

India Transformed? Insights from the Firm Level 1988-2007



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Using firm-level data, this paper analyzes the transformation of India's economic structure following the implementation of economic reforms. We focus on publicly listed and unlisted firms from a wide cross-section of manufacturing and services industries and ownership structures such as state-owned, business group, private, and foreign firms. Detailed balance sheet and ownership information permit an investigation of a range of variables such as sales, profitability, employment, and assets. Specifically, we analyze firm characteristics by industry before and after liberalization and investigate how industrial concentration, the number and size of firms evolved between 1988 and 2007 by ownership type. We find great dynamism by foreign and private firms as given by the growth in their numbers, assets, sales and profits. However, closer examination does not suggest a story of dramatic transformation following liberalization, but rather one of an economy still dominated by the incumbents (state-owned firms and business groups). The exception to this pattern is the growing importance of new and large private firms in the services sector. Sectors dominated by state-owned and business group affiliated firms before liberalization (assets, sales and profits representing shares higher than 50%), however, remain so following liberalization. Rates of return also remain stable over time and show low dispersion across sectors and across ownership groups within sectors.

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1. Introduction

“Is there some action a government of India could take that would lead the Indian economy to grow like Indonesia’s or Egypt’s? If so, what exactly? If not, what is it about the ‘nature of India’ that makes it so?”
R. E. Lucas Jr. (Marshall Lecture, Cambridge University, 1985).

Between the 1950s and 1980s, India’s growth rate remained at a low 3.5% per annum. Paradoxically, following Lucas’ 1985 lecture at Cambridge University, India’s growth started accelerating in 1986 culminating in a rate of over 9% per annum by 2007. Also ironically, India’s average growth rate over the entire period between 1986 and 2007 surpassed those of Egypt and Indonesia (see Table A).

There are numerous views about the driving forces behind the transformation of India’s growth landscape.¹ While Rodrik and Subramanian (2005) point out that growth initially accelerated during the 1980s and stress the role of what they term “pro-business” reforms that began in the early 1980s, Bosworth, Collins, and Virmani (2007) argue that the emphasis on the services sector as the driving force behind the expansion of the Indian economy is perhaps overstated as it represents only a small share of the country’s GDP and overall employment level. Srinivasan (2003b) and Panagariya (2004) make the case that, before the more substantial liberalizations that emerged in the 1990s, growth was built largely on unsustainable increases in public expenditures and excessive foreign borrowing that precipitated the balance of payments crisis of 1991. Yet others stress the widespread reforms in 1991 following the crisis as the underlying driving force behind India’s spectacular growth.

In this paper we focus on the evolution of India’s industrial structure from 1988 until 2007. We focus on the period following the liberalization program of 1991 where industrial licensing was gradually eliminated and significant sectors of the economy were opened up for private participation.

The end of the license Raj and implementation of Washington Consensus style reforms had far-reaching implications for changes in India’s industrial structure. Following the reforms, India began to integrate into the world economy: import licensing was abolished in many sectors, import duties were sharply reduced, and many restrictions on FDI were lifted.² Investment increased from 23% of gross domestic product (GDP) in 1985 to 38% in 2007. During the eighties, total foreign direct investment (FDI) inflows barely reach one billion dollars. Conversely, India attracted more than \$70 billion in FDI between 2000 and 2007, the bulk of which was concentrated in the services, computer software and

¹ See Bosworth, Collins and Virmani (2007), Kochar et al. (2006), Panagariya (2008) and references therein.

² Industrial reforms include privatization, trade and FDI deregulation, and de-licensing or domestic deregulation; financial reforms include banking sector deregulation allowing foreign bank entry, stock market liberalization, exchange rate deregulation, and capital account liberalization; corporate governance reforms including setting up of a regulatory body (SEBI), regulations concerning listing requirements, insider trading laws, protection of minority shareholders, board membership rules, executive compensation rules etc.

hardware, construction, and telecommunications sectors. Many Indian firms established an international presence. The economy transitioned from being mainly dependent on agriculture and manufacturing to one that is services-oriented.³

Liberalizations are believed to transform economies via more competition (domestic and foreign), providing access to international capital markets, and foreign technology. The effects of liberalization processes, however, may not be uniform. Some industries may be better equipped to change while others are not. Within industries, new entrants may gain market share, while incumbents go bankrupt. However, restrictions may linger in some sectors; and for some firms.⁴

In this paper our goal is to analyze the evolution of India's industrial composition by focusing on the micro-foundations of its productive structure. How has India's industrial structure evolved at the firm-level as a result of the reforms? What was the industrial composition by ownership before and after reforms? Has the influence of traditional incumbents such as state- and group-owned firms changed? If so, what is the emerging role of private, domestic and foreign firms? What has happened to firm size, market share and industry concentration following liberalization?

Specifically, we analyze firms' characteristics by industry before and after the reforms of 1991. We use firm-level data from the Prowess database collected by the Centre for Monitoring the Indian Economy from company balance sheets and income statements. Prowess covers both publicly listed and unlisted firms from a wide cross-section of manufacturing, services, utilities, and financial industries. About one-third of the firms in Prowess are publicly listed firms. The companies covered account for more than 70% of industrial output, 75% of corporate taxes, and more than 95% of excise taxes collected by the Government of India (Centre for Monitoring the Indian Economy). Prowess covers firms in the organized sector, which refers to registered companies that submit financial statements.⁵

The main advantage of firm-level data is that detailed balance sheet and ownership information permit an investigation of a range of variables such as sales, profitability, employment, and assets for an average of more than 17,000 firms across our sample period firms by 109 3-digit industries covering agriculture, manufacturing and services, an additional advantage of our data over existing work focused on the manufacturing sector.⁶ The data are also classified by ownership categories such as state-owned,

³ Manufacturing as a share of GDP had increased only marginally over the past three decades, from 22% in 1980 to 27% in 2006. The sector was hampered by restrictive labor laws, and moderate corporate investment.

⁴ Fareed Zakaria, editor of *Newsweek International*, remarked, "India's growth is messy, chaotic and largely unplanned. . . . [I]t is not top-down but bottom-up. . . . India does not have a government that rolls out the red carpet for foreign investment. But it has vast and growing numbers of entrepreneurs who want to make money. And somehow they find a way to do it, overcoming the obstacles, bypassing the bureaucracy."

⁵ Section 3 describes in detail the advantages and short-comings of the data set.

⁶ As Goldberg et al (2009) note, unlike the Annual Survey of Industries (ASI), the Prowess data is a panel of firms, rather than a repeated cross section and therefore particularly well suited for understanding how firms adjust over time and how their responses may be related to policy changes.

business groups, private stand-alone firms and foreign firms. We study four sub-periods 1988-1990; 1991-1995; 1996-2000, 2001-2007.⁷ These periods broadly match the different liberalization waves explained in detail in the text. We examine industries where entry restrictions (foreign and domestic) were lifted to see whether the ownership composition of firms changed in terms of the number and size of firms, and the fraction of sales/assets by ownership category.

Specifically, we present detailed information on number of firms, firm size (assets, sale) and profitability (profit before interest depreciation and taxes and return on assets) for all firms in our sample by sector as well as by category of firm: state-owned enterprises, foreign firms, private groups and other private, for the four sub-periods. We also look at market dynamics with regard to promotion of competition in order to understand the efficient allocation of resources. We measure the degree of competition (consolidation) as a measure of competitive efficiency to examine how industrial concentration has evolved over time, and in liberalized versus non-liberalized industries. We examine in detail how industrial concentration evolved before liberalization, and after specific reforms.

The evidence shows great dynamism by foreign and private firms as given by the growth in numbers, assets, sales and profits. However, from closer examination, what emerges is not a story of dramatic transformation in India's micro-economic structure following liberalization. Rather, the data suggest an economy still dominated by the incumbents (state-owned firms and business groups). We find evidence of continuing incumbent control in terms of shares of assets, sales and profits accounted for by state-owned and business group firms. In sectors dominated by state-owned and business group affiliated firms before liberalization (with shares higher than 50%), these incumbents remain the dominant ownership group following liberalization. Interestingly, rates of return remain remarkably stable over time and show low dispersion across sectors and across ownership groups within sectors. These results imply that fewer numbers of state-owned and business group affiliated firms combined with their dominant shares of assets, sales and profits are suggestive of high industry concentration.

The exception to the pattern of incumbent firm dominance is seen in the growth of private firms in the services industries between 2001 and 2007. In particular, the asset and sales shares of private firms in business and IT services, communications services and media, health and other services shows a substantial increase in growth and in shares over this period coinciding with the reform measures that took place in the services sectors after the mid-1990s and also consistent with the growth in services documented in the aggregated data.⁸

⁷ Although liberalization process has been gradual, and the pattern of foreign entry liberalizations (and more general reforms) driven by private interests (see Chari and Gupta 2008), this does not preclude the analysis of firms size distribution and effects of reducing these constraints on its evolution.

⁸ In the case of information technology, pharmaceuticals and telecom, some new and very large players have emerged.

Schumpeter (1942) argued that creative destruction, the replacement of old firms by new firms and of old capital by new capital, happens in waves. A system wide reform or deregulation, such as the one implemented in India, may be the shock that prompts the creative destruction wave. “Creation” in India seems to have been driven by new entrants in the private sector and foreign firms. The sectoral transformation in India does not seem to have gone through an industrial shake out phase in which incumbent firms are replaced by new ones.⁹ Sectors in which state-owned enterprises and private business groups dominated activity pre- liberalization continue to do so even twenty years later after the reforms began.

Our results are consistent with the observation in Topalova (2007) that there seems to be very little exit at the firm level in India’s industry data, Goldberg et al. (2008) finding that net product creation following trade liberalization was almost exclusively driven by product addition as opposed to discontinuation of product lines, and arguments in Panagariya (2008) about the slow transformation of the country following reforms.¹⁰ Different explanations may account for these findings such as lingering restrictions and regulation constraining firm flexibility to adjust and inefficiencies in the financial sector among others.¹¹ However, one additional explanation, perhaps not sufficiently stressed in the debate, may be the important remaining role of incumbents (state-owned firms and business groups). As emphasized in the political economy literature, entrenched incumbents firms may have incentives to oppose the liberalization efforts. In fact, we find both industry concentration and state-ownership to be inversely correlated with the probability of liberalization. These results are consistent with findings in Chari and Gupta (2008) focusing on FDI liberalization.

Our work links to several strands of the literature. Papers have focused on different aspects of the recent evolution of the Indian economy. Recent work by Bosworth, Collins and Virmani (2007) examines India’s economic growth experience during 1960-2004, focusing on the post-1973 acceleration. The analysis focuses on the concentration of growth in services production, and the modest levels of human and physical capital accumulation. Other recent work examines the effects of India’s nineties liberalization with an emphasis on employment (see for example Aghion, Burgess, Redding, Zilibotti,

⁹ Interestingly, many of the older firms (pre-independence) have on average withstood the reforms (not considering sectoral composition effects), see Table 8.

¹⁰ The authors find little evidence of “creative destruction” and no link between declines in tariffs on final goods induced by Indian’s 1991 trade reform and product dropping.

¹¹ Abhijit (2006) notes the banking sector in India, dominated by managed public sector banks, fails to pull plug on firms that ought to have been long shut down referring to practices of “ever-greening” of loans in the Indian banking system. Bloom and Van Reenen (2007) and Bloom, Sadun, and Van Reenen (2007) find that decision making in Indian firms is highly centralized and management practices do not provide strong incentives for good performance. See also Khanna and Palepu (1999) for explanations put forth for the lack of product dropping in case-studies on the product scope of Indian conglomerates.

2007¹²), bank lending (Cole 2008), product mix and imported intermediate inputs (Goldberg et al. 2008, 2009). These papers shed light on some of restrictions to the “transformation” of the economy (labor regulation, bank regulation, tariffs, and so on). Our work contributes to this literature by analyzing in detail the evolution of firm activity by ownership, sector, and industry. Sales, entry, profitability and overall firm activity are disaggregated measures of economic growth and proxies of efficiency and thus provide an understanding of the effectiveness of reforms.

In addition to the literature studying the evolution of India’s economy and the effects of current reforms, our work more generally relates to literature emphasizing the effects of policy in the allocation of resources across establishments and that studying effects of liberalization particularly those that use firm level data.¹³ The evidence regarding impact of liberalization on economic growth is mixed (Edison, Klein, Ricci and Sloek, 2004; Kose, Prasad, Rogoff, and Wei, 2006). Henry (2007), however, argues that studies using micro-level data and tighter interpretations of theory show more conclusive results. Channels of growth have been difficult to establish in part because detailed micro-evidence using firm- or plant-level data have been hard to come by. This paper will take a step in this direction by characterizing the evolution of firm-activity in India following the liberalization in 1991.

The rest of the paper is organized as follows. Section 2 presents a review of the related literature. Section 3 describes the data. Section 4 presents the main empirical results. The last section concludes.

2. Related Literature

This study is related to different strands of research analyzing the recent performance of the Indian economy as well as the broad literature analyzing the impact of liberalization on investment, changes in the allocation of resources and economic growth. A thorough review of these large and diverse studies is clearly beyond the scope of this paper. We limit our attention to a few examples most closely related to our work.

As noted in the introduction, there is an extensive empirical literature analyzing different aspects of India’s economic growth. Work in this literature has focused on characterizing India’s economic performance at the aggregate level to examine the relative contributions of factor accumulation and total factor productivity. Bosworth, Collins and Virmani (2007), for example, use growth accounting

¹² The authors study the effects of the progressive elimination of the system of industrial regulation on entry and production (“license raj”), on registered manufacturing output, employment, entry and investment across Indian states with different labor market regulation. The effects are found to be unequal depending on the institutional environment.

¹³ Chari and Henry (2008), for example, find that capital account liberalization has increased the efficiency of the allocation of investment in publicly traded firms in the liberalizing economies. See Hsieh and Klenow (2009), Restuccia and Rogerson (2008), Alfaro, Charlton and Kanzcuk (2008) for role allocative efficiency.

techniques to analyze of India's economic growth experience during 1960-2004, focusing on the post 1973 acceleration.

Aggregate data, however, cannot be used to examine the micro-channels which can impact economic growth. Firm-level data, on the other hand, offer a lens through which to examine transmission mechanisms that impact growth at the micro-level. Until recently, the literature focusing on firm-activity using micro data, has however, predominantly focused on developed economies. Data availability being an obvious constraint (see Tybout, 2000).

More importantly, firms in developed economies operate in relatively unconstrained environments while in contrast firms in developing countries often face constraints such as excessive regulation and underdeveloped financial markets. These constraints become particularly important when it comes to the ease with which resources can be reallocated across sectors and within firms. Liberalization policies in many emerging and developing nations have relaxed some of these constraints and changed the environment in which firms operate. These reforms provide an ideal setting to investigate the firm-level response to a changing economic environment.¹⁴ In particular, our results suggest that industry concentration and average market shares decline in industries that experienced either delicensing or FDI and/or trade liberalization. At the same time, firms' profits rise across the board in liberalized industries. The coefficient of variation in average firm sales and assets increased suggesting that there is greater dispersion in firm size within liberalized industries.

