(PRELIMINARY: ON-GOING STUDY, SOME DATA MAY BE REVISED!)

WHAT HOLDS BACK BANGALORE BUSINESSES?

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As in the U.S., the number of small low growth enterprises in underdeveloped economies is known to be large. But what about the developing economy counterparts of high-growth businesses in the U.S.? In what way do differences in technological, institutional and cultural factors matter? Do they make high-growth businesses more or less numerous in under-developed economies than in the U.S? How, if at all, do they lead to differences in characteristics, growth rates and economic role of high growth businesses?

This paper focuses on businesses operating in the city of Bangalore, India. Data compiled from statutory regulatory filings suggest that the number and proportion of businesses that expand rapidly are much lower than in the U.S. In-depth interviews with over a hundred entrepreneurs in Bangalore suggest that deficiencies in the performance of basic governmental functions (such as in collecting taxes and the maintaining land records) play a significant role in discouraging businesses from starting at or expanding to an economically efficient scale of operation.

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1. Introduction

Most businesses in the U.S start small and remain small; their economic significance is limited in that they simply replace other small businesses that used to do the same thing. The proportion of businesses that expand rapidly and make significant contributions to the growth of the economy is rather low. According to researchers like Birch, only about 3 to 5% of very rapidly growing businesses account for about three-quarters of the jobs created through firm expansions (Birch 1993, Birch, Hagerty, Parsons 1997). Studies from Canada, Italy, Spain and Sweden also report a disproportionately large contribution by a few high growth businesses (Gailly et. al 2004). Moreover, my previous work (Bhide 2000) suggests that rapid growth does not seem to be just a matter of chance --the relatively few fast growing businesses appear to belong to a different category from the more numerous businesses that do not expand.

This paper asks whether high-growth firms located in the city of Bangalore, India, play a similar role as they do in the U.S. It presents and analyzes data collected in the course of an on-going research project by a team based at the Indian Institute of Management, Bangalore. We might expect the rapid expansion of the Bangalore economy to be reflected in – and sustained by – a large number of high growth businesses. In fact we find that whereas rapid expansion in the U.S. is unusual, its occurrence in the ranks of legitimate businesses in Bangalore seems extraordinarily rare. Apparently, palpable boom in Bangalore represents the product of a very narrow 'off-shoring' sector and a large 'subterranean' economy. Our research also suggests reasons for the low incidence of legitimate high-growth firms in Bangalore.

Section 2 of the paper analyzes the overall pattern of firm and employment growth in Bangalore, using prior research on U.S. patterns as a basis for comparison. Section 3 contrasts our findings about high-growth businesses in Bangalore with my earlier work on high-growth businesses in the U.S. Section 4 discusses hypotheses about the relatively low rates of growth of businesses in Bangalore. The last section concludes.

2. Overall firm and employment growth

Prior research on U.S. patterns

As is well known, the U.S. job market is marked by a great deal of turbulence. According to the U.S. Census department data, employment in U.S. business establishments increased from about 102 million at the start of 1996 to 115 million by the end of 2001. The 13 million increase was the net result of about 93 million of jobs created and 80 million jobs lost

(See Table 1). Issues such as distinguishing between 'firms' and 'establishments,' extrapolating from the manufacturing industry to the economy as a whole, and the choice of time periods make it difficult to estimate the relative contribution of different ages and sizes. Nevertheless, a review of the available evidence about private sector employment in the past few decades suggests that:

1. Employment in the very large 'Fortune 500' type firms (who have more than 10,000 employees) has stagnated or declined in the last quarter century. But, if we define 'large' to include firms with more that 500 employees (numbering approximately 17,000 in 2001), employment in large firms has not declined. And the debate about whether large firms (with more than 500 employees) add more jobs at a faster *rate* than small firms (with less than 500 employees) seems difficult to resolve. Between 1996-97 and 2000-01, the most recent five-year period for which the Census bureau provides 'enterprise' level data, employment in firms with more than 500 employees appears to have grown more rapidly. In previous periods, firms with less than 500 employees have grown more rapidly.

2. The distribution of employment by firm size has shown only modest variation over time. As shown in Table 2, the share of total employment accounted for by large firms has shown a slight upward trend, growing from 46.9% in 1991 to 50.1% in 2001. The apparent stability, however, masks considerable dynamism. On average, during the 5 years from 1996-97 to 2000-01, about 6% of the establishments operated by large firms closed down and 32% contracted each year. Yet because of the expansion of existing large firms and small firms becoming large, total employment by large firms increased by about 10 million and the number of large firms grew by about 7% over this five year period.

3. Firm growth has made at least as important a contribution to the growth of overall employment in the U.S. as the formation of new firms. For instance, during the 5 years from 1996-97 to 2000-01 the expansion of existing establishments added an average of 1.78 times as many jobs as the births of new establishments each year. This number probably understates the relative contribution of *firm* expansions and births – only existing firms can expand their establishments, whereas existing as well as new firms can form new establishments.

The ratio of jobs added through expansions of establishments to births is slightly lower for firms employing less than ten employees (1.63 for firms with less than 4 employees and 1.76 for firms with 5 to 9 employees). In earlier periods small firm births created more jobs than small firm expansions. This proportion according to Dennis et al (1994) varies with the business cycle.

4. Relatively few firms have shown high rates of employment growth. On average, in the 5 year period between 1996-97 and 2000-01 about 29% of establishments expanded their employment each year. Given that one firm can operate multiple establishments, the proportion of

firms that expanded in a year should be even lower. Moreover, the proportion of firms that show consistently high growth (i.e. over multiple years) appears to be small. For instance, according to a study by the National Commission on Entrepreneurship (2001) only about 5% of businesses that existed in 1991 grew their employment by 15% a year from 1992 until 1997. Similarly, according to Birch (2002) just 3% of all companies in 1998 were "gazelles" i.e. they had grown by at least 20% a year for the prior 4-year period with a minimum of $100,000 in revenues at the start of the period.

Primary data collection

Compared to the extensive, albeit inconclusive, research about the U.S., the literature on the dynamics of firm and employment growth in India is sparse, as is the availability of reliable data. Birch's (1979) The Job Creation Process was based on Dun & Bradstreet's data files, which now contain over 9 million records and cover 98 % of all private sector employment in the U.S. Data on the growth in employment of individual companies over time is also available in the U.S through the Census Bureau's Business Information Tracking Systems (BITS) database. The BITS database has been used for research such as the National Commission on Entrepreneurship's (2001) study on fast-growth companies. Such databases do not exist in India. The Government of India conducts a census, but only once every ten years. Moreover, the results are highly aggregated and only available after a considerable time lag. They cannot be used to form the kind of estimates of job and firm growth that I discussed in the previous section. Data provided by the governments of individual states also suffer from the same limitations, and as we will see, do not inspire confidence in their reliability.

Our research team investigated a variety of sources for creating a database that would allow us to track individual firms. Several entities have at least some data on individual firms: these include telephone companies, distributors of electricity and water, industry associations, government agencies that promote small scale enterprise, the Software Technology Parks of India that regulates all software units in Bangalore, and several tax and regulatory agencies of the state and local government. We found though that some databases were too 'broad' because the records covered individual consumers as well as businesses and did not have tags to distinguish between the two. In other cases the coverage was too 'narrow' – the data included only some types of businesses.

Eventually, we concluded that registration information required under three Acts – the Factories Act, the Shops and Commercial Establishments Act, and the Contract Labour (Regulation and Abolition) Act – could be treated as being mutually exclusive and collectively

exhaustive. All the three Acts have the same broad purpose – to regulate working conditions. Most for-profit businesses have to register, but only under one of the Acts. Conveniently, a single Labour Commissioner, appointed by the government of the State of Karnataka (whose capital happens to be Bangalore) has responsibility for administering all the Acts.* Additionally, most of the employees of the Labour Department in Bangalore work out of (and keep their records in) one location.

The types of businesses required to register under the three Acts are as follows: The Factories Act covers manufacturing businesses which have more than 20 employees or have more than 10 employees and an "industrial" electricity connection (locally called "power"). The Shops and Commercial Establishments Act covers all non-manufacturing businesses, regardless of their size; its applicability to manufacturing businesses not covered under the Factories Act (e.g. because they employ less than 10 workers) is not clear. In my reading of the legislation, the definition of a "commercial establishment" is broad enough to cover a manufacturing business. When asked, an employee of the Labour department (not the Commissioner) would not officially confirm this; however he said that "an abundance of caution" leads the department to encourage the registration of small manufacturing businesses under the Shops and Commercial Establishments Act. Chartered Accountants, who also provide legal and regulatory advice to businesses in Bangalore, appear to take the same point of view.† All in all, we may reasonably assume that establishments not covered under the Factories Act de facto fall under the Shops and Commercial Establishments Act.

Businesses can supplement their normal workforce with 'contract' employees who perform occasional or peripheral functions under conditions specified by the Contracts Act. The Act also requires registration by 'contractors' who provide more than twenty such contract employees to other businesses and by the 'Principal Employers' who use their services.

We decided to focus our study on businesses registered under the Factories Act and the Shops and Commercial Establishments Act and exclude businesses covered under the Contracts Act. This choice was based on our concerns about the availability of reliable data. We expected inaccuracies in the registration records. But we were primarily interested in legitimate businesses

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* The Labour Commissioner took a great deal of interest in our research. The cooperation of the inspectors who worked for the Labour Commissioner's office and were responsible for maintaining the registration information was however somewhat variable.

† Apparently many business owners fully delegate the responsibility for regulatory compliance to their chartered accountants. In the course of a visit to a small manufacturing unit, we asked the owner whether he had to register under the Shops and Commercial Establishments Act. He said he didn't. We then looked at a wall in his office on which hung many framed certificates and registrations. One of these was a Shops and Commercial Establishments registration. When we pointed this out to the owner he said he didn't know about it, because he left such matters to his chartered accountant.

that complied with basic regulatory requirements. We also thought it reasonable to assume that the degree of non-compliance and other errors would be stable over time. Discussions with the Labour Commissioner persuaded us that we could not rely on this assumption for Contract Act registrations. According to the Commissioner the use of contract Labour had become increasingly widespread – the number of registered 'principal employers' in Bangalore had grown by 34% (from 2,345 in 1998 to 3138) in 2002. Yet the number of licensed contractors had decreased by 21% (from 6,846 to 5,403) during this period and the corresponding number of contract workers covered had decreased by 19% (from 310,825 to 253,016). In other words, compliance had very likely declined. According to the Commissioner, this was because on the one hand, the relatively weak protections for workers under the Contract Labour Act have encouraged employers to use contract workers instead of their own full-time employees. On the other hand, it is difficult to monitor the compliance of contractors with the registration requirement because (in contrast to businesses covered under Factories or Shops and Commercial Establishments Acts) contractors generally don't have fixed premises that Labour inspectors can visit.

Registrations under the Shops and Commercial Establishments Act are maintained as follows. The city is geographically divided into 26 circles and 100 wards. One inspector is responsible for enforcing the Act in each ward. These responsibilities include registering new businesses and periodically renewing the registrations of existing businesses. Registration information is entered into a hardbound book called the 'B-register.' When a business first registers it is assigned a page in the B-register. Each page of the register comprises a form. The left half of the form contains information about the business at the time when it first registers, such as its name, address, names of the owners, the number of employees and the registration fee paid. The right half of the form contains information entered when a business renews its registration, such as the date of renewal, the fee paid and (in the newer versions of the form) the number of employees at the time of renewal.

Since the B-register consists of a hardbound book, pages cannot be added or removed. If a business shuts down, its registration page is supposed to be marked with stamp indicating closure and the date of its closure. If instead a business continues in operation for many years, a single page cannot accommodate all its renewal information. The inspector responsible then starts a new page for the business and copies over the initial registration information from the left hand side of the original page on to this new page. New pages also get used up when new businesses register. And when all the pages in a particular B-register are filled up, a new B-register is started.

A different set of inspectors has responsibility for the enforcement of the Factories Act. The Factories inspectors maintain a different set of registers. But the general arrangements are about the same as for the Shops and Commercial Establishments Act.

We decided to collect data on every twentieth business in every register. The Shops and Commercial Establishments inspectors (and their immediate boss) were initially less helpful. Eventually, through the intercession of the Commissioner, all Shops and Commercial Establishments registers extant were assembled in a room in the Labour Department. We hired an outside agency to photocopy every twentieth page, so that we would subsequently always have physical access to the data; the photocopies were then sent to a transcription agency, which translated the information from the local language (Kannada) into English and entered this information into an electronic spreadsheet. The Factories Act registers were of a physical size that made their photocopying difficult. But because the official who supervised the Factories inspectors had been helpful, we did not have the same level of concern about continued physical access as we did with Shops and Commercial Establishments registers. Thus, for the Factories registers we used a transcription agency, which (in about a month) directly entered data for every 20^{th} registrant into an electronic spreadsheet.

We found that many of the registration records, especially in the Shops and Commercial Establishments registers, had been haphazardly maintained. In particular, we had to deal with two kinds of problems. First, many records did not have entries indicating either closure of the business or the renewal of its registration. Apparently inspectors often neglect to mark the demise of businesses with an official stamp, and obviously businesses that die do not renew their registrations. We therefore decided to attach a "presumed dead" tag to businesses in the year in which their registrations expired (and were never subsequently renewed).

Second, data on the number of employees of the business (either at the outset or at the time of renewal or both) had not always been entered. In such cases we tried to estimate employment from the registration or renewal fees paid. For instance, according to the schedule for 2003, businesses with less than 10 employees had to pay Rs. 250. We also calculated that the modal employment of businesses that paid Rs. 250 (and whose fee and employment information had been properly recorded) was 4 employees. So if we encountered a company that paid Rs. 250 in 2003, but for whom there was no entry for the number of employees in its registration page, we assumed it had 4 employees. (We could not of course use this estimation method where there was no entry for either fees or employment.)

'Static' distributions

Discrepancies with official numbers. According to the most recent statistics published by the state government, there are about 81,575 businesses registered under the Shops and Commercial Establishments Act in Bangalore. We therefore should have photocopied at least 4079 records from the Shops register, when in fact we copied only 3,893. It seems unlikely that pages 'missed' by the photocopying agency can account for this difference – the registration numbers on the photocopies suggest that every 20th page was in fact copied. (It is possible – but improbable – that entire registers were withheld from us.)

Moreover, of the 3,893 pages that we copied, 429 were for businesses that had been officially marked as closed. Another 1,236 pages covered businesses that had not been marked as officially closed but whose registrations had expired and had not been renewed before 2003. So the number of businesses with current registrations that we found in our sample was 2,228 instead of 4079.

Similarly, according to the most recent official statistics, about 4,855 factories operate in Bangalore. Our transcriptions covered 621 registrations under the Factories Act. Of these 621, 252 had been officially closed and 310 had not renewed. Only 59 were of live units with up-to-date registrations rather than the 243 (5 % of 4855) that we should expect from the official totals.

We have reason to believe however that the number of unregistered units is quite large: during the course of our study, we had presented preliminary findings about the large number of 'lapsed' registrations to the Labour Commissioner. He thereupon ordered an intensive survey of one ward. This survey was conducted by 26 inspectors (from all over the city) over a two-day period. The survey found 1,444 businesses, of which only 489 had ever been registered. And of the 489, 112 had not renewed their registrations. In other words only about 26% of operating businesses had 'valid,' up-to-date registrations.[*] This is consistent with the common belief in the existence of a large subterranean economy comprising a multitude of small enterprises that operate outside the official purview of the state.

