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STUDY OF CAPITAL STRUCTURE DETERMINANTS IN EMERGING MARKET ECONOMIES: EVIDENCE FROM INDIA

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ABSTRACT

This report examines the key determinants of a firm's choice of capital structure in emerging market economies of the world. The study also attempts to analyze the challenges and considerations unique to emerging market economies and those not faced by firms in major industrialized countries. Emerging market economies present their own set of challenges, arising from availability of data, country-specific considerations and numerous political/social factors. One specific factor that is explained in detail is the impact of ownership and control, by institutions, government or banks, and the effect of economic reforms on development in these emerging markets.

The second half of the study investigates the determinants of capital structure specifically for listed Indian companies. Some of the key measures found to be significant in determining financing decision and affecting capital structure are tangibility, profitability, growth, taxes and interest coverage. In addition to this initial determination, also observed is the different impact played by these measures on the capital structure of the firm, depending on whether it is government controlled or private sector owned, which could be an interesting aspect to research in future.

Keywords: Capital structure, Ownership, Control, Emerging Markets, India.

Contents

I. Introduction

Pioneering research by Modigliani and Miller (1958) forms the basis for most modern day thinking on capital structure. Though the theory is generally viewed as a purely theoretical view, given that it assumes away the various factors critical to the important capital structure decision process, it sets the foundation to understanding the important considerations introduced over the years to adapt the theory to the real world of corporate finance. Various features have been incorporated into the choice of capital structure, beyond the seminal work done by these pioneering researchers.

Most early research on an international scale has focused on understanding the determinants of a firm's capital structure and financial leverage in industrialized countries, but there has been limited work in this area in developing countries and transition economies. Most early empirical evidence is based on firms in the United States and other industrialized countries, but it is important to understand how these determinants of capital structure relate with those in developing countries. In their influential work in the area of capital structure in an international setting, Rajan and Zingales (1995) investigate the similarities and highlight the differences in capital structure in G-7 countries. At an aggregate level, their work concludes that firm leverage and capital structure is fairly similar across industrialized nations, with some exceptions for differences stemming from country-specific institutional control.

Until this past decade, industrialized countries were the only major players in the world economy, but over the past decade, emergence of large developing countries has

resulted in a more complex, integrated world economy. Globalization, trade, growing markets, huge populations and a large middle class have substantially increased the significance of these countries to world economic growth. In many ways, the growth of the world economy today lies in these developing countries and some of their emerging markets. Due to their significance to the global economy, the past decade has seen renewed interest in understanding the financial underpinnings of firms in these developing economies and resulted in some research into the factors that determine capital structure of firms in these markets. Consequently, there still remains a great amount of work that needs to be done to understand the determinants of capital structure in these emerging economies.

Developing countries today account for more than 80% of the world population (Appendix, I). While most of the developing economies are still comparatively small and do not have an impact on the dynamics of the world economy, a few have grown rapidly over the past decade to grab a major share of the growth in global trade (Appendix, II). These developing regions that have seen explosive growth over the past decade are commonly described as Emerging Markets. Different countries in this category have achieved growth and economic development to various degrees. Some countries, like South Korea and Taiwan, are close to being deemed developed economies with higher standard of living and solid industrialization, while others like Brazil, Russia, India and China are rapidly growing and positioned to make up a lion share of the world economy and be potentially large markets for business in the future (Appendix, III).

The primary motivation for this report is to analyze the determinants of capital structure in emerging markets of the world. Most often the broad criteria are similar to those considered in industrialized countries, but a closer investigation is required to understand impact of country-specific factors, like reforms, government control, license control, ownership structure, institution control and socialist policies, that tend to play a bigger role in the developing world. Most emerging market countries are still in the mode where growth is being spurred by broad-based, government managed economic and financial reform policy, which is not always consistent across the spectrum of countries in the developing world. The early emphasis on institutional control and recent growth in stock markets has changed capital structure dynamics in emerging market economies.

This report also researches the trends in the area of capital structure in a rapidly growing economy of the world – India. India, the world's largest democracy and second most populous country, is an exciting country to research, given its relatively recent transition from a government license driven economy (pre-liberalization, 1992) to a government managed capitalistic economy (post liberalization). After getting past the doldrums of the 1990s, the economy has seen consistent 5-10% growth this decade, supported by solid exports, domestic consumption and strong appreciation in the stock market, particularly in the past 5 years (Appendix, IV). This scenario helps understand how the political climate over the past two decades has played a role in determining firm capital structure of firms in this country. Subsequently, the recent economic liberalization and emergence as a high growth economy, also means that research specific to India is

relatively limited and presents the opportunity to more closely analyze matters impacting capital structure choice of domestic firms.

This report begins with a brief primer to capital structure theory, before analyzing the factors that determine choice of capital structure in emerging markets. This assessment of determinants of capital structure is followed by an analysis of the Indian economy, firm analysis for capital structure determinants and a summary of results.

II. Capital Structure Theory – A Primer

One of the most important decisions in financial management involves determination of the appropriate capital structure for the corporation, i.e. the mix between debt and equity. Firms raise funds for their projects in many ways – either through borrowing or loans from banks and private institutions or through issuance of debt, preferred stock and common equity. The degree to which a firm raises capital through these various channels determines the capital structure of the firm. If a firm's capital structure includes a high portion of debt, the firm is said to be highly levered and financial leverage becomes an important consideration in the firm's capital structure. Capital structure plays an important role in the present and future positioning of the firm and affects financing decisions and remains a very important consideration the firm makes.

The starting point for any discussion on capital structure is an introduction to the Modigliani-Miller theorem. Proposition I of the MM theorem states that, in the absence of taxes and other market frictions (bankruptcy and transaction costs), the capital structure choice of a firm does not affect the firm's value. In other words, given no taxes, value of a levered firm is the same as the value of an unlevered firm ($V_L=V_U$). Additionally, if capital structure decision has no effect on the total cash flows to stakeholders, then the decision has no effect on the total firm value. The key takeaway from this theorem is that managers should focus their efforts on making real investment decisions, regardless of how these investments would actually be financed.

An additional theorem widely discussed in financing decision-making comes from the MM Proposition II, that states that expected rate of return on equity is positively related to the leverage, because as leverage increases, so does the risk to equity.

The relationship is shows as, $r_E = r_0+(r_0-r_D)*(D/E)$, where,

r_E = cost of equity,

r_0 = cost of all equity firm,

D = value of debt,

E = value of equity,

r_D = cost of debt.

Essentially, MM theory concludes that substituting debt with equity even if debt appears a cheaper way to finance cannot reduce firm's overall cost of capital. The logic behind this is that as a firm increases its leverage, its remaining equity becomes more risky. Any reduced cost of debt is thus offset by the increased cost of equity.

The MM Theorem, however, is not directly applicable to the real world of corporate finance, where this perfect view gets complicated with tax considerations and their impact on financing decisions. The insight into the tax impact is that interest payments from debt issuance are tax deductible, while dividend payouts to shareholders are not, resulting in debt being a less expensive form of financing than equity. At the same time, some of the corporate tax advantage of debt can be mitigated by the personal tax advantage of equity, thus complicating the choice of capital structure. Contrarily, capital gains to shareholders from equity might be taxed less than tax on interest payments to debt holders potentially favoring use of equity by the firm. Subsequently, given the tax on dividend income for equity holders, they might just prefer to have firms use retained earnings to finance their activities.

While taxes are a major update to the original theorem, market friction costs related to bankruptcy and transactions are an additional consideration to the MM Theorem. In the event of bankruptcy, Modigliani-Miller Proposition I assumes that assets transfer from equity to debt holders without any friction losses. In reality, legal costs are associated with this transfer and undermine firm value. Also, managerial decision-making is vastly affected as a firm nears bankruptcy or financial distress. Due to these potential costs, firms tend to limit use of debt financing in spite of their tax advantages.

Four main theories have been proposed over the years – the trade off, signaling, pecking order and agency theories. The Trade Off theory refers to the idea that a firm chooses how much debt finance and how much equity finance to use, by balancing the costs vs. the benefits. The trade off theory states that there is an advantage to financing

with debt (tax benefit) and there is a cost to financing with debt (financial distress, bankruptcy cost). The marginal benefit of increase in debt declines as debt increases, while the marginal cost increases, resulting in the firm that chooses to optimize its overall value focuses on this tradeoff when choosing extent of leverage in its capital structure. The Signaling theory is based on asymmetric information problems arising when individuals who supply capital do not run the firms themselves. The two main issues that arise due to information asymmetry are adverse selection and principal-agent conflict. The problem of adverse selection arises when controlling managers possess some information not known to outside investors. In such a case, financing method can serve as a signal to outside investors. This results in the creation of a financing hierarchy – first internal funds, followed by debt and then equity, leading us to the Pecking Order theory.

The Pecking Order theory states that companies prioritize their source of financing from internal funds to debt to equity. Hence, firms use internal funds first and when depleted, issue debt and once the costs outweigh the benefits, issue equity. This theory thus maintains a sequence of financing that drives decision-making and capital structure. The Agency theory is based on the second problem from information asymmetry – principal-agent conflict. The conflict arises when there is a moral hazard inside the firm. Managers may pursue their own interests, which may conflict with shareholder's interest. This agency problem can be solved by increasing manager ownership and closer alignment of manager interest with shareholders. Other possibilities include monitoring of management and use of debt financing to discipline managers.

While the theories of capital structure are well researched and sophisticated, in practice, the firm's choice of capital structure cannot be summarized by an exact formula. Neither theory nor research has been able to provide a satisfactory solution to the factors that affect the capital structure decision. As there is no formula for the optimal debt-equity ratio across the corporate world, empirical evidence drives the choice of financing decision, while charting out a capital structure policy.

III. Capital Structure Determinants in Emerging Markets

The previous section discusses the theory behind the considerations leading to the financing decisions made by firm managers. This section reviews the various factors that play a role in the choice of debt and capital structure in emerging markets. Very little is known about the determinants of the capital structure of developing countries or transition economies. Yet with the increased importance of these countries to the global economy, understanding the factors leading to their capital structure tendencies is only going to get even more important. As the capital markets of emerging countries are relatively less developed; problems of information asymmetry are more pervasive due to accounting and auditing standards. These pose unique challenges to understanding the determinants of capital structure in these markets.

Rajan and Zingales (1995) investigate the determinants of capital structure by analyzing financing decisions of public firms in the G-7 nations. Although the G-7

countries are fairly homogeneous in their level of economic development, their institutions, bankruptcy and tax code, market for corporate control, and historical role of banks and securities markets, are fairly different. One could assume the same diversity in determinants in emerging markets. Some deductions could carry over from past research as well; leverage increases with size in all countries (Titman and Wessels, 1988), as larger firm size leads to better diversification, lower probability of financial distress and lower bankruptcy costs, which enable firms to take on more debt.

