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# Creating an Environment for Venture Capital in India

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**Summary.** — The institution of venture capitalism is a difficult one to initiate through policy intervention, particularly in developing countries with unstable macroeconomic environments and histories of state involvement in the use of national capital and in the composition of production. India has all these constraints. The emergence of a thriving software services industry after 1985 created the raw material that venture capital could finance, thus achieving a critical precondition for venture capital's growth. It was followed by efforts to create a venture capital industry. After several setbacks, some success has been achieved largely due to a slow process of moulding the environment of rules and permissible institutions. The process was assisted by the role of overseas Indians in Silicon Valley's success in the 1990s. Yet, in terms of what is needed, most of the work remains to be done. Inevitably, this will be the result of joint work by policymakers and practitioners. © 2002 Elsevier Science Ltd. All rights reserved.

*Key words* — venture capital, India, entrepreneurship

## 1. INTRODUCTION

In the last decade, one of the most admired institutions among industrialists and economic policymakers around the world has been the US venture capital industry. A recent OECD (2000) report identified venture capital as a critical component for the success of entrepreneurial high-technology firms and recommended that all countries consider strategies for encouraging the availability of venture capital. With such admiration and encouragement from prestigious international organizations has come various attempts to create an indigenous venture capital industry. This paper examines the efforts to create a venture capital industry in India.

The possibility and ease of crossnational transference of institutions has been a subject of debate among scholars, policy makers, and industrialists during the entire 20th century, if not earlier (e.g., Kogut & Parkinson, 1998). National economies have particular path-dependent trajectories, as do their national systems of innovation (NIS). [1] The forces arrayed against transfer are numerous and include cultural factors, legal systems, entrenched institutions, and even lack of adequately trained personnel. Failure to transfer is probably the most frequent outcome, as institutional inertia is usually the default option. In the transfer process, there is a matrix of possible interactions between the transferred institution and the environment. There are four possible interactions: (a) The institution can be successfully transferred with no significant changes to either the institution or the environment.

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(b) The institutional transfer can fail. (c) The institution can be modified or hybridized so that it is able to integrate into the environment. (d) An interaction between the existing institutions and venture capital to modify the environment occurs. Though (a) and (b) are exclusionary, it is possible for transfer to yield a combination of (c) and (d). [2]

The establishment of any institution in another environment can be a difficult trial-and-error learning process. Even in the United States, state and local government policies to encourage venture capital formation have been largely unsuccessful, i.e., Interaction (b) (Florida & Smith, 1993). Similarly, efforts in the 1980s by a number of European governments to create national venture capital industries also failed. Probably the only other country to develop a fully Silicon Valley-style venture capital industry is Israel. Taiwan, perhaps, is another country that appears to have developed a venture capital industry, though there has been little research on the dynamics of this process in Taiwan. Given the general difficulties in more wealthy and developed countries, it would seem that India would have poor prospects for developing a viable venture capital community.

India is a significant case study for a number of reasons. First, in contrast to the United States, India had a history of state-directed institutional development that is similar, in certain ways, to such development in Japan and Korea, with the exception that ideologically the Indian government was avowedly hostile to capitalism. Furthermore, the government's powerful bureaucracy tightly controlled the economy, and the bureaucracy had a reputation for corruption. Such an environment would be considered hostile to the development of an institution dependent upon a stable, transparent institutional environment. India did have a number of strengths. It had an enormous number of small businesses and a public equity market. Wages were low, not only for physical labor, but also for trained engineers and scientists, of which there was a surfeit. India also boasted a homegrown software industry that began in the 1980s, and became visible upon the world scene in the mid-1990s. Experiencing rapid growth, some Indian software firms became significant successes and were able to list on the US NASDAQ. Finally, beginning in the 1980s, but especially in the 1990s, a number of Indian engineers who had emigrated to the United States became entrepreneurs and began their own high-technology firms. They were extremely successful, making them multimillionaires or even billionaires, and some of them then became venture capitalists or angel investors. So there was a group of potential transfer agents.