Growth rates. Table 3 contains our estimates of the distribution of employment in Bangalore by their employment size of registrants. It shows that total employment (across all businesses with valid registrations) increased by 160 % in the Shops and Commercial Establishments category between 1998 and 2003. Among Factories Act registrants total employment declined by 24 %. The growth of employment among Shops and Commercial

[*] Mysteriously some 226 units in the ward which had up-to-date registrations were not recorded in the survey. This could be because the survey itself was not exhaustive or because some units exist only in the register. The latter possibility raises the question of who pays their registration fees.

Establishments registrants and its decline among Factories registrants is consistent with common beliefs in Bangalore about a booming service sector and a declining manufacturing sector. Overall, employment by all registrants grew by 26% between 1998 and 2003.

This rate of overall employment growth in Bangalore is greater than the rate recorded in the U.S. even during the boom years of the 1990s. (As shown in Table 2, paid employment in U.S. businesses grew by 13% in the five year period between 1996 and 2001). However, the total number of new jobs created in the U.S. (scaled to its population) is greater because the U.S. economy has a much larger base of employment in legitimate businesses. For instance, the state of Massachusetts has a population comparable to that of Bangalore. At the start of 1996, firms in Massachusetts had 2,777,000 employees. In the next five years, this number grew by about 10% which is somewhat lower than the 13% rate for the U.S. as a whole and much lower than the aforementioned 26% increase of jobs in Bangalore in 5 years from the start of 1999. But the total number of jobs – 285,000 – created over the 5 years in Massachusetts is 2.54 times our estimate of the 112,260 jobs created in Bangalore.

Size Distributions. Table 3 shows a considerable reduction in employment accounted for by small businesses registered under the Shops and Commercial Establishments Act in Bangalore. In 1990, businesses with fewer than 20 employees accounted for 81% of total employment in our sample of Shops and Commercial Establishments registrants. In 1998 this percentage had fallen to 70% and in 2003, to 56%. Conversely businesses with 100 or more employees accounted for 8% of total employment in our Shops and Commercial Establishments sample. In 1998 this percentage had increased to 13% and in 2003, to 25%. In our sample of registrants under the Factories Act, the proportion of employment accounted for businesses with fewer than 20 employees was low from the outset (1.3% in 1990) because the Act was not intended to cover small manufacturing units. So the subsequent changes (to 0.2% in 1998 and 1.6% in 2003) are not noteworthy. We do find a change of greater magnitude in the percentage of employment accounted for by businesses with greater than 100 employees between 1990 and 1998 – from 66% of the total to 74%. Between 1998 and 2003 the percentage declined slightly to 73%.

The overall percentages, derived by adding the Shops and Commercial Establishments and the Factories figures, however show increases in the proportion of employment accounted for by businesses with fewer than 20 employees. After a small dip from 22% to 19% between 1990 and 1998, the percentage increases to 32% in 2003. This is simply because the proportion of total employment accounted for by Shops and Commercial Establishments registrants (that have a

larger percentage of small businesses) has increased from 27% of the total in 1990 to 56% of the total in 2003.

Regardless of the category of registrant, differences in the distribution of employment by size of firm in the U.S. and Bangalore remain large. In the U.S. at the end of 2001, firms with fewer than 20 employees accounted for 89% of the total number of firms with paid employment, but only 18% of total paid employment (Table 2); in Bangalore, registrants with fewer than 20 employees accounted for 90 % of total registrants and as mentioned for 32 % of the total employment in our sample in 2003. Conversely, U.S. firms with more than 500 employees accounted for just 0.3% of the total number of firms with paid employment, but for slightly over 50% total paid employment at the end of 2001. In our Bangalore sample registrants with more than 500 employees accounted for 0.3 % of total registrants and 16 % of total employment in 2003.

If we make the plausible assumption that unregistered units are predominantly small, the "true" gap between the employment accounted for by large businesses in Bangalore and the U.S. is likely to be even greater. Some indication of this is provided by comparing the absolute numbers employed by large firms. For instance, according to our estimates, registrants in Bangalore with more than 500 employees had a total workforce of about 88,000 employees in 2003. In Massachusetts, firms with more than 500 employees had a workforce of more that 1.5 million (representing as in the U.S. as a whole, about half of total private sector employment in the state) in 2001.

Underlying 'dynamics'

Table 5 presents data about the underlying births, deaths, expansions and contractions of businesses responsible for the annual 'snapshots' presented in Table 3. As in the U.S., the overall changes in employment are the net consequence of a great many jobs being created and destroyed. For instance, according to Table 5 births and expansion in our sample of Shops and Commercial Establishments registrants added 223,100 jobs between 1999 and 2003 – approximately 228 % of the number of jobs existing at the start of the period. But we estimate that the net addition of jobs in our sample was only 168,000 because of the loss of 55,340 jobs – approximately 57 % of the number of jobs existing at the start of the period – due to closures and contractions. (Losses due to businesses 'officially' marked as closed in the Shops and Commercial Establishments registers were relatively small. We include in our estimates the much larger number of businesses that did not renew their registration, but were not marked as closed.). Conversely, the net reduction of 116,060 jobs from 1999 to 2003 in our sample of

Factories registrants resulted from the creation of 80,580 jobs and the loss of 196,640 jobs. And if we combine both categories of registrants, the net growth of 51,700 jobs in our sample was due to the creation of 303,680 jobs and the loss of 251,980 jobs. Put differently, every 'net' job addition by registrants required the gross creation of 6 jobs.

The sources of the 'gross' increases in employment appear to be quite different in Bangalore and the U.S. A noteworthy contrast lies in the role played by the birth of new firms. Table 5 shows that the number of new businesses registered (under the Shops and Commercial Establishments and Factories Acts) in the five years between 1999 and 2003 represents 135 % of the total number of registrants (with up-to-date renewals) at the start of 1999. Employment added by the new businesses at the end of 2003 represents about 74 % of the total employment of all registrants at the start of 1999. These percentages are even higher if we exclude Factories Act registrants (214% of the total employment at the start of 1999). In the U.S. by contrast, employment added by the births of new establishments in five years after 1996 amounts to just 40% of total employment in 1995[*].

But as mentioned earlier in this section, the base numbers of employment by legitimate firms (scaled for the total population) are much higher in the U.S., The higher rates in Bangalore thus do not mean higher absolute numbers of jobs created. Consider for instance, jobs created by the births of new businesses in Massachusetts. As mentioned, Massachusetts has roughly the same population as Bangalore and at the start of 1996 firms in Massachusetts had 2,777,000 employees. This compares to the 434,920 that we estimate were employed by Bangalore businesses with current registrations at the start of 1999. The birth of new establishments in Massachusetts between 1996 and 2001 added about 815,000 jobs – this is just 29% of the employment existing at the start of the period. But in total numbers, births in Massachusetts added 3 times as many jobs as did new registrants in Bangalore.

Another noteworthy difference between businesses in Bangalore and the U.S. lies in the low contributions to job creation made by the expansion of existing businesses and the low incidence of high-growth businesses. As mentioned, the expansion of existing businesses in the U.S. has created at least a comparable number of jobs as those created by the birth of new firms. For instance, between 1996 and 2001, business births in the U.S. created at least 40% fewer jobs than business expansions. In our Bangalore sample however, births created 15 times *more* jobs in the 1999-2003 period among Shops and Commercial Establishments registrants; 6 times more among Factories registrants; and 11 times more for the two categories combined. Similarly in the

[*] Since some 'establishments' may have been started by businesses formed before 1995, the contribution made by the births of new businesses may be even lower.

U.S. the total number of jobs created through expansions in the five-year period from 1996 to 2001 equaled about 58% of the jobs existing at the start of the period. In our Bangalore sample, jobs created through the expansion of Shops and Commercial Establishments registrants in the 1999-2003 represented just 15 % of employment in this category at the start of the period. This percentage is 4% for Factories registrants and 7 % for the two categories combined.

Table 6 contains the distribution of Bangalore businesses that had 'current' registration at the start of 1999, categorized by the degree to which the number of their employees changed over the next 5 years. It shows that only 2.6 % of Shops and Commercial Establishments registrants, 2 % of Factories registrants, and 2.5 % of all registrants recorded any increase in their employment. The proportion of establishments increasing their employment by more than 15% per year was miniscule – only 2 % of Factories registrants and 1.9 % of all registrants exceeded this threshold. This is well below the 5% or so of U.S. businesses that grew at 15% or more per year (over a five year period) in the National Commission on Entrepreneurship's study. The differences in the actual number of high growth business are sharper. According to our estimates (shown in table 5) about 400 registrants operating in Bangalore at the start of 1999 increased their employment by more than 15% a year for the next five years. According to the National Commission on Entrepreneurship's study, the average number of firms that grew at this rate across all Labor Market Areas in the U.S with populations of more than 5 million is 6,277. This is more than fifteen times the number of high-growth firms in Bangalore.[*]

How then does one explain the increase in the 'static' share of total employment accounted for by large Shops and Commercial Establishment registrants? Table 7 categorizes businesses operating in 2003 by the size of their employment in 2003 and at the time of their first registration. It shows that the majority of large employers started large rather than became large over time. Their share of total employment (among Shops and Commercial Establishment registrants) has increased only because the proportion of large start-ups has risen (see Table 8).

3. High-growth firms

Prior U.S. findings

Earlier I had investigated whether high-growth businesses in the U.S. (Birch's 'gazelles') were drawn from a different distribution or sub-category of start-ups than the 'run-of-the-mill'

[*] The smallest number of high growth firms in any Labor Market Area reported in the National Commission study is 3,569. This is for Bridgeport, Connecticut whose population in 1995 of about 3.5 million was about 30% lower than the population of Bangalore. The Boston Labor Market area which has roughly the same population as Bangalore had 5,498 high growth firms.

businesses that started and stayed small. For this I had interviewed founders of 100 companies from the 1989 *Inc.* "500" list, a compilation of the fastest growing privately held companies in the United States.

Inc. magazine compiles this list after soliciting application and nominations for companies that have at least a five-year track record, with a minimum of $100,000 in revenues at the start of the five-year period (corroborated by their income-tax filings). Since appearance on the list has 'marketing cachet', Inc. receives between 10,000 to 20,000 applications or nominations; from these, it picks the top 500 as ranked by their five-year sales record. The average company on the 1989 list had 1988 revenues of about $15 million, 135 employees, and a five-year sales growth of 1,407%. I narrowed my list of prospective interviewees to companies founded in the previous eight years, on the ground that the start-up history of older companies would be more difficult to obtain. My interviewees therefore turned out to be a little smaller (in terms of revenues and employees) than companies on the full list.

The *Inc.* list's requirement of a five-year track record of rapid growth helped to eliminate marginal ventures whose stories I believed would not contribute much to my objectives. At the same time, by sampling from a population of 500 companies, I avoided drawing inferences from a few billion dollar "outliers" like Microsoft or Federal Express whose success might be attributed to the extraordinary talent or luck of the founders. The companies I studied were successes (besides having enjoyed rapid growth, about 90% were profitable) but they were not household names.

The interviews (conducted with the help of two research associates) took a little over a year to complete. We visited more than twenty cities and towns in a dozen states. Although we had some difficulty in scheduling appointments that would coincide with our visits, only a few founders had declined to be interviewed. Each interview lasted between 1 to 3 hours.

The interviews suggested that new businesses that grow rapidly have attributes that put them in a distinctive subcategory of 'promising' start-ups. Although 'promising' attributes do not ensure rapid growth, according to my hypothesis, the presence of these attributes increased the likelihood of growth. For instance, beauty salons, auto-repair, house painting and house cleaning represent 'popular' areas for starting a business; in such businesses, the entrepreneur provides relatively low unit price goods or services to consumers. These businesses rarely achieve high growth however. I found instead that fast growth businesses provide high unit price goods and services to other businesses rather than to consumers. Similarly, while 'popular' start-ups are mainly found in industries where the technology has matured and demand has stabilized, more

than a third of *Inc.* 500 companies were in the computer industry which has long been in a state of technological flux.

The interviews also suggested ways in which *Inc.* 500 companies resemble low-growth businesses but differ from the exceptional business, numbering only in the hundreds each year, that start with financing provided by professional venture capitalists. For instance, in contrast to venture capital-backed startups the *Inc.* companies don't have 'proprietary' technologies or top-notch founding teams who can raise large amounts of capital. *Inc.* founders also did not spend much effort on market research or writing business plans.[*] (Bhidé 2000).

Bangalore interviews

As we began our collection of registration data (described in the previous section), we concurrently tried to conduct face-to-face interviews with founders of high-growth businesses. Our goal was to replicate as far as possible the study that I had previously conducted in the U.S. This was not because I expected to find the same patterns. In fact, my goal was to discover salient differences – I had very diffused 'priors' about what these might be – and through an inductive process, identify the institutional, cultural or other environmental factors that could explain these differences.[†]

One obstacle we faced in replicating such a study in Bangalore lay in identifying high-growth businesses. There are no *Inc.* 500 type lists for the city, and for a variety of logistical reasons we wanted to start the interviews at the same time as we began gaining access to the Shops and Commercial Establishment and Factories registers. We therefore decided to lower our sights: instead of trying to interview founders of the 'fastest growing' businesses we decided to look merely for founders of businesses that were not 'marginal' in that they had grown to 10 or more employees. And as with the *Inc.* 500 companies, we would restrict our attention to businesses that were less than eight years old.

We initially used a database of businesses that had registered as Small Scale Industry units with the state government to try to identify interviewees. While technically voluntary, registration as a small-scale unit is necessary to take advantage of incentives provided by the government to encourage small-scale enterprise. The database we were given covered about 30,000 businesses. We also used a smaller database provided by an association of small-scale

[*] This does not imply that making careful plans (or having proprietary technologies or access to a lot of capital) makes **no** difference to the likelihood that a start-up will subsequently appear on an *Inc.* 500 list.

[†] Perhaps high-growth start-ups in the U.S. provide a less than ideal basis for comparison. But even in a purely descriptive study, researchers need a frame that helps them decide what to observe. My *Inc.* 500 interviews was the only frame that I could use. It is extremely likely that with another frame I might have observed other kinds of differences and formulated different hypotheses.

businesses in the state. Later, as transcriptions of Labour department registers became available, we began to use this information as well.

We had anticipated that because all our interviews would be in a single city we would complete 100 interviews in about 3 to 4 months. The estimate was way off the mark. Tracking down target companies and their founders was difficult. I cannot estimate the proportions, because we used individuals who were not on our core team to try to set up the interviews, but a number of the business owners that were contacted declined to be interviewed.

Restricting our interviews to businesses that were no more than eight years old also proved challenging. The records in the Small Scale Industry database about starting dates of registrants (and much else) were simply wrong – and we often discovered this after we had arrived for our interview. Another problem was that the formation of a new legal entity in Bangalore does not necessarily correspond to what would normally be regarded as the launch of a new business in the United States. For instance, a small firm in the U.S. that starts a new manufacturing facility will usually not establish a new legal entity; but as we will see later tax-breaks and other incentives for the small-scale sector make such proliferation of 'new businesses' commonplace in India.

In the event, it took us about eight months to complete a hundred interviews. About twenty of our interviewees were not randomly located through a database. Rather, they were referred to us by prior contacts and in some cases by interviewees we had found from the databases. We also relaxed our criteria of only interviewing founders of businesses that were less than eight years old.