A. Macroeconomic Factors

The macroeconomic environment has a significant effect on firm level activities, as it tends to influence demand and supply dynamics faced by firms. Economic growth and inflation rate reflect the degree of stability in the economy. Higher the rate of economic growth the higher leverage, while lesser the leverage with higher inflation. In other words, in an inflationary environment, firms would avoid issuing debt. Financial liberalization and development of the stock market in developing countries also has promoted the increase of debt in the capital structure of firms. Trade openness is another factor that impacts debt structure of domestic firms. Open, less restrictive policies results in competition intensity between domestic and foreign firms and with limited protection from government, domestic firms avoid high leverage to reduce the risk of bankruptcy.

Politics is integrally involved with the economy in many developing countries. The emerging market nations provide the world with a variety of political ideology, ranging from authoritarian control (China) to democracy (India). Country specific capital

structure determinants are controlled to a great extent by the stability of these countries. Most of these economies can also be considered as 'relationship based', due to the high value placed on relationships. This relationship over the decades has translated over to business and has played a key role in determining financing options for firms. The potential link between political patronage and capital structure is well researched by Fraser, Zhang and Derashid (2005), in their case on Malaysia. They note that Malaysian firms that have close link with politicians tend to have more debt. This is typical of a developing economy, where relations are built into business over time and are critical in growth and debt structure. This also takes us into the topic of government control, where socio-economic policy is established and passed on to business and individuals alike.

State enterprise or government controlled institutions have also played a big part in setting capital structure trends in developing countries. Most emerging markets arose out of socialistic, government controlled economies following liberalization over the past two or three decades. With support of the national governments, firms have been able to issue large loans and debts to investors and have carried on that legacy into the privatized, liberalized era. Some examples of this are seen in China, where the banking system has undergone considerable reforms over the years, but is still considered fairly inefficient and highly government controlled. Similarly, in India until recently, most state owned enterprises had been under government control (also called the public sector) with investments always funded by debt, issued to institutions or investors. In the last decade, a wave of privatization and issuance of equity has resulted in transforming these firms into ones with more typical debt-equity capital structures.

B. Firm level Factors:

Many factors play a role in financing decision and firm value, including taxes, non-debt tax shield effects, risk of financial distress and bankruptcy, agency costs and asymmetric information. This section will cover some of these factors one by one.

A.   <u>Debt Tax Shields</u>:   Tax code is an important determinant of choice of capital structure, though not always apparent. Some studies conclude that tax have no effect on leverage, while some have compared the competition between tax deductibility of debt and other non-debt tax shields. In most countries, interest expenses are tax deductible for corporate tax purposes, while dividends have to be paid out of income, net of tax. Most tax systems favor debt finance over equity finance, but to differing degrees (Huizinga and Laeven, 2006). Studies on leverage and tax rates by Huizinga and Laeven conclude that, the two are closely related. Since interest payments are tax-deductible, firms have advantage to be levered in order to save tax payments. Research finds that firms raise their debt usage in response to increase in the corporate tax rate (MacKie-Mason, 1990). While the impact of taxes on decision-making might not be apparent and depend on many factors such as the comparison of personal vs. corporate tax, we cannot dismiss the possibility that taxes influence the aggregate corporate leverage in the country. Studies by Fan, Titman and Twite (2006) conclude that more profitable firms have lower leverage, the result being weaker in countries where dividends are preferentially taxed, which is consistent with the idea that personal taxes can influence payout policies and in turn

influence capital structure. It is therefore imperative to analyze both personal and corporate taxes and understand their relationship and impact on choice of capital structure. Tax advantages of debt also vary from country to country, and affect financing decisions. At the same time, on equity, when dividends are more highly taxed, firms tilt their capital structures towards debt.

B.   Non-Debt Tax Shield (NDTS): The relative attractiveness of debt financing can be mitigated by the existence of non-debt related corporate tax shield, such as depreciation on investments, investment tax credits, pension funds and R&D expenses, to reduce corporate tax payments. Firms can use such non-interest items to reduce their tax bills and help their bottom-line. Firms with higher NDTS are likely to use less debt.

C.   Bankruptcy and/or Financial Distress Costs: Per the Trade Off theory, the benefits from debt financing are limited by increasing bankruptcy costs. Bankruptcy costs and laws play a huge role in leverage and debt contracts, per research done by Harris and Raviv (1992). Variations in bankruptcy procedures, especially the extent of liquidation over renegotiations of claims can have a lasting impact on firm's choice of capital structure. Firms in countries with strict bankruptcy laws and strict enforcement will be less likely to take on more debt and would tend to be less leveraged. From the industrialized world, comparison of the bankruptcy code of the US and UK reveals that the US code tends to provide strong incentive towards keeping the firm a going concern and fosters reorganization, even if value is greater in liquidation, while the UK or German code, by emphasizing the right of creditors, most often leads to liquidations. Per

studies by White (1993) and Kaiser (1994), German bankruptcy code is not conducive to reorganization and firms entering bankruptcy are usually liquidated. Since liquidation value is lower than going concern, bankruptcy is more costly in Germany. Countries differ in the extent to which they manage this trade-off in enforcing creditor rights.

D.   Bank Influenced versus Market Based Countries: There are major differences in the power of banks and financial institutions in various countries. In the industrialized world, the two extreme cases are of Germany and USA. In Germany, banks are allowed to own equity in industrial firms and underwrite corporate securities, while in US significant limitation are placed on both activities. It is observed that the banking sector is more important in bank-oriented economies than market driven economies. Given this preference, one could assume that market driven economies would have a more active stock and bond market and bank driven economies would have a market for private financing with bank loans. Through their studies, Demirguc-Kunt and Maksovic (1999) conclude that legal and institutional differences among countries explain a large part of the leverage and debt maturity choices of firms. In their paper, Hussain and Nivorozhkin (1997) find that Poland has extremely low leverage levels, suggesting a growing stock market and a potential reluctance by banks to grant loans to old and risky firms.

E.   Ownership Structure: Ownership concentration varies among countries. This has been the case in the developed world and seen in the diffused structure in North America and UK. Europe tends to have a more concentrated ownership model with inter-company cross holdings and ownership pyramids. Ownership structure benefits capital structure by

maintaining a concentrated shareholder presence on the board, increased aversion to debt and a reduction in agency costs. It has been found that countries like Korea, Indonesia, India and Pakistan have strong family controlled firms. Research by Claessens, Djankov and Lang (2000) in family holdings in developing countries found that the top fifteen families in Indonesia, Thailand and Malaysia owned 62%, 53% and 28% respectively of all listed domestic equity in their countries. Through their studies, Hussain and Nivrozhkin (1997) also arrive at the same conclusion; large business houses control firms in Indonesia. They also conclude that shareholder concentration has a neutral to a beneficial effect on firm leverage, primarily due to the nature of ownership.

China presents its own interesting ownership mix. Most firms have a state ownership of 40%, institutional of 20%, private of 30% and foreign holdings at 3%, per Hovey (2003). It all started with the privatization of state owner enterprises (SOE). Through this scheme, vast numbers of small to medium SOEs were sold, merged or formed into joint ventures. In China, a typical listed company has a few major owners – state, legal persons and domestic individual investors. The ownership structure is a form of pyramid holdings, none of which are publicly traded. As can be seen in China's case, state ownership and control continues to be an important aspect of firm structure. In Turkey, per studies by Gonenc (2003), large corporations are affiliated with each other within a business group and almost every private bank is within a business group and serves as the source of funds. Also, the Turkish government has been the founder and manager of many large to medium firms in several key industries and the banking sector.

F.   Tangibility of Fixed Assets: It has been suggested that firms with more tangible assets have a greater ability to secure debt financing. In other words, leverage is positively associated with liquidation value (Harris and Raviv, 1990). This would otherwise mean that the collateral value of the assets could be used to ease and improve terms of debt financing. Another feature of tangibility of assets is in the type of debt that can be issued; long-term debt financing is easier accessed with sizeable fixed assets.

G.   Profitability: Profitability is a significant variable influencing capital structure. According to the Pecking Order Theory, profitable firms will retain more internal funds and will carry less debt, but in contrast, the Trade Off theory states that the more profitable the firm is, the more free cash flow is available to managers, leading to wastage and poor choice of investments to fund. To avoid this, firms with solid free cash flow will tend to acquire debt and the discipline associated with it.

H.   Size: Size has been found to also play a factor in determining capital structure. It has been suggested that large firms might choose to use equity financing, but at the same time small firm pay much more for equity issuance and more for debt. This would suggest that small firms are more levered that large firms. In other words, an inverse relationship is expected between size and total debt. But on the other hand, due to the tax deductibility of interest payments, it is argued that highly profitable companies tend to have high levels of debt (Modigliani and Miller, 1963). Another observation stresses that larger firms are more diversified and less prone to bankruptcy (stable), resulting in favorable debt terms than smaller firms (Rajan and Zingales, 1995). One would contend

that the second hypothesis is more plausible and that larger firms are expected to hold more debt in their capital structure.

I.   <u>Growth</u>: Growth opportunities determine the leverage ratio that firms choose to finance their projects with. Based on the Pecking Order theory, firms with high growth rates pursue debt as preferred choice of financing. However, firms with high growth rates might not optimize investments and creditors would be reluctant to lend them long-term funds. At the same time, excessive leverage may force firms to pass up on profitable investment opportunities that would involve higher risk that credits would not be willing to support or fund. For this reason, firms will tend to keep lower leverage to be able to pursue new opportunities as they arise.

J.   <u>Agency Problems</u>: Agency problems exist when managers pursue activities such as excessive perk taking or maximizing sales or asset growth that benefit them at the expense of outside shareholders. There are many ways to reduce this problem. Debt financing reduces this cost not only by reducing free cash flow available for managers to invest, but also by encouraging lenders to monitor. However, the magnitude of agency costs varies from firm to firm and country to country. Booth et al. (2001) show that there is a country effect on the determinants of capital structure. Different institutional factors can result in different governance and financing systems. These could impact relationship between leverage and firm's characteristics. Another way to reduce agency problems is through equity ownership by managers. Increased ownership aligns manager interests

with that of external shareholders and reduces the role of debt as an agency conflict-mitigating tool.

IV. Emerging Market – INDIA

A. Introduction

Over the past 50 years, policies of the Indian government have shaped the economy. From the period 1947-1992, India was a socialist, government controlled economy. Government economic policy was based on the idea of centralized economic planning and a two-sector model (public and private). Regulatory and licensing structures guided private investment into desired areas and discouraged or banned investments in others. Conspicuous consumption was discouraged through license burdens and self-reliance came to the forefront. Self-reliance also meant that imports of consumer goods were banned or were subject to stiff tariffs.

The economic policy was designed to encourage domestic economic activity and to conserve extremely scarce foreign exchange for importation of food, oil and essential industrial goods for both the public and private sectors. Most industries were reserved for the public sector with huge investments and relatively little private investment. To some extent at this early stage in the country's development, the focus on government enterprises was justified, as a viable alternative to government leadership did not exist. The private sector did not have the industrial base or the financial capital to participate in

industry growth. Private ownership was typically restricted to firms established by favored business houses and families with strong national and regional political contacts.