For any transfer process, there has to be some match between the environment and the institution. In addition, there must be agents who will mobilize resources to facilitate the process, though these agents can be in the public or private sector. Prior to 1985, the development of venture capital in India was very unlikely. But the environment began to change after 1985, and continues to change. Even in the United States, venture capital is only a small component of the much larger NIS, and as such is dependent on many other institutions. In the United States and in India the development of venture capital has been a coevolutionary process. This is particularly true in India, where it remains a small industry precariously dependent upon other institutions, particularly the government, and external actors such as international lending agencies, overseas investors, and successful Indian entrepreneurs in Silicon Valley. The growth of Indian venture capital must be examined within the context of the larger political and economic system in India. As was true in other countries, the Indian venture capital industry is the result of an iterative learning process, and it is still in its infancy. If it is to be successful it will be necessary not only for it to grow, but also for its institutional context to evolve.

The paper begins with a brief description of the development of US, Israeli, and Taiwanese venture capital industries. Particular attention is given to the role of the state. The second and third sections discuss the Indian economic and financial environment. This is followed by a brief overview of the Indian information technology (IT) industry and a section on the role of nonresident Indians (NRIs). These three sections provide the environmental context within which the Indian venture capital industry was formed. The actual development of the Indian venture capital is described chronologically. The first period is when government and multilateral lending agencies are the primary actors and investors in the Indian venture capital industry. In the second period there is a gradual process of liberalization of the venture capital market and the entrance of more private venture capitalists particularly from the United States. The final sections reflect upon the progress of the Indian venture capital industry,

while also highlighting the institutional barriers to continuing expansion.

## 2. VENTURE CAPITAL AS AN INSTITUTION IN OTHER COUNTRIES [3]

Investing in a fledgling start-up firm is extremely risky, because of the high rate of failure among new firms, something Stinchcombe (1965) termed the "liability of newness." In general, private banks are unwilling to lend money to a newly established firm, because of the lack of collateral and high risk of losing the principal. The alternative of financing growth from retained earnings is feasible, however, for a start-up this can be very slow. Moreover, technology-based start-ups often experience a period of financial losses prior to the generation of surpluses for reinvestment. Prior to WW II, the source of risk capital for entrepreneurs everywhere was either the government, government-sponsored institutions meant to invest in such ventures, or informal investors that usually had some prior linkage to the entrepreneur.

After WW II, a set of intermediaries, the venture capitalists, emerged whose sole activity was investing in fledgling firms that they believed were capable of rapid growth with a concomitant capital appreciation. From these modest beginnings, venture capital gradually expanded and became increasingly formalized. Moreover, the locus of the venture capital industry shifted from the East Coast to the West Coast (Florida & Kenney, 1988a,b). By the mid-1980s, the ideal-typical venture capital firm was based in Silicon Valley and invested largely in the electronics sector, with lesser sums devoted to medical technology. [4] During this process, the US over-the-counter market was formalized and technically upgraded into what is now known as the NASDAQ, which specialized in listing technology-based firms.

After an evolutionary learning process, the ideal-typical institutional form for venture capital became the venture capital firm operating a series of funds raised from wealthy individuals, pension funds, foundations, endowments and various other institutional sources. Moreover, this form has now diffused globally. The venture capitalists were professionals, often with industry experience, and the investors were silent limited partners. At present a fund generally operates for a set number of years (usually between seven and 10) and then is terminated. Normally, each firm manages more than one partnership simultaneously. Even though the venture capital firm is the quintessential organizational format, there are other vehicles, the most persistent of which have been venture capital subsidiaries of major corporations, financial and nonfinancial.

The venture capitalist invests in recently established firms believed to have the potential to provide a return of ten times or more in less than five years. This is highly risky, and many of the investments fail entirely; however, the large winners are expected to more than compensate for the failures. In return for investing, the venture capitalists not only receive a major equity stake in the firm, but they also demand seats on the board of directors. By active intervention and assistance, venture capitalists act to increase the chances of survival and rate of growth of the new firm. Their involvement extends to several functions, such as helping to recruit key personnel and providing strategic advice and introductions to potential customers, strategic partners, later-stage financiers, investment bankers and various other contacts (Florida & Kenney, 1988a; Gompers & Lerner, 1999). The venture capitalist therefore provides more than money, and this is a crucial difference between venture capital and other types of funding. The venture capital industry has, more recently, specialized even by stages of growth: there are early or seed funds, mature-stage funds, and bridge funds.