All this raised concerns in our minds about whether we were interviewing an unrepresentative sample of founders. In fact, I now believe it's likely that we ended up doing what didn't seem feasible at the outset: focusing our interviews on the founders of high-growth businesses.

We discovered that we were probably unable to track down businesses in the Small Scale Industries database because more than two thirds of them had ceased to function or may have never existed except on paper. The official who had given us the database acknowledged this, but did not give us the names of the sub-set of functioning businesses, which he said he would, even after repeated visits to his office. Then we found (as has been discussed) that only a few registrants in our sample had (from the start or through growth) ten or more employees. So it was unlikely that the most 'representative' founders from our target group were refusing to be interviewed. Rather, our target group itself was quite small.

Moreover, after we compiled the results we found that the growth rates of the businesses started by our interviewees were well above the usual growth rates in Bangalore. The median increase in the number of employees from the year in which our interviewees started their business to 2004 was 700%. The median compound annual rate of increase was 20%. As shown in Table 6, the median growth rate for all Bangalore registrants is zero. About 63% of companies in our 'interview sample' grew at an annual rate of 15% or more, while less than 2% of all registrants recorded this rate of growth. It may well be the case that 'exceptional' entrepreneurs who expanded their businesses at an out-of-the-ordinary rate were more willing to be interviewed. In other words, we may have benefited from an unintended but desirable bias in our sample.

Performance vis-à-vis Inc. 500 companies

Employment. Although employment growth in our Bangalore sample borders on the stellar by the standards of other local companies, it is considerably lower than in my Inc. 500 sample. The median annual growth of employees between 1984 and 1988 (data in the year of formation is unavailable) of the Inc. companies was 64%, compared to the 20% growth of the Bangalore companies. The median number of employees (38) in our Bangalore sample in 2003 is just slightly over a third of the median number of employees (100) in my *Inc*. sample in 1988. This is in spite of the Bangalore companies being older than *Inc.* companies. (The median of the number of employees in 2003 divided by the age of the business for the Bangalore companies was 4.5, whereas for the *Inc.* companies the median of the number of 1988 employees divided by age was 9.)

Revenues. Median annual revenues for the Bangalore companies in 2003 amounted to Rs. 30 million (or about $666,000), whereas median annual revenues in 1988 for the Inc. companies that we interviewed amounted to $5.5 million.[*] We have revenue data for the Bangalore companies just for 2003 so we cannot compare the growth rate of their revenues with the *Inc.* company growth rates. We can only report that median 2003 revenues divided by age amounted to Rs. 2.8 million (about $62,000), whereas for the *Inc.* companies median 1988 revenues divided by age amounted to $960,000.

'Return' on start-up equity. The median equity invested by the founders of *Inc.* companies to start their businesses amounted to $10,000. The equivalent amount for the Bangalore founders was Rs. 375,000, or about $8,333. However, we should note that $10,000 amounts to half or less of per capita GDP in the U.S. (in the years during which the investment was made) whereas Rs. 375,000 represents at least 10 times the estimated per capita GDP in the

[*] The median revenue for the full list was even larger.

city of Bangalore (and Bangalore GDP is considerably higher than Indian GDP). The median ratio of 1988 revenues to start-up equity (which we can think of as a crude 'output-input' measure) for the *Inc.* companies works out to 378, whereas the median ratio of 2003 revenues to start-up equity for the Bangalore companies works out to just 19.4.

Under-reporting issues. Our interviews do suggest the possibility of differences between the numbers that the entrepreneurs reported to us (as well as to the government agencies) and the actual numbers. For instance, in one case we observed 15 employees on the premises when the entrepreneur asserted that he had only 8 employees. In another interview, the number of employees fell by half when we went from the open-ended questions to the structured survey instrument. In two other cases the founders said they actually employed twice as many people as they had on their official books. Similarly, four of our interviewees said they reported only half the revenues they actually earned. One said that he used to make a significant portion of his sales in cash and without receipts. Eventually, he could not take the psychological strain and he now does all his business 'on the books.' Two interviewees refused to divulge their revenue numbers at all.

Could it be that there were in fact many more business owners who significantly misrepresented their numbers to us, and could this eliminate the 'performance gap' discussed above between Bangalore and *Inc.* 500 entrepreneurs? I don't believe it does. On the employment side, there are two 'thresholds' which businesses have an incentive to avoid crossing. Businesses with more than 10 employees may have to contribute 4.75% of wages to an Employees' State Insurance Scheme (a state operated health plan). Those with 20 or more employees have to contribute about 10% of wages to a Provident Fund scheme (a retirement plan); the Payment of Bonus Act also requires businesses with more than 20 employees that have been operating for more than five years to pay (whether or not the business is profitable) a minimum annual bonus to employees. (The Act further specifies a detailed method for computing the minimum amount.). Therefore, it is likely that in the overall population of businesses in Bangalore, many businesses that report fewer than 10 or 20 employees actually employ more than these numbers. In our sample, though, only about a quarter of our interviewees reported fewer than 20 employees. For the remaining three quarters, there is no obvious reason for them to have understated their employment numbers to us.

Similarly, businesses with less than Rs. 10 million in revenues are exempt from paying excise taxes, levied at a base rate of 16% of sales. But only 30% of our sample reported revenues of less than Rs. 10 million (i.e. 70% did not have a strong incentive to under-report their revenues to us). Additionally, we would have to assume extreme underreporting by businesses with less

than Rs. 10 million in sales to eliminate the differences observed between them and my *Inc.* 500 interviewees. For instance, the median ratio of 2003 revenues to initial equity was just 11.25. To get to the Inc. ratio of 271 we would have to assume that the true revenues of these Bangalore companies were 24 times their reported revenues.

Nature of Opportunities

As mentioned, the originality of their ideas or technologies did not distinguish the *Inc.* 500 companies I studied from the typical low-growth start-ups. Only 6 out of a hundred interviewees even claimed they started with a unique product or service and of these only 3 had applied for a patent. In contrast, most venture capital-backed startups have proprietary technologies or some other source of sustainable competitive advantage that investors can observe and try to investigate. But, the *Inc.* start-ups did find other ways of making at least transitory profits that we usually don't find in low-growth start-ups.

About half the Inc. founders started businesses in fields that were in a state of flux or turbulence because of a new technology, regulatory regime, fashion or other such external change. Starting a profitable business in a stable market, where competitive forces have long shaken out weak technologies and firms, requires a significantly better approach or a new "combination." In a new or changing market, however, entrepreneurs do not require a significant innovation to make a profit. Customers and suppliers take some time to learn about their alternatives after a change occurs. Meanwhile, entrepreneurs can buy inputs cheap from uninformed suppliers and sell them dear to uninformed customers. They do not even need to discover the opportunity themselves. Provided that the first arbitrageur faces some capacity constraint, knowledgeable followers can also profit for as long as buyers and sellers remain ill informed. Moreover in new industries that don't have entrenched incumbents, relatively minor innovations can yield very high returns. So even if entrepreneurs don't spot opportunities for no-risk arbitrage, they can exploit "heads-I-win, tails-I-don't-lose-much" opportunities through incremental innovations.

In about 40% of cases, start-ups had neither a unique product nor the benefit of a market in disequilibrium. Here the profitability of the venture apparently derived from the founders' capacity to differentiate their product or service through their personal effort. This was not simply a matter of putting in longer hours – rather, the founders catered to (or even created) wants that were difficult to specify and could not be satisfied using a standardized 'production function.' Moreover, the return to such effort will be low when customers evaluate offerings along simple, concrete dimensions, as is the case with many popular but low-growth businesses.

The *Inc.* interviewees (that relied on the personal efforts of their founders) usually flourished in markets where customers placed a high value on what Sabini and Silver (1982) call "fuzzy" attributes, whose dimensions, such as trendiness, elegance, and responsiveness, customers cannot easily measure or even articulate.

Like the *Inc.* founders, our Bangalore interviewees did not start their businesses to exploit a significant innovation – roughly the same percentage in both groups claimed to have started with a unique offering. We also recorded some similarities in the nature of opportunities: only a small proportion (14% in the case of *Inc.* companies and 23% of Bangalore start-ups) offered consumer goods or services. Few businesses in either group sold low ticket, 'impulse' purchases: the sales cycle took a day or longer in more than three quarters of both sets of interviewees. Casual observation of registration data also suggests that these features, which distinguish *Inc.* 500 companies from businesses with low growth prospects in the U.S., distinguish our Bangalore interviewees from small low growth businesses in Bangalore as well.

There is however a noteworthy but unquantifiable difference. Interviews with the *Inc.* 500 founders provided some plausible (albeit unverifiable) explanation for why their businesses might have earned 'abnormal' returns without a significant innovation (e.g. by exploiting unsettled market conditions; their resourcefulness and "hustle" in satisfying fuzzy wants). This was not the case with many of our Bangalore interviews. Some interviewees had apparently taken advantage of unexpected changes in customer wants. For instance, one entrepreneur we interviewed had started a business making bottled soft-drinks. The market was mature and the entrepreneur faced much larger and well-entrenched rivals. The venture was on the brink of failure when it suddenly started becoming fashionable to serve bottled water (instead of tap water) at weddings in Bangalore. The entrepreneur salvaged his business by switching to this new market where he did not face intense competition.

Other interviewees served the large software companies and call centers that have enjoyed rapid growth in recent years. Our interviewees were able to secure orders for new kinds of goods and services demanded by these customers without having to compete with any existing suppliers. One undertook the construction of a one-hole golf course on the campus of Infosys (a large software company headquartered in Bangalore). The entrepreneur had no prior experience in building golf courses, but he said that no one else did either. Another started selling disposable paper cups to multinational companies who didn't want to use disposable plastic cups that are cheaper but are regarded as more damaging to the environment.

There were several businesses, however, for which I couldn't discern a plausible basis for 'excess' returns. For instance, the proportion of our Bangalore interviewees who started

businesses in mature industries (where demand had stabilized and there were existing competitors) is roughly the same as in my earlier *Inc.* interviews. But as mentioned, the *Inc.* companies offered goods and services that satisfied fuzzy wants. Furthermore, their founders had some story to tell about their resourcefulness or ingenuity in satisfying – in fact or in perception – these wants in a better way than could their rivals. The interviewees in Bangalore in contrast offered goods or services (such as water tanks, plastic tubes, or simple machining services) that did not satisfy fuzzy wants and whose production did not require any scarce resource or ability. When we asked our interviewees about what competitive advantage they might have in such a business, their usual response was to say that they were more "prompt" than their competitors (i.e. they kept to their promised delivery schedules). They attributed their promptness to factors such as their closer supervision of their workforce or simply because they "worked harder."

Another difference between the *Inc.* 500 and Bangalore businesses lay in the extent to which they competed against larger companies. The great majority of my *Inc.* interviewees competed against other small companies or start-ups, so they were not handicapped by their lack of scale economies. Only four start-ups – all of who had developed a unique product or service – competed against large companies. In Bangalore however nearly a quarter of the start-ups in our sample competed against much larger competitors. Moreover the competition was apparently head-on: the Bangalore entrepreneurs did not even claim to focus on different customer segments, provide more customized products and services, or rely on different kinds of inputs. When we asked our interviewees about how they managed to do so, they acknowledged that their larger competitors probably enjoyed some economies of scale on the manufacturing side but that they had lower "overhead costs."

Could it be that our interviewees relied on tax evasion or bribery to compete in mature markets (and compensate for their lack of scale)? As mentioned, some of our interviewees told us that they did not report all their revenues in order to evade excise taxes. If small businesses have advantages in such evasion, they could offset the scale economies of their large competitors. About a quarter of our interviewees served governmental (or quasi-governmental) customers where paying bribes to secure orders is known to be commonplace. Some of our interviewees suggested that purchasing agents employed by private companies also demand bribes. Corruption and tax evasion though cannot by themselves explain abnormal returns. As long as the corruption is competitive, that is to say there are many vendors willing and able to pay a bribe to secure an order, none of them should earn a large profit.

An alternative hypothesis is that our interviewees did not in fact earn 'abnormal' returns. They invested their capital and their time on which they may have earned a 'normal' or market-

determined rate of return, but they didn't get anything for their insight, ingenuity, or 'hustle.' In Knight's (1921) terminology, they didn't earn a true profit. This would help explain why the *Inc.* 500 interviewees were able to build much larger businesses starting with roughly the same amount capital – the high profitability of the *Inc.* companies helped finance much higher rates of growth. But why should entrepreneurs take the risk of investing their resources in a single business, only to earn market rates of return? One possibility is that the entrepreneurs made a mistake and thought they could earn high profits without having a competitive edge. Or, entrepreneurs might face 'frictions' or high 'transactions costs' that would significantly reduce the net return that they could earn on their labor and capital in other people's businesses.

The hypothesis that many Bangalore interviewees earned a return just on their capital and labor is consistent with the source of their start-up ideas. 71% of *Inc.* founders replicated or modified an idea they had encountered through previous employment and nearly half simply copied their previous employer's business model (although they did not necessarily compete head-to-head with their previous employer). In contrast, just 35% of Bangalore interviewees got their idea in the course of their previous employment and less than 20% started their ventures in the same line of business as their previous employers. This suggests that fewer entrepreneurs in Bangalore were likely to have the prior knowledge (e.g. of fuzzy wants or opportunities for incremental innovation) that could sustain high profits.

Diversification

Only about half our interviewees in Bangalore (whose businesses, as I mentioned, were considerably smaller than those of my *Inc.* interviewees to start with) anticipated rapid growth in the future. Yet more that 80% planned to start or already owned another business. Some of these businesses were in the same or related fields. For instance, one entrepreneur we interviewed started as an electrical contractor. Then he started a service business that operated electricity generation plants (that provided a back up source of supply) for large software companies. And after that he started a manufacturing business that produced spare-parts for transformers. But in a majority of cases the diversification was unrelated. For instance an entrepreneur who started in road construction then opened a business that sold tomato ketchup. Another who developed 'smart cards' was also into biotechnology. The founders of a market research firm developed real estate.

Many of my *Inc.* interviewees had also entered new fields. For instance, two entrepreneurs started a business selling cables that connected personal computers to printers. At the outset they made extremely high 'arbitrage' profits, but as buyers and sellers became better

informed these profits disappeared. Our interviewees then got into the business of wiring up large commercial buildings with data networks. Another company started as a broker for scrap plastic morphed into a recycler of Styrofoam containers. Overall, about a third of the *Inc*. interviewees had significantly altered their original business idea and another third reported moderate changes. Another quarter or so were so-called 'serial entrepreneurs,' who had started one or more businesses before launching the venture that was in my *Inc.* 500 sample.

There is an important difference however, between the changes in business models and serial entrepreneurship of my *Inc.* interviewees and the diversification strategies of the Bangalore entrepreneurs. The entrepreneurs who started installing data networks got out of selling printer cable and the entrepreneurs who got into Styrofoam recycling stopped buying and selling plastic scrap. Similarly, serial entrepreneurs generally sell or shut down their prior business before starting their next venture. Our Bangalore interviewees however usually continued to operate their prior business – the entrepreneur who started selling tomato ketchup didn't stop constructing roads for instance. Their diversification strategies thus led to the creation of quasi-conglomerates that in India are called business 'groups.'