Theories emphasizing the role of "creative destruction" emphasize rapid output and input reallocation, product obsolescence and changes in productivity levels as necessary ingredients for the pace of reallocation to play an important role in aggregate productivity growth. Schumpeter (p. 83, 1942) describes "creative destruction as: "The fundamental impulse that keeps the capital engine in motion comes from the new consumers' goods, the new methods of production and transportation, the new markets...[The process] incessantly revolutionizes from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact of capitalism. It is what capitalism consists in and what every capitalist concern has got to live in..." In addition to technological change, a system wide reform or deregulation may prompt the creative destruction wave. Industries then go through a shakeout phase during which the number of producers decline in the industry, as incumbents and new entrants replace the firms that exit.¹⁵ Restructuring is one manifestation

¹⁴ Bertrand and Kamarz (2002) study of the expansion decisions of French retailers following new zoning regulations in France. Black and Strahan (2002), and Guiso, Sapienza, and Zingales (2004) find that competition in the banking sector and financial development fosters firm entry in the U.S. and Italy respectively; Beck, Demirguc-Kunt, Laeven, and Levine (2006) find that financial development exerts a disproportionately positive effect on small firms.

¹⁵ See Caballero and Hammour (1996).

of creative destruction, by which the production structure weeds out unproductive segments; upgrades its technology, processes and output mix, and adjust to the evolving regulatory and global environment.

Using data on product lines, Goldberg et al. (2009) find the contribution of the net product margin to total output growth following liberalization in India to be driven almost exclusively by product additions, and not by discontinuation of product lines that have become obsolete.¹⁶ The authors argue that product churning or “creative destruction” along the product dimension, did not happen in India in the 1990’s, despite the fact that firms were faced with major trade and other structural reforms during this period.¹⁷ In relation to these findings, our results suggest that creative destruction does not appear to characterize firm activity in the Indian context following liberalization. Consistent with the addition of product lines in Goldberg et al. (2009), there was substantial firm entry across all sectors and in particular in the services sectors. However, it does not appear that firm entry was also accompanied by a decline in the importance of incumbent firms.

Most models, however, assume that firms are able to efficiently allocate resources within the firm and that factor markets are frictionless. Goldberg et al. (2009) argue that remnants of industrial regulation still affect the operation of Indian firms may constrain their flexibility to adjust to new economic conditions.¹⁸ In India, evidence suggests that despite the extensive industrial deregulation in the early 1990’s, remnants of industrial licensing and rigid labor market regulations may continue to affect the daily operations of Indian firms, potentially precluding them from eliminating unprofitable product lines.¹⁹ In addition, liquidation procedures are cumbersome and long. As noted by Panagariya (2008), “India operates in a world with virtually no exit doors.” India’s bankruptcy rate was, according to the World Bank (2005), of 4 per 10,000 firms, compared with 15 in Thailand and 350 in the United States. Our findings corroborate this observation. While there was dynamism in firm entry particularly by private and foreign firms following liberalization, we observe little incumbent firm exit (notwithstanding methodological issues in the collection of the data). Taken together, traditional incumbents like state-

¹⁶ Recent theoretical models that focus on the relationship between trade costs and product mix predict that firms adjust to a decline in trade costs through product dropping, see Bernard, Redding and Schott (2006b).

¹⁷ Goldberg et al. (2008, 2009) examine whether Indian firms change their extensive product margin in response to India’s large-scale tariff liberalization during the 1990s. Their analysis suggests that despite the regulatory constraints, changes in firms’ product mix had a non-negligible contribution to growth; on net, they account for approximately 25% of the increase in Indian manufacturing output during our sample period. However, in contrast to the U.S., only 30 percent of Indian firms show a change in their product-mix over a 5-year period. Firms in India infrequently drop a product or simultaneously add and drop a product. See Bernard, Redding and Schott (2006a,b) for evidence in U.S.

¹⁸ Some of their results also suggest that declines in tariffs are associated with somewhat bigger changes in firms’ product scope in industries no longer subject to licenses at the onset of the 1991 reform compared to regulated industries.

¹⁹ For example, an all India amendment to Industrial Disputes Act (1947) in 1982 required firms with more than 100 employees to seek government approval to dismiss workers (Kochhar et al, 2006).

owned and group owned firms account for almost 80% of firms assets, sales and profits throughout our sample period.

Many studies have emphasized the gains in aggregate output that arise when policy reforms or changes in market fundamentals induce reallocation of resources. Several papers focus on the effects of trade and FDI liberalization on the economy.²⁰ In the case of India, Krishna and Mitra (1998) find contraction of low-productivity plants and an increase in industry-level productivity following liberalization. Similar results are shown in Sivadasan (2006) and Topalova (2007) following trade liberalization while Arnold et al. (2008) find positive productivity effects from India's policy reform in services. Aghion, Burgess, Redding, Zilibotti (2007) find differential effects of liberalization on manufacturing output, employment, entry and investment across Indian states with different labor market regulation while Besley and Burgess (2004) show that Indian states which amended their labor regulations in a pro-worker direction experienced lowered output, employment and productivity.

Somewhat missing in many papers in this literature, or perhaps not emphasized, are political economy considerations and in particular the role of ownership and incumbents.²¹ The widespread privatizations of the 1980s and 1990s around the world generated a large empirical literature focused on understanding the effects of ownership on firm performance.²² As reported by Chong and Lopez de Silanes (2004), between 1984 and 1996, the participation of the state-owned enterprises in industrial countries declined 8.5% of GDP to 5%. In middle income countries it went from 11% of GDP in 1980 to 5% in 1997 and from 15% to 3% in low-income economies. Employment went from 13% to 2% in middle income and 20% to 9% in low income countries.²³ For India, our data suggest that between 2001-2007, state-owned firms still accounted for 59%, 42%, and 50% of total assets, sales and profits.

Gupta (2005) studies the effects of partial privatization of state-owned enterprises in India and finds a positive impact on profitability, productivity, and investment. Her results also suggest that partial privatization does not seem to cause the government to abandon the political objective of maintaining employment. This paper finds that the fractions of sales, assets and profits accounted for by state-owned firms remain substantial in India nearly two decades following liberalization and is substantially higher than other countries including the transition economies of Eastern Europe.

As emphasized by Stigler (1971), incumbent firms in profitable, concentrated sectors have a greater incentive to prevent entry. Chari and Gupta (2008) find that reforms may be captured by powerful

²⁰ See Goldberg and Pavcnik (2004) and Alfaro and Rodriguez Clare (2004) for an overview of recent findings on trade and FDI respectively.

²¹ Ownership data is difficult to find for a panel of industries.

²² Megginson and Netter (2001), surveying the literature, find that most studies reveal a positive impact of privatization on profitability and efficiency of firms.

²³ These averages, however, mask huge variation. In Africa, state ownership remains higher than 15% of GDP; in China the government still has control over important sectors of the economy.

interests particularly firms in profitable, concentrated industries and in industries with substantial state-owned firm presence. However, given the widely documented improved performance following privatizations (Megginson 2005) and the deadweight loss associated with industry concentration, selective liberalization may inhibit economic growth.²⁴

In fact, a growing literature, argues that policy and institutions differential effects on the investment climate broadly defined might significantly influence the allocation of resources across establishments. The working hypothesis in this literature is that not only the level of factor accumulation, but also how these factors are allocated across heterogeneous production units, matters in trying to understand income differences (see Hsieh and Klenow (2009), Restruccia and Rogerson (2008), Alfaro et al. (2008)). That is, the great divide between rich and poor countries may not just be explained by lack capital and skilled labor but also a consequence of the misallocation or misuse of available resources.

For India, Hsieh and Klenow (2007) use plant level information from the Indian manufacturing census data to measure dispersion in the marginal products of capital and labor within 4-digit manufacturing sectors. When capital and labor are hypothetically reallocated to equalize marginal products to the extent observed in the United States, the authors find efficiency gains of 50%-60% in India.²⁵ As noted by Klenow (2008), the importance of allocative efficiency has been motivated by the fact the growth took off in India in the wake of a series of policy reforms. In this paper, we find that the coefficient of variation in the rate of return on assets is relatively low across both industries and owners. Further, state-owned firms earn substantial profits. It is not clear whether these returns stem from monopoly power in concentrated industries or because they are efficient. If it is the former, further privatization may serve to raise returns even higher barring the caveat that private monopolies do not replace the state-owned monopolies.

In addition to the literature studying the evolution of India's economy and the effects of current reforms, our work more generally relates to literature studying effects of liberalization (in particular and those exploiting firm level data). Alfaro and Charlton (2007) study the effects on firm activity for capital account liberalization in a sample of developed and developing economies after 1999. Galindo, Schiantarelli, and Weiss (2007) and Chari and Henry (2008) study whether capital account liberalization has increased the efficiency of the allocation of investment in publicly traded firms in the liberalizing

²⁴ Reviewing the evidence in Latin America (perhaps more comparable to India than others), Chong and Lopez de Silanes (2004), note that most privatization cases led to higher profitability, output and productivity growth, fiscal benefits, and even access and quality improvements. The authors do highlight that many instances of failure exist, but many may be understood within the political framework (state participation in opaque processes, poor contract design, inadequate regulation or deregulation).

²⁵ Hsieh and Klenow use manufacturing data from India's Annual Survey of Industries (ASI) from 1987-1988 through 1994-1995.

economies. The literature also suggests that reforms may be captured by powerful interests (Kroszner and Strahan, 1999; Chari and Gupta, 2008), so that new firms may not benefit from liberalization.

The next section provides micro evidence about the evolution of India's industrial composition.

3. The Data

We use firm-level data from the Prowess database. The sample period is from the dataset's year of inception, 1988 to 2008.²⁶ The data are collected by the Centre for Monitoring the Indian Economy (CMIE) from company balance sheets and income statements and covers both publicly listed and unlisted firms from a wide cross-section of manufacturing, services, utilities, and financial industries. About one-third of the firms in Prowess are publicly listed firms. The companies covered account for more than 70% of industrial output, 75% of corporate taxes, and more than 95% of excise taxes collected by the Government of India (Centre for Monitoring the Indian Economy).

Prowess covers firms in the organized sector, which refers to registered companies that submit financial statements. According to the government, "The organized sector comprises enterprises for which the statistics are available from the budget documents or reports etc. On the other hand the unorganized sector refers to those enterprises whose activities or collection of data is not regulated under any legal provision or do not maintain any regular accounts" (Informal Sector in India: Approaches for Social Security, Government of India, page 2). Indian firms are required by the 1956 Companies Act to disclose information on capacities, production and sales in their annual reports. All listed companies are included in the database regardless of whether financials are available or not.²⁷

The main advantage of firm-level data is that detailed balance sheet and ownership information permit an investigation of whether the presence of certain types of incumbent firms in an industry affects the evolution of industry and firm characteristics and the responses to policy changes such as liberalization. In contrast, industry-level databases usually do not provide information about sales, assets, profits, and employment by different ownership categories.²⁸ The firms in the data belong to three main ownership categories: state-owned firms, private firms and foreign firms. Private firms include family-

²⁶ The Prowess database has now been used in several studies including Bertrand et al. (2002), Khanna and Palepu (1999), Fisman and Khanna (2004), Topalova (2007), Dinc and Gupta (2007), Chari and Gupta (2007), and Goldberg et al. (2008, 2009).

²⁷ Non-listed companies are not required to disclose its financials. CMIE asks them for permission, but if they refuse they cannot include those companies in Prowess.

²⁸ Since firms are not required to report employment in their annual reports, we observe employment data for only a more restricted sample of firms. Financial services are the only industry that is mandated by law to disclose employment information. Since the sample of firms that report employment is small, we do not focus on these numbers.

owned business groups and unaffiliated private firms. Appendix Table 2 provides a description of variables used in the data analysis.

Another advantage is the considerable regional variation in industrial, demographic, and political characteristics across the different Indian states. Prowess has financial data on 536 industry-state observations. Industry location and geographic concentration depends on proximity to natural resources, product markets, and infrastructure. For example, firms in the basic chemicals industry are located in 19 different states, whereas the mining of lignite is concentrated in the state of Gujarat, close to the ore deposits.

One concern of the data may be related to new entrants versus improvements in the data coverage by CMIE. However, for all firms that Prowess decides to cover, regardless of when the decision is made, financial data from 1989 onwards, wherever available, is added to the database. That is, even if coverage for a firm begins only in 1995, CMIE goes back and gets data from at least 1989, if not earlier. Hence, for the sample that we consider, there is the entry numbers are not distorted by changing coverage (except, of course, from firms that are actually incorporated in that period). Nevertheless, we are cautious when interpreting the results.

A point regarding data coverage of foreign firms is worth highlighting. Firms are classified as domestic or foreign depending on the incorporation location. For example, in the case of Jet Airways, the holding company is incorporated overseas and therefore classified as a foreign. Also, similar to unlisted domestic firms, data on unlisted foreign firms is available only if the firm chooses to disclose its financial information. CMIE requests unlisted foreign firms for permission, but if they refuse (as for example, McDonalds and Coca Cola have done) then the firms are not included in Prowess.

Chari and Gupta (2007) compare the Prowess data with the Annual Survey of Industries (ASI) conducted by the Government of India. The ASI is a survey collected on a sampling basis of factories employing 100 or more workers. Although the overlap in the list of industries covered by the two datasets is not perfect, the ASI data nevertheless provide a useful cross-industry benchmark for the coverage in Prowess. For instance, the ASI data focus primarily on the manufacturing sector, whereas Prowess covers several additional service sectors including defense, restaurants, hotels, and IT services. The authors find that in 41 of the 51 three-digit industries covered by both databases, total industry sales in Prowess is on average 77% of the value of total sales for the same industry in the ASI.

Goldberg et al. (2009) argue that the Prowess data set is not a manufacturing census, and therefore may not be ideal for studying firm entry and exit, given that it includes only larger firms, for which entry and exit are not important margins of adjustment. However, it is important to note that unlike the Annual Survey of Industries (ASI) which is a survey of manufacturing, the Prowess data is a panel of firms, rather than a repeated cross section. Prowess is therefore particularly well suited to examining how

firm-characteristics including entry and exit evolve over time and may respond to policy changes. (For instance, Goldberg et al. (2009) use the Prowess dataset to examine how firms adjust their product-mix over time). Moreover, the predominant emphasis of the extant literature using firm-level data on India has been on the manufacturing sector. An important advantage of Prowess is its coverage of firms in the services sector widely credited for India's growth miracle.

The *Industrial Policy Resolution of 1991* (Office of the Economic Advisor, 2001) provides information about the list of manufacturing industries in which the state liberalized foreign entry and also a list of industries where domestic entry restrictions were lifted. The firms in the sample belong to 109 three-digit industrial categories, of which foreign entry restrictions were reduced in 46 industries while domestic entry restrictions were removed in 51 industries. Tariff reductions took place in 77 industrial categories. The Indian National Industrial Classification (NIC) (1998) system is used to classify firms in the Prowess dataset into industries. The data include firms from a wide range of industries including mining, basic manufacturing, financial and real estate services, and energy distribution.

The Prowess database provides four- and five-digit industry classifications for most firms. However, because the liberalization policy was enacted at the three-digit level, the explanatory variables such as industry concentration are computed at the three-digit level.

