

**LINKAGE BETWEEN THE PRODUCT MARKET
AND FINANCIAL MARKET PERFORMANCE:
A CASE STUDY OF INDIA**

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CERTIFICATE

This dissertation entitled **LINKAGE BETWEEN THE PRODUCT MARKET AND FINANCIAL MARKET PERFORMANCE : A CASE STUDY OF INDIA** submitted by **ARINDAM BANDYOPADHYAY** in partial fulfillment for the M.Phil Degree of this University has not been previously submitted for any other degree of this or any other university and is his original work.

We recommend that the dissertation be placed before the examiners for evaluation.

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**TO
MY SISTER**

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Chapter – 1

1. Introduction

Today quality Management and International Trade are among the most important concerns of the industry and the government of India. Firms have realized quality and reputation as necessary requirement for long-term survival in the competitive export market with heterogeneous products. Not only in the export market, domestic buyers are also becoming loyal to the good quality firms. Quality is fast becoming a watchword for Indian companies and the corporate sectors. More and more Indian companies are realizing that in a global village they can survive only by offering goods and services, which at least meet global standards. There is an increase of activity in Indian industry and corporate sector to upgrade quality and reputation to meet the global market requirements. The export-import policy ('92-'97) has been tailored to promote quality of goods and services.

Quality is going to be the biggest competitive issue of the late 20th and early 21st centuries. Therefore quality management and international trade are among the most important concerns of industry and the government. A commitment to excellence in manufacturing and services is essential to a nation's long term economic welfare. Globalization of markets and their expansion at an unprecedented scale has created a fierce competition among nations bidding for such a market. Price factor being no longer valid, has turned the emphasis on quality encompassing safety, reliability, guarantee, performance, maintainability, durability and acceptability by the customer.

There is a ground swell in activity of the Indian industry due to liberalization of Indian economy and the need to upgrade quality to meet the global market requirements. As a result factors like productivity, efficiency, quality and competitiveness rather than just the price of the product have come to the forefront. These received impetus from national policies to encourage exports and strengthen the economy. To realize and consolidate the gains of liberalization, the Government has tailored its policies for promoting quality of goods and services. The policies focus on quality and accord it a

prime place in the policy making to win over the international customer's confidence by providing goods and services of consistent quality.

The challenge faced by the Indian industry is posed not only by Globalization of market but also by emerging dominant regional markets such as European Union (EU) and 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.

Thus the Indian industries reckon quality as prime instrument for long term survival and for entry into competitive global and regional markets and striving to bring India to the threshold of faster growth and internationally competitive industrial production.

The main problem in the export market is that there are information imperfections that cause consumers to practise statistical discrimination¹ against imports from developing countries. 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 the quality of the firms unless purchase has been made and also due to the fact that these exporting countries (like India) often lack internationally established brands. One of the key problems that exporting companies must overcome is these informational barriers to entry (Scherer, 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 or the firm offering it can credibly demonstrate that it is of superior quality. This puts exporters at least initially at considerable disadvantage vis-à-vis local incumbents.

¹ The theory of "statistical discrimination" of Arrow (1973) and Phelps (1972) was applied to grouping of potential employees by race, sex or creed may discourage a disadvantaged group's investments in human capital and perpetuate the practice of discrimination in a vicious circle.

Informational barriers to entry are likely to be especially important in consumer goods industries, such as consumer electronics, automobiles, household appliances and personal computers². In these industries, it is hard to assess the quality of a product by mere inspection³, and poor quality can impose large costs on consumers.

International trade in services, which is becoming increasingly important due to advances in communication technology, may suffer from this problem, too (Grossman and Horn, 1988). For many services, such as accounting, insurance, advertising and management consulting, the provider's reputation is one of the key factors in determining consumer's choice.

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 those countries can export markets.

The major explanation of this low-quality phenomena that has 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 q [$q = \alpha \cdot Q_H + (1-\alpha) \cdot Q_L$ where Q_H = high quality & Q_L = low quality].

² Another example is the market for film and photographic equipment. In Japan, the incumbent, Fuji Photo Film Company, holds a 70% market share and Kodak only 10% share. Coincidentally, the market share of Kodak and Fuji in the United States are almost exactly the reverse (Example taken from and Scherer 1993, Raff and Kim 1999). According to a New York Times (1996) survey of two dozen Japanese film retailers, the main barrier faced by Kodak in increasing its share of the Japanese market is informational. Consumers know Fuji's products, but do not know whether Kodak offers comparable quality. Moreover, the potential cost of consuming an inferior product may be quite high in the photo industry, especially when there is a chance that, as Scherer (1995), (pp. 25) notes, "a unique experience is recorded unsuccessfully."

³ If the true quality of the product is not known before purchase, we call them as "experience goods".

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. The presence of people in the market who are willing to offer inferior goods tends to drive the market out of existence and make export possibility much severe as in the case of Akerlof's automobile "lemons". Dishonest dealings tend to drive honest dealings out of the market. There may be potential buyers of good quality products who want to buy from the importers and there may be potential sellers who want to sell them 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 underdeveloped countries like India. There is a considerable evidence that quality variation is greater in underdeveloped than in developed areas. For example, in case of Indian leather manufacturer-exporters, leather production being a low investment, high turnover activity has lured many one-time leather workers or small leather traders to undertake small-scale production for export. However, the entry of these new exporters has had a negative effect on India's export markets as, for many of them, the main motivation is to garner the export incentives and build up capital in the shortest possible time rather than to establish a lasting reputation in the export market and supply shoddy products.

Rashid in 1988 ("Quality in contestable market") had made an empirical study on milk industry in Bangladesh and Baltimore. He came to the conclusion that in a contestable market⁴ if entry is easy then fierce competition between the large suppliers

4 Rashid gave example of Bangladesh where pure milk is hard to find. Several hundred peasants supply milk to the capital city Dhaka, from surrounding villages. The only fixed capital, cows, is readily salable in an active market. So both entry and exit are easy. And adulteration is widespread. In 1978 a local newspaper went so far as to publish photographs showing peasants from the village stepping on the wayside in order to adulterate their milk. Not only was the water added in public but it was from a local irrigation canal. A variant of this situation as in Rashid is -

will produce large number of cheaters because cutting prices becomes more important than improving product quality.

There is need for quality control of exports and State Trading Corporations to take care of the problem. This is the reason why ISO 9000 has a rapid rise to wide application the world over which is evident from the fact that as many as 99 countries have adopted them and more than 1,50,000 companies have been certified around the world. Today it is recognised internationally as a benchmark for measuring quality.

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 analyzing 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.

Our work tries to capture the importance of these business groups in Indian exports. When the 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. In this case, product prices will depend on firm reputation. There is a series of papers by Klein and Leffler (1981), Shapiro (1983), and Allen (1984). They mainly talk about individual firm reputation as an indicator of quality of the goods produced by individual firms. We want to check these individual firm reputation effects on its performance in the export market. Although the theoretical literature of firm reputation is well developed, few empirical studies exist that quantify the importance of quality and reputation effects on firm's product market performance. Landon and Smith (1998) have made an elegant empirical study to quantify the importance of reputation effects on the price of export. The current

reported in India where rice is sold with mixed pebbles. So great is the speculation in this line that small hawkers can be found next to large rice sellers whose only task is to provide them with pebbles!

work goes one-step further to show the importance of quality and reputation on the volume of exports.

Our study tries to capture various signals of firm quality and reputation to check whether quality matters in the export market or not. The signals that have been considered have taken from both the product market as well as the financial market. Real market signals considered are advertisement, marketing, distribution and ISO third party quality certification. Financial variables like issue of commercial paper and debenture are indicators of firm specific qualities and reputations. In this way, we have tried to establish the linkage between product markets and financial markets. We have a lot of evidence supporting the fact that financial decisions may drive product market outcomes. We have shown the direction of causality of the above linkage, which have remained unexplored in many empirical works of finance.

Models in which informed managers attempt to signal private information to the capital market have been used to explain a wide variety of corporate financial behaviour, including capital-structure decisions. Capital market imperfections raise the cost of external financing, the cash flows playing an important role in capital expenditure decisions. This is popularly known as “pecking order” theory of financing, whereby capital structure of a firm will be driven by the firms’ desire to finance new investments, first internally, next with low-risk debt, and finally with equity as a last resort. There are two approaches to cash flow theories—the managerial approach and the information-theoretic approach. In the managerial theory of investment, professional managers avoid relying on external finance, as it would subject them to the discipline of the external capital market and, therefore, the fundamental determinant of investment is the availability of internal investment. The managerial theory is based on the premise that managers have objectives different from those of shareholders. Managers do not maximise profits and shareholder wealth, but instead maximise the rate of growth of size of the firm. Given the separation of ownership and control (management), the managerial behaviour is discretionary and constrained rather weakly by shareholder-owner interests, on the one hand and by competitive market conditions on the other.

In the asymmetric information models, firm managers or insiders are assumed to possess private information about the characteristics of firm’s return stream or investment

opportunities. Myers and Majiluf (1984) showed that, if outside suppliers of capital are less-well informed than insiders about the value of firm's assets, equity may be mispriced by the market as it may associate new equity issues with low-quality firms. As internal funds and riskless debt involve no undervaluation of the firm's value, these (like commercial paper, debentures, loans from the development financial institutions DFIs (like IDBI, IFCI, ICICI etc.) will be preferred to equity. Similarly, models of Leland and Pyle 1977, Bhattacharya 1979, Miller and Rock 1985, account for corporate financial behaviour that is otherwise difficult to rationalise, and they are based on rational assumption that a manager has private information about firm's performance.

These models, like most in the finance literature, do not consider the markets other than the capital one in which firm operates. Gertner, Gibbons and Scharfstein (1988) showed that when a firm reveals information to the capital market, it often does so by a publicly observable action (such as a dividend) that reveals information to otherwise uninformed agents in other markets (such as product-market rivals). These agents then condition their behaviour on this information, and this affects the profit of the informed firm. When informed firm's profit is endogenously determined in this way, product-market considerations affect the informed firm's decision to reveal information through its financial policy. We capture these ideas empirically for the first time and try to show whether financial decisions in terms of financial signalling can affect the company's export performance. This way, we have tried to link the real and financial markets. Till date, there has been no empirical study, which address these issues especially with respect to the Indian firms.

There is ample theoretical work suggesting that good quality firms signal their quality by advertising. Foreign buyers, when they place large or bulk orders, are likely to check the balance sheet⁵ and other financial information of the exporters. Information on

⁵ A statement of the wealth of a business, other organization or individual on a given date, usually the last day of the financial year. A balance sheet of a company has two parts: assets and liabilities. The assets of the company –debtors, cash, investments and property-are set out against the claims or liabilities of the persons or organizations owning them and liabilities-creditors, lenders, and shareholders-so that the two parts of the balancesheet are equal. This is the principle of double-entry bookkeeping.

advertising can be obtained from financial statements⁶. The same is true of marketing expenditure. One can also argue that there are economies of scale in marketing. Firms that have established marketing channels may be able to access export markets better as well. Finally, on quality rating, it is well known that foreign buyers check the quality certifications (like ISO quality certificates) received by exporters.

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. 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. The same is true for debentures. Because of mandatory credit rating, debentures are like a certificate of financial health.

These issues have been addressed in our study by taking a panel data of 572 Indian firms over nine years (starts from 1989 to 1997). Logit and Tobit models fitted on the data confirm that these quality and reputation signals (advertisement, marketing, distribution, ISO certification, commercial paper, debenture etc.) have a significant influence in determining the probability of a firm to export in the next year. Other control variables like firm size, capital intensity play significant role in the export market. Moreover, we have taken care of any industry or group effects by introducing suitable dummies in the model. Industry dummies identifying the different industries take care of industry specific effects. Year dummies that have been taken to take care of time specific effects in the panel data identify different years. The results of the empirical analysis (based on panel data methodology) support the notion of a positive relation between quality signals and product market performance. We have found a strongly significant positive relation between export and profitability. We have used cash profit over total assets as the measure of profitability. We have used market to book value ratio as an approximation of the most widely used measure of market performance of firms, namely, Tobin's Q. The other important explanatory variable in our analysis is the Development Financial Institutions (DFIs) loan over total assets (DFITA) to check whether DFIs are

⁶ Traditionally and popularly, in India the term "Financial Statement" means Balance Sheet and Profit and Loss Account. However, the term is formally defined as a statement that contains financial information. It does not merely consist of Annual Report.

lending to promote export and domestic sales. This will link the firm's capital structure with its performance in the product market. What is interesting is that we have found DFITA is negatively significant for both non-business group and top fifty business group firms. This has interesting policy implications, which are relevant in the Indian context. Firms that are dependent on development financial institutions suffer from adverse selection problems in financial markets, and are unlikely to perform well in exports, as the markets are uncertain about quality of these firms. However DFIs often lend to promote socially desirable projects, so domestic growth of sales may be positively related to funding from these institutions. We have found that DFIs are not lending to promote exports. Our empirical result shows that DFITA (Debt from development financial institutions such as ICICI, IDBI over total assets) is significant for non-top fifty business group firms, but insignificant for top fifty business group firms in domestic sales. This make sense that large group firms have more established reputation in domestic markets, so the additional financial signal is not important for domestic markets. However, it is vitally important for independent or smaller group firms. For export market, loan from development financial institutions is more important for the top fifty business group firms than the non-top group firms.

Finally, we have tried to give answer to the empirical question: "should the same quality argument apply for domestic sales as well?" The Least squares model with industry and time effects is applied to get the answer.

The immediate concern of our dissertation is to address the causality of the linkage. The question is "are exports affected by debentures and commercial paper or is it the other way around?" To address this question, panel Vector-Auto regression (VAR) is eventually necessary, because the issue of causality will invariably arise. However, doing a panel VAR only on the firms with positive exports will give biased results. So we have tried to address the causality issue in a different way. We have run Logit and Tobit with one period-lagged values of the explanatory variables, rather than the current values. The idea of all these are to explore whether there is any causality in the other direction; i.e., exports explain debenture issues and so on. This is explained in Chapter 4 and Chapter 5. The rest of the dissertation is organised as follows: The following chapter briefly surveys the literature, which is of relevance to the current analysis. Chapter 3 describes the data,

explains the variables that are used in the analysis in detail and report the descriptive statistics. Chapter 4 explains the econometric models. Chapter 5 reports the results of the empirical analyses. Chapter 6 concludes the dissertation.

Chapter – 2

2. Review of Related Literature

As indicated in the previous chapter, the relationship between quality, reputation and firm performance has been a new research area. Firms have realized quality and reputation as necessary requirements for long-term survival in the competitive export market with heterogeneous products. Not only in the export market, their domestic sales performance is also sensitive to these quality issues. Price factor being no longer valid, in turned has caused the emphasis to be laid on quality encompassing safety, reliability, guarantee, performance, maintainability, durability and acceptability by the customers. There is an upswing of activity in the Indian industry due to liberalization of the Indian economy and the need to upgrade the quality to meet the global market requirements. As a result, aspects like productivity, efficiency, quality and competitiveness rather than just the price of the product have come to the forefront. These received impetus from national policies to encourage exports and strengthen the economy. To realise and consolidate the gains of liberalization, the Government has tailored its policies for promoting quality of goods and services. The policies focus on quality and accord it a prime place in the policy in order to win over the international customer's confidence by providing goods and services of consistent quality. Although the theoretical literature on firm reputation and quality is well developed, few empirical studies quantify the importance of quality and reputation effects on firm's performance in the export market. The present work investigates the relationship between quality and reputation signals to product market performance at an empirical level. Our study tries to capture various signals of firm quality and reputation to check whether quality matters in the export market or not under perceived quality uncertainty. Signals that have been considered have taken from both the product market as well as the financial market. Real market signals considered are advertisement, marketing, distribution and ISO third party quality certification (measures quality). Financial variables like issue of commercial paper (CP) and debentures (DEBEN) are indicators of firm specific qualities and reputations. These quality and

reputation aspects so far have not been addressed empirically with reference to the Indian scenario. In our panel Logit and Tobit analysis, we have been tried to examine the influence of these quality and reputation signals in determining the probability of a firm to export in the next year to check whether quality and reputation are of importance in the export market or not. In this way, we have tried to establish the linkage between the financial market performance and product market performance at the level of an individual firm. Price to book value ratio and cash profit over total assets measures firm's financial market performance. We have also taken care of any effect due to firm size, capital intensity and any group or industry effects. There is no such empirical work that has captured this linkage between the real market performance and financial market performance with Indian data.

From the literature it is quite evident that these quality and reputation signals are the most important factors that influence firm performance in the product market. A number of economists agree that capital structure and financial decision of managers influence the product market performance. But these are mainly theoretical papers. We for the first time have tried to capture the above linkage empirically. Section 2.1 discusses the various streams of arguments and the relevant evidences on how quality and reputation matter in the product market under information asymmetry about the quality of the firm. Section 2.2 reviews the relevant literature on quality and trade. Finally, section 2.3 discusses the ways in which the capital market can influence product market performance and the link between the two markets.

2.1. Quality, Reputations and Firm performance under Imperfect Information:

The main problem in the export market is that there are information imperfections that cause consumers to practise statistical discrimination against imports from developing countries. Products from such countries often lack internationally well established brand names. Consumers often associate the quality of such goods with their

country of origin. If consumers are, on average, correct about their perceptions of the quality of products from a country then “Lemons” effect emerges. Akerlof (1970), in his classic discussion of lemons in the automobile market relates quality and uncertainty for the first time. There are many markets in which buyers use some market statistics to judge quality of prospective purchases. Here in this case sellers might be interested to sale merchandise of poor quality since by the time the buyers realize the poor quality and stop buying. The returns the seller would get would be sufficiently high. Although the entire group (the firm belongs to) statistics would be affected instead of the individual seller. As a result there tends to be a reduction in the average quality of goods and also in the size of the market. It should also be perceived that in these markets social and private returns differ, and therefore, in some cases, governmental intervention may increase the welfare of all parties. The automobile market was used as a finger exercise to illustrate and develop these thoughts. Akerlof had given the example of used cars to capture the essence of the quality uncertainty problem under asymmetric information. For the sake of clarity, he took four kinds of cars for example. There are good cars and bad cars (which in America are known as “lemons”). A new car may be a good car or a lemon and of course the same is true of used cars. An asymmetry in the available information has developed because sellers have more knowledge about the quality of a car (as quality is endogenous) than the buyers. Good cars and bad cars will be sold at the same price since it is impossible for a buyer to tell the difference between a good car and a bad car. So once a buyer buys a bad car, the buyer will be eager to dispose it off more quickly than if he buys a good car. Thus in the used car market most cars that will be sold are bad cars. And since most buyers buying cars in the used car market will perceive the car to be bad, a good car will get a much lower than expected price. So ultimately most cars traded will be the “lemons” and good cars may not be traded at all. The “bad” cars tend to drive out the good as bad money drives out the good by Gresham’s Law. Bad cars drive out the good because they sell at the same price as good cars due to information asymmetry and this causes market failure for good cars. Thus, a firm, which pays the full cost for quality improvement, will receive only diluted benefits in return, while all competitors gain by free riding. This creates adverse selection problem, as product quality is endogenously determined. Suppliers know their product quality, but foreign buyers do not know the

quality unless purchase has been made. One of the key problems that exporting companies must overcome are these informational barriers to entry. Since experimenting with different products is costly, consumers who learn the benefit of consuming a product from experience typically know only one or at most few brands and, if consumers find the locally produced brands to be of satisfactory quality, they may not try an imported product unless it is considerably cheaper or the firm offering it can credibly demonstrate that it is of a superior quality. This puts exporters at least at considerable disadvantage vis-à-vis local incumbents (Scherer, 1995; Raff and Kim, 1999). 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. Now what can be done to prevent this? This is, of course, only one of a number of similar situations where one individual is in a position to cheat or otherwise take advantage of another. A worker can shirk on his job, thus in effect cheating his employer of the promised labour service. A borrower can abscond with the lender's money. In all of these situations, there is either no explicit contract or, if there is a contract, it is sufficiently costly to resort to legal processes that are not viewed to be a viable recourse.

In spite of widespread complaints about the prevalence of cheating, it is perhaps more of a surprise that it does not occur more frequently than it does. Why do "rational" individuals not take advantage of others, when they have the opportunity to do so? Do we need to rely on vague notion of "morality" or "social pressure?" Economists at this juncture are wanted to introduce the notion of *reputations*: firms produce high quality commodities because they fear the loss of reputation will do greater harm than the slight temporary advantage of cheating.

Models of reputation focus on goods, which the individual purchases repeatedly, on what Nelson (1974) has called "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, 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). 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, 1983) and Von Weizacker (1980), who assume that individuals extrapolate past behaviour to make inferences about likely future behaviour.

