consumers can determine the firm's type from firm's choice of capital structure. If they assume different quality for equity financed and debt financed firm (i.e., $\beta^d \neq \beta^e$), then it can be shown that firm's choice of capital structure will affect its total sales in the product market.

Comparing firm 2's total sales under all equity and debt we get

(18)

$$E_2^* - E_2 = \frac{\left\{ (a + 2c - \sqrt{\beta^d(1+r)})(a - c - 4\sqrt{\beta^d(1+r)}) - (a + 2c - \sqrt{\beta^e})(a - c - 4\sqrt{\beta^e}) \right\}}{9}$$

(19)

$$\sqrt{\beta_0^e} = \sqrt{\beta^d(1+r)} \text{ when } E_2^* - E_2 = 0$$

β_0^e is the critical value of β^e

If $\beta^e > \beta_0^e$, then $E_2^* - E_2 > 0$

$\Rightarrow \beta^e > \beta^d(1+r)$

Under this condition, debt will increase product market sales of the 2nd firm. Therefore, we can say that if the consumers assume lower β (means high quality) for debt issue as compared to equity, firm will experience an increase in sale by issuing debt. This is illustrated in *Figure 1*. Given d and e , there exists a critical level of consumer's perception about firm quality where he or she is indifferent between debt firm and equity firm.

The critical value of consumer's perception is β_0^e which is defined by $\beta_0^e = \beta^d(1+r)$. It is clear that for the values of β^e greater than β_0^e , consumer's perception changes in favor of debt firm as against equity firm and as a result firm 2's total sales increases due to debt issue i.e., $E_2^* > E_2$. Firm's borrowing decision will affect customer perceptions about the

firm quality as well as the quality of its product if customers are able to observe the firm's financial condition.

Thus, we see that financial policy choice can impact firm's product market sales if the consumers are aware of the firm's financial condition. The model presented in this chapter suggests that consumers of nondurable goods and services (such as hospitals, pharmaceuticals, and air travel) might also be concerned with the financial status of the producer.

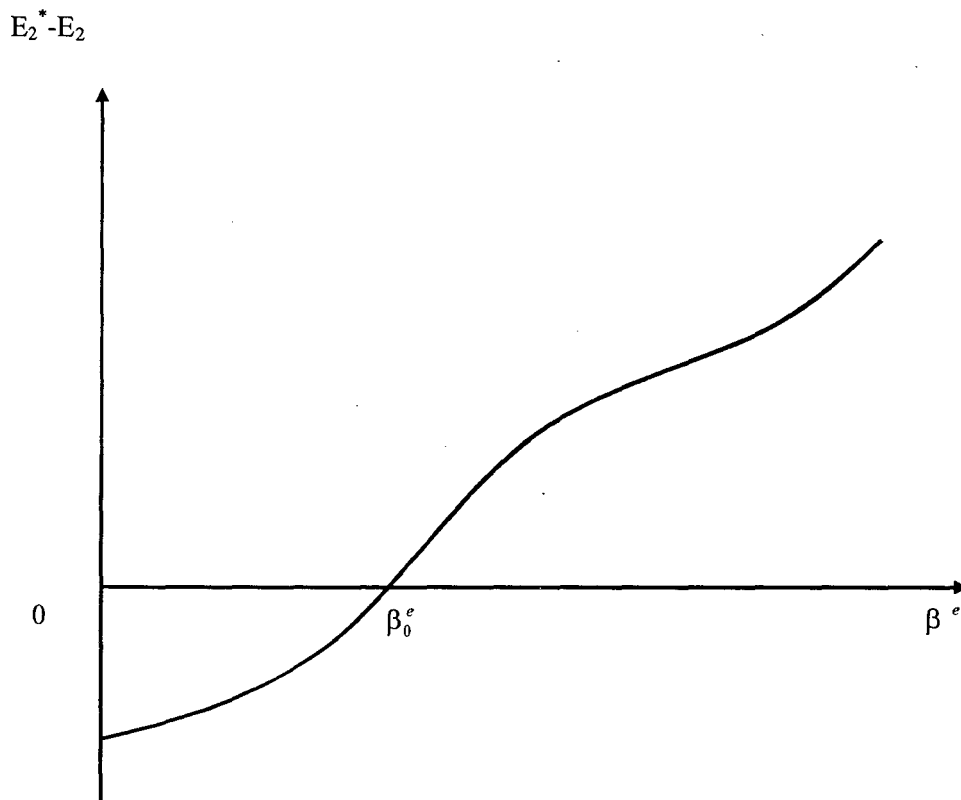


Figure 1: Determining the critical level consumer's perception about equity above which debt improves product market sales

3.4. Taking the Model for Empirical Testing

The model suggests that fixed interest carrying debt brings about improvement in firm's performance in the product market if it can get better consumer's perception about firm quality. In empirically testing the idea that financing decisions affect product market performance, previous researchers have typically used financial leverage as a measure of financial structure (e.g., Phillips, 1995; Kovenock and Phillips, 1997; and Campello, 2002). Here, we will take certain types of debt instruments like short term commercial paper loans and fixed interest carrying debentures to examine the relationship between firm's financial policy and real market performance. Similarly, we will also test the effectiveness of short term leverage on firm's foreign market share.

There is another interesting hypothesis in the last equation of (10) that we will test empirically. It is shown that when the LDC firm competes with the DC firm in the world market, the former faces informational barriers to entry into the market. The existing information imperfections cause consumers to practice statistical discrimination against imports from Less Developed Country. Consumers often use "country of origin" as an index of quality of the firm. In such a situation, the LDC firm can improve the market perception of its quality by giving real market signals like advertising, marketing, international quality certification (ISO 9000). Being a member of a reputed business group is also advantageous to better performance in the product market. We will test the significance of these signals in explaining firm-level export performance by exploiting a panel dataset of Indian manufacturing firms. Our model does not distinguish between the domestic market and the export market and assumes that a constant proportion of output is exported. In many developing countries, the domestic consumers are less sensitive to quality than international consumers. In other words, quality matters much more in exports than in domestic sales. In an econometric analysis it will be possible to see if the product and financial market signals operate differently for exports and domestic sales.

Chapter 4: Linkage between Quality, Reputation, Financing Decisions and Firm Performance in the Product Market: An Empirical Study of Indian Corporate Sector

4.1. Introduction and Major Hypotheses

With the removal of all quantitative restrictions on imports and the falling import tariffs under the WTO regime, Indian manufacturing companies are now facing the challenges of international competition both at home and abroad. As a result, aspects like productivity, efficiency, quality and competitiveness rather than just the price of the product have come to the forefront. Indian companies are taking full advantage of falling trade barriers and increasing market access that new era of globalization has provided. Thus, it has become crucial for them to recognize the importance of quality and reputation as necessary requirements for long-term survival in today's competitive world.

One of the primary problems that firms face in the product market is that of information asymmetry. When true quality of a product is not known before purchase, consumers may rely on a firm's reputation to form expectations about the product's quality. Since it is impossible to ascertain firm quality before purchase due to the presence of information asymmetry, buyers seek, and good quality sellers send credible signals of quality. Under conditions of such uncertainty, potential exchange partners experience greater transaction risk with regard to the actual quality of the product or service that is being exchanged (Akerlof, 1970). Firm reputation is an important uncertainty reducing mechanism in such environments for promoting its sales (Klein & Leffler, 1981; Shapiro, 1983 and Allen, 1984).

Advertising is one such costly signal that can be viewed as an investment in reputation building by the firms (Nelson, 1974; Shapiro, 1983; Allen, 1984, Milgrom & Roberts, 1986). Firms use advertising through television or radio or newspaper to inform potential consumers about the existence, characteristics and prices of the commodities they offer. Shapiro (1983), in his classic article, argued that high quality producers have more incentives to incur the costs of investing in reputation building through advertising because they more likely to generate repeated purchases. Nelson's (1974) crucial insight

was that if high quality brands advertise more and if advertising expenditures are observable, then rational and informed consumers would respond positively to advertising even if it does not have much direct informational content. Spending an astronomical amount of money on the ad campaign transmits the information that the firm wants to establish reputation with the intension of staying in the market for longer time. Hence enterprises with advertising and promotional activities are likely to do better in the product market.

Firms may use ISO certification as a signaling device in markets where consumers rely on information specialists and experts to screen various products to certify their quality. ISO-9000 series certification is essentially a quality certification for the firms issued by the underwriters. Quality certification signals that the firm is concerned with customer expectations and satisfaction and wants to meet customer needs and requirements. It reduces the uncertainty in the mind of the consumers regarding the quality of the product that the firm produces and thereby raises their willingness to pay for it. ISO 9000 provides measures of an organization's ability to pursue continuous improvement in quality and to consistently deliver a product or service that meets the requirements of its customers. This way certification gives the firm an edge over its competitors in the product market.

Producing a good quality product that responds to the needs of consumers is not the only issue that a company would face in the product market. In order to sustain competitive advantages in the domestic market as well as in the foreign market, companies need to establish marketing and distribution networks in enhancing their sales operation. Marketing in a business directly involves contact with the consumer and assessment of his needs, which enables the firm to increase sales in the product market. Successful marketing requires the use of intermediaries, agents and distributors. Marketing encompasses much more than just advertising as it involves researching the customer's preferences that play a major role in the success or failure of firm's business. Therefore, marketing and distribution are major determinants of firm performance.

R&D is also a performance promoting activity as it improves both the product quality and process quality. The firm's decisions on R&D activities are explicitly seen from the strategic point of view. Firms with large R&D expenditure may move to the

forefront of the technology boundary in their market when they invest in new products or new production processes. Therefore, a firm can increase its market share by spending on R&D especially in a much more competitive export market where competition is mostly on the technology front.

Finally, the value of reputation to observers derives from the summary and synthesis of the past behavior of firms (Shapiro 1982 & 1983). Firms may engage in activities that enable them to borrow reputations from others, mainly a third party (viz. Commercial Banks, Development Financial Institutions).¹ Newly public firms as well as the established firms borrow reputation from their underwriters by issuing short-term securities like commercial paper and fixed interest carrying debentures to have better credibility in the product market. Financial intermediaries have a comparative advantage in monitoring borrowers because bankers have economies of scale in obtaining information (Diamond, 1984). In the presence of asymmetric information about borrowers, good quality firms (with higher credit rating) may choose some debt instruments (with short maturity or promising fixed interest payable at specified periods) which are secured by creditworthiness of the company because they will be able to take advantage of the revelation of future good news (Diamond, 1991 and 1993).² This positive information effect outweighs the liquidity risk of not being able to refinance oneself and running the risk of being liquidated by the lender. Further, short-term debt may also increase efficiency of firms because of its role in disciplining management (Jensen, 1986). Because of the more continuous scrutiny of a firm's operations and the threat of liquidation, certain debt instruments may in fact constrain wasteful activities.

Economic policy makers have traditionally held the view that, due to capital market imperfections, there is a shortage of long term finance and that this acts as a

¹ Megginson & Weiss (1991) consider the role of venture capitalists in certifying the quality of projects to the IPO market; Gande et al (1997) consider the certifying role played by banks underwriting public debt offerings.

² Commercial paper or more commonly called just 'CP' is one such short-term debt instrument. In India they have maturity of 90 days or 180 days. CP is required to be rated by an approved credit rating agency (e.g., CARE or ICRA or CRISIL). In India, CP is popular among highly rated companies as a tool for diversifying their sources of short term borrowings and for reducing the cost of such borrowings. Similarly, Debentures are debt instruments which enable the holder to earn a fixed rate of return with a fixed maturity period. Debentures are secured against the assets of the borrower. Though, there is no bar on the issue of unsecured debentures, by and large, most of the debentures issued by companies are secured. In order to lend credibility and as per Securities and Exchange Board of India (SEBI) guidelines all debentures are rated by credit rating agencies.

barrier to industrial performance and growth. This belief has led to the establishment of Development Financial Institutions in India to help firms that are financially constrained and that are not able to raise funds to undertake projects.³ Long term finance is thought to allow firms to invest in more productive technologies, even when they do not provide an immediate payoff, without the fear of premature liquidation. However, short term finance may have better incentive properties compared with long term finance, because it allows suppliers of finance to monitor and control firms more effectively, with favorable effects on firms' performance. In this context, we separately assess the product market impact of issuance of certain financial securities like fixed interest carrying debentures, short term commercial paper and long term DFIs loans.

The established firms in the market enhance their reputations through strategic partner selection by forming business groups. Thus, associations with highly regarded actors can also help firms build reputations. In a developing country like India, the presence of information asymmetry prevents the financial market to operate efficiently. Therefore, business groups may act as an intermediate between firms and markets.

From a theoretical perspective, business group affiliation can act as a good signal of firm quality in the product market due to the existence of financial ties between affiliated firms. These relationships take the form of cross holding of equity, inter firm loans, or mutual debt guarantees. These financial inter linkages may serve to mitigate moral hazard problems within the group (Berglof and Perotti, 1994) and can restrict cheating through risk sharing. Therefore, in the presence of asymmetric information, group membership can act as a signal of relative stability in the firm's cash flows, reducing the harmful effects of adverse selection (Gangopadhyay, Lensink and Molen, 2001). Together with the existence of debt-guarantees, it may reduce the probability of financial distress.

Studies covering various countries find that firms associated with business groups show better financial performance and productivity as well as risk sharing than

³ The first of these was the Industrial Finance Corporation of India (IFCI), established in 1948. This was followed in 1951 with the setting up of regional institutions - the State Financial Corporations (SFCs). Subsequently, the National Industrial Development Corporation (NIDC) was set up in 1954 and the Industrial Credit and Investment Corporation of India (ICICI) was floated in 1955 with sponsorship by the World Bank. In 1964 the Industrial Development Bank of India (IDBI) was established as an apex institution in the sphere of long and medium-term finance.

unaffiliated firms. Khanna and Palepu (2000) find that membership in a large business group in India makes a company more likely to be able to issue Global Depository Receipts (GDRs), enter into foreign collaborations and be scrutinized by the equity analysts.

Accordingly, we hypothesize that top fifty business group firms may have a better reputation advantage in the product market than the non-top fifty business group firms.⁴ We explicitly look at the effect of business group affiliation on firm sales.

The challenges Indian firms face in the export market is quite different from those in the domestic market. In the domestic market, Indian buyers are price sensitive rather than quality sensitive. But the foreign consumers may be reluctant to buy the imported product if it is of inferior quality in comparison to the locally produced brands. Therefore, firms reckon quality as prime instrument for entry into competitive global and regional markets. To move up the value chain, Indian exporters need to manufacture according to global standards, upgrade technology to reduce cost to keep pace with international competitors and be more aggressive. Therefore, investment in Research and Development for product innovation and ISO third party quality certification may act as crucial signaling device for exporting firms.⁵ However, the organized players with an established brand name in the domestic market may depend more on advertising and marketing for promoting their products.

We compare the behavior of firms (both group and non group) in foreign and domestic market. In this context the empirical question we have set is: "Does the product and financial market signals operate differently for domestic sales and foreign sales?" In order to answer this, we split total sales of a firm between domestic and foreign sales and test the significance of real and financial signals separately. We estimate panel logit and

⁴ The top fifty business groups in our sample are: Bangur, BSES, Essar, Goenka, Modi, MRF, Omprakash Jindal, Raunaq Singh, RPG enterprise, Ruchi, TVS Iyengar, Williamson, WIPRO, Amalgamation, Bajaj, Balaj (Reddy), Birla group, BPL, Chidambaram, Dalmia, Escorts, Finolex (Chhabria PP group), Firodia, Godrej, GP Duncans, HCL, Hero Munjals, J K Singhanian, Kalyani (Bharat Forge), Kirloskar group, Lakshmi, Lalbhai, Larsen and Toubro, Lloyd Steel, LNJ Bhilwara, Mafatlal, Mahindra&Mahindra, Murugappa Chettiar, Nagarjuna, Piramal, Ranbaxy, Reliance group, Shriram, TATA group, Thapar, UB group, Usha Rectifier, Vardhaman, Videocon and Walchand.

⁵ In export market, consumers may rely on information specialists, experts to screen various products, to certify their qualities. Leland (1979) demonstrates that establishing minimum quality standards can solve the lemons problem through quality control of exports. The dimension of quality problem and its adverse effect on export growth has recently been studied in detail by a collaborative research carried out by Roychaudhuri, Acharya, Marjit and Rahman (2003). At both the cross country as well as for the South Asian countries, statistically significant positive effects of ISO-9000 series certification on exports has been observed by them.

tobit models with a sample of 533 Indian listed manufacturing companies between 1989 and 2000.

The main purpose of our work in this chapter is to test the connections between financial instruments, real market signals, and firms' product market performance. We test the significance of these signals on firm's total sales as well as domestic and foreign market sales using panel logit and panel tobit regression models. Unfortunately, this one-equation regression might suffer from the problem of regressors' endogeneity. This implies that we cannot identify the cause-effect relations. Therefore, in order to determine these effects correctly, we performed various univariate tests on real market variables consequent upon the issuance of financial securities by exploiting our panel data set. We mainly look at how the issuance of debentures, commercial papers, and DFI loans affect product market performance of Indian firms. By doing so, we present empirical evidence on the linkage between firm's financing decisions and its subsequent behavior in the product market. Finally, we test the causality between financial instruments and export.

The rest of the chapter is structured as follows. In the next section, 4.2, we portray how the financial instruments act as signals of firm quality and have interaction with the product market. Here we give a brief survey of the existing literature on the interaction of firm's financing decisions with the product market performance. The third section 4.3 lays out data, construction of variables and descriptive statistics. The fourth section 4.4 presents the results and methodology based on the hypotheses that have been discussed in section 4.1 and section 4.2 of this chapter. The fifth section 4.5 discusses the main conclusions. Tables are given at the end of the chapter along with a list of variables and their definitions in Appendix A.

4.2. Financial Instruments as Signals of Firm Quality and its Interaction with the Product Market

The interrelation between the financial and real decisions of firms comes from the role of financial instruments in conveying information (on the firm's profitability) to investors as well as the product market rivals, consumers and input suppliers. Brander and Lewis (1986) and Maksimovic (1988) in their pioneering work have analyzed the use

of debt as a credible signal for a more aggressive position in the product market competition. Brander and Lewis refer to this effect of risky debt, which may confer a strategic advantage (or “strategic investment effect”) on the issuing firm in the product market, as “the limited liability effect.”

Ravid (1988), in an interesting survey on interactions of production and financial decisions, discusses the effect of capital structure on a firm’s interaction with customers and suppliers. Chronologically, Titman (March 1984) was the first to formalize the notion that capital structure may have a strong effect on firm’s position in the product markets. The idea is that a firm’s liquidation decision may impose costs on other stakeholders, especially the customers, workers or input suppliers who make specific investments in the relationship. Customers, who can predict firm’s behavior from their knowledge of its financial status, may be reluctant to do business with firms that are threatened with bankruptcy or in financial difficulties (Maksimovic and Titman, 1991 and Dasgupta and Titman, 1998) and would pay less for the firms’ products in the market.⁶ Therefore, firms may deliberately use financial instruments to convey information to customers as well as the marketing agents and distributors about its quality.

The firms that issue debentures or commercial papers have to pass the scrutiny of credit rating agencies or banks that guarantee the loans. Commercial Paper is a very short term debt issued by companies. The maturity is often less than three months. It is almost always backed by a bank guarantee. That is, in the event of default, the bank will assume the liability of the company to repay the lenders. So banks are extremely picky about this and they will agree to guarantee the commercial paper of only very well reputed companies or those that they think are in sound financial health.⁷ Similarly, debenture is a loan taken by a company having a certain maturity. In India, debentures have maturities ranging between one and ten years. Long maturity debentures are rarely issued as

⁶ Evidence from the U.S. airline industry (Rose 1988) suggests that the financial position of firms may affect their incentives to maintain product quality. A firm will have greater incentive to provide air safety (good quality) if it is financially sound. The case of Beech-Nut Nutrition Corporation, manufactures of baby food, provides additional evidence of the relationship between financial health and product quality. Beech-Nut, facing financial difficulties, sold adulterated apple juice to reduce its cost (Dasgupta, 2001).

⁷ All CP issues are regulated by RBI guidelines and one such guideline requires all CPs to be credit rated. In India, two key regulations govern the issuance of Commercial Papers (CPs). Firstly, CPs have to be compulsorily rated by a recognized credit rating agency and only those companies can issue CPs which have a short term rating of at least P1. This rating indicates that the degree of safety regarding timely payment of the instrument is very strong.

investors are not comfortable with such maturities. Importantly debenture holders have a prior claim on the earning and assets of the issuing company in the event of liquidation to preference and equity share holders. A third party (may be Bank) who acts as a debenture trustee must ensure that the issuer abides by the promises, pledges and restrictions mentioned in the offer document of the debenture issue. Thus it is backed by bank guarantee and scrutinized by the credit rating agencies. Because of the mandatory credit rating by banks or credit rating agencies like Credit Rating Information Services of India (CRISIL), commercial paper and debenture instruments are like certificates of good financial health of a company. This is primarily the reason why we have selected debentures and commercial papers as an Indian firm's financial signaling instruments, though there are other sources of debt instruments. If the company defaults to pay the interest (monthly or quarterly or annual) or repay the loan, it would be very difficult for him to re-finance and the firm may liquidate due to its bad reputation among the investors. The risk of refinancing and the reputation concern will thus induce the firm to do well in the product market by investing in profitable projects.

For exporting firms also the import dealers check the financial statement of the firms before placing bulk orders. Accordingly, they will under rate firms with weak financial conditions and will not be willing to do business with them. In this case debt instruments like debenture and commercial paper can indirectly act as signals of firm quality. Moreover, firms with high financial solvency can afford higher risk and therefore they are expected to have a higher likelihood of becoming exporters and to have a higher export share.

Asymmetric information theory of corporate finance (Flannery, 1986; Kale and Noe, 1990; Barclay and Smith, 1995) claims that financial instruments may be deliberately used to convey information to investors about the quality of firms. Barclay and Smith (1995) find empirical evidence that firm use maturity structure of debt to signal information to the market. Interestingly, their study finds firms with greater information asymmetry (in terms of fluctuations in growth of sales) issue more short-term debt.

Therefore, financial instruments may not only convey a firm's commitment to its investors, but also to its consumers in the local product market, import dealers in the

foreign market, its distributors and marketing agents who are assured that the firm would abstain from opportunism. In this chapter, we empirically examine whether firm's financing decisions have impact on its real market variables and can improve product market performance.

4.3. Data Description, Variables and Summary Statistics

4.3.1. Data and Sample Selection

The variables are extracted from the electronic database "Prowess" supplied by the Centre for Monitoring Indian Economy (CMIE) which provides comprehensive data for about 6000 companies listed in Bombay Stock Exchange (BSE).⁸ The database contains information on all the major financial variables. The database we use is similar to the *Compustat* database in the U.S.

The Prowess database's coverage essentially begins in the year 1989. Our Initial sample consists of all Indian manufacturing firms in the private sector that CMIE has covered throughout the period 1989-2000. Since it is important for our analysis to control for industry effects, we require the firms to have an industry category. For this, we build up a concordance with 2 digit and 3 digit codes of National Industrial Classification (NIC), wherein NIC items are matched with the industry categories in Prowess.⁹ We finally get 21 industry categories, which we capture by 21 industry dummies. The industry details with number of firms within each category are given in Table 4. Construction of a balanced panel resulted in a sample of 533 firms, of which 290 are top fifty and large business group related and 243 non-top fifty and non-large business group. So, the basic data set contains 533 firms over 12 years with 6396 observations. Pooling of cross sectional and time series has some advantages in the field of applied research. It gives the researcher more observations with more degrees of freedom leading to improved efficiency of econometric estimates.

⁸ Other recent studies that have used the similar database are Sarkar and Sarkar (1998), Khanna and Palepu (2000), Bhandari, Dasgupta and Gangopadhyay (2000).

⁹ For an excellent discussion on concordance, see Veeramani (2001), Debroy and Santhanam (1993).

We collected the ISO quality certification data from Q-Prod's directory (various issues) of ISO 9000 certified companies in India. The principal limiting factor was the availability of data on year in which listed companies received the ISO certification from various third party intermediaries. The information regarding the year of certification we got from the direct consultation with the publisher of the directory and Total Quality Management Institute (TQMI) and INFOTECH of India.

4.3.2. Variables of Interest

Appendix A gives the list of the variables used in the regressions. There are three major dependent variables of interest. We use growth of total sales in the current year (GRSAL) and change in sales (ADSALF) in the following year as measures of firm performance in the product market in general. As we hypothesize, the behavior of firms may differ with respect to its operation in the local market in comparison with foreign market. We compare firm performance in the foreign market with its domestic market performance. We use firm's export as a percentage of its total sales as a measure of performance in the foreign market (EXPSLRP). Firm's domestic market performance is measured by change in firm sales in the domestic market in the following year (ADDOMSALF).

Among the explanatory variables, we take five real market variables as signals of firm quality and reputation. We use ISO quality certification dummy as a direct signal of firm's quality. The dummy takes value one if company has ISO 9000 series certificate in a particular year and zero if it has not. Based on our hypothesis, we expect ISO dummy to be positively significant on firm's product market performance especially on export performance.

Advertisement intensity (ADVINT) defined as the ratio of advertisement expenditure to sales proxy for firm specific quality and brand reputation. As we see in the literature and hypothesis that good quality firms signal their quality by advertising their product in Television or Radio. Advertisement signals producing firm's commitment to its product. Thus, enterprises with advertising and promotion activity are likely to do better in the output market.

Marketing intensity (MARKINT) is defined as the ratio of marketing expenses over sales. Marketing includes sum of all expenses related to the marketing of goods and services including discounts, rebates, commissions to sole selling agents, etc. Marketing in a business directly involves contact with the customer and assessment of his needs and translates this information into outputs for sales consistent with the firm's objectives. Thus, firms are able to attract more customers through investment in marketing. Hence, we expect marketing intensity to positively influence firm's product market performance.

Distribution intensity (DISTRINT) is the distribution expenses over total sales. Firms need to spend on building its distribution network to have strategic advantage in the product market. Hence, a positive relationship is expected between distribution intensity (DISTRINT) and firm performance.

Research and Development intensity (R&DINT) the amount firm spends in research and development as proportion of its total sales. As discussed in the introduction of this chapter, investment in in-house R&D activity is important for quality improvement. It is probably the most human-capital-intensive activity in a company. As a consequence, it is expected that firms engage in R&D activities have comparative advantages in exporting.

Three main financial variables have been taken to capture firm's financing decisions. They are ratio of commercial paper over assets (COMPAPTA), debenture over assets (DEBENTA) and DFIs borrowing over assets (DFISTA).

Commercial Paper to total assets ratio (COMPAPTA) is taken as signal of firm reputation. As we have already discussed that Commercial Paper captures the reputation of borrowing activities by the corporate through financial intermediaries as only highly rated corporate can issue CPs as per RBI rules.