4. The Evidence

We study four sub-periods 1988-1990; 1991-1995; 1996-2000, 2001-2007. These periods broadly match the different waves of liberalization. We note that the trend towards de-licensing and de-reservation began with the industrial policy statements in 1985 where business houses were not restricted to Appendix 1 industries as long as they moved to industrially backward regions and minimum asset limit defining business houses was raised from Rs. 200 million to Rs. 1 billion. The pace of these policy trends accelerated with the New Industrial Policy outlined in the Industrial Policy Resolution of 1991. Industrial licensing was abolished for all except 18 industries. Large companies no longer needed MRTP approval for capacity expansions. The number of industries reserved for the public sector in Schedule A (IPR1951) was cut from 17 to 8; Schedule B was abolished altogether. Importantly limits on foreign equity holdings were raised from 40 to 51% (for industries listed in Annexure III of the Statement of Industrial Policy in 1991) under the "automatic approval route" and tariffs were also reduced for a wide range of industries from an un-weighted average of about 85% in 1990 to about 60% in 1992.²⁹

²⁹ Aluwahlia (2002) shows that the weighted average import duty rate declined from the very high level of 72.5 percent in 1991-92 to 24.6 percent in 1996-97. However, he also shows that the average tariff rate then increased by more than 10 percentage points in the next four years. "In February 2002, the government signaled a return to reducing tariff protection. The peak duty rate was reduced to 30 percent, a number of duty rates at the higher end of

Services reforms while rapid in the 1990s varied across sectors. Appendix A in Arnold, Javorcik, Lipscombe and Mattoo (2008) provides an excellent and detailed survey of the services liberalization reforms by sector between 1991 and 2005.

Our objective is to provide the reader with a detailed overview of the evolution of India's industrial composition in the last twenty years. For expositional purposes, the tables collapse the sectors in ten: agricultural, mining & extraction; business & IT services; financial services, real estate; hotels, restaurants; manufacturing; communication services; media, health, & other; transport; utilities, construction, retail; miscellaneous diversified. Tables 1 to 5 present detailed information on the number of firms, firm size (assets, sale) and profitability (profit before interest depreciation and taxes and return on assets) for all firms in our sample by sector as well as by category of firm: state-owned enterprises, foreign firms, private groups and other private, for the four sub-periods. Appendix Table 1 presents detailed information on the industries included in each sector and the number of firms by sector.

4.1 Reforms and Dynamism?

The first four columns in Table 1 present data on the average number of firms by type of ownership and sector. The last three columns in the table show the growth rates across sectors. The table shows information for the full sample across all sectors by type of ownership, followed by information for each of the different sectors by type of ownership and finally, data consolidated by sector.

Consistent with the rapid growth observed in India after the mid eighties (as documented in Table A) overall firm activity as proxied by the number of firms increased substantially throughout the sample period. There is, however, heterogeneity by ownership type. The average number of state owned firms increased from 662 in the 1988-1990 to 856 on average by 2001-2007. The number of business group affiliated firms also increased during this period: 2041 in 1988-1990 to 4,935 in 2001-2007. These numbers, however, are dwarfed by the growth rates in the average number of private firms: up from 8,153 in 1988-1990 and close to 15,063 at the end of the period. The number of foreign firms increased from an average of 540 in 1988-1990 to 1,035 in the 2001-2007 period.

Following the reforms in the mid-1980s and early 1990s, the increasing number of private but also of foreign firms suggests that the liberalization measures enacted to allow domestic entry through de-licensing and de-reservation combined with the liberalization of foreign direct investment were successful in promoting greater dynamism in new entry by firms other than the incumbents (state-owned and business group affiliated firms) of the pre-reform period. Indeed, the doubling of number of foreign firms

the existing structure were lowered, while many low end duties were raised to 5 percent. The net result is that the weighted average duty rate is 29 percent in 2002-03.”

in this period is suggestive of substantial foreign entry albeit from very low levels in the pre-reform period

These patterns are broadly mimicked within sectors. Agriculture, for example, is characterized by a relative stable number of state-owned firms and increasing activity by private and foreign firms (again the former from a relatively low base). The number of business groups firms in agriculture increased substantially but mostly between 1991 and 1995 leveling off somewhat after that. In manufacturing, the number of state-owned firms and business groups has also remained relatively stable. In contrast, the number of private and foreign firms has increased substantially. Similarly, we observe high growth in the number of private and foreign firms in sectors such as transportation, utilities and construction, hotels and restaurants, media and other services with relatively little change in the number of state-owned firms. Business and IT services, financial service, real state, and communication services by far show the highest growth rates for all type of firms, but again, private firms (also business groups) and foreign show substantial activity in terms of number of firms. Panagariya (2008) hails the success story in the telecommunication sector as the triumph of reforms. As the last panel in Table 1 shows, there was an overwhelming increase in the number of firms in this sector.

Overall, Table 1 presents a picture of a dynamic economy driven by private and foreign firms and the transformation of the Indian economy. In fact the data suggests that 1988-1990 was already a period of great activity in terms of the number of firms.³⁰ The evidence is therefore consistent with arguments in Rodrik and Subrahmanian (2005) and Panagariya (2008) that the regime shift in India's growth path began in the mid-1980s. However, we note that there was an acceleration in entry in the period following 1991 and continuing through the rest of the decade.

Table 2 presents similar information for average assets by ownership type and sector. Average assets have also grown in the last two decades years particularly in the private and foreign sector, although the initial value of assets under private and foreign ownership were very low. The table shows high accumulation of assets in private and foreign firms in all sectors of the economy but in particular in transports, utilities, business and IT services, financial services, and other services. Foreign firms also show increased participation in recent periods, and in sectors such as transportation, and media, health and other services. The lower panel shows asset accumulation across sectors suggesting an increasing role for the service sectors. In particular, the growth of assets is far more dramatic in financial services, business and IT services, transport, construction and media.

³⁰ We examined within-period growth in the number of firms for this period and found it to be substantial ranging from 33.3% for foreign firms, 31.5% for private firms and 15.8% for business-group affiliated firms.

Table 3 presents detailed information on sales. A similar pattern emerges. Although there is substantial growth across all forms of ownerships and sectors, the data suggest higher activity in terms of sales growth by foreign and private firms and in growth in the services sectors.

Table 4 shows profits (profits before depreciation, interest payments and rents of firms) by ownership and sector. Private firms stand out in terms of the growth rate in their average profits. State-owned, business group and foreign firms also show high rates of growth in the average level of their profits. For foreign firms, financial services and business and computer-related services delivered the highest rates of growth in average profits. It is also worth noting that across ownership groups, the services sectors dominate manufacturing for profit growth.

A more subtle picture emerges from Table 5, which shows the return on assets. In the early period of 1988-1990, for the full sample, business groups display the highest average rate of return (13.93%) followed by foreign firms (12.36%) and private firms (12.22%). State-owned firms come last with an average rate of return of 8.49% during this period. Following 1991 the picture changes. Business groups and private firms experience a decline in the return of assets settling at 11.42% and 9.51% respectively, for the 2001-2007 period. State-owned firms in contrast experienced an increase in the return on assets with a figure of 10.22% for 2001-2007. Foreign firms also experience a steady increase in the return on assets with a 14.98% return for the 2001-2007 period. Between 1996 and 2000, business group, private and foreign firms all experienced a decline in the return on assets. The exception was state-owned firms which experienced a steady increase over the entire sample period.³¹ It is also interesting that while the dispersion in rates of return has remained almost the same from 5.44% in 1988-1990 to 5.47% in 2001-2007. The coefficient of variation in returns across ownership increased from 0.45 in the 1988-1990 to 0.52 in 2001-2007.

For state-owned firms the highest rate of return was in agriculture, mining and extraction (21.23%) followed by manufacturing (13.03%) and then the services industries (with an un-weighted average of 8.5%) in 2001-2007. The sectors with the highest rates of return for private business groups were agriculture, mining and extraction and business and IT services. For private firms, the highest rate for return was in business and IT services. It is important to highlight that in agriculture, mining and extraction, manufacturing, miscellaneous diversified activities, utilities, construction, and retail, business and IT services and communication services, foreign firms earned the highest rates of return across ownership groups.

In 1988-1990, the dispersion in returns across ownership groups within a sector was the highest in transport (22%) and the lowest in manufacturing (6.2%) and financial services (7.5%). In the period 2001-

³¹ Bai et al. (2006) estimate the aggregate marginal product of capital in China to be around 20%, down from 25% in the pre-reform period.

2007, the dispersion in returns ranged from 24% in miscellaneous diversified production to 1.39% in financial services. The coefficient of variation within sectors across ownership groups was 0.19 in agriculture, mining and extraction and 0.72 in transport in 1988-1990 and ranged from 0.08 in financial services to 0.75 in miscellaneous diversified production in 2001-2007.

For the full sample, the highest rate of return was in media, health and other services (21%) and the lowest in the miscellaneous diversified sector (8.15%) in 1988-1990. In 2001-2007, the highest rate of return was in business and IT services (18%) and the lowest in financial services (7%).

Interestingly, the dispersion in returns across sectors remained almost unchanged at 12.87 in the early period and 12% in the most recent period. Table 6 presents data on the sectoral variance of return on assets measured by dispersion in the top panel and by the coefficient of variation³² in the second one. Consistent with the dispersion numbers, the coefficient of variation in returns across sectors remained virtually unchanged from 0.32 in 1988-1990 to 0.31 in 2001-2007.

In sum the panels in Table 5 and 6, tell an analogous story. The rate of return is remarkably stable for the full sample across time with an average return on assets of 11.75% in 1988-1990 to 11.53% in 2001-2007. While there is cross-sectional variation in rates of return across ownership groups, sectors, there is relatively little dispersion in the rates of return as seen in the tight range of returns and the low coefficient of variation within sectors by ownership group and across sectors. The patterns in the return on assets are striking when compared to the large variations we see in terms of new firm entry by foreign and private firms and in the growth of their assets, sales and profits in comparison to the lower rates of entry by state-owned and business-group affiliated firms.

4.2 Or, Continuing Incumbent Control?

Table 7 presents information about the shares of the number of firms, assets, sales and profits by ownership group and sector. Although the table shows substantial information, some clear interesting patterns emerge. Overall, what appears is not a story of dramatic transformation in India's micro-economic structure following liberalization. Rather one of an economy still dominated by the incumbents (state-owned firms and business groups) and the sectors of the pre-reform period. The evidence corroborates the arguments in Panagariya (2008).

Despite low shares in the number of firms, India's formal sector continues to be dominated by state-owned enterprises and business groups in terms of shares of assets, sales and profits. Between 1988-1990, private and foreign firms accounted for 66% and 25% of the total number of firms on average

³² The coefficient of variation is a normalized measure of the dispersion of a probability distribution. It is defined as the ratio of the standard deviation to the mean. For examples, distributions with coefficient of variation less than one are considered low variance and higher than one high variance.

respectively, state-owned firms and business group-affiliated firms accounted for 5% and 4% of the total number of firms, respectively. Between 2001-2007, the shares of private firms (69%), foreign firms (23%), business group firms (5%) and state-owned firms (4%) remain virtually unchanged. The 90-10 split between the shares of private and foreign firms and the shares of state-owned and business group firms in the number of firms is replicated across sectors with the exceptions being agriculture, mining and extraction and transport where the split is 80-20.

In striking contrast, state-owned and business group affiliated firms dominate the shares of assets, sales and profits. Between 1988 and 1990, state-owned and business group firms accounted for 92%, 82% and 89% of total assets, sales and profits. Between 2001 and 2007, these fractions stood at 83%, 76% and 83%, respectively. While the rising importance of foreign and private firm activity is apparent from the data, it is clear that the economy nearly four-fifths of the economy is dominated by the incumbents from the pre-reform period: state-owned firms and business group affiliated firms.

The importance of the state-owned firms has remained extraordinarily high despite the reforms. For example, total assets by state owned-firms represented close to 70% of total assets in 1988-1990, and remain close to 60% by 2007. The average share of total assets owned by business groups remained relatively constant at 25% through the whole period (1988-2007), while the shares of private and foreign firms went from 3% and 5% respectively to 9% and 7%. Sales by state owned firms were close to 40% of total sales throughout the sample and the share of business groups went from 40% to 34% while private and foreign represent each close to 10% each. Profit shares also remained relatively stable throughout the whole period with state-owned firms representing close to 60%, business groups close to 30% and private and foreign 9% each.

Although there is considerable variation in asset, sales and profit shares across sectors and interesting pattern emerges from the data. Sectors dominated by state-owned and business group affiliated firms before liberalization (with fractions higher than 50%), remain the dominant ownership groups following liberalization. For example in agriculture, state-owned firms represented close to 95% of all assets, sales and profits in the period 1988-1990. By 2000-2007, state-owned still represented close to 90% of assets, sales and profits. Similarly, in transport, utilities, hotels and restaurants, state-own firms accounted for more than 50%, 70% and 60% of assets respectively in the period 1988-1990 and in 2001-2007; with similar shares for sales and profits. Business group firms represented a 20% share over the sample period. In all of these sectors the shares of private and foreign firms has remained low gaining slight importance in recent years.

The only exceptions to state- and business group dominance is seen in business and IT services, communication services and media, health and other services where private and foreign firms accounted for 47%, 31% and 41% of asset shares in 2001-2007. Shares of total sales and profits display a similar

pattern in these sectors. These sectors therefore represent not only growth in terms of numbers of firms but also in terms of importance in asset, sales and profit shares. The firm-level evidence in these industries mirrors the services growth in the aggregate data especially following 2000. State-owned and business group firms accounted for 97% of total assets, sales and profits in the financial services sector in 1988-1990. These shares stood at 85%, 77% and 86%, respectively in 2001-2007.

Manufacturing still dominates sales; while it also represents a high share of assets. In manufacturing, state-owned firms account for 25%, 35% and 30% of assets, sales and profits in the current period down from 43%, 29% and 38% in the pre-liberalization period. This sector, however, remains dominated by business groups which still account for close to 50% of assets and sales and close to 60% of profits. The combined role of private and foreign firms peaked at close to 25% in recent years. However, the picture remains one of a manufacturing sector dominated by incumbents before and after the reforms.

Table 8 presents information by year of incorporation (between 1947-1977; 1977-1990; and 1991-2007) for number of firms, firm size, assets, sales, employment, profitability, and rate of return and their evolution in the different periods of study.³³ The oldest firm in the sample (Howrah Mills Company Ltd.) was incorporated in 1825, and the sample begins with over 1200 firms that were incorporated pre-independence. 91 firms from this group exit the sample through mergers. Many of these older firms (pre-independence), however, remain in operation following the reforms (although we do not control for sectoral and ownership differences). The data also suggest that the profitability of older firms surpasses that of newer firms (for those incorporated from 1977-1990 and from 1991-2007). In fact, newer firms seemed to have had on average negative returns in the most recent years. An industrial shakeout perhaps characteristic of a creative destructive wave following widespread reform is not manifest in the data.

Overall the evidence presented in Sections 4.1 and 4.2, the low number of state-owned and business group affiliated firms combined with their dominant shares of assets, sales and profits, is suggestive of high industry concentration by incumbents. The next section examines the evolution of industry concentration, firm size and market shares across industries and ownership shares and the impact of various liberalization measures enacted in 1991.

³³ A point about firm exit is worth noting. The dataset contains a code for firms that exited the data via mergers and acquisitions. However, the data do not contain a flag for firms shutting down versus discontinued coverage. Therefore, when we no longer observe data for a firm, we assume firm exit, however this may also reflect discontinued coverage by Prowess or the failure of unlisted firms to provide data about their operations. Results should be interpreted with caution.

4.3 Maintaining Control: Market Share and Concentration

In order to understand the efficient allocation of resources, we look at market dynamics with regard to promotion of competition. We measure the degree of competition (consolidation) as a measure of competitive efficiency to examine how industrial concentration has evolved over time.