In 1992, with the high risk of default on its debt financing and under pressure from the IMF, the Indian government chose to undergo drastic economic reform, open the economy and move from a controlled to a regulated regime. The new 'liberalization' policies and programs announced in 1992 included significant reduction in import tariffs and elimination of import quotas, except for consumer goods, elimination or reduction of restrictions on foreign ownership, currency convertibility, reduction in licensing requirements, regulations and red tape. Reduction in income tax, capital tax gains, corporate tax and excise taxes on a large variety of items established an economic environment of incentives for savings and investments. The reforms in the capital market prompted many privately owned firms to take their firms public and many public sector firms started raising funds from capital markets. As a result of the economic reforms, foreign direct investment began to pour in from multinational firms, and, foreign institutional investment from global mutual funds, commercial banks and financial institutions. Since the economic reforms over the last 15 years, India's GDP has grown at a higher rate and more importantly remained on a steady, upward trend (Appendix, V)

Over the past decade, license control has drastically reduced, considerable progress has been made in divestiture of public sector government enterprises, and financial markets have been liberalized to increase investment in the economy. The capital market reforms have changed ownership structure and capital structure of Indian firms. With these steps to economic progress, the Indian economy has finally taken off with solid

foreign fund flow in both direct and portfolio investments, inflow of foreign capital and technologies (Appendix, VI), limited state intervention and with an estimated 100 to 300 million middle class consumers to support consumption in the economy.

While the pace of reforms has increased over the past decade, issues on firm capital structure, financing decisions, use of debt and equity financing, the factors behind all these decisions are still not well understood, in India's context. The objective of the study is to empirically investigate the determinants of firms' capital structure in India, based on the well-known capital structure theories and through the use of firm specific data.

B.   Data

The raw data for the analysis is gathered by my review of annual reports for India's largest firms and ranking them based on revenues. The benefit of this method of data collection is that it is primary and official, and is based on listed firms that must comply with the capital market rules and regulations of the BSE and broadly speaking, the SEBI (Securities and Exchange Board of India), the equivalent of the SEC stateside.

The original top 50 listed firms include a large number of banks and financial institutions, which I remove from the analysis to focus only on non-financial firms. This decision is made due to the fact that banks with their exceedingly high asset composition would skew the sample data and analysis. However, to understand the big picture macroeconomic impact, I have included the banks to give a preliminary understanding of the role each sector plays in the economy (Appendix, X). In addition to the sector distribution within industry, I also consider the role of government. As stated previously,

most large Indian firms have their roots in government enterprise, so it is not surprising to see 7 of India's top 10 firms (by revenue) were formerly Public Sector Undertakings (PSUs). While the government has divested some of its share in these firms over the past decade, it remains a key play in the economy with a 55% market share of firms that can claim government majority ownership (Appendix, XI).

In sum, from the standpoint of capital structure analysis, it would be accurate to say that my data covers the top 50 non-financial firms listed on the Indian stock market. The period under consideration is the most recent complete fiscal year, 2006-2007. These top 50 firms are all publicly listed on the Bombay Stock Exchange (BSE) (Appendix, VII, VIII), the oldest stock exchanges in Asia. To show the significance of these firms to the aggregate economy, one only needs to look at the size of these top 50 firms versus the remainder of the market. These firms account for approximately 54% of the total market capitalization of the Indian stock market and 22% of India's GDP (Appendix, XII). In contrast, the top 50 US-based firms only account for 27% of the market capitalization of US listed firms, but nearly 30% of US GDP, per my study outside of this report.

C.   Methodology

With that introduction, I explain the methodology of the analysis. The key term I am working to understand in my analysis is financial leverage; debt and equity and the constituents of capital structure. Leverage can be defined in many ways with minor tweaks, but for this analysis, I choose to evaluate impact to two specific leverage ratios – total debt to total assets and total debt to total equity. The key determinants I consider to

impact leverage are similar to the ones that are considered to be critical in emerging markets. One major difference I had to face in my review of the annual reports was the fact that Indian firm balance sheets and income statements are rarely written to meet US GAAP standards and as such the terms used in the analysis are arrived at slightly differently from the ones we are used to in our review of equivalent US statements. One example of this is the use of the term, Profit before Tax, which is earnings after interest, depreciation and amortization, but before tax. With this short comment, I proceed to explain each of the variables critical to capital structure in a firm context,

A.　　Tax Effect:　Leverage and tax are expected to have a positive correlation. Based on the tax benefit of debt financing and per the principle of Trade Off theory, tax and financing leverage have a positive correlation right up to the point where financial benefits of debt are outweighed by the cost of bankruptcy and financial distress. My metric for measuring tax effect is by computing the ratio of tax paid by the firm to the Profit before Tax (PBT). If the hypothesis is true, the leverage should be positively correlated to the tax effect.

B.　　Growth:　Two measures of growth are identified; one is revenue based and the other is market/book value based. The logic is both can signify a future growth pattern. The revenue measure is defined as $(Revenue_t - Revenue_{t-1})/(Revenue_{t-1})$, while the other measure is simply the firm's MV/BV. Comparing the two, I believe the MB/BV metric is a more accurate representation of long-term perception of growth, as the revenue change

could be due to many year specific factors, such as acquisitions. The Pecking Order theory would suggest that a positive relationship between leverage and growth rate.

C.   Tangibility: The tangibility of assets is measured by calculating the tangible portion of the firm's total assets. It is computed as (Fixed Assets+Inventories)/Total Assets. The Trade Off theory would suggest a positive relationship between tangible assets and the amount of debt the firm takes on its balance sheet.

D.   Size: Similar to the tangibility of assets, size of the firm as identified by firm sales is positively related to level of leverage, as hypothesized by the Trade Off theory. The firm size is evaluated by the natural logarithm of revenues. The theory would suggest that a firm with larger revenues would have higher leverage.

E.   Profitability: Per the Pecking Order theory, profitability of a firm would drive the firm towards using retained earnings to fund its investments and only then resort to debt as means of financing. In other words, more profitable firms would resist increase in leverage and use internal funds for projects. This would mean that profitability and leverage are inversely proportional to each other. Measure of profitability used in the analysis is Profit before Tax / Total Assets.

F.   Operating Leverage: Operating leverage as measured by calculating Operating Income / Revenue helps identify the return on sales for the firm, which in turn dictates the profitability of the firm. In other words, the tendency for leverage would be, to follow in line with the results for profitability.

G.   <u>Liquidity/Bankruptcy Risk</u>:   The metrics I identified to evaluate the risk of liquidity or bankruptcy concerns are two,

    i.   Current ratio = Current Assets / Current Liabilities, where current ratio > 1 is very important to be able to pay off short-term obligations. The higher this ratio the more capable the firm is of paying its short-term liabilities.

    ii.   Coverage ratio = Profit before Tax/ Interest Expense, where a higher coverage ratio (and more importantly, coverage ratio > 1) would mean a lower debt burden for the company and the lower risk of bankruptcy or liquidity concerns.

One would expect leverage to be negatively correlated with these ratios. In other words, a higher current or coverage ratio should mean lower leverage for the firm.

H.   <u>Ownership/Origin</u>: This variable determines the type of ownership structure that exists within the firm. The types of ownerships considered are Public Sector and the Private Sector. Ownership or origin was determined primarily by identifying the type of history the firm had and who the majority owners were – government or private individuals or business houses.

I.   <u>Age</u>:   The age of the firm also plays a potential factor in the determination of capital structure. Some firms that have been around in mature industries have higher debt in their capital structure than newer firms that resort to public issue of equity. So, in other words, one would expect age and leverage to be mildly positively correlated in nature.

D. Analysis

My analysis consists of a regression model of the following general form: Leverage = f (tax, growth, tangibility, liquidity, profitability, size, origin). The specific regression model could be written as a combination of many variables and coefficients as determined by the model, $L_t = \alpha Ta + \beta P + \chi G + \delta Tx + \varepsilon$, where α, β, χ, δ, and ε are coefficients determined by regression model and Ta (tangible assets), P (profitability), G (growth) and Tx (tax effect) are the statistically significant variables.

E. Results

The results of the analysis reveal some interesting findings, much of which goes to confirm our prior belief in capital structure theories (Appendix, XIII). Additionally, the aspect of analyzing an emerging market such as India presents other interesting data on interaction of variables that would typically not be considered or seen in the developed world. Two main approaches to understanding the relationship of leverage to the various determinants are correlation of leverage to the variables and a regression analysis. The former helps understand how critical the determinants are and their impact on leverage; the latter helps us understand how completely the determinants define the total leverage.

As professed by the Pecking Order theory, my results suggest that leverage and profitability are negatively correlated, which implies that as firms become more profitable, the debt element in their capital structure reduces. This is also confirmed by the negative correlation between financial leverage and operating leverage. As proof to

confirm the Trade Off theory hypothesis, leverage is negatively correlated to liquidity (as measured by current and coverage ratio). Significance of the correlation between leverage and profitability, operating leverage and liquidity is very high (Appendix, XIV). Another result in support of the trade off theory is that leverage and tax effect are positively correlated, which implies that higher tax effect would have a positive impact on leverage (higher). However, to note here, is that this correlation is mild at best. All firm data for growth (increase in sales and MV/BV) shows positive correlation with financial leverage. Market value to book value as a measure of growth is a more appropriate measure of growth perception and has a higher degree of positive correlation with leverage.

Given the above summary of all firm results, I proceed to split the data by firm sector type - public and private sector, to understand if the conclusions drawn above remain the same. Interestingly, for the public sector owned firms, the key observations from the analysis of this subset is the fact that the significance of most of the determinants become much stronger e.g. profitability, operating leverage and liquidity ratios. All the determinants are more negatively correlated than the all-firm dataset, which would suggest that they play a more significant role in determining capital structure leverage in public sector firms. Interestingly, growth as a determinant provides opposite results from the all-firm data, in that Market-Book value is more positively correlated to leverage than discussed in the all-firm case. This would seem to suggest that higher the MV/BV, the higher the leverage of public sector firms (Appendix, XV). Another aspect that shows up as significant in this correlation is that of age. For the first time, in the analysis it is mildly negatively correlated with leverage, which could mean

that older firms have lower leverage, though I would warn that the sample size of public sector firms might be a disadvantage to drawing any conclusions on age. On the other hand, key observations from the private sector are very similar to the all-firms data.

Between the public and private sector firms, there are some glaring differences in correlation with leverage. For one, tax effects seem to have a negative correlation with leverage for public firms, while they have a positive effect for private sector firms. There are other significant differences that one could analyze outside their impact to leverage by reviewing the correlation matrices in the Appendix (XIII, XIV and XV).