Similarly, debenture over total assets (DEBENTA) is taken as another signal of firm specific quality. Only top rated corporates issue fixed interest carrying debenture. Thus it reflects the financial soundness of a company issuing this financial security. We therefore expect DEBENTA to be positively associated with firm performance in the product market.

Debt from development financial institutions over assets (DFISTA) mainly represents the long term financial need of a company. In many countries, Development

Financial Institutions (DFIs) have been major conduits for channeling funds to particular firms, industries and sectors during their process of development. In India DFIs (like ICICI, IDBI, IFCI etc.) have been a more important source of long term funds (mainly debt) for industry than bank loans or other source of debt. The primary role of DFIs is to reduce the financial constraints faced by the firms. As we discussed in our hypothesis at the beginning of this chapter, DFIs loan should have positive impact on firm's real market decisions.

4.3.3. Control Variables

Apart from the above variables of our interest, we control various firm specific factors which are also important in determining firm performance.

The firm size is known to affect a firm's performance in the product market. It also has importance in determining the choice of financial instruments (both long run and short run). Accordingly we control the size of a firm by taking natural log of firm's total assets (LNASSETS) or by natural log of total sales (LNSALES).

We take investment (INVEST), which is the change in gross fixed assets net of revalued reserves in the current year over total assets, to capture the effect of investment in analyzing firm's product market behavior.

We use cash profit over total assets as a measure of firm's profitability (CPROFTA). One can also define it as return on assets or ROA.

The industry effects are captured by 21 industry dummies and time effects by 12 yearly dummies. As we noted in beginning of this chapter, group membership may affect the ability of firms to take advantage of growth opportunities due to reputation advantage and also through financial inter linkages. In order to take care of the business group effects, we take three group dummies. DTOP50 represents the firms belonging to top 50 and large business group. DOTHGRP is the dummy for firms belonging to other small business houses. The private standalone firms who are not affiliated to any business group are represented by the dummy DPVT.

For our measure of investment opportunities, we take market to book ratio (MBR) of equity. This is the standard practice for developing country studies (Xu and Wang,

1997, for China; Khanna and Palepu, 1996; Sarkar and Sarkar, 1998; Chibber and Majumdar, 1998 for India). Capon, Farelly and Hoeing, 1996 also use MBR as a measure of market assessment of company's performance. The PROWESS database gives the market-to-book ratio of equity directly for the last trading day of the financial year. Since negative MBR is a misinterpretation of market assessment of performance, as the negativity of MBR may be due to negative book value and it has no meaning, we use outliers only to include positive values of MBR. We also exclude observations having MBR higher than 13.16 which corresponds to 99 percentile.

We include the share of wages and salaries to total sales as an additional control variable for growth potential as it reflects the labor intensity of production or the labor cost of production.

4.3.4. Descriptive Statistics

Table 1 shows the correlation coefficient between the different variables used in our empirical analysis. The financial variables debenture and commercial paper are too highly correlated with either total sales or total assets. So while studying the effect of financial variables on firm performance, we are never sure whether we are picking up the size effect or not. Therefore, to reduce the multicollinearity problem, the financial variables have been scaled down by the total assets and always use them either with natural log of total sales or natural log of total assets. There is also alarming correlation between total sales, advertisement, marketing and distribution. Hence we take advertisement over sales ratio, marketing intensity and distribution intensity instead of the level. Table 1a shows the correlation coefficient between the different explanatory variables that have been finally used in the regressions. One can check from Table 1a that the correlation among the regressors after we divided either by sales or total assets are very low and hence our regression models do not suffer from multicollinearity problem.

In Tables 2 and 3, we give some descriptive statistics about our sample of firms. The parametric t-tests and Wilcoxon rank-sum non parametric tests are conducted to evaluate the significant difference between top group firms and their smaller group or

non-affiliated counterparts. The Wilcoxon tests generally indicate that top 50 business group firms and non top 50 group firms are not drawn from the same distribution.

Inspection from Table 2 indicates that on average (both mean and median), top 50 business group firms are significantly larger than non-top 50 business group firms in terms of total sales, foreign sales and domestic sales. However, average (mean) non-top group firm's export orientation is higher than the top fifty. In terms of growth opportunities, reflected by market to book ratio (MBR), market performances are much better for top 50 firms than non top group firms.

The top group firms on the average (both mean and median) spend more on advertising, marketing and distribution as proportion of their total sales compared to non top group affiliated firms. The performance of top 50 group affiliates, measured by their profitability (cash profit over total assets) appears to be better than that of non top 50 firms. Top group firms also issue more debenture and commercial paper than non top group firms.

Table 3 gives some descriptive statistics of the variables for the total data set as well as for the sub-samples of top 50 business group affiliates and non top 50 business group companies. From Table 3 we see that most remarkable difference between top group related and non top group firms is the much higher standard deviation of export intensity for non top group firms.

4.4. Estimation Technique and Results

4.4.1. Parametric and Non Parametric Univariate Tests:

In order to test the effectiveness of financial instruments on firm performance in the product market, we first present tables of univariate tests (both parametric and non parametric) on total sales, foreign sales, domestic sales, R&D intensity, advertising and marketing intensity in the year prior to, the year of and the year following the issuance of such securities. We use t-test to test the equality of pair of means and Wilcoxon signed-rank test for difference in the median and distributions. In panel A of each table, we report the mean values of these variables with the significance for yearly changes. In

panel B, we report the median values and z-statistics for difference in distribution. We report these for the whole sample and the two sub-groups.

In Table 5, univariate results document the fact that average total sales and domestic sales are significantly higher for firms subsequent the issuance of commercial paper. The post effect of commercial paper issue stochastically dominates the pre effect. This is true for all firms combined and top 50 and non-top 50 groups. Export is also higher for all firms and top 50 firms. However, for non top 50 group firms, there is no significant change in foreign sales. From Panel B we find significant difference in their distributions also. The average advertisement and marketing intensities are also higher after the issuance of CP. But they are insignificant for non-top 50 business group firms. There is no significant change in R&D intensity on average (both mean and median) following the issuance of CP.

In Table 6, we inspect the effect of debenture. The t-test and Wilcoxon z- test show that on average, firm's total sales, domestic sales and foreign sales significantly increase due to debenture issue. Similarly, firms are spending (all firms combined and top 50 business group) more on marketing and advertisement as proportion to total sales after debenture issue. Average R&D intensity is significantly higher only for top 50 business group firms. Therefore, firms issuing commercial paper and debenture strategically use them to increase marketing efforts and promote their products through increased advertising to ease capacity constraints to expand its sales opportunities.

One may ask to compare the yearly changes of sales (including foreign and domestic sales) for CP (or debenture) issuing firms with non CP (or non debenture) issuing firms to be more sure that financial instruments are really bringing changes in firm's product market performance. Accordingly we report the results of some additional univariate tests to compare the prior and post sales growth of CP issuing firms with non CP issuing firms. The results are reported in Table 7 where we evaluate the significance of changes in growth of total sales, foreign sales and domestic sales for all the firms together in our sample. In panel A of Table 7, we test the equality between mean current growth of sales with next year's mean growth of sales for both CP issuing and non CP issuing firms. Using the same format, we test the growth difference for foreign sales and domestic sales. The t statistics and the level of significance are reported in the fifth

column. In panel B, we compare the median difference by applying Wilcoxon signed rank test. In panel C, we then test the difference in the distribution of difference in the growth rate of total sales, foreign sales and domestic sales between CP issuing and non CP issuing firms. For conducting this, we apply rank-sum test. The rank-sum test statistics (i.e. z-statistic) and the level of significance are being reported in column 5. From panel A, it is clear that the post average growth of total sales, foreign sales and domestic sales are significantly higher than the current rate of growth for CP issuing firms. The following year's median growth rates are also significantly higher for firms issuing commercial paper in comparison to the growth rate in the current year as indicated by the Wilcoxon z-statistics. The next year's growth distribution of CP issuing firms is also stochastically larger than the current year's growth distribution (except for the foreign sales). Finally, in panel C, we see that the growth difference is positively significant due to CP issuance. This is true for total sales, foreign sales and domestic sales. Thus, our parametric and non parametric tests clearly indicate that CP issuance really making changes in the firm's growth rate.

One can further look at the Tables 8 and Table 9 where we report univariate tests showing CP issuing firms on average spending more on advertisement, marketing, distribution and research and development than non CP issuing firms. This is true for whole sample as well as both top group and non-top group firms. Similarly, advertisement intensity, marketing intensity, distribution intensity and R&D intensity are higher (significant for both mean and median) for debenture issuing firms. Thus, CP issuing and debenture issuing firms are generally high quality firms.

4.4.2. The Multivariate Model at the Firm Level:

We next present an econometric estimation of the performance effect of debentures and commercial paper and Development Financial Institutions loans to examine whether interactions between firm's financing and performance are reasonably significant.

Based on our hypotheses that we discussed at the beginning of this chapter (section 4.1) and in section 4.2 and in the description of explanatory variables, our model takes the following functional form:

$$\text{Firm's Product Market Performance} = f(\text{Firm Size, ISO, R \& DINT, ADVINT, MARKINT, DISTRINT, COMPAPTA, DEBENTA, DFISTA, CPROFTA, Group Reputation})$$

In order to capture some common elements among firms (or firm specific effects), many of whom are unobserved by the researcher, we include 21 industry dummies and 12 yearly dummies to remove any biases into our regressions. The industry dummies take into account for individual (company) effects and the time effects are captured by the year dummies. In order to avoid the problem of dummy trap which may arise due to the problem of multicollinearity, our model takes 21-1 =20 industry dummies and 12-1=11 year dummies in estimation. The firm size is either captured by natural log of total assets (LNASSETS) or natural log of total sales (LNSALES). The last explanatory variable “Group Reputation” is captured by two group dummy DTOP50 which represent the top50 and large business group affiliated firms and DOTHGRP for firms belonging to business houses other than top 50. We drop the dummy DPVT that represent the private standalone firms and DTOP50 and DOTHGRP dummies are being compared with respect to DPVT to examine the effect of group reputation on firm performance. In spite of taking so many dummies, our model does not suffer from insufficient degrees of freedom as our pooled data set has enough number of observations (total number of firm years=no. of firms (533)× no. of years (12)=6,396).

As we discussed in section 4.3.2, we measure firm’s product market performance by three sets of variables. At first, we test the significance of real market signals and financial market signals on firm’s product market performance in general. Here we take additional sales obtained by a firm in the following year (ADSALF) as dependent variable. Since the dependent variable has lot of zero and negative values, we apply a Tobit censored regression model (maximum likelihood estimation method) to predict the probability of increase in sales in the following year due to real market as well as financial market instruments.

Next, we split the firm's total sales into foreign market sales and domestic market sales and examine whether real market and financial market instruments operate in a different way in both the markets. Accordingly, we separately analyze firm performance in the foreign market and in the domestic market. In analyzing, firm's foreign market performance, we take firm sales in the foreign market as a percentage of its total sales (call it export share or export intensity of sales) as dependent variable. In order to avoid the potential endogeneity problem, we examine whether current year's explanatory variables determine next year's export probability ($EXPLRP_{t+1}$). We estimate the probability of exporting in the following year applying both logit and tobit estimation technique to find which kind of firms are likely to export in the Indian market. Similarly, we look at the firm performance in the domestic market to see whether quality as well as financing decisions matters or not. Using a censored Tobit regression model, we estimate the probability of increase in domestic sales in the following year through real and financial signaling.

Next, we evaluate the role of long term DFIs loan on firm performance. We carry out some additional univariate tests and regressions to better explain the long term impacts of DFIs borrowing.

Finally, we try to answer the causality between financing decisions and firm's export performance by applying a two step estimation technique.

Five sets of results are reported in the following sections.

4.4.2A. Quality Signals and Total Sales:

We first estimate a panel Tobit regression to ascertain whether real and financial signals plays any role in determining the probability that a firm will experience an increase in sales in the following year. The regressions are run with all firms combined, as well as with top 50 group and non-top 50 group firms separately. We control industry effects as well as time effects by incorporating 21 industry and 12 yearly dummies. The results presented in Table 10 indicate that the financial variables COMPAPTA and DEBENTA are significant for both the groups. This supports our hypothesis that the

issuance of commercial paper and debenture improve firm's product market sales in the next year.

ISO dummy is significant for both groups of firms. Thus, quality matters in the product market. Advertisement and Distribution appear to be significantly positive for top 50 business group firms. This is consistent with the theoretical propositions we discussed in the introduction that quality and reputation signaling affect firm performance. Firms are more likely to obtain higher sales if they are top 50 business group firms (DTOP50 dummy is significant) again suggesting that group reputation matters in the product market.

To better interpret our results, and to further distinguish the results between the two-sub groups, we have calculated the economic significance of the variables for Table 7.¹⁰ We find that total sales go up by 2.4% for top 50 business group firms and by 2.5% for non top-50 firms if commercial paper over assets (COMPAPTA) increases by one standard deviation. Therefore, effects of commercial paper on sales are almost the same for both categories. In the same way, we find that the effect of debenture over assets (DEBENTA) on sales is more pronounced for non-top 50 firms (9.5%) in comparison to top 50 firms (4.7%). In case of advertisement intensity (ADVINT), total sales go up by 3.1% for top 50 business group firms in comparison to 1% increase of their non 50 counterparts. Therefore, effect of advertisement on sales is more significant for top 50 business group firms than the smaller group or non group firms.

The DFISTA coefficient is insignificant for top 50 business group affiliates, whereas it is significantly positive for standalone and other small business group firms. This may be due to the fact that stand-alone firms are more financially constrained than top 50 business group firms. Among the control variables, we find firm profitability (CPROFTA) and investment (INVEST) significantly increase total sales. We infer two things. First, firms that invest more in the current year seem to outperform market rivals in the following year. Second, firms that are more profitable in the current year tend to receive greater boost in sales in the following year. DTOP50 on the other hand, is seen to

¹⁰ To calculate the economic significance of the independent variables of Table 7, we multiply the estimated coefficients by the standard deviations of the variable and divide it by mean value of current period's sales. Finally, we multiply the ratio by 100 to calculate percentage change in sales due to one standard deviation change in the independent variable.

have a positive and significant effect on firm performance, showing that firms belonging to top 50 groups perform better than those belonging to the other business houses and private standalone ones. Among the industry dummies, Power generation (IND18), and Diversified (IND19) which includes firms in the miscellaneous industry category are seen to be highly positively significant.

4.4.2B. Quality and Export Performance:

Next we study the relationship between real and financial quality signals with respect to firm's foreign market performance. We first run logit regressions to examine the factors that determine the next year's export probability for all firms together and separately for top 50 group firms and non-top 50 group firms. The dependent variable equals one if firm exports as a proportion of its total sales in the following year. The results from Table 11 indicate that top 50 business group firms are more likely to export in the next year if they issue commercial paper and debenture this year. For non group firms however, these financial instruments have no significance on export further suggesting that these financial instruments are more important for top 50 business group firms to have higher share in the export market. ISO dummy is significant for both group firms. Marketing intensity is also significant for both groups. R&D intensity turns up to be significant only for top fifty business group firms.

Among the industry dummies, food products including sugar, tea, coffee, vegetable oils (represented by IND2), cotton textiles (IND4), man made fiber textiles (IND5), textile products including wearing apparel (IND7), wood and wood products (IND8), paper and paper products (IND9), chemicals (IND10), rubber and rubber products (IND11), non metallic and mineral products (IND12), basic metal like Iron and Steel (IND13), metal products and parts (IND14), machinery and equipments like electronics, electrical equipments, computers, insulated wires and cables etc. (IND15), transport equipments and parts (IND16), and Gems and Jewellery (IND17) are highly positively significant. Among the other industries, IND1 has a negative and significant effect on the export probability, indicating that companies belonging to hotel, banking, insurance and financial services are less export oriented than others.

However, the above results concerning the effects of financial securities on firm's export market performance may not be without criticisms. People may argue that firms issue debentures this year anticipating that they would need funds to produce for the export market next year. So we try a dummy which takes a value of 1 if a firm had debentures outstanding from 1990 (Ddebut90), and zero otherwise in our regressions. We also try a commercial paper dummy (Dcp) with these regressions. The results are presented in Table 11a. Interestingly, the debenture dummy Ddebut90 is highly significant and positive for all firms combined as well as for both groups. This suggests that debenture holding firms are more likely to perform well in the export market. The commercial paper dummy (Dcp) is significant for top 50 business group firms but is not significant for non top 50 category. This makes sense as it indicates that good quality firms export more. Thus, quality and reputation matters for Indian export.

Using the same format, we run Tobit regressions of next year's export share as a function of this year's exports share and the other independent variables. The results are reported in Table 12. The variable DEBENTA is significant in overall, as well as top 50 business group. One immediate concern would be that DEBENTA proxies for firms with greater availability of finance and those which are expected to invest more. If firms were investing more in anticipation of export growth, then it would not be surprising to find DEBENTA significant. To alleviate this concern, we include INVEST which is the change in the level of gross fixed assets (net of revalued reserves) in the current period over total assets to control investment effect. Thus, the significance of DEBENTA can be only attributed to firm specific qualities reflected in a higher DEBENTA stimulating export growth.

Among the other variables, LNASSETS has a highly positive and significant effect on export performance, showing that larger firms generally perform better than smaller ones. The group dummies DTOP50 and DOTHGRP have a positive and significant effect on firm export showing that firms belonging to top 50 and other business groups perform better than private standalone and smaller group firms. Thus group reputation matters in the export market.

4.4.2C. Quality and Domestic Sales:

What about domestic sales? Should the same “quality” argument apply for domestic sales as well, i.e. if a firm can signal quality, then will it experience more rapid growth of sales? To examine this question, we ran similar Tobit regressions on domestic sales. The results are reported in Table 13. Column 1 reports results for all firms together, column 2 for top 50 business group firms and column 3 for non-top group firms. The ISO dummy is significant overall and for both type of firms. Advertisement and distribution intensities are significant for all firms collectively and for top 50 business group firms. Marketing intensity is significant for non-top 50 group firms. The coefficients of COMPAPTA and DEBENTA are significant and positive in overall, as well as for top 50 group and non-top 50 group companies separately. The significance of COMPAPTA and DEBENTA can be attributed to firm specific qualities reflected in higher commercial paper and debenture issue (as proportion of their total assets) stimulating domestic sales growth.

4.4.2D. Effect of Development Financial Institutions (DFIs) Loan on Product Market Performance:

In India, Development Financial Institutions (DFIs) loan have been a more important conduit of long term debt for industry than bank loans or other sources of debt. DFIs provide direct finance in the form of term loans and also directly subscribe in share and debenture issues of companies. Both the logit and tobit regression results (Tables 11 and Table 12) show that the probability of a firm to export in the year following a DFI loan is much smaller. However, one may raise questions about the endogeneity issue, as the loan is long term in nature. May be the firm took a DFI loan now so that it could rebuild its infrastructure in order to achieve a higher export market share five or ten years down the road. Hence, for a clearer understanding of how DFI loans affect product market performance, we present three time series tables of total sales, domestic sales, foreign sales (or export), R&D expense, and advertising expense for all the firms that took DFI loans from two years prior till five years after the loan was taken. Table 14

reports the average yearly changes of these real variables due to DFIs loan for the entire sample, top 50 and non-top 50 business category firms. The results of paired t-test and Wilcoxon signed rank test reinforce what we predicted. We find significant increase in firm's average total sales over time in the long run after it has taken loan from DFIs. The average (both mean and median) foreign market sales as well as the domestic market sales have significant and stochastically upward trend. This is true for top 50 group members as well as non top 50 group members.

Furthermore, we obtain two or three period lagged values of DFI loans-to-asset ratio (DFISTA) to see its effect on firm performance. Here we take firm's growth of sales in the current year as a measure of performance in the product market. In assessing the consequence of DFIs loans on growth of sales, we study the case of firms which have taken the loan. Firm profitability CPROFTA (proxied by cash profit over assets), investment INVEST (proxied by capital expenditures over assets), and size (proxied by the natural log of total assets) are used as controls in Tobit regressions of sales growth in the current year on lagged values of DFIs loan.

The pooled cross-sectional-time series Tobit regressions we estimate below resemble those of Opler and Titman (1994) and Campello (2002). However, instead of leverage (as they used), we test the significance of lagged values of DFIs lending to examine its effect on firm's growth of sales. They have the following general form:

$$\begin{aligned} Sales\ Growth_{i,t} = & \beta_0 + \beta_1 LNASSETS_{i,t} + \beta_2 INVEST_{i,t-1} + \beta_3 CPROFTA_{i,t-1} \\ & + \beta_4 DFISTA_{i,t-2(or,t-3)} + \varepsilon_{i,t} \end{aligned}$$

The lagged structure used in the above equation is meant to mitigate simultaneity problems. As far as the error structure is concerned, the Maximum Likelihood Estimation of panel tobit assume that $\varepsilon_{i,t}$ is uncorrelated with $\varepsilon_{i,t'}$ and $\sigma_{i,t,t'} = 0$ when $t \neq t'$; where t and t' are indexes for time periods when observations of the same firm are collected. Similarly, we assume $\varepsilon_{i,t}$ is uncorrelated with $\varepsilon_{j,t} \forall i \neq j$ at same t . However, in a panel structure, firm specific and time specific effects may be unobserved by the econometrician. So there may be still correlation among panels. Accordingly, we include

21 industry dummies and 12 yearly dummies to mitigate the autocorrelation within panels.

Table 15 reports six regression results. The regression evidence suggests that firms that have taken loan from DFIs 2 or 3 years back are likely to experience higher growth of sales in the current year. Thus, DFIs lending seems to boost sales growth in the long run. The effects are marked for both top 50 group and smaller group or private standalone firms. Again, we calculate the economic significance of the variables in Table 15 to draw the distinction between the top 50 and the non-top 50 group of firms.¹¹ The economic significance of the 2 period and 3 period lagged values of variable DFISTA interpret the results more strongly. We find that with 1 standard deviation increase in 2 period-lagged DFIs borrowing over assets (DFISTA) lead to 50% increase in growth of sales for non-top50 group of firms and 30% increase in growth of sales for firms in top 50 business group category. Similarly, for 3-period lagged values of DFISTA, growth of sales rises by 39% for non-top50 firms and 25% for top50 firms. Thus, an increase in DFISTA by one standard deviation leads to economically significant increase in growth of sales for firms belonging to both groups. Further, one can see that DFIS borrowing over assets (DFISTA) is a more powerful variable in explaining increase in growth of sales for smaller group and private standalone firms in comparison to top50 firms. As far as control variables are concerned, we find that Firms that invested more in the previous year tend to observe higher sales growth this year. Interestingly, larger firms seem to outperform market rivals and have higher sales growth.

4.4.2E. Does Export Share explain Issuance of Financial Securities? The Question of Reverse Causality:

One of the major concerns in our paper is the causality issue. It could well be the case that firms are able to issue commercial paper and debenture because they acquire

¹¹ To calculate the economic significance for the independent variables of Table 15, we divide the sum of mean value of the dependent variable (annual sales growth at time t) and the estimated coefficient of the independent variable ($\hat{\beta}$) by mean value of the dependent variable (average annual sales growth at time t) and multiply it by the standard deviation of the independent variable (x) and then multiply by 100. This will tell the percentage change in growth of sales due to one standard deviation change in independent variable.

reputation in export markets. The question is: are exports affected by debentures or does having a good export market performance record affect the issuance of these securities? Because of the possibility of endogeneity between export share and commercial paper, debenture and DFIs loan, we apply a two-step regressions method. More concretely, our two step estimation is of the form:

In the first step, we estimate the following Tobit equation:

$$\begin{aligned} \text{Prob}(EXP\text{SLRP}_{i,t+1} = EXP\text{SLRP}_{i,t+1} > 0) = & \alpha + \beta_1 EXP\text{SLRP}_{i,t} + \beta_2 LN\text{ASSETS}_{i,t} \\ & + \beta_3 ISO_{i,t} + \beta_4 INVEST_{i,t} + \beta_5 ADVINT_{i,t} + \beta_6 MARKINT_{i,t} \\ & + \beta_7 DISTRINT_{i,t} + \beta_8 R \& DINT_{i,t} \\ & + \beta_9 (COMPAPTA_{i,t} \text{ or } DEBENTA_{i,t} \text{ or } DFISTA_{i,t}) \\ & + \beta_{10} CPROFTA_{i,t} + \Gamma_i + T_t + u_{it} \end{aligned}$$

where 'i' indexes companies and 't' indexes time periods. Γ_i is firm specific fixed effect which we capture by 21 industry dummies and three group dummies. The time trend T_t is captured by 12 yearly dummies.

We regress following year's export share on this year's export share and on debenture over assets or commercial paper asset ratio or DFIs loans over assets. We apply Tobit model to predict amounts receivable from exports. These regressions are similar to those reported in Table 12. From these regressions we obtain the predicted values of export share in the following year (we call it $EXP\text{SLRPHAT}_{t+1}$). We calculate $EXP\text{SLRPHAT}_{t+1}$ for all firms in the sample and top 50 and non top 50 groups. In the second step, we use these predicted values of export share to explain the issuance of the securities. This is an adequate way to take care of the endogeneity issue.

The second step estimated Tobit regression equation takes the following form:

$$\begin{aligned} \text{Prob}(\text{DebtInstruments}/\text{Assets}) = & \delta_1 + \delta_2 \text{FirmSize} + \delta_3 \text{GrowthOpportunities} \\ & + \delta_4 \text{CostCompetitiveness} + \delta_5 EXP\text{SLRPHAT}_{t+1} + \epsilon_{it} \end{aligned}$$

Table 16 reports Tobit regressions where the dependent variable is observed only when the company has outstanding debentures in the current year as proportion of its

total assets and the variable is left censored. We use natural log of total sales to control for firm size, market to book ratio (MBR) for growth opportunities and wages plus salaries over total sales (WAGSAL) for cost competitiveness. Table 17 and Table 18 report similar results for commercial paper and DFIs loan. The key explanatory variable is the predicted value of the export share in the following year ($EXPSLRPHAT_{t+1}$), which is partly explained by these securities. This variable is statistically insignificant for all firms as well as separately for top 50 group and non top 50 business group firms as we see from Table 17. Therefore, there is no reverse causality in case of commercial paper.

In explaining debenture issue (Table 16), $EXPSLRPHAT_{t+1}$ is negatively significant for the entire sample and non top 50 business group firms. However, for top 50 business group affiliated firms, it is positively significant. It is also interesting to note that in all these cases, the coefficient of $EXPSLRPHAT_{t+1}$ is numerically very small in magnitude. Therefore, firms in general are less likely to issue debenture further if they already have higher share in the export market. We have similar results for long-term DFIs loans (Table 18).

From regression outputs reported in Table 16-18, we can make following inferences about the control variables. Firms with higher growth opportunities (captured by higher MBR) are more likely to issue commercial paper. The probability of issuing CP is higher for non top 50 business group firms compared to the firms belonging to top 50 groups. While the larger firms seem to issue more commercial paper and debenture, the smaller firms within top 50 business group are likely to be taking more loans from Development Financial Institutions.