Sources of funds

Equity. We found one striking similarity as well as some differences in the strategies used by our Bangalore subjects and my earlier *Inc.* 500 interviewees. A large proportion of interviewees from both groups said that their personal funds represented the main source of their start-up equity. The size of the minority that reported raising arms-length equity financing (from parties who weren't relatives or friends of the founders) was however larger in the *Inc.* group. 7% of *Inc.* founders said that they had raised equity funds from private ("angel") investors and 4 % said they had raised equity from professional venture capital firms. In our Bangalore sample, only three businesses had raised equity from investors who weren't related to the founders. Of these three businesses, one raised equity from a U.S. based customer that wanted to create a reliable supplier. Another issued equity to a group of the founders' friends (who were informally assured that they would get a specified dividend). Only one business raised its initial equity from a truly arms-length investor. (According to the founder, the investor was a real-estate developer who provided a suitcase full of cash.) Moreover whereas about a third of our *Inc.* interviewees said that they had tried to raise outside equity and failed to do so, none of our Bangalore interviewees said they had tried and failed.

Similarly, 23% of our *Inc.* interviewees said they had raised outside equity after they had started their businesses to finance growth. In our Bangalore sample, 17 interviewees said they

had issued more equity after start-up. However, virtually all of them raised this follow on equity from the same (and therefore not arms-length) investors who had been stockholders from inception – only three did not. Of these three, one had issued stock to employees, one had taken an additional partner who then became active in the business and only one issued equity to truly arms-length investors. (This company first got financing from professional venture capitalists and then from the public markets.)

Some of our interviewees in Bangalore said that the growth of their businesses was constrained by their lack of capital. So we asked them whether they had tried to raise additional equity. One interviewee said that he had but that only "unsavory" characters were willing to invest and usually through a debt rather than an equity-like investment. Others expressed incredulity that anyone (who wasn't an active partner) would want to invest in the equity of a private company. As one of them said: "How would the investor know I wasn't cooking the books? Only public companies can have such investors."

Debt. 44% of Bangalore interviewees used borrowed funds to finance their start-ups compared to just 20% of the *Inc.* interviewees. Approximately the same proportion of interviewees from both groups (a little over 60%) used to debt to finance their growth.

All but four of the Bangalore founders who borrowed from banks said that they provided real estate, worth at least as much the value of their loans, as collateral. I did not record the proportion of Inc. founders who did so – the issue never came up in our interviews. However interviews with bankers in the U.S. who make loans to small businesses (see Bhidé, Stevenson and Bilden 1990) suggest that banks generally do not extend start-ups; this helps explain why 80% of the *Inc.* had no borrowing at the outset. The borrowing capacity of small businesses with track records depends on assets such as receivables, inventory or equipment that the business can provide as collateral. Banks will also routinely ask small business owners to provide personal guarantees of repayment, but this is mainly to align interests. Therefore owners do not have to pledge personal assets that will cover the full amount borrowed by their business.

Some of our Bangalore interviewees who did not have the collateral they would need to borrow from banks got unsecured credit from non-institutional lenders instead. Apparently they faced a variety of choices. For instance, some wealthy individuals lend money 'on the side' (in the same way that 'angel' investors make equity investments in the U.S.). These individuals, who are said to be unsystematic in their approach to screening borrowers, face high rates of default and charge extremely high interest rates. In contrast, professional moneylenders make systematic efforts to find good borrowers and assess creditworthiness. They require repayment through "post dated checks" – bouncing checks is criminal offence in India. They often form (or

so we were told) associations with other moneylenders belonging to their ethnic community. The associations circulate the names of defaulters and provide funds for their members' lending operations. As a result, default and interest rates are lower than those of the more free-lance moneylenders.

'Chit funds' represent another source of unsecured borrowing for businesses. A common type of chit fund comprises participants who commit to contribute a certain sum to a common 'pot' every month for as many months as the number of participants. For instance, a fund may have 10 members who commit to contributing $1000 per month for ten months. In the first month, any participant can bid for the pot, which is given to the participant willing to accept the smallest total amount. For instance, a winning bid might be for a pot of $9,000, which would require each participant to contribute $900 instead of $1000. In the next month, only nine participants can bid: each participant can only win a pot once. Ultimately in the final month, because there is only one eligible bidder left, the winning bid rises to the full $10,000. In effect, the early winners borrow from the later winners. The later winners receive 'interest' (because they get larger pots) but face the risk that the early winners may stop making contributions. So some chit funds restrict participation to a small group of individuals who know each other. Other schemes use 'managers' who recruit participants and guarantee their contributions; these schemes can mobilize larger pots, but because of the greater costs of protecting against defaults (e.g. having to compensate managers for their guarantees) the implicit interest rates are higher.

It is possible that similar sources of unsecured lending exist in the U.S. for very small businesses or low-income individuals. But none of the U.S. entrepreneurs I have interviewed have ever used post-dated checks to borrow from a moneylender or participated in a chit-fund like scheme.

Uses of funds

Our Bangalore interviewees said they made large outlays for the physical space they needed for their business. Excluding the 24% of founders who already owned their premises and 2 entrepreneurs who started out of their homes, our interviewees reported a median expenditure of Rs. 200,000. This compares to the median start-up equity of Rs. 375,000 and total capital (equity plus debt) of Rs. 500,000. By contrast, none of my *Inc.* interviewees said that premises represented a significant item on expenditure for their start-ups. The topic was only even mentioned in a few interviews, by founders who said that their lack of track record made landlords nervous.

The relatively high outlay on premises in part reflects the deposits demanded by landlords in Bangalore – tenants generally have to pay a deposit equal to at least 11 months of rent, compared to one month in the U.S. Similarly, in the U.S., owners of commercial retail space will sometimes trade off lower rents for a share of the revenues of their tenants. None of the businesses in Bangalore who used retail space had entered into such an arrangement. When we brought the possibility in one of our interviews, the entrepreneur ruled it outside the realm of possibility.

The high outlays of our Bangalore interviewees also reflected a preference for owning rather than renting premises. As mentioned 24% of founders already owned the premises they used for their start-ups: indeed two of them said that having a place provided the impetus to search for business. 12% acquired premises at the same time as they started their business. And of those who started by renting, over a third bought their own premises later on. So when we interviewed them in 2004, only 40 % of our subjects were in rented premises. In the U.S., just one *Inc.* interviewee – a Cuban immigrant in Miami who said he wanted to help out his father in the construction business – had purchased real estate to house his business.[*]

Bangalore entrepreneurs apparently used more funds to start or expand their businesses than their U.S. counterparts in other areas as well. They usually extended credit for 90 days or longer to their customers, compared to the 30 days that are customary in the U.S. But they received less credit and vendor financing from large suppliers than do their U.S. counterparts. For instance, a retailer of motorcycles told us that "because of some bad experiences" motorcycle manufacturers required immediate payment from all their dealers. An entrepreneur who had started a printing-and-copying shop told us that that the Xerox Corporation, which leases equipment to copy shops in other parts of the world, requires its purchase in Bangalore.

The Bangalore entrepreneurs we interviewed invested in 'making' goods that U.S. entrepreneurs routinely 'buy.' For instance, more than half of the entrepreneurs we interviewed in Bangalore owned electrical generators, and 22 % had uninterruptible power supply units as backups to the electricity supplied by the state-owned utility. Two entrepreneurs who had manufacturing units located outside city limits said that they relied entirely on their in-house generators. To my knowledge, none of the *Inc.* business that I interviewed had invested in electrical generators, although it is possible that some had attached small uninterruptible power supply units to their computers. (Famously, although they were not part of our random interview

[*] Until personal tax rates were sharply reduced in the early 1980s, it was more common for small business owners to personally own their premises in the U.S. as well.

sample, the large software companies and call centers run their own fleets of buses to transport employees.)

Moreover it is not just the services of public utilities that the Bangalore entrepreneurs had chosen to make instead of buy. Investments to create self-contained businesses were commonplace. For instance, our very first interview was of an entrepreneur who started duplicating audiocassettes (from a "master") for producers of devotional music. Now he makes his own blank audio cassettes and has built his own music studio for recording the "master". Another entrepreneur who started assembling power distribution panels and switches now fabricates his own components.

Organizational development

In the U.S., founders of archetypal venture capital-backed start-ups use equity options to recruit and motivate well-qualified employees. The founders of the *Inc.* companies we had interviewed generally did not. The questionable prospects of their ventures, which made it difficult to raise outside equity, also made it hard to use options to attract top-notch employees. Instead, many founders provided most of the critical labor themselves. They also used their networks and relationships to try to hire 'diamonds in the rough' (i.e. innately talented individuals who lacked verifiable credentials or had some taint -- such as being unemployed -- that made it difficult for them to find good jobs.) For such individuals, the modest incomes *Inc.* companies provided constituted an "efficiency wage."

Later as the *Inc.* companies grew and uncertainties about their prospects resolved, their hiring policies evolved toward the venture-capital archetype. The companies would offer higher wages and stock options to attract experienced employees. And, founders would stop making all the decisions and hire professional managers. For instance, in my sample of *Inc.* companies, the proportion offering equity or equity options to employees rose from about a quarter at the outset to a about third when we interviewed them. Similarly, only 9% had professional managers at the outset; another 25% added them later.

Like the *Inc.* 500 interviewees, our Bangalore interviewees did not pay high wages to attract well-qualified employees. They made even less use of equity or equity options – only four founders, all of whom had started Information Technology based businesses said they had. None hired professional managers at the outset. Furthermore, our interviewees did not try to hire 'diamonds in the rough.' Apparently the Bangalore entrepreneurs were only looking for undifferentiated 'lumps of labor' rather than exceptionally talented or driven individuals.

Moreover the minimum skill level expected was generally low – only 28% of interviews mentioned starting with "skilled" employees.

We also found little evidence of post start-up 'professionalization' through the hiring of managers, at least in the way the word would be used in the U.S. Only one interviewee spoke of the importance of hiring good 'middle-managers' and even in this case I believe that the entrepreneur was really referring to production supervisors in his garment factory. Similarly, a few other interviewees referred to office administrators as managers. Judging by the kinds of tasks that many of our interviewees undertook in the course of our visits it seems extremely unlikely that they had delegated any true managerial authority to anyone. And 'upgrading' of the non-managerial employees only appeared to occur primarily through the adoption of new technologies. For instance, when businesses replaced lathes with numerically controlled machines, they hired people who could operate the new equipment.

In a few cases our interviewees told us that they had to go to some trouble to find the employees they needed. For instance, one entrepreneur who had started a hair exporting business told us about standing outside a competitor's factory in the city of Chennai in order to buttonhole someone who might be willing to join his start-up. But such cases were an exception to the generally more passive and impersonal approach to recruiting. Interviewees who had manufacturing businesses used what they called 'gate recruiting' – putting up a notice outside their factory gates – for blue collar employees. Others said that blue collar employees simply 'showed up' looking for work. The selection process itself did not involve extensive interviewing – in some cases entrepreneurs could not speak the language of their recruits (usually Kannada) fluently and had to rely on subordinates to do the hiring for them. And when we asked interviewees about the educational qualifications of their blue collar employees it was apparent that they didn't have much knowledge or concern about this.

Interviewees who hired white collar employees (including software programmers) used the impersonal mechanisms of advertisements and placement agencies in situations where their U.S. counterparts would have relied on personal referrals and relationships. One interviewee had in fact previously started a business in the U.S. before moving to Bangalore. In the U.S. he had relied only on prior relationships. He first hired former colleagues. These former colleagues then used their contracts to bring in more employees. Through this process the organization grew to over a hundred employees. In Bangalore however, the entrepreneur said that his company had hired exclusively through advertisements and head-hunters. Another founder of a software business said he did hire people who had been referred to him but with great reluctance. Apparently he belonged to a religious order (a *mutt*) and when the leader of the order sent him a

candidate he felt he had offer the person a job. Given the choice however he would much rather advertise.

We heard many complaints, almost never expressed in my *Inc.* interviews, about the difficulty of retaining employees. Software programmers, we were told, were always trying to move to large companies like Infosys and Wipro. And as soon as they got a job offer, they would leave, sometimes in the middle of a project. Moreover complaints about turnover were not restricted to businesses in the booming software industry. We also heard them from the owners of manufacturing companies – a sector in which employment has declined in recent years. One founder of a machine tool company said that he often felt that he was running a 'training institute.'

A few entrepreneurs had used traditional paternalism to try to control turnover. For instance one staffed his plant entirely with people who he brought to Bangalore from the village his wife came from and gave them lodging and board at his home. A few other interviewees told us about making gifts or loans to their employees to pay for weddings and medical expenses; in other words they created indebtedness or the expectation of 'insurance' that would discourage employees from leaving. More commonly however, employers tried to ameliorate the consequences of turnover rather than to prevent it. For instance they would overstaff software projects so that the disruption of departures would be minimized. Manufacturing companies would use technologies and equipment that fresh recruits could learn to operate quickly. They might also have more quality checks on the line to catch the mistakes of inexperienced operators. None of our interviewees however spoke of paying an efficiency wage to discourage turnover. When I brought up the possibility in a few interviews, the entrepreneurs expressed the same incredulity as when I had asked them about raising equity from arms-length investors. Efficiency wages couldn't work in India our interviewees said – workers just didn't think enough about the long term.

Founders' backgrounds

Education. The founders of the *Inc.* companies we had interviewed were considerably better educated than the U.S. workforce as a whole (and presumably the founders of low-growth businesses). For instance, only about 20% of the U.S. workforce has college degrees. In contrast 81% of my interviewees had college degrees and 10% had M.B.As. Many had attended prestigious institutions: the undergraduate colleges included Amherst, Caltech and Princeton and the list of graduate business schools included Harvard, UCLA and Stanford.

Our Bangalore interviewees were, like the *Inc.* founders, very well-educated compared to the overall population of their countries. Only two had not completed high school. Sixty three percent had received university degrees and another 16% had completed 'pre-university college' or earned 'diplomas' (from 'accredited' institutions that don't have the status of a university). Thirteen percent also had earned degrees from graduate programs – they included one founder with a PhD, two with medical degrees and two MBAs. By contrast, according to the latest census, the overall literacy rate in India stands at just 52.2% and about 40% of the children who enroll in primary schools in India drop out. [*]

About a quarter of our interviewees had grown up in rural or semi-rural parts of India where levels or education are generally lower than in urban areas. For instance, according to the most recent census the literacy rate in rural India is 44.7% compared to 73% in urban India. But interviewees who had grown up in rural areas did not appear to be less well-educated than interviewees from urban areas. In fact, a slightly higher percentage of rural interviewees than urban interviewees had received university degrees. (The two entrepreneurs who had not completed high school both grew up in rural areas, however.)