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 that obviously happens in the export market. Reputation is one of several mechanisms by which the potential problems arising from consumers’ inability to observe perfectly product quality prior to purchase become ameliorated. In our work, we have taken both firm level reputation and group reputation as signals of the quality of the firms. This form of reputation is consistent with that used in the theoretical studies of Klein and Leffler (1981), Shapiro (1983), and Allen (1984).

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. In this context, we have introduced business group dummies to take care of the group reputation effect on export performance. 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. Although the theoretical literature on reputation is well developed, there have been few attempts to empirically quantify the magnitude of reputation effects. Landon and Smith (1998) have made an elegant empirical study to quantify the importance of reputation effects on the price of export. The current work goes one-step further to show the importance of quality and reputation for export performance. Our empirical study tries to capture various signals of firm quality and reputation to check whether quality matters in the export market or not. These signals are coming from both the product market as well as the financial market, in this way we have tried to establish the linkage between the product market and financial market.

2.1.1. Signals of Firm Quality:

When the 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. We have taken some financial variables that signal firm’s reputation. These reputation signals are as follows:

Commercial Paper: 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, i.e., in the event of default; the bank will assume the liability of the company to repay the lenders. 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. Hence commercial paper often conveys information about firm reputation. So we have taken it as a signal of firm quality. The detailed are discussed in chapter 3.

Debenture: Debenture is a commercial document, representing a certificate of long term debt issued by the company in order to raise capital and sold to investors. Because of the mandatory credit rating, debentures are like a certificate of financial health of a company. The firms that issue debentures or commercial papers have to pass the scrutiny of credit rating agencies or banks (that guarantee the commercial paper loan). Thus, they presumably reflect “ quality ” of the firm issuing these financial instruments.

Myres and Majluf (1984) showed that, if outside suppliers of capital are less well informed about than insiders about the value of firm’s assets, equity may be mispriced by the market as it may associate new equity issues with low-quality firms. As internal funds and risk less debt involve no undervaluation of the firm’s value, these short term (like commercial paper) and long term debts (like debentures, loans from the development financial institutions DFIs like IDBI, IFCI, ICICI etc.) will be preferred to equity.

In Ross’s (1977) model, managers know the true distribution of firm returns, but investors do not. Firm return distributions are ordered by first order stochastic dominance. Managers benefit if the firm’s securities are more highly valued by the market but are penalised if the firm goes bankrupt. Investors take larger debt levels as a signal of higher quality. Managers can commit to paying dividends and suffer a penalty if the promised dividend is not paid. Ravid and Sarig (1989) considered a combination of debt and dividend commitment. They have shown that both dividend and debt level increase with firm quality. Since lower quality firms have higher marginal expected bankruptcy costs for any debt level, managers of low quality firms do not imitate higher quality firms by issuing more debt.

Another model that uses debt as a signal is that of Poitevin (1989) which involves potential competition between an incumbent firm and an entrant. The entrant has information about its marginal cost, which the incumbent doesn't know. In equilibrium, low cost entrants signal this fact by issuing debt while the incumbent and high cost entrants issue only equity. The cost to a firm of issuing debt is that it makes the firm vulnerable to predation by the other firms, possibly resulting in bankruptcy of the debt-financed firm. The benefit of debt is that the financial market places a higher value on the debt financed firms since it believes such a firm to be low cost. High cost entrants will not issue debt since the resulting probability of bankruptcy is too high.

Some real variables have been used in our empirical analysis as signals of firm quality. They are as follows:

Certification: In many markets, consumers may rely on information specialists, experts, to screen various products, to certify their qualities. The economics of certification, including who bears the cost, and the circumstances under which it does and does not pay to become certified, are discussed at greater length in Stiglitz (1989). Narueput & Sethaput (1994) theoretically explained the role of quality certification as signalling for developing country exports. We have introduced ISO (International Organization for Standardization) third party certification dummy that signal quality of the firm in spirit of Stiglitz for our empirical analysis for the first time. The dummy takes value one if company has ISO certificate in a particular year and zero if it has not. The rationale for using ISO as signals of firm quality and its wide spread use in India and abroad are discussed in chapter 3.

Advertisement: There is ample theoretical work (Akerlof 1970, Brozen 1974, Grossman and Shapiro 1984) suggesting that good quality firms signal their quality by advertising. Advertisement signals producing firm's commitment to his product as foreign buyers placing large or bulk orders are likely to check the balance sheet and other financial information of the exporters. Advertising is important when consumers lack information

about the quality of the firm. Firms use advertising to inform potential customers about the existence, characteristics, and prices of the commodities they offer.

In a series of provocative articles, Nelson (1970, 1974, and 1978) has suggested that advertisement is a useful positive message to prospective customers. Nelson differentiated between products on a “search good” versus “experience good” basis. With the former, the relevant characteristics of the product are evident on inspection, and, because there is little scope for misinterpretation, ads for them can be directly informative. With the latter, crucial aspects of the product’s quality are impossible to verify except through use of the product. Thus, unless the product is given away, one must buy without really knowing what one is getting. In such a circumstance, a seller’s claims to be offering high quality are unverifiable before purchase. In the absence of strong and sure penalties for misinterpretation, such claims can be freely copied. They are consequently meaningless, and consumers will rationally ignore them. As a result, ads for such a product cannot credibly convey much direct information about the product. Yet it remains in the interest of the consumers to identify high-quality goods and the producers of these “best buys” to make themselves known. The question of how advertising affects sales where products are differentiated by quality is a complex one, and we can only consider some of the issues here that we have tried to capture in our empirical work.

Nelson’s crucial insight was that the mere fact that a particular brand of an experience good was advertised could be a signal to customers that the brand was of high quality. It is clear that if high quality brands advertise more and if advertising expenditures are observable, then rational, informed consumers would respond positively to advertising, even if the ads cannot and do not have much direct informational content. What then is needed to complete the explanation is a reason why advertising should be differentially advantageous for high-quality sellers so that they will be willing to advertise at levels that low-quality sellers will not mimic.

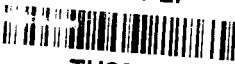
The factor on which Nelson focused to provide this linkage was repeat purchases. He argued that, because a high-quality product is more likely to attract repeat purchases, an initial sale is, *ceteris paribus*, more valuable to a high-quality producer, and such a firm would be willing to expend more-on advertising or whatever-to attract an initial sale.

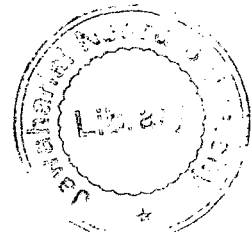
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quality firms finds that it is not. Encouraged by the idea of Nelson, Mil-grom and Roberts (1986) offered a modelling based on the repeat sales mechanism in which they have taken both prices and advertising as signals of quality. They have shown that in equilibrium both may simultaneously be used as signals, with the chosen levels of both prices and advertising differing between high and low quality firms. Kihlstrom and Riordan (1984) present an interesting model of advertising as a signal. In their model, however, firms do not choose prices. Instead, a firm's advertising alone determines whether customers believe it to high or low quality, and once this assignment to one or the other submarket is made, prices are determined via a standard supply and demand model. In equilibrium, prices in fact, end up being correlated with quality but are not used to infer quality. Klein and Leffler (1981) offer an alternative, complementary explanation for introductory advertising. In their formulation, quality is a choice variable, and the problem is to motivate firms not to cheat by cutting quality. The incentive to maintain quality comes through positive mark-ups and repeat sales, which are lost once cheating is discovered.

In the present empirical work we have found that advertising is acting as true quality signals and it's effect on sales in the export market as well as in the domestic market is much more pronounced. The success of advertisement to convey the information about high quality to the buyers is very much related to 'marketing' and 'distribution' capacity of the firm. Hence we have introduced these variables as additional signals of firm quality. What is more interesting is that advertisement, marketing, distribution are highly correlated with total sales. So we have divided them by sales and used intensity (like advertisement intensity, marketing intensity, and distribution intensity) instead of the level in our analysis to avoid the multicollinearity problem.

Marketing & Distribution: Producing a good quality product which responds to the needs of consumers is not the only issue that a company can face in the foreign markets. How to enter the market and sell the product is also a big task. To sell their products in the foreign markets, companies usually need to establish their marketing and distribution

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networks that on the one hand fit with the local market conditions and on the other facilitate their entry to the market and enhance their sales operation. Marketing in a business directly involves contact with the consumer and assessment of his needs, and translates this information into outputs for sale consistent with the firm's objective. Hence it is a good signal of firm's quality (Milgrom & Roberts 1986). Successful marketing requires the use of intermediaries, agents and distributors. Because of the local market and legal factors, even large corporations that usually sell directly in other overseas markets find these local partners indispensable for sales promotion. These local and exclusive agencies are owned totally by nationals of the host country. Thus, marketing and distribution variables can be interpreted as "economies of scale" variables. Nigel, Katsikeas, Constantine, Cravens and David (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.

The critical challenge for most Indian corporations is therefore how to distribute and market the products to scattered consumers in both the domestic and foreign markets. Most corporations tend to rely on a mix of distribution channels like exclusive distributors, distribution houses, wholesalers and retailers to ensure the availability of their products in their domestic as well as in the export markets (Aneja 1996). New entrants either build their own distribution channels from the production centres to the customers, or tie up with existing manufacturers of similar products. For instance, Pepsi has built its exclusive dealer infrastructure to distribute soft drinks in India. However, Coke tied up with an existing local manufacturer to get a distribution apparatus expeditiously. Building one's own exclusive distribution network is time-consuming. But, in the long run, it is certainly provident to have dedicated channels like distribution houses, exclusive distributors, wholesalers, semi-wholesalers, and professional retailers etc.

2.1.1. Quality Problem in the Product Market and Other Signals of Firm Quality: Role of business groups:

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 those countries can export. There are many markets in less developed countries (LDCs) that persistently suffer from variable and poor quality. Rashid (1988) provides an interesting documentation of several such cases, ranging from non-uniform quality cloth in the pre-Industrial Revolution England to diluted milk and pebble-blended rice in contemporary less developed countries. Suri (1988) also reports a well-documented case where small, labour-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. A notable common characteristic of the cases examined by Rashid is that they are all markets with a multiplicity of small producers and with free entry.

Akerlof (1970), who has also been puzzled by his observations of quality problems in India, seems to suggest that the scarcity of entrepreneurial skills may prevent LDC producers from building up reputation and capitalising on honesty. However, according to Esfahani (1991) it is rather difficult to believe that the pursuit of simple rules of honesty should require greater skills than the conduct of a business based on cheating. Moreover, it seems natural that consumers should punish dishonest sellers by not buying from them and reward the honest ones by showing willingness to pay for the quality they offer. Such buyer behaviour should instinctively teach the value of reputation to sellers. It is true that such mechanisms may not work where consumers cannot identify sellers or do not make repeated purchases.

Quality problems may also persist if a group of consumers fails to gather information about sellers' reputations, and thus falls victim to the dishonest ones [Salop and Stiglitz (1977), Grossman and Stiglitz (1980), Chan and Leland (1982), Cooper and Ross (1984), Schwartz and Wilde (1985)]. In this class of asymmetric information, there

is always an informed group of consumers that supports the business of honest sellers and keeps the market for the high quality products.

Unreliability and variability of product quality is an integral part of the quality problem in LDC markets [Bardhan and Kletzer (1984)]. Consumers seem not to have given up on finding quality, so when they receive low quality products they feel cheated.

Dishonesty in business is a serious problem in underdeveloped countries like India. Many suppliers try to make fast buck by supplying shoddy products, which is one of the reasons for the poor image of Indian products in the world market. Many importers of the consuming countries are loath to believe that their products are of high quality. This causes information barrier for the entry of good firms for further exports. There is a need for quality control of exports and State Trading Corporations to take care of the problem. In this context, role of third party quality certification like ISO 9000 is very crucial. The International Organization for Standardization (ISO) is the specialized international agency to promote the development of standardisation and related world activities to facilitate the international exchange of goods and services, and to develop co-operation in intellectual, scientific, technological, and economic activity. However, ISO 9000 registration is not a legal requirement for access to foreign markets, but it can be beneficial for the good quality sellers to give the right signal to the buyers of the importing country. International and National competition is tougher and companies must struggle continuously to provide quality products and services at a lower cost. The present day customers have high awareness and expectation regarding the quality of the product or service being procured. The supplier should provide confidence or assurance to the customer that the expected quality is being achieved, or will be achieved. Providing such confidence may involve producing evidence. Providing such confidence may involve producing evidence. Certification is one of the major forms of such evidence. The ISO families consists of standards and guidelines relating to management systems, and related supporting standards on terminology and specific tools, such as auditing. In the chapter 3 we have discussed these issues in detail. Briefly, 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 recognised internationally as a benchmark for measuring quality. To the

supplier, it is invaluable to be able to provide objective evidence that he operates an effective quality system that has been examined and approved by an independent and well-qualified third party certification body. Increasingly, customers are accepting supplier quality system registration from an accredited third party assessment based on these standards. Hence, the certificate helps the consumers to distinguish between the various classes of suppliers and reduce the adverse selection problem, particularly in high-tech areas, where product reliability is crucial. If two suppliers are competing for the same contract, the one with ISO 9000 registration will have a competitive edge with some buyers since a third party registrar accredits him. The certifying bodies have qualified auditors, panel experts in all industrial sectors covered and quality analysts who perform periodic surveillance to assure that company's quality system is being maintained.

Thus, the good companies may be able to restrict the cheaters and overcome the information barrier by providing good quality signals, as discussed above. They will use quality certificates to establish their reputations in the export market as well as in the domestic market or internalise the information externality through industrial consolidation. Chiang and Masson (1988) have shown that the statistical discrimination by the buyers due to information asymmetry leads to sub-optimal international trade equilibrium. The country may be able to raise its welfare through more export by using export quality standards or by internalising the externality by 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 (e.g., Chaebol in Korea) 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 the presence of business groups leads to less product variety but higher product quality, using data on export from these countries to the United States. In their empirical results, they have found that Taiwan exports a greater variety of products to the US than Korea, and this holds particularly for final goods. This fits the pattern of business groups in the two economies, which are located principally in the upstream sectors of Taiwan. Taiwan tends to focus on niche markets for its products, while

changing product design to meet the demands of overseas purchasers. In contrast, Korea tends to aggressively market particular products (such as Hyundai car, or microwave ovens), with high volume of production but more limited product variety. Japan exceeds either of these countries in product variety, which can be explained by its very large group size. The smaller size of Taiwanese business groups and their focus on intermediate inputs are two of the major distinctions between the Taiwanese and Korean business groups. Although both economies are heavily export oriented, the largest business groups in each economy occupy very different structural locations. The Korean chaebol dominate in the export sector, and the biggest business groups in Taiwan produce intermediate goods that are sold domestically. We have tried to capture the importance of Business groups in Indian exports. For this, we have tried to examine the behaviour of group firms (top fifty largest business groups) and non-group firms (unaffiliated firms) separately in the export and domestic market.

2.2. Quality and Trade:

The analysis of quality differentials in international trade is particularly important. Such differentials are a new source of comparative advantage while the classical ones, like different factor endowments or unit labour cost differentials, do not apply to industrialised countries which are becoming increasingly similar in these respects (Krugman, 1981). Policy-makers in Less Developed Countries (LDCs) are concerned that the volumes of trade their countries can achieve with Developed Countries (DCs) is very low. One reason for this concern is that the quality of LDC export is so low that consumers of developed countries do not want them, and at the same time developed country consumer goods are too expensive for LDCs consumers. This concern is ill founded in a Heckscher Ohlin trade model, where very different countries such as those of Developed and Less Developed world must have plenty to gain from trade. In this model, labour intensive goods would flow from LDCs to DCs and capital intensive goods would flow back.

In the traditional international trade literature, the modelling of exports consists of a demand function in which the volume of trade usually depends on income and relative prices. Nevertheless, the development of modern theories of international trade in the last two decades gave rise to a major revolution, which led to the introduction of industrial organization variables into the analysis. Variables like technological effort, advertising, marketing, distribution and publicity expenditure have been introduced in the empirical analysis of trade.

In a pioneering work, Murphy and Shleifer (1997) have presented a model of trade in which similar countries trade more with each other than with very different countries. The reason is that high human capital countries have a comparative advantage at producing high quality goods, but are also rich enough to want to consume high quality goods. As a result, countries choose trading partners at a similar level of development who produce similar quality products. They took example of less developed Eastern Europe and developed Western Europe. High income countries of West Europe both produce and demand high quality goods where low income countries of Eastern Europe both produce and demand low quality goods. More specifically, countries rich in human capital produce high quality goods, but also demand high quality goods because human capital makes them wealthier. On the other hand, countries poor in human capital produce low quality goods because they have low skills and so can't make high quality goods efficiently, and also prefer lower quality goods than what rich countries do because they don't want to spend too much on quality. In principle, rich countries could produce lower quality goods for export to poor countries in exchange for grain, steel or other goods for which achieving quality is not as human capital intensive. In this context, they have argued that countries rich in human capital typically have a comparative disadvantage at lower quality goods relative to high quality goods and therefore can't profitably export them to poor countries. In their model, human capital provides the link between tastes and endowments that was missing in the standard trade models.

To illustrate this idea, they gave example of Car market. As the failure of Yugos and Ladas in the West illustrates, Westerns do not want East European cars even at low prices. East Europeans clearly do not have a comparative advantage at cars. But why don't western countries make inferior versions of their own cars at home and export them

to Eastern Europe? The point they have shown is very interesting: they would be too expensive for most people in Eastern Europe and Russia. For example, Volkswagen probably can't offer even the simplest car made in Germany for less than \$5000. In 1994, this amounted to 10 years' income for an average Russian worker. Some Russians can surely afford VWs or even BMWs, but there are not many of them. The point is that new Western cars are too expensive for virtually all Russians, who can't afford such luxuries. Eastern and Western Europe are too different for substantial amount of trade in cars to take place. This is also true for trade between developed (USA, UK, Germany etc.) and less developed countries (like India).

More generally, because countries are good at producing the quality not far from the one they demand, similar countries trade more with each other than very different countries as far as quality issue is concerned as suggested by Linder (1961), Linder's result that similar countries trade more with each other has been derived by Markusen (1986), who argued that richer countries produce capital-intensive goods because of high quality, but also demand capital-intensive goods because these goods have more than unit elastic income elasticity. Murphy and Shleifer's theoretical model is related to Markusen's but stresses on quality rather than capital intensity of goods, as well as human rather than physical capital.

A large literature in price theory in general and trade theory in particular looks at the quality of goods. The hedonic approach of Lancaster (1966) assumes perfect substitutability between quality and quantity of a good, so only the product of quantity and quality enters utility. Taken literally, this means that a wealthy German would be indifferent between driving ten Ladas and one BMW. If quality and quantity are imperfectly substitutable, as many quality-trade models assumes, the wealthy German wants only one good car rather than many bad ones and poor Russian want a low quality car rather than a German car one day a month.

Since Vernon (1966), the role of product quality in International Trade has been extensively studied. Flam and Helpman (1987) present a model of trade with many qualities of goods, and also discuss the effect of income distribution on trade. Bond (1984) has presented a model of international trade in which consumers are unable to

determine the quality of individual products until after the purchase has been made and examined the impact of quality uncertainty on the gains from trade. As in the pioneering work of Akerlof (1970), he assumed that consumers base their expectations about quality on the average quality of products in the market. International trade is introduced by allowing the average quality of products to differ between home and foreign produced goods. He has shown that if products are not distinguished by origin, the country with high quality products may lose from trade if it imports low quality products. This result arises from the fact that the importing of low quality products reduces the average quality of products in the market, which spills over to affect the expected utility of all consumers in the importing country. If consumers differ in their willingness to pay for quality (he assumed unequal income distribution), this spill over effect can reduce national welfare. Accordingly, he has suggested that the preferred policy would be labelling or product regulation that will allow consumers to distinguish home and foreign products so that the products will be sold for different prices in equilibrium. A large literature on intra-industry trade (Helpman & Krugman, 1985) focuses on increasing return as the motive for trade, and explains why rich countries trade more with each other than with poor countries. These models, however, do not generally focus on differences in demand patterns. At present, the analysis of quality differentials in international trade is particularly important. Such differentials are a new source of comparative advantage. Most recent work in this area includes Zarzoso and Sinclair (1997) at the forefront. Their paper made a first step towards exploring the importance of product quality and preference bias, as determinants of export demand. Their paper studied the determinants of the demand for exports in different markets. They set up a theoretical model to show how the relative demand for exports of a product variety increases when its relative quality rises and when the taste for this variety is more pronounced. They adopted a framework of imperfect competition where product differentiation may well be an additional form of competition. A country may shift its export demand curve outwards by increasing the variety and quality of the goods produced. Similarly, a country can shift its import demand curve inwards by increasing the quality and diversity of its products. The model is then tested empirically for Spanish manufacturing exports to the European Union using panel data methodology. The theoretical importance of these factors in

explaining the evolution of trade flows derives from the new trade theories outlined by Krugman (1983) and Helpman and Krugman (1985). Grossman and Helpman (1991) built a model where consumers choose between goods on the basis of both quality and price. They acknowledged the role of variety but also stressed the importance of product quality. In their model, increasing R&D expenditure enables firms to manufacture new products and move up the quality ladder. Published empirical work on India is relatively limited in this field. Most empirical trade studies focus on the analysis of aggregate export and import functions thereby neglecting the microeconomic aspects. Our work tries to capture the importance of these non-price factors, derived from industrial organization and finance, on Indian export using a panel data approach. There is very little known about how important non-price determinants of trade really are in both a quantitative and aggregative sense. Schott and Pick (1984) made an empirical study of British exports and imports. They used both cross-section and time series data within a panel data framework to empirically capture the importance of non price factors like quality and reputation on United Kingdom export and import performance.