4.5. Concluding Discussions

The primary contribution of the research delineated in this paper is to demonstrate the importance of corporate quality and reputation building activities for competing in the product market in the context of India. From our regression results we find a positive relationship between the firm's issuance of certain financial securities and product market sales. From univariate tests, we find commercial paper and debenture issuing firms strategically using them to ease capacity constraints, build distribution networks, product

innovation, increase marketing efforts, or promote their products through increased advertising to expand sales opportunities. Thus, firms can use financial instruments like commercial paper and debentures for strategic purposes to gain competitive advantage in the product market. While these securities can give issuing firm a strategic advantage in the domestic market, they may also act as signals of firm specific quality to customers or distributors as well as marketing agents and thereby stimulate foreign sales. Thus, firm's financing decisions may drive product market outcomes.

We also evaluated the role of long-term loan from Development Financial Institutions on firm performance. DFIs in India have been set up apparently to help firms that are financially constrained to undertake socially desirable projects. Accordingly we find that DFIs loans positively affect total sales (mainly domestic sales) for non top 50 group firms who are more financially constrained than the top 50 business group affiliated firms. However, DFIs loans are long term in nature. In order to capture its effect on performance properly, we looked at its consequence for a longer period of time. Our univariate results on yearly changes in performance variables reveal that both category firms utilize DFI loans in increasing expenditure on advertising, distribution, marketing and Research and Development to increase its market share in the long run. Finally, we used 2 or 3 period lagged values of DFIs loan over assets for the firms that have taken the loan on growth of sales. We find that DFIs lending boosts sales growth in the long run.

With regard to real market signals, we find that firms that are spending more on advertising and marketing for brand promotion become successful in overseas market. Improvement in quality is a prerequisite for establishing market dominance abroad. Expenditure on R&D is crucial as it significantly improves export share especially for the firms belonging to top 50 business group. Further, quality certification plays an important role in inducing foreign customers into buying a firm's products. Moreover, firms are more likely to export if they are top 50 group firms again suggesting that quality matters for export. Group reputation matters in the export market since it reduces uncertainty among the foreign customers about firm quality. The top 50 business group firms on an average spend more on advertising, marketing, distribution and R&D and thus have larger amount of intangible assets. Therefore, they are generally high quality firms with greater growth option in their investment opportunities in comparison to their

counterpart. For independent or smaller group firms, distribution is an important factor in determining higher export probability.

In the domestic market regressions, we find that firms spending more on advertising and marketing experience more rapid growth of sales. This is true for top 50 business group affiliates. Top group firms already have more established reputation in the domestic market. Therefore, for them, high ratios of advertisement and distribution to sales may be good at establishing entry barriers against competition. For the independent and smaller group firms, we find that expenditure on marketing significantly improves their performance in the domestic market. We however find that R&D intensity has no effect on domestic sales for both categories of firms while we got it significant for export. This may be due to two reasons: Firstly, the degree of competition on the quality front is quite low in the domestic market in comparison to the international market. This is due to multiplicity of sellers and easy entry into the market which destroy incentives for maintenance of high qualities. Secondly, unlike the export market, domestic consumers in India are not much quality conscious.

APPENDIX-A

Dependent variables:

Table 10: Additional Sales obtained in period $t+1$ (ADSALF):

$$\Delta SALES_{t+1} = SALES_{t+1} - SALES_t$$

where $SALES_t$: Total sales revenue generated from main business activity at time t .

Table 11 and 11a: $D_{\text{expslrp}}(t+1)$: Dummy for next year's export to sales ratio. It is 1 if a company exports in the following year and 0 if it doesn't. Export ($XGDS$) is defined as export earnings, which are specifically through export of goods, reported on cash basis.

Table 12: $EXP_{\text{SLRP}}(t+1)$: Following year's export as percentage of firm's total sales.

Table 13: Additional domestic sales obtained in the following year (ADDOMSALF):

$$(DOMSAL_{t+1} - DOMSAL_t); \text{ where } DOMSAL = SALES - XGDS$$

Table 15: Sales Growth at t (GRSAL): $(SALES_t - SALES_{t-1}) / SALES_{t-1}$

Explanatory variables appearing in the regressions (in order of appearance):

LNASSETS: Natural log of total assets at period t .

ISO dummy: Dummy for ISO quality certification. It is 1 if the company got the certification in a particular year and 0 otherwise.

R&DINT: (Total expenses on Research and Development in capital account)/ K_t

K_t : Total Assets at time t .

ADVINT: (Advertising and sales promotion expenses during the current year)/ $SALES_t$,
 $SALES_t$: Total sales at time t .

MARKINT: (Sum of all expenses related to the marketing of goods/services)/ $SALES_t$,

DISTRINT: (Incidental expenses incurred by an enterprise on the distribution of goods and services sold)/ $SALES_t$.

INVEST: $(RGFA_{t+1} - RGFA_t) / K_t$.

where $RGFA_{t+1}$: Gross fixed assets less revalued reserves at time $t+1$ and $RGFA_t$ is that at time t . K_t is Total assets at time t .

COMPAPTA: (Commercial Paper issued by companies to raise short term funds with maturity period between 180 days and a year)/ K_t .

DEBENTA: (amount of money raised by a company by the issuance of debentures including privately placed debentures with financial institutions like UTI (Unit Trust of India): non-convertible debentures, the non-convertible part of partial and fully convertible debentures)/ K_t .

DFISTA: DFIs debt/ K_t .

Dcp: Commercial Paper dummy, the dummy takes the value 1 if a company issues commercial paper in a particular year and zero other wise.

Ddebout90: Dummy for companies issue debenture outstanding as of 1990. The dummy takes the value 1 if the company issues debenture since 1990 and zero otherwise.

CPROFTA: (Cash Profit)/ K_t

where Cash Profit: Net Profit+ Depreciation +Amortization.

DPVT: Dummy variable taking the value 1 if the firm does not belong to any business group.

DTOP50: Dummy variable taking the value 1 if the firm belongs to top 50 and large business group.

DOTHGRP: Dummy variable taking the value 1 if the firm belongs to business houses other than top 50.

WAGSAL: (Wages and salaries include the total expenses incurred by a company on all employees including the management, also includes payment of bonus, contribution to employees' provident fund, staff welfare, expenses on account of VRS (Voluntary Retirement Scheme) and retrenchments & commission)/Total sales at t .

MBR: Market to book ratio at t .

LNSALES: Natural log of total sales.

EXPSLRPHAT (t+1): Predicted value of export share (% of export over sales) of regressions similar to table 9 where dependent variable is export to sales ratio in percentage and independent variables are either COMPAPTA or DEBENTA or DFISTA and other control variables.

Table 1: Sample Correlation Coefficients

	XGDS	TOTASS	SALES	R&D	ISO	ADVERT	MARKT	DISTR	COMP	DEBN	DTOP	WAGES	DFISBOR	CPROF
XGDS	1.00													
TOTASS	0.63*	1.00												
SALES	0.67*	0.92*	1.00											
R&D	0.21	0.20	0.23	1.00										
ISO	0.29	0.24	0.28	0.12	1.00									
ADVERT	0.27	0.33	0.44	0.22	0.20	1.00								
MARKT	0.53*	0.51*	0.61*	0.27	0.28	0.43	1.00							
DISTR	0.49	0.55*	0.62*	0.06	0.18	0.24	0.44	1.00						
COMP	0.24	0.35	0.36	0.07	0.15	0.22	0.30	0.51	1.00					
DEBEN	0.62*	0.88*	0.85*	0.13	0.21	0.25	0.46	0.56*	0.37	1.00				
DTOP	0.16	0.18	0.23	0.08	0.15	0.17	0.22	0.15	0.08	0.15	1.00			
WAGES	0.63*	0.69*	0.76*	0.16	0.27	0.30	0.53	0.72*	0.44	0.64*	0.22	1.00		
DFISBOR	0.47	0.57*	0.52*	0.08	0.21	0.14	0.39	0.52*	0.17	0.53	0.20	0.61*	1.00	
CPROF	0.56*	0.88*	0.90*	0.22	0.20	0.35	0.49	0.45	0.22	0.81	0.15	0.58*	0.40	1.00

Notes:
XGDS= Export of goods and services; TOTASS= Total Assets; SALES= total turnover; ISO= ISO quality certification dummy; ADVERT= Advertisement; MARKT= Marketing; DISTR= Distribution; COMP= Commercial Paper; DEBEN= Debenture; DTOP= Dummy for top 50 and large business group; WAGES= Wages and Salaries; DFISBOR= Borrowing from DFIs; CPROF= Cash Profit.

* denotes the high correlation level.

Table 1a: Correlation coefficient between different explanatory variables

	EXPSLRP	LNASSETS	LNSALES	WAGSAL	ADVINT	MARKINT	DISTRINT	R&DINT	ISO	COMPAPTA	DEBENTA	DFISTA	INVEST	CPROFTA	MBR	DPVT	DOTHGRP	DTOP50
EXPSLRP	1.00																	
LNASSETS	0.06	1.00																
LNSALES	0.05	0.89	1.00															
WAGSAL	-0.02	-0.05	-0.16	1.00														
ADVINT	-0.04	0.05	0.09	-0.01	1.00													
MARKINT	0.05	0.08	0.09	-0.02	0.11	1.00												
DISTRINT	0.07	0.17	0.17	-0.02	0.06	0.03	1.00											
R&DINT	0.02	0.03	0.02	-0.01	0.01	0.04	-0.02	1.00										
ISO	0.09	0.4	0.36	-0.01	0.02	0.01	0.04	0.03	1.00									
COMPAPTA	-0.01	0.17	0.18	-0.01	0.09	0.04	0.03	0.02	0.15	1.00								
DEBENTA	-0.05	0.32	0.3	-0.02	-0.01	0.01	0.07	0.01	0.09	0.05	1.00							
DFISTA	-0.05	-0.04	-0.08	-0.01	-0.08	-0.01	0.21	-0.03	-0.05	-0.07	-0.01	1.00						
INVEST	-0.03	-0.02	-0.02	-0.03	-0.01	-0.02	-0.03	0.01	-0.04	-0.01	0.05	0.03	1.00					
CPROFTA	0.04	0.05	0.15	-0.15	0.03	0.03	-0.03	0.02	0.01	0.03	-0.08	-0.14	0.24	1.00				
MBR	0.01	0.03	0.04	-0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-0.03	0.02	0.03	1.00			
DPVT	0.04	-0.42	-0.41	0.03	-0.05	-0.05	-0.15	0.01	-0.14	-0.04	-0.16	-0.01	-0.05	-0.06	-0.01	1.00		
DOTHGRP	0.06	-0.12	-0.13	-0.01	-0.01	0.02	0.01	0.13	-0.01	-0.06	-0.02	0.05	0.01	-0.05	-0.03	-0.27	1.00	
DTOP50	-0.07	0.47	0.47	-0.03	0.05	0.03	0.14	-0.01	0.15	0.08	0.17	-0.02	0.05	0.09	0.03	-0.76	-0.42	1.00

Table 2: Descriptive Statistics					
Units in Rupees Million					
	All firms	Top 50 Business Group firms	Non-top 50 Business Group firms	Difference	t statistics for Difference
<i>Panel A: Means</i>					
Total Sales	2174.77	3440.9	649.67	2791.23	18.94***
Foreign Sales	154.5	232.9	60.78	172.12	13.28***
Domestic Sales	2019.9	3207.8	588.54	2619.26	18.82***
Export Sales Ratio (in %)	7.35	6.31	8.61	-2.3	-6.06***
Natural log of Total Assets	6.64	7.28	5.87	1.41	42.99***
Advertisement/Sales	0.005	0.006	0.005	0.001	4.02***
Marketing/Sales	0.016	0.017	0.015	0.002	2.80***
Distribution/Sales	0.02	0.023	0.01	0.013	11.49***
Research and Development/Sales	0.0006	0.0005	0.0007	-0.0002	-1.18
Commercial Paper/Total Assets	0.002	0.002	0.001	0.001	6.45***
Debenture/Total Assets	0.05	0.06	0.03	0.03	13.54***
DFIS loan/Total Assets	0.119	0.116	0.123	-0.007	-1.93***
Cash Profit/Total Assets	0.06	0.07	0.05	0.02	7.16***
Market to Book Ratio	1.37	1.89	0.7	1.19	2.35***
<i>Panel B: Medians</i>					z-stat. for difference
Total Sales	720.5	1427.8	375.9	1051.9	39.31***
Foreign Sales	9.8	28.2	2.6	25.6	19.75***
Domestic Sales	648.35	1336.1	326.3	1009.8	40.44***
Export Sales Ratio (in %)	1.48	2.01	0.76	1.25	8.17***
Natural log of Total Assets	6.57	7.24	5.81	1.43	38.95***
Advertisement/Sales	0.0004	0.0005	0.0003	0.0002	4.76***
Marketing/Sales	0.009	0.010	0.008	0.002	6.89***
Distribution/Sales	0.011	0.013	0.008	0.005	10.41***
Research and Development/Sales	0.00	0.00	0.00	0.00	11.03***
Commercial Paper/Total Assets	0.00	0.00	0.00	0.00	9.8***
Debenture/Total Assets	0.012	0.033	0.00	0.033	22.26***
DFIS loan/Total Assets	0.07	0.08	0.07	0.01	2.26***
Cash Profit/Total Assets	0.07	0.07	0.06	0.01	6.47***
Market to Book Ratio	0.92	1.08	0.72	0.36	9.42***
Notes:					
(1) ***, ** denote significance at the 5% or better, 5-10%-level, respectively.					
(2) z-statistic denotes the outcome of a Wilcoxon rank-sum (Mann-Whitney) test of equality of median and distribution between series.					

Table 3: Descriptive Statistics												
												Units in Rupees Million
Variable	All firms				Top 50 Business Group firms				Non-top 50 Business Group firms			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Total Sales	2174.77	6007.76	0.1	203013.9	3440.9	7848.4	0.3	203013.9	649.67	1060.6	0.1	29250
Foreign Sales	154.5	522.3	0.00	14759.9	232.9	678.1	0.00	14759.9	60.78	181.87	0.00	2040.6
Domestic Sales	2019.9	5671.7	0.00	188254	3207.8	7408.8	0.3	188254	588.54	1023.7	0.00	27633.2
Export Sales Ratio (in %) (EXPSLRP)	7.35	15.12	0.00	100	6.31	10.37	0.00	97.42	8.61	19.27	0.00	100
Natural log of Total Assets (LNASSETS)	6.64	1.49	1.82	12.59	7.28	1.43	3.14	12.59	5.87	1.15	1.82	11.40
Advertisement/Sales (ADVINT)	0.005	0.015	0.00	0.30	0.006	0.015	0.00	0.30	0.005	0.014	0.00	0.16
Marketing/Sales (MARKINT)	0.016	0.023	0.00	0.32	0.017	0.023	0.00	0.32	0.015	0.023	0.00	0.19
Distribution/Sales (DISTRINT)	0.02	0.03	0.00	0.50	0.023	0.035	0.00	0.50	0.01	0.02	0.00	0.14
Research & Development /Sales (R&DINT)	0.0006	0.006	0.00	0.34	0.0005	0.002	0.00	0.05	0.0007	0.01	0.00	0.34
Commercial Paper/Total Assets (COMPAPTA)	0.002	0.01	0.00	0.17	0.002	0.011	0.00	0.14	0.001	0.01	0.00	0.17
Debenture/Total Assets (DEBENTA)	0.05	0.08	0.00	1.29	0.06	0.08	0.00	0.77	0.03	0.08	0.00	1.29
DFIS loan/Total Assets (DFISTA)	0.12	0.14	0.00	1.73	0.12	0.14	0.00	1.73	0.12	0.15	0.00	1.23
Cash Profit/Total Assets (CPROFTA) @	0.06	0.13	-3.52	1.53	0.07	0.11	-1.65	1.53	0.05	0.16	-3.5	0.48
Market to book ratio (MBR)	1.37	19.1	-1294	209.12	1.89	6.16	-142.2	196.5	0.7	28	-1293.8	209.12
ISO Dummy	0.17	0.37	0.00	1	0.22	0.41	0.00	1	0.11	0.31	0.00	1
Investment # (INVEST)	0.10	0.19	-4.61	3.57	0.11	0.19	-1.10	3.57	0.10	0.19	-4.61	1.82

Notes:
#: Investment is the change in gross fixed assets net of revalued reserves over total assets. @: Cash profit = net income + depreciation + some adjustments.

Table 4: Industry Categories of Sample Companies		
Industry Dummy	Industry Type	Number of firms
IND1	Hotel, Banking, insurance and financial services	17
IND2	Manufacture of dairy products, Sugar, tea, coffee, vegetable oils and fats, bakery and food products	40
IND3	Manufacture of Beverages, Breweries, Tobacco and related products	3
IND4	Manufacture of Cotton Textiles	48
IND5	Manufacture of Wool, Silk and Man-Made Fiber Textiles	18
IND6	Manufacture of Jute and Other Vegetable Fiber Textiles (Except Cotton)	2
IND7	Manufacture of Textile Products (Including Wearing Apparel)	2
IND8	Manufacture of Wood and Wood Products, Plywood, Furniture and Fixtures	3
IND9	Manufacture of Paper and Paper Products, Newsprint and Printing, Publishing & Allied	16
IND10	Manufacture of Organic and Inorganic Chemicals and Chemical Products, Fertilizers, Pesticides, Drugs, medicines and allied products, matches, explosives, paints, dyes and pigments, photographic and cinematographic goods	82
IND11	Manufacture of Rubber, Solid rubber tyres, tube, plastic, petroleum and coal Products.	25
IND12	Manufacture of Non-Metallic Mineral Products like cement, mica, stone, glass and glass products, ceramic and refractory etc.	35
IND13	Basic Metal and Alloys Industries: Iron and Steel, Ferro alloys, aluminum, casting of metals, copper, steel tubes, transmission towers etc.	55
IND14	Manufacture of Metal Products and Parts, Except Machinery and Equipment	7
IND15	Manufacture of Machinery and Equipment Other than Transport Equipment: Electronics, electrical and equipments, computers, hydraulics, engineering, insulated wires and cables, fire protection equipments, industrial machinery for food and textile industries etc.	57
IND16	Manufacture of Transport Equipments and Parts: Ships and boats building, railway and tramway equipment, commercial vehicles, passenger cars & jeeps, automobiles ancillaries and transport equipments, two and three wheelers, bicycles, cycle rickshaws, aircrafts, bullock carts etc.	82
IND17	Jewellery and related articles	4
IND18	Power generation and Electricity generation and transmission.	6
IND19	Diversified (Miscellaneous)	27
IND20	Watches and Clocks	1
IND21	Other manufacturing: medical, surgical, scientific and measuring equipment, optical goods, stationary articles, sports and athletic goods etc.	3
Total Number of Firms		533

Table: 5 Effect of Commercial Paper

(1) Real Market Variables	(2) t-1	(3) t	(4) t+1	(5) t-stat for difference between col.3 & col.2	(6) t-stat for difference between col. 4 & col.3
<i>Panel A: Means</i>					
Total Sales					
All firms	7779.07	8567.57	8844.5	7.23***	8.2***
Top50 Business Group	8857.54	9712.327	9992.432	6.94***	8.07***
Non-top50 firms	2258.32	2707.51	2067.97	2.11***	3.71***
Domestic Sales					
All firms	7298.74	8041.69	8288.95	6.89***	7.89***
Top50 Business Group	8301.49	9107.86	9354.85	6.54***	7.75***
Non-top50 firms	2165.58	2583.92	1996.65	2.23***	3.52***
Foreign Sales					
All firms	480.33	525.88	555.55	2.47***	3.24***
Top50 Business Group	556.05	604.47	637.58	2.27***	3.26***
Non-top50 firms	92.74	123.59	71.32	1.09	0.01
R&D intensity					
All firms	0.0012	0.0013	0.0014	0.38	-0.17
Top50 Business Group	0.0009	0.0011	0.0014	1.24	1.21
Non-top50 firms	0.0024	0.0025	0.0011	0.04	-0.79
Advertising Intensity					
All firms	0.0087	0.0101	0.0109	3.97***	2.65***
Top50 Business Group	0.0085	0.01	0.0105	3.88***	2.88***
Non-top50 firms	0.0097	0.011	0.0138	1.16	0.13
Marketing intensity					
All firms	0.0190	0.0202	0.0222	2.29***	2.6***
Top50 Business Group	0.0192	0.0207	0.0226	2.36***	2.61***
Non-top50 firms	0.0177	0.0181	0.0193	0.29	0.38
				z-stat for difference between col.3 & col.2	z-stat for difference between col.3 & col.2
<i>Panel B: Medians</i>					
Total Sales					
All firms	3675.3	4449.5	4840.65	10.61***	10.7***
Top50 Business Group	4704.5	5184.5	5712.7	9.60***	9.98***
Non-top50 firms	1484.5	1604.9	1289.7	4.53***	3.96***
Domestic Sales					
All firms	3456.7	4104.5	4475	10.51***	10.64***
Top50 Business Group	4231.5	4834.4	5268.1	9.51***	9.93***
Non-top50 firms	1445.6	1409.75	1245.8	4.57***	3.94***
Foreign Sales					
All firms	151.5	172.3	196.45	4.21***	5.57***
Top50 Business Group	187.9	199.9	251.6	3.99***	5.43***
Non-top50 firms	12.4	21.6	14.2	1.25	1.18
R&D intensity					
All firms	0.0000	0.0000	0.0000	1.14	1.24
Top50 Business Group	0.0000	0.0000	0.0000	1.31	1.45
Non-top50 firms	0.0000	0.0000	0.0000	-0.19	-0.22
Advertising Intensity					
All firms	0.0036	0.004	0.0037	4.22***	1.81**
Top50 Business Group	0.0037	0.0042	0.004	4.54***	2.23***
Non-top50 firms	0.0022	0.0018	0.0017	-0.02	-0.8
Marketing intensity					
All firms	0.0116	0.0126	0.0140	3.51***	2.45***
Top50 Business Group	0.0116	0.0131	0.01412	3.33***	2.85***
Non-top50 firms	0.0084	0.0074	0.0123	1.17	-0.62

Notes:

This table compares the effectiveness of issuance of commercial paper on real variables. *** denotes significant at 5% or better and ** denotes significant at 5-10%; z-statistic for difference between paired series denotes the outcome of a Wilcoxon signed-rank test for difference in the distributions.

Table: 6 Effect of Debenture

(1) Real Market Variables	(2) t-1	(3) t	(4) t+1	(5) t-stat for difference between col.3 & col.2	(6) t-stat for difference between col.4 & col.3
<i>Panel A: Means</i>					
Total Sales					
All firms	2990.51	3296.14	3509.55	14.35***	14.28***
Top50 Business Group	4039.45	4423.13	4709	13.41***	13.38***
Non-top50 firms	848.31	934.02	984.1	8.16***	7.96***
Domestic Sales					
All firms	2789.87	3067.09	3259.99	14.07***	14.02***
Top50 Business Group	3770.7	4118.8	4378.58	13.17***	13.16***
Non-top50 firms	796.31	875.7	919.63	7.78***	7.6***
Foreign Sales					
All firms	199.97	227.96	248.26	8.56***	8.4***
Top50 Business Group	268.75	304.33	330.42	7.83***	7.7***
Non-top50 firms	61.31	71.08	79.03	4.86***	4.64***
R&D intensity					
All firms	0.0007	0.0007	0.0007	0.25	-0.04
Top50 Business Group	0.0005	0.0005	0.0006	0.72	1.59**
Non-top50 firms	0.0010	0.0010	0.0008	0.08	-0.53
Advertising Intensity					
All firms	0.0054	0.0057	0.0058	2.43***	2.72***
Top50 Business Group	0.0058	0.0061	0.0062	2.71***	2.8***
Non-top50 firms	0.0047	0.0047	0.0050	0.25	0.67
Marketing intensity					
All firms	0.0175	0.018	0.0182	2.94***	2.06***
Top50 Business Group	0.0169	0.0174	0.0176	2.64***	2.18***
Non-top50 firms	0.0185	0.0191	0.0193	1.46**	0.62
				z-stat for difference between col.3 & col.2	z-stat for difference between col.4 & col.3
<i>Panel B: Medians</i>					
Total Sales					
All firms	1225.9	1326.5	1454.35	33.6***	33.1***
Top50 Business Group	1842.25	1978.55	2116.5	29.14***	28.75***
Non-top50 firms	548.5	599.85	652.7	16.2***	15.77***
Domestic Sales					
All firms	1134.5	1227.44	1335.2	32.11***	31.6***
Top50 Business Group	1720.62	1829.35	1970.65	27.89***	27.57***
Non-top50 firms	502.3	541.3	586.25	15.29***	14.8***
Foreign Sales					
All firms	28.3	33.4	40.7	17.01***	16.76***
Top50 Business Group	52.05	60.5	71.58	15.37***	15.14***
Non-top50 firms	8.1	10	11.8	7.25***	7.13***
R&D intensity					
All firms	0.0000	0.0000	0.0000	1.56	1.94**
Top50 Business Group	0.0000	0.0000	0.0000	1.76	1.5
Non-top50 firms	0.0000	0.0000	0.0000	1.11	1.31
Advertising Intensity					
All firms	0.0005	0.0005	0.0005	1.04	0.90
Top50 Business Group	0.0005	0.0006	0.0005	2.33***	1.94**
Non-top50 firms	0.0005	0.0004	0.0004	-1.48	-1.14
Marketing intensity					
All firms	0.0105	0.0107	0.0108	4.83***	3.65***
Top50 Business Group	0.0105	0.0108	0.0109	4.73***	3.9***
Non-top50 firms	0.0102	0.0105	0.0106	1.69**	0.83

Notes:

This table compares the effectiveness of issuance of debenture on real variables. *** denotes significant at 5% or better and ** denotes significant at 5-10%. z-statistic for difference between paired series denotes the outcome of a Wilcoxon signed-rank test for difference in the distributions..