Table 9 includes information on industry concentration (market shares and the Herfindhal index³⁴) firm profits, firm size (assets and sales), dispersion measures (coefficient of variation calculated by assets and sales). Underlying values are calculated for the average firm by year and then by industry. That is, each number in the table represents the average share in the sub-period for the average firm.³⁵ We present data for the full sample first and then by the different forms of ownership.

For the overall economy, Table 9 shows a reduction in market concentration for the average firm throughout the whole sample period. Both the market share ratios (for asset) and the Herfindahl indices suggest an increased degree of competition among firms in India. This finding is consistent with the earlier evidence on increased firm activity and overall higher dynamism in the economy. However, despite the evidence about increased levels of competition, even by 2001-2007 the concentration measures remain high. Chari and Gupta (2008) compare the industrial structure in India with that of the United States (taken as a benchmark of a country with fewer regulations and more developed financial markets). In 1990, a year before the reforms, the average Herfindahl index in India was significantly higher (40%) than in the United States (24%) for the same three-digit SIC industries while concentration in Industries that remained protected was significant higher than their U.S. counterparts (54% versus 22%).

For the average firm, average profits increased consistently for the whole sample period, although perhaps more so in 2001-2007 (a period in which the overall growth rate in the country picked up). Measures of average firm size (by assets and sales) also increased considerably between 1988 and 2007 and in particular in recent years from Rs. 254 core and Rs 100 core, respectively, to Rs. 642 core and Rs. 251 cores. The coefficient of variation (for both sales and assets) indicates increased dispersion. Overall, what emerges is a picture of the average firm in India becoming bigger, in terms of assets, sales and profits perhaps with some gaining more than others as heterogeneity increased substantially in the period.

³⁴ The Herfindahl index is an indicator of the degree of competition among firms in an industry. It is defined as the square of the market shares of each firm in an industry. The value of the Herfindahl index can range from zero in perfectly competitive industries to one in single producer monopolies).

³⁵ The shares are calculated at firm-level. Each firm's share shows the average firm's share in the sub-period averaged out across industries. For example, the interpretation of 36.8% in period 1 is that on average in period 1, the average state-owned firm accounted for 36.8% of the sales of its own industry.

However, in terms of market share, the average firm seems to have become less powerful although as they have also become more unequal some firms may have gained disproportionate market shares.

The average state-owned firm has significantly higher share of assets, sales and higher profits than the average firm in the economy throughout the whole period. The share of the state-owned firms, however, has decreased throughout the whole period but perhaps mostly after 1996. In particular, the average market share for state-owned firms measured by assets decreased from 27% in 1988-1999 to 11% in 2001-2007 and that of sales from 25% in 1988-1999 to 11% at the end of the period. Average profits, however, have grown consistently and substantially between 1988 and 2007 (as well as by assets and sales, not shown). Dispersion has also increased. Overall, the average state-own firm has become bigger, more profitable and somewhat more dissimilar.

For business group-affiliated firms, the share in terms of assets started 16% in 1989-1990 decreasing to 8% in 2001-2007. In terms of sales, the average market share was 16% in 1988-1990 and 6% by the end of the period. These shares were lower than that of the average state owned enterprise throughout the whole period. As there are substantially more business group firms relative to state-owned firms, it appears that considerably more market power is concentrated in the state-owned firms. Profits for the average business group-affiliated firm increased substantially during the period. Note that average profits for business group affiliated firms are lower than for state owned firms (not controlling for sector, scale and so on). Dispersion in business groups also increased slightly during the period. In sum, the average business group firm has become more profitable, bigger, and slightly more disperse (particularly during the last subperiod of the data).

The relative importance of private firms for the full sample has fallen both in terms of sales as well as assets from around 14% in 1989-1990 and to 7% in 2001-2007 for both indicators. Average profits for the average private firm, although higher, remain relatively low compare to the previous two ownership types. There is a substantial increase in heterogeneity in this group, which is characterized by many firms. That is, masked behind the increased average market share and slightly bigger average firm size (taking place mostly in the recent period of 2001-2007) there is a story of large numbers of heterogenous private firms.

The market share of the average foreign firm in terms of assets and sales went from around 13% between 1989-1995 to 8% between 1996-2007. Average profits increased though out the period from Rs. 10 crore to Rs. 71 crore. We also observe increased dispersion.

The previous discussion portrays the evolution of firms in India from 1988-2007 a period characterized by substantial reforms. These reforms took many forms (liberalization of FDI, trade, domestic markets, etc) at different times as different sectors were liberalized at difference pace. Although a formal causal analysis of the effect of these policies is beyond the scope of this paper, Tables 10a-c

examine how firms evolved before and after in industries that enacted specific reforms: liberalization of foreign direct investment, trade liberalization and domestic market deregulation.

Table 10a shows measures of industry concentration, firm profits, firm size and dispersion averaged across sectors for the period before FDI liberalization in the first column and after FDI liberalization in the second one. The FDI reforms in 1991 reduced barriers to foreign entry in a subset of industries. Specifically, according to the Industrial Policy Resolution of 1991, automatic approval was granted for foreign direct investment of up to 51% in 46 of 96 three-digit industrial categories (Office of the Economic Advisor, 2001). In the remaining 50 industries, the state continued to require that foreign investors obtain approval for entry. The top panel of the table shows the results for the whole sample and the lower ones by ownership group. The sample is restricted to industries that deregulated foreign investment and to two years before (1989-1990) and five years after (1991-1995) the policy was implemented in 1991.

For the average firm, market share and industry concentration declined significantly following the policy change from 1014 and 0.22 to 3.94 and 0.17 respectively in liberalized industries. Average firm profits and measures of average firm size (assets, sales) decreased as well (although differences do not appear to be significant). Dispersion seems also to have increased following the reforms. Industries that were liberalized had lower concentration ratios before liberalization than non-liberalized economies. Concentration falls below the Herfindahl index for the full sample after liberalization suggesting that non-liberalizing industries had and continue to have substantially higher levels of concentration. These results are consistent with findings in Chari and Gupta (2008).

Closer examination reveals substantial heterogeneity across groups. Although the average market share of the typical firm fell following foreign entry liberalization, firm profits increased for the average state-owned firm five years following liberalization. Similarly assets and sales increased substantially. There was also a significant increase in dispersion across state owned firms.

In the case of business groups, market shares appear at best constant over time (although slightly higher if measured by assets, although difference does not appear to be significant). Average firm profits, sales and assets increased following foreign entry liberalization. Note that dispersion seems to have increased substantially as well. FDI liberalization of up to 51% involved in many instances the need for a local partner. As such, many local business groups stood to gain from the process (as they were the obvious partner to undertake in many instances).

The results show that for private firms, the stake in terms of sales and sales increased slightly (although differences are not always significant) post-liberalization in liberalizing industries. Profits, assets and sales increased substantially as well following FDI liberalization. As expected, for foreign owned firms, post-liberalization share of assets and sales, as well profitability appear to increase

following liberalization. While one cannot infer causality from our results, greater foreign firm access did not seem to come at the expense of the overall performance of the private domestic firms (see Alfaro and Charlton (2007) for similar results for a broad sample of countries).

Table 10b presents similar results for trade liberalization. Following trade liberalization, the market share and industry concentration of the average firm in the economy declined significantly five years following the policy change. Average assets increased while sales and profits decreased (although differences are not always significant). Dispersion increased as well following trade liberalization. Looking across ownership types, we find substantial heterogeneity. The share of state-owned firms was slightly lower in terms of assets and sales while profits, sales and assets increased following liberalization. The stake of business groups in terms of assets and sales, however, increased slightly in the pre- and post liberalization periods from 24.01 and 43.75 to 43.66 and 44.98, respectively (although differences are not significant). Profits, sales and assets increased significantly. Private firms displayed similar patterns, with the share of sales and asset increasing significantly from 12.14 and 13.36 to 16.74 and 17.01 respectively. Interestingly, the share of assets and sales for foreign firms decreased slightly following trade liberalization, from 20.47 and 20.88 to 18.75 to 19.11 respectively, although profits and size (sales and assets) increased.

Finally, 10c shows similar summary statistics for pre- and post domestic market deregulation. The trends also display substantial heterogeneity across groups. The data show higher profits, sales and assets across all ownership groups. However, market share seems to have gone down significantly for state-owned firms, perhaps remained constant or slightly lower for business groups and foreign firms and increasing for private firms. One interesting pattern is that market concentration seems to have diminished for the liberalizing industries more dramatically following domestic market regulation than the other two policies discussed (perhaps not very surprising given the extent of regulation). Although as mentioned, there is considerable heterogeneity across ownership types, shares of sales and assets for state-owned firms, declined substantially while the private firms' share seemed to have increased more dramatically following domestic market de-regulation as well. The only exception is the market share of business groups, which as mentioned, seems to have remained relatively constant for all policies changes discussed.

5. Conclusion

Between 1986 and 2007, Indian growth put to rest the concern that there was something about the ‘nature of India’ that made rapid growth difficult. Following broad-ranging reforms in the mid 1980s and early 1990s, the State deregulated entry, both domestic and foreign, in many industries and also hugely reduced barriers to trade. We note that while liberalizations are believed to transform economies primarily through competition, the effects of liberalization may not be uniform. Some industries may be better equipped to change while others are not. Within industries, new entrants may gain market share, while incumbents go bankrupt. Restrictions may linger in some sectors; and for some firms.

In this paper we analyze the evolution of India’s industrial composition by focusing on the micro-foundations of its productive structure: we examine the evolution of India’s industrial structure at the firm-level following the reforms. In addition to changes in the industrial composition, we examine whether entry took place and if so, whether at the expense of traditional incumbents such as state-owned and business group affiliated firms. Finally, we examine the evolution of firm size, market share and industry concentration over time and in industries that were liberalized to either domestic or foreign entry or trade.

Using firm-level data, we document dynamism and change in the productive micro-economic structure of India following the implementation of economic reforms. Substantial new entry by foreign and private firms went along with high growth in their assets, sales and profits. In recent years, for example, some new and important private players have emerged in sectors such as information technology services (IT), pharmaceuticals and telecom. However, despite the substantial increase in the number of private and foreign firm, the overall pattern that emerges after close to two decades of reforms is one of continued dominance in terms of assets, sales and profits by the traditional incumbents: state-owned firms and business group affiliated firms. In sectors dominated by state-owned and business group-affiliated firms before liberalization (with assets, sales and profits representing 50% or higher shares), these firms remain the dominant ownership group following liberalization. Further, rates of return remain stable over time and show low dispersion across sectors and across ownership groups within sectors.

Most certainly, the welfare implications of our findings are not clear cut especially in light of the current international financial crisis and the increased role of the State in private enterprise the U.S. and other developed countries. It may, however, be hard to justify the extent of state-owned presence that we continue to see in India. Of course a lingering question in the literature is whether ownership per se

matters or whether exposure to competition through liberalization is a sufficient condition for improvements in efficiency.³⁶

Recent literature highlights the idea that economic growth may be impeded not simply because of a lack of resources such capital, skilled labor, entrepreneurship but also because available resources are misallocated. The high-levels of state-ownership and ownership by business group affiliated firms in India raise the question of whether existing resources could be allocated more efficiently and whether remaining barriers to competition penalize the effectiveness of reform measures that have been put in place. While rates of return across ownership groups do not display significant dispersion, it is not clear whether the rates of return for the incumbent groups are being driven by monopoly power that comes with high industry concentration or through inherent efficiency. We conclude with a policy question of whether privatization in the context of high industry concentration may simply replace state-owned monopolies with private ones as it has done in the case of many countries Latin America.

³⁶ Most certainly one could argue that the slow/uneven reform process and the small private sector still could be setting “marginal incentives”. As Schumpeter (1942) notes, “[monopolistic] competition of the kind we now have in mind acts not only when in being but also when it is merely an ever-present threat. It disciplines before it attacks. The businessman feels himself to be in a competitive situation even if he is alone in his field or if, though not alone, he holds a position such that investigating government experts fail to see any effective competition between him and any other firms in the same or a neighboring field and in consequence conclude that his talk, under examination, about his competitive sorrows is all make-believe.”

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Appendix Table A1: Industry Classifications

Industry	3 digit NIC code	# Years	# Firms	Industry	3 digit NIC code	# Years	# Firms
1. Agriculture, mining, extraction				2. Manufacturing (cont.)			
Coal & lignite	101, 102	361	19	Dyes & pigments	241, 242	1881	99
Cotton & blended yarn	11,14	171	9	Dyes & pigments	242	247	13
Crude oil & natural gas	111	247	13	Fertilisers	241	1463	77
Floriculture	11	1083	57	Footwear	192	1387	73
Granite	141	1292	68	Gems & jewellery	369	2299	121
Minerals	101, 103, 120, 131, 132, 141, 142 11, 12, 14, 20,	2052	108	General purpose machinery	291 289, 291, 311,	2071	109
Other agricultural products	142, 112	4731	249	Generators & switchgears	312, 319	2717	143
Other const. & allied act.	112	285	15	Glass & glassware	261	1292	68
Other textiles	11	456	24	Industrial machinery	291, 292, 300	3515	185
Poultry & meat products	11, 12	456	24	Inorganic chemicals	241,242	2185	115
Processed/package foods	11	627	33	Inorganic chemicals	242	19	1
Rubber & rubber products	11	228	12	Lubricants, etc.	232	1254	66
Tobacco products	11	95	5	Machine tools	292	1425	75
Vegetable oils & products	11	19	1	Marine foods	151	1919	101
Wood	20	152	8	Media-print	221	874	46
2. Manufacturing				Metal products	271, 281, 289, 361	5377	283
Abrasives	269	247	13	Milling products	153, 155 269, 291, 292,	1444	76
Air-cond. & refrigerators	291, 293	437	23	Misc. electrical machinery	312, 319 232, 331, 332,	1216	64
Alkalies	241	323	17	Misc. manufactured articles	333, 361,369	1881	99
Alum. & alum. products	272	1444	76	Organic chemicals	241	3344	176
Automobile ancillaries	343	8056	424	Other agricultural products	155	76	4
Bakery products	154	551	29	Other chemicals	241-242, 293, 300, 311-312, 314, 319, 321-323, 331	8379	441
Beer & alcohol	155	2603	137	Other industrial machinery	172,291-292	570	30
Books & cards	210, 221, 222	1520	80	Other leather products	191	1178	62
Castings & forgings	273, 289	3287	173	Other non-ferrous metals	272	817	43
Cement	269	3021	159	Other non-metallic mineral prod.	269	703	37
Ceramic tiles	269	1368	72	Other recreational services	223,253	57	3
Cloth	171	4142	218	Other storage & distribution	232	133	7
Coal & lignite	231	304	16	Other textiles	171-173,181,252	4959	261
Cocoa products	154	228	12	Other transports equipment	351-353,359	912	48
Coffee	154	399	21	Paints & varnishes	242	836	44
Commercial vehicles	341	152	8	Paper	210	3895	205
Communication equipment	319, 322,331	1349	71	Paper products	210	1254	66
Comp., perip. & storage dev.	221, 252, 300	1501	79	Pass. cars & multi utility vehicles	341	228	12
Construction equipment	291, 292	1007	53	Pesticides	241-242	2185	115
Consumer electronics	300, 321,323	817	43	Pig iron	271	247	13
Copper & copper products	272	855	45	Plastic films	252	1064	56
Cosmetics, toiletries, soaps & detergents	242	2242	118	Plastic packaging goods	252	2603	137
Cotton & blended yarn	171	8607	453	Plastic tubes & sheets, others	252	4161	219
Dairy products	152, 154	1311	69	Polymers	241	1577	83
Domestic elec. appliances	289, 292,293,315	1444	76	Poultry & meat products	151, 154	342	18
Drugs & pharmaceuticals	242	11894	626	Prime movers	281, 291	703	37
Dry cells	314	133	7	Prime movers	291	494	26