The results from the regression analysis conclude that a significant percentage of leverage can be explained by the variables determined. Based on the intercept and coefficient data in the 'summary output', we can build a model that could effectively predict leverage in firms in India. An example of a viable model would be,

Leverage = 0.547 + 0.09*Growth+0.2*Tangibility-1.2*Profitability+0.5*TaxEffect

Obviously, more work needs to be done to check the robustness of this kind of a model and could be something to look at in future analysis.

V. Conclusions

The study investigates the determinants of capital structure in emerging markets and specifically researches the determinants for listed Indian companies. Some of the key measures found to be significant in determining financing decision and affecting capital structure are tangibility, profitability, growth, taxes and interest coverage. In addition to

this determination, the differences in significance of these measures also depends on whether the firm is government owned or private sector and is an interesting aspect to research in future. Ownership pattern seems to have a significant impact on leverage.

In conclusion, while the analysis reveals some very interesting findings based on actual and recent data for Indian listed firms, there are a few drawbacks of the analysis and the dataset chosen. It is important to remember that while the sample data may do well in capturing aggregate leverage in the country, it probably is not representative of the average firm. Another bias is from the fact that only listed companies are selected for the analysis. While listed companies are perhaps of greatest interest to financial research, it is hard to establish whether this sample size represents effectively the larger bodies of firms in the country. That being said, there exists a high probability that any future research done on a different sample selection would most likely conclude that the same determinants of capital structure impact that sample as well.

VI. References

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VII. Appendix

I.   World historical and predicted populations (in millions)

Region	1750	1800	1850	1900	1950	1999	2050	2150
World	791	978	1,262	1,650	2,521	5,978	8,909	9,746
Africa	106	107	111	133	221	767	1,766	2,308
Asia	502	635	809	947	1,402	3,634	5,268	5,561
Europe	163	203	276	408	547	729	628	517
Latin America and the Caribbean *	16	24	38	74	167	511	809	912
Northern America *	2	7	26	82	172	307	392	398
Oceania	2	2	2	6	13	30	46	51

Source: Wikipedia, World Population, http://en.wikipedia.org/wiki/World_population

II.   World historical and predicted populations by percentage distribution

Region	1750	1800	1850	1900	1950	1999	2050	2150
World	100	100	100	100	100	100	100	100
Africa	13.4	10.9	8.8	8.1	8.8	12.8	19.8	23.7
Asia	63.5	64.9	64.1	57.4	55.6	60.8	59.1	57.1
Europe	20.6	20.8	21.9	24.7	21.7	12.2	7.0	5.3
Latin America and the Caribbean *	2.0	2.5	3.0	4.5	6.6	8.5	9.1	9.4
Northern America *	0.3	0.7	2.1	5.0	6.8	5.1	4.4	4.1
Oceania	0.3	0.2	0.2	0.4	0.5	0.5	0.5	0.5

Source: Wikipedia, Emerging Markets, http://en.wikipedia.org/wiki/Emerging_markets

III.   MSCI All Country World Index – Emerging and Developed Markets, 2006
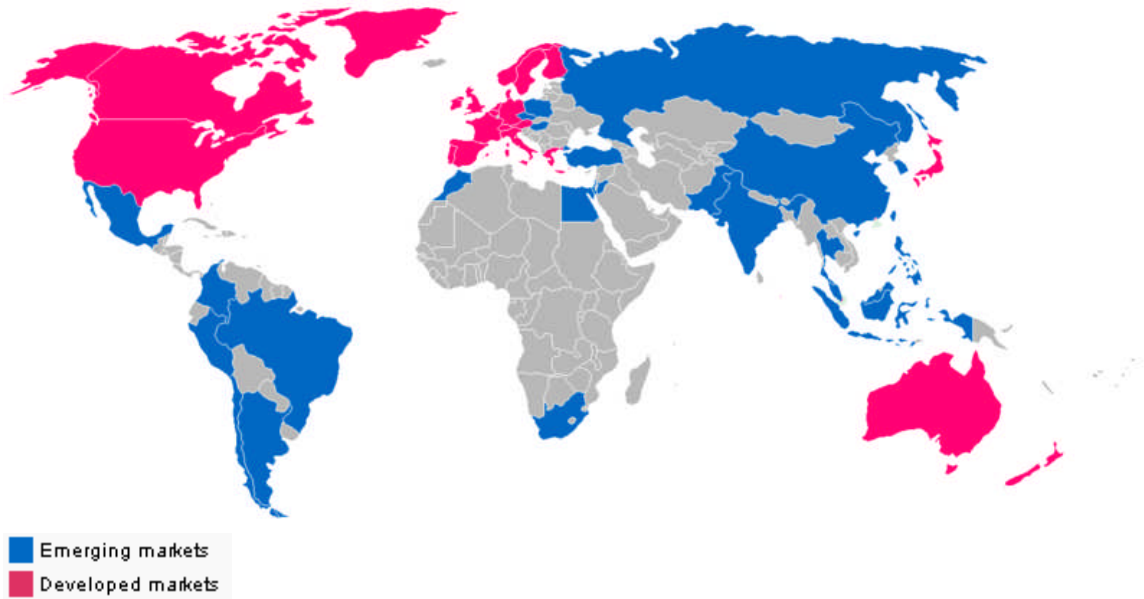
Source: Wikipedia, Emerging Markets, http://en.wikipedia.org/wiki/Emerging_markets

IV. India: GDP Growth Forecast vs. Key Trading Partners
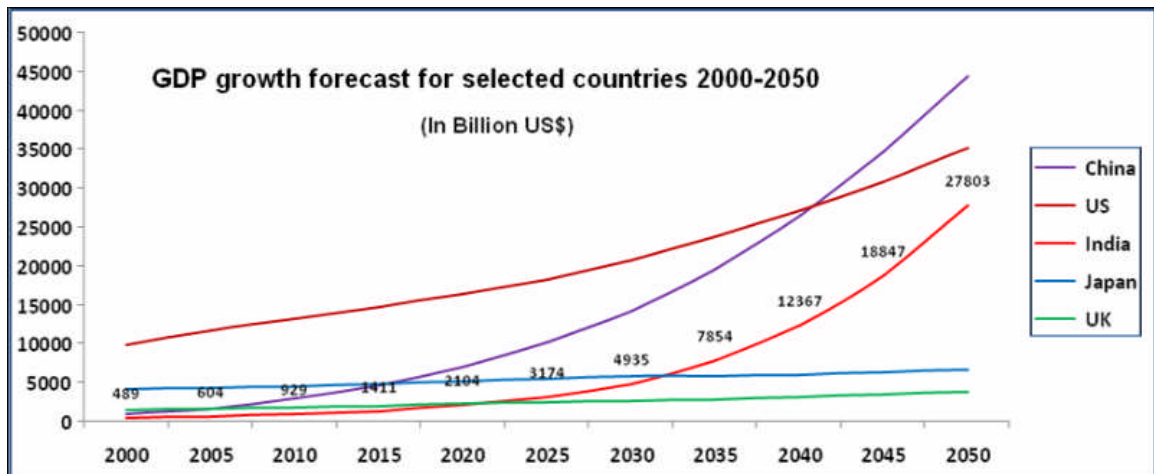
Goldman Sachs has predicted that India will become 3rd largest economy of the world by 2035 based on predicted growth rate of 5.3 to 6.1%. Currently It is cruising at 9.4% growth rate.

V.   India: GDP Growth since Launch of Pre-Liberalization Government Programs

India GDP Growth Rate

Source: Economy Watch, http://www.economywatch.com/indianeconomy
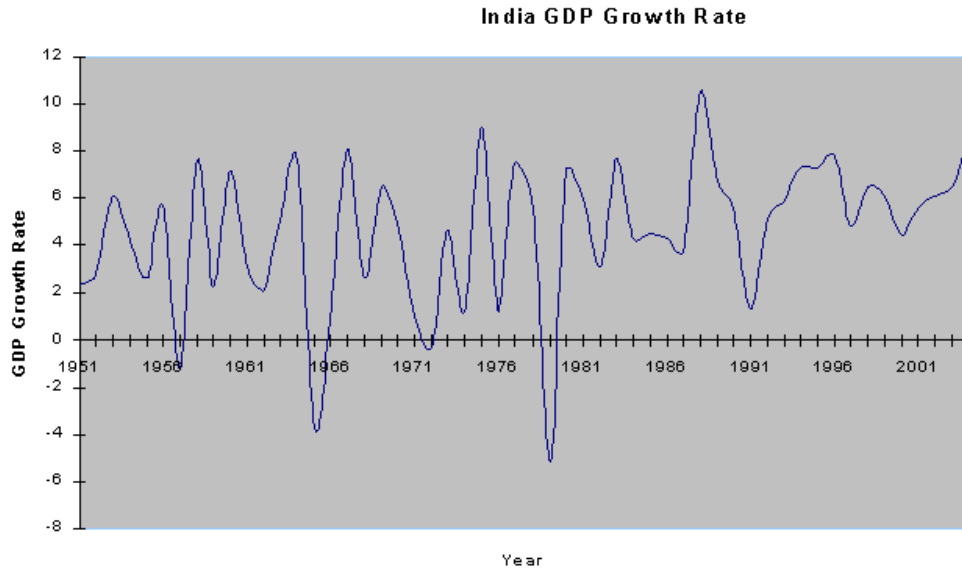
VI.   Macroeconomic Data since Implementation of Economic Reforms (1992)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
GDP ($, trillion)	0.52	0.53	0.57	0.60	0.64	0.69	0.72	0.77	0.80	0.84	0.88	0.92	0.98	1.06	1.14	1.25
GDP Growth (%)	2.00	3.00	5.90	5.90	7.30	7.30	4.80	6.50	4.10	4.40	5.60	4.40	6.20	7.80	8.40	9.30
Industrial Prod ($, billions)	1.00	1.00	1.00	1.09	1.23	1.31	1.40	1.45	1.55	1.63	1.67	1.77	1.89	2.05	2.22	2.47
Foreign Investment ($, billions)	0.13	0.56	4.24	4.81	4.81	6.15	5.39	2.41	5.19	5.10	5.36	5.89	6.48	7.13	11.88	20.14
Inflation (%)	10.10	8.40	12.50	8.10	4.60	4.40	5.90	3.30	7.00	5.40	5.40	3.80	4.20	4.20	5.30	
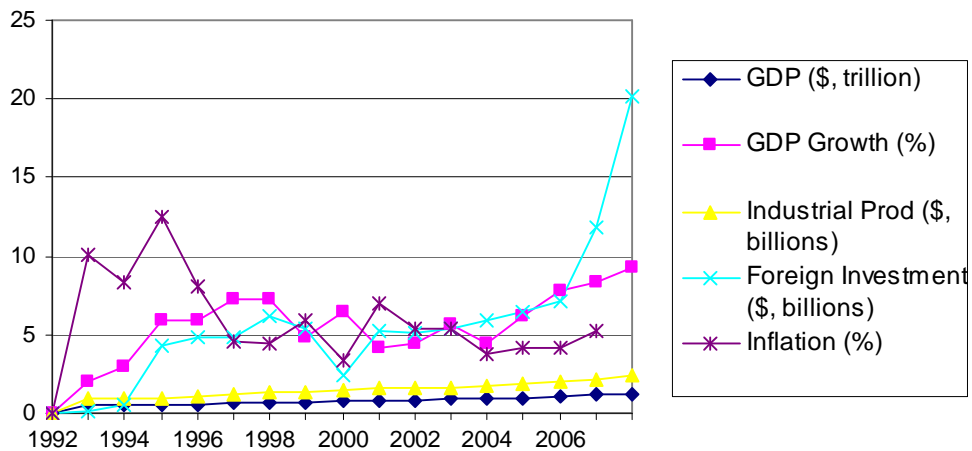
VII.   India: Bombay Stock Exchange Index Performance, 1997-2008