2.2.1. Increasing the focus on quality as the basis for a dynamic evaluation:

The notion of quality has become increasingly important in economics during the past decade. At the macroeconomic level, it has become obvious that the advanced industrialised countries can compete with countries well endowed with cheap labour only when they climb up the “quality ladder” by producing ever more sophisticated products. The competition between Mexico and the US, between the former socialist countries and Western Europe, as well as between China or the Philippines and Japan cannot be countered by lower wages. Grossman and Helpman (1991) provide such a model, in which the South is imitating the North, using lower wages to threaten its position. The North can regain its advantage through innovation, and both countries are thus consecutively up the quality ladder. This proves the fact that price factor is no longer important.

Microeconomics tells us that the willingness to pay, on the part of the consumer, can be increased by horizontal or vertical product differentiation. Horizontal product differentiation leads to a price premium, due either to value placed by consumers on diversification as such (love of variety approach), or because a specific new product comes nearer to the ideal variety preferred by some consumer (preferred variety approach). Product innovation results in a product assessed as superior by all consumers (vertical product differentiation). At a given regional market, products at different prices can coexist, if they have different product attributes. Tirole (1989) discussed a theoretical model in which different tastes lead to product differentiation. In a series of contributions Shaked and Sutton (1982, 1987) established a model in which income diversity leads to product differentiation. The latter model permits the sequential choice of quality by two firms in the first stage of game. The first firm chooses the high-quality line and the second firm the low-quality segment; markets are cleared by price competition in the second stage of the game. Prices are different for different qualities in equilibrium, and the number of firms is limited from above, even for a market increasing in size. Aiginger (1997) made an empirical study using the unit value of exports to discriminate between markets in which the quantity traded depends more on price competition and those markets in which the quantity traded depends more on non-price competition. The unit value of export measure enables them to judge competitiveness for broad industries as well as to trace its sources and structures in narrowly defined product markets. He took example of German economy to provide an easy way to discriminate between industries in which low unit value signal low costs and those industries in which high unit values signal high quality or highly processed goods.

2.3 Link between the Product market and Financial market:

Models in which informed managers attempt to signal private information to the capital market have been used to explain a wide variety of corporate financial behaviour, including capital structure decisions. Capital market imperfections raise the cost of external financing with the cash flow playing an important role in capital expenditure

decisions. This is popularly known as “pecking order” theory of financing, whereby capital structure of a firm will be driven by firms’ desire to finance new investments, first internally, then with low risk debt, and finally with equity as a last resort. A business firm can raise capital from various sources. Long-term funds can be raised either through issue of securities or by borrowing from certain institutions. Short-term funds can also be borrowed from various agencies. Thus business units can raise capital from issue of securities and borrowings (long-term and short-term). The borrowers and lenders are brought together through the financial markets. The term “financial market” collectively refers to all those organizations and institutions which lend funds to business enterprises and public authorities.

There are two approaches to the cash flow theories—the “managerial approach” and the “information” theoretic approach. In the managerial theory of investment, professional managers avoid relying on the external finance, as it would subject them to the discipline of the external capital market and, therefore, the fundamental determinant of investment is the availability of internal investment. The managerial theory is based on the premise that managers have objectives different from those of shareholders. Managers do not maximise profits and shareholder wealth, but instead maximise the growth rate of size of the firm. Given the separation of ownership and control (management), the managerial behaviour is discretionary and constrained rather weakly by shareholder-owner interests, on the one hand and by competitive market conditions on the other.

In the asymmetric information models, firm managers or insiders are assumed to possess private information about the characteristics of firm’s return stream or investment opportunities. Myres and Majluf (1984) showed that, if outside suppliers of capitals are less well informed than insiders about the value of firm’s assets, equity may be mispriced by the market as it may associate new equity issues with low quality firms. As internal funds and riskless debt involve no undervaluation of the firm’s value, these (like commercial paper, debenture, and loans from the development financial institutions DFIs like IDBI, IFCI, ICICI etc.) will be preferred to equity. Similarly, models of Leland and Pyle (1977), Bhattacharya (1979), Miller and Rock (1985), account for corporate financial behaviour that is otherwise difficult to rationalise, and they are based on rational assumption that a manager has private information about firm’s performance.

These models, like most in the finance literature, abstract from the other markets in which firm operates. Gertner, Gibbons and Scharfstein (1988) showed that when a firm reveals information to the capital market, it often does so by a publicly observable action (such as dividend) that reveals information to the otherwise uninformed agents in other markets (such as product market rivals). These agents then condition their behaviour on this information, and this affects the profit of the informed firm. When informed firm's profit is endogenously determined in this way, product market considerations affect the informed firm's decision to reveal information through its financial policy. They have theoretically modelled information transmission as a signalling game that links both the capital and product market. The informed firm offers the uninformed creditors a menu of financing contracts (debt or equity). The creditor chooses either to accept or reject the menu. If the creditor accepts the menu, then firm chooses a contract from the menu that signals the uninformed firm in the product market. This leads to a signalling game in the product market. Their model is closer in spirit to the asymmetric-information models used in the finance literature, and this enables them to identify the changes in equilibrium financial structure that occur when product-markets effects are included. In the present work, we have captured their ideas empirically for the first time and tried to show whether financial decision in terms of financial signalling can affect company's export performance. This way, we have tried to link the real and financial markets at micro level.

Bhattacharya and Ritter (1983) also consider the informational links between the product and capital markets. They have analyzed a model in which a firm needs to raise capital for an R&D (Research & Development) project. The firm's uninformed rivals observe information revealed to the capital market about the firm's technology. Bhattacharya and Ritter 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 signalling on product market competition. They show that the choice among alternative compensation schemes by an informed manager of an incumbent monopolist can affect the entry decision of a potential competitor. In their model, however, the incumbent's shareholders contract with

the manager before the manager becomes informed, so that subsequent game between the manager and the potential competitor is a standard one-audience signalling problem.

A few other papers studied the interplay between the product and capital markets. Bolton and Scharfstein (1988) analyzed the product-market effects of moral-hazard problems in the capital market. In particular, they showed that such capital-market imperfections could provide a rigorous rationale for the long-purse theory of predation. Allen (1986), Brander and Lewis (1986) and Maksimovic (1986) considered models in which a firm's capital structure affects its probability of bankruptcy, and therefore also strategic incentives in the product market. There is no information transmission in these models, however, because they assumed complete information.

Chapter – 3

3. Description of the Data

3.1. Data Source and Sample:

To evaluate the linkage between firm's product market and financial market performance, our study uses firm-level panel data for 572 Indian firms listed in the Bombay Stock Exchange¹. The data set was observed over Nine years (from 1989 to 1997). The empirical analysis is done with data extracted from two sources: Corporate database in electronic medium compiled by the Centre for monitoring Indian Economy (CMIE) called Prowess, and a database software called Capitaline Olé and its updated version Capitaline 2000 developed by Capital Market Publishers (I) Ltd. We had to check the balance sheet and profit and loss account of individual companies. Then we pooled the data in balanced format that combines time series (9 years) and cross section (572 companies). So our longitudinal data set contain 5148 observations. Pooling cross-sectional units does have certain advantages in the field of applied research. For example, its use provides the researcher with a large number of Observations leading to improved efficiency of econometric estimates. With additional, more informative data, one can get more reliable estimates and test more sophisticated behavioural models with less restrictive assumptions. Another advantage of panel data sets is their ability to control for individual heterogeneity. Not controlling for these unobserved individual specific effects leads to bias in the resulting estimates. Panel data sets are also better able to identify and estimate effects that are simply not detectable in pure cross-sections or pure time series data. In particular, panel data sets are better able to study complex issues of dynamic behaviour (Hsiao 1986, Baltagi 1995). Another advantage is that the researcher is able to

¹ The Bombay Stock Exchange Sensitivity Index: 1981=100 is the most popular share price index in India.

undertake in depth analysis of complex econometric hypothesis by controlling for influences corresponding to both individual and time specific effects.

The ISO (International Organisation for Standardisation) data were collected from Q-Prod's directory, which is a very authentic one. The principal limiting factor was the availability of data on year in which listed companies received the ISO certification. In conjunction with the guidance provided to us by officials of the Total Quality management Institute and INFOTECH of India, we were able to collect the ISO data. In some cases, we had to pay to collect the relevant information on ISO. Other relevant data was extracted from Capitaline. It should be pointed out that the companies in the above sample contain many industries. So we have clubbed them in 22 Industry dummies for estimation purpose.

Unfortunately, it is very difficult to check whether there has been any bias in our sample. However an overall glance at the descriptive statistics of the sample at various levels of elimination made us feel that there is no reason to believe that there is any bias. Moreover, the sheer size of the sample makes the results reasonable general. It may be noted that, to the best of our knowledge, there has been no empirical work on Indian data with such a large data set to check the linkage between the firm level performance in the product market and financial market at empirical level.

3.2. Description of Variables:

The variables used in our analysis are listed in the Appendix: A.

A. Measure of firm performance:

- (i) ***Product market performance:*** The following variables are used to measure real market performance of companies:

Dummy for next period export: The variable is defined by $Dexp [n+1]$.

$Dexp [n+1]=1$ if firm exported in the next year i.e., $Xgds_{n+1}>0$ & $Dexp [n+1]=0$ if did not. Where $n=1,2,\dots,8$. We have taken it as dependent variable to predict the probability of exporting in the next period as a measure of performance.

Export Performance in the next period: Export of goods and services in the next period ($Xgds[n+1]$) measures firm's performance in the export market.

Current period export performance: $Xgds$ is the level of export in the current period also measures firm's export performance.

Domestic Sales performance: Domestic sales (DOMSAL) measures firm's performance in the domestic market. It is total sales minus total export (TX-SALES). The larger the domestic sales, the higher the probability of reaping the benefits of large-scale production without incurring the extra costs usually associated with exporting. Exporting is likely to enable firms, especially those in LDCs, to reap economies of scale in production by relaxing the constraint of market size (Basevi 1970, Frenkel, 1971, Caves 1974, and White 1974). Thus, a positive correlation can be expected between domestic sales and exports.

Domestic sales in the next period: The variable Domestic sales in the next period (DOMSAL $[n+1]$) measures sales performance of firms in the domestic market. Firm is doing well if it experiences more rapid growth in domestic sales.

Total Sales Growth: The variable GRSAL1 is growth of sales lagged one period measures sales performance. This variable captures aspects of industry level as well as general business-cycle-related conditions that influence individual firms. This actually helps to control for industry level as well as business cycle factors.

$$GRSAL1 = (S_t - S_{t-1}) / S_{t-1}$$

S = Total sales.

Export Dummy: Finally, we have taken dummy for exports >0 (Dexp) as explanatory variable in the logit regression set to address the causality issue. Dexp=1 if Xgds >0 and Dexp=0 otherwise.

(ii) **Financial Market performance:** The following variables measure the financial market performance of companies:

Price to book value ratio (PB) is used to measure the true performance of a company. It is defined as the ratio of market value of a company's equity at the closing price of its share in the financial year ended to the book value² of equity plus reserves and surplus at the same time point. It is a close approximation of the most widely used measure of performance, namely, Tobin's Q. Tobin's Q is defined as the ratio of market value of equity plus market value of debt to the replacement costs of assets. It is labelled as the true measure of performance as it not only takes into account the current performance of the company but also its expected future prospects. In developing countries like India, a substantial portion of corporate debt is raised through borrowings from nationalised banks and government owned financial institutions, which are not actively traded in the debt market. Hence, it is impossible to calculate a satisfactory figure to represent the market value of debt. Primarily due to this reason, PB has been used as a measure of performance in a number of earlier studies on developing countries, e.g., by Xu and Wang (1997) in a study on China, and Khanna and Palpepu (1996) and Sarkar and Sarkar (1998) on studies with Indian corporate sector. Capon, Farely and Hoeing (1996, pp54) also uses PB as a measure of market assessment of a companies performance. Smith

² Book value of equity indicates the historical depreciated book cost of all the assets (net of all the outside obligations) per share. Book Value (Rs.) is calculated as the ratio of Equity Share Capital plus Reserves to Total Shares Outstanding at the end of the period. Book value primarily reflects the addition to the equity shareholders' wealth on account of increase in capital reserves/share premium and accumulated retained earnings. While the concept is quite useful for evaluating large chunks of shares, particularly when the management control of the company is at stake (e.g. for mergers/ amalgamations/takeovers), it is of crucial significance for long-term valuation of small lot of shares and the company.

(1996) also suggests that PB is used by institutional investors in the US to assess performance when selecting target companies.

Cash profit over total assets: We have also tried to find out the relationship between accounting performance and export and domestic sales performance. Cash profit over total assets (CASHPRFTA) is used as a measure of profitability or accounting performance. Cash Profit = Net income + Depreciation + Some adjustments. Where
Total assets = Fixed assets (=Net Block + Capital works in progress) + Investment + Current assets + Miscellaneous expenditure. It may be pointed out that defining total assets as above is the international practice. In Indian standards, current liability is subtracted from the above definition (Actually, in the Indian definition, current assets in the above definition is replaced by net working capital = Current assets – Current liability). We have replicated the analysis using this Indian definition and found that the basic results (not reported) do not change.

B. Target Variables:

Real Variables are acting as signals of quality and reputation of firms:

ISO third party certification dummy: We have taken ISO dummy as a signal of firm's quality. It is a third party certification of quality of the firm. This quality signal is predetermined with respect to firm's performance because most of the factors that affect the quality of the firms are exogenous and determined by the decision made by the certifying bodies. This is an entirely new real variable that has not been introduced in any earlier empirical work. The dummy takes value one if company has ISO certificate in a particular year and zero if it hasn't. Some unexplored issues about ISO are discussed below that will explain the rationale for using it as a good quality signal of firms. Here it follows:

- **What is ISO?**

The International Organization for Standardisation (ISO) is the specialized international agency for standardisation, at present comprising the national standards bodies of 91 countries. It is based in Geneva, Switzerland and was formed in the year 1947. The organization consists of representatives from ninety-one countries. Each country is represented by its standard body. ISO comprises more than 180 technical committees, covering many industrial sectors and products. These technical committees, as far as possible, try to address the requirements of the member countries while formulating their standards. It aims at harmonization of standards at the international level with a view to minimize trade and technical barriers. ISO publishes both product and system standards. The American National Standards Institute (ANSI) is the member body representing the United States. These ISO series standards are equivalent to U.S ANSI standards provided the third party registrar includes both the ISO number and date and the ANSI number and date on registration certificate and in the registrar's published directory of registered suppliers (for example, "ISO9001-1994; ANSI Q9001-1994"). ISO is made up of approximately 180 Technical Committees. Each Technical Committee is responsible for one of many areas of specialization ranging from asbestos to zinc. The purpose of ISO is to promote the development of standardisation and related world activities to facilitate the international exchange of goods and services, and to develop cooperation in intellectual, scientific, technological, and economic activity. However, ISO 9000 registration is not a legal requirement for access to foreign markets, but it can be beneficial. In the European Union (EU) for many regulated products, ISO 9000 registration is an alternative for product certification, not an absolute requirement. In fact, as cited in most EU legislation, quality system registration is neither mandatory –there are other paths to product certification-nor is it a stand-alone procedure. Manufacturers interested in the European markets need to review relevant EU product safety directives available from the U.S. Department Commerce for specifics applicable to their product area.

Outside of regulated product areas, the importance of ISO 9000 registration as a competitive market tools varies from sector to sector. For instance, in some sectors, European companies may require suppliers to attest that they have approved quality

system in place as a condition for purchase. This could be specified in any business contract. ISO 9000 registration may also serve as a means of differentiating “ classes” of suppliers, particularly in high-tech areas, where product reliability is crucial. In other words, if two suppliers are competing for the same contract, the one with ISO 9000 registration may have a competitive edge with some buyers. Sector and product areas where purchasers are more likely to generate pressure for ISO 9000 registration include aerospace, autos, electronic components, measuring and testing instruments, and so on. ISO 9000 registration may also be a competitive factor in product areas where safety or liabilities are concerns. The accredited third-party registrar performs periodic surveillance to assure that company’s quality system is being maintained. Many registrars also require a full re-audit after a specified time (typically three or four years). If Company fails to maintain its quality system; the registrar will suspend or cancel the registration.

- **Why certification?**

International and national competition is tougher than ever and companies must struggle continuously to provide quality products or services at a lower cost. The present day customer has high awareness and expectation regarding the quality of the product or service being procured. The company (supplier) should provide confidence (or assurance) to the customer that the expected quality is being achieved, or will be achieved. Providing such confidence may involve producing evidence. Certification is one of the major forms of such evidence.

- **What are the ISO 9000 series standards?**

ISO 9000 is primarily concerned with "quality management". Like "beauty", everyone may have his or her idea of what "quality" is. In plain language, the standardized definition of "quality" in ISO 9000 refers to all those features of a product (or service) which are required by the customer. "Quality management" means what the organization does to ensure that its products conform to the customer’s requirements. ISO9000 is a series of standards for Quality Management and Quality Assurance. While ISO9001, ISO9002 and ISO9003 are meant for certification purpose, ISO9000 and ISO9004 provide guidelines. When a company approaches a certifying agency for

ISO9000 certification, the certifying agency does on-the-spot assessments of the applicant's Quality Management System. If it is found to comply with ISO9001/ ISO9002/ ISO9003, the certifying agency awards the relevant certificate.

The ISO 9000 series is a set of five individuals, but related, international standards on quality management and quality assurance. The ISO families consist of standards and guidelines relating to management systems, and related supporting standards on terminology and specific tools, such as auditing (the process of checking that the management system conforms to the standard).

They are generic, not specific to any particular products. They can be used by manufacturing and services industries alike. These standards were developed to effectively document the quality system elements to be implemented in order to maintain an efficient quality system in every company. The ISO 9000 series standards do not themselves specify the technology to be used for implementing quality systems elements. There are several benefits to implementing this series in companies. For example, it will guide managers to build quality into their product or services and avoid costly after-the-fact inspections, warranty costs, and rework. In addition, they may also be able to reduce the number of audits customers perform on their operation. Increasingly, customers are accepting supplier quality system registration from an accredited third-party assessment based on these standards.

- **How does the series work?**

ISO9000 provides the user with guidelines for selection and use of ISO 9001, 9002, 9003 and 9004. ISO 9001, 9002, and 9003 are quality system models for external quality assurance. These three models are actually successive subsets of each other. ISO 9001 is the most comprehensive-covering design, manufacturing, installation, and servicing systems. ISO 9002 covers production and installation, and ISO 9003 covers only final product inspection and test. These three models were developed for use in contractual situations such as those between a customer and supplier. ISO 9004 provides guidelines for internal use by a producer developing its own quality system to meet business needs and take advantage of opportunities.

The choice of which model to implement depends on the scope of company's operation. For example, if he designs his own product or service, he must consider ISO 9001. If he only manufactures (working off someone else's design) he may wish to consider ISO 9002. If he is neither designer nor manufacturer, he may wish to consider ISO 9003.

- **What Standards make up the ISO 9000 family?**

The following standards currently make up the ISO 9000 family. Note that standards are consistently being added and revised.

ISO 9000-1: 1994 Quality management and quality assurance standards Part 1: Guidelines for selection and use.

ISO 9000-2:1993 Quality management and quality assurance standards-Part 2: Generic guidelines for the application of ISO9001, ISO9002 and 9003.

ISO 9000-3: 1991 Quality management and quality assurance standards-Part 3: Guidelines for the application of ISO9001 to the development and quality assurance standards-Part 4: Guide to dependability program management.

ISO 9001:1994 Quality system-model for quality assurance in design, development, production, installation and servicing.

ISO 9002:1994 Quality system-model for quality assurance in production, installation and servicing.

ISO 9003: 1993 Quality System-Models for quality assurance in final inspection and test.