About half of the Bangalore interviewees with university degrees had trained as engineers. In contrast, my notes from our *Inc.* 500 interviews suggest that only about 15% of the college graduates had majored in engineering. I also do not have precise numbers but it is unlikely that half of the university degrees granted in India are in engineering. (For instance, engineering students accounted for only about 8% of total university enrollment in the city of Mumbai in 1997.) However, competition for places in engineering colleges is generally stronger than competition for places in colleges offering degrees in the Arts and Sciences or in Commerce. Apparently, our interviewees were more successful than the average applicant for these desired places.[†]

Socio-economic origins. Founders of the companies on the *Inc.* '500' lists, according to the magazine's own survey, have middle class or upper middle class upbringings; only 5% of founders reported that they came from poor backgrounds. Although we didn't specifically ask our *Inc.* interviewees about this, none mentioned that they had grown up poor. And, groups that (for whatever reasons) have lower than average incomes were underrepresented in my sample. I recall interviewing only one African-American, who also happened to have an M.B.A. from Harvard Business School, and just 12% of the founding teams included women. At the same time

[*] Census data on literacy rates is posted at www.censusindia.net/literates1.html. Drop out rates from primary schools have been reported in *Selected Educational Statistics 2000-2001, Government of India.*

[†] Two of our interviewees provided a quite unasked for explanation about why they had earned a bachelors degree in science instead of in engineering.

none of my interviewees were the off-spring of parents who appear on the *Forbes* 400 billionaire list.*

Our Bangalore interviewees too did not appear to come from disadvantaged segments of Indian society. One interviewee did say that he had to drop out of school as teenager after his father died – he was one of ten children – leave his village home, and take a job as a busboy in restaurant in Bangalore. Other than that one instance, we didn't hear of seriously deprived upbringings. The professions of the fathers of most of our interviewees also don't point to a low-status background. About a quarter of our interviewees' fathers were businessmen. Thirteen percent were engineers, lawyers or doctors. Six percent had been in the army (including one general) and another Six percent had worked for the government (two in the upper echelons). Eight percent were farmers (but not of the landless variety) and 10% had been 'landlords.' We were also told about 5 teachers (including one headmaster), one coffee 'planter' (it was not clear whether he was the owner or manager), one 'senior executive,' one employee of a private bank, one police officer, one 'village scribe' and one priest. Only three (2 mechanics and a weaver) had blue collar jobs. (We did ask our interviewees about their mothers' professions. Only two said they had working mothers.)

At the same time, our interviewees did not appear to have had extremely wealthy parents. The businessmen our interviewees said they were the children of were not running sizeable enterprises or groups. Some interviewees had parents who had fallen on hard times. For instance one of our interviewees had to drop out of college to support his mother after his father, who had previously earned a handsome living overseas, died. Another did finish college but had to use some of his scholarship money to support his parents – apparently he came from a landowning family that had given away its property to charity.

We also asked our Bangalore interviewees a question that I could not have asked the *Inc.* interviewees – whether they belonged to a 'business' community (eg. *Vysya* or *Chettiar*) or hailed from a region (such as the *Marwar*) that has been traditionally associated with business. About a third – which is almost certainly greater than their share of the population – said they did. Moreover, 40% of interviewees from business communities said that their fathers had also been businessmen compared to 16% of interviewees who did not come from a business community who said their fathers were businessmen. This data suggests that whereas business might be more of a hereditary profession in India than in the U.S., it is not the exclusive preserve of traditionally

* I believe the individual with the most well-to-do background we interviewed was John Katzman. Katzman was raised in a tony part of Manhattan. His grandfather invented the electric vaporizer and his father ran a family-owned manufacturing business. Katzman used to tutor college-bound for their SAT exams and shortly after graduating from Princeton University started the eponymous Princeton Review.

business communities. After all, two thirds of interviewees were not from such communities, and a majority of the interviewees from business communities did not have fathers who were in business.

About 40% of the interviewees who said they were not from business communities (i.e. about a quarter of the total sample) volunteered the information that they were Brahmans. This means Brahmans (who constitute about 10% of the population) were also 'overrepresented'; indeed there were almost as many Brahmans in our sample of interviewees as there were members of business communities. Slightly over half of the Brahman interviewees also said that they didn't have any relatives from earlier generations who had been businessmen; but only one said that he didn't have any relatives of his generation or from a younger generation in business. Some of our interviewees said this pattern reflected a change in how Brahmans regard careers in business. Brahmans used to avoid business, they said. But dwindling opportunities in the careers Brahmans had traditionally dominated (because of factors such as the improved education of the members of other castes and reservation policies) had encouraged them to start businesses. Similarly, one interviewee mentioned that the loss of family lands due to land reforms had led him and other Brahmans in his village to move to cities to open restaurants. In other words, starting a business had become an avenue for Brahmans to maintain their social and economic status.[*]

If Brahmans and business communities were 'over-represented,' what groups were under-represented? It seems likely that (as with the *Inc.* founders I had interviewed in the U.S.) there weren't many members of traditionally disadvantaged groups among our Bangalore interviewees. We didn't ask our interviewees about whether they were members of 'scheduled castes or scheduled tribes' – the 10-15% of the Indian population previously referred to as 'untouchables.' But very few had fathers in occupations traditionally considered 'low' caste. Only 4% of interviewees were Muslims. And Muslims, who account for about 13% share of the overall population, have considerably lower incomes and literacy rates, (especially in urban areas) than Hindus who make up about 80% of the population (Perry 2003).

Geographic origins. The *Inc.* 500 interviewees were, geographically speaking, restless rather than rooted; our Bangalore interviewees even more so. About half the *Inc.* interviewees had been not raised in or around the place where they had started their companies – they had

[*] Although it many not be part of their identity, Brahmans have never really shunned business. Some of the most prominent industrial groups in Southern India (e.g. the TTK, TVS and Pai groups) have been owned and started by Brahman families. Similarly, the business historian Tripathi (2004 p. 31) notes that the Deshastha Brahmans and Chitpavan Brahmans became prominent bankers and traders (*savakars* or *sahukars*) during the ascendancy of the Maratha empire in the early 1700s.

moved there for an education or to take a job. About 20% percent of these transplanted founders had been born outside the United States. Similarly, in our Bangalore sample two thirds were not natives of the city. About half of the non-natives had moved to Bangalore for a job, a fifth had come as students, and nearly 30% had moved to Bangalore specifically in order to start their businesses. In my *Inc.* interviews none of my transplants had moved to the place where they started their business.[*]

Moreover the transplants had often studied or worked in several places in India before moving to Bangalore; many of the Bangalore natives had also worked in other parts of the country before returning 'home.' This moving around is reflected in the languages spoken by our interviewees. All but two of our interviewees spoke English (at least to the point that we could interview them in English). Ninety percent of interviewees spoke at least two languages, 65% spoke three or more languages and about 30% spoke more than three languages. (Interestingly several of the transplanted interviewees expressed diffidence in their ability to speak Kannada – the official local language – fluently.)

Although the interviewees had studied or worked in many parts of India, only four had lived outside India – namely in Indonesia, Britain, the U.S. and the Middle East. And of the four, two had lived outside India with their parents; only two had gone abroad on their own. (None of the native born *Inc.* founders we had interviewed had indicated that they had lived outside the U.S. either.)

Opportunity costs. Although they were well-educated few *Inc.* founders appear to have faced high opportunity costs – they didn't give up high paying jobs to start their businesses. Indeed over a third reported that they had started after being fired or after having a serious disagreement with their employers. We didn't specifically ask about their age, but our best-guess reconstruction suggests that about 35% of interviewees were under 30 and 70% under 35 when they started their businesses. Therefore if their ventures had failed, the founders had many years of their working lives ahead of them to do something else.

We found similar patterns among our Bangalore interviewees. About half were less than 30 years old and about 72% were under 35 when they started their first business. Of the interviewees who started their businesses before they turned 30, about half had never worked for anyone else. In some cases this was because they couldn't find attractive jobs, whereas in some

[*] The transplants did not arrive in equal numbers from everywhere however. The distribution of their mother-tongues indicates systematic patterns to the ethnicity of the transplants. The mother-tongues of 74% of transplants were languages native to one of the four 'southern' states (Kannada, Konkani, Malayalam, Tulu, Telgu, Tamil and Urdu). 13% had mother-tongues used by the business-oriented communities of the north (Gujarati, Punjabi, Sindhi and Marwari). The mother tongue of just 11% of the transplants was Hindi, the official national language of India. None had Marathi, the official language of the state just north of Karnataka.

other cases they came from business families and were expected to start their own business. Of the over 35s, two had started their businesses after they had turned 60 and had retired from their jobs. Here too there was little opportunity cost. The other over 35s however may have faced a significant opportunity cost in that they voluntarily gave up secure employment; in contrast to the third of *Inc.* interviewees who started their businesses after being fired or having a serious disagreement with their previous employers, all but three of our Bangalore interviewees said they had left their previous job on cordial terms.

Family roles.

The relatives of the founders were an important source of the seed capital raised by about 7% of the *Inc.* startups. In addition, 10% of the *Inc.* startups had relatives on the founding teams. Twelve percent had relatives as employees; 5% used relatives to provide counsel or contacts and 11% to provide part-time services. Casual observation suggests that this sort of family involvement may also be common in low-growth start-ups but not in venture capital-backed start-ups.

Relatives appear to have played a somewhat more important role in the ventures of our Bangalore interviewees than in my *Inc.* interviewees. Fifteen percent raised their initial equity from their parents and other relatives. Parents and occasionally other relatives also pledged their property as collateral for bank loans.

More Bangalore interviewees than *Inc.* interviewees had family members on their founding teams. The proportion of businesses started by teams of founders (rather than by individuals) was lower in Bangalore. Just over 60% of Bangalore founders reported starting with a team compared to about three-quarters of *Inc.* interviewees. However, less than one in seven of the *Inc.* founding teams had members who were related – generally through marriage – to each other. In Bangalore about half of the founding teams had members who were related. (Except in three cases, these were not husband-and wife teams; the others comprised male relationships of father-and-son, cousins and brothers.) About 60% of Bangalore interviewees (i.e. five times the proportion of *Inc.* interviewees) also reported hiring employees on a full time basis.

Family considerations had provided an impetus to some interviewees to start their business. For instance one of our interviewees was from a *Marwari* 'joint' family (or to use the proper legal term, a Hindu Undivided Family) that had a manufacturing business in the northern state of Rajasthan. In law and in fact, such families function as 'firms.' The male head of the family (or *karta*) serves as CEO. Other family members help him manage the enterprise. When our interviewee finished college, the existing enterprise didn't need any more managers, so he

was sent off (at age 23) to replicate the business in Bangalore. The Bangalore operation was independently incorporated but for practical purposes was a wholly-owned subsidiary of the family. We also found interviewees who had participated in a family business in some other part of India. Our interviewees had moved to Bangalore to set their own businesses after they had come into conflict with their relatives or because they had exhausted the potential of their prior local markets.

Family obligations also apparently led some interviewees to delay starting their businesses. For instance one interviewee said that he had wanted to start a business when he was in his twenties. But he had parents, a wife and children – he had been married early – to support. So he deferred his entrepreneurial dreams and got a secure job in a state-owned bank. Then more than twenty year later, after he felt that he had discharged his family responsibilities, he resigned his position in the bank and started looking around for a business to start.

Some interviewees said they had faced family pressures not to start their business but had gone ahead nonetheless. One recalled asking his mother for permission after he had graduated from college to start a business. She said 'yes' and then reminded him of his responsibility to send regular remittances to support his parents. Another interviewee, who was from to a well-to-do farming family, had come to Bangalore to attend (an engineering!) college. He refused to return to his village after he finished because he wanted to start a business. An irate father then cut off financial support. Our interviewee said he then subsisted on one meal and many glasses of water a day till he could get his business off the ground.

4. Hypotheses about differences

Proximate explanations

Earlier we saw that the proportion of Bangalore businesses that show gazelle-like growth is about half of that in the U.S. and the number of such firms (adjusted for population) is many times smaller. Our analyses of registration data (and interview results) suggest that businesses in Bangalore that grow very rapidly by local standards do not expand as rapidly as *Inc.* 500 companies that occupy the high growth tail in the U.S. distribution. Crude measures suggest that high-growth Bangalore start-ups make less efficient use of capital.

Our interview findings suggest some first level or proximate explanations for the relatively low performance of Bangalore businesses. They pursue less promising opportunities and so don't earn the high profits that they could use to expand their businesses. Low profitability also makes it difficult to raise arms-length capital for finance expansions. They build mini-conglomerates comprising many small businesses instead of focusing on realizing

economies of scale and scope in one large business. Economies of scale and scope may also be lost because of vertical integration – 'making' goods on services instead of 'buying' them from a large specialized provider. Vertical integration also ties up capital, as does purchasing real estate and extending very long credit terms.

The same factors may also explain the low number of high growth businesses in Bangalore: if their capital requirements are high compared to average levels of income, only a few very well-to-do individuals will be able to start them.

But what makes entrepreneurs pursue low-profit opportunities? Why do so many diversify when their U.S. counterparts focus on growth? Why do they invest in real estate, extend 90 days or more of credit, and make what they could buy?

Catching up on technological backwardness

The following case can be made that wealth-constrained individuals in the U.S. have more opportunities to start and grow profitable businesses by helping to push the technological frontier: increases in incomes and profits require improvements in the productivity of labor and capital. In advanced countries like the U.S., most resources are already in or near their highest-valued use. Any increase in their productivity requires new technologies (broadly defined). Without new technologies economic growth winds down and profits and incomes stagnate and so there are strong incentives to develop new technologies.

In some fields (such as bio-technology) large capital requirements preclude any role for the small start-up. In many other fields however self-financed entrepreneurs, who have advantages in conducting low budget experiments on novel ideas, can play a significant role. For instance, most of the early stage development that took place between 1975 and 1980 was undertaken by self-financed entrepreneurs. Although the technological contributions of any single start-up are generally not dramatic, their collective efforts transform novel yet primitive ideas into technologies of demonstrable commercial viability. Moreover, at least some of the start-ups can earn very high returns, through rather incremental innovations. Later, as industries mature many of the early entrants die off. A small number though can expand rapidly as markets grow and innovations that offer economies of scale and scope become available.

In an under-developed economy, however, increases in incomes and profits do not require U.S.-style technological innovation. Almost by definition, the actual productivity of its resources is below that in developed economies since the technologies in wide use in it are inferior to the technologies already introduced and in extensive use in developed economies. Rapid growth can be achieved merely through the introduction into and diffusion through the

economy of such superior technologies. (A contrary view is that poor countries need to evolve "appropriate" technologies of their own to raise their productivity.)

Moreover, the returns from investing in new technologies are generally lower than the returns from acquiring and implementing existing technologies from the developed countries. This is because existing technologies can be acquired at lower costs since the outlays required for their development have already been incurred. And although there is some uncertainty about the fit of transplanted technologies with the local environment, the basic technical and market risks are long gone.[*] Therefore, the opportunities that U.S. entrepreneurs have to profit from making incremental contributions in the early stages of the development of new technologies will be considerably less abundant for their counterparts in India.

Individual entrepreneurs who cannot mobilize large amounts of capital also face disadvantages in acquiring technologies from abroad. Proven technologies usually require large-scale operation. New technologies often start out in niche markets; their subsequent application to mass use turns on the realization of significant economies of scale, through mass production techniques, for instance. By the time many technologies become proven they are no longer suited for entrepreneurs' small start-up businesses. In addition, the acquisition of proven technologies, even when it is just a matter of copying or reverse engineering, involves fixed costs. These costs are more easily amortized by a large enterprise. Since large, established organizations (including wealthy family groups) have natural advantages in mobilizing the resources required to operate a large-scale enterprise, much of the low-hanging fruit offered by proven overseas technologies lies outside the reach of wealth-constrained individual entrepreneurs.

And indeed, large organizations – or exceptionally well-credentialed individuals who are capable of mobilizing capital on a large scale have been at the forefront of the visible manifestations of technological catch-up in India. Many modern automobile and motor-cycle plants have been started, but all by existing Indian and multi-national companies. Two chains of coffee shops, apparently based on the Starbucks model, have opened; both have been sponsored by powerful business houses and families. With the exception of Infosys (which like the typical *Inc.* 500 type start-up was started with modest funding provided by its founders), much of software off-shoring and call-center operations are controlled by diversified Indian conglomerates or groups, overseas companies or individuals with venture capital backing.