Source: Yahoo!Finance, http://finance.yahoo.com
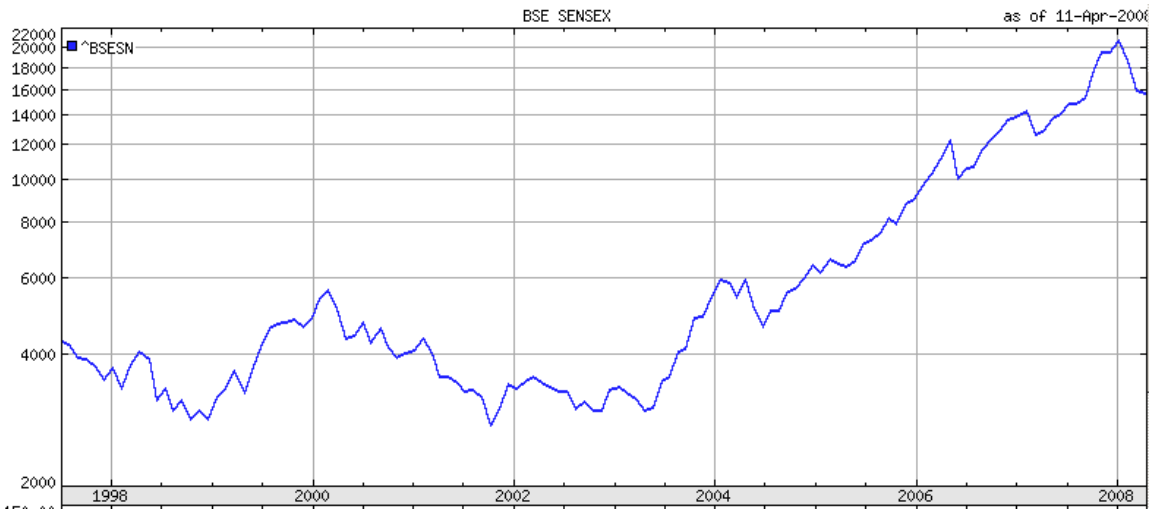
VIII.   India: Foreign Exchange Rate, Rupee (Rs.) vs. US Dollar ($), 2003-2008

Source: Yahoo!Finance, http://finance.yahoo.com
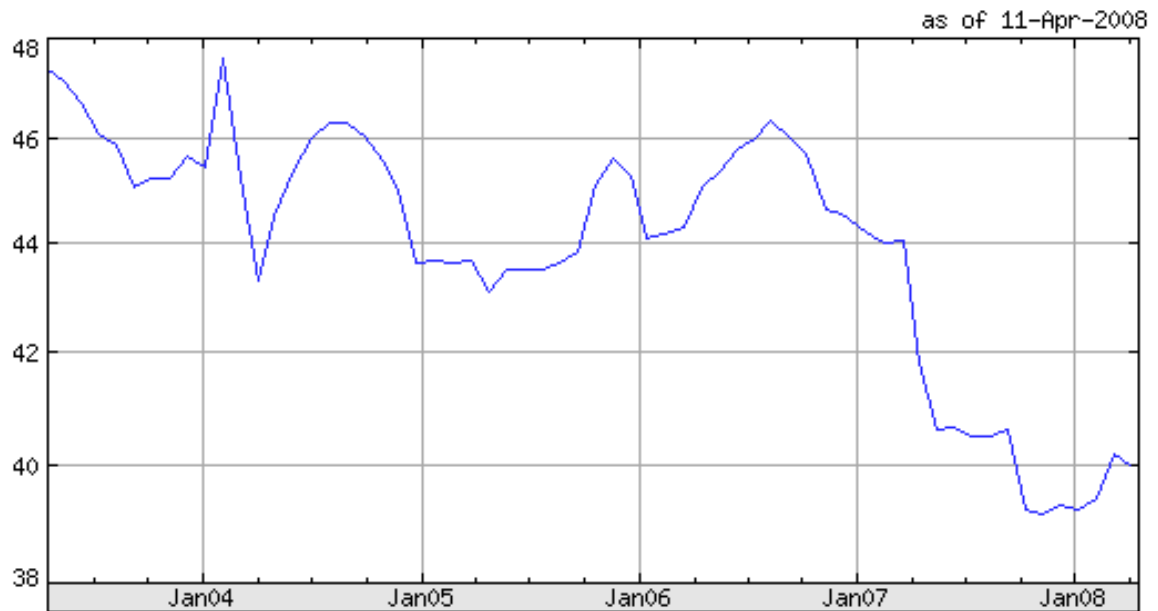
IX.   India: Raw Data for Largest Listed Indian Firms, 2006-2007

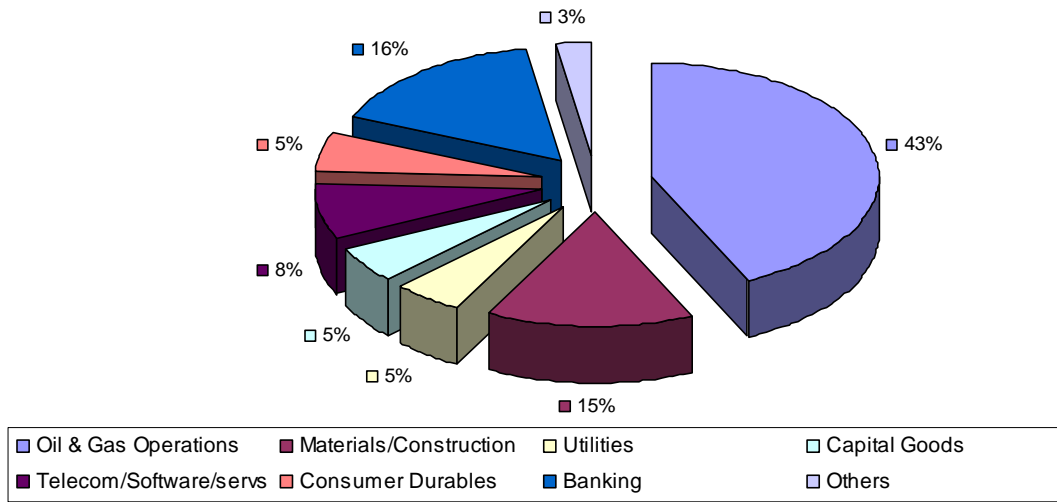| Sr. No.	Company	History	Industry	Sales ($bil)	Profits ($bil)	Assets ($bil)	MV ($bil)
1	Indian Oil	Public Sector	Oil & Gas Operations	50.77	2.04	26.04	13.45
2	Reliance Industries	Private	Oil & Gas Operations	27.23	2.75	30.67	92.69
3	Bharat Petroleum	Public Sector	Oil & Gas Operations	26.86	0.45	8.44	3.56
4	Hindustan Petroleum	Public Sector	Oil & Gas Operations	22.43	0.39	7.91	2.08
5	State Bank of India Group	Public Sector	Banking	15.77	1.47	188.56	33.29
6	Oil & Natural Gas	Public Sector	Oil & Gas Operations	14.76	3.91	20.50	53.49
7	Icici Bank	Private	Banking	9.84	0.64	91.07	29.85
8	Steel Authority of India	Public Sector	Materials	9.80	1.55	8.46	16.75
9	NTPC	Public Sector	Utilities	8.83	1.72	20.19	38.44
10	Tata Motors	Private	Capital Goods	7.97	0.48	4.76	6.00
11	Vedanta Resources	Private	Materials	6.50	1.81	8.07	22.94
12	MMTC	Public Sector	Materials	5.84	0.03	0.92	30.51
13	Larsen & Toubro	Private	Capital Goods	5.18	0.57	6.22	20.24
14	Tata Steel	Private	Materials	5.05	1.06	7.76	10.54
15	ITC	Private	Food Drink & Tobacco	4.96	0.67	3.74	19.22
16	Bharat Heavy Electricals	Public Sector	Capital Goods	4.68	0.60	5.82	22.39
17	Hindalco Industries	Private	Materials	4.57	0.59	6.24	5.41
18	Bharti Airtel	Private	Telecom Serv	4.45	1.01	6.71	38.16
19	Maruti Suzuki	Private	Consumer Durables	4.32	0.40	2.59	5.34
20	GAIL (India)	Public Sector	Utilities	3.99	0.60	4.65	9.37
21	HCL	Private	Software & Services	3.98	0.36	1.83	3.82
22	National Aluminium	Private	Materials	3.91	0.13	5.98	6.79
23	Tata Consultancy Svcs	Private	Software & Services	3.79	0.94	2.69	22.22
24	Wipro	Private	Software & Services	3.78	0.74	3.54	14.84
25	Infosys Technologies	Private	Software & Services	3.29	0.95	3.25	20.34
26	Reliance Communications	Private	Telecom Serv	3.28	0.82	6.21	25.44
27	Adani exports	Private	Consumer Durables	3.09	0.03	1.10	4.18
28	Punjab National Bank	Public Sector	Banking	3.03	0.38	38.42	4.76
29	Canara Bank	Public Sector	Banking	3.03	0.35	38.54	2.85
30	Mahindra & Mahindra	Private	Consumer Durables	2.89	0.27	1.97	3.71
31	Hero Honda	Private	Consumer Durables	2.89	0.21	1.06	3.69
32	Bajaj Auto	Private	Consumer Durables	2.65	0.31	2.89	0.29
33	Bank of Baroda	Public Sector	Banking	2.55	0.26	33.97	3.33
34	Bank of India	Public Sector	Banking	2.48	0.26	32.80	4.72
35	Grasim Industries	Private	Construction	2.40	0.38	2.80	5.85
36	Essar Group	Private	Materials	2.25	0.11	3.99	6.87
37	HDFC Bank	Private	Banking	1.96	0.27	21.09	12.87
38	Union Bank of India	Public Sector	Banking	1.90	0.20	23.76	2.34
39	Videocon	Private	Consumer Durables	1.90	0.20	2.77	1.73
40	ACC	Private	Construction	1.80	0.36	1.77	3.82
41	Indl Dev Bank of India	Public Sector	Banking	1.70	0.14	24.51	2.14
42	Unitech	Private	Construction	1.61	0.33	3.27	10.67
43	Satyam Computer Services	Private	Software & Services	1.60	0.36	1.71	7.25
44	Central Bank of India	Public Sector	Banking	1.58	0.12	21.44	1.05
45	Syndicate Bank	Public Sector	Banking	1.54	0.17	20.66	1.28
46	HDFC-Housing Devel	Public Sector	Banking	1.49	0.40	16.97	19.07
47	Indian Overseas Bank	Public Sector	Banking	1.43	0.23	19.03	2.25
48	Suzlon Energy	Private	Utilities	1.37	0.27	1.59	10.87
49	UCO Bank	Public Sector	Banking	1.35	0.07	17.32	1.01
50	Oriental Bank of Commerce	Public Sector	Banking	1.32	0.13	17.05	1.57
51	Axis Bank	Private	Banking	1.29	0.15	16.91	9.10
52	Tata Power	Private	Utilities	1.26	0.17	2.86	6.80
53	Allahabad Bank	Public Sector	Banking	1.22	0.18	15.68	1.23
54	Idea Cellular	Private	Telecom Serv	1.10	0.13	2.76	6.56
55	Jindal Steel	Private	Materials	1.08	0.18	1.90	7.24
56	NMDC	Public Sector	Materials	1.05	0.58	1.56	49.03
57	Power Grid of India	Public Sector	Utilities	1.02	0.33	9.19	10.37
58	Raxbaxy Labs	Private	Pharma	1.01	0.10	1.73	4.14
59	Power Finance	Public Sector	Business Serv & Sup	0.98	0.25	11.67	4.06
60	Asian Paints	Private	Materials	0.92	0.07	0.32	2.88
61	Jayprakash Ind	Private	Construction	0.90	0.10	2.80	6.21
62	Cipla	Private	Pharma	0.88	0.17	1.10	4.16
63	Neyveli Lignite	Public Sector	Materials	0.69	0.14	3.57	5.36
64	Sun Pharma	Private	Pharma	0.60	0.16	0.97	6.42
65	GMR Infrastructure	Private	Construction	0.49	0.06	1.75	6.48
66	DLF	Private	Diversified Financials	0.36	0.10	2.80	25.49
67	Reliance Capital	Private	Business Serv & Sup	0.22	0.16	1.69	7.18