Table:7 Univariate tests for testing the effectiveness of commercial paper on total sales, foreign sales and domestic sales for all firms combined

Panel A		Mean (Paired t-test for difference in average)			
	g_{t+1}^S	g_t^S	Difference in Mean	t-statistics for difference	
DCP _t =1	0.1778185	0.1334793	0.0443393	2.3606***	
DCP _t =0	0.1648201	0.2008741	-0.0360541	-2.5190***	
	g_{t+1}^F	g_t^F			
DCP _t =1	0.7106668	0.6049479	0.105719	0.2753	
DCP _t =0	1.048374	1.925668	-0.87729	-2.5599***	
	g_{t+1}^D	g_t^D			
DCP _t =1	0.1780898	0.1307008	0.0473891	2.4964***	
DCP _t =0	0.2278639	0.2634558	-0.0355919	-0.4227	
Panel B		Median (Wilcoxon signed-rank test for difference in median)			
	g_{t+1}^S	g_t^S	Difference in Median	z-statistics for difference	
DCP _t =1	0.1447381	0.1186368	0.026101	2.497***	
DCP _t =0	0.1356593	0.1371395	-0.00148	-9.955***	
	g_{t+1}^F	g_t^F			
DCP _t =1	0.1847992	0.1070646	0.077735	0.024	
DCP _t =0	0.1608041	0.1710801	-0.01028	-9.307***	
	g_{t+1}^D	g_t^D			
DCP _t =1	0.1432358	0.1197715	0.023464	2.882***	
DCP _t =0	0.1259693	0.1277473	-0.00178	-9.569***	
Panel C		Wilcoxon Rank-sum Test for difference in distribution			
	Group	Cases (N)	Sum of Ranks	Mean Rank	z-statistics for difference
$\Delta^S = g_{t+1}^S - g_t^S$	DCP _t =1	214	663242	3099.262	4.477***
	DCP _t =0	5069	13294444	2622.696	
	Total	5283	13957686	2642	
$\Delta^F = g_{t+1}^F - g_t^F$	DCP _t =1	199	379009.5	1904.57	2.580***
	DCP _t =0	3255	5587775.5	1716.675	
	Total	3454	5966785	1727.5	
$\Delta^D = g_{t+1}^D - g_t^D$	DCP _t =1	214	664313	3104.266	4.561***
	DCP _t =0	5063	13261690	2619.334	
	Total	5277	13926003	2639	

Notes:

(1) ***, **, * denote significance at the 1%, 5%, 10%-level respectively.

(2) g_{t+1}^S denotes Growth of sales in the following year i.e., $(S_{t+1} - S_t)/S_t$; g_t^S denotes growth of sales in the current year i.e., $(S_t - S_{t-1})/S_{t-1}$; Similarly, g_{t+1}^F denotes growth of foreign sales in the following year and g_t^S is the growth of foreign sales in the current year, g_{t+1}^D denotes growth of domestic sales in the following year and g_t^S is the growth of domestic sales in the current year.

(3) DCP_t is a dummy, it takes the value 1 for firms issuing commercial paper in the current period (call it as treatment group) and 0 for firms not issuing commercial paper (call it as control group).

(4) "Δ" denotes the difference in growth rates.

Table: 8 Comparison between Commercial Paper issuing firms with non CP issuing firms				
	CP issuing firms	Non-CP issuing firms	Difference	t statistics for difference
<i>Panel A: Means</i>				
Advertisement/Sales				
All firms	0.010	0.005	0.005	5.32***
Top 50 Business group affiliates	0.01	0.006	0.004	3.87***
Non-top 50 Business group firms	0.01	0.005	0.005	3.03***
Marketing/Sales				
All firms	0.02	0.016	0.004	2.92***
Top 50 Business group affiliates	0.02	0.017	0.003	2.46***
Non-top 50 Business group firms	0.18	0.15	0.03	0.82
Distribution/Sales				
All firms	0.026	0.019	0.007	4.04***
Top 50 Business group affiliates	0.027	0.023	0.004	1.93***
Non-top 50 Business group firms	0.021	0.015	0.006	2.17***
R&D/Sales				
All firms	0.001	0.0006	0.0004	2.14***
Top 50 Business group affiliates	0.001	0.0005	0.0005	3.55***
Non-top 50 Business group firms	0.0025	0.0007	0.0018	1.5**
<i>Panel B: Medians</i>				
Advertisement/Sales				
All firms	0.004	0.0003	0.0037	8.25***
Top 50 Business group affiliates	0.004	0.0004	0.0036	6.99***
Non-top 50 Business group firms	0.002	0.0003	0.0017	2.73***
Marketing/Sales				
All firms	0.013	0.01	0.003	5.01***
Top 50 Business group affiliates	0.013	0.01	0.003	4.2***
Non-top 50 Business group firms	0.007	0.008	-0.001	-0.9
Distribution/Sales				
All firms	0.019	0.011	0.008	6.76***
Top 50 Business group affiliates	0.019	0.012	0.007	4.62***
Non-top 50 Business group firms	0.02	0.008	0.012	3.52***
R&D/Sales				
All firms	0.00	0.00	0.00	12.88***
Top 50 Business group affiliates	0.00	0.00	0.00	9.6***
Non-top 50 Business group firms	0.00	0.00	0.00	5.5***
Notes:				
(1) ***, ** denote significance at the 5% or better, 5-10% level, respectively.				
(2) z-statistic denotes the outcome of a Wilcoxon rank-sum (Mann-Whitney) test of equality of median and distribution between series.				

Table: 9 Comparison between Debenture issuing firms with non Debenture issuing firms

	Debenture issuing firms	Non-Debenture issuing firms	Difference	t statistics for difference
Panel A: Means				
Advertisement/Sales				
All firms	0.006	0.005	0.001	1.38**
Top 50 Business group affiliates	0.006	0.006	0.00	0.99
Non-top 50 Business group firms	0.005	0.005	0.00	0.37
Marketing/Sales				
All firms	0.018	0.014	0.004	7.13***
Top 50 Business group affiliates	0.017	0.016	0.001	1.93***
Non-top 50 Business group firms	0.019	0.013	0.006	7.6***
Distribution/Sales				
All firms	0.022	0.016	0.006	7.65***
Top 50 Business group affiliates	0.025	0.019	0.006	4.47***
Non-top 50 Business group firms	0.015	0.014	0.001	1.44**
R&D/Sales				
All firms	0.001	0.0005	0.0005	1.47**
Top 50 Business group affiliates	0.0005	0.0005	0.00	0.44
Non-top 50 Business group firms	0.001	0.0005	0.0005	1.81***
Panel B: Medians				
Advertisement/Sales				
All firms	0.0005	0.0002	0.0003	4.37***
Top 50 Business group affiliates	0.0006	0.0004	0.002	0.6
Non-top 50 Business group firms	0.0004	0.0002	0.0002	3.8***
Marketing/Sales				
All firms	0.011	0.007	0.004	11.42***
Top 50 Business group affiliates	0.011	0.009	0.002	4.82***
Non-top 50 Business group firms	0.011	0.006	0.005	8.9***
Distribution/Sales				
All firms	0.014	0.008	0.006	11.8***
Top 50 Business group affiliates	0.15	0.009	0.141	8.76***
Non-top 50 Business group firms	0.011	0.007	0.004	4.25***
R&D/Sales				
All firms	0.00	0.00	0.00	12.01***
Top 50 Business group affiliates	0.00	0.00	0.00	6.17***
Non-top 50 Business group firms	0.00	0.00	0.00	7.33***
Notes:				
(1) ***, ** denote significance at the 5% or better, 5-10% level, respectively.				
(2) z-statistic denotes the outcome of a Wilcoxon rank-sum (Mann-Whitney) test of equality of median and distribution between series.				

Table 10: Total Sales (Tobit exercise): Columns (1)-(3) give the results of a Tobit regression in which the dependent variable is additional total sales obtained by a firm in the following year. The dependent variable is left censored at zero. The regressions include 21 industry dummies and 12 yearly dummies. The numbers are the coefficients of the Tobit model. Figures in the parentheses are the t values.

Variables	(1)	(2)	(3)
	All Firms Combined	Top 50&Large Group Firms	Non-Top 50 & Non-Large Group Firms
Intercept	-548.39** (-1.67)	-620.22 -1.01	-215.33** (-1.83)
ISO dummy	595.48*** (9.01)	757.29*** (6.89)	154.99*** (6.02)
R&DINT	359.64 (0.09)	14211.89 (0.94)	-869.07 (-0.81)
ADVINT	5060.28*** (3.33)	7016.15*** (2.69)	450.76 (0.81)
MARKINT	141.36 (0.16)	-765.89 (-0.49)	480.98 (1.49)
DISTRINT	3104.31*** (2.63)	2676.24*** (2.10)	182.01 (0.46)
INVEST	632.66*** (5.51)	843.01*** (4.52)	159.85*** (3.54)
COMPAPTA	5893.75*** (2.66)	7580.84*** (2.21)	1614.22** (1.66)
DEBENTA	1666.43*** (5.78)	2038.76*** (4.34)	771.13*** (6.82)
DFISTA	-22.16 (-0.14)	-224.84 (-0.78)	90.57** (1.69)
CPROFTA	1055.73*** (4.7)	1181.96*** (2.97)	323.6*** (4.21)
DTOP50	267.24*** (5.56)	Dropped	Dropped
DOTHGRP	-110.88 (-1.61)	Dropped	-51.72*** (-3.19)
IND1	-217.07 (-0.66)	-264.21 (-0.41)	238.81*** (2.00)
IND2	-98.52 (-0.31)	148.58 (0.24)	181.69 (1.56)
IND3	-413.88 (-0.99)	-324.06 (-0.43)	21.65 (0.14)
IND4	-183.37 (-0.58)	-5.18 (-0.01)	133.46 (1.16)
IND5	-184.47 (-0.56)	26.52 (0.04)	117.09 (0.96)
IND6	-102.98 (-0.23)	Dropped	167.41 (1.24)
IND7	Dropped	253.31 (0.35)	Dropped
IND8	-196.61 (-0.48)	Dropped	100.66 (0.74)
IND9	-170.72 (-0.51)	77.81 (0.12)	72.09 (0.6)
IND10	-215.85 (-0.69)	14.87 (0.02)	107.82 (0.94)
IND11	-171.7 (-0.53)	38.41 (0.06)	101.81 (0.85)
IND12	-267.52 (-0.83)	-141.53 (-0.23)	131.66 (1.13)

Continued.....

Variables	(1)	(2)	(3)
	All Firms Combined	Top 50&Large Group Firms	Non-Top 50 & Non-Large Group Firms
IND13	-85.96 (-0.27)	137.26 (0.22)	133.78 (1.16)
IND14	-291.11 (-0.82)	-317.32 (-0.45)	110.05 (0.88)
IND15	-282.61 (-0.89)	-110.84 (-0.18)	86.25 (0.74)
IND16	-94.61 (-0.3)	141.37 (0.23)	165.16 (1.43)
IND17	113.13 (0.29)	Dropped	232.23** (1.85)
IND18	737.72*** (2.05)	1046.82 (1.62)	Dropped
IND19	1091.97*** (3.4)	1423.74*** (2.33)	665.76*** (5.4)
IND20	-367.67 (-0.63)	Dropped	Dropped
IND21	-124.83 (-0.31)	-97.71 (-0.13)	174.37 (1.13)
YRD89	244.08*** (2.41)	338.24** (1.87)	Dropped
YRD90	133.22 (1.33)	214.12 (1.21)	-37.31 (-1.2)
YRD91	145.12 (1.44)	255.21 (1.43)	-36.26 (-1.16)
YRD92	101.36 (1.01)	179.91 (1.01)	-44.54 (-1.42)
YRD93	114.14 (1.14)	194.79 (1.1)	-37.65 (-1.2)
YRD94	265.34*** (2.7)	364.42*** (2.11)	40.32 (1.3)
YRD95	433.23*** (4.45)	685.81*** (4.01)	49.51 (1.59)
YRD96	-72.61 (-0.74)	-3.55 (-0.02)	-79.35*** (-2.43)
YRD97	-225.06*** (-2.28)	-256.9 (-1.49)	-103.14*** (-3.09)
YRD98	-333.18*** (-3.34)	-363.24*** (-2.11)	-119.48*** (-3.47)
YRD99	Dropped	Dropped	12.64 (0.37)
YRD2000	Dropped	Dropped	Dropped
Number of Observations	5781	3152	2629
Observation Summary	1340 left-censored & 4441 uncensored observations	640 left-censored & 2512 uncensored observations	700 left-censored & 1929 uncensored observations
Chi-square statistic	720.24	326.76	377.19
Degrees of Freedom	42	37	39
Probability > Chi-square	0.00	0.00	0.00
Pseudo R ²	0.01	0.01	0.01
Notes:			
***: Significant at 5% or better.			
**: Significant at 5-10%			

Table 11: Foreign Sales (Logit exercise): Columns (1)-(3) give the results of a Logit regression in which the dependent variable is a dummy $D_{expslrp}(t+1)$. The dummy takes the value 1 if firm exports as a percentage of its total sales in the following year. The regressions include 21 industry and 12 yearly dummies. The numbers are the coefficients of the Logit model. Figures in the parentheses are the z ratios.

Variables	(1)	(2)	(3)
	All Firms Combined	Top 50&Large Group Firms	Non-Top 50 & Non-Large Group Firms
Intercept	-3.96*** (-8.68)	-2.28*** (-2.02)	-4.52*** (-5.15)
LNASSETS	0.52*** (14.21)	0.47*** (9.21)	0.55*** (9.52)
ISO dummy	0.68*** (5.19)	0.65*** (3.61)	0.85*** (4.02)
R&DINT	77.88*** (3.01)	2049.15*** (4.59)	15.68 (1.06)
ADVINT	11.96*** (3.61)	1.63 (0.49)	25.19*** (4.29)
MARKINT	11.32*** (5.71)	10.07*** (3.51)	17.42*** (5.43)
DISTRINT	3.05*** (2.25)	-1.08 (-0.72)	20.05*** (6.47)
COMPAPTA	13.55** (1.88)	23.62*** (2.18)	-2.69 (-0.28)
DEBENTA	1.38*** (2.25)	2.56*** (2.83)	0.17 (0.20)
DFISTA	-2.38*** (-9.4)	-1.85*** (-5.12)	-2.49*** (-6.62)
CPROFTA	1.69*** (5.2)	0.83** (1.88)	2.72*** (5.47)
DTOP50	0.32*** (3.94)	Dropped	Dropped
DOTHGRP	0.81*** (7.33)	Dropped	0.73*** (6.13)
IND1	-0.78** (-1.84)	-2.21*** (-2.05)	-1.42** (-1.77)
IND2	0.74** (1.77)	-1.32 (-1.23)	0.62 (0.79)
IND3	Dropped	-2.12** (-1.82)	Dropped
IND4	2.19*** (5.2)	0.18 (0.17)	2.34*** (2.99)
IND5	2.54*** (4.76)	-0.25 (-0.23)	2.84*** (3.23)
IND6	Dropped	Dropped	Dropped
IND7	2.38*** (2.14)	Dropped	Dropped
IND8	1.55*** (2.76)	Dropped	0.7 (0.77)
IND9	1.01*** (2.31)	-0.7 (-0.65)	0.45 (0.55)
IND10	1.79*** (4.36)	-0.13 (-0.13)	1.69*** (2.19)
IND11	1.41*** (3.31)	-1.13 (-1.06)	1.94*** (2.39)
IND12	1.09*** (2.56)	-1.16 (-1.09)	1.45** (1.83)

Continued.....

Variables	(1)	(2)	(3)
	All Firms Combined	Top 50&Large Group Firms	Non-Top 50 & Non-Large Group Firms
IND13	1.51*** (3.61)	-0.81 (-0.77)	1.78*** (2.28)
IND14	2.63*** (4.94)	Dropped	2.42*** (2.83)
IND15	1.66*** (4.08)	-0.69 (-0.65)	1.85*** (2.4)
IND16	1.12*** (2.74)	-1.47 (-1.39)	1.71*** (2.19)
IND17	3.94*** (5.38)	Dropped	4.32*** (4.38)
IND18	-5.15*** (-4.7)	-8.18*** (-5.41)	Dropped
IND19	1.87*** (4.09)	0.17 (0.15)	1.36 (1.62)
IND20	Dropped	Dropped	Dropped
IND21	0.25 (0.46)	Dropped	Dropped
YRD89	Dropped	0.97*** (4.03)	0.24 (1.0)
YRD90	0.05 (0.34)	1.02*** (4.26)	0.27 (1.15)
YRD91	0.22 (1.47)	1.26*** (5.19)	0.39 (1.63)
YRD92	0.29** (1.93)	1.25*** (5.05)	0.53*** (2.21)
YRD93	0.37*** (2.38)	1.29*** (5.11)	0.62*** (2.58)
YRD94	0.23 (1.46)	1.04*** (4.12)	0.54*** (2.27)
YRD95	0.12 (0.77)	0.88*** (3.57)	0.49*** (2.08)
YRD96	-0.19 (-1.17)	0.5*** (2.09)	0.24 (1.01)
YRD97	-0.28** (-1.73)	0.21 (0.87)	0.24 (1.02)
YRD98	-0.39*** (-2.41)	0.29 (1.22)	0.03 (0.15)
YRD99	-0.56*** (-3.36)	Dropped	Dropped
YRD2000	Dropped	Dropped	Dropped
Number of Observations	5748	3088	2585
Observation Summary	1507.54	899.01	731.03
Chi-square statistic	40	34	36
Degrees of Freedom	0.00	0.00	0.00
Probability > Chi-square	0.22	0.26	0.21
Pseudo R ²	5748	3088	2585

Notes:
***: Significant at 5% or better.
**: Significant at 5-10%

Table 11a: Foreign Sales (Effect of debenture outstanding since year 1990 in Logit model): Columns (1)-(3) give the results of a Logit regression in which the dependent variable is a dummy $D_{\text{expslrp}}(t+1)$. The dummy takes the value 1 if firm exports as a percentage of its total sales in the following year. The regressions include 21 industry and 12 yearly dummies that have not been reported to conserve space. The numbers are the coefficients of the Logit model. Figures in the parentheses are the z ratios.

Variables	(1)	(2)	(3)
	All Firms Combined	Top 50&Large Group Firms	Non-Top 50 & Non-Large Group Firms
Intercept	-2.43*** (-5.43)	-2.33*** (-2.06)	-3.94*** (-4.46)
LNASSETS	0.42*** (11.44)	0.41*** (7.95)	0.41*** (6.82)
ISO dummy	0.59*** (4.54)	0.63*** (3.47)	0.75*** (3.56)
R&DINT	87.39*** (3.3)	2069.84*** (4.71)	19.92 (1.27)
ADVINT	13.49*** (3.34)	2.45 (0.72)	26.28*** (4.56)
MARKINT	10.31*** (5.23)	8.85*** (3.12)	16.76*** (5.21)
DISTRINT	1.42 (1.09)	-2.48 (-1.68)	19.24*** (6.27)
Dcp	0.62*** (1.98)	0.93*** (2.28)	-0.33 (-0.6)
Ddebout90	0.61*** (7.59)	0.75*** (6.38)	0.49*** (4.19)
CPROFTA	2.06*** (6.5)	1.01*** (2.34)	3.22*** (6.67)
DTOP50	3.13*** (3.86)	Dropped	Dropped
DOTHGRP	0.78*** (7.07)	Dropped	Dropped
DPVT	Dropped	Dropped	-0.72*** (-6.09)
Number of Observations	5748	3088	2585
Chi-square statistic	1460.2	896.16	702.51
Degrees of Freedom	39	33	35
Probability.>Chi-square	0.00	0.00	0.21
Pseudo R ²	0.21	0.26	

Notes:

***: Significant at 5% or better.

**: Significant at 5-10%

Table 12: Foreign Sales (Tobit exercise): Columns (1)-(3) give the results of a Tobit regression in which the dependent variable is the following years export as percentage of firm's total sale :EXPSLRP (t+1). As the dependent variable is the observed only when exports are positive, the dependent variable is left censored at zero. The regressions include 12 yearly dummies that have not been reported to conserve space. The numbers are the coefficients of the Tobit model. Figures in the parentheses are the t values.

Variables	(1)	(2)	(3)
	All Firms Combined	Top 50 & Large Group Firms	Non-Top 50 & Non-Large Group Firms
Intercept	-5.48*** (-6.9)	-3.76*** (-4.77)	-8.09*** (-4.41)
EXPSLRP	0.99*** (146.04)	0.93*** (95.34)	1.01*** (91.94)
LNASSETS	0.52*** (4.75)	0.39*** (3.75)	0.82*** (3.24)
ISO dummy	1.09*** (3.09)	0.97*** (2.76)	1.52*** (1.97)
R&DINT	36.27** (1.91)	103.85*** (2.1)	32.49 (1.31)
ADVINT	-1.29 (-0.15)	-9.91 (-1.15)	14.28 (0.89)
MARKINT	12.02*** (2.45)	14.02*** (2.74)	13.21 (1.39)
DISTRINT	-0.47 (-0.11)	-7.11** (-1.82)	19.73** (1.68)
INVEST	0.51 (0.79)	0.90 (1.39)	-0.70 (-0.53)
COMPAPTA	3.04 (0.25)	2.12 (0.18)	1.45 (0.05)
DEBENTA	4.40*** (2.6)	4.76*** (2.9)	3.07 (0.81)
DFISTA	-2.92*** (-3.27)	-0.95 (-0.98)	-5.003*** (-2.98)
CPROFTA	5.91*** (4.76)	1.76 (1.37)	10.54*** (4.47)
DTOP50	0.25 (0.86)	Dropped	Dropped
DOTHGRP	1.62*** (4.31)	Dropped	1.83*** (3.75)
Number of Observations	5781	3152	2629
Observation Summary	1712 left-censored & 4069 uncensored observations	740 left-censored & 2412 uncensored observations	972 left-censored & 1657 uncensored observations
Chi-square statistic	7737.03	3567.38	3572.29
Degrees of Freedom	24	22	23
Probability > Chi-square	0.00	0.00	0.00
Pseudo R ²	0.2016	0.1754	0.2101
Notes:			
***: Significant at 5% or better.			
**: Significant at 5-10%			

Table 13: Domestic Sales: Columns (1)-(3) give the results of a Tobit regression in which the dependent variable is additional domestic sales obtained by a firm in a particular year. The dependent variable is left censored at zero. The regressions include 21 industry and 12 yearly dummies that have not been reported to conserve space. The numbers are the coefficients of the Tobit model. Figures in the parentheses are the t values.

Variables	(1)	(2)	(3)
	All Firms Combined	Top 50&Large Group Firms	Non-Top 50 & Non-Large Group Firms
Intercept	-671.38 (-1.30)	-634.17 (-1.11)	-308.04*** (-2.52)
ISO dummy	520.88*** (8.42)	679.23*** (6.64)	129*** (5.24)
R&DINT	-141.88 (-0.04)	8258.91 (0.59)	-907.22 (-0.87)
ADVINT	5016.56*** (3.54)	7084.93*** (2.93)	485.58 (0.93)
MARKINT	119.9 (0.14)	-1084.09 (-0.75)	517.99** (1.7)
DISTRINT	2119.01*** (2.84)	2753.09*** (2.33)	9.08 (0.02)
INVEST	594.78*** (5.54)	764*** (4.41)	164.16*** (3.82)
COMPAPTA	6303.92*** (3.06)	8339.98*** (2.62)	1730.94** (1.88)
DEBENTA	1565.16*** (5.81)	1828.72*** (4.19)	790.4*** (7.37)
DFISTA	0.399 (0.001)	-189.14 (-0.71)	85** (1.67)
CPROFTA	894.74*** (4.28)	1125.57*** (3.04)	248.17*** (3.46)
DPVT	-245.40*** (-5.46)	Dropped	63.76*** (4.12)
DOTHGRP	-400.06*** (-6.61)	Dropped	Dropped
Number of Observations	5781	3152	2629
Observation Summary	1439 left-censored & 4342 uncensored observations	676 left-censored & 2476 uncensored observations	763 left-censored & 1866 uncensored observations
Chi-square statistic	733.22	331.79	380.62
Degrees of Freedom	42	37	39
Probability.>Chi-square	0.00	0.00	0.00
Pseudo R ²	0.01	0.01	0.01

Notes:
***: Significant at 5% or better.
**: Significant at 5-10%

Table:14 Effect of DFIs									
(Units are in Rupees Million)									
Real Market Variables		t-2	t-1	t	t+1	t+2	t+3	t+4	t+5
Panel A: Means									
Total Sales	All Firms	2055.04	2233.05*** (16.6)	2426.8*** (15.05)	2582.36*** (15.08)	2743.15*** (14.20)	2916.35*** (13.47)	3093*** (12.42)	3280.89*** (11.48)
	Top 50	3105.28	3370.8*** (15.11)	3665.84*** (13.63)	3903.6*** (13.67)	4149.39*** (12.95)	4412.58*** (12.31)	4679.72*** (11.33)	4963.28*** (10.51)
	Non-top 50	608.24	655.12*** (12.56)	708.22*** (11.04)	752.63*** (10.99)	794.24*** (9.83)	838.70*** (9.14)	883.59*** (8.53)	932.42*** (7.64)
Domestic Sales	All Firms	1921.81	2085.9*** (15.87)	2263.45*** (14.82)	2404.94*** (14.88)	2551.72*** (14.0)	2711.92*** (13.3)	2877.07*** (12.26)	3052.55*** (11.37)
	Top 50	2903.86	3148.23*** (14.51)	3417.26*** (13.51)	3634.35*** (13.56)	3857.84*** (12.83)	4099.94*** (12.23)	4345.57*** (11.26)	4605.83*** (10.48)
	Non-top 50	560.44	601.78*** (11.32)	649.1*** (10.28)	688.43*** (10.31)	725.33*** (9.11)	765.07*** (8.41)	807.27*** (7.95)	852.17*** (7.05)
Foreign Sales	All Firms	139.06	154.26*** (11.02)	172.31*** (9.47)	185.62*** (9.26)	200.94*** (8.86)	216.97*** (8.47)	233.28*** (7.78)	250.44*** (7.03)
	Top 50	202.59	223.72*** (9.55)	249.74*** (8.18)	269.25*** (8.05)	291.55*** (7.66)	314.45*** (7.29)	338.44*** (6.75)	362.63*** (6.01)
	Non-top 50	51.54	57.93*** (7.02)	64.92*** (6.87)	69.80*** (6.5)	75.35*** (6.35)	81.61*** (6.2)	86.86*** (5.48)	93.71*** (5.36)
R&D expense	All Firms	1.35	1.55** (1.61)	1.76** (1.5)	1.88 (1.24)	2.13** (1.47)	2.37** (1.52)	2.61** (1.35)	2.90 (1.25)
	Top 50	2.08	2.4** (1.53)	2.77** (1.44)	2.92 (1.13)	3.30** (1.37)	3.68** (1.44)	4.04 (1.25)	4.46 (1.75)
	Non-top 50	0.345	0.362 (0.50)	0.376 (0.46)	0.44 (0.68)	0.496 (0.70)	0.551 (0.57)	0.627 (0.62)	0.718 (0.50)
Marketing expense	All Firms	29.87	32.94*** (12.41)	36.59*** (11.93)	39.21*** (11.68)	42.24*** (11.10)	45.37*** (10.33)	48.86*** (9.97)	52.78*** (9.32)
	Top 50	44.95	44.64*** (11.49)	55.29*** (11.0)	59.20*** (10.79)	63.89*** (10.24)	68.69*** (9.60)	74.18*** (9.34)	80.14*** (8.70)
	Non-top 50	9.1	9.78*** (5.97)	10.65*** (6.4)	11.51*** (6.1)	12.23*** (5.71)	12.98*** (5.16)	13.60*** (4.69)	14.58*** (4.39)
Panel B: Medians									
Total Sales	All Firms	726.75	769.8*** (38.64)	833*** (38.87)	903.7*** (38.7)	969.4*** (35.46)	1051.6*** (32.35)	1143*** (28.73)	1206.85*** (25.6)
	Top 50	1345	1453.25*** (31.2)	1533.5*** (31.5)	1670.65*** (31.44)	1806.2*** (29.2)	1897.75*** (26.74)	1993.25*** (23.86)	2106.9*** (21.52)
	Non-top 50	374.7	394.1*** (22.19)	412.4*** (22.14)	453.1*** (21.90)	490.1*** (11.50)	523.8*** (17.77)	556.2*** (15.66)	590.7*** (13.59)
Domestic Sales	All Firms	672.4	713.9*** (36.76)	754*** (36.73)	820.3*** (36.67)	876.1*** (33.43)	939.1*** (30.43)	1006.9*** (27.0)	1071.65*** (24.0)
	Top 50	1217.7	1348.8*** (30.13)	1434.25*** (30.17)	1552.75*** (30.14)	1680*** (27.86)	1781*** (25.56)	1857.7*** (22.73)	1942.75*** (20.50)
	Non-top 50	334.7	350.72*** (20.2)	372.7*** (20.18)	401.3*** (20.10)	422.1*** (17.74)	447.85*** (15.95)	477.95*** (14.13)	502.6*** (12.18)
Foreign Sales	All Firms	10.85	12.5*** (19.31)	14.1*** (19.28)	17.5*** (18.77)	20.5*** (17.03)	24.7*** (16.15)	27.5*** (13.57)	31*** (11.19)
	Top 50	28.3	31.5*** (15.92)	35.4*** (16.26)	43.9*** (15.95)	52*** (14.77)	59.05*** (13.58)	65.85*** (11.63)	70.8*** (9.59)
	Non-top 50	2.7	3.1*** (10.86)	3.5*** (10.32)	4.8*** (9.9)	5.8*** (8.5)	7.1*** (8.75)	8.0*** (7.06)	8.8*** (5.8)
R&D expense	All Firms	0.00	0.00*** (4.62)	0.00*** (3.63)	0.00*** (3.88)	0.00*** (3.98)	0.00*** (3.77)	0.00*** (2.86)	0.00*** (1.31)
	Top 50	0.00	0.00*** (3.76)	0.00*** (3.01)	0.00*** (3.11)	0.00*** (3.2)	0.00*** (3.32)	0.00*** (2.19)	0.00*** (0.97)
	Non-top 50	0.00	0.00*** (2.75)	0.00*** (2.05)	0.00*** (2.34)	0.00*** (2.03)	0.00*** (1.79)	0.00*** (1.92)	0.00*** (0.97)
Marketing expense	All Firms	6.7	7.2*** (24.8)	7.9*** (25.11)	8.5*** (24.41)	9.3*** (22.63)	10.3*** (20.4)	11.3*** (18.26)	12.1*** (15.95)
	Top 50	13.5	14.7*** (21.22)	15.84*** (21.27)	17.3*** (20.92)	19.3*** (19.33)	21.1*** (17.73)	22.85*** (15.92)	24.7*** (13.96)
	Non-top 50	2.72	2.9*** (12.67)	3.2*** (13.19)	3.5*** (12.42)	3.9*** (11.65)	4.3*** (10)	4.5*** (8.97)	4.8*** (7.71)
Notes: Sign rank tests the equality of matched pairs of observations using the Wilcoxon matched-pairs signed-ranks test. The null hypothesis is that both distributions are the same. In panel A, t values are in the parentheses and in panel B; z-values are in the parentheses.									