- **What is ISO 14000?**

ISO 14000 is primarily concerned with "environmental management". In plain language, this means what the organisation does to minimize harmful effects on the environment caused by its activities. It comprises a series of standards on environmental management tools and systems. ISO 14000 will deal with a company's system for managing day-to-day operations as they have an impact on the environment. However, a portion of this standard has arrived in India in 1998. I have a list of companies included in ISO 14000 standards but that is outside our sample range (1989-1997).

- **ISO 9000 Developments in India**

Quality is going to be the biggest competitive issue of the late 20th and early 21st centuries. Therefore quality management and international trade are among the most important concerns of industry and the government. A commitment to excellence in manufacturing and services is essential to a nation's long term economic welfare. Globalisation of markets and their expansion at a scale visualized never before has created a fierce competition among nations bidding for such a market. Price factor no longer valid, has turned the emphasis on quality encompassing safety, reliability, performance, maintainability, durability and acceptability by the customer. The challenge faced by the Indian industry is not only by globalization of markets but also by 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 industry has recognized quality as necessary requirement for long term survival and for entry into competitive global and regional markets. In pursuit of excellence, quality has emerged at the centre stage and it has taken a tangible form with the advent of ISO 9000 standards. It 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 is the reason why ISO 9000 has a rapid rise to worldwide application from the fact that as many as 99 countries have adopted them and more than 1,50,000 companies have been certified around the world. Today it is recognized internationally as a benchmark for measuring quality.

In an increasing number of markets, third party quality assessment and certification is becoming a prerequisite for doing business. In Europe, purchasing organizations place great reliance upon the ability of their suppliers to demonstrate that they are operating effective quality systems, which meet the requirements, laid down by ISO/EN 9000 series of standards. The fact that the supplier operates a quality system complying with standard allows the customer to have increased confidence in the quality

of the product, and the services associated with the supply of the product. To the supplier, it is invaluable to be able to provide objective evidence that he operates an effective quality system, which has been examined and approved by an independent and well-qualified third party certification body.

The year 1988 set the scene for certification in India-the first company got certified in that year. However, the certification received the real impetus in 1991 when BIS (Bureau of Indian Standards), the national standard body of India launched quality system certification. This provided the snowballing effect and today, there is a large increase in number of certified companies. Companies started to report from 1992 onwards. So we have data from 1993 as reported in various quality directories supported by TQMI (Total Quality management Institute), INFOTECH etc. To encourage competition among certification bodies, more agencies have been encouraged to operate certification of quality management systems. These are both national and overseas bodies acting as third party quality registrar. They have qualified auditors, panel experts in all industrial sectors covered, quality analyst. Besides inspection, they provide the following services:

- 1) Design approval, 2) Shop and site inspection, 3) Certification of manufactured goods and appliances, 4) Periodic inspection & testing, 5) Vendor evaluation (i.e., inspection on raw material and input purchase), and 6) Approval of quality systems.

The foreign certification bodies follow the pattern of their parent bodies. The Indian certification bodies, representing private organisations, government departments and statutory bodies under an Act of Parliament, follow their own systems and procedures. There are about 14 certification bodies operating quality certification in India. Around 4020 Indian companies have been certified to ISO 9000, by these certification bodies. The ISO data has been collected on the basis of the year in which they have certified our companies They are: (i) BIS: Bureau of Indian Standards. The only national standards body of India, operating the Quality Systems Certification scheme under the act of parliament. (ii) DNV: Det Norske Veritas. DNV Region India is an operational unit of DNV. It possesses technological capability in a wide range of fields, backed by extensive research and development efforts. It has a worldwide organization with offices in more than 110 countries. The objective of the quality

Systems Certification Scheme (QSC) of DNV, having been accredited by Australia, Austria, Belgium, Brazil, Denmark, Germany, Italy, U.K etc. to carry out the assessment and certification of quality systems operated by companies and organisation according to recognised standards. (iii) KPMG: Quality registrar, a business unit of KPMG, global leader in professional services. (iv) BVQI: is a wholly subsidiary of Bureau varitus group having its head quarters in London and Paris. (v) NQA: established in 1992 as a certification body for conducting third party assessment of quality management systems and is directly accredited by RVA, the world renowned Dutch Accreditation council based in Holland. (vi) IRQS: Indian Registrar Quality systems. (vii) KEMA : Registerd Quality Netharlands. (viii) LRQA, (viii) QAS, (ix) EAQ UK, (x) AVI, (xi) SQS-ICS etc.

Advertisement Intensity: Advertisement Intensity (ADINT) defined as the ratio of advertisement expenditure to sales turnover in the sample period. Advertisement includes advertising and sales promotion expenses. Sales = Total sales generated from main business activity of manufacturing companies. It includes sales from manufacturing, income from trading, fiscal benefits, internal sales (interdivisional transfer is vertically integrated company). Does not include non-recurring income. There is ample theoretical work (Akerlof 1970, Brozen 1974, Grossman and Shapiro 1984) suggesting that good quality firms signal their quality by advertising. Advertisement signals producing firm's commitment to his product as foreign buyers when they place large or bulk orders are likely to check the balance sheet and other financial information of the exporters. In a competitive market, advertising of goods and services is necessary to ensure that potential buyers are informed and helps to make markets function efficiently. Proponents of heavy advertising expenditure argue that it provides a signaling mechanism whereby high quality producers publicly demonstrate commitment to their product, something they would do only if they genuinely believed that it had a long-term future. A large literature has shown advertising and firm-level performance to be positively related. We also expect to observe a positive relation between advertising to sales ratio and the firm's product market performance.

Marketing Intensity: Marketing intensity (MARKTINT) defined as the ratio of marketing expenditure over sales. Marketing includes sum of all expenses related to the marketing of goods and services including discounts, rebates, commission to sole selling agents, etc. Marketing in a business directly involves contact with the consumer and assessment of his needs, and translates this information into outputs for sale consistent with the firm's objectives. So it is a good signal of firm's quality. Hence we expect positive relation between marketing to sales ratio on export and domestic sales.

Distribution Intensity: Distribution intensity (DISTRINT) is the distribution expenditure over total sales. Distribution = Incidental expenses incurred by an enterprise on the distribution of goods and service expense.

Marketing and Distribution variables can be interpreted as "economy of scale" variables. We want to check whether firms that already have marketing and distribution channels are successful in exporting.

We have used intensity instead of the level due to high correlation with sales (Table 1).

Financial Variables are acting as signals of quality and reputation of firms:

Commercial paper to total assets ratio: Commercial paper over total assets (COMPAPTA) is taken as signal of firm reputation. Commercial Paper (CP) 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, i.e., in the event of default; the bank will assume the liability of the company to repay the lenders. 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. So we are

expecting COMPARTA should have positive significant effect on export and domestic market. Commercial paper (CP) was introduced in Jan 1990 in India as an additional money market instrument. CPs are unsecured debts of corporate. They are issued in the form of promissory notes, redeemable at par to the holder of maturity. Only highly rated corporates who get an investment grade rating can issue CPs as per RBI rules. The tangible net worth and working capital (fund based) of the issuing company should be not less than Rs. 4 crores as per RBI rule in India. Corporates are allowed to issue commercial paper up to 100% of their fund based working capital limits. However, no prior approval of RBI is needed to issue commercial paper and underwriting the issue is not mandatory. All expenses (such as dealers fees, rating agency fee and charges for provision of stand-by facilities) for issue of CP are to be borne by issuing company. The purpose of introduction of CP in India was to release the pressure on Bank funds for small and medium sized borrowers and at the same time allowing highly rated Companies to borrow directly from the market.

Debenture over total assets: Debenture over total assets (DEBENTA) is used as a signal of firm's quality. Only top rated corporate issue debenture. Debenture (DEBEN) is a commercial document, representing a certificate of long term debt issued by the company in order to raise capital and sold to investors. Debentures carry a fixed rate of interest payable irrespective of the level of profit of the company. It represents the amount of money raised by a company by issuance of debentures including privately placed debentures with financial institutions like UTI, non-convertible debentures, the non-convertible part of partial and fully convertible debentures. Convertible Debenture can be exchanged at option of the holder into preference shares or equity at a predicted price, on a certain future date. Fully Convertible Debenture (FCDs) is fully convertible into equity shares or preference shares of the issuer Company at a predicted price, on certain future date. Partly Convertible Debenture (PCDs) consisting of two parts, one part being convertible into equity share of the Issuer Company, at a predicted price, on certain future date and the other part is redeemable on maturity.

DFIs loan over total assets: Debt from development financial institutions such as IFCI, ICICI, IDBI over total assets (DFITA) is taken to check whether DFIs are lending to promote export and sales. This will link the firm's capital structure with its performance in the product market.

Development Financial Institutions (DFIs) provide long and medium term finance to the private entrepreneurs and also undertake various promotional activities in their specific field of operations. These institutions are also known as term lending institutions. The very name " Development financial institutions " indicates that activities of their institutions are not merely to provide finance, but also encourage enterprise, prepare development plans, undertake project evaluation, arrange for finance, help raise capital from the market, render technical advice, and provide market information about domestic and export markets.

The growth of DFIs in India in the post-Independence period is a significant achievement that has tremendously strengthened the capital market. Among the all India industrial development banks, the Industrial Finance Corporation of India (IFCI) was the first to be established in 1948. The Industrial credit and Investment Corporation of India (ICICI), a private sector industrial development bank, was set up in 1955. The Industrial Development Bank of India (IDBI) was set up as a subsidiary body of the RBI in 1964 and was made an autonomous institution in 1976. Let us explain the major functions of these Development Financial Institutions.

Functions of IFCI. The Industrial finance Corporation of India grants financial assistance in the following forms: (1) It grants loans and advances to industrial concerns and subscribes to the debentures floated by them (both in rupees and foreign currencies); (2) Underwrites the issue of shares, bonds and debentures of the industrial concerns provided such stocks, debentures etc. are disposed of by the corporation within a period of seven years from the time of acquisition; (3) Guarantees loans raised by the industrial concerns in the capital market.

The corporation is authorized to issue bonds and debentures in the open market, to borrow foreign currency from the World Bank and other organisations, accept deposits from the public and also borrow from the Reserve Bank.

In the beginning, the IFCI was expected to extend financial assistance only to industrial concern in the private cooperative sectors. Now both public sector and joint sector projects are also eligible for financial assistance from the IFCI. Financial assistance is available from the IFCI for new industrial projects as well as for expansion, renovation, modernisation or diversification of the existing ones. This may include the purchase of plant and machinery, construction of factory building and purchase of land for the factory. Normally the IFCI does not provide finance for the repayment of existing liabilities. Its funds are also not available to raising working capital, which includes the purchase of raw material.

Functions of IDBI. The IDBI is the apex institution providing term finance as a subsidiary of the RBI till 1976. The main function of the Industrial Development bank is to finance industrial enterprises such as manufacturing, mining, processing, shipping and other transport industries and hotel industry. The functions of IDBI can be broadly grouped into three categories, viz., (i) direct assistance to industrial units in the form of loans and advances; (ii) indirect assistance through refinancing of the loans and advances given by other financial institutions and (iii) promotional activities in respect of industrialisation of backward areas, small industries etc.

Functions of ICICI. The ICICI was sponsored by a mission from the World Bank for the purpose of developing small and medium industries in the private sector. ICICI assists all sectors, that is, the private sector, joint sector, the public sector and cooperative sector. The assistance comes in the form of foreign currency loans, rupee loans, guarantees and subscription of shares and debentures. The ICICI introduced three tier lending rates viz., Long Term Prime Lending Rate (LTPLR) for the loan of maturity of more than 3 years, Medium Term Prime Lending Rate (MTPLR) for loan of maturity of more than 1 year and less than 3 years, & Short Term Prime Lending Rate (STPLR) of variable maturity with interest rate to be reset annually. The main functions of the corporation are as follows:

a) to help promotion, expansion and modernisation of privately owned industrial enterprises;

b) to encourage and extend participation of private capital, both Indian and foreign, in such enterprises;

c) to help expansion of the investment market.

To achieve these ends it provides medium and long-term loans, underwrites or participates in new issues of shares and securities, guarantees loans and furnishes technical assistance and guidance to the Indian Industry.

C. Control Variables:

Apart from the above variables, our study control for a variety of other factors, which affect performance either positively or negatively. First, we must consider a size variable in the specification.

Firm Size: The size of a firm is known to affect a firm's performance in the export market as well as in the domestic market. Key features of a large firm are its diverse capabilities, the ability to exploit economies of scale, and the formalisation of procedures. These characteristics make the implementation of operations more effective and allow large firms not only to generate greater returns on assets and sales but also to capture more exports and sales than is possible for smaller firms. Alternatively, larger firms could be less efficient in the risky export market than the smaller firms because of loss of control by top managers over strategic and operational activities within the firm (Williamson 1967). Usually total assets or sales turnover is considered to represent size of a firm. But as evident from table 1, total sales (SALES) and total assets (TOT_ASTS) has significantly high correlation (0.8950 at 5% level of significance). Hence inclusion of SALES & TOT_ASTS on the right hand side of the regression as control variables may lead to a problem of multicollinearity in the analysis. Hence, we decided to use TOT_ASTS as the size variable of firms.

Firm Size is an important control variable for another reason. While our panel data are cross-sectionally extensive, we do not have the ability to measure a firm's market power or the level of concentration in the industries in which the firms in our

sample operate. So we can't include controls for market-structure factors that are important determinants of economic performance. **Firm Size** reflects the ability of firms to obtain economies of scale as well as market power. Finally, the inclusion of TOT_ASTS as firm size allows us to avoid the criticism directed against much empirical work in this area. H.Short (1994) notes that "a major criticism that can be levied at the majority of the empirical studies is that they tend to concentrate on large firm sample, rather than taking a broad cross-section of firms of different sizes."

Cost: SALARIES, which is defined as the total amount paid out by the firm as salaries, wages and bonus in the fiscal year of 1996 –1997, as a proxy cost of the firms in the analysis. As evident from table 1, SALARIES has a high correlation with SALES and TOT_ASTS. So we have take share of wages to sales (SHWASAL) as a measure of labour intensity and share of wages to total assets (SHWATA) as proxy for capital intensity.

Change in the level of gross fixed assets in the current period: We have included GFANRR, which is the change in the level of gross fixed assets net of revalued reserves in the current period for our tobit regression.

$$GFANRR = (GRRNFATA)*(TOT_ASTS)$$

$$\text{Now, } GRRNFATA = [NRFA (t+1) - NRFA (t)]/ TOT_ASTS (t)$$

NRFA = GFA – REVALRES where GFA is gross fixed assets and REVALRES is revalued reserves. Revalued reserves are positive if a firm has revalued its assets. It is purely an accounting change, and should not be considered as part of fixed investment.

If firm were investing more, GFANRR would be positive.

Finally, to take care of the industry and group effects we have introduced several dummy variables.

Group Dummies: There are three dummy variables to take care of the various groups in which the sample firms fall:

GRPT50BH =1 if the company falls under private top fifty business houses of India;
= 0 otherwise

GRPPVT =1 if the firm is controlled by private Indian stand-alone companies
other than the above top fifty.

GRPPVT =0 otherwise

GRPOTHBH =1 if the company belongs to other business houses.
= 0 otherwise

Industry Dummies: In the Prowess database, industries are classified at various levels. We take the two-digit level of classification of Prowess, which gives us 22 industry dummies. Hence the final sample has been divided into 22 industries. We introduce the industry variable as a categorical variable called INDUSTRY. The regression analysis is done absorbing INDUSTRY. This is equivalent to using 21 industry dummies without reporting their coefficients. In the Logit and Tobit analysis, we have taken 21 industry dummies to capture the firm specific fixed effect. We assume that firms belong to the same industry category have more or less same cost. Industry dummies have been introduced to reduce the correlation between cross sectional units.

$IND_i = 1$ if firm belongs to industry i

= 0 otherwise.

Where $i = 1, \dots, 22$

Year Dummies: Year dummies have been taken to take care of year specific effects in our panel data.

$YREND_{89} = 1$ if year is 1989

= 0 otherwise

$YREND_{90} = 1$ if year is 1990

= 0 otherwise.

$YREND_{91} = 1$ if year is 1991

= 0 otherwise.

$YREND_{92} = 1$ if year is 1992

=0 otherwise.

$YREND_{93} = 1$ if year is 1993

=0 otherwise.

$YREND_{94} = 1$ if year is 1994

=0 otherwise.

$YREND_{95} = 1$ if year is 1995

=0 otherwise.

$YREND_{96} = 1$ if year is 1996

=0 otherwise.

$YREND_{97} = 1$ if year is 1997

=0 otherwise.

3.3. Descriptive Statistics:

Before analyzing the regression results to understand the relation between various quality signals that are coming from the product market and financial market and export performance, it would be interesting to observe certain descriptive statistics. The descriptive statistics of the variables are given in the Appendix B. To get an idea about how quality, reputation signals, financial market performance, financial decision and group ownership influence on export performance and domestic sales, we have restricted the sample several times. In the first set of results, subsample consists of those companies that export in the next period and are both group and non-group firms. Then we check whether the same results hold for group and non-group firms separately (Table 2-4). In Table 5-10 results, we have taken restriction on PB ($0 < PB < 14.8$). We have included only those observations where PB is positive because negative PB is a misinterpretation of market assessment of performance, as the negativity of PB is due to negative book value, which has no meaning. In a similar logic, very high values of PB (very good firms) and very low values of lagged sales growth GRSAL1 (very bad firms) are also exceptions to the general market trends and are considered as outliers to the sample size. We have excluded observations having PB is higher than the 99-percentile and lower than 1% value and by excluding those where growth of Sales lagged one period (GRSAL1) is less than the upper and lower 5% value. The restriction on lagged sales growth is at the 5% (putting restriction $-0.17 < GRSAL1 < 0.72$). One can see in the Appendix B, the restriction on lagged sales growth is at the 5% lower and 95% upper level. The PB cut-off is very close to the 1% level lower and 99% upper level (probably, a single firm is making this difference). It is standard to exclude extreme outliers in this manner. These exclusions left us with 3193 observations for group and non-group firms. In case of top 50 business groups, sample observations are 1834 and for non-group it is 1359. In this way, we have separated the sample to observe the performance of group and non-group firms separately.

Table 1 shows the correlation coefficient between the different variables used in the analysis. The financial variables, DEBEN and CP, are too highly correlated with

SALES and TOT_ASTS. So we are never sure whether we are picking up the size effect or not. Not only that, our regression results might suffer from multicollinearity problem if we take them on the right hand side together. Accordingly, we have scaled the financial variables by total assets and always used them along with either SALES or TOT_ASTS. There is alarming correlation between SALES, ADVT, MARKT and DISTR. Hence, We have taken advertisement over sales ratio, marketing over sales ratio and distribution over sales instead of the level. Table 1a shows the correlation coefficient between the different explanatory variables used in the regressions after we have scaled them by either SALES or TOT_ASTS.

Chapter – 4

4. Econometric Models:

4.1 Empirical exercise: Logit Analysis to Prediction of firm's export in the next period:

We consider a firm's ability to export or not in the next year as a qualitative variable. It depends upon a number of non-price factors. Based on past studies, important variables are firm size (captured by total assets, sales), domestic sales, quality rating (ISO quality certification), signals of firm reputation (issue of commercial paper, debenture), loan from DFIs, distribution, group category, advertisement, marketing etc. Some of the variables are qualitative & others are quantitative in nature.

Let the qualitative dependent variable (showing whether firm will export next year) is described by the Y. "Y" assumes only two values '1' if exports & '0' if does not, respectively. For such 1, 0-response models, commonly cumulative distribution functions of the random variable is chosen and represented by (i) the logistic and /or (ii) the normal; the former give rise to a logistic model and the latter to a Probit model. Our work adopts a logit model to predict the probability that firms will go for export in the next year.

The hypothesized model takes the following linear form

$$Y = f \left(\text{DEBENTA, COMPAPTA, DFITA, CASHPRFTA, ADINT, MARKTINT,} \right. \\ \left. \text{DISTRINT, SHWASAL, SHWATA, TOT_ASTS, DOMSAL, PB, ISO,} \right. \\ \left. \text{Group Dummies Industry Dummies, Year dummies,} \right)$$

(1)

Where Y is the probability of a firm will export in the next year or not at each period. DEBENTA, COMPAPTA, DFITA, CASHPRFTA, ADINT, MARKTINT, DISTRINT, SHWASAL, SHWATA, are this year's values of debenture over total assets, commercial paper over total assets, loan from development financial institutions over total assets, cash profit over total assets, advertisement intensity (advertisement over sales), marketing intensity, distribution intensity, wages to sales, and wages to total assets. All these variables have been either scaled by total assets (TOT_ASTS) or total sales (SALES) to remove the size effect that they would otherwise represent. PB is the price to book value ratio that measures the true performance of a company in the financial market. DOMSAL captures the economies of scale effect. ISO has been taken as third party quality certification that signals firm's quality. The dummy takes the value of one for firms having ISO certificate and zero for firms devoid of ISO certificate. Industry and group dummies capture various industry and group behaviors. Year dummies identify different years. These are explained in chapter 3 section 3.2 in more detail.