Total Sales (2006-2007)   330.70
% of GDP   26%

India GDP ($, billions)   1250

Source: 2007 Forbes Global 1000, 1000 Largest Global Firms

X.   India: Revenue Distribution by Firm Origin (Public Sector vs. Private)

□ Oil & Gas Operations	■ Materials/Construction	□ Utilities	□ Capital Goods
■ Telecom/Software/servs	■ Consumer Durables	■ Banking	□ Others

XI.   India: Revenue Distribution by Economic Sector

□ Public	□ Private
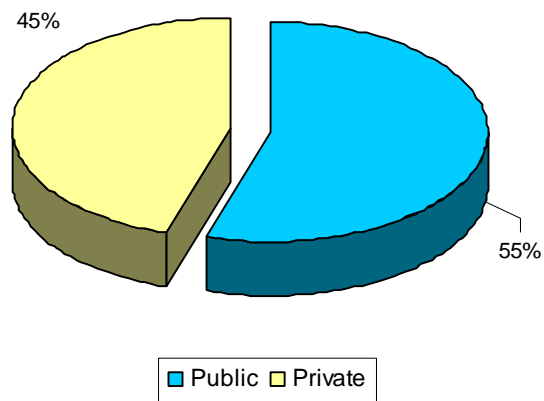
XII.   India: Balance Sheet and Income Statement Data for 50 Largest Non-Financial Firms, FY 2006-2007

(Exchange Rate, $1 = Rs. 40)

Sr. No.	Company	CA	CL	LT Debt	ST Debt	Debt ($ bil)	Tangible Assets	Inventories	Assets ($bil)	Equity ($ bil)	MV ($bil)	Sales ($bil)	Sales (y-1)	Op inc	PBT ($bil)	PAT	Interest	TAX
1	Indian Oil	9.00	6.76	7.37	2.77	16.90	9.29	7.25	26.04	9.14	13.45	50.770	41.433	3.75	2.90	2.04	0.44	0.86
2	Reliance Industries	4.43	4.22	6.97	3.49	14.68	15.92	3.03	30.67	15.99	92.69	27.230	22.470	5.13	4.72	2.75	0.30	1.98
3	Bharat Petroleum	3.01	2.55	2.71	0.61	5.87	2.75	2.17	8.44	2.57	3.56	26.863	21.287	1.04	0.69	0.45	0.12	0.24
4	Hindustan Petroleum	2.46	2.22	2.63	0.66	5.51	2.21	2.02	7.91	2.40	2.08	22.431	17.814	0.65	0.49	0.39	0.11	0.10
5	Oil & Natural Gas	11.10	3.50	1.63	0.02	5.15	5.92	0.76	20.50	15.35	53.49	14.764	12.360	5.29	5.92	3.91	0.01	2.01
6	Steel Authority of India	5.09	1.75	1.05	1.38	4.17	2.90	1.66	8.46	4.30	16.75	9.797	8.070	2.74	2.36	1.55	0.08	0.81
7	NTPC	4.53	1.36	6.11	0.57	8.04	6.41	0.63	20.19	12.15	38.44	8.834	7.334	3.21	2.23	1.72	0.01	0.51
8	Tata Motors	1.03	1.50	1.00	0.54	3.04	0.97	0.63	4.76	1.72	6.00	7.971	6.000	0.83	0.64	0.48	0.10	0.16
9	Vedanta Resources	4.06	1.59	0.88	1.46	3.92	3.84	0.88	8.07	4.15	22.94	6.502	3.701	2.51	2.48	1.81	0.00	0.67
10	MMTC	0.68	0.38	0.28	0.04	0.70	0.04	0.04	0.92	0.22	30.51	5.837	4.098	0.07	0.05	0.03	0.02	0.02
11	Larsen & Toubro	2.89	2.32	1.61	0.56	4.49	0.93	0.92	6.22	1.73	20.24	5.175	4.187	0.84	0.75	0.57	0.01	0.18
12	Tata Steel	2.66	0.88	2.41	0.95	4.24	2.76	0.58	7.76	3.52	10.54	5.049	4.350	1.79	1.57	1.06	0.04	0.51
13	ITC	1.27	0.60	0.05	0.49	1.13	1.19	0.84	3.74	2.61	19.22	4.960	4.128	1.07	0.98	0.67	0.11	0.31
14	Bharat Heavy Electricals	4.98	2.97	0.02	0.63	3.63	0.25	1.05	5.82	2.20	22.39	4.685	3.631	1.01	0.93	0.60	0.01	0.33
15	Hindalco Industries	1.65	0.69	1.84	0.60	3.13	1.75	1.08	6.24	3.10	5.41	4.570	3.119	0.92	0.80	0.59	0.06	0.22
16	Bharti Airtel	1.11	2.36	1.33	0.65	4.33	4.83	0.01	6.71	2.38	38.16	4.450	2.807	1.82	1.15	1.01	0.06	0.14
17	Maruti Suzuki	0.74	0.51	0.17	0.16	0.84	0.67	0.18	2.59	1.75	5.34	4.323	3.700	0.66	0.58	0.40	0.01	0.18
18	GAIL (India)	1.01	0.65	0.33	0.82	1.80	1.86	0.14	4.65	2.85	9.37	3.987	3.603	0.88	0.71	0.60	0.03	0.12
19	HCL	0.90	0.67	0.07	0.02	0.77	0.19	0.20	1.83	1.07	3.82	3.976	1.356	0.45	0.87	0.36	0.00	0.51
20	National Aluminium	1.39	0.77	3.19	0.90	4.86	1.39	0.35	5.98	1.12	6.79	3.912	3.603	0.48	0.21	0.13	0.01	0.08
21	Tata Consultancy Svcs	0.97	0.42	0.01	0.24	0.68	0.37	0.00	2.69	2.02	22.22	3.789	2.823	1.13	1.04	0.94	0.00	0.10
22	Wipro	1.33	0.84	0.10	0.20	1.14	0.46	0.10	3.54	2.40	14.84	3.783	2.670	0.83	0.82	0.74	0.00	0.09
23	Infosys Technologies	1.95	0.29	0.00	0.17	0.46	0.54	0.00	3.25	2.79	20.34	3.287	2.257	1.06	0.94	0.95	0.00	-0.01
24	Reliance Communications	1.11	2.36	1.33	0.30	3.98	4.33	0.01	6.21	2.23	25.44	3.279	2.931	1.27	0.84	0.82	0.07	0.02
25	Adani exports	0.89	0.52	0.34	0.02	0.88	0.04	0.11	1.10	0.21	4.18	3.085	3.751	0.08	0.04	0.03	0.04	0.01
26	Mahindra & Mahindra	0.71	0.49	0.41	0.18	1.08	0.40	0.22	1.97	0.89	3.71	2.890	2.363	0.36	0.36	0.27	0.02	0.09
27	Hero Honda	0.16	0.26	0.04	0.14	0.44	0.29	0.07	1.06	0.62	3.69	2.886	2.522	0.34	0.31	0.21	0.00	0.10
28	Bajaj Auto	0.21	0.37	0.41	0.73	1.51	0.31	0.08	2.89	1.38	0.29	2.652	2.137	0.50	0.43	0.31	0.00	0.12
29	Grasim Industries	0.79	0.32	0.74	0.19	1.25	0.85	0.21	2.80	1.56	5.85	2.402	1.910	0.65	0.56	0.38	0.03	0.17
30	Essar Group	0.83	0.86	1.74	0.28	2.88	2.22	0.58	3.99	1.12	6.87	2.255	1.713	0.49	0.17	0.11	0.15	0.06
31	Videocon	0.94	0.19	1.24	0.08	1.51	1.22	0.32	2.77	1.26	1.73	1.895	1.413	0.37	0.23	0.20	0.09	0.02
32	ACC	0.45	0.35	0.08	0.29	0.73	0.85	0.19	1.77	1.04	3.82	1.797	1.496	0.51	0.48	0.36	0.01	0.12
33	Unitech	2.48	1.24	1.00	0.54	2.77	0.15	0.01	3.27	0.50	10.67	1.606	0.384	0.53	0.45	0.33	0.04	0.12
34	Satyam Computer Services	1.48	0.15	0.05	0.06	0.26	0.09	0.00	1.71	1.45	7.25	1.603	1.253	0.43	0.39	0.36	0.00	0.04
35	Suzlon Energy	0.92	0.38	0.28	0.00	0.66	0.10	0.34	1.59	0.93	10.87	1.367	0.964	0.32	0.28	0.27	0.03	0.01
36	Tata Power	0.82	0.28	0.90	0.16	1.34	0.76	0.10	2.86	1.51	6.80	1.265	1.215	0.27	0.15	0.17	0.05	0.01
37	Idea Cellular	0.52	0.54	1.06	0.00	1.60	1.11	0.00	2.76	1.16	6.56	1.097	0.502	0.37	0.13	0.13	0.08	0.00
38	Jindal Steel	0.25	0.20	0.88	0.20	1.28	1.04	0.16	1.90	0.62	7.24	1.084	0.819	0.77	0.24	0.18	0.04	0.06
39	NMDC	1.34	0.07	0.00	0.04	0.11	0.13	0.03	1.56	1.45	49.03	1.046	0.927	0.90	0.87	0.58	0.00	0.29
40	Power Grid of India	0.50	1.00	4.83	0.61	6.45	5.45	0.05	9.19	2.74	10.37	1.021	0.889	0.86	0.37	0.33	0.01	0.04
41	Raxbaxy Labs	0.53	0.18	0.79	0.17	1.14	0.36	0.24	1.73	0.59	4.14	1.006	0.913	0.15	0.11	0.10	0.01	0.02
42	Power Finance	0.40	0.30	8.40	0.82	9.52	0.02	0.00	11.67	2.15	4.06	0.982	0.782	0.38	0.38	0.25	0.59	0.13
43	Asian Paints	0.15	0.11	0.02	0.03	0.17	0.08	0.09	0.32	0.16	2.88	0.917	0.755	0.11	0.11	0.07	0.00	0.04
44	Jayprakash Ind	0.79	0.50	1.38	0.20	2.08	0.73	0.20	2.80	0.72	6.21	0.898	0.827	0.26	0.15	0.10	0.06	0.05
45	Cipla	0.54	0.13	0.03	0.13	0.29	0.35	0.24	1.10	0.81	4.16	0.883	0.755	0.20	0.20	0.17	0.00	0.04
46	Neyveli Lignite	0.13	0.31	0.38	0.80	1.48	0.96	0.11	3.57	2.08	5.36	0.686	0.675	0.34	0.22	0.14	0.01	0.08
47	Sun Pharma	0.47	0.06	0.27	0.03	0.35	0.15	0.08	0.97	0.61	6.42	0.601	0.452	0.17	0.16	0.16	0.00	0.00
48	GMR Infrastructure	0.43	0.17	0.93	0.16	1.25	0.73	0.01	1.75	0.50	6.48	0.492	0.266	0.14	0.07	0.06	0.01	0.01
49	DLF	1.16	0.76	1.69	0.19	2.64	0.08	1.07	2.80	0.16	25.49	0.357	0.286	0.25	0.16	0.10	0.09	0.05
50	Reliance Capital	0.13	0.02	0.35	0.03	0.40	0.02	0.00	1.69	1.29	7.18	0.221	0.163	0.20	0.18	0.16	0.01	0.02