Appendix Table 1 (cont.): Industry Classifications

Industry	3 digit NIC code	# Years	# Firms	Industry	3 digit NIC code	# Years	# Firms
2. Manufacturing (cont.)				4. Hotels, restaurants, tourism			
Processed/package foods	151-155	1045	55	Hotels & restaurants	551-552	5358	282
Prod., distrib. & exh. films	242	19	1	Tourism	552	190	10
Readymade garments	181	3781	199	5. Transport			
Polymers	241	1577	83	Air transport infra. services	630	133	7
Poultry & meat products	151, 154	342	18	Air transport services	621	513	27
Prime movers	281, 291	703	37	Other storage & distribution	603, 630	798	42
Prime movers	291	494	26	Railway transport services	601	114	6
Processed/package foods	151-155	1045	55	Road transport infra. services	630	608	32
Prod., distrib. & exh. films	242	19	1	Road transport services	602	1273	67
Readymade garments	181	3781	199	Shipping transp. infra. services	611-612,630	361	19
Refinery	232	285	15	Shipping transport services	611-612	1653	87
Refractories	269	817	43	Tourism	630	513	27
Rubber & rubber products	241,251	1995	105	Transport logistics services	602, 630	1881	99
Sponge iron	271	608	32	6. Communication services			
Starches	153	247	13	Courier services	641	266	14
Steel	271	9272	488	7. Financial services, real estate			
Steel tubes & pipes	271	2109	111	Banking services	651	3800	200
Storage batteries	314	228	12	Brokers	659	19	1
Sugar	154	2793	147	Brokers	671	2071	109
Synthetic textiles	171-172,243	3002	158	Business consultancy	671	627	33
Tea	154	4066	214	Commercial complexes	701-702	6156	324
Textile processing	171,243	3344	176	Commercial complexes	702	19	1
Tobacco products	155, 160, 369	570	30	Computer software	701	228	12
Tractors	292	266	14	Drugs & pharmaceuticals	701	19	1
Trading	293	19	1	Financial institutions	659	1007	53
Two & three wheelers	359	418	22	Housing finance services	659	1330	70
Tyres & tubes	251	798	42	Non-banking finan. (NBFCs)	659	10013	527
Vegetable oils & products	151-153	5833	307	Other financial services	659-660	48773	2567
Wires & cables	313	2090	110	Other financial services	660	76	4
Wood	201-202	1007	53	Readymade garments	701	19	1
	261	19	1	Securities and stock traders	659	36214	1906
	343	19	1	8. Business and IT services			
3. Utilities, construction, retail					711,723,741-		
Copper & copper products	511	19	1	Business consultancy	743,749	10013	527
Electricity distribution	401	912	48	Computer software	722	14250	750
Electricity generation	401	4009	211	ITES	722	1919	101
Housing construction	452	3363	177	Other constr. & allied activities	742	171	9
Industrial construction	452	2964	156	Other misc services	731, 741	342	18
Infrastructural construction	452	1729	91	9. Media, health, and other services			
Irrigation	410	95	5	Animation content provider	924	114	6
LNG storage & distribution	402	114	6	Exhibition of films	924	323	17
Other constr. & allied act.	452-453	3021	159	Health services	851	2109	111
Other misc services	502, 519, 521, 526	5111	269	Media-broadcasting	922	1026	54
Other misc services	519	1976	104	Media-content	924	703	37
Other misc services	521	2812	148	Other financial services	753	38	2
Other misc services	526	285	15		751, 801, 803,		
Other storage & distribution	402	190	10	Other misc services	809, 851, 911, 919	2584	136
Retail trading	521, 523	684	36	Other recreational services	921, 924	1311	69
Trading	511-515,519	35359	1861	Production, distr. & exhib. films	921	760	40
Trading	512	2793	147	10. Misc. diversified			
Trading	513	6498	342	Diversified	970	1197	63
Trading	514	2907	153	Misc. manufactured articles	970	13205	695
Trading	515	6327	333				
Trading	519	6327	333				

Appendix Table A2 - Description of Variables

Variables	Definition
<i>State-Owned (SOE)</i>	Firms majority-owned by the federal and state governments.
<i>Group-Owned and Private</i>	Includes firms majority-owned by a business group and private firms not affiliated to a group. Indian business groups or family-owned firms are groups of companies that are controlled by the same shareholders, usually all members of a family.
<i>Foreign Firms</i>	Firms incorporated overseas.
<i>Sales</i>	Sales generated by a firm from its main business activity measured by charges to customers for goods supplied and services rendered. Excludes income from activities not related to main business, such as dividends, interest, and rents in the case of industrial firms, as well as non-recurring income.
<i>Assets</i>	Gross fixed assets of a firm, which includes movable and immovable assets as well as assets which are in the process of being installed.
<i>Firm Size (Assets & Sales)</i>	Average firm assets and sales in an industry. For the full sample, the industry-level averages are averaged across industries.
<i>Market Share</i>	Ratio of Sales to Industry Sales for a firm.
<i>Herfindahl Index</i>	Sum of the squares of the <i>Market Share</i> of all firms in an industry in each 3-digit industrial category.
<i>SOE Share</i>	The ratio of total sales, assets, profits produced by state-owned firms in an industry to <i>Industry Sales</i> , <i>Industry Assets</i> , <i>Industry Profits</i> in that industry.
<i>Group Share</i>	The ratio of total sales, assets, profits produced by group-owned firms in an industry to <i>Industry Sales</i> , <i>Industry Assets</i> , <i>Industry Profits</i> in that industry.
<i>Private Share</i>	The ratio of total sales, assets, profits produced by stand alone private firms in an industry to <i>Industry Sales</i> , <i>Industry Assets</i> , <i>Industry Profits</i> in that industry.
<i>Foreign Share</i>	The ratio of total sales, assets, profits produced by foreign firms in an industry to <i>Industry Sales</i> , <i>Industry Assets</i> , <i>Industry Profits</i> in that industry.
<i>Industry Sales</i>	Sum of <i>Sales</i> across all firms in an industry.
<i>Industry Assets</i>	Sum of <i>Assets</i> across all firms in an industry.
<i>PBITDA</i>	Excess of income over all expenditures except tax, depreciation, interest payments, and rents in a firm.
<i>Return on Assets</i>	Ratio of <i>PBITDA</i> to <i>Assets</i> in a firm, averaged across firms in that industry.
<i>Sales Growth</i>	$(\text{Industry Sales} - \text{Lagged Industry Sales}) / \text{Lagged Industry Sales}$ in that industry.
<i>Coefficient of Variation</i>	Ratio of standard deviation to mean of assets, sales, return on assets at the industry level
<i>Tade liberalization measure</i>	Percentage decrease in tariffs at the three-digit industry level between 1986-1990 and 1991-1995.
<i>NIC Code</i>	Three-digit industry code includes manufacturing, financial, and service sectors.

Tabla A: Egypt, India and Indonesia: Economic Growth (1975-2007)

	1975-1985	1986-2007	1996-2007
	<u>GDP Growth Rates</u>		
Egypt	8.3%	4.2%	4.8%
India	4.1%	6.0%	6.8%
Indonesia	6.8%	4.9%	2.8%
	<u>Per Capita Growth Rates</u>		
Egypt	5.8%	2.3%	2.9%
India	1.9%	4.3%	5.2%
Indonesia	4.6%	3.4%	1.5%

Notes: Average growth rate of GDP and GDP per capita (constant 2000 US\$), from World Bank Development Indicators.

Table 1: Industrial Composition--Total Firms and Growth Rates (1988-2007)

Owner/Period	Number of Firms: Average				Owner/Period	Number of Firms: Growth Rates		
	I 1988- 1990	II 1991- 1995	III 1996- 2000	IV 2001- 2007		II-I	III-II	IV-III
	<u>Full Sample</u>					<u>Full Sample</u>		
State	662	705	782	856	State	6.5%	10.9%	9.5%
Business Group	3,041	3,787	4,534	4,935	Business Group	24.5%	19.7%	8.8%
Private	8,153	11,559	14,213	15,063	Private	41.8%	23.0%	6.0%
Foreign	540	727	952	1,035	Foreign	34.6%	31.0%	8.6%
	<u>Agriculture, mining, extraction</u>					<u>Agriculture, mining, extraction</u>		
State	42	44	45	47	State	4.3%	2.7%	3.3%
Business Group	62	84	97	98	Business Group	35.4%	14.5%	1.4%
Private	194	330	423	442	Private	69.9%	28.2%	4.4%
Foreign	7	10	15	16	Foreign	36.4%	50.0%	6.7%
	<u>Manufacturing</u>					<u>Manufacturing</u>		
State	246	252	260	267	State	2.5%	3.2%	2.4%
Business Group	1,723	1,982	2,207	2,298	Business Group	15.1%	11.4%	4.1%
Private	4,023	5,383	6,132	6,341	Private	33.8%	13.9%	3.4%
Foreign	328	409	498	519	Foreign	24.9%	21.7%	4.2%
	<u>Misc. diversified</u>					<u>Misc. diversified</u>		
State	5	5	6	10	State	0.0%	24.0%	64.0%
Business Group	70	84	105	135	Business Group	18.9%	25.4%	28.7%
Private	172	278	426	492	Private	61.9%	53.1%	15.6%
Foreign	7	10	17	20	Foreign	33.6%	77.6%	14.0%
	<u>Transport</u>					<u>Transport</u>		
State	34	39	45	51	State	14.7%	16.1%	13.1%
Business Group	50	64	82	96	Business Group	27.6%	29.2%	16.7%
Private	99	136	186	217	Private	37.8%	36.5%	16.5%
Foreign	9	16	22	26	Foreign	80.0%	34.6%	20.8%
	<u>Utilities, construction, retail</u>					<u>Utilities, construction, retail</u>		
State	105	109	132	165	State	4.0%	21.2%	24.2%
Business Group	318	427	552	632	Business Group	34.1%	29.2%	14.6%
Private	998	1,409	1,844	2,010	Private	41.2%	30.9%	9.0%
Foreign	56	78	103	116	Foreign	39.2%	31.1%	12.7%

cont.

Table 1 (contd.): Industrial Composition--Total Firms and Growth Rates (1998-2007)

Owner/Period	Number of Firms: Average				Owner/Period	Number of Firms: Growth Rates		
	I 1988- 1990	II 1991- 1995	III 1996- 2000	IV 2001- 2007		II-I	III-II	IV-III
	<u>Business & IT services</u>					<u>Business & IT services</u>		
State	23	26	30	35	State	16.5%	12.9%	16.3%
Business Group	93	146	220	280	Business Group	57.2%	50.5%	27.3%
Private	294	495	779	930	Private	68.4%	57.4%	19.3%
Foreign	32	54	90	108	Foreign	68.1%	66.5%	20.7%
	<u>Financial services, real estate</u>					<u>Financial services, real estate</u>		
State	188	209	239	254	State	10.9%	14.4%	6.3%
Business Group	632	861	1,064	1,140	Business Group	36.4%	23.5%	7.1%
Private	2,128	3,175	3,945	4,083	Private	49.2%	24.3%	3.5%
Foreign	80	123	169	185	Foreign	53.1%	37.1%	9.5%
	<u>Communication services</u>					<u>Communication services</u>		
State	2	3	4	6	State	40.0%	50.0%	42.9%
Business Group	10	27	54	71	Business Group	165.2%	97.8%	31.6%
Private	16	23	40	50	Private	48.1%	72.4%	24.2%
Foreign	2	6	13	16	Foreign	200.0%	110.0%	27.0%
	<u>Hotels, restaurants, tourism</u>					<u>Hotels, restaurants, tourism</u>		
State	8	8	10	11	State	5.0%	16.7%	12.2%
Business Group	49	62	74	80	Business Group	26.5%	19.2%	8.0%
Private	98	131	161	179	Private	33.7%	23.2%	11.0%
Foreign	11	11	14	15	Foreign	3.6%	19.3%	10.3%
	<u>Media, health, & other services</u>					<u>Media, health, & other services</u>		
State	9	10	10	12	State	6.7%	6.3%	12.7%
Business Group	33	48	78	103	Business Group	48.2%	61.6%	31.9%
Private	131	198	276	320	Private	51.2%	39.6%	16.1%
Foreign	7	9	13	14	Foreign	32.0%	47.7%	7.7%
Industry/Period	<u>Full Sample</u>				Industry/Period	<u>Full Sample</u>		
	1988- 1990	1991- 1995	1996- 2000	2001- 2007		II-I	III-II	IV-III
Agri., mining & extrac.	306	468	580	602	Agri., mining & extrac.	53.1%	23.8%	3.9%
Manufacturing	6,320	8,026	9,097	9,425	Manufacturing	27.0%	13.3%	3.6%
Misc. diversified	254	376	554	657	Misc. diversified	48.0%	47.2%	18.6%
Transport	192	255	335	390	Transport	33.0%	31.5%	16.4%
Utilities, constr., retail	1,477	2,024	2,631	2,922	Utilities, constr., retail	37.0%	30.0%	11.1%
Business & IT services	442	722	1,119	1,353	Business & IT services	63.4%	55.0%	20.9%
Finan. Serv., real estate	3,029	4,368	5,417	5,662	Finan. Serv., real estate	44.2%	24.0%	4.5%
Communication serv.	30	59	111	143	Communication serv.	98.0%	86.9%	28.8%
Hotels, restaurants	166	213	259	286	Hotels, restaurants	28.2%	21.6%	10.1%
Media, health, & other	179	264	377	449	Media, health, & other	47.7%	42.7%	19.0%

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 2: Industrial Composition--Total Assets and Growth Rates (1988-2007)

Owner/Period	Total Assets (Rs. Crore): Average				Owner/Period	Total Assets: Growth Rates		
	I 1988- 1990	II 1991- 1995	III 1996- 2000	IV 2001- 2007		II-I	III-II	IV-III
	<u>Full Sample</u>					<u>Full Sample</u>		
State	245,727	732,176	1,515,892	3,121,822	State	198%	107%	106%
Business Group	83,040	268,348	649,873	1,272,748	Business Group	223%	142%	96%
Private	10,664	63,460	185,862	484,054	Private	495%	193%	160%
Foreign	17,912	73,874	195,102	392,297	Foreign	312%	164%	101%
	<u>Agriculture, mining, extraction</u>					<u>Agriculture, mining, extraction</u>		
State	10,074	45,184	75,609	161,610	State	349%	67%	114%
Business Group	333	1,122	3,390	6,117	Business Group	237%	202%	80%
Private	82	1,595	3,892	14,384	Private	1851%	144%	270%
Foreign	57	436	730	1,473	Foreign	671%	68%	102%
	<u>Manufacturing</u>					<u>Manufacturing</u>		
State	61,197	106,652	179,542	283,062	State	74%	68%	58%
Business Group	59,542	167,884	360,738	556,764	Business Group	182%	115%	54%
Private	8,607	35,981	80,556	167,279	Private	318%	124%	108%
Foreign	13,911	33,521	78,744	129,486	Foreign	141%	135%	64%
	<u>Misc. diversified</u>					<u>Misc. diversified</u>		
State	638	650	1,002	1,115	State	2%	54%	11%
Business Group	4,159	9,695	15,168	20,677	Business Group	133%	56%	36%
Private	208	353	450	1,475	Private	70%	27%	228%
Foreign	235	286	383	770	Foreign	22%	34%	101%
	<u>Transport</u>					<u>Transport</u>		
State	1,616	14,082	23,986	44,790	State	771%	70%	87%
Business Group	1,429	4,554	9,440	22,532	Business Group	219%	107%	139%
Private	39	430	1,150	6,736	Private	1011%	168%	486%
Foreign	12	217	2,514	9,171	Foreign	1681%	1059%	265%
	<u>Utilities, construction, retail</u>					<u>Utilities, construction, retail</u>		
State	24,002	88,864	167,176	431,663	State	270%	88%	158%
Business Group	8,640	27,054	65,110	124,632	Business Group	213%	141%	91%
Private	523	4,639	11,961	46,577	Private	787%	158%	289%
Foreign	372	1,000	8,290	7,805	Foreign	169%	729%	-6%

cont.