Model 1:

The function specified above defines the dependent variable Y to be the firm's probability of exporting in the next period or not. The issue of a firm's probability of exporting in the next year can be appropriately addressed within the framework of a binary choice model. The dependent variable here is a qualitative response or out come, such as yes or no decision, representing a choice, which can be given a meaningful value with a zero/one coding. Here no is equated with zero and yes is equated with one, both of which are qualitative choices. The outcome can be seen as the probability that a firm will be exporting in the next period or not, under the assumption that this outcome is a function of a set of factors. The regression model is constructed so as to link the decision or outcome to a set of factors.

Let's start with a simple Logit model of the form:

$$Y^*_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \quad (2)$$

$$Y_{it} = 1 \text{ if } Y^*_{it} > 0$$

$$= 0 \text{ if } Y^*_{it} \leq 0$$

Y_{it} = Observed variable

Y^*_{it} = Actual latent variable

In our estimation, we have not exploited the error structure that is usual in panel estimation. In STATA, there does not seem to be an easy way to do it. We have not considered any fixed effect model. The idea is to see if some of the variables proxy for certain firm-specific attributes. If we control for firm-specific effects, none of them may have any explanatory power. To eliminate the impacts of the individual fixed effects, the following assumptions are made about the error structure:

ε_{it} uncorrelated with $\varepsilon_{it'}$; $t' \neq t$

ε_{it} uncorrelated with ε_{jt} ; $\forall i \neq j$ & $\forall t, t'$

These assumptions about the error structure collapse the panel to obtain cross-section values.

On the right hand side of eq.2, X_{it} = value of attribute, e.g., total assets, commercial paper over total assets, debenture over total assets, advertisement intensity, marketing intensity, price to book value ratio, cash profit over total assets, ISO etc. for i^{th} individual at t^{th} period.

In our model, the relevant question is whether the firm will export in the next year ($Y = 1$) or not ($Y = 0$). The probability of a firm being an exporter in the next period is explained by a set of factors of the present period, a vector X .

$Y_{it} = 1$ If export in the next year i.e., $X_{gds} [n+1] > 0$

$Y_{it} = 0$ Otherwise .

P_i = Probability that $Y_{it} = 1$,

$$P_i = E (Y^*_{it}=1) = \alpha + \beta X_{it} + \varepsilon_{it} \quad (3)$$

Since Y^*_{it} can take on only two values, 1 and 0, we can describe probability distribution of Y^*_{it} by letting $P_i = \text{Prob}(Y^*_{it}=1)$ and $1 - P_i = \text{Prob}(Y^*_{it}=0)$. Then,

$$E(Y^*_{it}) = 1(P_i) + 0(1-P_i) = P_i$$

$$P_i = E(Y_i=1) = 1/[1+e^{-\alpha-\beta X_{it}}] \quad (4)$$

$$\text{or, } P_i = F(Z_{it}) = 1/[1+e^{-Z_{it}}] \quad (5)$$

Where $Z_{it} = \alpha + \beta X_{it}$

Equation (5) represents *cumulative logistic distribution function*. Now it can be easily verified that as Z_{it} varies between $-\infty$ to $+\infty$, P_i varies between 0 and 1 and that P_i is nonlinearly related to Z_{it} (i.e., X_{it}). But this creates an estimation problem because P_i is not only nonlinear in X_{it} but in β s as well, as can be seen clearly from (eq.4). This means that we can't use the familiar OLS procedure to estimate the parameters. But it is intrinsically linear, which can be shown as follows:

Eq.(5) can be written as: $(1+e^{-Z_{it}})P_i = 1$

Dividing by P_i

$$1+e^{-Z_{it}} = 1/P_i$$

$$\text{or, } e^{-Z_{it}} = 1/P_i - 1 = (1 - P_i)/P_i$$

Since $e^{-Z_{it}} = 1/e^{Z_{it}}$

$$\therefore e^{Z_{it}} = P_i/(1-P_i) \quad (6)$$

$P_i/(1-P_i)$ is simply the *odd ratio* in favoring of export possibility—the ratio of the probability that a firm will be exporting in the next year.

By taking natural log of (eq.6), we obtain,

$$\log(e^{Z_{it}}) = \log(P_i/(1-P_i))$$

$$\text{or, } \log(P_i/(1-P_i)) = Z_{it} = \alpha + \beta X_{it} \quad (7)$$

Where $\log(P_i/(1-P_i)) = \log L = \log$ of the odds ratio is not only linear in X_{it} but linear in parameters also. $L = \text{odd ratios}$ is called the logit. Although $\log L$ is linear in X_{it} , the probabilities themselves are not.

4.1a Estimation:

To estimate the model (eq.7), we need, apart from X_{it} , the values of the logit L_i . Since we have data at the micro level, we can't estimate the eq.7 by the standard OLS technique. In this situation we have to resort to the maximum-likelihood estimation (MLE) method to estimate the "β" parameters.

It is postulated that export performance of a firm in the next year depends on the following factors:

(i) TOT_ASTS, (ii) DEBENTA, (iii) COMPTA, (iv) DFITA, (v) PB, (vi) CASHPRFTA, (vii) ISO, (viii) ADINT, (ix) MARKINT, (x) DISTRINT, (xi) DOMSAL, (xii) SHWASAL, (xiii) SHWATA, etc.

So equation (6) can be written as: -

$$\begin{aligned} Z_{it} = & \alpha_1 + \beta_1(\text{TOT_ASTS}_{it}) + \beta_2(\text{DEBENTA}_{it}) + \beta_3(\text{COMPAPTA}_{it}) + \beta_4(\text{DFITA}_{it}) \\ & + \beta_5(\text{PB}_{it}) + \beta_6(\text{CASHPRFTA}_{it}) + \beta_7(\text{ISO}_{it}) + \beta_8(\text{ADINT}_{it}) + \beta_9(\text{MARKTINT}_{it}) \\ & + \beta_{10}(\text{DISTRINT}_{it}) + \beta_{11}(\text{DOMSAL}_{it}) + \beta_{12}(\text{SHWASAL}_{it}) + \beta_{13}(\text{SHWATA}_{it}) \\ & + \beta_{14}(\text{GRP}_{it}) + \beta_{15}(\text{Industry dummies}_i) + \beta_{15}(\text{Year dummies}_t) \end{aligned} \quad (8)$$

$i = 572$, $t = 9$ as we are using panel data in our estimation. $Z_{it} = 1$ if firm exports in the next year i.e., $X_{gds}[n+1] > 0$ and 0 if do not.

In sum, we estimate the following logit model by maximum likelihood:

$$\begin{aligned} \Pr(\text{Dexp}[n+1]_{it} = 1) = & F \left[\alpha_1 + \beta_1(\text{TOT_ASTS}_{it}) + \beta_2(\text{DEBENTA}_{it}) + \beta_3(\text{COMPAPTA}_{it}) \right. \\ & + \beta_4(\text{DFITA}_{it}) + \beta_5(\text{PB}_{it}) + \beta_6(\text{CASHPRFTA}_{it}) + \beta_7(\text{ISO}_{it}) \\ & + \beta_8(\text{ADINT}_{it}) + \beta_9(\text{MARKTINT}_{it}) + \beta_{10}(\text{DISTRINT}_{it}) \\ & \left. + \beta_{11}(\text{DOMSAL}_{it}) + \beta_{12}(\text{GRP}_{it}) + \beta_{13}(\text{IND}_i) + \beta_{14}(\text{YREND}_t), \right] \end{aligned} \quad (9)$$

$F(z_{it}) = e^{z_{it}} / (1 + e^{z_{it}})$ is the cumulative logistic distribution.

Where $Dexp[n+1]_{it}$ is a variable that equals 1 if company i exported in period $n+1$ and equals 0 if did not. Where $n = 1, 2, \dots, 8$. We have taken this dependent variable to predict the probability of exporting in the next period that measures firm's performance in the product market. $F(\cdot)$ is the cumulative logistic distribution function.

We have applied MLE for estimation of β parameters. The likelihood equation is obtained by setting $\delta \log L(\beta_i) / \delta \beta_i = 0$. Solving this equation we get β_i parameters. We require the second order condition: $\delta^2 \log L(\beta_i) / \delta \beta_i^2 < 0$. Estimated values of the parameters β_1 through β_{14} can be used to describe the probability of export to equation (8). The test procedure is as follows: we would reject the joint null hypothesis that $\beta_1 = \beta_2 = \dots = \beta_{14} = 0$ if χ^2 value is greater than its critical value. Next, we test the null hypothesis that each β is insignificant and see the z values to reject the null.

4.1b Reason for using MLE as an estimation technique:

Maximum Likelihood Estimation (MLE) procedure is applied to the model, because it is possible to prove that a unique maximum always exists for the logit model. In fact, maximum-likelihood estimation yields consistent parameter estimators, and the calculation of the appropriate large-sample statistics is not difficult.

We have—

$$\beta X_{it} = E(Y^*_{it}) \text{ and } \neq E(Y_{it})$$

$$\text{But } P(Y_{it} = 1) = P[(\epsilon_{it} + \beta X_{it}) > 0]$$

$$= P(\epsilon_{it} > -\beta X_{it})$$

$$= 1 - P(\epsilon_{it} < -\beta X_{it})$$

$$= 1 - F(-\beta X_{it})$$

F is the distribution function of ϵ_{it}

Since standard OLS does not work, we have to proceed in a different way. We can estimate β by knowing certain probability distribution. A particular distribution function F estimates the probability likelihood:

$$L = \Pi_{y^*it=0} F(-\beta X_{it}) \Pi_{y^*it=1} [1 - F(-\beta X_{it})]$$

We have taken F as logistic form:

$$\begin{aligned} F(-\beta X_{it}) &= e^{-\beta X_{it}} / [1 + e^{-\beta X_{it}}] \\ &= 1 / [1 + e^{\beta X_{it}}] \end{aligned}$$

As X_{it} lies between $-\infty$ & $+\infty$, $F \sim (1,0)$

4.1c Notable features of logit model:

The most important appeal of the logit model is that it transforms the problem of predicting probabilities (0,1) interval to the predicting the odds of an event's occurring within the range of real line. In the analysis of models with dummy dependent variables, we assume the existence of a latent (unobserved) continuous variable, which is specified as the usual regression model. However, the latent variable can be observed only as a dichotomous variable. We mainly adopt an ordered logit estimation procedure to investigate the influence of product market and financial market signals on the probability of a firm for exporting in the next period. Logistic presents the estimates in terms of odd ratios rather than coefficients.

4.1d About goodness of fit:

There is a problem with the use of R^2 as a measure of fit in the logit model. In the classical regression model, R^2 can range in value between 0 & 1, with a value of closer to 1 indicating a good fit. However, the linearly dependent variable model is not likely to yield a R^2 close to 1*. But our model fits reasonably well making the applicability of the Pearson's χ^2 good ness of fit test. Pearson χ^2 goodness-of-fit is a test of the observed

* Discussed in Morrison D.G., 1972, "Upper bounds for correlation between binary outcomes and probabilistic predictions", *Journal of American Statistical Association*, vol. (67).

against expected number of responses using cells defined by the covariance pattern. We basically look into the χ^2 to reject the null hypothesis (low goodness of fit). We have reported pseudo R^2 as a measure of goodness of fit. Pseudo R^2 is a likelihood ratio index, which is analogous to the R^2 in a conventional regression model. Pseudo $R^2 = (1 - L_0) / L_{\max}$. Where L_0 is the initial value of likelihood function and L_{\max} is the highest value. We have used another measure of goodness of fit by percentage of correct predictions made which is usually considered a naïve predictor (As in Greene 1993, pp. 652). In the naïve predictor, $Y = 1$ if $P > 0.5$ and 0 otherwise (where P is the proportion of ones in the sample). To calculate the percentage of correct predictions we have multiply the explanatory variables by its estimated coefficients and add them to find the probability (if the sum is > 0.5 , we have taken it as one and 0 otherwise).

4.2 Empirical exercise: Linear regression with a large number of dummy-variable set:

We want to check whether the same signals of quality and reputation such as advertisement, marketing, commercial paper, debenture, distribution, ISO etc. matter in the domestic market as well or not. We have taken 22 industry dummies (IND_i) as to show the various industry specific characteristics. Nine year dummies take care of the time series (1989 to 1997) component of our panel data set. We have compared the group and non-group effects to take care of firm specific factors.

Model 2:

We have a regression model that includes among the explanatory variables a large number of 'k' mutually exclusive and exhaustive dummies:

$$Y_{it} = X_{it}\beta + \gamma_1 (d_1)_{it} + \gamma_2 (d_2)_{it} + \dots + \gamma_k (d_k)_{it} + \varepsilon_{it} \quad (1)$$

Dependent variable Y_{it} is domestic sales in the next period (DOMSAL [n+1]) that measures firm's domestic sales performance.

Where d_i indicates 22 industry dummies. X denotes the vector of independent variables: DOMSAL $_{[n]}$, GFANRR, SHWASAL, DEBENTA, COMPAPTA, DFITA, CASHPRFTA, ISO, ADINT, MARKETINT, DISTRINT, business group and year dummies etc. The coefficient of explanatory variable DOMSAL can be interpreted as the coefficient of this year's domestic sales as the growth rate.

We have used "areg" in STATA computer package for getting better fit. "areg" provides a way of obtaining estimates of β -but not the γ_i 's- in this case. The effects of 22 Industry dummy variables are absorbed. The areg output shows a test that all coefficients excluding the dummies and the constant are equal to zero. We would check the F and t values to reject the joint hypothesis that all β_s are zero and each β is zero.

4.3 Empirical exercise: Tobit estimation for checking linkage between the firm's product market performance and financial market performance:

Model 3:

We consider the following latent variable regression model

$$Y^*_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \quad (1)$$

In the canonical censored regression model, known as tobit, the observed data Y are given by-

$$Y_{it} = Y^*_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \quad \text{for those with positive export in the next year i.e., } Y^*_{it} > 0$$

$$= 0 \quad \text{for those with no exports in the next year i.e., } Y^*_{it} \leq 0$$

Y_{it} = Observed variable

Y^*_{it} = Actual latent variable

$\varepsilon_{it} \sim \text{IN}(0, \sigma^2)$

The latent variable Y^*_{it} is observed if $Y^*_{it} > 0$ and is not observed if $Y^*_{it} \leq 0$. In other words, all negative values of are coded as a single value 0. We say that these data are left censored. This is known as the *tobit model* (Tobin's probit) and was first analyzed in the econometrics literature by Tobin (1958). It is also known as a censored normal regression model because some observations on Y^*_{it} (those for which $Y^*_{it} \leq 0$) are censored and we are not allowed to see them. Our objective is to estimate the parameters α , β & σ .

We assumed the following error structure for our estimation purpose:

ϵ_{it} uncorrelated with $\epsilon_{it'}$; $t' \neq t$

ϵ_{it} uncorrelated with ϵ_{jt} ; $\forall i \neq j$ & $\forall t, t'$

$E(\epsilon_{it}) = 0$, $\text{Var}(\epsilon_{it}) = \sigma^2$.

So actually we are using the panel structure cross sectionally in our empirical exercise. Industry and group dummies identify the different firm characteristics and year dummies capture different years.

Where X_{it} = value of attributes, e.g., total sales, firm size, debenture, commercial paper, advertisement intensity, marketing intensity etc. for i^{th} individual at t^{th} period.

In sum, we estimate the following tobit model by maximum likelihood:

$$\begin{aligned} \Pr (Xgds[n+1]_{it} = Xgds [n+1] > 0) = F \left[\alpha_1 + \beta_1(Xgds_{it}) + \beta_2 (TOT_ASTS_{it}) \right. \\ + \beta_3 (COMPAPTA_{it}) + \beta_4 (DEBENTA_{it}) + \beta_5 (DFITA_{it}) \\ + \beta_6 (CASHPRFTA_{it}) + \beta_7 (ISO_{it}) + \beta_8 (ADINT_{it}) \\ + \beta_9 (MARKINT_{it}) + \beta_{10} (DISTRINT_{it}) \\ + \beta_{11} (SHWASAL_{it}) + \beta_{12} (SHWATA_{it}) \\ + \beta_{13} (DOMSAL_{it}) + \beta_{14} (GFANRR_{it}) + \beta_{15} (IND_i) \\ \left. + \beta_{16} (GRP_{it}) + \beta_{17} (YREND_{it}), \right] \end{aligned} \quad (2)$$

In our Tobit regression model, dependent variable, next year's export level – (Xgds [n+1]) is a function of this year's exports (Xgds) and other independent variables total assets (TOT_ASTS), commercial paper over total assets (COMPAPTA), DFIs loan over total assets (DFITA), change in the level of gross fixed assets (net of revalued reserves) in the current period (GFANRR), cash profits over total assets (CASHPRFTA), third party quality certification dummy (ISO), advertisement over sales (ADINT), ratio of marketing to sales (MARKTINT), distribution over sales (DISTRINT), share of wages to sales, share of wages to total assets, domestic sales in the current period (DOMSAL), group dummies (GRP) , industry dummies (IND_i) and year dummies (YREND_t) etc. The coefficient of this year's exports (Xgds) can be interpreted as the growth rate of export. Most of the variables are either scaled by total assets or total sales to avoid the multicollinearity problem. Otherwise they may be picking up the size effect which is difficult to identify.

The dependent variable Xgds [n+1] is left censored at zero. The dependent variable is only incompletely observed due to censoring. F is the cumulative distribution function of ϵ .

Using the notion of the standard normal density function, we can write the likelihood function for the tobit model as

$$L = \prod_{y_{it} > 0} 1/\sigma F [(Y_{it} - \beta X_{it})/\sigma] \prod_{y_{it} \leq 0} F [(-\beta X_{it})/\sigma]$$

Maximizing this likelihood function with respect to α , β & σ , we get the maximum likelihood (ML) estimates of these parameters.

The tobit^{*} model is a censored regression model. Observations on the latent variable Y^*_{it} are missing (or censored) if Y^*_{it} is below (or above) a certain threshold level. This model has been used in a large number of applications where the dependent variable is observed to be zero for some individuals in the sample. In our sample we have a large number of observations for which the export in the next year is zero. Tobin argued that we should use the censored regression model.

^{*} T. Aemiyā, 1984, "Tobit Models: A survey", *Journal of Econometrics*, Vol. 24, which lists a large number of applications of the tobit model.

Chapter – 5

5. Empirical Results

5.1. Logit Estimation on next year export:

In order to quantify the impact of quality and reputation signals on the export performance of firms, we have done logit estimation. The logit regression was run using the STATA 5 computer program and the results are reported in Tables 2-4. The dependent variable takes a value of 1 if the company exported next year. The regressions are run with all firms combined, as well as with top 50 business group (GRPT50BH) and non-top fifty business group firms separately. Tables 2-4 give the estimated coefficients, z values and the level of significance ($p > |z|$) of the variables that are reported in the columns 1, 2 and 3. The main problem is that the financial variables, debenture and commercial paper, are too highly correlated with sales and total assets (Table 1). So we are never sure whether we are picking up the size effect or not. Accordingly, we have scaled the financial and real variables by total assets and always used them along with either sales or total assets. In addition, we have used advertisement over sales (ADINT), marketing over sales (MARKTINT) and distribution over sales (DISTRINT) instead of their levels in view of high correlation with SALES (table 1). We have also used a measure of profitability of the companies, cash profits over total assets CASHPRFTA (cash profit = net income + depreciation + some adjustments). The three main financial variables used are DEBENTA= DEBEN/TOT_ASTS (debenture/total assets), DFITA= debt from DFIs (development financial institutions such as ICICI, IDBI) over total assets and COMPAPTA= commercial paper over total assets. In Table 1a, we have shown the correlation between all the variables taken together that have been used as regressors in various stages. The low correlation between the various explanatory variables confirms that our regression models are free from the multicollinearity problem.