Total	715.31	277.22	
% of	54%	22%	
Market Cap	1331	1250	GDP
	Market Cap	GDP	

40

XIII. India: Results - Data Analysis for 50 Largest Non-Financial Firms, FY 2006-2007

(Exchange Rate, $1 = Rs. 40)

Sr. No.	Company	Leverage 1 TD/TA	Leverage 2 TD/TE	Growth	Tangibility	Size	Profitability	Op. Lev	Cov Rat	Liquidity Curr Ratio	TaxEffect	Growth MV/BV	Origin	DIVERSIFIED	AGE	Owner	Origins	Industry	Est	Major Owner
1	Indian Oil	0.65	1.85	0.23	0.64	3.93	0.11	0.07	6.66	1.33	0.30	1.47	1	0	44	1	Public Sector	Oil & Gas Operations	1964	PSU
2	Reliance Industries	0.48	0.92	0.21	0.62	3.30	0.15	0.19	15.89	1.05	0.42	5.80	0	1	42	2	Private	Oil & Gas Operations	1966	Business House
3	Bharat Petroleum	0.70	2.29	0.26	0.58	3.29	0.12	0.04	5.80	1.18	0.23	1.38	1	0	32	1	Public Sector	Oil & Gas Operations	1976	PSU
4	Hindustan Petroleum	0.70	2.30	0.26	0.53	3.11	0.06	0.03	4.57	1.11	0.20	0.87	1	0	32	1	Public Sector	Oil & Gas Operations	1976	PSU
5	Oil & Natural Gas	0.25	0.34	0.19	0.33	2.69	0.29	0.36	599.25	3.17	0.34	3.48	1	0	52	1	Public Sector	Oil & Gas Operations	1956	PSU
6	Steel Authority of India	0.49	0.97	0.21	0.54	2.28	0.28	0.28	28.38	2.92	0.34	3.90	1	0	54	1	Public Sector	Materials	1954	PSU
7	NTPC	0.40	0.66	0.20	0.35	2.18	0.11	0.36	152.52	3.34	0.23	3.16	1	0	33	1	Public Sector	Utilities	1975	PSU
8	Tata Motors	0.64	1.77	0.33	0.34	2.08	0.14	0.10	6.60	0.69	0.26	3.49	0	0	63	2	Private	Capital Goods	1945	Business House
9	Vedanta Resources	0.49	0.94	0.76	0.58	1.87	0.31	0.39	828.00	2.56	0.27	5.53	0	1	32	2	Private	Materials	1976	Business House
10	MMTC	0.76	3.19	0.42	0.09	1.76	0.05	0.01	2.66	1.80	0.33	138.35	1	0	45	1	Public Sector	Materials	1963	PSU
11	Larsen & Toubro	0.72	2.59	0.24	0.30	1.64	0.12	0.16	109.67	1.25	0.24	11.70	0	0	70	3	Private	Capital Goods	1938	Private
12	Tata Steel	0.55	1.20	0.16	0.43	1.62	0.20	0.36	36.01	3.02	0.33	2.99	0	0	101	2	Private	Materials	1907	Business House
13	ITC	0.30	0.43	0.20	0.54	1.60	0.26	0.22	8.92	2.13	0.31	7.37	0	1	98	3	Private	Food Drink & Tobacco	1910	Private
14	Bharat Heavy Electricals	0.62	1.65	0.29	0.22	1.54	0.16	0.21	86.48	1.67	0.35	10.19	1	0	46	1	Public Sector	Capital Goods	1962	PSU
15	Hindalco Industries	0.50	1.01	0.47	0.45	1.52	0.13	0.20	13.27	2.41	0.27	1.74	0	0	46	2	Private	Materials	1962	Business House
16	Bharti Airtel	0.65	1.82	0.59	0.72	1.49	0.17	0.41	18.00	0.47	0.12	16.04	0	0	23	3	Private	Telecom Serv	1985	Private
17	Maruti Suzuki	0.32	0.48	0.17	0.33	1.46	0.22	0.15	57.33	1.44	0.31	3.05	0	0	27	3	Private	Consumer Durables	1981	Private
18	GAIL (India)	0.39	0.63	0.11	0.43	1.38	0.15	0.22	26.58	1.56	0.17	3.29	1	0	24	1	Public Sector	Utilities	1984	PSU
19	HCL	0.42	0.72	1.93	0.21	1.38	0.47	0.11	268.22	1.33	0.59	3.58	0	0	32	3	Private	Software & Services	1976	Private
20	National Aluminium	0.81	4.35	0.09	0.29	1.36	0.03	0.12	30.15	1.81	0.38	6.07	0	0	32	1	Private	Materials	1976	PSU
21	Tata Consultancy Svcs	0.25	0.34	0.34	0.14	1.33	0.39	0.30	1226.68	2.30	0.10	11.03	0	0	40	2	Private	Software & Services	1968	Business House
22	Wipro	0.32	0.47	0.42	0.16	1.33	0.23	0.22	266.03	1.59	0.11	6.18	0	0	63	3	Private	Software & Services	1945	Private
23	Infosys Technologies	0.14	0.16	0.46	0.17	1.19	0.29	0.32	939.00	6.71	-0.01	7.29	0	0	27	3	Private	Software & Services	1981	Private
24	Reliance Communications	0.64	1.79	0.12	0.70	1.19	0.14	0.39	12.61	0.47	0.02	11.41	0	0	4	2	Private	Telecom Serv	2004	Business House
25	Adani exports	0.81	4.15	-0.18	0.14	1.13	0.04	0.03	1.13	1.71	0.22	19.62	0	1	20	3	Private	Consumer Durables	1988	Private
26	Mahindra & Mahindra	0.55	1.22	0.22	0.31	1.06	0.18	0.13	21.40	1.46	0.26	4.17	0	1	63	3	Private	Consumer Durables	1945	Private
27	Hero Honda	0.42	0.72	0.14	0.34	1.06	0.29	0.12	311.53	0.62	0.31	5.98	0	0	24	3	Private	Consumer Durables	1984	Private
28	Bajaj Auto	0.52	1.09	0.24	0.14	0.98	0.15	0.19	326.06	1.56	0.28	0.21	0	0	63	3	Private	Consumer Durables	1945	Private
29	Grasim Industries	0.44	0.80	0.26	0.38	0.88	0.20	0.27	19.95	2.50	0.31	3.75	0	1	60	2	Private	Construction	1948	Business House
30	Essar Group	0.72	2.58	0.32	0.70	0.81	0.04	0.22	1.11	0.96	0.36	6.15	0	0	52	2	Private	Materials	1956	Business House
31	Videocon	0.55	1.20	0.34	0.56	0.64	0.08	0.19	2.68	4.92	0.10	1.37	0	1	21	2	Private	Consumer Durables	1987	Business House
32	ACC	0.41	0.70	0.20	0.59	0.59	0.27	0.29	79.22	1.28	0.26	3.67	0	0	61	3	Private	Construction	1947	Private
33	Unitech	0.85	5.56	3.18	0.05	0.47	0.14	0.33	11.28	2.00	0.27	21.39	0	0	34	3	Private	Construction	1974	Private
34	Satyam Computer Services	0.15	0.18	0.28	0.05	0.47	0.23	0.27	206.97	9.94	0.10	5.01	0	0	21	3	Private	Software & Services	1987	Private
35	Suzlon Energy	0.42	0.71	0.42	0.28	0.31	0.18	0.24	11.02	2.46	0.05	11.70	0	0	13	3	Private	Utilities	1995	Private
36	Tata Power	0.47	0.89	0.04	0.30	0.23	0.05	0.21	3.09	2.91	0.07	4.49	0	0	106	2	Private	Utilities	1902	Business House
37	Idea Cellular	0.58	1.38	1.19	0.40	0.09	0.05	0.34	1.67	0.96	0.01	5.67	0	0	13	2	Private	Telecom Serv	1995	Business House
38	Jindal Steel	0.67	2.04	0.32	0.63	0.08	0.12	0.71	6.28	1.28	0.26	11.60	0	0	56	3	Private	Materials	1952	Private
39	NMDC	0.07	0.08	0.13	0.10	0.04	0.56	0.86	874.58	19.97	0.34	33.81	1	0	50	1	Public Sector	Materials	1958	PSU
40	Power Grid of India	0.70	2.35	0.15	0.60	0.02	0.04	0.85	61.75	0.50	0.10	3.78	1	0	54	1	Public Sector	Utilities	1954	PSU
41	Raxbaxy Labs	0.66	1.95	0.10	0.34	0.01	0.06	0.15	7.59	2.90	0.14	7.04	0	0	47	3	Private	Pharma	1961	Private
42	Power Finance	0.82	4.43	0.26	0.00	-0.02	0.03	0.38	0.64	1.36	0.35	1.89	1	0	22	1	Public Sector	Business Serv & Sup	1986	PSU
43	Asian Paints	0.51	1.06	0.21	0.51	-0.09	0.33	0.12	112.39	1.35	0.34	18.50	0	0	51	2	Private	Materials	1957	Business House
44	Jayprakash Ind	0.74	2.90	0.09	0.33	-0.11	0.06	0.29	2.41	1.57	0.33	8.64	0	1	29	2	Private	Construction	1979	Business House
45	Cipla	0.27	0.36	0.17	0.54	-0.12	0.18	0.23	168.33	4.07	0.17	5.14	0	0	73	3	Private	Pharma	1935	Private
46	Neyveli Lignite	0.42	0.71	0.02	0.30	-0.38	0.06	0.50	20.13	0.41	0.35	2.57	1	0	52	1	Public Sector	Materials	1956	PSU
47	Sun Pharma	0.37	0.58	0.33	0.24	-0.51	0.17	0.29	160.13	8.12	0.02	10.48	0	0	25	3	Private	Pharma	1983	Private
48	GMR Infrastructure	0.71	2.50	0.85	0.42	-0.71	0.04	0.29	5.25	2.62	0.15	13.00	0	1	12	2	Private	Construction	1996	Business House
49	DLF	0.94	16.16	0.25	0.41	-1.03	0.06	0.69	1.74	1.53	0.35	156.16	0	0	62	3	Private	Diversified Financials	1946	Private
50	Reliance Capital	0.24	0.31	0.36	0.01	-1.51	0.11	0.89	17.29	5.20	0.12	5.57	0	0	8	2	Private	Business Serv & Sup	2000	Business House