Table 2 (contd.): Industrial Composition--Total Assets and Growth Rates (1998-2007)

Owner/Period	Total Assets (Rs. Crore): Average				Owner/Period	Total Assets: Growth Rates				
	I 1988- 1990	II 1991- 1995	III 1996- 2000	IV 2001- 2007		II-I	III-II	IV-III		
<u>Business & IT services</u>								<u>Business & IT services</u>		
State	57	1,036	1,995	4,017	State	1720%	93%	101%		
Business Group	491	1,758	8,026	33,456	Business Group	258%	357%	317%		
Private	52	534	3,893	21,151	Private	923%	629%	443%		
Foreign	67	482	2,494	11,542	Foreign	623%	417%	363%		
<u>Financial services, real estate</u>								<u>Financial services, real estate</u>		
State	144,079	465,650	1,035,487	2,065,567	State	223%	122%	99%		
Business Group	7,214	51,373	159,539	414,923	Business Group	612%	211%	160%		
Private	1,032	19,055	80,384	213,617	Private	1746%	322%	166%		
Foreign	3,220	37,542	98,858	219,177	Foreign	1066%	163%	122%		
<u>Communication services</u>								<u>Communication services</u>		
State	55	295	469	732	State	439%	59%	56%		
Business Group	755	2,119	6,024	11,499	Business Group	181%	184%	91%		
Private	117	539	1,698	4,682	Private	362%	215%	176%		
Foreign	40	269	723	919	Foreign	575%	169%	27%		
<u>Hotels, restaurants, tourism</u>								<u>Hotels, restaurants, tourism</u>		
State	4,009	9,739	30,494	128,954	State	143%	213%	323%		
Business Group	440	2,431	18,482	71,926	Business Group	452%	660%	289%		
Private	0	19	133	1,569	Private		582%	1079%		
Foreign	0	122	2,177	11,240	Foreign		1691%	416%		
<u>Media, health, & other services</u>								<u>Media, health, & other services</u>		
State	0	24	131	314	State		447%	140%		
Business Group	37	359	3,956	10,222	Business Group	879%	1001%	158%		
Private	4	313	1,745	6,584	Private	6994%	457%	277%		
Foreign	0	0	190	714	Foreign			276%		
Industry/Period	Full Sample				Industry/Period	Full Sample				
	1988- 1990	1991- 1995	1996- 2000	2001- 2007		II-I	III-II	IV-III		
Agri., mining & extrac.	10,545	48,336	83,622	183,585	Agri., mining & extrac.	358%	73%	120%		
Manufacturing	143,256	344,039	699,580	1,136,591	Manufacturing	140%	103%	62%		
Misc. diversified	5,239	10,984	17,003	24,037	Misc. diversified	110%	55%	41%		
Transport	3,096	19,283	37,090	83,228	Transport	523%	92%	124%		
Utilities, constr., retail	33,536	121,556	252,538	610,677	Utilities, constr., retail	262%	108%	142%		
Business & IT services	667	3,811	16,408	70,166	Business & IT services	471%	331%	328%		
Finan. Serv., real estate	155,546	573,621	1,374,269	2,913,284	Finan. Serv., real estate	269%	140%	112%		
Communication serv.	4,450	12,311	51,286	213,689	Communication serv.	177%	317%	317%		
Hotels, restaurants	966	3,222	8,913	17,832	Hotels, restaurants	233%	177%	100%		
Media, health, & other	41	696	6,021	17,833	Media, health, & other	1594%	765%	196%		

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 3: Industrial Composition--Total Sales and Growth Rates (1988-2007)

Owner/Period	Gross Sales (Rs. Crore): Average				Owner/Period	Gross Sales: Growth Rates		
	I 1988- 1990	II 1991- 1995	III 1996- 2000	IV 2001- 2007		II-I	III-II	IV-III
	<u>Full Sample</u>					<u>Full Sample</u>		
State	81185	172791	365076	820597	State	113%	111%	125%
Business Group	78173	176332	346541	666304	Business Group	126%	97%	92%
Private	13025	42582	103274	272807	Private	227%	143%	164%
Foreign	21718	44218	97112	185591	Foreign	104%	120%	91%
	<u>Agriculture, mining, extraction</u>					<u>Agriculture, mining, extraction</u>		
State	6457	20174	42880	85349	State	212%	113%	99%
Business Group	286	904	2113	4363	Business Group	216%	134%	107%
Private	54	832	2897	7545	Private	1453%	248%	160%
Foreign	99	320	453	1408	Foreign	224%	41%	211%
	<u>Manufacturing</u>					<u>Manufacturing</u>		
State	58584	100037	210789	437261	State	71%	111%	107%
Business Group	61930	136538	260655	486713	Business Group	120%	91%	87%
Private	11525	35341	80391	187407	Private	207%	127%	133%
Foreign	19861	40812	85715	153210	Foreign	105%	110%	79%
	<u>Misc. diversified</u>					<u>Misc. diversified</u>		
State	828	625	917	1211	State	-24%	47%	32%
Business Group	4200	8150	11694	17555	Business Group	94%	43%	50%
Private	177	263	268	850	Private	49%	2%	217%
Foreign	710	669	784	1621	Foreign	-6%	17%	107%
	<u>Transport</u>					<u>Transport</u>		
State	1051	5740	13213	23625	State	446%	130%	79%
Business Group	714	1970	4744	9027	Business Group	176%	141%	90%
Private	97	361	825	4295	Private	272%	129%	421%
Foreign	18	112	1997	5789	Foreign	519%	1678%	190%
	<u>Utilities, construction, retail</u>					<u>Utilities, construction, retail</u>		
State	12789	42096	87663	232525	State	229%	108%	165%
Business Group	7014	17873	39375	75394	Business Group	155%	120%	91%
Private	992	4968	14675	48218	Private	401%	195%	229%
Foreign	923	1781	5357	9619	Foreign	93%	201%	80%

Table 3 (contd.): Industrial Composition--Total Sales and Growth Rates (1998-2007)

Owner/Period	Gross Sales (Rs. Crore): Average				Owner/Period	Gross Sales: Growth Rates			
	I	II	III	IV		II-I	III-II	IV-III	
	1988-1990	1991-1995	1996-2000	2001-2007					
<u>Business & IT services</u>					<u>Business & IT services</u>				
State	42	360	499	909	State	765%	39%	82%	
Business Group	582	1651	6848	27566	Business Group	184%	315%	303%	
Private	103	340	2479	14451	Private	228%	629%	483%	
Foreign	37	320	1747	8401	Foreign	755%	446%	381%	
<u>Financial services, real estate</u>					<u>Financial services, real estate</u>				
State	232	690	1304	1329	State	197%	89%	2%	
Business Group	2795	5360	9493	13160	Business Group	92%	77%	39%	
Private	37	164	649	4141	Private	337%	296%	538%	
Foreign	49	77	135	198	Foreign	56%	75%	47%	
<u>Communication services</u>					<u>Communication services</u>				
State	40	254	391	548	State	539%	54%	40%	
Business Group	391	1017	1972	3362	Business Group	160%	94%	70%	
Private	36	196	489	1474	Private	441%	149%	201%	
Foreign	21	127	322	467	Foreign	501%	154%	45%	
<u>Hotels, restaurants, tourism</u>					<u>Hotels, restaurants, tourism</u>				
State	1164	2794	7271	37713	State	140%	160%	419%	
Business Group	240	2698	8451	25904	Business Group	1022%	213%	207%	
Private	0	23	141	1805	Private		501%	1181%	
Foreign	0	1	505	4530	Foreign		38181%	798%	
<u>Media, health, & other services</u>					<u>Media, health, & other services</u>				
State	0	22	148	127	State		586%	-14%	
Business Group	21	171	1197	3260	Business Group	725%	600%	172%	
Private	2	93	461	2621	Private	3862%	396%	468%	
Foreign	0	0	99	347	Foreign			253%	
Industry/Period	Full Sample				Industry/Period	Full Sample			
	1988-1990	1991-1995	1996-2000	2001-2007		II-I	III-II	IV-III	
Agri., mining & extrac.	6895	22230	48343	98666	Agri., mining & extrac.	222%	117%	104%	
Manufacturing	151900	312728	637550	1264591	Manufacturing	106%	104%	98%	
Misc. diversified	5915	9708	13663	21238	Misc. diversified	64%	41%	55%	
Transport	1879	8183	20778	42736	Transport	335%	154%	106%	
Utilities, constr., retail	21719	66717	147070	365756	Utilities, constr., retail	207%	120%	149%	
Business & IT services	765	2671	11573	51327	Business & IT services	249%	333%	344%	
Finan. Serv., real estate	3114	6291	11580	18828	Finan. Serv., real estate	102%	84%	63%	
Communication serv.	1404	5516	16367	69952	Communication serv.	293%	197%	327%	
Hotels, restaurants	488	1594	3174	5850	Hotels, restaurants	227%	99%	84%	
Media, health, & other	23	285	1905	6355	Media, health, & other	1138%	567%	234%	

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 4: Industrial Composition--Profits (PBDIT) and Growth Rates (1988-2007)

Owner/Period	Profits (PBDIT Rs. Crore): Average				Owner/Period	Profits (PBDIT): Growth Rates		
	I 1988- 1990	II 1991- 1995	III 1996-2000	IV 2001- 2007		II-I	III-II	IV-III
	<u>Full Sample</u>					<u>Full Sample</u>		
State	19,095	61,723	136,300	264,791	State	223%	121%	94%
Business Group	11,525	34,551	68,300	139,062	Business Group	200%	98%	104%
Private	1,337	6,796	15,834	43,007	Private	408%	133%	172%
Foreign	2,630	8,778	21,310	42,449	Foreign	234%	143%	99%
	<u>Agriculture, mining, extraction</u>					<u>Agriculture, mining, extraction</u>		
State	902	7,006	12,834	34,966	State	677%	83%	172%
Business Group	44	170	320	1,203	Business Group	285%	88%	276%
Private	10	169	361	997	Private	1570%	113%	176%
Foreign	11	60	70	482	Foreign	447%	17%	586%
	<u>Manufacturing</u>					<u>Manufacturing</u>		
State	5,958	10,287	16,491	37,407	State	73%	60%	127%
Business Group	8,562	22,067	37,884	74,537	Business Group	158%	72%	97%
Private	1,147	4,183	7,247	18,863	Private	265%	73%	160%
Foreign	2,259	5,351	10,541	22,177	Foreign	137%	97%	110%
	<u>Misc. diversified</u>					<u>Misc. diversified</u>		
State	69	63	70	39	State	-9%	10%	-44%
Business Group	467	1,222	1,333	2,419	Business Group	162%	9%	81%
Private	14	-3	7	156	Private	-122%	-336%	2041%
Foreign	50	70	73	202	Foreign	41%	4%	176%
	<u>Transport</u>					<u>Transport</u>		
State	217	1,226	2,319	5,101	State	465%	89%	120%
Business Group	282	712	1,127	2,781	Business Group	153%	58%	147%
Private	9	53	103	761	Private	523%	94%	636%
Foreign	0	27	266	1,037	Foreign		897%	289%
	<u>Utilities, construction, retail</u>					<u>Utilities, construction, retail</u>		
State	1,742	8,281	18,443	38,643	State	375%	123%	110%
Business Group	976	2,792	5,664	11,707	Business Group	186%	103%	107%
Private	59	564	765	3,589	Private	855%	36%	369%
Foreign	34	108	822	750	Foreign	222%	661%	-9%

cont.

Table 4 (contd.): Industrial Composition--Profits (PBDIT) and Growth Rates (1998-2007)

Owner/Period	Profits (PBDIT): Average				Owner/Period	Profits (PBDIT): Growth Rates		
	I 1988- 1990	II 1991- 1995	III 1996-2000	IV 2001- 2007		II-I	III-II	IV-III
	<u>Business & IT services</u>					<u>Business & IT services</u>		
State	4	75	152	441	State	1825%	103%	189%
Business Group	75	273	1,715	7,005	Business Group	265%	528%	308%
Private	10	80	673	3,970	Private	722%	744%	490%
Foreign	4	90	537	2,911	Foreign	2392%	494%	442%
	<u>Financial services, real estate</u>					<u>Financial services, real estate</u>		
State	9,679	33,061	81,860	128,629	State	242%	148%	57%
Business Group	907	6,374	16,950	30,845	Business Group	603%	166%	82%
Private	79	1,661	6,374	13,470	Private	2010%	284%	111%
Foreign	265	3,024	8,904	13,334	Foreign	1041%	194%	50%
	<u>Communication services</u>					<u>Communication services</u>		
State	5	59	38	58	State	1162%	-35%	51%
Business Group	102	374	700	1,218	Business Group	267%	87%	74%
Private	9	60	157	417	Private	596%	161%	166%
Foreign	7	50	102	166	Foreign	568%	103%	64%
	<u>Hotels, restaurants, tourism</u>					<u>Hotels, restaurants, tourism</u>		
State	520	1,663	4,084	19,497	State	220%	146%	377%
Business Group	106	509	2,203	6,792	Business Group	379%	333%	208%
Private	0	2	9	117	Private		291%	1205%
Foreign	0	-2	-14	1,339	Foreign		473%	-9994%
	<u>Media, health, & other services</u>					<u>Media, health, & other services</u>		
State	0	2	9	10	State		378%	23%
Business Group	5	58	404	553	Business Group	1042%	601%	37%
Private	1	27	139	666	Private	3586%	415%	381%
Foreign	0	0	8	50	Foreign			510%
	<u>Full Sample</u>					<u>Full Sample</u>		
Industry/Period	1988- 1990	1991- 1995	1996-2000	2001- 2007	Industry/Period	II-I	III-II	IV-III
Agri., mining & extrac.	967	7,406	13,586	37,648	Agri., mining & extrac.	666%	83%	177%
Manufacturing	17,926	41,887	72,163	152,984	Manufacturing	134%	72%	112%
Misc. diversified	600	1,352	1,484	2,816	Misc. diversified	125%	10%	90%
Transport	507	2,019	3,816	9,680	Transport	298%	89%	154%
Utilities, constr., retail	2,810	11,744	25,694	54,688	Utilities, constr., retail	318%	119%	113%
Business & IT services	92	518	3,077	14,327	Business & IT services	462%	494%	366%
Finan. Serv., real estate	10,930	44,121	114,087	186,278	Finan. Serv., real estate	304%	159%	63%
Communication serv.	627	2,172	6,283	27,746	Communication serv.	247%	189%	342%
Hotels, restaurants	123	543	997	1,860	Hotels, restaurants	342%	84%	87%
Media, health, & other	6	86	559	1,281	Media, health, & other	1395%	548%	129%