This does not mean, however, that small entrepreneurs cannot find profitable opportunities to contribute to underdeveloped countries' progress in catching up. Even in the

[*] The social returns are also unattractive: resources devoted to innovation can impair development by diverting resources from the more valuable tasks of adopting known-to-be superior technologies.

U.S., experimenting with completely new technologies is only one of the contributions that individual entrepreneurs make to economic growth. The entrepreneur's capacity to undertake low budget experiments has value not just in the very early stages of a new technology; even after the basic elements of a new technology have been proven, its subsequent diffusion also requires considerable trial and error. Thus, low budget entrepreneurs stopped playing a preeminent role in the development of personal computers after IBM's entry in 1981 raised the scale requirements in many segments of the industry's value chain. Yet their contribution didn't end in 1981. In the decades that followed, entrepreneurs helped develop a host of complementary products and services that made the PC a ubiquitous artifact. In fact, all the computer related companies from the 1989 *Inc.* lists that we interviewed had started in this second, post-1981 phase.

Similarly, the successful implementation of technologies that are 'new' to India should require a host of new complementary goods and services to make them suitable for local use. Individual entrepreneurs who have a comparative advantage in conducting low budget experiments can play a critical role in developing such small-scale complements, many of them unique to the less developed economy. For instance, large companies may have an advantage in acquiring and implementing modern technologies to build automobiles. However, the widespread diffusion of the new automobiles requires a host of new distribution and servicing outlets. Individual entrepreneurs may enjoy advantages in starting these outlets. In other words, we might expect large new catch-up businesses to create – either through their own purchases or by creating demand for complements – opportunities for small businesses to grow.

The registration data reviewed in Section 2 might suggest that large organizations have deprived small businesses of growth opportunities -- as mentioned, businesses in Bangalore start large instead growing large. But businesses started on a large scale appear to have flourished only in a few industries such as automobiles and software. Outside these sectors, the number of large new businesses appears too low for them to have either usurped many opportunities from small businesses – or helped them grow. On the whole, large organizations continue to play a very modest role in Bangalore. As mentioned in Section 2, our estimates suggest that firms with more than 500 employees in Massachusetts employ 17 times as many people as do Bangalore registrants with more 500 employees. And as Table 8 shows, the proportion of new registrants with more than 500 employees has increased in recent years only because there were no such registrants in the 1990s. The actual percentages remain extremely small – 0.3% in 2002 and 0.3% in 2003.

In a previous era, the government reserved many sectors for small units in which large businesses were simply not permitted to operate. Although most of these reservations have been

removed, as we will see below, other features of the environment continue to encourage businesses to start small and stay small.

Indirect taxes

The system of indirect taxation has a powerful influence on the decision of entrepreneurs to operate many small businesses instead of one large business. From colonial times, indirect taxes (such as excise duties and sales taxes) have been a major source of the government's revenues. Although their share has declined, they still account for about 60% of total tax revenues. Excise duties in turn account for about 60% of indirect taxes. The basic excise tax has been fixed at 16% of the value of a firm's output. Then there are a variety of concessions, exemptions and surcharges. For instance, a "concessional duty rate" of 8% is levied on categories like food products, matches, cotton yarn and computers. An additional "special excise duty" (SED) of 8% is levied on products that include polyester filament, cars, air conditioners and tires. An "additional excise duty" ('AED,' not to be confused with 'SED') is levied on "goods of special importance" like sugar, tobacco and textiles.

Some goods, like cement, are taxed by weight or by volume rather than by their value.

Exemptions are numerous and complex. They fall under 70 broad categories, subdivided into 259 entries, 52 conditions and 7 lists, with each list containing numerous items. Businesses located in certain troubled or backward areas don't have to pay excise taxes, nor do businesses with less than Rs. 10 million in total revenues.[*] A large business (with more than Rs. 10 million in revenues) subject just to the basic rate would have to realize cost savings through economies of scale of 16% of the market price of its output in order to survive. For businesses with "special" and "additional" duties the cost savings have to be twice that. Statutory contributions to health insurance and retirement schemes and other non-wage compensation that employers have to provide under the rules such as the Bonus Act have similar effects. As mentioned, statutory contributions to health insurance and retirement schemes amount to about 15% of regular wages. If we include other payments such mandatory bonuses, the total non-wage costs faced by the typical employer amount to 50% of regular wages according to one estimate. And here too there is size threshold – businesses with less than 20 employees don't have to incur these costs.

Apprehensions about the long term consequences may also play a role in discouraging businesses from expanding. According to some of our interviewees, once a business registers with the excise tax authorities or enrolls in the provident fund scheme it cannot easily withdraw

[*] I have relied on the report published by the Ministry of Finance (2004) for the facts on indirect taxes mentioned in this section.

even if its revenues or employment subsequently fall below the prescribed thresholds. Businesses who register for excise taxes also run the risk that tax officials who have to satisfy a collection 'quota' or expect a bribe may make excessively high assessments of the tax liability.

The tax system helps maintain sub-scale businesses in subtle ways because of the abuses that its exemptions invite. For a price, low ranking officials who have considerable discretion in applying the conditions can be persuaded to reach favorable interpretations. Goods taxed at high rates (e.g. polished granite) are sold as goods taxed at lower rates (e.g. unpolished granite). A business with Rs. 20 million in sales will record sales of less than Rs. 10 million. Or it may operate multiple units where each unit has sales of less than Rs.10 million and, ostensibly, different owners.

The evasion of excise taxes is more contagious than the evasion of taxes on profits and incomes. If one firm evades excise taxes (and the tax rate is high compared to pre-tax profit margins in the industry), its competitors also have to cheat just in order to survive. In contrast, if a firm evades 'direct' corporate income taxes, survival does not require its competitors to do the same thing. And as evasion increases, governments levy 'additional" or "special" duties, which leads to further evasion.

The evasion of direct taxes also increases. The bribe paid to the excise tax collector for a favorable classification, the difference between the value of polished and unpolished granite, and the under-reporting of true revenues, creates "black" funds, which cannot be declared on income-tax returns. And this black money in turn can be more easily recycled into the assets of many small businesses rather than one large business. Moreover, widespread evasion also discourages investors from providing the equity capital that can help businesses expand. Domar and Musgrave (1944) pointed out sixty years ago that taxes on business profits represent an equity claim. If investors believe that business owners routinely cheat on the government's equity claim they will be skeptical about receiving their due share of profits as well.

Labor Laws and regulations

Rules intended to protect workers also contribute to the reluctance to operate on a large scale. In particular, our respondents expressed concerns that employing more than 20 workers makes them liable for inspections under the Factories Act (which additionally requires them to contribute to health insurance and retirement plans that increase their labor costs). Surprisingly (at least to me) restrictions on layoffs and terminations did not seem to concern any of the entrepreneurs we interviewed. One entrepreneur said that as workers see signs of business failure, they leave for greener pastures of their own accord. This explanation would be consistent

with the widespread unwillingness of employers to pay efficiency wages. Another entrepreneur claimed that when employers run short of funds they often stop contributing to their employees' insurance schemes and retirement plans and may even stop paying salaries. The employers' subsequent inability to clear these unpaid dues (which can lead to criminal prosecutions) then makes it impossible to terminate unwanted employees.

Infrastructure

Power failures are an everyday occurrence in Bangalore, and no one can fail to notice the poor state of the roads and public transport. These deficiencies do not however necessarily penalize large firms. Indeed, they may increase the benefits of scale – for instance, a large business can use a higher capacity and lower per unit cost generator for its in-house supply of electricity than a small business. But 'making' instead of buying electricity does tie up capital, and the higher costs of generating electricity on a small scale reduces profits. This makes it difficult for wealth-constrained individuals to finance the expansion of their businesses.

Deficiencies in the transportation system for physical goods also likely impede the realization of economies of scale. In principle, India's huge population should support large scale production; but in fact, for many goods and services the country comprises a collection of small local and regional markets. Manufacturers who produce on a national scale face high costs in transporting goods to their customers because large efficient trucks cannot operate on narrow poorly maintained roads. My first hand experience[*] suggests that traffic police and officials of the road transport routinely extort bribes from truck drivers; truck owners I interviewed also said that such extortion is widespread and conducted in a remarkably well-organized manner. The railway system operates at more than its safe level of capacity utilization and goods transport has to compete with the politically more powerful demand for passenger trains. As a result, even companies that are large often produce their goods in dispersed regional plants. This in turn limits the optimal size of suppliers' facilities.

Similarly, bottlenecks in harbors and inefficiencies in loading and unloading sea-containers limits scale economies of exporting companies in the manufacturing sector. The deficiencies of the Indian system compared to that of countries like China[†] makes it difficult for Indian companies to compete in export markets for goods where the cost and speed of sea-borne

[*] I was in a truck carrying my parents' household furniture between two cities and had taken responsibility for making all the necessary payments en route.

[†] I have argued elsewhere (Bhide 2004) that the defects in system of direct taxes starve the government of the revenues needed to improve the infrastructure.

transportation matter to their customers. Typically, such goods involve high volume manufacturing.

Although interviewees did seem to be aware of its influence, the types of businesses they were in appeared to reflect the parlous state of the transportation infrastructure. About 40% of our interviewees manufactured physical goods; of these only 3 sold their goods to customers in India outside the immediate region. And in all three cases the transportation costs accounted for a small percentage of the value of the goods (namely smart cards and specialty chemicals). Similarly, most of the businesses that served export markets (15% of the sample) provided services rather than physical products. The three companies that did not export services made high-value, low volume products (such as human hair sold to wig makers abroad) in which they did not face competition from Chinese producers and could bear the costs of air-freight.

Land

Our interviewees believed that acquiring land and buildings was a good investment because prices "always went up." The expectation has some basis in the dynamics of supply and demand. The demand for land in cities will almost certainly continue to increase because the transition from a rural to an urban economy is far from complete in India. The supply of land with basic municipal amenities such as water and electricity is limited by infrastructural constraints mentioned above. Moreover because of poorly maintained land records, many parcels lack clean titles.

But shouldn't rising future demand and inelastic supply be fully reflected in current prices, thus erasing the incentive to buy instead of rent? Not necessarily. Given the lack of reliable data (about virtually everything) there is ample room for disagreement. So buyers may believe – without deviating from 'rational' decision-making standards – that the price a seller is asking for a particular property is too low. Tenants may also be afraid of being 'held-up' by landlords when leases run out if they don't have many other places they can move to.

Government policies encourage businesses to purchase commercial and industrial properties by making offers to 'owner-occupants' that they cannot refuse. This in the following manner: the government uses eminent domain-like rights to acquire raw land – this cleans up its title – and provides it with municipal amenities. Then rather than selling it at the highest price the market will bear, the land is sold at an administered price to businesses (who are not supposed to sell or rent the property for a specified period). One of our interviewees estimated that his purchase price from the government was about 25% lower than the purchase price of an equivalent plot plus the bribes he would have had to pay to clean up the title and secure municipal

amenities. The implicit subsidy for a buyer unwilling to pay such bribes is much larger, since without a bribe it may be simply impossible to get a clean title and amenities. In addition to selling land at subsidized prices, government agencies also provide financing at favorable terms to small businesses.

Property rights

We have already seen that the failure of the state to properly define land rights (i.e. who owns what) has a profound albeit indirect influence on investment decisions. The failure to define and enforce property rights also increases capital requirements in other ways. As mentioned, copy shops in Bangalore have to buy copiers because manufacturers are no longer willing to lease copiers. Apparently the market for copier leases collapsed because the legal system could not limit the disappearance of leased copiers to levels that would allow the market to function. Similarly, the legal system was apparently unable to adequately deter motor-cycle dealers from 'diverting' the inventory financed by manufacturers. As a result, manufacturers now demand up-front payment.

The judicial enforcement of private contracts in India is also almost certainly worse than it is in the U.S. But to what degree does this explain the 'performance gap' between the *Inc.* 500 and Bangalore interviewees? Certainly our Bangalore interviewees expressed great skepticism about the court system. They also rarely used written contracts. Interestingly, the few interviewees who did offered reasons that had little do with trying to secure judicial protections for their rights. For instance, one interviewee said his company had started making more of an effort to write up agreements to avoid misunderstandings as its projects had become more complex. Another said that he started using contracts to improve internal controls – he didn't want his salespeople making reckless oral promises to customers.

But even in the U.S., which has far more reliable and efficient courts, parties aggrieved about the breach of contractual commitments often do not seek legal redress. Garment suppliers will continue selling to department stores that flagrantly breach contracts (while trying to get even by surreptitiously raising prices). And when suppliers don't want to continue servicing an errant buyer, they will often take a loss and walk away rather than spend time and money on a lawsuit (Bhidé and Stevenson 1990).

Even in the U.S., a lot of business gets done without written contracts (Macaulay 1963, 1985). And, at least in part, written contracts may be more common because they have more

value in a technologically advanced economy – for instance, businesses undertake more complex projects where there is greater scope for misunderstandings.[*]

Common beliefs

I have previously argued (Bhide 2000) that economies of scale and scope are created by driven entrepreneurs rather than automatically or accidentally discovered. Thus the ambition and ability of a Ray Kroc or a William Wrigley, rather than innate differences in product attributes, explains why hamburger and chewing-gum markets are highly concentrated when markets for hot-dogs and lollipops are not. In other words, the choices and mind set of individual decision makers matter. Similarly, in India entrepreneurs can choose whether or not to search for scale economies that will allow them to overcome the tax and labor cost penalty faced by large businesses. This choice in turn is influenced by the beliefs of the individuals.

Our interviews in Bangalore suggest that many entrepreneurs start out with a presumption that favors a search for opportunities to diversify rather than for ways to expand their existing businesses. For instance (in the course of an 'ad-hoc' interview) I asked an entrepreneur who had recently started a software business what he hoped to accomplish in the next 5 years. He said he wanted to build a 'group.' When asked why he had such a goal, he said that it was what all the successful businessmen he knew did.

It is important to note that such beliefs are widespread but not universal. If everyone shared the same belief in diversification then we would have to say that decision makers were simply responding to objective incentives. In fact, as mentioned, several of our interviewees did not diversify; moreover in our interviews these individuals said they did not believe in diversification because it would cause them to "lose focus." Similarly, we had some entrepreneurs who justified diversification into wholly unrelated fields because they could "manage anything." In contrast others said that they could become experts in only one field.

Widespread (but not universal) beliefs and conventions also help explain practices that hinder growth by tying up capital. For instance, many entrepreneurs we interviewed claimed they had to extend credit for lengthy durations and desist from demanding instruments (such as post-dated checks) to secure timely payment. Otherwise their customers would patronize some other supplier. Now the many small businesses that don't seem to have any distinctive value added probably do have weak bargaining positions vis-à-vis their customers. But why don't customers use their bargaining power to demand lower prices instead of extended payment terms? Such

[*] It is also worth noting that China and other Far Eastern economies have enjoyed booming economies without noticeably efficient judicial mechanisms for enforcing contracts.

bargains would benefit both parties in situations where customers have better access to credit than their suppliers. But only a minority of customers does so. So apparently because of sheer habit, we find sellers maintaining "marketing" departments devoted to collecting unpaid bills and their customers devoting resources to fending off collection efforts.

Beliefs and conventions also seem to behind excessive vertical integration and staffing. In the U.S., firms routinely pay premium prices and efficiency wages to encourage their vendors and employees to provide reliable high quality goods and services. Many of the Bangalore entrepreneurs have as little faith in the reliability of private vendors and employees as they do in the State electricity board. They also believe that because vendors and employees place a low value on long term payoffs, paying premium prices or wages cannot elicit responsible behavior. So entrepreneurs 'make' instead of 'buy' and hire five people to do the job of four.