Table: 15 DFIs loan and Product Market Performance: Long-term effects-Panel Tobit regressions. The dependent variable is firm annual sales growth at time t , given by $(Sales_t - Sales_{t-1})/Sales_{t-1}$. The dependent variable is left censored at zero. LNASSETS is the contemporaneous natural logarithm of total assets. INVEST is Investment which is the growth in fixed assets minus revalued reserves over total assets at $t-1$. CPROFTA is Profitability, which is the cash profit over assets at $t-1$. DFISTA is the loan from Development Financial Institutions over assets, and is measured either at $t-2$ or $t-3$. DTOP50, DOTHGRP & DPVT are the dummies of top 50 business groups, other business groups and private standalone firms. The sample period is 1989-2000. The regressions include 21 industry dummies and 12 year dummies (not reported). The numbers are the coefficients of the Tobit model. Figures inside brackets are the t values. Outlier cutoff DFISTA > 0 at 10 percentile.

Dep. Var.: Sales Growth	All Firms		Top50 Business Group		Non-top 50 business group	
	2-Year Lagged DFISTA	3-Year Lagged DFISTA	2-Year Lagged DFISTA	3-Year Lagged DFISTA	2-Year Lagged DFISTA	3-Year Lagged DFISTA
Intercept	-0.18 (-0.72)	-0.07 (-0.26)	-0.14 (-0.74)	-0.19 (-0.82)	-0.10 (-0.18)	-0.70 (-0.88)
LNASSETS	0.03*** (3.29)	0.04*** (3.27)	0.02*** (3.18)	0.02*** (3.07)	0.05** (1.90)	0.06** (1.95)
INVEST	0.51*** (8.68)	0.54*** (8.24)	0.54*** (13.38)	0.55*** (12.62)	0.39*** (2.72)	0.45*** (2.69)
CPROFTA	-0.11 (-0.95)	-0.06 (-0.46)	-0.12 (-1.30)	-0.08 (-0.76)	0.04 (0.17)	0.12 (0.48)
DFISTA	0.37*** (4.76)	0.22*** (2.57)	0.30*** (5.28)	0.15*** (2.45)	0.47*** (2.74)	0.32** (1.70)
DTOP50	-0.05 (-1.33)	-0.05 (-1.25)	Dropped	Dropped	Dropped	Dropped
DPVT	-0.06 (-1.6)	-0.05 (-1.25)	Dropped	Dropped	-0.06 (-1.19)	-0.06 (-0.97)
Observations	4241	3793	2473	2216	1768	1577
Observation Summary	958 left censored & 3283 uncensored observations	909 left censored & 2884 uncensored observations	496 left censored & 1977 uncensored observations	496 left censored & 1977 uncensored observations	474 left censored & 1742 uncensored observations	435 left censored & 1142 uncensored observations
LR Chi ² statistic	294.91	261.9	408.37	363.3	100.09	89.29
d.f	35	34	30	29	32	31
Prob.>Chi ²	0.00	0.00	0.00	0.00	0.00	0.00
Pseudo R ²	0.04	0.04	0.15	0.14	0.02	0.02

Notes:

***: Significant at 5% or better.

**: Significant at 5-10%.

Table 16: Effect of export share on Debenture Issue. Columns (1)-(3) give the results of Tobit regression in which the dependent variable is debenture issued in the current period over total assets (DEBENTA). EXPSLRPHAT (t+1) is the predicted values of export share in the following year obtained from the first step regressions reported in table 9. The dependent variable is left censored at zero. The numbers are the coefficients of the tobit model. Figures in the parentheses are the t values. Outlier cut off: $0 < \text{MBR} < 13.16$ at 99%.

	(1)	(2)	(3)
Variables	Overall	Top 50 & Large-Group	Non-top 50 Group
Intercept	-0.19*** (-17.57)	-0.16*** (-10.97)	-0.25*** (-10.54)
LNSALES	0.03*** (23.34)	0.03*** (15.12)	0.04*** (12.21)
EXPSLRPHAT (t+1)	-0.001*** (-5.52)	0.001*** (2.46)	-0.001*** (-6.49)
MBR	0.0006 (0.7)	0.001 (0.99)	-0.0003 (-0.19)
WAGSAL	-0.6*** (-2.17)	0.006 (0.16)	-0.16*** (-3.53)
Number of Observations	4012	2354	1659
Observation Summary	1449 left-censored & 2563 uncensored observations	618 left-censored & 1736 uncensored observations	832 left-censored & 827 uncensored observations
LR Chi-square statistic	634.85	262.09	218.06
Degrees of Freedom	4	4	4
Probability > Chi-square	0.00	0.00	0.00
Pseudo R ²	0.35	0.14	0.18
Notes:			
***: Significant at 5% or better.			
**: Significant at 5-10%.			

Table 17: Effect of export share on issuance of commercial paper. Columns (1)-(3) give the results of Tobit regression in which the dependent variable is commercial paper issued in the current period over total assets (COMPAPTA). EXPSLRPHAT (t+1) is the predicted values of export share in the following year obtained from the first step regressions reported in table 9. The dependent variable is left censored at zero. The numbers are the coefficients of the tobit model. Figures in the parentheses are the t values. Outlier cut off: $0 < \text{MBR} < 13.16$ at 99%

	(1)	(2)	(3)
Variables	Overall	Top 50 & Large-Group	Non-top 50 Group
Intercept	-0.42*** (-12.6)	-0.36*** (10.75)	-0.83*** (-5.09)
LNSALES	0.03*** (10.97)	0.03*** (9.03)	0.08*** (4.55)
EXPSLRPHAT (t+1)	-0.0001 (-0.31)	0.0002 (0.59)	-0.0005 (-0.71)
MBR	0.01*** (4.52)	0.004*** (3.7)	0.01*** (3.0)
WAGSAL	0.10** (1.89)	0.11** (1.91)	0.08 (0.57)
Number of Observations	4013	2354	1659
Observation Summary	3810 left-censored & 203 uncensored observations	2180 left-censored & 174 uncensored observations	1630 left-censored & 29 uncensored observations
LR Chi-square statistic	267.93	153.38	55.43
Degrees of Freedom	4	4	4
Probability>Chi-square	0.00	0.00	0.00
Pseudo R ²	0.38	0.36	0.31
Notes:			
***: Significant at 5% or better.			
**: Significant at 5-10%.			

Table 18: Effect of export share on DFIs loan. Columns (1)-(3) give the results of Tobit regression in which the dependent variable is DFI loans over total assets (DFISTA) in the current year. EXPSLRPHAT (t+1) is the predicted values of export share in the following year obtained from the first step regressions reported in table 9. The dependent variable is left censored at zero. The numbers are the coefficients of the tobit model. Figures in the parentheses are the t values. Outlier cut off: $0 < \text{MBR} < 13.16$ at 99%

	(1)	(2)	(3)
Variables	Overall	Top 50 & Large-Group	Non-top 50 Group
Intercept	0.16*** (13.42)	0.19*** (11.2)	0.11*** (4.15)
LNSALES	-0.004*** (-2.22)	-0.01*** (-3.09)	0.005 (1.18)
EXPSLRPHAT (t+1)	-0.001*** (5.7)	-0.0003 (-1.13)	-0.001*** (-5.55)
MBR	-0.0001 (-0.15)	-0.001 (-0.99)	0.002 (1.21)
WAGSAL	-0.46*** (-13.87)	-0.50*** (-11.10)	-0.43*** (-8.6)
Number of Observations	4013	2354	1659
Observation Summary	669 left-censored at DFITA ≤ 0 & 3344 uncensored observations	312 left-censored at DFITA ≤ 0 & 2042 uncensored observations	357 left-censored at DFITA ≤ 0 & 827 uncensored observations
LR Chi-square statistic	212.71	126.64	98.01
Degrees of Freedom	4	4	4
Probability > Chi-square	0.00	0.00	0.00
Pseudo R ²	0.1	0.06	0.15
Notes: ***: Significant at 5% or better. **: Significant at 5-10%.			

Chapter 5: The Effect of Capital Structure on Firm's Product Market Performance: Empirical Evidence from the Indian Manufacturing Firms

5.1. Introduction and Hypotheses

Until late 1980s, the corporate finance literature has ignored the interaction between capital structure and firm's product market decisions. The lack of interest in these output-related decisions is due to the "irrelevance proposition" of finance theory. This proposition, known as the Modigliani-Miller (1958) theorem, postulates that the choice of a firm's capital structure (i.e., its financing decision of holding debt or equity) is irrelevant for its value. In many circumstances where the product market is imperfectly competitive and firms have some market power the irrelevance would be broken and financial structure and output market decisions would be interrelated. Current research in corporate finance has begun pointing to a direct interrelation between the financial and real decisions of firms. That interrelation comes from the role of financial instruments in conveying information to investors as well as the product market rivals and consumers. This literature stresses that a firm's mode of financing influences both the firm's conduct in the product market as well as the conduct of other market participants, thereby influencing competitive outcomes. Harris and Raviv (1991) make this point and discuss recent theoretical work which models product market and capital structure interactions. Ravid (1988) also surveys the literature on the interaction between capital structure and product market decisions. Both of these surveys identify two types of interaction: the effect on firm's product market strategy and the effect on a firm's product choice. Titman (1984) and Maksimovic and Titman (1991) show how capital structure can affect a firm's choice of product quality and the viability of its product's warranties. Thus, capital structure can alter a firm's ability to compete in the product market. Recent empirical evidence on how financing decisions affect product market competition among firms has further stimulated interest in the area.

In theory there are two schools of thought in examining the interaction between firm product market strategy and its financing choice. One believes that firm's debt issue

can lead to stiffer competition in the product market by raising its output in a strategic way. Brander and Lewis (1986 and 1988) and Maksimovic (1988) in their pioneering work analyze how debt financing commits a firm to a more aggressive output stance in the product market. Rotemberg and Scharfstein (1990), and Bolton and Scharfstein (1990) also predict that increased debt will lead to increased output at the firm level and at the industry level and thereby make the competition stiffer.

The seminal paper of Brander and Lewis's (AER, 1986) is the most important one to explore the linkage between capital structure and competition in the product market. This paper shows that issuing risky debt induces firms to be more aggressive in the product market than they would otherwise be, and this aggressive behavior may confer a strategic advantage on the firm in the product market. This effect of risky debt can be thought of as a special form of asset substitution effect (in the asset substitution effect the firm also adopts an aggressive investment behavior). As in Brander Lewis (1986), the strategic effect of debt arises primarily due to the adverse incentives of limited liability of the shareholders.¹ Shareholders, being residual claimants, are unconcerned about firm value in those states of nature where profits do not exceed the face value of debt (which means bankruptcy situation or insolvency situation). As a consequence, they prefer to undertake riskier projects. When the demand for a firm's output is stochastic, producing a level of output that is larger than the one that maximizes firm value is equivalent to investing in a riskier project. The anticipated increase in output encourages supplier entry, lowers the firm's input sourcing costs, and enhances the firm's sourcing efficiency.

Another line of argument, put forth by Telser (1966) and extended by Bolton and Scharfstein (1990) suggests that too much dependence on outside financing hinders a firm's ability to compete, prompting industry rivals to pursue predatory market strategies. Chavelier and Scharfstein (1996) propose that externally financed firms invest less in

¹ The debt instruments carry with them fixed rules and covenants that usually monitor the lending process. The repayment schedule of the principal loan amount and the interest payments are stipulated in the contract, with debt holders having primary claim over the firm's cash flows from the assets. The firm is often required to meet liquidity tests to ensure that the lender's investment is not jeopardized. Equity owners, on the other hand, have a residual claimant status over the cash flow from asset earnings and asset liquidation. That is, they obtain the cash flows that are left after paying off more senior claims such as debt. However, debt holders are limited in their ability to interfere with firm operations so long as the contractual stipulations are satisfied. That is, they have much lesser ability to control managerial actions in the ensuring that assets are utilized efficiently. They can step in only when a firm defaults on its repayments or gets bankrupt.

market share building during recessions, raising price cost margins to boost short-term profits at the expense of locked-in customers. The other more recent papers by Showalter (1995), Dasgupta and Titman (1998) and Grimaud (2000) have shown that debt leads to weaker competition in the output market by helping the firms to collude and increase its price while cutting output.

The small empirical literature investigating the links between capital structure and product market decisions contains the following papers: Showalter (1999) studies the strategic use of debt in US manufacturing industries. Based on his own theoretical work (1995) and that of Brander and Lewis (1986), he regresses debt ratios of manufacturing firms on variables approximating demand and cost uncertainty as well as a set -of control variables. He finds significant relationships between the uncertainty measures and firms leverage, and can support the hypothesis of strategic use of debt.

Chevalier (1995) considers the supermarket industry in the US during the late 1980s. In an event study analysis she finds the announcement of a leveraged buyout within the industry to increase the expected profit of rivals. However, leveraged buyouts encourage local entry and expansion by rivals. Her results suggest higher leverage to soften product market competition. These findings contrast with the qualitative results found in the theoretical literature following Brander and Lewis (1986).

Opler and Titman (1994) find that during industry downturns highly levered firms are most vulnerable. They find that firms with higher levels of debt lose more sales and market share than their more conservatively financed competitors. Thus, these empirical results seem to be at odds with the predictions of the theoretical models.

Philips (1995) also provides evidence that financial leverage interacts with product market competition. In his intra-industry analysis about US markets, he tests whether industry output is affected by changes in firms' capital structure. He finds a change in the firms' market share following an increase in financial leverage. Depending on certain industry characteristics, however, this effect goes in opposite directions. This study shows the importance of including industry specific characteristics both on the supply and demand side to understand the firms' capital structure decisions.

Hellmann and Puri (1999) investigate the relationship between the type of capital that new firms choose to finance their projects and their product market strategies and the

corresponding market outcomes. Their work is based on a unique data set of 173 start-up companies in the Californian Silicon Valley. They find firms pursuing innovator strategies being more likely to use venture capital financing. Also, they are much faster in bringing new products on the market than imitator firms.

Gertner, Gibbons and Scharfstein (1988) consider a two audience signaling with signaling to capital and products markets. There is an informed firm, who first issues debt and then competes with its product market rival, who does not know the level of demand. The choice of the debt level by the informed party may not only reveal information to the capital market but also to its uninformed rival, who adjusts his behavior depending on the transactions it observes between the informed firm and the capital market. By doing so, the uninformed firm affects the profits of the informed firm. The character of the capital market equilibrium is thus determined by the structure of the product market.

As one can see that the relevant empirical works focusing on capital structure and product market interactions are limited to US firms operating in various industries in various cities of USA. The informational problem is much more severe for a developing country firms (like Indian firms) competing in the product market. Financially healthy firms can use their deeper pockets to prey on rivals and eventually can gain some market share (Benoit, 1984; Fudenberg and Tirole, 1986; Poitevin, 1989a; Bolton and Scharfstein, 1990) or firms can strategically design their capital structure to deter potential entrants (McAndrews and Nakamura, 1992; Fulghieri and Nagarajan, 1996; Stenbacka, 1994; Showalter, 1999). It would be interesting to empirically examine whether firms gain any strategic advantage through issuance of debt.

The small empirical literature on interactions between firm financing and product market performance generally seeks to determine whether debt financing either hurts or boosts competitive performance. Short-term and long-term debt contracts involve trade-offs for entrepreneurs. Short-term debt comes with lower interest charges attached. However, an entrepreneur generally must produce positive results within a year or two. If these results don't materialize, the entrepreneur may default on the loan and there may be shift in control to the investors. In this case, short-term debt is a powerful disciplining device for good firms, because it gives control back to the investor. Therefore, short-term forces an entrepreneur to abandon his or her dream if the business is realistically doomed

to failure. It's a way of committing the entrepreneur to a realistic viewpoint. Thus short term leverage provides firm an incentive to perform better in the product market. In contrast, long-term debt gives the entrepreneur more time to make his or her company successful and pay back the debt, with the trade-off being higher interest payments. Therefore, firms taking long term debt take time to build up its infrastructure, R&D, marketing channels and distribution networks to gain strategic advantage over the longer period of time.

Our work proposes that debt financing must have positive influence on firm's competitive performance in the product market. To motivate this claim, we empirically examine the relationship between short term and long term corporate debt and sales performance (export as well as total sales) using Indian firm level data from a panel of 533 firms over 12 years. However, study of competitive performance following capital structure changes may suffer from potential endogeneity problem which first needs to be taken care of. Another concern is there may be unobserved factors arising from the market environment which may jointly influence both a firm's financial structure and its competitive performance. One way to mitigate concerns about the endogenous nature of the relation between capital structure and product market performance is to look at the real market performance changes following the changes in financial decisions. Accordingly, we perform some univariate parametric and non parametric tests to examine the consequences of taking both short term and long term debt on various real market variables like export, total sales, advertising intensity, marketing intensity, R&D intensity, distribution intensity. These univariate tests will tell us how firms (if they are actually) can use its short term and long term loans to gain strategic advantage in the product market. Next, in our multivariate analysis of product market impact of long term debt, we use lag structures to mitigate the simultaneity problems. The unobserved firm specific factors which may disturb the error structure (within firm autocorrelation) are being corrected in our panel Tobit model by incorporating 21 industry dummies and 3 group dummies. The yearly changes are also being captured by taking 12 yearly dummies. Similarly, in studying the statistical significance of interactions between firms's short term debt financing and export performance we apply a two step GMM estimation method to take care of the possible endogeneity of short term leverage.

The remainder of this chapter is organized as follows. In section 5.2, we briefly discuss the corporate financing pattern in India during the post reform period. Here, we also talk about developments in the Indian financial market which provides a background of our study. Section 5.3 discusses the data, summary statistics and variable construction methods. In section 5.4, we look at the trends in financing pattern of our sample firms over the period 1989-2000. Section 5.5 contains the methodology of different econometric tests and the main empirical results of the chapter. Using univariate parametric and non parametric tests and multivariate panel Tobit and GMM regressions, we have made an attempt to find empirical evidence of the effects of capital structure on product markets with particular reference to Indian corporate sector. In section 5.6, we discuss the major findings of our empirical tests and conclude.

5.2. Indian Financial Sector: Some Relevant Issues

5.2.1. The Corporate Financing Pattern in India

India has historically followed a financial intermediary based system, where banks and financial intermediaries played a dominant role. The corporate financing pattern in India indicates that, on average, internal sources constitute about one-third of total sources of funds, while external sources account for the rest. As far as RBI report on trend and progress of Banking in India 2001-02 is concerned, the share of borrowings in total sources (all sources of finance from the capital market) has moved inversely with equity financing in the post reform period (1991). The main sources of long-term debt are development finance by the all-India and state financial institutions (DFIs), who lend mainly for investment in priority sector, and debentures (cumulative and non cumulative), which is a capital market instrument.

Short-term financing, mainly for working capital purposes, is usually provided by the commercial banks as a mix of cash credit and bills discounting facilities. Commercial paper came into existence following RBI notification in 1990 as a new short term debt instrument. CPs usually has a maturity of 90 days. CPs can also be issued for maturity periods of 180 and one year but the most active market is for 90 day CPs.

5.2.2. Key Developments in the Indian Financial Market

During the early nineties, the Indian financial sector was undergoing important changes. The banking sector reforms, with the publication of the Narasimham Committee Report, aimed at increasing the profitability and efficiency of then 27 public sector banks. Entry deregulation was accompanied by progressive deregulation of interest rates on deposits and advances, reduction of reserve requirements and removal of credit allocation. Strengthening financial systems has been one of the central issues because sound financial systems drive competitive efficiency in the real sectors of the economy. Thus, the principal objective of financial sector reform was to improve mobilization of financial savings, putting them to productive use and transforming various risks and accelerate the growth process of the real sector by removing structural deficiencies affecting the performance of financial institutions and financial markets.

From October 1994, interest rates were deregulated in a phased manner and by October 1997, banks were allowed to set interest rates on all term deposits of maturity of more than 30 days and on all advances exceeding Rs. 200,000. Three major credit rating agencies had been set up by the early nineties.² The Security and Exchange Board of India (SEBI) was given the regulatory powers in 1992 to shape the financial markets and a new stock exchange was set up in 1994 (the National Stock Exchange). With this background, we will examine whether, under post reform period, both the short term and long term debt can contribute to promote corporate performance in the product market.

5.3 Research Design

5.3.1. Proxies for Product Market Performance

In examining the link between firm's product market performance and capital structure, previous empirical research has often linked price-setting behavior with some aspect of debt financing to reflect how a firm's financial status affects its competitive behavior (see, e.g., Chavelier, 1995; Phillips, 1995; and Chavelier and Scharfstein, 1996,

² They are Credit Rating Information Services of India Limited (CRISIL), Investment Information and Credit Rating Agency of India (ICRA), and Credit Analysis & Research Limited (CARE)

Campello, 2002). However, firms can implement a number of alternative policies that significantly affect product market outcomes but that may not be reflected in how they choose to price their products. Examples of such policies are decisions about fixed investments, research and development expenditures, advertising, promotion and distribution activities. One way to build a practical measure of performance that summarizes information from the combined effects of pricing and other product market strategies is look at the firm's total sales growth in general. Similarly, in the foreign market, a more practical measure would be to look at the changes in its export share as proportion of its total sales. We use a firm's total sales growth at the current period to gauge its performance in the product market in general and export intensity to sales to determine its performance in the export market.

5.3.2. Proxies for Capital Structure

Capital structure is defined by short term leverage and long term leverage. Short term leverage is the ratio of short term debt to total assets. Long term leverage is the ratio of long term debt tot total assets. Total debt is total borrowings of firms. In Prowess, total borrowings include all forms of debt-interest bearing or otherwise. All secured and unsecured debt is included under borrowings. Thus, borrowings include debt from banks (both short term and long term) and financial institutions, inter-corporate loans, fixed deposits from public and directors, foreign loans, loan from government, etc. Funds rose from the capital market through the issue of debt instruments such as debentures (both convertible and non-convertible) and commercial paper are also included here.

We define short term debt as the loans of short maturity of less than one year. Accordingly we took short term bank borrowings since they have a maturity of less than a year. We have also added commercial paper which is a relatively new type of debt instrument through which corporates source their short-term fund requirements. The current portion of long term debt is also included in generating the short term debt variable. This is the amount of long term debt due for repayment within twelve months. It measures the funds needed for repayment of debt in the near future.

Long term debts are those loans having maturity of more than one year. We subtract short term debt from total debt to derive long term debt. In appendix A, we discuss in detail about the construction of these financial variables.

5.3.3. Control Variables

The profitability and investment can be determinants of sales growth and export growth and may be correlated with leverage. Therefore, one should control for profitability in any empirical model designed to measure the effect of debt on sales or export growth. Similarly, leverage coefficients may be biased if the model fails to control for investment spending, which might have been financed with debt. Throughout this chapter, firm profitability (proxied by cash profit over total assets), investment (proxied by growth in fixed assets net of revalued reserves over assets), and size (proxied by natural log of total assets) are used as controls in regressions of sales growth or export growth on both short term and long term leverage.