We have run the Logit regressions on dummy for next period export $D_{exp [n+1]}$ as dependent variable with the above explanatory variables. The dependent variable takes the value one if firm exported in the next year (i.e., $X_{gds_{n+1}} > 0$) and zero if did not (i.e., $X_{gds_{n+1}} = 0$). We have divided the sample of companies into three group categories to see whether there is any significance group effects on the export probability or not. We have clubbed the companies in the following groups: top fifty business houses (GRPT50BH), private Indian stand alone companies (GRPPVT) and the companies belonging to other business houses (GRPOTHBH). We have used GRPT50BH as the group firms and rest two as (GRPPVT & GRPOTBH) non-group firms in our empirical exercise and compared the behavior of group and non-group firms. The financial variables mainly COMPAPTA, DEBENTA are all significant, for both group and non group firms (Table 2, 3 & 4). The different industries are identified by industry dummies (IND_1 to IND_{22}) and different years by year dummies ($YREND_{89}$ to $YREND_{97}$). The coefficient of industry dummies shows whether the effect of being in that industry has any positive effects on export or not. Similarly, year dummies capture whether the effect of that year has any positive influence on export in the next year. Since we are estimating the probability of export in the next year at each period, $YREND_{97}$ is dropped from the regression otherwise it could have caused dummy trap. The best we can say is that firms that issue debentures or commercial papers have to pass the scrutiny of credit rating agencies (like CRISIL etc.) or banks (that guarantee the commercial paper loans). Thus, they presumably reflect “quality” of the firm issuing these financial instruments and they are playing significant role in the export market. So the results show that good quality firms export more. Quality matters for exports. Firms are more likely to export if they are in top fifty business group GRPT50BH – again suggesting that quality matters because these groups have their own reputation in the export market. One can interpret the advertisement in the same way: advertisement is a signal of product quality (there is a big literature on this discussed in Ch.2). Marketing and distribution variables can be interpreted as “economy of scale” variables (firms that already have marketing and distribution channels are successful in exporting). The significance of the variables ADINT, MARKTINT, DISTRINT for both group and non-group firms is consistent with the theoretical propositions discussed in the literature (Ch. 2 & Ch. 3) that they signal

firm quality and reputation in the product market. The industrial effects, whether firm belongs to a particular industrial class like manufacturing, tea, textiles etc., on export are captured by 22 industry dummies shown in the tables. IND_1 is dropped by econometric rule since we are using them as intercept dummies. STATA is such a strong econometric package that it drops dummies whenever there is any collinearity problem. Other industry dummies are compared in respect of IND_1 . The companies that belong to other industries are compared with respect to India Gelatine, which is IND_1 .

In Table 2, we have tried to show whether the financial and real variables are acting as quality attributes of both small private Indian stand alone firms (GRPPVT) and the firms belonging to other business group (GRPOTHBH) firms compared to top 50 business groups (dropped from the regression as we are using them as intercept dummies). The financial variables DEBENTA and COMPAPTA are significantly affecting the export probability of firms in the next year. However the group effects are significantly negative. This tells the firms belonging to GRPPVT & GRPOTHBH have negative group reputation in the export market compared to top fifty business groups. So they probably try to signal their quality through issue of debentures and commercial paper. They also give more emphasis on advertisement and marketing of their products to win over customer confidence in the export market (see that ADINT and MARKTINT are significantly affecting their export performance). This stresses the importance of quality in the export market. The significance of ISO dummy supports the view that quality certificates have important role to play in the export market to help the buyers to identify the high quality suppliers from the market. We got significantly negative coefficients of industry dummies (except IND_2) because company that belongs to IND_1 is highly export intensive in comparison to others. IND_1 mainly comprises India Gelatin Company, which is highly an exporting company. In Table 2, only the coefficient of IND_2 is positive which comprises mainly tea plantation and manufacturing companies. This means, firms belonging to tea and plantation industry are experiencing higher growth in exports.

The sharpest results are shown in the Tables 3 & 4. In Table 3, we have studied the behavior of top fifty Indian group firms (GRPT50BH). The year and industry dummies have been taken to take care of different years and industry specific

characteristics. In Table 3, the financial variables DEBENTA ($z = 5.169, P > |z| = 0.000$) and COMPAPTA ($z = 1.728, P > |z| = 0.084$) are significantly affecting the export probability of the group firms in the next year. So these financial variables are acting as firm specific attributes to signal that firms are reputed one. This means, if the group firms issue commercial paper and debenture, they will probability experience higher export growth of their merchandise. Thus, quality and reputation matter in the export market. One reason why the financial variable ratio of cash profit to total assets CASHPRFTA ($z = -0.410, P > |z| = 0.033$) is insignificant in the export regression is very interesting. May be that the group firms are taking reputation building as the prime task than making profit to stay in the competitive export market for the longer time. This again seems to suggest that reputation matters in the export market. The real variables marketing intensity MARKETINT and advertisement over sales ADINT are significantly affecting firms export performance. We can say that firms that are spending more on advertisement and marketing are experiencing higher growth in exports. Moreover, ISO quality certification is acting as a signal that firm is able to maintain its quality system that the foreign buyers are expecting. This quality dummy is highly significant that confirms the fact that quality matters in the export market. The control variable share of wages over total assets (SHWATA) is taken as a measure of capital intensity. This variable is significantly affecting firms export performance in the next year suggesting that labour intensive goods are exported more. Firms, who are paying higher wages compared to their assets, are exporting more. This is supporting the Heckscher Ohlin type of trade that labour abundant Indian companies are exporting more labour intensive goods. The companies are giving higher wages to attract the skilled labours to export high quality products. Since we are estimating the probability of export in the next year, we have dropped YREND₉₇ from the regression and have considered export performance in different years in comparison to YREND₉₆, which is dropped by econometric rule since we are using intercept dummies. We can say that in the later years since globalization after the gulf crisis (1990), companies are experiencing higher growth of exports. What is interesting is that in these later years, ISO 9000 certificates are becoming very popular to judge the firm's quality in the export market? The year dummies IND₆, IND₁₀, IND₁₇, IND₁₉ and IND₂₁ are significant compared to IND₁ (comprising India Gelatin company which is

highly export intensive). We have listed grouped our companies in 22 industries as by prowess industry code reported in Appendix C. The significance of the above industry dummies is telling us firms that belong to textile, chemical automobile engineering and services (for e.g., consultancy, shipping etc.) are exporting more. This tells that tea plantation and manufacturing companies have higher export growth in comparison to the India Gelatin Company. The industry types that have been considered in our regression are mentioned in the Appendix C.

In Table 4, we describe the behaviour of firms that do not belong to top fifty business group (GRPT50BH) to see whether same quality and reputation arguments apply for them or not. For non-group firms, ISO dummy is significantly explaining export performance in the next period. Thus it is acting as a good signal of quality for non-group firms also. There is no doubt that third party quality certificates are helping them to perform well in the export market. The ISO9000 certification is helping them to build confidence in the minds of foreign customers who are very much quality aware. The financial variables COMPAPTA, DEBENTA and real variables MARKTINT, ADINT, DISTRINT are all significant. This again is supporting the fact, for non-group firms also, that quality matters in the export market. Still the variable SHWATA is positively significant. This again supports the fact that labour intensive firms are exporting more which is consistent with the Heckscher Ohlin kind of trade pattern. The positive significance of CASHPRFTA tells that the non-group firms, with higher profit on assets (CASHPRFTA) are exporting more. GRPPVT ($z = -0.410$, $P > |z| = 0.033$) is negatively significant compared to GRPOTHBH (dropped from the regression as we have taken it as an intercept) in estimating the firm's probability of exporting next year. This confirms the fact that Indian private stand-alone firms have no group reputation that can help them in the export market compared to firms are belonging to other business houses. May be other business houses have positive group effect compared to private stand-alone firms.

We have reported pseudo R^2 as a measure of goodness of fit¹. We have used another measure of goodness of fit by the percentage of correct predictions made which is

¹ Pseudo R^2 is a likelihood ratio index, which is analogous to the R^2 in a conventional regression model. Here, Pseudo $R^2 = (1 - L_0)/L_{\max}$. Where L_0 is the initial value of likelihood function and L_{\max} is the highest value.

usually considered a naïve predictor². The detailed methodology of correct prediction is discussed in Chapter 4 (model 1). The percentage of correct predictions are reported at the bottom of the tables 2, 3 & 4. The results tell that our model predicts reasonably well. Another interesting result that is not reported in the tables is that domestic sales (DOMSAL) has significant influence on the export performance. This probably reflects the importance of economies of large-scale production. Firms having large domestic sales would try to export more to enjoy the economies of scale in the export market. Exporting is likely to enable firms, especially those in small countries, to reap economies of scale in production by relaxing the constraint of market size. Thus, a positive correlation can be expected between domestic sales and export performance.

What is interesting is that the variable DFITA is significantly negative in export regression for both group and non-group firms (Tables 2, 3 & 4). Thus, firms that are dependent on development financial institutions like IDBI, IFCI, ICICI are unlikely to perform well in exports. The reason behind is that firms that have taken loan from the DFIs suffer from adverse selection problems in financial markets, as the markets are uncertain about the quality of these firms. Hence, we can say that DFIs are not lending to promote export.

We have taken total assets of the firms (TOT_ASTS) as a measure of firm size. This variable is positively significant over all in the export regression for both the group and non-group firms (Tables 2-4). We interpret that large firms are more likely to export than small firms are. The larger is the firm size, larger are the firm's capital resources and generally, higher is the firm's capacity to finance export. Key features of a large firm are its diverse capabilities, the ability to exploit economies of scale, and the formalization of procedures. These characteristics make the implementation of operations more effective and allow larger firms not only to generate greater returns on assets and exports but also to capture more value as a proportion of the value of production than is possible for smaller firms. Total assets is an important control variable to measure firm size as it also measures a firm's market power or the level of concentration in which the firms in our sample operate.

² As Greene (1993: pp. 652) points out, in the naïve predictor $Y = 1$ if $P > 0.5$ and 0 otherwise (where P is the proportion of ones in the sample), this rule will always predict 100 percent of the observations, which means that the naïve model does not have zero fit.

5.2. Causality issue: Logit & Tobit Regressions:

One can notice that the above results show nothing about the causality. It could be the case that firms are able to issue financial instruments like commercial paper and debenture because they acquire reputation in the export markets. The question is “do debentures and commercial paper affect exports or it is other way around?” To get the answer empirically, we redo all the results we got in Logit with next period export (Tables 2-4) with one period lagged values of the explanatory variables rather than the current values. Even this may not be without criticism, as people may argue that firms issued debenture last year anticipating that they would need funds for the export market this year. So we try a dummy, which takes a value one if firm had debentures outstanding as of 1990, and zero otherwise and use it as dependent variable (D_{DEBEN}). The explanatory variables are lagged sales growth $GRRSAL1$, market to book value ratio PB , cash profit over total assets $CASHPRFTA$. Tables 5-7 report Logit regressions where the dependent variable takes a value of one if company has outstanding debentures, and zero otherwise. In Table 5, we have taken the private stand-alone companies $GRPPTVT$ and small group firms belonging to other business house $GRPOTHBH$. One of the explanatory variables is the export dummy (D_{exp}). The other explanatory variables are TOT_ASTS , PB , $CASHPRFTA$, and $GRSAL1$. We have taken restriction on PB ($0 < PB < 14.8$) because we want to include only positive values, as the negative PB (price to book value ratio) is a misinterpretation of market assessment of performance. The negative PB is due to negative book value, which has no meaning. In a very similar logic, very high values of PB (very good firms) and low values of lagged sales growth $GRSAL1$ (very bad firms) are also exceptions to the general market trends and are considered as outliers to the sample size. We have excluded observations having PB is higher than the 99-percentile and lower than 1% value and by excluding those where growth of sales lagged one period ($GRSAL1$) is less than the upper and lower 5% value. The restriction on lagged sales growth is at the 5% (putting the restriction: $-0.17 < GRSAL1 < 0.72$). One can see in the Appendix B, the restriction on lagged sales growth is at the 5% lower and 95% upper level. The PB cut off is very close to the 1% level lower and 99% upper level (probably, a single firm is making this difference). It is

standard to exclude extreme outliers in this manner. These exclusions left us with 3193 observations for group and non-group firms issuing debentures. The export dummy *Dexp* is highly significant for both the group ($z = 6.611, P > |z| = 0.000$) and non-group ($z = 5.795, P > |z| = 0.000$) firms. This means that if a firm exports, it is more likely to issue debentures. Tables 8-10 report similar results for commercial paper with the same restriction on *PB* and *GRSAL* 1. Export dummy *Dexp* is also significant here for both the group ($z = 3.730, P > |z| = 0.000$) and non-group ($z = 1.790, P > |z| = 0.074$). Again, this establishes the importance of quality for exports. In Table 5 and Table 8, we have taken private stand-alone companies (*GRPPVT*) and firms in other business houses (*GRPOTHBH*) and compared them with top fifty business group firms (*GRPT50BH*). Hence *GRPT50BH* has been dropped from the regression as we are taking it as intercept dummy. It is interesting to note that both the group categories *GRPPVT* and *GRPOTHBH* (we have treated them as non-group) have no role to play with the probability to issue debenture and commercial paper, as they are negatively significant compared to the top fifty-business group (Table 5 & Table 8). This is due to the fact that top fifty business group characteristics of firms has significant role in explaining the probability of issuing debenture and commercial paper. Still export dummy (*Dexp*) significantly affects the probability that firms will issue debenture and commercial paper. If a firm exports, it is more likely to issue debentures and commercial paper. This establishes the importance of quality for exports. We should note that *PB* is significant for both the group and non-group firms in Logit regressions of both debenture and commercial paper (Tables 6, 7, 9 & 10). Market to book value ratio (*PB*) represents not only the present performance of the company, but also the its future prospect. Investors will assume the company to be less risky if they see that the company has high *PB*. Thus the results that high *PB* firms are more likely to issue debentures and commercial paper indicate that good market assessment of firms induce them to issue commercial paper and debentures. However, the causality between exports and financial instruments is not still clear.

As a first step towards establishing causality, we run a Tobit regression of next year's export level as a function of this year's exports and the other independent variables mentioned above. This is like running regression on growth of exports. We interpret the

coefficient of this year's exports as the growth rate. The variable DEBENTA [debenture/total assets] is significant in overall, as well as for GRPT50BH and non-GRPT50BH companies separately (Tables 11 & 12). The ratio of commercial paper over total assets (TOT_ASTS) is not so significant. It is more significant if we do not use year dummies. One immediate concern would be that DEBENTA proxy for firms with greater availability of finance and that 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. So to mitigate against this concern, we have included GFANRR which is the change in the level of gross fixed assets (net of revalued reserves) in the current period. It is highly significant for GRPT50BH firms ($t = 11.397$, $P > |t| = 0.000$), but insignificant for non-GRPT50BH firms ($t = 0.061$, $P > |t| = 0.951$). Interestingly, the correlation between GFANRR and DEBENTA or COMPAPTA is very low (Table 1a). That means, top business group firms usually raise their assets to finance higher export demand but it has nothing to do with the decision of the managers to issue debentures for establishing their reputation in the competitive export market. Similarly, firms with small groups need to establish their reputation in the export market so they issue debentures. Thus, the significance of DEBENTA can be only attributed to firm specific qualities reflected in a higher DEBENTA stimulating export growth. This is probably signaling, as firms would have little incentive to issue debentures if this quality were observable otherwise. One very interesting result is that DFITA is negative for export regressions, for both categories of firms. Firms that are dependent on development financial institutions suffer from adverse selection problems in financial markets, and are unlikely to perform well in exports, as the markets are uncertain about the quality of these firms. However, DFIs often lend to firms to promote socially desirable projects, so domestic growth of sales may be positively related to funding from these institutions. (Apparently, DFIs are not lending to promote exports).

The ISO dummy is more significant for group firms ($t = 2.111$, $P > |t| = 0.035$) compared to non-group firms ($t = 1.580$, $P > |t| = 0.114$) in Tobit regression. This means that top fifty Indian group firms are more concerned with exporting quality products in the foreign market. So they are using ISO as an additional quality signal in the uncertain export market where product reliability is crucial.

The real variables ADINT is more significantly affecting export growth if firm is a group firm. Similarly, MARKTINT and DISTRINT are more significant for non-group firms. This clearly shows that MARKTINT, ADINT and DISTRINT are significantly representing firm specific attributes that are helping them in achieving higher growth in the export market. This is true for both the group and non-group firms.

What is interesting to point out that TOT_ASTS is negatively significant in the Tobit results (Tables 11 & 12) where it is positive significant in Logit regression (Tables 2, 3 & 4). This different size effect may be confusing. The reason for different sign of size is the following. Large firms are more likely to export than small firms are. However, conditional on exporting, large firms may be exporting a smaller proportion of their sales as they maybe engaged in many lines of business. The large firms have diverse capabilities, the ability to exploit the economies of scale, and the formalization of procedures.

5.3. Quality and Domestic Sales:

Now the question is 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 empirical question, we ran similar regressions on domestic sales. The results are reported in Table 13 for group and Table 14 for non-group firms. What is interesting is that DEBENTA is significant for non-GRPT50BH firms ($t = 3.213$, $P > |t| = 0.001$), but insignificant for GRPT50BH firms ($t = 1.470$, $P > |t| = 0.142$). This makes sense: large group firms have more established reputation in domestic markets, so the additional financial signal is not important for domestic markets. However, it is very important for independent or smaller group firms. On the other hand, we have noticed from the earlier regressions that DEBENTA is more significant for the GRPT50BH firms in the export regression than the non- GRPT50BH firms. Again, this makes sense: large group firms need to establish their reputation in external markets; for the independent or smaller group firms, the major opportunity for expansion are still in the domestic markets.

The ISO quality dummy is insignificant in the domestic sales regression for both group and non-group firms. This is due to the lack of quality awareness of the domestic buyers unlike the foreign buyers who are much more quality sensitive. Hence firms do not need to give additional signal in the domestic market to increase their sales.

The variable COMPAPTA is significant for group firms but insignificant for non-group firms. This is obvious, because groups firms need to raise more funds to enjoy the economies of large-scale production by issuing debts. This signals that they are reputed firms. Thus domestic sales is sensitive to commercial paper as signal of firm reputation. But this reputation signal is more effective in the export market than the domestic market as export market is different from the domestic market.

The coefficients of ADINT, MARKTINT and DISTRINT have positive sign but are insignificant, as they were in the export regressions, for both the group and non-group firms. Again supporting that domestic buyers are not much quality sensitive.

What is interesting is that domestic growth of sales (DOMSAL [n+1]) is positively related to funding from development financial institutions DFITA for group firms ($t = 1.683$, $P > |t| = 0.092$) & non-group firms ($t = 2.931$, $P > |t| = 0.003$). Moreover, the variable DFITA is more significantly affecting domestic sales if firm is not a top fifty-business group firm. Hence these development financial institutions are helping to promote socially desirable projects for domestic market only. The positive significance of GFANRR can be attributed to the fact that companies need to raise their funds to finance additional production in the coming year.

In table 13 & 14, we have reported the regression results after incorporating the INDUSTRY dummies in the model. As it is a very large dummy variable set, we have absorbed INDUSTRY in the specification to avoid unnecessary complications. But unfortunately, econometric packages do not provide the facility of testing heteroskedasticity in this kind of model specification. However, we got considerable symptoms of heteroskedasticity, we have replicated the regression with robust standard errors and reported the corresponding t-values in column (2) of tables 13 & 14. The high F-value of the absorbed categorical variable INDUSTRY indicates its strong significance in the model. One can easily check that we get high R^2 and adjusted R^2 in our results, which tells that our regression model fits very well.

Chapter – 6

6. Conclusions

The relationship between quality, reputation and firm performance has been a new research area. Firms have considered quality and reputation as necessary requirements for long term survival in the competitive export market with heterogeneous products. Not only in the export market, their domestic sales performance is also sensitive to these quality issues. Price factor, being no very crucial, in turn caused the emphasis to be laid on quality encompassing safety, reliability, guarantee, performance, maintainability, durability and acceptability by the customers. There is need for the Indian industries to upgrade the quality of exports to meet the global market requirements and consolidate the gains of liberalization. As a result, aspects like productivity, efficiency, quality and competitiveness have come to the forefront. Although the theoretical literature of firm reputation is well developed, few empirical studies exist that quantify the importance of reputation effects on the price of export.

This dissertation investigates the relationship between quality and reputation signals to product market performance at an empirical level. Our study tries to capture various signals of firm quality and reputation to check whether quality matters in the export market or not under perceived quality uncertainty in the export market. Signals that have been considered are from both the product market as well as the financial market. Real market signals considered are advertisement, marketing, distribution and ISO third party quality certification (measures quality). Financial variables like issue of commercial paper and debenture are indicators of firm specific qualities and reputations. These quality and reputation aspects so far have not been addressed empirically with reference to the Indian scenario. A panel data of 572 Indian firms over nine years (starts from 1989 to 1997) has been analyzed. Logit and Tobit models have been fitted on the data to examine the influence of these quality and reputation signals in determining the probability of a firm to export in the next year to check whether quality and reputation are

of importance in the export market or not. In this way, we have tried to establish the linkage between the financial market performance and product market performance at the level of an individual firm. In a pioneering work Gertner, Gibbons and Scharfstein (1988), have modelled information transmission as a signalling game that links both the capital and product market. In their article they have analyzed an informed firm's choice of financial structure when the financing contract is observed not only by the capital market but also by a second uninformed party, such as a competing firm. The informed firm's gross profit is endogenous, because the second party's action depends on the transaction it observes between the informed firm and the capital market. The informed firm offers the uninformed creditors a menu of financing contracts (e.g., debt or equity). The creditor chooses either to accept or reject the menu. If the creditor accepts the menu, then firm chooses a contract from the menu that signals the uninformed firm in the product market. Their model is closer in spirit to the asymmetric information models used in the financial literature, and this enables them to identify the changes in equilibrium financial structure that occur when product market effects are included. In the present work, we have captured their ideas empirically for the first time to show that financial decision of company managers in terms of financial signalling can affect company's export performance.