Our data does not however suggest that the different attitudes towards failure or risk have much influence on the relative performance of Bangalore and U.S. entrepreneurs. A few of our Bangalore interviewees did claim that there was a social stigma attached to failure. This does not seem consistent with the very high rate of business closures that we found in our registration data. As shown in Table 8, 43% of the registrants operating at the start of 1999 went out of business in the next five years. This is only modestly lower than the rate of establishment deaths reported by the U.S. census bureau in the latest available five year period. (See Table 1.)

Moreover some our interviewees said they their first businesses had ended in failure. There was no indication that this had in any way affected their ability to start their subsequent business. As far as risk-taking in concerned, I have previously suggested that the founders of *Inc. 500* usually don't have much to lose either by way of long-term opportunity costs or because of the funds they commit. If anything, the Bangalore entrepreneurs seemed to have a greater disregard for risk: many started their business at an older age, thus giving up more remunerative compensation; they put in more capital (compared to local incomes) and many pledged valuable property to secure loans. Moreover they took these risks to start businesses in which they didn't seem to know how they would make a profit.

Our data also do not support the hypothesis that the poorer performance of the businesses of our Bangalore interviewees derives from the low social standing accorded to individuals who start a business. An argument might be made in some other countries that businesses don't expand because they aren't started by the most ambitious or well-connected members of society. For instance, a former student, Mauro Pretolani has suggested to me (private correspondence) that Italy has a long-standing entrepreneurial tradition. But its entrepreneurs have been drawn mainly from the ranks of manual or blue collar workers who have been satisfied with building small

businesses. Individuals from upper middle class backgrounds who might have aspired to build larger companies have been attracted to professions such as medicine and the law. The socio-economic backgrounds and the educational attainments of our interviewees (e.g. the high proportion with coveted engineering degrees) suggest that this is unlikely to be the case.[*]

5. Conclusions

We should expect differences in the 'entrepreneurial' activity of starting and expanding businesses in the technologically advanced U.S. economy and the considerably more technologically backward Indian economy. And differences we do find. But they are not of the sort that we would expect to observe if the Indian economy was "catching up" quickly. If the catch-up process was proceeding quickly, we ought to see more births and expansion of businesses and more job creation than in a more mature advanced economy. In fact, these numbers (scaled by population) are considerably lower in Bangalore than in the U.S. We ought to see more parsimonious and economical use of capital; instead businesses in Bangalore appear to be less efficient in their use of capital. Moreover the indicators of sub-par performance do not appear to be an artifact of sampling procedures or defective data. Rather, we find systematic features of the environment that make it difficult for businesses to start on a large scale or attain large scale through growth. And to the extent that scale helps businesses more efficiently acquire and implement proven modern technologies, these features retard the catch-up process. The wealth-constrained individual entrepreneur unwittingly becomes an obstacle to development rather than an agent of technological progress.

Our data also raise questions about how much of a difference the growth of the off-shoring of services from the developed world can make to the overall performance of the Indian economy. Bangalore has become a magnet for software development units and call centers. These operations have directly created a few hundred thousand relatively high paying jobs. They have also stimulated demand for the services of drivers, maids, cooks, gardeners and so on. But the growth of this so-called informal sector of the economy contributes little to technological catch-up and long-run economic growth. Furthermore, the boom in off-shoring does not seem to have engendered rapid growth in the other 'formal' sectors of the economy. (This is not to say that the growth of software development units and call centers has had no echo in the formal

[*] It is true that only two of our interviewees had earned their undergraduate degrees from the elite engineering schools that admit students through a competitive national examination. But this is not because graduates of the elite engineering schools don't start businesses. They have founded many ventures in Silicon Valley, and three of my *Inc.* interviewees were graduates of these schools. Rather, they apparently find (for the reasons we have already discussed) more rewarding opportunities to start businesses in the U.S. than they do in Bangalore.

sector – as mentioned we did encounter interviewees whose businesses provided complementary services to software companies. Also, we cannot observe the contra-factual – what the rate of job and employment growth would have been in the absence of the off-shoring boom.)

These observations certainly do not preclude policies that would lead to more rapid catch-up. Indeed the system has shown a capacity for constructive change. Policy biases against economic efficiency have been considerably reduced. In the last decade most direct restrictions on firm size (e.g. through reservations) and on the importation of modern technologies have been removed. Domestic companies no longer have to apply for licenses to enter a new line of business. Although the system is still rife with exemptions, the number of excise tax rates has been reduced from 100 to three. Some of the distortions have been moderated through the introduction of "value added principles" (Ministry of Finance 2004). Remarkably, these reforms followed the end of one-party rule by the Congress party in a period during which the country has been governed by a succession of coalitions. Apparently there has been a broad consensus for reforms. For instance, even the business owners we interviewed who admitted to evading taxes said they would welcome a system where everyone had to pay.

The development glass is now partially full. Economic reforms of the last ten years have significantly reduced the state's sins of commission. Given the extremity of these prior sins, reforms engendered significant improvements in economic performance with little evident pain or disruption. But many sins of omission in some basic functions of the state – maintaining land records; making sure that goods can be easily transported, that the supply of electricity is reliable and municipal functions are available; collecting taxes; and deterring and punishing theft – remain. In order to fill the still empty portion of the glass, the state has to focus on these basic roles.

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Table 1: Changes in Employment and Number of Establishments of U.S. firms

		Employment Size of the Enterprise ("firm")					
	TOTAL	**1-4**	**5-9**	**10-19**	**20-99**	**100-499**	**500+**
Number of establishments at the start of 1996-97	5,970,420	2,611,353	1,011,039	623,167	633,233	274,988	816,640
Percent:	100%	44%	17%	10%	11%	5%	14%
Net change in establishments*	324,979	160,512	25,202	-2,204	9,938	44,407	87,155
Total establishment births*	3,691,599	2,201,147	418,569	204,577	205,568	146,931	514,807
Total establishment deaths*	3,318,470	2,014,003	386,542	208,506	199,495	96,473	413,451
Average number of establishment expansions per year*	1,809,001	577,202	326,842	235,965	265,403	112,638	290,952
Average number of establishment contractions per year*	1,607,069	350,099	354,565	251,701	257,629	106,186	286,890
Number of employees at the start of 1996-97	102,151,341	5,477,345	6,533,356	7,847,568	18,634,030	14,646,771	49,012,271
Percent:	100%	5%	6%	8%	18%	14%	48%
Net change in employment*	12,864,587	4,791,545	1,364,083	856,268	1,442,065	1,034,431	3,376,195
Percent:	100	37%	11%	7%	11%	8%	26%
Gross employment added due to births*	33,590,526	3,989,971	2,666,186	2,520,174	5,076,597	4,317,131	15,020,467
Gross employment lost to deaths*	-29,361,916	-3,518,761	-2,433,479	-2,508,279	-5,109,449	-3,562,272	-12,229,676
Gross employment added due to expansions*	59,507,116	6,519,790	4,694,926	4,939,908	10,633,733	7,969,005	24,749,754
Gross employment lost due to contractions*	-50,871,139	-2,199,455	-3,563,550	-4,095,535	-9,158,816	-7,689,433	-24,164,350
Ratios:							
Net change in # of establishments*/# of establishments at start of '96-97	0.05	0.06	0.02	0.00	0.02	0.16	0.11
Net employees added*/employees at the start of '96-97	0.13	0.87	0.21	0.11	0.08	0.07	0.07
Total establishment births*/establishments at start of '96-97	0.62	0.84	0.41	0.33	0.32	0.53	0.63
Total establishment deaths*/establishments at start of '96-97	0.56	0.77	0.38	0.33	0.32	0.35	0.51
Number of births during year/# of establishments at the start of the year**	0.06	0.14	0.08	0.06	0.05	0.06	0.06
Number of deaths during year/ # establishments at the start of the year**	-0.05	-0.13	-0.07	-0.06	-0.05	-0.05	-0.05
Number of expansions during year/# of establishments at the start of the year**	0.29	0.22	0.32	0.37	0.40	0.38	0.33
Number of contractions during year/# of establishments at the start of the year**	0.26	0.13	0.35	0.39	0.39	0.36	0.32
Number of establishment expansions/births**	2.46	1.31	3.91	5.91	7.79	4.20	2.82
Number of establishment contractions/deaths**	2.42	0.87	4.59	6.06	6.55	5.53	3.48
Total employees added from births*/employees at start of '96-97	0.33	0.73	0.41	0.32	0.27	0.29	0.31
Total employees lost due to deaths*/employees at the start of '96-97	-0.29	-0.64	-0.37	-0.32	-0.27	-0.24	-0.25
Employment added due to births/employees at the start of the year**	0.06	0.14	0.08	0.06	0.05	0.06	0.06
Employment lost due to deaths/employees at the start of the year**	-0.05	-0.13	-0.07	-0.06	-0.05	-0.05	-0.05
Employment added due to expansions/employees at the start of the year**	0.11	0.23	0.14	0.12	0.11	0.10	0.09
Employment lost due to contractions/employees at the start of the year**	-0.09	-0.08	-0.11	-0.10	-0.09	-0.10	-0.09
Employees added in expansions/emp. added in births**	1.78	1.63	1.76	1.97	2.15	1.92	1.65
Employees lost in contractions/emp. lost in deaths**	1.73	0.63	1.46	1.63	1.79	2.16	1.98
Employees added per birth**	9.09	1.81	6.37	12.49	27.80	30.25	29.20
Employees lost per death**	-8.85	-1.75	-6.30	-12.06	-25.91	-37.01	-29.60
Employees added per expansion**	6.58	2.26	2.87	4.19	8.02	14.18	17.03
Employees lost per contraction**	-6.33	-1.26	-2.01	-3.25	-7.11	-14.49	-16.83

*: For the 5 year period from 1996-97 to 2000-01
**: Average of each year's average for the 5 year period
Source: Author' s analysis of data posted on Census website

Table 2: Distribution of U.S. firms and paid employees by employment size of enterprise

	Firms by employment size of enterprise *(%)*				Paid Employees by employment size of enterprise *(%)*			
Year	Total	20 +	100 +	500 +	Total	20 +	100 +	500 +
2001	5,657,774	11.0	1.8	0.3	115,061,184	82.1	64.4	50.1
2000	5,652,544	10.9	1.8	0.3	114,064,976	82.0	64.2	49.9
1999	5,607,743	10.7	1.7	0.3	110,705,661	81.6	63.8	49.7
1998	5,579,177	10.6	1.7	0.3	108,117,731	81.2	63.3	49.1
1997	5,541,918	10.5	1.7	0.3	105,299,123	80.9	62.7	48.2
1996	5,478,047	10.4	1.7	0.3	102,187,297	80.5	62.3	48.0
1995	5,369,068	10.5	1.7	0.3	100,314,946	80.5	62.1	47.5
1994	5,276,964	10.2	1.7	0.3	96,721,594	80.2	61.9	47.3
1993	5,193,642	10.2	1.7	0.3	94,773,913	79.9	61.5	46.9
1992	5,095,356	10.3	1.6	0.3	92,825,797	79.8	61.3	47.0
1991	5,051,025	10.3	1.6	0.3	92,307,559	79.7	61.2	46.9

Source: Compiled from Census website

Table 3: Distribution of Number of Employees in Bangalore by Employment size of Registrants

Shops and Commercial Establishments Act

	Estimated Total*	Percentage of total registrants with employees numbering;							
Year	Employees	0-9	10-19	20-29	30-39	40-49	50-99	100-499	500+
2003	303,920	42.5	13.8	6.0	2.1	6.7	4.2	8.3	16.5
2002	234,560	41.8	13.4	5.5	2.6	5.2	2.5	11.9	17.1
2001	160,880	48.2	15.1	4.9	5.2	5.9	3.4	17.4	0.0
2000	119,960	50.0	13.8	7.7	2.8	5.4	5.7	14.6	0.0
1998	116,880	55.6	15.5	8.9	2.7	2.3	2.1	12.9	0.0
1994	68,700	65.4	15.1	1.4	9.4	0.0	4.4	4.3	0.0
1990	72,520	65.0	15.5	0.0	6.9	0.0	4.2	8.3	0.0

Factories Act

	Estimated Total*	Percentage of total registrants with employees numbering;							
Year	Employees	0-9	10-19	20-29	30-39	40-49	50-99	100-499	500+
2003	243,260	0.0	1.6	5.6	0.5	2.2	16.7	58.6	14.8
2002	286,220	0.1	1.0	5.6	0.2	0.9	18.3	54.4	19.6
2001	316,080	0.1	0.4	5.6	0.9	0.5	15.7	52.7	24.0
2000	346,800	0.1	0.3	6.4	1.1	0.5	16.0	59.5	16.1
1998	318,040	0.1	0.1	6.0	1.0	0.0	19.1	62.4	11.3
1994	222,500	0.2	0.2	7.8	0.3	0.4	20.9	49.5	20.7
1990	211,340	0.8	0.5	7.8	0.3	0.4	23.8	44.7	21.8

Shops and Commercial Establishments + Factories Acts

	Estimated Total*	Percentage of total registrants with employees numbering;							
Year	Employees	0-9	10-19	20-29	30-39	40-49	50-99	100-499	500+
2003	547,180	23.6	8.3	5.8	1.4	4.7	9.7	30.7	15.7
2002	520,780	18.9	6.6	5.6	1.3	2.8	11.2	35.3	18.4
2001	476,960	16.3	5.4	5.4	2.4	2.3	11.5	40.8	15.9
2000	466,760	12.9	3.7	6.7	1.5	1.7	13.3	48.0	12.0
1998	434,920	15.0	4.2	6.8	1.4	0.6	14.6	49.1	8.3
1994	291,200	15.5	3.7	6.3	2.5	0.3	17.0	38.9	15.8
1990	283,860	17.2	4.3	5.8	2.0	0.3	18.8	35.4	16.2

*: Equals sample multiplied by 20

Source: Research team analysis of registration data

Table 4: Distribution of Number of Registrants in Bangalore by Employment Size

Shops and Commercial Establishments Act

	Estimated Total*	Percentage of total registrants with employees numbering;							
Year	Registrants	0-9	10-19	20-29	30-39	40-49	50-99	100-499	500+
2003	36,160	87.9	7.5	1.9	0.5	1.2	0.4	0.4	0.1
2002	28,280	88.4	7.3	1.8	0.6	0.9	0.3	0.6	0.1
2001	21,840	88.2	7.2	1.5	1.1	0.9	0.4	0.7	0.0
2000	17,100	88.8	6.5	2.2	0.6	0.8	0.6	0.5	0.0
1998	18,400	90.1	6.3	2.2	0.5	0.3	0.2	0.3	0.0
1994	14,240	93.3	4.8	0.3	1.3	0.0	0.3	0.1	0.0
1990	8,920	90.4	7.2	0.0	1.6	0.0	0.4	0.4	0.0

Factories Act

	Estimated Total*	Percentage of total registrants with employees numbering;							
Year	Registrants	0-9	10-19	20-29	30-39	40-49	50-99	100-499	500+
2003	2,660	0.0	9.0	25.6	1.5	4.5	29.3	27.8	2.3
2002	3,100	0.6	5.8	25.2	0.6	1.9	32.9	30.3	2.6
2001	3,320	0.6	2.4	25.9	3.0	1.2	28.9	29.5	8.4
2000	3,720	1.1	1.6	29.0	3.2	1.1	28.5	32.3	3.2
1998	3,500	1.1	0.6	26.9	2.9	0.0	32.6	34.3	1.7
1994	2,720	1.5	1.5	31.6	0.7	0.7	31.6	28.7	3.7
1990	2,820	7.1	2.8	29.1	0.7	0.7	33.3	23.4	2.8