5.3.4. Data Description, Variable Construction and Summary Statistics

The data are retrieved from PROWESS database provided by the Centre for Monitoring the Indian Economy (CMIE). Firms, which were dropped, include firms without the basic data from 1989 to 2000 and without any industry category. Further, we dropped many firms with zero wages and salaries but with positive sales. This procedure resulted in a sample of 533 firms, which is the basis for the empirical analysis of the chapter 4. However, after close scrutiny, we discovered that few companies' names have been changed (roughly 16 firms over the period 1989-2000 and that match our criteria) and they are already in the Prowess data set. For example, "Gramophone India Ltd." is being renamed as "Saregama India Ltd." and Prowess reports the financial figures of the company. These firms have been incorporated in our sample. However, among those 533 firms, few company figures on borrowing structure are not available for some years. Since we want to work with a balanced sample, those companies are being dropped from our sample. All these corrections resulted in a final sample of 538 firms. This final

sample includes 242 independent and small group firms and 296 top 50 and large business group-affiliated firms.

Table 1 displays the comparison between top 50 and large business houses with their private standalone counter parts. The top and large business group firms on average are bigger in size (in terms of total sales and total assets) in comparison to smaller group and private stand alone firms. Both the parametric univariate t-test and non parametric rank sum test confirm that the difference in size is significant. There is also significant difference in average sales growth distribution between two categories of firms.

From Table 1, we can also see that there are some remarkable differences in the composition of corporate debt in capital structure between group affiliations and stand-alone firms. The top group firms on average are more dependent on long term loan compared to the smaller group firms. On the other hand, smaller group and private firms have more leverage towards short term loans. The average profitability and investment are higher for top group compared to private group firms.

From Table 2, we see that the most remarkable difference between the top group and stand alone firms is the much higher coefficient of variation of export intensity and growth of sales for smaller group and private stand alone firms. Therefore, we need to control for group affiliation in assessing firm's performance.

Table 3 gives a correlation matrix of the main variables for the different groups of firms. For both the top group and non top group firms, short term leverage is positively related to export sales ratio. Similarly, long term leverage is positively related to growth of sales. This is the first indication that firms' capital structure is related to real market performance. The profitability is inversely related with both short term and long term leverage implying that firms with good growth prospects will exhaust their internal sources of funds before soliciting outside financing. However, in all the cases the correlation coefficients between independent variables are not high enough which may cause multicollinearity when we take them together as regressors. In every regression, we have checked the correlations among independent variables along with instruments and the tests reject the presence of multicollinearity problem.

In Table 4, our sample firms have been classified under 21 industry categories according to their business activities. Here, we have harmonized CMIE industry

categories with NIC 2 digit industry category for industry classification. The table also displays the number of firms under each industry category. Later we control for industry effects in assessing the role of long term debt on firm performance.

5.3.5. Trends in Financing during the Period 1989-2000

In Tables 5 and 6, we record certain trends in corporate financing over the sample period. In Table 5, we look at the long term financing trends between the periods 1989 to 1995 and then 1995 to 2000. From Table 5, we see that for our sample firms, bank debt and debentures were almost as significant as DFI loans as of 1989. However, the large difference in the figures for the first and second columns for debenture suggest that debenture issue was dominated by some of the largest firms, a pattern that had not changed even in 1995 and in 2000. This is also confirmed by columns 3, 4 & 5 that gives idea about the distribution of firms. By 1995, bank debt as a source of long term finance had diminished drastically in importance. However, it slightly recovered until 2000 but still much lower than 1989 level. In contrast, DFI lending and debentures have played a more important role during this period. DFI lending grew rapidly by 1995, and then slowed down slightly by 2000. Debenture sharply increased all over. Bank debt recovered after 1995. These two are responsible for offsetting the slight decrease in DFI borrowing.

From Table 6, it is clear that short term bank borrowing constitute the major source of short term debt requirement of firms in all the years 1991, 1995 and till the year 2000. However, there is growing demand for commercial paper in the later years mainly by the large firms. There is also growing importance of funds needed for repayment of debt in the near future (reflected by the ratio of current portion of long term debt over total short term debt).

5.4. The Econometric Models and Results

5.4.1. Effect of Short-Term Debt on Export Performance:

First, we want to address the question as to how short-term debt affects export performance. For this, we analyze the effect of short term leverage on firm performance

in the foreign market, controlling for the other firm characteristics of exporting firms. In order to make a statement on the short-term leverage position of the firm we need to take into account all the sources of short-term loan available to the firm. We define short term leverage as the ratio of short term debt over total assets. Short term debt includes bank borrowings plus commercial papers plus current portion of long term debt. Also leverage is endogenously determined by the firm at a point in time. Possibility of expanding to the export market in the future may cause the firm to increase short-term leverage to ease capacity constraints, build distribution networks, increase marketing efforts, or promote their product through increased advertising. Thus, in order to answer how short-term leverage affects export performance, the possible endogeneity of leverage should be taken into account.

To test whether short term debt affects firm's export performance, we estimate the following equation:

$$\begin{aligned} EXPSLRP_{it} = & \gamma_0 + \gamma_1 EXPSLRP_{it-1} + \gamma_2 FSIZE + \gamma_3 NRFATA_{it} + \gamma_4 CPROFTA_{it} \\ & + \gamma_5 SHORTLEV_{it} + \gamma_6 T + \alpha_i^* + u_{it} \end{aligned} \quad (1)$$

where *EXPSLRP* is the percentage of total sales exported by firm *i* at time *t*, *NRFATA* is the gross fixed assets net of revalued reserves over total assets, *CPROFTA* is profitability, *SHORTLEV* is short term debt over total assets and *T* a time trend to controls for timely changes. Lags of export are included to control for firm specific characteristics that may contribute to performance over time.

To test whether export performance parameters are significantly different between top 50 and large business group firms and smaller group or private standalone firms, we introduce two dummy variables, *DTOP50* and *DPVT*. *DTIP50* dummy is equal to 1 when the firm is owned by top 50 and large business groups. Similarly *DPVT* is equal to 1 if firm either does not belong to any business group or it belongs to smaller group. We derive different sets of results for the two types of firms. We also derive results for all firms taken together and there we compare the effects of *DTOP50* and *DPVT* with respect to firms belonging to other business houses represented by another dummy *DOTHGRP*. Taking first differences of equation (1) eliminates the α_i^* , which were the source of the bias in the OLS estimator.

This gives:

$$\begin{aligned} \Delta EXPSLRP_{it} = & \gamma_1 \Delta EXPSLRP_{it-1} + \gamma_2 \Delta FSIZE_{it} + \gamma_3 \Delta NRFATA_{it} + \gamma_4 \Delta CPROFTA_{it} \\ & + \gamma_5 \Delta SHORTLEV_{it} + \Delta u_{it} \quad i = 1, \dots, N \quad t = 1, \dots, \end{aligned} \quad (2)$$

Arellano and Bond (1991) argue that a more efficient estimator results from the use of additional instruments whose validity is based on orthogonality between lagged values of the dependent variable y_{it} and the errors u_{it} . The first two observations are lost to lags and differencing. The first differences of the exogenous variables will serve as its own instruments in estimating the first differenced equations. Now we have to instrument for $\Delta EXPSLRP_{it-1} = (EXPSLRP_{it-1} - EXPSLRP_{it-2})$, which is clearly correlated with the error $\Delta u_{it} = (u_{it} - u_{it-1})$. Assuming that u_{it} are not autocorrelated, for each i at $t=3$, $EXPSLRP_{i1}$ acts as valid instrument for $\Delta EXPSLRP_{it-1}$. Similarly, at $t=4$, $EXPSLRP_{i1}, EXPSLRP_{i2}$ are valid instruments. Continuing in this fashion, we obtain an instrument matrix with one row for each time period that we are instrumenting.

The basic instrument set used in our results in Table 7 is of the form:

$$Z_i = \begin{pmatrix} Y_{i1} & 0 & 0 & 0 \dots & 0 \dots \dots 0 \dots & \Delta x_{i3} \\ 0 & Y_{i1} & Y_{i2} & 0 & 0 \dots \dots 0 \dots & \Delta x_{i4} \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ 0 & 0 & 0 & 0 \dots \dots \dots Y_{i1} \dots \dots Y_{i10} \dots & \Delta x_{i12} \end{pmatrix} \begin{matrix} 1991 \\ 1992 \\ 1993 \\ \vdots \\ 2000 \end{matrix}$$

Here, Y represents the dependent and X represents the independent variables.

Short term leverage changes are likely to reflect changes in expectations about future product market outcomes. Note that as we see from the descriptive statistics that top 50 and large business group firms are typically bigger than stand-alone or smaller group firms. One may argue that these differences between the two sub-samples drive our

results. In order to correct for this possibility, we introduce the variable *F*SIZE as additional control variable.³ The variable *F*SIZE is the natural log of total assets.

OLS estimates or even panel tobit estimates are biased and inconsistent due to endogeneity problems. Therefore, we estimate our models using an instrumental variable approach. The instrumental variable estimation technique controls for the fact that the explanatory variables are likely to be correlated with the error term and the firm-specific effect, and deals with possible endogeneity problems. Equation (2) is therefore estimated with the system of generalized methods of moments (GMM⁴) estimators as proposed by Arellano and Bond (1991)⁵. For details about the technique we refer to the appendix B.

The Arellano and Bond two step GMM results as reported in Table 7 shows GMM estimates of equation 2 (based on first difference). Export in the current period significantly related to the previous year's changes. We clearly see that export responds positively to current rise in firm's short term leverage. This is true for all firms taken together (column 2) as well as for two sub groups (column 3 & column 4). The control variables are firm size, profitability and investment. If current profit rises, the smaller group or standalone firm's export decreases. This may be due to the fact that if profit rises, firms are more willing to sale in the domestic market instead of the risky foreign market.⁶ However, rise in investment boosts export. For top groups, we find change in profit or investment does not significantly influence export. If the firm gets bigger it experiences increase in foreign sales. Thus size matters for export.

³ Controls have also been carried out by interacting all variables with size and industry dummies. Results are in general robust. However, when all potential interactions are introduced, the number of coefficients increases remarkably and the interpretation becomes harder. Moreover, we are not interested in the effect of size on export as we are more interested to see the effect of group affiliation. For this reason, these results are not reported.

⁴ GMM is a robust estimator in that, unlike maximum likelihood estimation, it does not require information of the exact distribution of the disturbances. In fact, many common estimators in econometrics can be considered as special cases of GMM. The theoretical relation that the parameters should satisfy is usually orthogonality conditions between some (possibly nonlinear) function of the parameters $f(\theta)$ and z , set of instrumental variables. The GMM estimator selects parameter estimates so that the sample correlations between the instruments and the function f are as close to zero as possible

⁵ Arellano and Bond (1991) developed a Generalized Method of Moments estimator that treats the model as a system of equations, one for each time period. The equations differ only in their instrument/moment condition sets. The predetermined and endogenous variables in first differences are instrumented with suitable lags of their own levels. Strictly exogenous regressors, as well as any other instruments, can enter the instrument matrix in the conventional instrumental variables fashion: in first differences, with one column per instrument.

⁶ In a separate regression, we observed that increase in profitability positively affects the firm's growth in domestic sales.

5.4.2. Effect of Long-Term Debt on Firm Performance:

The pooled cross-sectional-time series Tobit regressions we estimate below resemble those of Opler and Titman (1994) and Campello (2002). We test the significance of lagged values of Long term leverage (LT_LEVERAGE) to examine the effect of long term debt on firm's growth of sales in the current year. They have the following general form:

$$\begin{aligned}
 Sales\ Growth_{i,t} = & \beta_0 + \beta_1 LNSALES_{i,t} + \beta_2 INVEST_{i,t-1} + \beta_3 CPROFTA_{i,t-1} \\
 & + \beta_4 LT_LEVERAGE_{i,t-2(or,t-7)} + \sum_{j=1}^{21} \gamma_j (IndustryDummies)_j \\
 & + \sum_{t=1}^{12} \mu_t (YearDummies)_t + \sum_{k=1}^3 \lambda_k (GrouDummies) + \varepsilon_{i,t}
 \end{aligned}
 \tag{3}$$

The lagged structure used in the above equation is meant to mitigate simultaneity problems. As far as the error structure is concerned, the Maximum Likelihood Estimation of panel Tobit assume that $\varepsilon_{i,t}$ is uncorrelated with $\varepsilon_{i,t'}$ and $\sigma_{i,t'} = 0$, when $t \neq t'$; where t and t' are indexes for time periods when observations of the same firm are collected. Similarly, we assume $\varepsilon_{i,t}$ is uncorrelated with $\varepsilon_{j,t}$ $\forall i \neq j$ at same t .

However, one may articulate the argument for unobserved or unmodeled firm specific variable which may actually influence the dependent variable and thus capable of introducing a simultaneity bias in our empirical specification. It is a very difficult case to argue since there is no such endogeneity test in a panel structure (keeping in mind the Hausman two step estimation method of endogeneity test). In such case, we control these unobserved factors by taking 3 business group dummies, 12 yearly dummies and 21 industry dummies. We assume that firms within each business group category and industry category have common characteristics but their behavior varies across groups and industries and also across various years. Accordingly, we include 21 industry dummies and 12 yearly dummies to control firm specific fixed effects.

It is obvious that we should drop 1 dummy each from 12 year dummies and 21 industry dummies and 3 group dummies to avoid dummy trap which will arise due to the

multicollinearity problem. Here long term leverage changes are likely to reflect the cumulative effect of past decisions.

Six regression outputs from equation 3 reported in Table 8. We can make following inferences from the results of Table 8. First, firms that invested more in the previous year seem to do better in the product market next year. This is supported by the positive and significant estimated coefficient of INVEST in all six cases. Second, firms that were more profitable in the previous year tend to observe lower sales growth. This is reflected by negative and significant estimated coefficient of CPROFTA for all firms combined and for top 50 business group category.

More importantly, the results show that for both 2 period and 7 period lag values of long term leverage (LT_LEV), there exists a remarkably consistent pattern in the way capital structure influences firm performance in the product market sales for all firms taken together. The results indicate that an increase in the use of long term debt financing significantly boosts sales growth mainly for the top 50 and large business group affiliated firms after 2 years or 7 years of taking the loan. Thus long term debt can commit the firm to compete in the product market and may in fact activate the firm to take aggressive output stance. At the same time, however, long term leverage is inconsequential to performance for smaller group and private standalone firms.

5.4.3. Parametric and Non Parametric Univariate Results:

We look at the results of univariate parametric and non parametric tests on real market variables. In Table 9, we see the effects of short term debt on export sales ratio, advertisement, marketing, R&D and distribution intensities. We compare the average values between before and after the short term loan has been taken. The parametric t-test shows (in panel A of Table 9) that mainly top group firms on average spend more on advertising, and research and development subsequent to taking short term debt in order to gain strategic advantage in the product market. Both the top group and private stand alone firms' average distribution intensity is higher after the loan has been taken compared to the previous of loan. Firms also export more following short term debt in comparison to the previous year of the loan.

In panel B of Table 9, we report the results of Wilcoxon signed rank tests to find the importance of short term capital structure to firm export and other strategic real market variables. Wilcoxon signed-rank nonparametric tests are conducted to evaluate the significance of changes in these measures. Observations are separated into situations before and after the loan have been taken. The null hypothesis is that the before and after short term debt are from populations with the same distributions and the same medians. Wilcoxon tests generally indicate that the before and after short term debt for these firms are not drawn from the same distribution. We see that firm export, expenditure on advertising, marketing, distribution and research & development increase with short term debt taking. Thus, we find relationship between short term debt and firm behavior in the real market. This relationship is evident for both types of firms.

Similarly, in establishing the importance of long term debt financing on the real economy, our objective is to identify its impact on various product market strategies (e.g., advertising, marketing, distribution, R&D etc.) which the firms might implement given their own as well as their rivals' choice of financing instruments. Accordingly, we look at the long term impact of debt financing on these real market variables through univariate parametric and non parametric tests. We present a time series table of R&D expense, advertising, marketing and distribution expenses for all firms that took long term debt from the current year (t) till 7 years ($t+7$) after the loan was taken. The univariate results are displayed in Table 10. The results from Panel A and Panel B confirm that both the top group and private standalone firms, taking long term debt on average (both mean and median), increase advertising expenses, marketing efforts, build distribution networks and improve R&D infrastructure over time. All of these may help the firm to expand market share in the product market in the long run.

5.5. Concluding Discussions

The strategic use of debt models shows that, under imperfect competition, firms may have strategic incentives to take debt. Financially healthy firms could use their deeper pockets or may strategically spend on building its distribution networks, increase marketing efforts and advertising for product promotion to prey on its rival or to deter potential entrants. Our results suggest that the strategic consideration in the output market

induce higher debt to gain strategic advantage and thus establishes a link between debt and firm competition in the product market. We distinguish between short term debt and long term debt in examining their impact on firm's product market outcomes. We compare the top group affiliated firms with their smaller group or unaffiliated counterparts. We find that short term debt induces the firms to do well in export. We also discover that short term debt influences firm's R&D, advertising, marketing, and distribution strategies. In case of long term debt, firms take time to build its infrastructure through increased marketing and promotions, R&D which have long term impact on their product market performance. Considering a longer time horizon, we find that long term debt boost total sales growth for top 50 and large businesses group affiliated firms. However, for the unaffiliated firms, it is inconsequential on total growth of sales. Thus, debt can shape industry competition. Consequently, we find empirical evidence about the existence of a linkage between firm's choice of capital structural and its product market performance.

Based on our empirical findings, we propose that development in the debt market could be an important determinant for corporate performance. In this context, credit rating agencies have an important role to play in the debt markets. Central banks should be more responsible for maintaining financial stability and integrity of financial market. The recently initiated major legal reforms in the financial sector relating to securities laws, frauds in banks, regulatory framework, asset securitization, and payment systems may facilitate the development of debt markets and benefit the borrowing firms. Banking development is also necessary to improve access of funds for both the top group and private standalone firms.

Appendix A

Variable Description:

Financial variables:

Total Debt=Short Term Debt+ Long Term Debt.

Short term Debt= Short term bank borrowing +Commercial paper + Current portion of long term loans.

Long term Debt=long term borrowing=Total debt-short term bank borrowing-commercial paper-current portion of long term debt.

LT_LEV refers to long term leverage. Long term leverage=Long term borrowing/Total Assets.

SHORT_LEV refers to short term leverage. **Short term leverage**= Short term debt/Total Assets.

Real Market Variables:

GRSALES refers to growth rate of sales in the current period.

LN SALES refers to the logarithm of sales. This variable reflects the unobserved factors that are related to the size of the company.

LNASSETS is natural log of total assets.

EXPINT refers to the export intensity of firms in percentage. It captures the effect of exposure to international competition.

Advertising intensity is measured as the ratio of advertisement expenditure to total sales. It captures the effect of intangible assets.

Distribution intensity is the distribution expenditure over total sales.

Marketing intensity is proportion of total sales that the firm spends on marketing expenditure.

R&D intensity measure what proportion of total sales firms spend on research and development.

CPROFTA is firm's profitability and measured by dividing firm's cash profit by its total assets. Cash profit is derived by adding the non cash charges such as depreciation and amortization to the profit after tax.

INVEST is how much a firm invests in a period. It is measured as change in gross fixed assets net of revalued reserves over total assets.

IND_i is an industry dummy for the i th industry. It takes a value of 1 for companies belonging to the i^{th} industry and 0 otherwise. The numbers of firms in various industry categories are presented in Table 4.

Appendix B: Details of the System GMM Estimation Method

Arellano and Bond (1991) derived a generalized method of moments estimator for estimating the coefficients using lagged level of the dependent variable and differences of the strictly exogenous variables. In STATA7, `xtabond` implements this estimator known as the Arellano-Bond dynamic panel estimator. In all estimators we control for time effects by adding time dummies for 1989-2000. In constructing lags and taking first differences, two cross-sections are lost. Therefore, the estimation period is 1991-2000. In order to avoid dummy trap, one year dummy in every three cases are being dropped and other years are being compared. These time dummies are used as additional instruments.

The reliability of the GMM estimation procedure depends very much on the validity of instruments. We consider the validity of the instruments by presenting a Sargan test. The Sargan test is a test on overidentifying restrictions. It is asymptotically distributed as χ^2 and tests the null hypothesis of validity of the (overidentifying) instruments. P-values report the probability of incorrectly rejecting the null hypothesis, so that a P value above 0.05 implies that the probability of incorrectly rejecting the null is above 0.05. In this case, a higher P-value makes it more likely that the instruments are valid.

The consistency of the estimates also depends on the absence of serial correlation in the error terms. This will be the case if the differenced residuals display significant negative first order serial correlation and non second order serial correlation. We present tests for first-order and second order serial correlation related to the estimated residuals in first differences. The test statistics are asymptotically distributed as standard normal variables. The null hypothesis here relates to “insignificance” so that a low P-value for the test on first-order serial correlation and a high P-value for the test on the second-order serial correlations suggests that the disturbances are not serially correlated. The serial correlation tests (AR1 and AR2 in the table) refer to the two-step estimates.

We also present Wald tests. These test statistics are also asymptotically distributed as χ^2 variables. The Wald test tests joint significance of all, or a subset of parameters. The null hypothesis refers to “insignificance”, implying that low P-values suggest joint significance. This can be termed as goodness of fit test for our model.

Table 1: Descriptive Statistics: Average Comparison Between Top 50 Business Group vs. Non top 50 and Private Standalone Firms				
	Units in Rs. Million, others in numbers			
	All firms	Top 50 Business Group firms	Non-top 50 Business Group firms	t statistics for Difference
Panel A: Mean Difference				
Export Sales Ratio (in %)	7.3	6.52	8.26	-4.7***
Annual Sales Growth at time <i>t</i>	0.19	0.19	0.19	0.07
SHORTLEV ^a	0.15	0.13	0.17	-12.42***
LT_LEV ^b	0.26	0.28	0.24	7.92***
INVEST \$	0.1	0.11	0.95	3.21***
PROFITABILITY@	0.06	0.07	0.05	5.73***
LNASSETS#	6.65	7.28	5.88	42.49***
LNSALES#	6.64	7.24	5.88	42.17***
				Wilcoxon z-statistics for difference in distribution^c
Panel B: Median Difference				
Export Sales Ratio (in %)	1.53	2.06	0.78	8.67***
Annual Sales Growth at time <i>t</i>	0.135	0.14	0.13	2.34***
SHORTLEV ^a	0.126	0.114	0.147	-11.2***
LT_LEV ^b	0.23	0.24	0.2	9.27***
INVEST \$	0.06	0.07	0.05	8.27***
PROFITABILITY@	0.07	0.07	0.06	5.7***
LNASSETS#	6.59	7.24	5.81	38.63***
LNSALES#	6.59	7.27	5.93	33.9***
Notes:				
z-statistic denotes the outcome of a Wilcoxon rank-sum (Mann-Whitney) test of equality of distribution between series.				
a Short term leverage measures the short term debt of a company as a fraction of its total assets. Short term debt consists of short term bank borrowing + commercial paper loan + current portion of long term debt.				
b Long term leverage measures a firm's indebtedness towards long term debt as proportion of its total assets. Long term debt is total borrowing - short term debt.				
S Annual Investment as proportion of Assets: change in gross fixed assets (one period lag) net of revalued reserves over total assets.				
@ Annual Profitability: Cash Profit/Total Assets. Cash profit is measured as net profit + depreciation + amortization.				
# LNSALES is natural log of total sales; LNASSETS is natural log of total assets. We have taken either of them as proxy for firm size (FSIZE). Total Assets include fixed assets, investments, and current assets.				
c The observations are separated into top 50 business and large business group affiliated and their non top 50 group counter parts. The Wilcoxon Rank-sum test is a nonparametric test. The null hypothesis is that variables in both groups are from populations with the same distribution and the same medians.				
***, ** denote significance at the 5% or better, 5-10%-level, respectively.				