In our empirical work, price to book value ratio (PB) and cash profit over total assets (CASHPRFTA) measure firms' financial market performance. Another important variable taken in our analysis is the Development Financial Institutions (DFIs) loan over total assets DFITA to check whether DFIs are lending to promote export and domestic sales. Our econometric results support the existence of linkage between the product market and financial market. Finally, we have tried to give answer to the empirical question: "should the same quality argument apply for domestic sales growth as well?" The least square model with industry and time effects are applied to get the answer. We find that unlike the export market, domestic market is not very much quality sensitive because of the fact that domestic buyers of the Indian market are not very much quality conscious.

The immediate concern of our dissertation is to address the causality issue, as it would invariably arise. The question is: "are exports affected by debentures and

commercial paper or it is other way around?” To get the answer empirically, we redo all the results (we got in Logit with next period export performance) with one period-lagged value of the explanatory variables, rather than the current values. Even this may not be without criticism, as people may argue that firms issued debenture last year anticipating that they would need funds for the export market this year. So we try a dummy which takes a value of one if a firm had debentures outstanding as of 1990, and zero otherwise. We run a Logit with the explanatory variables lagged sales growth, PB (market to book ratio), CASHPRFTA (cash profit over total assets), GRPPVT, GRPOTHBH. We have introduced export dummy in the right hand side of the regression to check whether export explains debenture issue or not. Similarly, we have run logit on commercial paper dummy. This export dummy Dexp is highly significant for both the group and non-group firms. This means that if a firm exports, it is more likely to issue debentures and commercial paper, as it would acquire reputation from the export market. This establishes the importance of quality for exports. We have run a Tobit regression of next year’s export level ($Xgds_{[n+1]}$) as a function of this year’s exports $Xgds$ and other independent variables COMPAPTA, DEBENTA, ISO, ADINT, MARKTINT, DISTRINT, TOT_ASTS, CASHPRFTA, DFITA etc. for both the group and non group firms separately. Controlling for any effect due to firm size (TOT_ASTS), capital intensity (SHWATA) and any group or industry ($IND_1 - IND_{22}$) or year effects ($YREND_{89} - YREND_{97}$), we conclude that financial decisions of company managers (issue of commercial paper and debenture) may drive product market outcomes. Thus it would be misleading to analyze the firm’s financial side separately from its real side. Interesting observations found in our empirical exercise are the following:

- 1) In our Logit regression results, run on next period export, show that real and financial variables proxy for certain firm-specific attributes and they are all significant for both the group and non-group firms. The financial variables like commercial paper over total assets (COMPAPTA) and debenture over total assets (DEBENTA) are significantly affecting next year export performance of group and non-group firms. Thus good quality firms export more. Because firms those issue debentures or commercial papers have to pass the scrutiny of credit rating agencies like CRISIL or banks that guarantee

commercial paper loans. Thus, they presumably reflect quality and reputation of the firm issuing these financial instruments. 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. In the event of default, the bank will assume the liability of the company to repay the lenders. Hence banks are extremely picky about this, and they will agree to guarantee the commercial paper of only very well reputed companies with sound financial health. Only highly rated corporates who get an investment grade rating (by CRISIL as credit rating agency for example) can issue CPs as per RBI rules. Similarly, debenture is a commercial document, representing a certificate of long term debt issued by the company in order to raise capital and sold to investors. Because of the mandatory credit rating by banks or credit rating agencies like CRISIL, debentures are like a certificate of financial health of a company. The significance of these variables on exports in the next period show that good quality firms export more. Hence we can conclude that quality matters for exports. This result is consistent with the asymmetric information model of finance as by Myres and Majiluf (1984) for an example. They showed that, if outside suppliers of capital are less well informed than insiders about the firm's assets, risk less debt like debentures, commercial paper involve no undervaluation of the firm's value and will be preferred to equity. Because, the market may misprice equity, may associate new equity issues with low quality firms. In Ross's (1977) model, Managers benefit from issuing equity if the firm's securities are more highly valued but are penalised if the firm goes bankrupt because of the unlimited liability with equity. Then investors take larger debt levels as a signal of higher firm quality because debt involves limited liability. Managers can commit to paying dividends and suffer a penalty if the promised dividend is not paid. Ravid and Sarig (1989) considered a combination of debt and dividend commitment. They have shown that both dividend and debt level increase with firm quality. Since lower quality firms have higher marginal expected bankruptcy costs for

any debt level, managers of low quality firms do not imitate higher quality firms by issuing more debt.

- 2) One interesting finding is that firms are more likely to export if they are in top fifty-business group. This again suggests that quality matters in export as group has its own reputation in the competitive export market. This result is consistent with the empirical study made by Feenstra, Yang and Hamilton (1999) on Korean, Japanese and Taiwanese export market. They test the hypothesis that a greater presence of business groups leads to less product variety but higher product quality, using data on exports from these countries to the United States. Landon and Smith (1998) have made an elegant empirical study to quantify the importance of group reputation effects on the price of export using the data from Bordeaux wine market. They named it as *collective reputation* similar to a concept suggested by Tirole (1996) and 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, it may be costly for consumers 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 individual firms in the group. Chiang and Masson (1988) made an empirical analysis on Taiwanese firm's export in the North America. Due to lack of internationally well established brands, consumers of North America are very much sceptical about the quality of their products where the buyers feel that "Made in Taiwan" means a product is not as high quality as one from Japan. The result of such statistical discrimination is that individual Taiwanese firms have little incentive to unilaterally upgrade quality levels. They demonstrate that, under some conditions, socially beneficial quality upgrading can be induced by industrial consolidation. We suggest that group reputation may be an effective instrument as a solution to this problem. The groups are consisting of legally independent firms affiliated under a common

group name and are centrally controlled through direct family ownership and mutual shareholding among member firms.

- 3) In our Logit and Tobit exercise, real variables like advertisement intensity (ADINT), marketing intensity (MARKTINT) are significantly affecting export performance suggesting that good quality firms signal their quality by advertising their products. Marketing and distribution are acting as an effective tool for the sustained export growth. We can say that firms having better marketing and distribution channels can directly contact with the customer and assess their needs in the one hand and on the other can enhance their sales operation in the export market. The firms, who are making high expenditure on advertisement, are attracting foreign buyers who check the company balance sheet and other financial information of the exporters before placing bulk orders. Hence, Indian companies should give more emphasis to sharpen their marketing and distribution channels to focus more attention on the buyer seller relationship building in export markets. This is very important. Studies made by Nelson (1970, 1974, and 1978), Milgrom & Roberts (1986) give importance to advertisement, marketing and distribution as effective instruments to garner higher export revenues from the foreign markets.
- 4) In the results, we have found that the third party quality certification ISO (we have used it as ISO dummy; the dummy takes the value 1 if company received ISO quality certificate in any year and zero otherwise) is helping firms to experience higher export growth. This is true for both the top fifty Indian group firms (GRPT50BH) and standalone private Indian firms (GRPPVT) and smaller group firms (GRPOTBH). We say that ISO 9000 quality certificates help to build confidence in the minds of the consumers who are very much quality cautious. For smaller and medium sized companies, who don't enjoy much of brand image, can still impress the buyers in the export market by having ISO quality certificates. As Chiang and Masson (1988) suggest, industries should use export quality standards as the best policy to harmonize the information in the export market where a lot of middlemen monitor

quality. If the information structure leads to statistical discrimination, an export quality standard might maintain atomism for exporters who want to sell high quality since it will restrict the cheaters who try to merchandise shoddy products. They note that Japan has minimum export quality standard for exporting companies and Japanese companies have good reputation in the international market as buyers will assume 'made in Japan' means high quality. We argue that the companies having ISO certificates, accredited by a third party registrar, can assure the buyers that the company maintains its quality system. In global market, it is widely believed that WTO is going to include ISO9000 certification as a pre-requisite for exports. The threat of competition and the urge to export continue to inspire more and more Indian companies to install a formal quality management system and get it certified from appropriate independent agency. In their urge to become a quality player, more and more Indian companies are following the ISO 9000 route. Nearly 4,000 Indian companies have demonstrated their ability to produce goods or services of consistent quality which has enabled them to get coveted certification under ISO 9000 series of international standards. It must be realized that ISO 9000 certification certainly provides a competitive edge in the world market. Today our share among the 1,50,000 certificates issued worldwide is nearly 3 percent. To make an impact of ISO 9000 certification on international trade, the pace of progress must be increased and the Indian industry should be convinced to undertake this transition of progressing from mere rhetoric on ISO 9000, to the point where they begin to practice it in the true spirit. There is no doubt that ISO 9000 international standards on quality management system have revolutionized the thinking on quality in the world market. However, in case of the domestic sales growth our results show that ISO certificates do not have any role to play. Possibly, Indian companies do not care about maintaining quality system as additional signals to the buyers in the domestic market. This may be due to the fact that domestic buyers are not familiar about quality system and quality standards like ISO 9000 series. It is the task of our industries and the government to make it popular to the

domestic buyers. Although Quality Council has been established in India, but all its wings are not yet fully functional. The momentum that has been generated for implementation of ISO 9000 must be accelerated to bring under its ambit large spectrum of industrial and service activities in this country. A strong national focus on quality would be necessary to increase the awareness of the domestic consumers.

- 5) Our empirical analyses have found an interesting observation. Firms that are dependent on loan from development financial institutions (DFIs) like IDBI, IFCI, ICICI etc., suffer from adverse selection problem in financial markets, and are unlikely to perform well in exports, as the markets are uncertain about the quality of these firms. However, DFIs often lend to promote socially desirable projects, so domestic growth of sales is positively related to funding from these institutions. Apparently, DFIs are not lending to promote exports. This is true for both the group and non-group firms. Recently, IFCI has stopped financing infrastructure projects. The move is aimed at checking the asset-liability mismatch as the institution is finding it tough to access long-term funds. At present, IFCI is facing fund shortage as it recently announced a four-pronged strategy to check the high non-performing assets (NPA) level, which was pegged at about Rs. 43 billion, constituting 20.78 percent of its assets, at the end of March 2000 (Economic Times, July 14, 2000).
- 6) Firms belonging to small groups or other business houses do not have group reputation effect in the export market. Hence they rely much on financial instruments like commercial paper, debenture etc. as additional signal in the export market. Additionally, they have to build up good marketing and distribution channel to sell their products in the foreign market. Advertisement also has a key role to play in the export market. ISO 9000 certificate will provide them the benefit of brand building exercise in the export market and they will experience with bulk order for the products following ISO standards from the foreign countries.

Our results support the idea of some linkage between the product markets and financial markets. The inter linkage between the two markets at firm level is well established in our empirical work. We have tried to address the causality issue in a different way. However, a good deal of work is still needed to establish the direction of causality. We have a little bit of evidence that financial decisions may drive product market outcomes. But much more work is still needed. We have planned to do a panel vector auto regression in a dynamic framework [like Holtz, Eakin, Newey and Rosen (1988) type] to address the causality of the linkage for further research. In the present work, we have not exploited the panel error structure and actually used them cross sectionally. Our aim was to see if some of the variables proxy for certain firm-specific attributes. If we control for firm-specific effects, none of them may have any explanatory power.

Tables

Table: 1 Correlation coefficients between the different explanatory variables

Variables	SALES	TOT_ASTS	DOMSAL	CP	DEBEN	MARKT	ADVT	DISTR
SALES	1.0000							
TOT_ASTS	0.8950* (0.0000)	1.0000						
DOMSAL	0.9972* (0.0000)	0.8912* (0.0000)	1.0000					
CP	0.1935 (0.0000)	0.1714 (0.0000)	0.1898 (0.0000)	1.0000				
DEBEN	0.7735* (0.0000)	0.8309* (0.0000)	0.7656* (0.0000)	0.2063 (0.0000)	1.0000			
MARKT	0.6323* (0.0000)	0.5182 (0.0000)	0.6193* (0.0000)	0.1971 (0.0000)	0.4658 (0.0000)	1.0000		
ADVT	0.4503 (0.0000)	0.3158 (0.0000)	0.4520 (0.0000)	0.0875 (0.0000)	0.2455 (0.0000)	0.3778 (0.0000)	1.0000	
DISTR	0.6763* (0.0000)	0.5643 (0.0000)	0.6575* (0.0000)	0.1533 (0.0000)	0.4928 (0.0000)	0.4915 (0.0000)	0.2057 (0.0000)	1.0000

Note:

1) '()' denotes the level of significance.

2) * denotes the high correlation level.

Table 1a: Correlation coefficient between the different explanatory variables

Variables	Xgds	TOT_ ASTS	GFAN RR	DEBEN TA	DFI TA	CASH PRFTA	COMPA PTA	MARKT INT	DISTR INT	ADINT	ISO	SHWA TA	PB
Xgds	1.000												
TOT_ ASTS	0.5568	1.000											
GFANRR	-0.1177	-0.3073	1.000										
DEBENTA	0.1363	0.1746	0.0192	1.000									
DFITA	-0.0579	0.132	0.0029	-0.0788	1.000								
CASH PRFTA	0.0211	0.004	0.0122	-0.1085	-0.1362	1.000							
COMPAP TA	0.0627	0.015	-0.0046	0.0802	-0.0395	0.0205	1.000						
MARKT INT	0.0417	0.009	0.0078	0.0029	-0.0011	0.0324	0.0375	1.000					
DISTRINT	0.1091	-0.139	-0.0133	0.0480	0.2287	-0.0478	0.0016	0.0242	1.000				
ADINT	0.0151	0.199	-0.0003	0.0046	-0.0904	0.0097	0.0334	0.1058	0.0539	1.000			
ISO	0.2538	0.252	-0.1218	0.0817	-0.0391	0.0330	0.0487	0.0049	0.0144	0.0187	1.000		
SHWATA	-0.0698	0.184	0.0095	-0.1314	-0.1551	-0.0013	-0.0223	-0.0129	-0.0854	0.0142	-0.0505	1.000	
PB	0.0172	0.010	0.0060	0.0060	-0.0292	0.0232	0.0197	0.0138	0.0199	0.0115	0.0070	-0.0099	1.000

Table: 2 Logit estimation of firm's exports in the next year (Dexp [n+1]) on various explanatory variables of the current year with industry, year and group dummies

Variables	(1) Estimates	(2) z -values	(3) p> z
INTERCEPT	1.535618	2.288	0.022
TOT_ASTS	0.0000503	3.013	0.003
DEBENTA	5.381421	7.384	0.000
COMPAPTA	24.3022	2.132	0.033
DFITA	-2.596943	-9.726	0.000
CASHPRFTA	0.7050762	1.945	0.052
ISO	0.7056786	3.271	0.001
MARKTINT	16.3222	6.992	0.000
DISTRINT	0.8644689	0.561	0.575
ADINT	20.33433	4.741	0.000
SHWATA	1.263544	2.891	0.004
GRPPVT	-0.8289051	-9.605	0.000
GRPOTHBH	-0.2637127	-2.158	0.031
YREND ₉₀	0.1469175	1.047	0.295
YREND ₉₁	0.4229946	2.947	0.003
YREND ₉₂	0.5533538	3.806	0.000
YREND ₉₃	0.7254269	4.881	0.000
YREND ₉₄	0.6172952	4.072	0.000
YREND ₉₅	0.6388425	4.206	0.000
YREND ₉₆	0.4693714	3.015	0.003
IND ₂	0.8337913	0.940	0.347
IND ₄	-0.9165436	-1.302	0.193
IND ₅	-2.396952	-3.554	0.000
IND ₆	-0.0973969	-0.146	0.884
IND ₈	-1.053467	-1.320	0.187
IND ₉	-1.897539	-2.783	0.005
IND ₁₀	-0.5261762	-0.790	0.430
IND ₁₁	-0.8433086	-1.244	0.213
IND ₁₂	-0.9859584	-1.473	0.141
IND ₁₃	-1.214892	-1.827	0.068
IND ₁₄	-0.7710776	-1.138	0.255
IND ₁₅	-1.427325	-2.122	0.034
IND ₁₆	-0.8252681	-1.199	0.231
IND ₁₇	-0.215689	-0.318	0.750

Continue.....

Table: 2 cont...

Variables	(1) Estimates	(2) z -values	(3) p> z
IND ₁₉	-3.034668	-4.173	0.000
IND ₂₁	-2.704881	-4.028	0.000
IND ₂₂	-0.7173135	-1.032	0.302
Pseudo R ²		0.2072	
Number of Observations (N)		4450	
LR Chi ² (36)		1119.56	
Prob > Chi ²		0.0000	
Maximum Log Likelihood		-2141.4071	
% Correct predictions		79%	

Note:

- 1) Convergence achieved after 5 iterations
- 2) GRPT50BH dropped due to collinearity
- 3) YREND₈₉ dropped due to collinearity
- 4) YREND₉₇ dropped due to collinearity
- 5) IND₁ dropped and 8 observations not used
- 6) IND₃ dropped due to collinearity
- 7) IND₇ dropped and 8 observations not used
- 8) IND₁₈ dropped and 24 observations not used
- 9) IND₂₀ dropped and 48 observations not used

Table: 3 Logit estimation of firm's exports in the next year (Dexp [n+1]) on various explanatory variables of the current year with industry, year and group dummies for firms are belonging to GRPT50BH

Variables	(1) Estimates	(2) z -values	(3) p> z
INTERCEPT	0.6043283	1.294	0.196
TOT_ASTS	0.0001463	3.833	0.000
DEBENTA	5.784798	5.169	0.000
COMPAPTA	24.15381	1.728	0.084
DFITA	-2.639945	-6.389	0.000
CASHPRFTA	-0.2361374	-0.410	0.682
ISO	0.5152127	1.790	0.073
MARKTINT	12.91886	3.576	0.000
DISTRINT	-0.9012941	-0.444	0.657
ADINT	19.80731	3.302	0.001
SHWATA	1.154805	1.570	0.116
YREND ₈₉	-0.1071398	-0.450	0.653
YREND ₉₀	-0.052408	-0.218	0.827
YREND ₉₁	0.2792185	1.136	0.256
YREND ₉₂	0.337936	1.362	0.173
YREND ₉₃	0.5243386	2.079	0.038
YREND ₉₄	0.3312657	1.313	0.189
YREND ₉₅	0.2904649	1.194	0.233
IND ₅	-1.38757	-2.865	0.004
IND ₆	0.8326318	1.773	0.076
IND ₉	-0.2539684	-0.508	0.612
IND ₁₀	0.83091	1.792	0.073
IND ₁₁	-0.3690504	-0.780	0.435
IND ₁₂	-0.0914023	-0.192	0.848
IND ₁₃	0.0519281	0.113	0.910
IND ₁₄	0.438952	0.912	0.362
IND ₁₅	0.1712139	0.362	0.717
IND ₁₆	0.1090508	0.204	0.838
IND ₁₇	1.100745	2.241	0.025
IND ₁₉	-2.071314	-3.463	0.001
IND ₂₁	-1.389275	-3.042	0.002
IND ₂₂	1.176791	2.075	0.196

Continue.....

Table: 3 cont...