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 5: Industrial Composition--Return on Assets (1988-2007)

Return on Assets (%): Average					Return on Assets (%): Average					
Owner/Period	I 1988- 1990	II 1991- 1995	III 1996- 2000	IV 2001- 2007	Owner/Period	I 1988- 1990	II 1991- 1995	III 1996- 2000	IV 2001- 2007	
	<u>Full Sample</u>					<u>Financial services, real estate</u>				
State	8.49	8.97	9.56	10.22	State	6.55	7.13	7.96	6.39	
Business Group	13.93	13.09	11.00	11.42	Business Group	13.56	12.36	10.79	7.39	
Private	12.22	10.49	8.63	9.51	Private	9.13	8.43	8.27	6.38	
Foreign	12.36	14.07	12.83	14.98	Foreign	8.37	8.01	9.14	6.30	
	<u>Agriculture, mining, extraction</u>					<u>Communication services</u>				
State	8.81	15.49	16.92	21.23	State	2.82	17.41	7.75	5.77	
Business Group	13.99	14.73	9.86	19.42	Business Group	13.66	17.15	12.57	10.03	
Private	14.37	10.30	9.14	9.28	Private	8.95	10.96	9.51	8.13	
Foreign	18.93	14.55	9.77	28.16	Foreign	17.95	19.10	14.36	17.82	
	<u>Manufacturing</u>					<u>Hotels, restaurants, tourism</u>				
State	9.84	9.60	9.26	13.03	State	13.40	16.30	18.68	15.22	
Business Group	14.33	13.18	10.53	13.01	Business Group	15.99	22.46	11.64	8.88	
Private	13.18	11.88	8.99	10.92	Private		7.10	5.99	7.23	
Foreign	16.08	16.07	13.51	16.77	Foreign		-0.41	-0.34	10.50	
	<u>Misc. diversified</u>					<u>Media, health, & other services</u>				
State	11.02	9.91	7.03	3.59	State		-0.17	6.85	3.67	
Business Group	11.06	12.61	8.77	11.18	Business Group	17.68	14.22	14.28	5.64	
Private	6.67	-3.98	1.25	10.74	Private	22.10	7.96	7.66	9.65	
Foreign	22.48	24.79	19.04	27.15	Foreign			4.74	7.42	
	<u>Transport</u>					<u>Full Sample</u>				
State	15.20	8.91	9.53	11.47	Industry					
Business Group	19.38	15.97	11.86	13.22	Agri., mining & extrac.	13.99	11.53	9.89	12.35	
Private	21.66	12.98	10.17	10.67	Business & IT services	16.43	15.73	17.43	18.50	
Foreign	-0.70	9.25	10.90	11.59	Finan. Serv., real estate	9.90	9.16	8.80	6.59	
	<u>Utilities, construction, retail</u>					Hotels, restaurants	10.80	13.37	10.56	9.08
State	6.97	9.22	11.02	9.03	Manufacturing	13.52	12.36	9.62	11.81	
Business Group	11.32	10.59	8.69	9.27	Communication serv.	20.94	17.74	8.68	8.74	
Private	11.32	11.86	6.49	7.41	Media, health, & other	21.02	9.24	9.09	8.50	
Foreign	8.35	11.08	9.51	9.51	Transport	18.79	12.97	10.56	11.47	
	<u>Business & IT services</u>					Utilities, constr., retail	10.96	11.40	7.34	7.99
State	4.58	6.58	7.74	11.49	Misc. diversified	8.15	0.68	3.48	11.14	
Business Group	14.80	15.54	20.20	19.86						
Private	18.38	15.97	16.47	17.64						
Foreign	5.28	17.31	21.95	24.88						

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 6: Return on Assets: Cross-Sectional Variance

Industry/ Period	Return on Assets (%): Dispersion			
	I	II	III	IV
	1988-1990	1991-1995	1996-2000	2001-2007
FullSample (across owners)	5.44	5.10	4.19	5.47
Agriculture, Mining, Extraction	10.12	5.19	7.78	18.88
Manufacturing	6.24	6.48	4.52	5.85
Misc. Diversified	15.81	28.76	17.79	23.55
Transport	22.36	7.06	2.33	2.55
Utilities, construction, retail	4.35	2.64	4.53	2.10
Business & IT Services	13.81	10.74	14.20	13.39
Financial Services, real estate	7.01	5.23	2.83	1.10
Communication Services	17.95	19.10	14.36	17.82
Hotels, restaurants, tourism	2.59	22.87	19.01	7.98
Media, health, & other services	4.42	14.39	9.54	5.98
Full Sample (Across Industries)	12.87	17.06	13.95	11.91

Industry/ Period	Return on Assets: Coefficient of Variation			
	I	II	III	IV
	1988-1990	1991-1995	1996-2000	2001-2007
FullSample (across owners)	0.20	0.20	0.17	0.21
Agriculture, Mining, Extraction	0.30	0.17	0.32	0.40
Manufacturing	0.20	0.21	0.20	0.18
Misc. Diversified	0.53	1.09	0.82	0.76
Transport	0.73	0.28	0.09	0.09
Utilities, construction, retail	0.23	0.10	0.21	0.11
Business & IT Services	0.64	0.35	0.38	0.30
Financial Services, real estate	0.32	0.26	0.14	0.08
Communication Services	0.60	0.22	0.27	0.50
Hotels, restaurants, tourism	0.12	0.89	0.90	0.33
Media, health, & other services	0.16	0.98	0.49	0.39
Full Sample (Across Industries)	0.32	0.40	0.36	0.32

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 7: Industrial Composition--Fraction of Number of Firms, Assets, Sales and Profits (1998-2007)

<u>Number of Firms: Fraction</u>					<u>Total Assets: Fraction</u>					<u>Total Sales: Fraction</u>					<u>Profits (PBDIT): Fraction</u>				
Owner/ Period	I 1988- 1990	II 1991- 1995	III 1996- 2000	IV 2001- 2007	Owner/ Period	I 1988- 1990	II 1991- 1995	III 1996- 2000	IV 2001- 2007	Owner/ Period	I 1988- 1990	II 1991- 1995	III 1996- 2000	IV 2001- 2007	Owner/ Period	I 1988- 1990	II 1991- 1995	III 1996- 2000	IV 2001- 2007
<u>Full Sample</u>					<u>Full Sample</u>					<u>Full Sample</u>					<u>Full Sample</u>				
State	5%	4%	4%	4%	State	69%	64%	60%	59%	State	42%	40%	40%	42%	State	55%	55%	56%	54%
Bus. G.	4%	4%	5%	5%	Bus. G.	23%	24%	26%	24%	Bus. G.	40%	40%	38%	34%	Bus. G.	33%	31%	28%	28%
Private	66%	69%	69%	69%	Private	3%	6%	7%	9%	Private	7%	10%	11%	14%	Private	4%	6%	7%	9%
Foreign	25%	23%	22%	23%	Foreign	5%	6%	8%	7%	Foreign	11%	10%	11%	10%	Foreign	8%	8%	9%	9%
<u>Agric., mining, extraction</u>					<u>Agric., mining, extraction</u>					<u>Agric., mining, extraction</u>					<u>Agric., mining, extraction</u>				
State	14%	9%	8%	8%	State	96%	93%	90%	88%	State	94%	91%	89%	87%	State	93%	95%	94%	93%
Bus. G.	2%	2%	3%	3%	Bus. G.	3%	2%	4%	3%	Bus. G.	4%	4%	4%	4%	Bus. G.	5%	2%	2%	3%
Private	64%	70%	73%	73%	Private	1%	3%	5%	8%	Private	1%	4%	6%	8%	Private	1%	2%	3%	3%
Foreign	20%	18%	17%	16%	Foreign	1%	1%	1%	1%	Foreign	1%	1%	1%	1%	Foreign	1%	1%	1%	1%
<u>Manufacturing</u>					<u>Manufacturing</u>					<u>Manufacturing</u>					<u>Manufacturing</u>				
State	4%	3%	3%	3%	State	43%	31%	26%	25%	State	39%	32%	33%	35%	State	33%	25%	23%	24%
Bus. G.	5%	5%	5%	6%	Bus. G.	42%	49%	52%	49%	Bus. G.	41%	44%	41%	38%	Bus. G.	48%	53%	52%	49%
Private	64%	67%	67%	67%	Private	6%	10%	12%	15%	Private	8%	11%	13%	15%	Private	6%	10%	10%	12%
Foreign	27%	25%	24%	24%	Foreign	10%	10%	11%	11%	Foreign	13%	13%	13%	12%	Foreign	13%	13%	15%	14%
<u>Misc. diversified</u>					<u>Misc. diversified</u>					<u>Misc. diversified</u>					<u>Misc. diversified</u>				
State	2%	1%	1%	2%	State	12%	6%	6%	5%	State	14%	6%	7%	6%	State	12%	5%	5%	1%
Bus. G.	3%	3%	3%	3%	Bus. G.	79%	88%	89%	86%	Bus. G.	71%	84%	86%	83%	Bus. G.	78%	90%	90%	86%
Private	67%	74%	77%	75%	Private	4%	3%	3%	6%	Private	3%	3%	2%	4%	Private	2%	0%	0%	6%
Foreign	28%	22%	19%	21%	Foreign	4%	3%	2%	3%	Foreign	12%	7%	6%	8%	Foreign	8%	5%	5%	7%
<u>Transport</u>					<u>Transport</u>					<u>Transport</u>					<u>Transport</u>				
State	18%	15%	13%	13%	State	52%	73%	65%	54%	State	56%	70%	64%	55%	State	43%	61%	61%	53%
Bus. G.	5%	6%	7%	7%	Bus. G.	46%	24%	25%	27%	Bus. G.	38%	24%	23%	21%	Bus. G.	56%	35%	30%	29%
Private	52%	53%	56%	56%	Private	1%	2%	3%	8%	Private	5%	4%	4%	10%	Private	2%	3%	3%	8%
Foreign	26%	25%	25%	25%	Foreign	0%	1%	7%	11%	Foreign	1%	1%	10%	14%	Foreign	0%	1%	7%	11%
<u>Utilities, construc., retail</u>					<u>Utilities, construc., retail</u>					<u>Utilities, construc., retail</u>					<u>Utilities, construc., retail</u>				
State	7%	5%	5%	6%	State	72%	73%	66%	71%	State	59%	63%	60%	64%	State	62%	71%	72%	71%
Bus. G.	4%	4%	4%	4%	Bus. G.	26%	22%	26%	20%	Bus. G.	32%	27%	27%	21%	Bus. G.	35%	24%	22%	21%
Private	68%	70%	70%	69%	Private	2%	4%	5%	8%	Private	5%	7%	10%	13%	Private	2%	5%	3%	7%
Foreign	22%	21%	21%	22%	Foreign	1%	1%	3%	1%	Foreign	4%	3%	4%	3%	Foreign	1%	1%	3%	1%

Table 7 contd.

<u>Total Assets: Fraction</u>					<u>Total Assets: Fraction</u>					<u>Total Sales: Fraction</u>					<u>Profits (PBDIT): Fraction</u>				
Owner/	I	II	III	IV	Owner/	I	II	III	IV	Owner/	I	II	III	IV	Owner/	I	II	III	IV
Period	1988-1990	1991-1995	1996-2000	2001-2007	Period	1988-1990	1991-1995	1996-2000	2001-2007	Period	1988-1990	1991-1995	1996-2000	2001-2007	Period	1988-1990	1991-1995	1996-2000	2001-2007
<u>Bus. & IT services</u>					<u>Bus. & IT services</u>					<u>Bus. & IT services</u>					<u>Bus. & IT services</u>				
State	5%	4%	3%	3%	State	9%	27%	12%	6%	State	5%	13%	4%	2%	State	4%	14%	5%	3%
Bus. G.	7%	7%	8%	8%	Bus. G.	74%	46%	49%	48%	Bus. G.	76%	62%	59%	54%	Bus. G.	81%	53%	56%	49%
Private	67%	69%	70%	69%	Private	8%	14%	24%	30%	Private	14%	13%	21%	28%	Private	11%	15%	22%	28%
Foreign	21%	20%	20%	21%	Foreign	10%	13%	15%	16%	Foreign	5%	12%	15%	16%	Foreign	4%	17%	17%	20%
<u>Finan. services, real estate</u>					<u>Finan. services, real estate</u>					<u>Finan. services, real estate</u>					<u>Finan. services, real estate</u>				
State	6%	5%	4%	4%	State	93%	81%	75%	71%	State	7%	11%	11%	7%	State	89%	75%	72%	69%
Bus. G.	3%	3%	3%	3%	Bus. G.	5%	9%	12%	14%	Bus. G.	90%	85%	82%	70%	Bus. G.	8%	14%	15%	17%
Private	70%	73%	73%	72%	Private	1%	3%	6%	7%	Private	1%	3%	6%	22%	Private	1%	4%	6%	7%
Foreign	21%	20%	20%	20%	Foreign	2%	7%	7%	8%	Foreign	2%	1%	1%	1%	Foreign	2%	7%	8%	7%
<u>Communication services</u>					<u>Communication services</u>					<u>Communication services</u>					<u>Communication services</u>				
State	7%	5%	4%	4%	State	6%	9%	5%	4%	State	8%	16%	12%	9%	State	4%	11%	4%	3%
Bus. G.	7%	10%	11%	11%	Bus. G.	78%	66%	68%	64%	Bus. G.	80%	64%	62%	57%	Bus. G.	83%	69%	70%	66%
Private	52%	39%	36%	35%	Private	12%	17%	19%	26%	Private	7%	12%	15%	25%	Private	7%	11%	16%	22%
Foreign	34%	46%	49%	50%	Foreign	4%	8%	8%	5%	Foreign	4%	8%	10%	8%	Foreign	6%	9%	10%	9%
<u>Hotels, rest., tourism</u>					<u>Hotels, rest., tourism</u>					<u>Hotels, rest., tourism</u>					<u>Hotels, rest., tourism</u>				
State	5%	4%	4%	4%	State	90%	79%	59%	60%	State	83%	51%	44%	54%	State	83%	77%	65%	70%
Bus. G.	7%	5%	5%	5%	Bus. G.	10%	20%	36%	34%	Bus. G.	17%	49%	52%	37%	Bus. G.	17%	23%	35%	24%
Private	59%	61%	62%	63%	Private	0%	0%	0%	1%	Private	0%	0%	1%	3%	Private	0%	0%	0%	0%
Foreign	30%	29%	29%	28%	Foreign	0%	1%	4%	5%	Foreign	0%	0%	3%	6%	Foreign	0%	0%	0%	5%
<u>Media, health, & other</u>					<u>Media, health, & other</u>					<u>Media, health, & other</u>					<u>Media, health, & other</u>				
State	5%	4%	3%	3%	State	0%	3%	2%	2%	State	0%	8%	8%	2%	State	0%	2%	2%	1%
Bus. G.	4%	3%	3%	3%	Bus. G.	89%	52%	66%	57%	Bus. G.	90%	60%	63%	51%	Bus. G.	87%	67%	72%	43%
Private	73%	75%	73%	71%	Private	11%	45%	29%	37%	Private	10%	33%	24%	41%	Private	13%	31%	25%	52%
Foreign	18%	18%	21%	23%	Foreign	0%	0%	3%	4%	Foreign	0%	0%	5%	5%	Foreign	0%	0%	1%	4%
<u>Full Sample: All Industries</u>					<u>Full Sample: All Industries</u>					<u>Full Sample: All Industries</u>					<u>Full Sample: All Industries</u>				
Agric.	2%	3%	3%	3%	Agric.	3%	4%	3%	3%	Agric.	4%	5%	5%	5%	Agric.	3%	7%	6%	8%
Manuf.	51%	48%	44%	43%	Manuf.	40%	30%	27%	22%	Manuf.	78%	72%	70%	65%	Manuf.	52%	37%	30%	31%
Misc.	2%	2%	3%	3%	Misc.	1%	1%	1%	0%	Misc.	3%	2%	1%	1%	Misc.	2%	1%	1%	1%
Transp.	2%	2%	2%	2%	Transp.	1%	2%	1%	2%	Transp.	1%	2%	2%	2%	Transp.	1%	2%	2%	2%
Util.	12%	12%	13%	13%	Util.	9%	11%	10%	12%	Util.	11%	15%	16%	19%	Util.	8%	11%	11%	11%
Bus.IT.	4%	4%	5%	6%	Bus.IT.	0%	0%	1%	1%	Bus.IT.	0%	1%	1%	3%	Bus.IT.	0%	0%	1%	3%
Financ.	24%	26%	26%	26%	Financ.	44%	50%	54%	55%	Financ.	2%	1%	1%	1%	Financ.	32%	39%	47%	38%
Comm.	0%	0%	1%	1%	Comm.	1%	1%	2%	4%	Comm.	1%	1%	2%	4%	Comm.	2%	2%	3%	6%
Hotels	1%	1%	1%	1%	Hotels	0%	0%	0%	0%	Hotels	0%	0%	0%	0%	Hotels	0%	0%	0%	0%
Media	1%	2%	2%	2%	Media	0%	0%	0%	0%	Media	0%	0%	0%	0%	Media	0%	0%	0%	0%