Table 2: Sample Descriptive Statistics					
Units in Rs. Million, others in numbers					
	Mean	Std dev.	CV ^a	Min	Max
All Firms					
EXPSLRP	7.3	14.76	2.02	0	100
GRSALES	0.2	0.79	3.95	-1	30.53
SHORTLEV	0.15	0.14	0.93	0	2.02
LT_LEV	0.26	0.22	0.85	-0.89	3.57
INVEST	0.1	0.19	1.9	-4.61	3.57
PROFITABILITY	0.06	0.11	1.83	-2.51	1.53
LNASSETS	6.65	1.48	0.22	1.82	12.59
LNSALES	6.64	1.44	0.22	0	12.22
Top 50 & Large Business Group					
EXPSLRP	6.52	10.78	1.65	0	100
GRSALES	0.19	0.54	2.84	-1	15.71
SHORTLEV	0.13	0.11	0.85	0	1.71
LT_LEV	0.28	0.24	0.86	-0.51	3.57
INVEST	0.11	0.19	1.73	-1.1	3.57
PROFITABILITY	0.07	0.11	1.57	-1.65	1.53
LNASSETS	7.28	1.43	0.2	3.14	12.59
LNSALES	7.24	1.36	0.19	0	12.22
Non Top 50 & Private Standalone Firms					
EXPSLRP	8.26	18.49	2.24	0	100
GRSALES	0.19	1.01	5.32	-1	30.53
SHORTLEV	0.17	0.16	0.94	0	2.02
LT_LEV	0.24	0.2	0.83	-0.89	2.14
INVEST	0.09	0.19	2.11	-4.61	1.82
PROFITABILITY	0.05	0.12	2.4	-2.51	0.52
LNASSETS	5.88	1.15	0.2	1.82	11.4
LNSALES	5.89	1.17	0.2	0	10.28
Notes:					
a CV is coefficient of variation=Std dev./Mean					

Table 3: Correlation Matrix							
All firms							
	EXPSLRP	GRSALES	LNASSETS	INVEST	PROF	SHORTLEV	LT LEV
EXPSLRP	1.00						
GRSALES	0.02	1.00					
LNASSETS	0.07	-0.02	1.00				
INVEST	-0.03	0.06	-0.01	1.00			
PROF	0.04	0.13	0.03	0.28	1.00		
SHORTLEV	0.1	-0.05	-0.15	-0.14	-0.33	1.00	
LT LEV	-0.1	0.06	0.016	0.06	-0.07	-0.18	1.00
Top50 & Large Business Group firms							
	EXPSLRP	GRSALES	LNASSETS	INVEST	PROF	SHORTLEV	LT LEV
EXPSLRP	1.00						
GRSALES	-0.01	1.00					
LNASSETS	0.11	-0.03	1.00				
INVEST	-0.03	0.05	-0.05	1.00			
PROF	-0.01	0.18	-0.02	0.2	1.00		
SHORTLEV	0.11	-0.04	-0.08	-0.1	-0.24	1.00	
LT LEV	-0.1	0.08	-0.04	0.03	-0.02	-0.16	1.00
Non-top50 & Private standalone firms							
	EXPSLRP	GRSALES	LNASSETS	INVEST	PROF	SHORTLEV	LT LEV
EXPSLRP	1.00						
GRSALES	0.03	1.00					
LNASSETS	0.13	-0.01	1.00				
INVEST	-0.03	0.08	-0.03	1.00			
PROF	0.08	0.11	0.01	0.36	1.00		
SHORTLEV	0.09	-0.06	-0.11	-0.16	-0.39	1.00	
LT LEV	-0.1	0.06	-0.02	0.11	-0.14	-0.19	1.00

Industry Dummy	Industry Type	Number of firms
IND1	Hotel, Banking, insurance and financial services	16
IND2	Manufacture of dairy products, Sugar, tea, coffee, vegetable oils and fats, bakery and food products	39
IND3	Manufacture of Beverages, Breweries, Tobacco and related products	3
IND4	Manufacture of Cotton Textiles	46
IND5	Manufacture of Wool, Silk and Man-Made Fiber Textiles	18
IND6	Manufacture of Jute and Other Vegetable Fiber Textiles (Except Cotton)	2
IND7	Manufacture of Textile Products (Including Wearing Apparel)	2
IND8	Manufacture of Wood and Wood Products, Plywood, Furniture and Fixtures	3
IND9	Manufacture of Paper and Paper Products, Newsprint and Printing, Publishing & Allied	17
IND10	Manufacture of Organic and Inorganic Chemicals and Chemical Products, Fertilizers, Pesticides, Drugs, medicines and allied products, matches, explosives, paints, dyes and pigments, photographic and cinematographic goods	89
IND11	Manufacture of Rubber, Solid rubber tyres, tube, plastic, petroleum and coal Products.	26
IND12	Manufacture of Non-Metallic Mineral Products like cement, mica, stone, glass and glass products, ceramic and refractory etc.	36
IND13	Basic Metal and Alloys Industries: Iron and Steel, Ferro alloys, aluminum, casting of metals, copper, steel tubes, transmission towers etc.	52
IND14	Manufacture of Metal Products and Parts, Except Machinery and Equipment	7
IND15	Manufacture of Machinery and Equipment Other than Transport Equipment: Electronics, electrical and equipments, computers, hydraulics, engineering, insulated wires and cables, fire protection equipments, industrial machinery for food and textile industries etc.	61
IND16	Manufacture of Transport Equipments and Parts: Ships and boats building, railway and tramway equipment, commercial vehicles, passenger cars & jeeps, automobiles ancillaries and transport equipments, two and three wheelers, bicycles, cycle rickshaws, aircrafts, bullock carts etc.	81
IND17	Jewellery and related articles	3
IND18	Power generation and Electricity generation and transmission.	6
IND19	Diversified (Miscellaneous)	27
IND20	Watches and Clocks	1
IND21	Other manufacturing: medical, surgical, scientific and measuring equipment, optical goods, stationary articles, sports and athletic goods etc.	3
Total Number of Firms		538

Table 5: Relative importance of different sources long term debt in 1989, 1995 and 2000. The numbers in the first column are the ratios of sum (over all sample firms) of a particular type of debt, to the sum (over all sample firms) of long-term debt. The numbers in the next four columns are sample means and quartile values (N=538)

	(1)	(2)	(3)	(4)	(5)
	$\sum_i (Num) / \sum_i (Denom)$	Sample mean	1 st Quartile	Median	3 rd Quartile
Year=1989					
DFI/LTD	0.31	0.31	0.01	0.2	0.54
LTBNKD/LTD	0.21	0.25	0	0.17	0.43
DEBEN/LTD	0.23	0.13	0	0.00	0.2
Year=1995					
DFI/LTD	0.35	0.47	0.1	0.43	0.7
LTBNKD/LTD	0.1	0.1	0	0.00	0.1
DEBEN/LTD	0.34	0.2	0	0.1	0.34
Year=2000					
DFI/LTD	0.31	0.42	0	0.34	0.63
LTBNKD/LTD	0.14	0.17	0	0.01	0.22
DEBEN/LTD	0.32	0.21	0	0.02	0.29
Notes:					
DFI is loan from Development Financial Institutions. LTBNKD is Long term bank debt. DEBEN is debenture. LTD is total long term debt.					

Table 6: Relative importance of different sources short term debt in 1991, 1995 and 2000. The numbers in the first column are the ratios of sum (over all sample firms) of a particular type of debt, to the sum (over all sample firms) of short term debt. The numbers in the next four columns are sample means and quartile values (N=538)

	(1)	(2)	(3)	(4)	(5)
	$\sum_i (Num) / \sum_i (Denom)$	Sample mean	1 st Quartile	Median	3 rd Quartile
Year=1991					
STBNKBOR/STD	0.9	0.92	0.93	1	1
CP/STD	0.01	0.003	0	0	0
CURLTD/STD	0.09	0.08	0	0	0.06
Year=1995					
STBNKBOR/STD	0.85	0.87	0.83	1	1
CP/STD	0.02	0.01	0	0	0
CURLTD/STD	0.13	0.12	0	0	0.16
Year=2000					
STBNKBOR/STD	0.7	0.82	0.73	0.99	1
CP/STD	0.07	0.03	0	0	0
CURLTD/STD	0.23	0.15	0	0	0.22
Notes:					
STBNKBOR is Short Term Bank Borrowing. CP is Commercial Paper Borrowing. CURLTD is current portion of long term debt. STD is total short term debt.					
Though CP/STD have "0" value at 3 rd Quartile, they are positive at 99 percentile indicating the presence of extreme values.					

Table 7			
Export Equations			
GMM estimates (all variables in first differences)			
Dependent variable: EXP_{SLRP}_{it}		Sample Period: 1991-2000	
Independent Variables	All firms combined	Top50 & Large Business Group	Smaller Group & Private Standalone
(γ_1) EXP_{SLRP}_{it-1}	0.39*** (19.19)	0.5*** (37.27)	0.22*** (15.41)
(γ_2) $FSIZE_{it}$	0.78*** (2.23)	0.61*** (2.41)	1.36*** (3.86)
(γ_3) $NRFATA_{it}$	1.34 (0.89)	-0.65 (-0.95)	2.46*** (2.06)
(γ_4) $CPROFTA_{it}$	-2.72 (-1.44)	0.14 (0.2)	-5.26*** (-3.05)
(γ_5) $SHORTLEV_{it}$	2.42*** (2.33)	2.53*** (2.52)	2.19*** (2.33)
No. of Observations	5339	2953	2386
No. of Firms	538	296	242
AR1	0.0001	0.0006	0.0168
AR2	0.1865	0.5730	0.1081
Sargan Test	0.39	0.13	0.1
Wald Test	500.14 (15)	1665.5 (15)	656.93 (14)
Notes:			
z values are in the parentheses. Time dummies and group dummies are included but not reported.			
GMM results are two step estimates with one period lag of the dependent variable.			
AR1 and AR2 are tests for the GMM estimators, the P-values reported refer to the two-step GMM estimators.			
Sargan is a test of the overidentifying restrictions for the GMM estimators, the P-values are only reported and number of instruments is in the brackets.			
FSIZE is proxied by natural log of total assets.			
***: Significant at 5% or better; **: Significant at 5-10%.			

Table 8: Capital Structure and Product Market Performance: The Effect of Long Term Leverage on Firm's Growth of Sales: Panel Tobit regressions. The dependent variable is firm annual sales growth at time t , given by $(Sales_{i,t} - Sales_{i,t-1}) / Sales_{i,t-1}$. The dependent variable is left censored at zero. LSALES is the contemporaneous natural logarithm of total assets. INVEST is Investment which is the growth in fixed assets minus revalued reserves over total assets at $t-1$. CPROFTA is Profitability, which is the cash profit over assets at $t-1$. LT_LEV is the long term debt over total assets, and is measured either at $t-2$ or $t-7$. The sample period is 1989-2000. The regressions include 21 industry and 12 year dummies and DTOP50, DOTHGRP & DPVT three group affiliation dummies (not reported). The numbers are the coefficients of the Tobit model. Figures inside brackets are the t values.

Dep. Var.: Sales Growth at t	All Firms		Top50 Business Group		Non-top 50 business group	
	2-Year Lagged LT LEV	7-Year Lagged LT LEV	2-Year Lagged LT LEV	7-Year Lagged LT_LEV	2-Year Lagged LT LEV	7-Year Lagged LT LEV
Intercept	-0.44 (-1.56)	-1.04 (-1.02)	-0.55*** (-2.96)	-0.72*** (-2.71)	-0.54 (-1.41)	-1.21 (-0.78)
LNSALES	0.07*** (6.43)	0.11*** (5.12)	0.05*** (5.79)	0.07*** (4.28)	0.09*** (3.99)	0.17*** (3.41)
INVEST	0.92*** (13.11)	1.84*** (10.76)	0.89*** (15.97)	1.68*** (13.67)	0.95*** (5.91)	2.02*** (4.86)
CPROFTA	-0.29*** (-2.16)	-0.2 (-0.8)	-0.27*** (-2.46)	-0.13 (-0.69)	-0.26 (-0.92)	-0.21 (-0.37)
LT_LEV	0.34*** (5.88)	0.38*** (3.1)	0.39*** (8.55)	0.46*** (4.7)	0.25** (1.81)	0.26 (0.97)
Observations	5347	2662	2955	1475	2392	1187
Observation Summary	1314 left censored & 4033 uncensored observations	889 left censored & 1773 uncensored observations	643 left censored & 2312 uncensored observations	437 left censored & 1038 uncensored observations	642 left censored & 1690 uncensored observations	452 left censored & 735 uncensored observations
LR Chi ² statistic	391.47	247.64	455.54	308.89	133.02	81.86
d.f	36	34	31	26	33	31
Prob.>Chi ²	0.00	0.00	0.00	0.00	0.00	0.00
Pseudo R ²	0.03	0.04	0.1	0.1	0.02	0.02
Notes:						
***: Significant at 5% or better.						
**: Significant at 5-10%.						

Table 9: Univariate Tests: Effect of Short Term Debt on Product Market Variables. Year t is the year of the issuance of Short Term Debt and this is taken as the control period.

(1) Real Market Variables	(2) t-1	(3) t	(4) t+1	(5) t-stat for difference between before vs. after (col.2 & col.4)
<i>Panel A: Means</i>				
Export Sales Ratio (%)				
All firms	7.23	7.64	7.93	8.7***
Top50 Business Group	6.45	6.79	6.99	6.32***
Non-top50 firms	8.21	8.71	9.11	6.05***
R&D Intensity				
All firms	0.0005	0.0006	0.0006	1.87***
Top50 Business Group	0.0005	0.0006	0.0006	2.87***
Non-top50 firms	0.0005	0.0006	0.0006	0.62
Advertising Intensity				
All firms	0.0058	0.006	0.006	4.27***
Top50 Business Group	0.0065	0.0068	0.007	4.3***
Non-top50 firms	0.0048	0.0049	0.0049	1.28
Marketing intensity				
All firms	0.016	0.016	0.017	5.72***
Top50 Business Group	0.0165	0.017	0.0172	4.86***
Non-top50 firms	0.015	0.015	0.016	3.18***
Distribution intensity				
All firms	0.02	0.02	0.02	4.47***
Top50 Business Group	0.023	0.024	0.024	3.11***
Non-top50 firms	0.015	0.016	0.016	3.56***
				z-stat for difference between before vs. after (col.2 & col.4)
<i>Panel B: Medians</i>				
Export Sales Ratio (%)				
All firms	1.65	1.88	2.06	11.32***
Top50 Business Group	2.24	2.46	2.72	9.26***
Non-top50 firms	0.88	1.05	1.31	6.64***
R&D intensity				
All firms	0.00	0.00	0.00	4.81***
Top50 Business Group	0.00	0.00	0.00	4.16***
Non-top50 firms	0.00	0.00	0.00	2.43***
Advertising Intensity				
All firms	0.0005	0.0005	0.0005	1.43
Top50 Business Group	0.0006	0.0006	0.0006	2.71***
Non-top50 firms	0.0005	0.0005	0.0005	-0.89
Marketing intensity				
All firms	0.0092	0.0095	0.01	8.1***
Top50 Business Group	0.01	0.011	0.011	7***
Non-top50 firms	0.008	0.0081	0.0082	4.21***
Distribution intensity				
All firms	0.012	0.012	0.0123	8.71***
Top50 Business Group	0.013	0.014	0.014	7.94***
Non-top50 firms	0.009	0.01	0.01	4.1***

Notes:

This table compares the effectiveness of short term debt on real variables. *** denotes significant at 5% or better and ** denotes significant at 5-10%.; z-statistic for difference between paired series denotes the outcome of a Wilcoxon signed-rank test for difference in the distributions. Both the "t-test" and "Wilcoxon Signed-rank tests" are paired univariate tests that compare the average values of common sample between the two series.

Table: 10 Effect of Long term Debt on Real Market Variables

(Units are in Rupees Million)

Real Market Variables		t	t+1	t+2	t+3	t+4	t+5	t+6	t+7
Panel B: Means									
R&D expense	All Firms	1.63	1.73** (1.56)	1.92** (1.64)	2.12*** (1.69)	2.32** (1.49)	2.53 (1.27)	2.68 (1.01)	2.9 (0.94)
	Top 50	2.68	2.82** (1.4)	3.15** (1.52)	3.48** (1.58)	3.8** (1.38)	4.13 (1.22)	4.4 (0.95)	4.76 (0.88)
	Non-top 50	0.31	0.36 (1.23)	0.4 (0.88)	0.44 (0.84)	0.49 (0.82)	0.52 (0.42)	0.56 (0.45)	0.61 (0.49)
Advertising expense	All Firms	15.97	16.95*** (9.09)	18.14*** (9.09)	19.56*** (8.92)	21.03*** (8.65)	22.64*** (8.13)	24.37*** (7.54)	26.02*** (6.58)
	Top 50	26.1	27.81*** (8.65)	29.83*** (8.65)	32.27*** (8.51)	34.78*** (8.26)	37.52*** (7.81)	40.48*** (7.27)	43.35*** (6.37)
	Non-top 50	3.26	3.43*** (4.28)	3.61*** (4.28)	3.82*** (4.13)	4.03*** (3.79)	4.24*** (3.34)	4.45*** (2.92)	4.62*** (2.31)
Marketing expense	All Firms	35.11	37.44*** (11.7)	40.1*** (11.26)	42.58*** (10.49)	45.28*** (10.01)	48.37*** (9.35)	51.43*** (8.13)	54.68*** (7.08)
	Top 50	53.76	57.22*** (10.42)	61.47*** (10.1)	65.45*** (9.41)	69.73*** (8.99)	74.63*** (8.42)	79.44*** (7.29)	84.71*** (6.4)
	Non-top 50	11.72	12.78*** (7.47)	13.52*** (6.92)	14.25*** (6.39)	15.04*** (6.02)	15.9*** (5.5)	16.8*** (4.93)	17.58*** (4.26)
Distribution expense	All Firms	61.59	65.46*** (4.3)	69.7*** (4.02)	74.3*** (3.82)	79.1*** (3.51)	84.52*** (3.28)	90.87*** (3.02)	97.56*** (2.56)
	Top 50	102.49	109.29*** (3.99)	116.35*** (3.72)	124.31*** (3.56)	132.46*** (3.26)	141.6*** (3.05)	152.33*** (2.81)	163.76*** (2.38)
	Non-top 50	10.29	11.01*** (6.08)	11.7*** (5.6)	12.36*** (5.2)	13.1*** (4.89)	13.93*** (4.56)	14.89*** (4.2)	15.8*** (3.46)
Panel B: Medians									
R&D expense	All Firms	0.00	0.00*** (4.18)	0.00*** (4.1)	0.00*** (4.1)	0.00*** (3.01)	0.00 (1.07)	0.00 (0.8)	0.00 (0.55)
	Top 50	0.00	0.00*** (3.55)	0.00*** (3.47)	0.00*** (3.55)	0.00*** (2.5)	0.00 (1.05)	0.00 (0.85)	0.00 (0.3)
	Non-top 50	0.00	0.00*** (2.2)	0.00*** (2.19)	0.00*** (2.02)	0.00** (1.72)	0.00 (0.37)	0.00 (0.14)	0.00 (0.62)
Advertising expense	All Firms	0.2	0.2*** (12.86)	0.2*** (12.86)	0.2*** (11.75)	0.2*** (11.25)	0.2*** (9.52)	0.2*** (7.8)	0.2*** (5.06)
	Top 50	0.3	0.3*** (12.45)	0.4*** (12.45)	0.4*** (11.56)	0.4*** (11.21)	0.5*** (9.91)	0.5*** (8.5)	0.5*** (6.32)
	Non-top 50	0.1	0.1*** (5.11)	0.1*** (5.11)	0.1*** (4.41)	0.1*** (4.1)	0.1*** (2.91)	0.1*** (1.98)	0.1 (0.21)
Marketing expense	All Firms	6.4	7.1*** (26.1)	7.7*** (24.12)	8.3*** (22)	8.9*** (20.14)	9.6*** (17.98)	10.3*** (15.47)	11*** (12.93)
	Top 50	13.8	15.25*** (21.54)	16.7*** (20.03)	17.9*** (18.43)	19.7*** (16.92)	21.3*** (15.04)	23.4*** (12.77)	24.7*** (10.97)
	Non-top 50	2.6	2.9*** (14.5)	3.1*** (13.28)	3.3*** (11.81)	3.6*** (10.74)	3.95*** (9.76)	4.15*** (8.62)	4.3*** (6.71)
Distribution expense	All Firms	6.8	7.8*** (27.9)	8.4*** (25.37)	9*** (23.01)	9.7*** (20.76)	10.4*** (18.91)	11.2*** (16.94)	12.2*** (14.38)
	Top 50	16.8	18.85*** (23.5)	20.7*** (21.67)	22.4*** (19.73)	24.3*** (17.83)	25.7*** (16.4)	27.5*** (14.96)	28.5*** (13.18)
	Non-top 50	2.8	3.1*** (15.05)	3.4*** (13.04)	3.8*** (11.84)	3.95*** (10.7)	4.1*** (9.53)	4.3*** (8.19)	4.4*** (6.18)

Notes:

Sign rank tests the equality of matched pairs of observations using the Wilcoxon matched-pairs signed-ranks test. The null hypothesis is that both distributions are the same. In panel A, t values are in the parentheses and in panel B; z-values are in the parentheses.

Chapter 6: Conclusions and Suggestions

This thesis is an attempt to add empirical evidence to the emerging literature on interaction between firm's financing decisions and its product market performance. The empirical work has been carried out for a developing nation such as India, where no such efforts have been made earlier. The idea is that a firm's financial policy may affect its product market operations can be extended to issues related to firm quality. Accordingly, as a main stem of the thesis, we demonstrate the importance of corporate quality and reputation building activities for competing in the product market in the context of India.

We first develop a Cournot type static duopoly model in chapter 3, where two firms belonging to two different countries compete in the world market. The first firm is located in a developed country possessing the technology to produce the best possible quality. The second firm is an Indian firm whose product quality needs improvement since it faces information asymmetry about its quality between customers and supplier. Since quality improvement is costly (though a better quality product could be sold at a higher price), the firm needs external financing by either issuing debt instruments or equity. The two firms, who face different demand conditions due to quality difference, play a static Cournot game and maximize their profits and we determine their reaction functions. From their reaction functions we determine total sales of the second firm in all equity case. Here we find that an improvement in quality perception brings higher profit to the second firm at the expense of the first firm. Therefore the second firm, which is an Indian firm, can increase its sales though improvement in quality perception (we termed it as fall in β) among its product market agents (like customers, import dealers, marketing agents etc.). For this, it has to provide signals to build reputation. These signals may come either from the real market through increased advertising, marketing and R&D expenses, forming business groups or through issuing short term securities like commercial paper or fixed interest carrying debentures which have to be passed through a bank guarantee and scrutiny of credit rating agencies. This proposition has been tested empirically in chapter 4. In the second part of the model in Chapter 3, we compare the profit and sales of the second firm financing its expenditure in improving quality by issuing debt against equity. We find that if the consumers assume lower β (means better

perception about quality) for debt issue as compared to equity issue, firm 2 will experience an increase in sales by issuing debt. We conclude that if firm's other product market agents like customers are aware of firm's financial condition, financial policy choice by the firm can alter its product market sales. We later test this proposition empirically in Chapter 4 and Chapter 5.

The main purpose of our work in Chapter 4 is to test the connections between financial instruments, real market signals and firm's product market performance. With a balanced sample of 533 Indian listed firms belonging to 21 industry types over the period 1989 to 2000, we compare the behavior of top fifty and large business groups with the small group and private standalone firms. We test the significance of these signals on firm's total sales as well as domestic and foreign market sales using panel logit and panel tobit censored regression techniques. Further, to bolster our findings, we examine the consequences of the issuance of financial securities on real market variables by performing parametric and non parametric univariate tests. Here we summarize the important findings of the empirical work:

First, we find that advertising intensity, marketing intensity and distribution intensity are on average higher for top group firms and thus have larger amount of intangible assets compared to non top group affiliated firms. Therefore, they are generally high quality firms with greater growth options in their investment opportunities in comparison to their counterparts. Their performance measured by their profitability (cash profit over total assets) appears to be better than that of non top 50 firms. Top 50 group firms also issue more debenture and commercial paper.

Second, the top fifty and large houses have a better reputation advantage in the product market in general as well as in the export market since they spend more on advertising, marketing, distribution and R&D as proportion of their total sales and are also able to issue more debenture and commercial paper loan than the non top group firms.

Third, CP issuing and debenture issuing firms on average spend more on advertising, marketing, distribution and research and development than non CP and non debenture issuing firms. Therefore, these firms are generally high quality firms.

Fourth, firms issuing commercial paper and debenture strategically use them to increase marketing efforts and promote their products through increased advertising over time. This is true for all firms as well for top 50 and also for smaller group or private standalone firm.

Fifth, we find that the issuance of commercial paper and debenture improves firm's product market performance for both the top group and non top group firms. While it directly impacts domestic sales of the firms, it also acts as a signal and stimulates its overseas sales. Moreover, other product market signals such as advertising, marketing intensity, ISO certification, etc., also positively affect firm sales, both foreign and domestic. As far as control variables are concerned, we find that larger firms generally perform well in export market compared to smaller ones. Thus size matters in export. It is also worthwhile to note that firms belonging to top 50 and other business houses perform better in foreign market than those belonging smaller groups and private standalone ones. This again suggests that group reputation matters in the export market.

Sixthly, we look at the effect of long term Development Financial Institutions (DFIs) loans on firm performance. The results show that it positively affects long-term sales of firms. We find that for non top 50 group firms (that are more financially constrained), DFIs borrowings have greater impact on growth of sales in the long run than the top 50 business group affiliated firms. Further, DFI lending help both category of firms in increasing expenditure on advertising for product promotion, building distribution networks, increasing marketing efforts and research and development in due course to increase its market share in the long run. Therefore, we find strong empirical evidence that firm's financial decisions drive product market outcomes.

Finally, we tried to answer the causality between financing decisions and product market performance of firms. One may be concerned about the possibility of the case that firms are able to issue commercial paper, debenture and get DFIs loan because of a good export market performance. We resolve the causality issue applying a two step tobit regressions method. We find there is no reverse causality in case of commercial paper. This means firms who already have higher export share are not in financial need to issue short term commercial paper further. This could also be due to the fact that they have already acquired reputation in the export market through commercial paper. Therefore,

additional financial signals are not important for those firms. In debenture case, firms are less likely to issue this instrument if they already have higher share in the export market. We have similar results for long term DFIs loans. We also look at the other factors that may influence the issuance of short term and long term debt instruments. We find that firms with higher growth opportunities (captured by higher market to book ratio) are more likely to issue short term commercial paper. The probability of issuing CP is higher for non top 50 business group firms in comparison to the firms belonging to top 50 category. While the larger firms seem to issue more commercial paper and debenture, the smaller firms within top 50 business group are likely to be taking more loans from Development Financial Institutions.

In chapter 5, we empirically test the effect of firm's capital structure on its product market performance. For this, we examine the consequences of short term and long term leverage on firm performance. We took percentage change in export intensity as measure of firm's export performance and growth of sales in the current year to gauge its product market performance in general. Commercial Paper, Short-term Bank Borrowing and current portion of long term loan, which have maturity of less than a year, constitute short term firm leverage. Long-term Bank Borrowing, Debenture, DFIs borrowings etc. that have a maturity of more than year are the major sources of long term firm leverage. The corporate financing trend during the period 1989-2000 among our sample firms reveals that debenture and Bank debt provide the stable sources of long term funds and they offset the slight decrease in need for DFI lending since the year 1995. There is also increased demand for short term debt instruments like commercial paper, in the post 1995 period, among the large corporations.

In addressing the question as to how short-term leverage affects export performance, we perform a two-step instrumental variable Arellano and Bond GMM panel VAR method. The results show that firm's export reacts positively to current rise in short term leverage. This is true for the entire sample as well as for two sub groups (i.e., top 50 and non top 50 categories). In order to have a clear understanding of the relationship between short term debt and the product market performance, we perform univariate tests to compare the changes in average values of real market variables before and after the loans have been taken. Both the t-test and Wilcoxon signed rank tests for

whole sample of firms and two sub-groups have been used. We observe that firm export, expenditure on advertising, marketing, distribution and research & development increase with short term debt taking. Thus, we find that short term debt influences firm behavior in the real market.

In assessing the importance of long term debt financing on the real economy, we identify its impact on various product market strategies (e.g., advertising, marketing, distribution, R&D innovation etc.) through a time series table reporting the changes in means and medians for all firms taking the loan from the current year till 7 years after the loan was taken. Our univariate parametric t-tests for changes in mean and non parametric Wilcoxon signed rank test for median changes show both the top group as well as private standalone firms using the loan to increase advertising expenses, marketing efforts, establish distribution networks and improve R&D infrastructure over time. These in return help the firm to expand its market share in the product market in future. In multivariate analysis, we performed Tobit regressions to test the significance of lagged values of long term leverage to examine its effect on firm's current year's sales growth. Considering a longer time horizon and controlling the other firm specific effects, we find that long term debt boosts total sales for top 50 and large business houses. However, for the unaffiliated and smaller group firms, it is inconsequential on total growth of sales. Therefore, we empirically find a strong linkage between firm's choice of capital structure and its product market performance in India.

The financial system acts as an efficient conduit for allocating resources among competing uses. In our study, we find that debt can shape industry competition. Therefore, development in the debt market is an important requisite for achieving improved product market performance for Indian corporate sector. The debt market provides important financing sources for India's domestic manufacturing firms. In this context, credit rating agencies as well as banks have important role to mitigate adverse selection problem by reducing uncertainty in the credit market. Banks as short-term financiers can impose discipline on borrowers through frequent refinancing. Similarly, credit rating agencies can scrutinize firm's financial health through mandatory credit rating on the issuance of financial securities. Stimulating the development in the banking sector does facilitate small firms' access to credit and raise income growth. Other

research shows that banking and stock market development are complementary, most likely because each produces and demands better information (Demigruc-Kunt and Levine, 1996). Hence, a policy of stimulating banking development will not only improve small firms' access but indirectly help larger firms by leading to a greater capital market development as well. There is need for improving informational, legal and judicial infrastructures needed for a sound capital market. Central Banks should be more responsible for maintaining financial stability and the integrity of financial market.