XIV.   India: Results - Correlation Matrix – All Firm Sample Data

	TD/TA	TD/TE	Growth	Tangibility	Size	Profitability	Op. Lev	Cov Rat	Curr Ratio	TaxEffect	MV/BV	Origin	Diversified	Age
TD/TA	1													
TD/TE	0.69	1												
Growth	0.15	0.13	1											
Tangibility	0.21	-0.02	-0.20	1										
Size	0.02	-0.22	-0.07	0.31	1									
Profitability	-0.69	-0.41	0.14	-0.13	0.13	1								
Op. Lev	-0.17	0.16	0.00	-0.04	-0.54	0.09	1							
Cov Rat	-0.57	-0.27	0.03	-0.28	0.08	0.69	0.19	1						
Curr Ratio	-0.56	-0.21	-0.06	-0.36	-0.24	0.47	0.38	0.45	1					
TaxEffect	0.21	0.20	0.09	0.01	0.27	0.22	-0.15	-0.10	-0.16	1				
MV/BV	0.33	0.71	0.03	-0.15	-0.20	-0.13	0.15	-0.05	0.04	0.15	1			
Origin	0.03	-0.03	-0.19	-0.01	0.35	-0.05	0.10	0.00	0.09	0.20	0.07	1		
Diversified	0.09	-0.02	-0.06	0.15	0.02	-0.08	-0.15	-0.07	-0.05	0.11	-0.09	-0.28	1	
Age	-0.05	0.01	-0.21	0.13	0.10	0.10	-0.03	-0.04	-0.06	0.27	0.07	-0.04	-0.02	1

XV.   India: Results – Correlation Matrix – Public Sector (Government Ownership) Firm Sample Data

	TD/TA	TD/TE	Growth	Tangibility	Size	Profitability	Op. Lev	Cov Rat	Curr Ratio	TaxEffect	MV/BV	Origin	Diversified	Age
TD/TA	1													
TD/TE	0.90	1												
Growth	0.60	0.61	1											
Tangibility	0.14	-0.19	-0.19	1										
Size	0.18	-0.04	0.45	0.56	1									
Profitability	-0.81	-0.65	-0.25	-0.19	-0.07	1								
Op. Lev	-0.49	-0.31	-0.61	-0.21	-0.75	0.43	1							
Cov Rat	-0.81	-0.56	-0.26	-0.35	-0.19	0.87	0.56	1						
Curr Ratio	-0.70	-0.44	-0.20	-0.39	-0.28	0.88	0.54	0.86	1					
TaxEffect	-0.19	-0.04	0.18	-0.60	-0.07	0.34	-0.11	0.27	0.26	1				
MV/BV	0.16	0.27	0.59	-0.48	-0.07	-0.02	-0.19	0.03	0.15	0.24	1			
Origin	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1		
Diversified	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	
Age	-0.33	-0.41	-0.18	0.11	-0.14	0.37	0.42	0.36	0.23	0.27	0.16	#DIV/0!	#DIV/0!	1

XVI. India: Results – Correlation Matrix – Private Sector (Individual, Business House Ownership) Firm Sample Data

	TD/TA	TD/TE	Growth	Tangibility	Size	Profitability	Op. Lev	Cov Rat	Curr Ratio	TaxEffect	MV/BV	Origin	Diversified	Age
TD/TA	1													
TD/TE	0.69	1												
Growth	0.15	0.11	1											
Tangibility	0.26	0.03	-0.22	1										
Size	-0.07	-0.30	-0.01	0.13	1									
Profitability	-0.63	-0.41	0.18	-0.10	0.37	1								
Op. Lev	0.01	0.30	0.08	0.08	-0.53	-0.15	1							
Cov Rat	-0.48	-0.24	0.04	-0.25	0.28	0.62	0.00	1						
Curr Ratio	-0.54	-0.22	-0.06	-0.38	-0.32	0.06	0.15	0.21	1					
TaxEffect	0.32	0.26	0.16	0.11	0.25	0.23	-0.20	-0.17	-0.46	1				
MV/BV	0.43	0.92	0.01	0.04	-0.38	-0.20	0.41	-0.10	-0.10	0.14	1			
Origin	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1		
Diversified	0.14	-0.02	-0.11	0.13	0.05	-0.12	-0.16	-0.07	-0.01	0.12	-0.08	#DIV/0!	1	
Age	-0.01	0.04	-0.22	0.15	0.22	0.06	-0.13	-0.10	-0.18	0.30	0.06	#DIV/0!	-0.04	1

XVII. India: Results – Descriptive Statistics – Firm Data

	TD/TA	TD/TE	Growth	Tangibility	Size	Profitability	Op. Lev	Cov Rat	Curr Ratio	TaxEffect	MV/BV	Origin	Diversified	Age
Mean	0.52	1.79	0.37	0.37	1.02	0.17	0.29	143.70	2.61	0.24	12.82	0.26	0.18	43.08
Standard Error	0.03	0.34	0.07	0.03	0.16	0.02	0.03	38.77	0.44	0.02	4.03	0.06	0.05	3.24
Median	0.52	1.08	0.24	0.34	1.09	0.14	0.23	20.04	1.63	0.26	5.62	0.00	0.00	43.00
Standard Deviation	0.20	2.41	0.51	0.20	1.14	0.12	0.21	274.12	3.14	0.12	28.46	0.44	0.39	22.93
Sample Variance	0.04	5.80	0.26	0.04	1.30	0.01	0.04	75143.84	9.85	0.02	810.08	0.20	0.15	525.75
Kurtosis	-0.57	26.30	19.43	-0.91	0.20	1.90	2.35	6.35	19.41	0.04	20.40	-0.76	0.99	0.69
Skewness	-0.18	4.60	4.09	-0.05	0.31	1.25	1.53	2.60	3.98	-0.06	4.53	1.13	1.72	0.77
Range	0.87	16.08	3.36	0.72	5.44	0.53	0.87	1226.03	19.56	0.60	155.96	1.00	1.00	102.00
Minimum	0.07	0.08	-0.18	0.00	-1.51	0.03	0.01	0.64	0.41	-0.01	0.21	0.00	0.00	4.00
Maximum	0.94	16.16	3.18	0.72	3.93	0.56	0.89	1226.68	19.97	0.59	156.16	1.00	1.00	106.00
Sum	26.19	89.48	18.52	18.35	50.96	8.32	14.27	7184.91	130.47	11.82	640.75	13.00	9.00	2154.00
Count	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00

XVIII. India: Results – Regression Analysis for Firm Data

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.859
R Square	0.738
Adjusted R Squar	0.653
Standard Error	0.119
Observations	50

ANOVA

	df	SS	MS	F	Significance F
Regression	12	1.475	0.123	8.684	1.57968E-07
Residual	37	0.524	0.014		
Total	49	1.999			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.547	0.071	7.741	0.000	0.404	0.691	0.404	0.691
Growth	0.087	0.037	2.329	0.025	0.011	0.163	0.011	0.163
Tangibility	0.199	0.116	1.707	0.096	-0.037	0.434	-0.037	0.434
Size	-0.005	0.025	-0.187	0.853	-0.056	0.046	-0.056	0.046
Profitability	-1.232	0.267	-4.617	0.000	-1.773	-0.692	-1.773	-0.692
Op. Lev	-0.073	0.124	-0.591	0.558	-0.324	0.178	-0.324	0.178
Cov Rat	0.000	0.000	0.560	0.579	0.000	0.000	0.000	0.000
Curr Ratio	-0.008	0.008	-0.963	0.342	-0.024	0.008	-0.024	0.008
TaxEffect	0.501	0.185	2.715	0.010	0.127	0.875	0.127	0.875
MV/BV	0.002	0.001	2.574	0.014	0.000	0.003	0.000	0.003
Origin	-0.006	0.053	-0.112	0.912	-0.113	0.101	-0.113	0.101
Diversified	-0.004	0.050	-0.086	0.932	-0.105	0.096	-0.105	0.096
Age	-0.001	0.001	-0.684	0.498	-0.002	0.001	-0.002	0.001

VITA

Anmol Bhate was born in Hubli, India on November 27, 1976. After completing his work at Fergusson College, Poona (India), he attended the University of Poona to pursue his Bachelors in Engineering. Upon graduation in 1998, he enrolled at Purdue University in West Lafayette, Indiana for graduate studies, and received the Master of Science degree in August 2000. During the following years he has been employed at Johnson Controls, Inc. In September 2003, he entered the Ross School of Business at the University of Michigan at Ann Arbor to pursue his Masters in Business Administration and plans to graduate in April 2008.

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