Variables	(1) Estimates	(2) z -values	(3) p> z
Pseudo R ²		0.2115	
Number of Observations (N)		2342	
LR Chi ² (31)		519.52	
Prob > Chi ²		0.0000	
Maximum Log Likelihood		-972.76536	
% Correct predictions		80%	

Note:

- 1) Convergence achieved after 6 iterations
- 2) GRPPVT dropped due to collinearity
- 3) GRPOTHBH dropped due to collinearity
- 4) YREND₉₆ dropped due to collinearity
- 5) YREND₉₇ dropped due to collinearity
- 6) IND₁ dropped due to collinearity
- 7) IND₂ dropped and 48 observations not used
- 8) IND₃ dropped due to collinearity
- 9) IND₄ dropped due to collinearity
- 10) IND₇ dropped due to collinearity
- 11) IND₈ dropped and 8 observations not used
- 12) IND₁₈ dropped and 8 observations not used
- 13) IND₂₀ dropped and 48 observations not used

Table: 4 Logit estimation of firm's exports in the next year (Dexp [n+1]) on various explanatory variables of the current year with industry, year and group dummies for firms are not belonging to GRPT50BH

Variables	(1) Estimates	(2) z -values	(3) p> z
INTERCEPT	-0.0029964	-0.005	0.996
TOT_ASTS	-7.19e ⁻⁰⁶	-0.248	0.804
DEBENTA	4.42883	4.486	0.000
COMPAPTA	20.46801	1.026	0.305
DFITA	-2.573597	-6.804	0.000
CASHPRFTA	1.136861	2.181	0.029
ISO	0.9312598	2.742	0.006
MARKTINT	18.5201	5.972	0.000
DISTRINT	8.754007	2.799	0.005
ADINT	20.35906	3.135	0.002
SHWATA	1.554427	2.666	0.008
GRPPVT	-0.5963723	-4.687	0.000
YREND ₈₉	-0.7247973	-3.380	0.001
YREND ₉₀	-0.5185037	-2.422	0.015
YREND ₉₁	-0.2763124	-1.279	0.201
YREND ₉₂	-0.0846269	-0.390	0.697
YREND ₉₃	0.0966967	0.442	0.658
YREND ₉₄	0.0559204	0.255	0.798
YREND ₉₅	0.1002672	0.461	0.644
IND ₂	2.039421	2.476	0.013
IND ₃	1.600313	1.886	0.059
IND ₄	0.9481879	1.511	0.131
IND ₅	-0.4880025	-0.837	0.402
IND ₆	1.895317	3.294	0.001
IND ₉	-0.6511429	-1.047	0.295
IND ₁₀	1.11604	1.971	0.049
IND ₁₁	1.702888	2.832	0.005
IND ₁₂	1.211984	2.096	0.036
IND ₁₃	0.5180373	0.920	0.357
IND ₁₄	1.073368	1.792	0.073
IND ₁₅	0.042062	0.072	0.943
IND ₁₆	1.155158	1.910	0.056
IND ₁₇	1.484047	2.505	0.012

Continue.....

Table: 4 cont...

Variables	(1) Estimates	(2) z -values	(3) p> z
IND ₁₉	-0.7726838	-1.094	0.274
IND ₂₁	-0.9045798	-1.544	0.123
IND ₂₂	-0.4393886	-0.642	0.521
Pseudo R ²		0.1944	
Number of Observations (N)		2060	
LR Chi ² (35)		535.03	
Prob > Chi ²		0.0000	
Maximum Log Likelihood		-1108.5727	
% Correct predictions		78.57%	

Note:

- 1) Convergence achieved after 5 iterations
- 2) GRPOTHBH dropped due to collinearity
- 3) YREND₉₆ dropped due to collinearity
- 4) YREND₉₇ dropped due to collinearity
- 5) IND₁ dropped and 8 observations not used
- 6) IND₇ dropped and 8 observations not used
- 7) IND₈ dropped due to collinearity
- 8) IND₁₈ dropped and 16 observations not used
- 9) IND₂₀ dropped due to collinearity

Table: 5 Logit estimation of firm's issue of debenture (D_{DEBEN}) on export dummy (Dexp) & various explanatory variables with group dummies

Variables	(1) Estimates	(2) z -values	(3) p> z
INTERCEPT	-0.0537595	-0.381	0.703
TOT_ASTS	0.0004666	11.184	0.000
CASHPRFTA	-5.580351	-7.127	0.000
Dexp	0.8175606	8.859	0.000
GRSAL1	0.2013538	0.807	0.420
PB	0.0149104	0.775	0.438
GRPPVT	-0.4774671	-4.999	0.000
GRPOTHBH	-0.636634	-0.498	0.618
Pseudo R ²		0.1640	
Number of Observations (N)		3193	
LR Chi ² (7)		683.27	
Prob > Chi ²		0.0000	
Maximum Log Likelihood		-1741.5536	

Note:

- 1) Convergence achieved after 7 iterations

Table: 6 Logit estimation of firm's issue of debenture (D_{DEBEN}) on export dummy (Dexp) & various explanatory variables for firms belong to GRPT50BH

Variables	(1) Estimates	(2) z -values	(3) p> z
INTERCEPT	-0.2213096	-1.120	0.263
TOT_ASTS	0.0004563	10.030	0.000
CASHPRFTA	-6.933605	-5.963	0.000
Dexp	0.9026517	6.611	0.000
GRSAL1	0.2013538	0.807	0.420
PB	0.0452742	1.690	0.091
Pseudo R ²		0.1765	
Number of Observations (N)		1834	
LR Chi ² (5)		371.83	
Prob > Chi ²		0.0000	
Maximum Log Likelihood		-867.32253	

Note:

1) Convergence achieved after 7 iterations

Table: 7 Logit estimation of firm's issue of debenture (D_{DEBEN}) on export dummy (Dexp) & various explanatory variables for firms do not belong to GRPT50BH

Variables	(1) Estimates	(2) z -values	(3) p> z
INTERCEPT	-0.429557	-0.220	0.826
TOT_ASTS	0.000527	5.154	0.000
CASHPRFTA	-4.287183	-4.040	0.000
Dexp	0.7265376	5.795	0.000
GRSAL1	0.0496969	0.147	0.883
PB	0.0452742	1.690	0.091
GRPPVT	-0.3999283	-3.103	0.002
Pseudo R ²		0.1359	
Number of Observations (N)		1834	
LR Chi ² (6)		151.35	
Prob > Chi ²		0.0000	
Maximum Log Likelihood		-866.00219	

Note:

1) Convergence achieved after 5 iterations

Table: 8 Logit estimation of firm's issue of commercial paper (D_{CP}) on export dummy (Dexp) & various explanatory variables with group dummies

Variables	(1) Estimates	(2) z-values	(3) p> z
INTERCEPT	-0.4166791	-8.704	0.000
TOT_ASTS	0.000188	3.148	0.002
CASHPRFTA	-1.384596	-0.695	0.487
Dexp	1.761942	4.132	0.000
GRSAL1	-2.495506	-3.616	0.000
PB	0.1910866	5.700	0.000
GRPPVT	-0.3999283	-3.103	0.002
GRPOTHBH	-2.911749	-2.885	0.004
Pseudo R ²		0.1293	
Number of Observations (N)		3193	
LR Chi ² (7)		130.53	
Prob > Chi ²		0.0000	
Maximum Log Likelihood		-439.69362	

Note:

1) Convergence achieved after 6 iterations

Table: 9 Logit estimation of firm's issue of commercial paper (D_{CP}) on export dummy (Dexp) & various explanatory variables for firms belong to GRPT50BH

Variables	(1) Estimates	(2) z -values	(3) p> z
INTERCEPT	-4.180742	-7.377	0.000
TOT_ASTS	0.000183	3.049	0.002
CASHPRFTA	-2.39008	-1.060	0.289
Dexp	1.936235	3.730	0.000
GRSAL1	-2.433635	-3.248	0.001
PB	0.2029083	5.519	0.000
Pseudo R ²		0.0910	
Number of Observations (N)		1834	
LR Chi ² (5)		71.70	
Prob > Chi ²		0.0000	
Maximum Log Likelihood		-357.96659	

Note:

- 1) Convergence achieved after 5 iterations

Table: 10 Logit estimation of firm's issue of commercial paper (D_{CP}) on export dummy (D_{exp}) & various explanatory variables for firms do not belong to GRPT50BH

Variables	(1) Estimates	(2) z -values	(3) p> z
INTERCEPT	-7.349175	-5.359	0.000
TOT_ASTS	0.000616	1.172	0.241
CASHPRFTA	2.893021	0.655	0.513
Dexp	1.405038	1.790	0.074
GRSAL1	-2.766052	-1.532	0.126
PB	0.1413207	1.592	0.111
GRPPVT	1.920983	1.850	0.064
Pseudo R ²			0.0821
Number of Observations (N)			1359
LR Chi ² (6)			14.27
Prob > Chi ²			0.0465
Maximum Log Likelihood			-79.839122

Note:

- 1) Convergence achieved after 7 iterations

Table: 11 Tobit estimation of firm's exports performance in the next year (Xgds [n+1]) on Xgds [n] and other explanatory variables of the current year with industry, year dummies for GRPT50BH firms

Variables	(1) Estimates	(2) t-values	(3) p> t
INTERCEPT	-71.64231	-0.952	0.341
Xgds	1.150106	86.685	0.000
TOT_ASTS	-0.0098765	-8.797	0.000
GFANRR	0.0482003	11.397	0.000
DEBENTA	203.9482	3.923	0.000
COMPAPTA	412.5617	0.847	0.397
DFITA	-104.9684	-3.006	0.003
CASHPRFTA	-21.93678	-0.428	0.669
ISO	33.84104	2.111	0.035
MARKTINT	323.415	1.798	0.072
DISTRINT	88.39462	0.507	0.612
ADINT	1126.102	3.167	0.002
YREND ₈₉	0.2239395	0.013	0.990
YREND ₉₀	-22.76518	-1.276	0.202
YREND ₉₁	7.519624	0.425	0.671
YREND ₉₂	15.08756	0.854	0.393
YREND ₉₃	13.27096	0.761	0.447
YREND ₉₄	-3.354677	-0.193	0.847
YREND ₉₅	33.86738	2.053	0.040
IND ₂	76.28748	0.968	0.333
IND ₄	99.43464	1.224	0.221
IND ₅	-45.51248	-0.603	0.547
IND ₆	0.547	1.080	0.280
IND ₈	79.57745	0.799	0.424
IND ₉	24.00071	0.314	0.753
IND ₁₀	60.88121	0.827	0.409
IND ₁₁	22.74024	0.306	0.759
IND ₁₂	6.877946	0.091	0.928
IND ₁₃	72.76394	0.979	0.327
IND ₁₄	40.10324	0.536	0.592
IND ₁₅	39.80546	0.538	0.591
IND ₁₆	29.5531	0.400	0.689
IND ₁₇	59.73348	0.811	0.418

Continue.....

Table: 11 cont...

Variables	(1) Estimates	(2) t-values	(3) p> t
IND ₁₉	-68.84199	-0.804	0.421
IND ₂₁	-51.7779	-0.704	0.481
IND ₂₂	69.01564	0.927	0.354
Pseudo R ²		0.1467	
N		2446	
Chi ² (36)		4419.33	
Prob > chi ²		0.0000	
Maximum Log Likelihood		-12851.414	
Observations Summary		563 left-censored observations at Xgds1<=0 & 1883 uncensored observations.	

Note:

- 1) GRPPVT dropped due to collinearity
- 2) GRPOTHBH dropped due to collinearity
- 3) YREND96 dropped due to collinearity
- 4) YREND97 dropped due to collinearity
- 5) IND1 dropped due to collinearity
- 6) IND₃ dropped due to collinearity
- 7) IND₇ dropped due to collinearity
- 8) IND₁₈ dropped due to collinearity
- 9) IND₂₀ dropped and 48 observations not used

Table: 12 Tobit estimation of firm's exports performance in the next year (Xgds [n+1]) on Xgds [n] and other explanatory variables of the current year with industry and year dummies for non-GRPT50BH firms

Variables	(1) Estimates	(2) t-values	(3) p> t
INTERCEPT	-8.032154	-0.269	0.788
Xgds	1.10951	61.474	0.000
TOT_ASTS	-0.0001982	-0.141	0.888
GRRNFATA	0.0007605	0.061	0.951
DEBENTA	56.82935	1.834	0.067
COMPAPTA	346.385	0.847	0.397
DFITA	-67.19961	-4.362	0.000
CASHPRFTA	58.86433	2.479	0.013
ISO	15.6400	1.580	0.114
MARKTINT	301.6672	3.210	0.001
DISTRINT	251.7792	2.237	0.025
ADINT	153.0443	0.940	0.347
GRPOTHBH	13.01808	2.876	0.004
YREND ₈₉	-19.14658	-2.297	0.022
YREND ₉₀	-11.93794	-1.452	0.147
YREND ₉₁	-14.29601	-1.753	0.080
YREND ₉₂	-9.36926	-1.161	0.246
YREND ₉₃	-5.721671	-0.718	0.473
YREND ₉₄	-7.947575	-1.009	0.313
YREND ₉₅	-4.945947	-0.639	0.523
IND ₁	15.46749	0.377	0.706
IND ₂	-19.92994	-0.631	0.528
IND ₃	-3.207149	-0.090	0.928
IND ₄	-3.039305	-0.097	0.923
IND ₅	-48.92021	-1.619	0.106
IND ₆	12.91356	0.43	0.662
IND ₈	-40.01423	-1.085	0.278
IND ₉	-61.33969	-1.936	0.053
IND ₁₀	-12.27697	-0.418	0.676
IND ₁₁	4.739905	0.157	0.875
IND ₁₂	0.9119603	0.030	0.976
IND ₁₃	-21.47349	-0.729	0.466
IND ₁₄	-17.56378	-0.576	0.564
IND ₁₅	-38.50745	-1.265	0.206
IND ₁₆	-17.24193	-0.562	0.574
IND ₁₇	-11.73629	-0.391	0.696

Continue.....

Table: 12 cont...

Variables	(1) Estimates	(2) t-values	(3) p> t
IND ₁₈	10.9664	0.310	0.757
IND ₁₉	-70.66818	-1.995	0.046
IND ₂₁	-65.23264	-2.134	0.033
IND ₂₂	-19.66151	-0.584	0.559
Pseudo R ²		0.1318	
Number of Observations (N)		2092	
Chi ² (39)		2398.02	
Prob > chi2		0.0000	
Maximum Log Likelihood		-7897.8713	
Observations Summary		800 left-censored observations at Xgds1<=0 & 1292 uncensored observations.	

Note:

- 1) GRPPTVT dropped due to collinearity
- 2) YREND₉₆ dropped due to collinearity
- 3) YREND₉₇ dropped due to collinearity
- 4) IND₇ dropped due to collinearity
- 5) IND₂₀ dropped due to collinearity
- 6) IND₈ dropped due to collinearity
- 7) IND₂₀ dropped and 48 observations not used

Table: 13 Regression of domestic sales in the future (DOMSAL [n+1]) on DOMSAL [n] and other explanatory variables of the current period for firms belong to GRPT50BH

Variables	(1) Estimates	(2) t-values	(3) p> t
INTERCEPT	-247.1857	-4.442	0.000
DOMSAL	1.160109	218.640	0.000
CASHPRFTA	106.5978	0.628	0.530
GFANRR	0.0715538	5.344	0.000
DEBENTA	280.5129	1.470	0.142
COMPAPTA	3562.701	1.941	0.052
DFITA	196.8097	1.683	0.092
ISO	-14.49682	-0.244	0.807
MARKTINT	-1093.142	-1.605	0.109
DISTRINT	-718.1286	-1.186	0.236
ADINT	1816.576	1.368	0.171
YREND ₈₉	333.5571	5.303	0.000
YREND ₉₀	218.9536	3.478	0.001
YREND ₉₁	238.7013	3.795	0.000
YREND ₉₂	157.6234	2.502	0.012
YREND ₉₃	170.8569	2.734	0.006
YREND ₉₄	329.3237	5.271	0.000
YREND ₉₅	457.6249	7.695	0.000
INDUSTRY (19 categories)		Present	
		F(18,2410) =	1.363
R ²			0.9804
Adjusted R ²			0.9802
Number of Observations (N)			2446
F(17, 2410)			6225.59
Prob > F			0.0000
Root Mean Square Error			723.88

Note:

- 1) GRPPVT & GRPOTHBH are dropped.
- 2) YREND₉₆ & YREND₉₇ are dropped

Table: 14 Regression of domestic sales in the future (DOMSAL [n+1]) on DOMSAL [n] and other explanatory variables of the current period for firms do not belong to GRPT50BH

Variables	(1) Estimates	(2) t-values	(3) p> t
INTERCEPT	-79.43238	-6.454	0.000
DOMSAL	1.098914	143.872	0.000
CASHPRFTA	20.33369	0.656	0.512
GFANRR	0.3510424	17.000	0.000
DEBENTA	181.184	3.213	0.001
COMPAPTA	393.3374	0.508	0.612
DFITA	72.64806	2.931	0.003
ISO	-13.68762	-0.746	0.456
MARKTINT	-175.5119	-1.039	0.299
DISTRINT	117.772	0.592	0.554
ADINT	41.5605	0.138	0.891
GRPOTHBH	-12.67295	-1.573	0.116
YREND ₈₉	100.226	6.952	0.000
YREND ₉₀	69.10537	4.822	0.000
YREND ₉₁	81.33446	5.681	0.000
YREND ₉₂	69.15318	4.859	0.000
YREND ₉₃	58.63874	4.159	0.003
YREND ₉₄	117.6523	8.404	0.000
YREND ₉₅	98.78409	7.188	0.000
INDUSTRY (21 categories)		Present	
		F(20,2053) =	1.899
R ²		0.9468	
Adjusted R ²		0.9458	
Number of Observations (N)		2092	
F(18, 2053)		1918.50	
Prob > F		0.0000	
Root Mean Square Error		154.75	

Note:

- 1) GRPPVT dropped.
- 2) YREND₉₆ & YREND₉₇ are dropped

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Appendices

APPENDIX: A

DESCRIPTION OF VARIABLES

Variable	Description
Dependent Variables:	
Dexp [n+1]	Dummy for next period exports (= 1 if firm exported in the next year i.e., $Xgds_{n+1} > 0$ & = 0 if it didn't)
Xgds [n+1]	Export of goods and services in the next period
DOMSAL [n+1]	Domestic sales in the next period
D _{DEBEN}	Dummy for debenture (= 1 if company has outstanding debentures and = 0 otherwise)
D _{CP}	Dummy for commercial paper (= 1 if company has outstanding commercial paper and = 0 otherwise)
Independent Variables:	
ISO	ISO dummy (= 1 if company has ISO and = 0 otherwise)
TOT_ASTS	Total assets represent firm size
CASHPRFTA	Cash profit over total assets
PB	Price to book value ratio
COMPAPATA	Ratio of commercial paper to total assets
DEBENTA	Ratio of debenture to total assets
DFITA	Debt from DFIs (development financial institutions such as ICICI, IDBI etc.) over total assets
CP	Commercial paper
GRRSAL 1	Growth of sales lagged one period

Continue.....

APPENDIX: A continue.....

Variable	Description
Independent Variables:	
DEBEN	Debentures
ADVT	Advertisement
MARKT	Marketing
DISTR	Distribution
ADINT	Ratio of advertisement expenditure to sales
MARKTINT	Ratio of marketing expenditure to sales
DISTRINT	Ratio of distribution to sales
SHWATA	Share of wages to total assets
GFANRR	Change in the level of gross fixed assets net of revalued reserves in the current period
GRPT50BH	Top 50 business groups
GRPPVT	Group of private Indian stand-alone companies
GRPOTHBH	Other business groups
IND ₁ – IND ₂₂	22 Industry dummies
YREND ₈₉ - YREND ₉₇	9 Year dummies
D _{exp}	Export dummy (=1 if total export >0 and = 0 otherwise)

APPENDIX: B

GRRSAL 1

	Percentiles	Smallest		
1%	-0.5502307	-1		
5%	-0.1772114	-1		
10%	-0.0652912	-1	Observations	4538
25%	0.0545045	-0.9868421	Sum of Wgt.	4538
50%	0.1703856		Mean	0.2289184
		Largest	Std. Dev.	0.5611269
75%	0.3070264	6.472004		
90%	0.4963014	6.971609	Variance	0.3148634
95%	0.7252692	12.58214	Skewness	16.23202
99%	1.863024	21.00649	Kurtosis	489.5198

PB

	Percentiles	Smallest		
1%	-2.73	-1293.86		
5%	0	-490		
10%	0	-142.22	Observations	4984
25%	0	-82.57	Sum of Wgt.	4984
50%	1.11		Mean	1.433904
		Largest	Std. Dev.	20.43308
75%	2.48	70.22		
90%	4.6	93.71	Variance	417.5107
95%	6.71	94.68	Skewness	-53.75301
99%	13.5	209.12	Kurtosis	3311.583

APPENDIX: C

Industry Dummies	Frequency	No. of Companies	Industry Type
IND ₁	9	1	Gelatin
IND ₂	90	10	Tea & Plantation
IND ₃	18	2	Stone
IND ₄	90	10	Soya Oil
IND ₅	243	27	Sugar
IND ₆	648	72	Textile 1
IND ₇	9	1	Machine Tools
IND ₈	27	3	Plywood
IND ₉	171	19	Paper
IND ₁₀	702	78	Chemical & Fertilizers
IND ₁₁	288	32	Tyre & Rubber
IND ₁₂	378	42	Cement
IND ₁₃	594	66	Iron & Steel
IND ₁₄	279	31	Engineering 1
IND ₁₅	306	34	Electrical
IND ₁₆	189	21	Electronics
IND ₁₇	351	39	Automobile
IND ₁₈	27	3	Watch
IND ₁₉	72	8	Engineering 2
IND ₂₀	54	6	Power
IND ₂₁	369	41	Hospital, Hotel, Bank, Consultancy, Shipping etc.
IND ₂₂	234	26	Textile 2
TOTAL	5148 = No. of Observations	572	