Further, we suggest that the Indian corporate sector should understand the importance of quality for improving its product market performance in both export as well as domestic sales. The new liberalized policies of the Government have impelled the industry to open up, absorb new technology, and improve product quality and services to survive in the competition. Therefore, the national policies should be designed to inculcate quality consciousness in the minds of domestic consumers. The good quality products are produced only when consumers in the home market insists on good quality. The government may advertise about the importance of quality certification and thereby raise the consciousness of the domestic consumers. One positive step in this direction is the appointment of a full time Secretary General of the Quality Council of India. Similarly, Total Quality Management Institute (TQMI) does survey on quality updates in India. Secondly, an incentive system that rewards firms who achieve the ISO certification would be a powerful mechanism. It would strike at a pivotal leverage point to speed up exports. At the same time, a quality oriented incentive structure will also make the domestic market more quality competitive vis-à-vis the multinationals. Thirdly, the effort involved in obtaining the certification like the ISO 9000, and in adhering to it will itself bring in a quality consciousness among Indian firms. Manufacturers going in for certification against the ISO 9000 series of standards may be granted special import licenses, assistance in modernization and upgradation of laboratories. Also a scheme to recognize and reward such manufacturers would definitely help the firms to make the investments on quality improvement. Similar incentives should be provided for firms to encourage them to invest in research and development and visualize the future benefits in reaching higher values of exports. Finally, with improved thrust on quality, the overall competitiveness of firms, both in the export and in the domestic market, can only

improve over time. This must in due course result in concomitant improvement in their profitability.

In studying the structure of competition in Indian manufacturing sector, Das and Pant (2004) find that after the liberalization (i.e. post 1990-91 period), firms that are entering and exiting are mainly small firms. This is because competitive nature of industry does not change very much as they do not find any middle sized firms in industry. Therefore, Indian industries are characterized by mainly large firms and a large number of small firms. Tybout (2000) has referred to this characterization of manufacturing firms as the problem of “missing middle”, and, according to him, many developing countries may have “missing middles” in their organized manufacturing sectors. Therefore, in such a situation, it is difficult for a new domestic firm to make a big entry into the market. It takes a long time to establish reputations in the credit market which does not work to the advantage of the new entry. In order to foster competition, DFIs should play an important role in financing established and new firms that deserve support. DFIs should operate and give loans to deserving small firms who need long term loans for expansion. It appears that firms grow faster and are more productive when more long-term finance is available to them (Caprio and Demigruc-Kunt, 1998). DFIs in India have been set up ostensibly to help firms that are in scarcity of long term funds. Instead of protecting the firms, it should act as a major conduit for channeling funds to financially constrained firms during their process of development.

Bibliography

- Aaker, D. 1992. *Managing brand equity: Capitalizing on the value of a brand name*. New York, NY: Free Press.
- Akerlof, G. A. 1970. The market for lemons: Qualitative uncertainty and the market mechanism, *Quarterly Journal of Economics* 84: 488-500.
- Allen, F. 1984. Reputation and product quality, *RAND Journal of Economics* 15: 311-327.
- Allen, F. 1986. *Capital structure and imperfect competition in product markets*, Mimeo, University of Pennsylvania.
- Aneja, H. R. 1996. Marketing and selling in India in the year 2000, *Economic and Political Weekly* May 25: M26-M30.
- Arellano, M., and Bond, S. 1991. Some tests of specification for panel data: Monte carlo evidence and an application to employment equations, *Review of Economic Studies* 58: 277-297.
- Balakrishnan, S., and Fox, I. 1993. Asset specificity, firm heterogeneity, and capital structure, *Strategic Management Journal* 14: 3-16.
- Baltagi, B. H. 2001. *Econometric analysis of panel data*. 2nd edition, New York: John Wiley & Sons.
- Barclay, M. J., and Smith, Jr., C. W. 1995. The maturity structure of corporate debt, *Journal of Finance* 50 (2), 609-631.
- Barney, J. 1991. Firm resources and sustained competitive advantage. *Journal of Management* 17: 99-120.
- Beatty, R. P., and Ritter, J. R. 1986. Investment banking, reputation and underpricing of initial public offerings, *Journal of Financial Economics*, 213-232.
- Becker, G. S., and Stigler, G. J. 1974. Law enforcement, malfeasance, and compensation of enforcers, *Journal of Legal Studies* 3: 1-18.
- Benoit, J. 1984. Financially constrained entry in a game with incomplete information, *RAND Journal of Economics* 15: 490-499.
- Berglof, E., and Perotti, E. (1994.) The governance structure of the Japanese financial keiretsu, *Journal of Financial Economics* 36: 259-284.

- Bernard B. A., and Jensen J. B. 1999. Exceptional exporter performance: cause effect or both? *Journal of International Economics* 47: 1-25.
- Bhandari, L., and Dasgupta, S., and Gangopadhyay, S. 2000. Development financial institutions, financial constraints, and growth: Evidence from the Indian corporate sector. Mimeo.
- Bhattacharya, S. 1979. Imperfect information, dividend policy, and the 'bird in the hand' fallacy, *Bell Journal of Economics* 10: 259-270.
- Bhattacharya, S., and Ritter, J. 1983. Innovation and communication: Signalling with partial disclosure, *Review of Economic Studies* 50: 331-346.
- Bland J.M. 1995. An introduction to medical statistics, 2nd eds. Oxford University Press, Oxford. pp. 212-215.
- Bolton, P., and Scharfstein, D. S. 1990. A theory of predation based on agency problems in financing contracting, *American Economic Review* 80: 93-106.
- Borenstein, S., and Zimmerman, M. B. 1988. Market incentives for safe commercial airline operation, *American Economic Review* 78: 913-935.
- Brander, J. A., and Lewis, T. R. 1986. Oligopoly and Financial Structure: The limited-liability effect, *American Economic Review* 76: 956-970.
- Brander, J. A., and Lewis, T. R. 1988. Bankruptcy costs and the theory of oligopoly, *Canadian Journal of Economics* 21: 221-243.
- Brander, J. A., and Spencer, B. J. 1984. Strategic commitment with R&D: The symmetric case, *Bell Journal of Economics* 14: 225-235.
- Brick, I., and Ravid, S. A. 1985. On the relevance of debt maturity structure, *Journal of Finance* 40 (5): 1423-1437.
- Brozen, Y. 1974. Entry barriers: advertising and product differentiation. In *Industrial Concentration: The new learning* (H. J. Goldschmid, H. M. Mann and J. F. Weston eds.). Little Brown.
- Campbell, T., and Kracaw, W. 1980. Information production, market signaling and the theory of financial intermediation, *Journal of Finance* 35 (4): 863-882.
- Campello, M. 2002. Capital structure and product markets interactions: Evidence from business cycles, *Journal of Financial Economics*, Forthcoming.

- Campello, M. 2003. Debt financing: Does it hurt or boost firm performance in product markets? University of Illinois at Urbana-Champaign, Working Paper.
- Capon, N., and Farely, J., and Hoeing, S. 1996. Toward and integrative explanation of corporate financial performance, Kluwer Academic Publishers, Boston.
- Caprio, G., and Demigruc-Kunt, A. 1998. The role of long-term finance: Theory and evidence. *The World Bank Research Observer* 13 (2): 171-189.
- Carter, R., and Manaster, S. 1990. Initial public offering and underwriter reputation, *Journal of Finance* 45 (4): 1045-1067.
- Cavusgil, S., and Zou, S. January 1994. Marketing strategy-performance relationship: An investigation of the empirical link in export market ventures, *Journal of Marketing* 58: 1-21.
- Chamberlin, G. 1984. Panel data in Z. Grilliches and M. Intrilligator (eds.) *Handbook of Econometrics* 2, North-Holland.
- Chang, S. J., and Hong, J. 2000. Economic performance of group-affiliated companies in Korea: Intra group resource sharing and internal business transactions, *Academy of Management Journal*, 43(3): 429-448.
- Chemmanur, T. J., and Fulghieri, P. 1994. Investment bank reputation, information production and financial intermediation, *Journal of Finance* 49 (1): 47-79.
- Chevalier, J. A. 1995. Capital structure and product-market competition: Empirical evidence from the supermarket industry, *American Economic Review* 85 (3): 415-435.
- Chevalier, J. A. and Scharfstein, D. 1996. Capital-markets imperfections and countercyclical markups: theory and evidence, *American Economic Review* 86 (4): 703-725.
- Chibber, P., and Majumdar, S. K. 1998. State as investor and state as owner: Consequences for firm performance in India, *Economic Development and Cultural Change*: 560-580.
- Conover W.J. 1980. Practical nonparametric statistics, 2nd eds. John Wiley and Sons, New York. pp. 278-292.
- Cornell, B., and Shapiro, A. C. 1987. Corporate stakeholders and corporate finance, *Financial Management*: 5-14.

- Crichton N.J. 1998. Statistical considerations in design and analysis, In *Research and development in clinical nursing practice*. (Roe B. and Webb C., eds.). Whurr, London, p. 209.
- Damania, D. 1997. Debt as a collusive device in an oligopoly supergame, *Journal of Economics* 66 (3): 249-269.
- Das, S. K., and Pant, M. 2004. Structure of competition in India's manufacturing sector, ITDD, SIS, JNU, Working Paper.
- Dasgupta, S. 2001. How firms' financial decisions impact product markets: A selective survey, In *Contemporary Macroeconomics* (A. Bose, D. Ray and A. Sarkar, eds.). Oxford University Press, pp. 237-268.
- Dasgupta, S., and Titman, S. 1996. Pricing strategy and financial policy, National Bureau of Economic Research, Working Paper No. 5498.
- Dasgupta, S., and Titman, S. 1998. Pricing strategy and financial policy, *Review of Financial Studies* 11 (4): 705-737.
- Debroy, B., and Santhanam, A. T. July 1993. Matching trade codes with industrial codes, *Foreign Trade Bulletin*. Indian Institute of Foreign Trade.
- Demigruc-Kunt, A. August 1998. The role of long-term finance: Theory and evidence, *World Bank Research Observer* 13 (2): 171-189.
- Demigruc-Kunt, A., and Levine, R. 1996. Stock market development and financial intermediaries: Stylized facts, *The World Bank Economic Review* 10 (2): 291-321.
- Diamond, D. W. 1984. Financial intermediation and delegated monitoring, *Review of Economic Studies* 51: 393-414.
- Diamond, D. W. 1991. Debt maturity and liquidity risk, *Quarterly Journal of Economics* 106: 709-737.
- Diamond, D. W. 1993. Seniority and maturity of debt contracts, *Journal of Financial Economics* 33: 341-368.
- Dotan A., and Ravid, S. A. 1985. On the interaction of real and financial decisions of the firm under uncertainty, *Journal of Finance* 40 (2): 501-517.
- Dybrig, P. H., and Spatt, C. S. 1983. Does it pay to maintain reputation? Consumer information and product quality, Working Paper.

- Eaton, J., and Gersovitz, M. 1981. Debt with potential repudiation: Theoretical and empirical analysis, *Review of Economic Studies* 48: 289-309.
- Esfahani, H. S. 1989. Reputation, product quality and production technology in LDC markets, Working Paper series on the Political Economy of the Institutions, no. 23. University of Illinois at Urbana-Champaign, Urbana, IL.
- Feenstra, R. C., and Yang, T. H., and Hamilton, G. G. 1999. Business groups and product variety in trade: Evidence from South Korea, Taiwan and Japan, *Journal of International Economics* 48 (1): 71-100.
- Flanery, M. J. 1986. Asymmetric information and risky debt maturity choice, *Journal of Finance* 41: 19-37.
- Fombrun, C. J. 1996. Reputation: Realizing value from the corporate image. Cambridge, MA. Harvard Business School Press.
- Fudenberg, D., and Tirole, J. 1984. The fat-cat effect, the puppy dog ploy, and the lean and hungry look, *American Economic Review Papers and Proceedings* 74: 361-368.
- Fudenberg, D., and Tirole, J. 1986. A signal jamming theory of predation, *RAND Journal of Economics* 17: 366-376.
- Fulghieri, P., and Nagarajan, S. 1996. On the strategic role of long-term debt in imperfect competition, *Journal of Economic Theory* 62 (2): 428-443.
- Gande, A., and Puri, M., Saunders, A., and Walter, I. 1997. Bank underwriting of debt securities: Modern evidence, *Review of Financial Studies* 10 (4): 1175-1202.
- Gangopadhyay, S., and Lensin, R., and Molen, R. 2001. Business groups, financing constraints, and investment: The case of India, Mimeo.
- Gertner, R., and Gibbons, R., and Scharfstein, D.S. 1988. Simultaneous signalling to the capital and product markets, *RAND Journal of Economics* 19 (7): 173-190.
- Glazer, J., and Israel, R. 1987. Managerial incentives and financial signalling in product market competition, Mimeo, Bell Communications.
- Greene, W. H. 2000. *Econometric analysis*, 4th edition, Prentice-Hall, Engle wood Cliffs, N.J.
- Grimaud, A. 2000. Product market competition and optimal debt contracts: The limited liability effect revisited, *European Economic Review* 44 (10): 1823-1840.

- Grossman, S., and Shapiro, C. 1984. Informative advertising with differentiated products, *Review of Economic Studies* 51: 33-52.
- Harris, M., and Raviv, A. 1991. Capital structure and the informational role of debt, *Journal of Finance* 45: 321-349.
- Hart, O., and Moore, J. 1994. A theory of debt based on the inalienability of human capital, *Quarterly Journal of Economics* November: 841-879.
- Hart, O., and Moore, J. 1995. Debt and seniority: An analysis of hard claims in constraining management. *American Economic Review* 85: 567-587.
- Hellman, T., and Puri, M. 1999. The interaction between product market and financing strategy: The role of venture capital, *Stanford University, Working Paper*.
- Horner, J. 2002. Reputation and competition, *American Economic Review* 92: 644-663.
- Jaramillo, F., and Schiantarelli F. 1997. Access to long term debt and effect on firms' performance: Lessons from Ecuador, the World Bank, Policy Research Department, Finance and Private Sector Development Division.
- Jarell, G., and Peltzman, S. 1985. The impact of product recalls on the wealth of sellers, *Journal of Political Economy* 93: 512-536.
- Jensen, M. C. 1986. Agency costs of free cash flow, corporate finance and takeovers, *American Economic Review* 76: 323-339.
- Kale, J. R., and Noe, T. H. 1990. Risky debt maturity choice in sequential equilibrium, *Journal of Financial Research* 13: 155-165.
- Kayanak, E., and Kuan, W. 1993. Environment, strategy, structure and performance in the context of export activity: An empirical study of Taiwanese manufacturing firms, *Journal of Business Research* 27: 33-49.
- Khanna, T. and Rivkin, J.W. 2001. Estimating the performance effects of business groups in emerging markets, *Strategic Management Journal* 22 (1): 45-74.
- Khanna, T., and Palepu, K. 1996. Corporate scope and the institutional context: An empirical analysis of diversified Indian business groups, Harvard Business School, Working Paper series no. 96-051.
- Khanna, T., and Palepu, K. 1998. Corporate scope and institutional context: An empirical analysis of diversified business groups, Harvard Business School Working Paper No. 96-051.

- Khanna, T., and Palepu, K. 2000. Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups, *Journal of Finance* 55(2): 867-891.
- Klein, B., and Leffler, K. B. 1981. The role of market forces in assuring contractual performance, *Journal of Political Economy*: 615-641.
- Kovenock, D., and Phillips, G. 1995. Capital structure and product market rivalry: how do we reconcile theory and evidence? *American Economic Review* 85 (2): 403-408.
- Kovenock, D., and Phillips, G. 1997. Capital structure and product market behaviour: An examination of plant exit and investment decisions, *Review of Financial Studies* 10 (3): 767-803.
- Kreps, D. M., and Milgrom, R., and Roberts, J., and Wilson, R. 1982. Rational cooperation in the finitely repeated prisoners' dilemma, *Journal of Economic Theory* 27: 245-252.
- Kreps, D. M., and Wilson, R. 1982. Reputation and imperfect information, *Journal of Economic Theory* 27: 253-279.
- Kumar, N., and Siddharthan, N. S. 1994. Technology, firm size and export behaviour in developing countries: The case of Indian enterprises, *Journal of Development Studies* 31: 289-309.
- Kumar, N., and Sidhharthan, N. S. 1993. Technology, firm size and export behavior in developing countries: The case of Indian enterprises, Working Paper No. 9, The United Nations University, INTECH.
- Landon, S., and Smith, C. E. 1998. Quality expectations, reputations and price, *Southern Economic Journal* 64 (3): 628-647.
- Leland, H. 1979. Quacks, lemons and licensing: A theory of minimum quality standards, *Journal of Political Economy* 87: 1328-1346.
- Maddala, G. S. 1983. *Limited-Dependent and Qualitative Variables in Econometrics*, Cambridge, Cambridge University Press.
- Mailath, G., and Samuelson, L. 2001. Who wants a good reputation? *Review of Economic Studies* 68: 415-441.
- Maksimovic, V. 1986. Capital structure in a stochastic oligopoly, Ph.D. Dissertation, Harvard University.

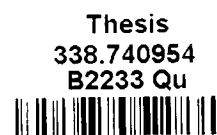
- Maksimovic, V. 1988. Capital structure in repeated oligopolies, *RAND Journal of Economics* 19 (3): 389-407.
- Maksimovic, V., and Titman, S. 1991. Financial reputation and reputation for product quality, *Review of Financial Studies* 2: 175-200.
- Mann, H. B., and Whitney, D. R. 1947. On a test of whether one of two random variables is stochastically larger than the other, *Annals of Mathematical Statistics* 18: 50-60.
- McAndrews, J. J., and Nakamura, L. I. 1992. Entry-detering debt, *Journal of Money, Credit and Banking* 24 (1): 98-110.
- McLaughlin, R., and Safieddine, A., and Vasudevan, G. K. Spring 2000. Investment Banker Reputation and the Performance of Seasoned Equity Issuers, *Financial Management*.
- Meggison, W., and Weiss, K. 1991. Venture capitalist certification in initial public offerings, *Journal of Finance* 46(3): 879-903.
- Milgrom, P. and Roberts, J. 1986. Price and advertising signals of product quality, *Journal of Political Economy* 94 (4): 796-821.
- Milgrom, P., and Roberts, J. 1982. Predation, reputation and entry deterrence, *Journal of Economic Theory* 27: 280-312.
- Miller, M., and Rock, K. 1985. Dividend policy under asymmetric information, *Journal of Finance* 40: 1031-1051.
- Modigliani, F., and Miller, M. 1958. The cost of capital, corporation finance, and the theory of investment, *American Economic Review* 48: 261-297.
- Myers, S. C. 1984. The capital structure puzzle, *Journal of Finance*: 575-592.
- Myers, S. C. 1974. Interaction of corporate financing and investment decisions-implications for capital budgeting, *Journal of Finance*: 1-25.
- Myers, S. C. 1977. Determinants of corporate borrowing, *Journal of Financial Economics* 5: 147-175.
- Myers, S. C., and Majluf, N. 1984. Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics* 13 (2): 187-221.

- Naveh, E., and Marcus, A. 2000. Implementing a managerial practice: Assimilation and going beyond, Working paper, Carlson School of Management, University of Minnesota.
- Naveh, E., Marcus, A., Allen, G., Koo Moon, H. 1999. ISO 9000 Survey '99: An Analytical Tool to Assess the Costs, Benefits and Savings of ISO 9000 Registration, MacGraw-Hill, Inc. New York, San Francisco, Washington D.C.
- Nelson, P. 1974. Advertising as information, *Journal of Political Economy* 82: 729-754.
- Nigel, P. F., and Katsikeas, C. S., and Cravens, D. W. Spring 1997. Examining the role of buyer-seller relationship in export performance, *Journal of World Business* 32 (1): 33-86.
- Opler, T. C., and Titman, S. 1994. Financial distress and corporate performance, *Journal of Finance* 49 (3): 1015-1040.
- Peterson, M. A., and Rajan, R. G. 1994. The benefits of lending relationships: Evidence from small business data, *Journal of Finance* 59: 3-37.
- Phillips, G. M. 1995. Increased debt and industry product markets: An empirical analysis, *Journal of Financial Economics* 37: 189-238.
- Poitevin, M. 1989a. Financial signalling and deep pocket argument, *RAND Journal of Economics* 20: 26-40.
- Poitevin, M. 1989b. Collusion and the Banking structure of a duopoly, *Canadian Journal of Economics* 22: 263-277.
- Raff, H., and Kim, Y. H. 1999. Optimal export policy in the presence of informational barriers to entry and imperfect competition, *Journal of International Economics* 49 (1): 99-123.
- Rajan, R. G., and Zingales, L. 1995. Is there an optimal capital structure? Evidence from international data, *Journal of Finance* 50: 1421-1460.
- Ramakrishnan, R., and Thakor, A. 1984. Information reliability and a theory of financial intermediation, *Review of Economic Studies*: 415-432.
- Rashid, S. 1988. Quality in contestable markets: A historical problem? *Quarterly Journal of Economics*: 245-249.
- Ravid, S. A. 1988. On interactions of production and financial decisions, *Financial Management*: 87-99.

- RBI Bulletin. December, 2002. Report on trend and progress of banking in India 2001-02.
- Rogerson, W. P. 1983. Reputation and product quality, *Bell Journal of Economics* 14: 508-516.
- Rose, N. 1988. Profitability and product quality: Financial indicators and airline accident performance, Working paper, MIT Sloan School of Management.
- Ross, S. 1977. The determination of financial structure: the incentive-signalling approach, *Bell Journal of Economics* 8: 23-40.
- Ross, S., and Westerfield, R. W., and Jordan, B. D. 1995. Fundamentals of Corporate Finance, Chicago: Richard D. Irwin.
- Rotemberg, J. J., and Scharfstein, D. S. 1990. Shareholder value maximization and product market competition, *Review of Financial Studies* 3 (3): 367-391.
- Roychaudhuri, A., and Acharya, R., and Marjit, S., and Rahman, M. 2003. Trade potentials of South Asian economies under the new global trade regimes: The role of some non-price factors a case study of India, Bangladesh and Srilanka, SNAE I-III project report presented at the fourth Annual Conference of the South Asian Network of Economic Research Institute held in Colombo, Srilanka.
- Samson, D., and Terziovski, M. 1999. The relationship between total quality management practices and operational performance, *Journal of Operations Management* 17 (4): 393-409.
- Sarig, O., 1987. Bargaining with a corporation and the choice of capital structure, Working Paper, Columbia University.
- Sarkar, J., and Sarkar, S. 1998. Large shareholder activism in corporate governance in developing countries: Evidence from India, Working Paper. Indira Gandhi Institute of Development Research.
- Schargrodsky, E. 2002. The effect of product market competition on capital structure: empirical evidence from the newspaper industry, Unpublished Harvard PHD dissertation.
- Scherer, F. M. 1995. Retail distribution channel barriers to international trade, J. F. Kennedy School of Government, Harvard University, Mimeo.

- Schiantarelli F., and Sembenelli, A. 1997. Determinants and consequences of the maturity structure of firms' debt; the case of the UK and Italy, World Bank, Policy Research Department, Finance and Private Sector Development Division.
- Schiantarelli F., and Srivastava, V. 1997. Debt maturity and firm performance: A panel study of Indian companies, World Bank, Policy Research Department, Finance and Private Sector Development Division.
- Shapiro, C. 1982. Consumer information, product quality and seller reputation, *Bell Journal of Economics* 13: 22-35.
- Shapiro, C. 1983. Premiums for high quality products as returns to reputation, *Quarterly Journal of Economics* 98: 615-641.
- Shapiro, C. 1999. Strategic debt: evidence in manufacturing, *International Journal of Industrial Organization* 17 (3): 319-333.
- Shapiro, C., and Varian, H. 1999. Information rules. Boston, MA: Harvard Business School Press.
- Showalter, D. M. 1995. Oligopoly and financial structure: A comment, *American Economic Review* 85: 647-653.
- Showalter, D. M. 1999. Strategic debt: Evidence in manufacturing, *International Journal of Industrial Organization* 17: 319-333.
- Simmons, B.L., and White, M.A. 1999. The relationship between ISO 9000 and business performance: Does registration really matter? *Journal of Managerial Issues* 11 (3): 330 – 343.
- Stenbacka, R. 1994. Financial structure and tacit collusion with repeated oligopoly, *Journal of Economic Behavior and Organization* 25 (2): 281-292.
- Sterlacchini, A. 1999. Do innovative activities matter to small firms in non-R&D-incentive industries? An application to export performance, *Research Policy* 28: 819-832.
- Styles, C., and Ambler, T. 2000. The impact of relational variables on export performance: An empirical investigation in Australia and the UK. *Australian Journal of Management* 25 (3): 261-281
- Suri, K. B. 1988. Technology, firm size and product quality, A study of laundry soap in India, in K.B.

- Tadelis, S. 1999. Reputation as a tradable asset, *American Economic Review* 89: 548-563.
- Telser, L. G. 1966. Cutthroat competition and the long purse, *Journal of Law and Economics* 9: 259-277.
- Tirole, J. 1996. A theory of collective reputations (with applications to the persistence of corruption and to firm quality), *Review of Economic Studies* 63: 1-22.
- Titman, S. 1984. The effect of capital structure on the firm's liquidation decision, *Journal of Financial Economics* 26: 137-152.
- Titman, S., and Trueman, B. 1986. Information quality and the valuation of new issues, *Journal of Accounting and Economics* 8 (2): 159-172.
- Titman, S., and Wessels, R. 1988. The determinants of capital structure choice, *Journal of Finance* 43: 1-19.
- Tybout, J. R. 2000. Manufacturing firms in developing economies: How will do they do and; why? *Journal of Economic Literature* 38 (1): 11-44.
- Veeramani, C. 2001. Analyzing trade flows and industrial structure of India: The question of data harmonization, CDS Working Paper. Thiruvananthapuram, India.
- Wakelin, K. 1998. Innovation and export behaviour at the firm level, *Research Policy* 26: 829-841.
- Weigelt, K., and Camerer, C. 1988. Reputation and corporate strategy: A review of recent theory and applications. *Strategic Management Journal* 9: 443-454.
- Wenmoth, B.A. & Dobbin, D. J. 1994. Experience with implementing ISO 9000, *Asia Pacific Journal of Quality Management* 3 (3): 9-27.
- Wilcoxon, F. 1945. Individual comparisons by ranking methods, *Biometrics* 1: 80-83.
- Williamson, O.E. 1988. Corporate finance and corporate governance, *Journal of Finance* 43: 567-591.
- Xu, X., and Wang, Y. 1997. Ownership structure, corporate governance and corporate performance: The case of Chinese stock companies, World Bank Policy Research. Working Paper series no. 1794.
- Yoon, E., and Guffey, H., and Kijewski, V. 1993. The effects of information and company reputation of intentions to buy a business service, *Journal of Business Research* 27: 215-228.



Th11875