Table 8: Year of Incorporation

Incorporation/Period	I 1988-1990	II 1991-1995	III 1996-2000	IV 2001-2007
<u>Pre-independence</u>				
Number of firms	1,227	1,205	1,142	953
Firm Size				
Assets (Rs. Crore)	152	514	1,070	1,869
Sales (Rs. Crore)	112	139	205	267
Employment	1,162	1,264	1,260	1,134
Profitability				
PBDIT (Rs. Crore)	16	48	98	146
ROA	13	13	11	6
<u>c1947-1977</u>				
Number of firms	2,877	2,805	2,595	2,051
Firm Size				
Assets (Rs. Crore)	203	361	626	963
Sales (Rs. Crore)	127	167	292	528
Employment	1,863	1,270	1,019	995
Profitability				
PBDITA (Rs. Crore)	20	36	65	103
ROA	14	13	8	9
<u>c1977-1990</u>				
Number of firms	7,678	8,041	8,041	8,041
Firm Size				
Assets (Rs. Crore)	89	82	133	201
Sales (Rs. Crore)	41	35	57	93
Employment	439	112	82	141
Profitability				
PBDIT (Rs. Crore)	8	9	14	21
ROA	13	13	7	4
<u>c1991-2007</u>				
Number of firms	0	3,253	7,692	9,447
Firm Size				
Assets (Rs. Crore)		62	87	209
Sales (Rs. Crore)		13	24	74
Employment		35	20	68
Profitability				
PBDIT (Rs. Crore)		5	7	19
ROA		7	6	-3

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 9: The Evolution of Firm Size and Market Concentration

	1989-1990	1991-1995	1996-2000	2001-2007
	Full Sample			
<i>Market Share</i>	27.25	15.64	13.66	10.93
<i>Herfindahl Index</i>	0.40	0.38	0.33	0.30
Firm Profits	22.72	26.28	32.56	58.91
Firm Size (Assets Rs. Crore)	253.94	249.58	317.85	633.60
Firm Size (Sales Rs. Crore)	110.01	105.72	148.10	250.96
Coefficient of Variation of Firm Size	1.41	1.67	2.01	2.30
Coefficient of Variation of Firm Size	1.33	1.76	2.23	2.56
Number of Firms	11988	15604	20043	21798
Number of Industries	116	117	120	122
	State-Owned Firms			
<i>Stake of State-owned Firms (Assets)</i>	26.95	20.70	13.54	10.97
<i>Stake of State-owned Firms (Sales)</i>	25.78	17.65	12.64	10.34
Firm Profits	66.86	92.35	127.95	230.61
Coefficient of Variation of Firm Size	1.47	1.78	2.16	2.59
Coefficient of Variation of Firm Size	1.38	1.86	2.44	2.94
Number of Firms	659	691	765	850
Number of Industries	83	84	88	90
	Group-Owned Firms			
<i>Stake of Group-owned Firms (Assets)</i>	16.38	12.21	9.44	8.07
<i>Stake of Group-owned Firms (Sales)</i>	15.90	12.68	8.79	6.21
Firm Profits	9.39	11.44	21.82	64.55
Coefficient of Variation of Firm Size	1.41	1.68	2.04	2.39
Coefficient of Variation of Firm Size	1.33	1.77	2.26	2.66
Number of Firms	2962	3586	4427	4906
Number of Industries	103	106	107	110
	Private Firms			
<i>Stake of Private Firms (Assets)</i>	13.75	7.30	7.42	7.04
<i>Stake of Private Firms (Sales)</i>	14.57	7.49	7.28	6.87
Firm Profits	2.63	2.16	4.08	6.14
Coefficient of Variation of Firm Size	1.41	1.67	2.01	2.30
Coefficient of Variation of Firm Size	1.33	1.76	2.23	2.56
Number of Firms	7841	10655	13932	15011
Number of Industries	110	112	115	117
	Foreign Firms			
<i>Stake of Foreign Firms (Assets)</i>	13.09	9.49	7.72	7.83
<i>Stake of Foreign Firms (Sales)</i>	12.21	8.24	7.62	7.53
Firm Profits	9.74	13.94	26.88	71.14
Coefficient of Variation of Firm Size	1.49	1.76	2.17	1.03
Coefficient of Variation of Firm Size	1.40	1.87	2.43	1.79
Number of Firms	526	672	918	1,031
Number of Industries	76	81	90	92

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 10a: The Evolution of Firm Size and Market Concentration (FDI Deregulation)

	Before FDI Deregulation	After FDI Deregulation
	Full Sample	
<i>Market Share</i>	10.14	3.93
<i>Herfindahl Index</i>	0.22	0.17
Firm Profits	8.39	8.23
Firm Size (Assets)	77.79	75.87
Firm Size (Sales)	72.16	67.89
Coefficient of Variation of Firm Size (Assets)	1.56	1.87
Coefficient of Variation of Firm Size (Sales)	1.49	1.82
Number of Firms	5463	6865
Number of Industries	43	43
	State-Owned Firms	
<i>Stake of State-owned Firms (Assets)</i>	24.22	20.20
<i>Stake of State-owned Firms (Sales)</i>	21.44	17.56
Firm Profits	92.17	148.72
Firm Size (Assets)	1011.79	1803.77
Firm Size(Sales)	624.36	956.05
Coefficient of Variation of Firm Size (Assets)	1.64	1.96
Coefficient of Variation of Firm Size (Sales)	1.56	1.90
Number of Firms	203	207
Number of Industries	33	34
	Group-Owned Firms	
<i>Stake of Group-owned Firms (Assets)</i>	48.58	49.24
<i>Stake of Group-owned Firms (Sales)</i>	49.61	49.61
<i>Firm Profits</i>	156.35	352.62
Firm Size (Assets)	1076.45	2657.81
Firm Size(Sales)	1141.64	2294.91
Coefficient of Variation of Firm Size (Assets)	1.56	1.87
Coefficient of Variation of Firm Size (Sales)	1.49	1.82
Number of Firms	1526	1750
Number of Industries	42	42
	Private Firms	
<i>Stake of Private Firms (Assets)</i>	16.46	18.91
<i>Stake of Private Firms (Sales)</i>	18.12	19.92
Firm Profits	17.55	59.41
Firm Size (Assets)	133.22	505.60
Firm Size(Sales)	181.38	508.18
Coefficient of Variation of Firm Size (Assets)	1.56	1.87
Coefficient of Variation of Firm Size (Sales)	1.49	1.82
Number of Firms	3410	4511
Number of Industries	43	43
	Foreign Firms	
<i>Stake of Foreign Firms (Assets)</i>	15.70	16.47
<i>Stake of Foreign Firms (Sales)</i>	15.35	17.38
<i>Firm Profits</i>	43.21	92.70
Firm Size (Assets)	280.45	601.49
Firm Size(Sales)	379.13	716.71
Coefficient of Variation of Firm Size (Assets)	1.63	1.92
Coefficient of Variation of Firm Size (Sales)	1.56	1.88
Number of Firms	324	397
Number of Industries	35	37

This table provides descriptive statistics of the "before-after" effect of foreign direct investment liberalization on the market share and profitability of firms and concentration ratios in liberalized industries. The sample is restricted to industries that deregulated foreign investment and to two years before (1989-1990) and two years after (1992-1993) the policy was implemented in 1991.

Table 10b: The Evolution of Firm Size and Market Concentration (Trade Liberalization)

	Before Trade liberalization	After Trade Liberalization
	Full Sample	
<i>Market Share</i>	14.91	5.92
<i>Herfindahl Index</i>	0.29	0.23
Firm Profits	16.46	14.40
Firm Size (Assets)	194.17	139.02
Firm Size (Sales)	151.09	124.85
Coefficient of Variation of Firm Size (Assets)	1.67	1.93
Coefficient of Variation of Firm Size (Sales)	1.59	1.89
Number of Firms	4428	5450
Number of Industries	35	35
	State-Owned Firms	
<i>Stake of State-owned Firms (Assets)</i>	32.32	28.74
<i>Stake of State-owned Firms (Sales)</i>	29.71	26.35
Firm Profits	193.33	308.64
Firm Size (Assets)	1843.50	3256.43
Firm Size(Sales)	1905.89	3020.42
Coefficient of Variation of Firm Size (Assets)	1.79	2.11
Coefficient of Variation of Firm Size (Sales)	1.69	2.04
Number of Firms	183	187
Number of Industries	28	28
	Group-Owned Firms	
<i>Stake of Group-owned Firms (Assets)</i>	42.91	43.66
<i>Stake of Group-owned Firms (Sales)</i>	43.75	44.98
<i>Firm Profits</i>	172.09	390.34
Firm Size (Assets)	1200.70	2997.63
Firm Size(Sales)	1266.93	2473.08
Coefficient of Variation of Firm Size (Assets)	1.67	1.93
Coefficient of Variation of Firm Size (Sales)	1.59	1.89
Number of Firms	1267	1425
Number of Industries	35	35
	Private Firms	
<i>Stake of Private Firms (Assets)</i>	12.41	16.74
<i>Stake of Private Firms (Sales)</i>	13.36	17.01
Firm Profits	19.31	67.19
Firm Size (Assets)	150.78	539.11
Firm Size(Sales)	199.78	548.25
Coefficient of Variation of Firm Size (Assets)	1.67	1.93
Coefficient of Variation of Firm Size (Sales)	1.59	1.89
Number of Firms	2744	3562
Number of Industries	34	34
	Foreign Firms	
<i>Stake of Foreign Firms (Assets)</i>	20.47	18.75
<i>Stake of Foreign Firms (Sales)</i>	20.88	19.11
<i>Firm Profits</i>	45.24	92.89
Firm Size (Assets)	285.93	615.87
Firm Size(Sales)	399.57	741.49
Coefficient of Variation of Firm Size (Assets)	1.76	2.01
Coefficient of Variation of Firm Size (Sales)	1.67	1.97
Number of Firms	234	276
Number of Industries	28	29

This table provides descriptive statistics of the "before-after" effect of foreign direct investment liberalization on the market share and profitability of firms and concentration ratios in liberalized industries. The sample is restricted to industries that deregulated foreign investment and to two years before (1989-1990) and two years after (1992-1993) the policy was implemented in 1991.

Table 10c: The Evolution of Firm Size and Market Concentration (Domestic Delicensing)

	Delicensing	After Domestic Delicensing
	Full Sample	
<i>Market Share</i>	19.86	4.60
<i>Herfindahl Index</i>	0.29	0.21
Firm Profits	10.46	10.82
Firm Size (Assets)	79.50	89.58
Firm Size (Sales)	86.36	85.41
Coefficient of Variation of Firm Size (Assets)	1.37	1.70
Coefficient of Variation of Firm Size (Sales)	1.28	1.70
Number of Firms	1814	2241
Number of Industries	24	24
	State-Owned Firms	
<i>Stake of State-owned Firms (Assets)</i>	20.67	14.46
<i>Stake of State-owned Firms (Sales)</i>	17.94	12.02
Firm Profits	71.69	108.55
Firm Size (Assets)	794.89	1060.45
Firm Size(Sales)	467.06	641.41
Coefficient of Variation of Firm Size (Assets)	1.53	1.85
Coefficient of Variation of Firm Size (Sales)	1.42	1.80
Number of Firms	659	691
Number of Industries	16	16
	Group-Owned Firms	
<i>Stake of Group-owned Firms (Assets)</i>	46.36	46.22
<i>Stake of Group-owned Firms (Sales)</i>	47.27	46.53
<i>Firm Profits</i>	198.56	440.82
Firm Size (Assets)	1318.26	3136.40
Firm Size(Sales)	1369.34	2657.24
Coefficient of Variation of Firm Size (Assets)	1.39	1.73
Coefficient of Variation of Firm Size (Sales)	1.30	1.72
Number of Firms	2962	3586
Number of Industries	23	23
	Private Firms	
<i>Stake of Private Firms (Assets)</i>	19.81	24.12
<i>Stake of Private Firms (Sales)</i>	21.27	24.66
Firm Profits	19.45	72.10
Firm Size (Assets)	149.57	586.11
Firm Size(Sales)	202.16	561.39
Coefficient of Variation of Firm Size (Assets)	1.37	1.70
Coefficient of Variation of Firm Size (Sales)	1.28	1.70
Number of Firms	7841	10655
Number of Industries	24	24
	Foreign Firms	
<i>Stake of Foreign Firms (Assets)</i>	20.47	18.75
<i>Stake of Foreign Firms (Sales)</i>	20.88	19.11
<i>Firm Profits</i>	45.24	92.89
Firm Size (Assets)	285.93	615.87
Firm Size(Sales)	399.57	741.49
Coefficient of Variation of Firm Size (Assets)	1.76	2.01
Coefficient of Variation of Firm Size (Sales)	1.67	1.97
Number of Firms	234	276
Number of Industries	17	18

This table provides descriptive statistics of the "before-after" effect of foreign direct investment liberalization on the market share and profitability of firms and concentration ratios in liberalized industries. The sample is restricted to industries that deregulated foreign investment and to two years before (1989-1990) and two years after (1992-1993) the policy was implemented in 1991.