Shops and Commercial Establishments + Factories Acts

	Estimated Total*	Percentage of total registrants with employees numbering;							
Year	Registrants	0-9	10-19	20-29	30-39	40-49	50-99	100-499	500+
2003	38,820	81.9	7.6	3.5	0.6	1.4	2.4	2.3	0.3
2002	31,380	79.7	7.1	4.1	0.6	1.0	3.5	3.5	0.3
2001	25,160	76.6	6.6	4.7	1.4	1.0	4.1	4.5	1.1
2000	20,820	73.1	5.7	7.0	1.1	0.9	5.6	6.1	0.6
1998	21,900	75.9	5.4	6.1	0.9	0.3	5.4	5.8	0.3
1994	16,960	78.5	4.2	5.3	1.2	0.1	5.3	4.7	0.6
1990	11,740	70.4	6.1	7.0	1.4	0.2	8.3	6.0	0.7

*: Equals sample multiplied by 20

Source: Research team analysis of registration data

Table 5: Employment changes due to births, deaths, expansions and contractions of Bangalore Registrants

	1999-2003 (both calender years inclusive)			1994-1998 (both calender years inclusive)		
Estimates for Bangalore Population*	**Shops and Commercial Establishements Act**	**Factories Act**	**Both Acts**	**Shops and Commercial Establishements Act**	**Factories Act**	**Both Acts**
Number of registrants at the start of the period	20,700	3,020	23,720	15,640	2,660	18,300
Number of registrants at the end of the period	41,200	1,740	42,940	20,700	3,020	23,720
Net change in number of registrants over period	20,500	-1,280	19,220	5,060	360	5,420
New registrations ("births") during period	29,520	2,580	32,100	17,900	1,700	19,600
Registrations officially closed during period	720	1,080	1,800	2,280	500	2,780
Registrations not renewed during period	8,080	2,780	10,860	10,260	820	11,080
Total "deceased* registrants during period	8,800	3,860	12,660	12,540	1,320	13,860
Number of registrants who expanded in period**	2,780	1,740	4,520	2,280	3,020	5,300
Number of registrants who contracted in period**	2,700	220	2,920	1,640	620	2,260
Employment by registrants at the start of the period	97,760	278,240	376,000	48,700	220,500	269,200
Employment by registrants at the end of the period	265,760	162,180	427,940	97,760	278,240	376,000
Net change in employment during period	168,000	-116,060	51,940	49,060	57,740	106,800
Employment added due to "births" (new registrants)	208,960	69,480	278,440	70,740	125,900	196,640
Employment lost due to official closures	3,080	71,400	74,480	4,640	31,200	35,840
Employment 'deemed lost' due to non-renewals	48,060	122,240	170,300	16,640	37,600	54,240
Employment lost to "deaths" (closures + non-renewals)	51,140	193,640	244,780	21,280	68,800	90,080
Employment added by registrants' expansions**	14,140	11,100	25,240	8,880	11,000	19,880
Employment lost due to registrants' contractions**	4,200	3,000	7,200	9,720	6,760	16,480
Ratios:						
Net change in # of registrants/registrants at start of period	0.99	-0.42	0.81	0.32	0.14	0.30
Net employees added/employees at the start of period	1.72	-0.42	0.14	1.01	0.26	0.40
Births during period/# of registrants at start	1.43	0.85	1.35	1.14	0.64	1.07
Deaths during period/registrants at start	0.43	1.28	0.53	0.80	0.50	0.76
Percent of registrants who expanded in period**	13.43	57.62	19.06	14.58	113.53	28.96
Percent of registrants who contracted in period**	13.04	7.28	12.31	10.49	23.31	12.35
Percent of registrants whose change is unavailable**	0.23	0.00	0.23	0.40	0.00	0.40
Number of registrant expansions**/births	0.09	0.67	0.14	0.13	1.78	0.27
Number of registrant contractions**/deaths	0.09	0.09	0.09	0.09	0.36	0.12
Employees added due to births**/employees at start of period	2.14	0.25	0.74	1.45	0.57	0.73
Employees lost due to deaths**/employees at the start of period	0.52	0.70	0.65	0.44	0.31	0.33
Employees added in expansions**/emp. added in births	0.07	0.16	0.09	0.13	0.09	0.10
Employees lost in contractions**/emp. lost in deaths	0.08	0.02	0.03	0.46	0.10	0.18
Employees added per birth	7.08	26.93	8.67	3.95	74.06	10.03
Employees lost per death	5.81	50.17	19.33	1.70	52.12	6.50
Employees added per expansion	5.09	6.38	5.58	3.89	3.64	3.75
Employees lost per contraction	1.56	13.64	2.47	5.93	10.90	7.29

*: Equals sample multiplied by 20

**: Includes only those registrants who had registered before the start of the period and whose registrations were current at the end of the period
Source: Research team amalysis of registration data

Table 6: Changes in employment in the five-year period 1999-2003 for registrants operating with current registrations at the start of the period

Shops and Commercial Establishments Act*

Estimated employment for population at the start of 1999			Percentage of registrants whose employment at the end of 2003 compared to the start of 1999						Total employment change due to			
Employment range	Total registrants in range**	Total employment in range**	Unavailable	Nil (due to closure)	Unchanged	Higher, less than 15%	Higher, by 15% or more	Lower	Closure of registrants	Contraction of registrants	Expansion of 'low to med. growth' (less than 15%) registrants	Expansion of 'high growth' (by 15% or more) registrants
0-10	15,820	45,880	9.6	35.7	52.0	0.0	1.8	0.0	15,600	460	0	1940
10-19	1,080	15,320	1.9	29.6	61.1	0.0	1.9	5.6	4,560	460	0	200
20-29	460	11,540	17.4	26.1	30.4	21.7	0.0	4.3	2,960	460	200	0
30-39	60	1,880	0.0	66.7	0.0	0.0	0.0	33.3	1,220	80	0	0
40-59	120	5,540	0.0	16.7	83.3	0.0	0.0	0.0	900	0	0	0
50-99	80	5,740	0.0	50.0	25.0	25.0	0.0	0.0	2,400	0	160	0
100-499	180	33,320	33.3	33.3	11.1	0.0	22.2	0.0	15,020	0	0	1080
500+	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0
All Units	17,800	119,220	9.4	35.1	51.5	0.7	1.9	1.5	42,660	1,460	360	3220

Factories Act*

Estimated employment for population at the start of 1999			Percentage of registrants whose employment at the end of 2003 compared to the start of 1999						Total employment change due to			
Employment range	Total registrants in range**	Total employment in range**	Unavailable	Nil (due to closure)	Unchanged	Higher, less than 15%	Higher, by 15% or more	Lower	Closure of registrants	Contraction of registrants	Expansion of 'low to med. growth' (less than 15%) registrants	Expansion of 'high growth' (by 15% or more) registrants
0-10	40	360	0.0	100.0	0.0	0.0	0.0	0.0	360	0	0	0
10-19	20	300	0.0	100.0	0.0	0.0	0.0	0.0	300	0	0	0
20-29	880	18,000	0.0	81.8	18.2	0.0	0.0	0.0	14,800	0	0	0
30-39	100	3,100	0.0	40.0	20.0	0.0	40.0	0.0	1,200	0	0	700
40-59	20	800	0.0	100.0	0.0	0.0	0.0	0.0	800	0	0	0
50-99	920	48,300	0.0	82.6	15.2	0.0	2.2	0.0	39,900	0	0	1,000
100-499	1,020	185,600	2.0	76.5	21.6	0.0	0.0	0.0	133,400	0	0	0
500+	20	36,000	0.0	0.0	100.0	0.0	0.0	0.0	0	0	0	0
All Units	3,020	292,460	0.7	78.8	18.5	0.0	2.0	0.0	190,760	0	0	1,700

Shops and Commercial Establishments + Factories Acts*

Estimated employment for population at the start of 1999			Percentage of registrants whose employment at the end of 2003 compared to the start of 1999						Total employment change due to			
Employment range	Total registrants in range**	Total employment in range**	Unavailable	Nil (due to closure)	Unchanged	Higher, less than 15%	Higher, by 15% or more	Lower	Closure of registrants	Contraction of registrants	Expansion of 'low to med. growth' (less than 15%) registrants	Expansion of 'high growth' (by 15% or more) registrants
0-10	15,860	46,240	9.6	35.8	51.8	0.0	1.8	1.0	15,960	460	0	1,940
10-19	1,100	15,620	1.8	30.9	60.0	0.0	1.8	5.5	4,860	460	0	200
20-29	1,340	29,540	6.0	62.7	22.4	7.5	0.0	1.5	17,760	460	200	0
30-39	160	4,980	0.0	50.0	12.5	0.0	25.0	12.5	2,420	80	0	700
40-59	140	6,340	0.0	28.6	71.4	0.0	0.0	0.0	1,700	0	0	0
50-99	1,000	54,040	0.0	80.0	16.0	2.0	2.0	0.0	42,300	0	160	1,000
100-499	1,200	218,920	6.7	70.0	20.0	0.0	3.3	0.0	148,420	0	0	1,080
500+	20	36,000	0.0	0.0	100.0	0.0	0.0	0.0	0	0	0	0
All Units	20,820	411,680	8.2	41.4	46.7	0.6	1.9	1.2	233,420	1,460	360	4,920

*: Includes only those registrants whose employment was known (or could be estimated from fees paid) in 1999
**: Equals sample multiplied by 20
Source: Research team analysis of registration data

Table 7: Employment of registrants in 2003 compared to their employment when they first registered

Shops and Commercial Establishments Act

Employment of registrants in 2003	Total registrants*	Percentage of registrants whose employment when they first registered numbered; 1-9	10-19	20-29	30-39	40-49	50-99	100-499	500 or more	% who started in a lower bracket	Number who started in a lower bracket
1-9	22,440	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
10-19	2,080	8.7	84.6	4.8	0.0	0.0	0.0	0.0	0.0	8.7	180
20-29	540	3.7	14.8	66.7	7.4	7.4	0.0	0.0	0.0	18.5	100
30-39	140	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0
40-49	220	9.1	9.1	0.0	9.1	72.7	0.0	0.0	0.0	27.3	60
50-99	100	20.0	0.0	0.0	0.0	0.0	80.0	0.0	0.0	20.0	20
100-499	140	14.3	0.0	0.0	0.0	0.0	14.3	71.4	0.0	28.6	40
500+	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0

Factories Act

Employment of registrants in 2003	Total registrants*	Percentage of registrants whose employment when they first registered numbered; 1-9	10-19	20-29	30-39	40-49	50-99	100-499	500 or more	% who started in a lower bracket	Number who started in a lower bracket
1-9	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
10-19	140	14.3	42.9	14.3	0.0	0.0	14.3	14.3	0.0	14.3	20
20-29	460	0.0	0.0	95.7	4.3	0.0	0.0	0.0	0.0	0.0	0
30-39	20	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0
40-49	60	0.0	0.0	33.3	0.0	33.3	0.0	33.3	0.0	33.3	20
50-99	700	0.0	8.6	5.7	8.6	0.0	74.3	2.9	0.0	22.9	160
100-499	640	0.0	0.0	12.5	0.0	0.0	31.3	56.3	0.0	43.8	280
500+	20	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	20

Shops and Commercial Establishments + Factories Acts

Employment of registrants in 2003	Total registrants*	Percentage of registrants whose employment when they first registered numbered; 1-9	10-19	20-29	30-39	40-49	50-99	100-499	500 or more	% who started in a lower bracket	Number who started in a lower bracket
1-9	22,440	95.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
10-19	2,220	9.0	82.0	5.4	0.0	0.0	0.9	0.9	0.0	9.0	200
20-29	1,000	2.0	8.0	80.0	6.0	4.0	0.0	0.0	0.0	10.0	100
30-39	160	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0
40-49	280	7.1	7.1	7.1	7.1	64.3	0.0	7.1	0.0	28.6	80
50-99	800	2.5	7.5	5.0	7.5	0.0	75.0	2.5	0.0	22.5	180
100-499	780	2.6	0.0	10.3	0.0	0.0	28.2	59.0	0.0	41.0	320
500+	40	0.0	0.0	0.0	0.0	0.0	0.0	50.0	50.0	50.0	20

*: Equals sample multiplied by 20
Source: Research team analysis of registration data

Table 8: Distribution of Bangalore registrants by employment size in their first year of registration

Shops and Commercial Establishments Act

Year	Total new registrants in year*	Percentage of registrants whose employment when they first registered numbered; 0-9	10-19	20-29	30-39	40-49	50-99	100-499	500+	No data
2003	11,300	82.8	5.5	1.2	0.4	1.8	0.5	0.2	0.2	7.4
2002	5,960	80.9	6.7	1.0	1.0	0.7	0.3	0.0	0.3	9.1
2001	5,860	80.9	10.2	0.7	0.3	1.0	0.0	1.4	0.0	5.5
2000	3,120	82.1	8.3	1.9	1.9	0.6	1.3	0.0	0.0	3.8
1998	4,120	85.9	5.3	1.0	0.5	0.5	1.0	0.0	0.0	5.8
1994	3,000	90.0	5.3	1.3	0.0	0.0	0.0	0.7	0.0	2.7
1990	1,860	79.6	8.6	0.0	0.0	0.0	0.0	0.0	0.0	11.8

Factories Act

Year	Total new registrants in year*	Percentage of registrants whose employment when they first registered numbered; 0-9	10-19	20-29	30-39	40-49	50-99	100-499	500+	No data
2003	580	0.0	17.2	37.9	3.4	10.3	13.8	17.2	0.0	0.0
2002	520	0.0	15.4	19.2	0.0	3.8	50.0	11.5	0.0	0.0
2001	480	0.0	4.2	37.5	0.0	4.2	20.8	33.3	0.0	0.0
2000	640	0.0	6.3	31.3	3.1	0.0	25.0	31.3	3.1	0.0
1998	380	0.0	0.0	26.3	0.0	0.0	57.9	15.8	0.0	0.0
1994	60	0.0	0.0	0.0	0.0	0.0	66.7	33.3	0.0	0.0
1990	180	0.0	0.0	22.2	0.0	11.1	44.4	22.2	0.0	0.0

Shops and Commercial Establishments + Factories Acts

Year	Total new registrants in year*	Percentage of registrants whose employment when they first registered numbered; 0-9	10-19	20-29	30-39	40-49	50-99	100-499	500+	No data
2003	11,880	78.8	6.1	3.0	0.5	2.2	1.2	1.0	0.2	7.1
2002	6,480	74.4	7.4	2.5	0.9	0.9	4.3	0.9	0.3	8.3
2001	6,340	74.8	9.8	3.5	0.3	1.3	1.6	3.8	0.0	5.0
2000	3,760	68.1	8.0	6.9	2.1	0.5	5.3	5.3	0.5	3.2
1998	4,500	78.7	4.9	3.1	0.4	0.4	5.8	1.3	0.0	5.3
1994	3,060	88.2	5.2	1.3	0.0	0.0	1.3	1.3	0.0	2.6
1990	2,040	72.5	7.8	2.0	0.0	1.0	3.9	2.0	0.0	10.8

*: Equals sample multiplied by 20
Source: Research team analysis of registration data