The venture capital process is complete when the company is sold through either a listing on the stock market or the acquisition of the firm by another firm, or when the company fails. For this reason, the venture capitalist is a temporary investor and usually a member of the firm's board of directors only until their investment is liquidated. The firm is a product to be sold, not retained (Kenney & von Burg, 1999). The venture capital process requires that investments be liquidated, so there must be the possibility of exiting the firm. Countries that erect impediments to any of the exit paths (including bankruptcy) are choosing to handicap the development of the institution of venture capital. Most recently, Jeng and Wells (2000, p. 241) found that the single strongest driver of venture capital investing is the number of IPOs. They also find that government policies can "have a strong impact, both by setting the regulatory stage and by galvanizing investment during downturns." This is not to say that countries not providing exit opportunities will be unable to foster entrepreneurship, only that

it is unlikely that venture capital as an institution will thrive. In fact, Black and Gilson (1998) argue that venture capital industries will be more vital in countries with stock market-centered capital markets than in nations with bank-centered capital markets. [5]

There has been much debate about the preconditions for venture capital. One obvious conclusion is that entrepreneurship is the precondition for venture capital, not vice versa; however, this is a misleading statement in a number of dimensions. At some level, entrepreneurship occurs in nearly every society, but venture capital can only exist when there is a constant flow of opportunities that have great upside potential. Information technology has been the only business field that has offered such a long history of opportunities. So entrepreneurship is a precondition, but not any type of entrepreneurship will do. [6] Moreover, venture investing can encourage and increase the "proper" type of entrepreneurship, i.e., successful venture capitalists can positively affect their environment.

In the US the government played a role in the development of venture capital, though for the most part it was indirect. This indirect role, i.e., the general policies that benefited the development of the venture capital industry, was probably the most significant. To list some of the most important, the US government generally followed sound monetary and fiscal policies ensuring relatively low inflation; as a result, the financial environment and currency were stable. US tax policy, though it changed repeatedly, has been favorable to capital gains, and several decreases in capital gains taxes may have had some positive effect on the availability of venture capital (Gompers, 1994). The stock market, which has been the exit strategy of choice for venture capitalists, has been strictly regulated and characterized by increasing openness. This has created a general macroeconomic environment of financial stability and openness for investors, thereby reducing the external risks of investing in high-risk firms. Put differently, an extra set of environmental risks stemming from government action was minimized—a sharp contrast to most developing countries during the last 50 years.

Another important policy has been a willingness to invest heavily in university-based research. This investment has funded generations of graduate students in the sciences and engineering, and from this research has come trained personnel and innovations, some of which have resulted in the formation of firms that have been funded by venture capitalists. US universities, such as MIT, Stanford, and UC Berkeley, played a particularly salient role (Kenney & von Burg, 1999; Saxenian, 1998).

The most important direct US government involvement in encouraging the growth of venture capital was the passage of the Small Business Investment Act of 1958 authorizing the formation of small business investment corporations (SBICs). The legislation was not aimed at encouraging venture capital *per se*. It meant to create a vehicle for funding small firms of all types. The legislation was complicated, but for the development of venture capital the following features were most significant: It permitted individuals to form SBICs with private funds as paid-in capital. They could then leverage their paid in capital to borrow money up to a limit that increased over time with government guarantees. There were also tax and other benefits, such as income and a capital gains pass-through and the allowance of a carried interest for the investors. The SBIC program also provided a vehicle for banks to circumvent the Depression-era laws prohibiting commercial banks from owning more than 5% of any industrial firm. The banks' SBIC subsidiaries allowed them to acquire equity in small firms. This made even more capital available to fledgling firms, and was a significant source of capital in the 1960s and 1970s. The final investment format permitted SBICs to raise money in the public market. For the most part, these public SBICs failed and/or were liquidated by the mid-1970s. After the mid-1970s, with the exception of the bank SBICs, the program was no longer important to the venture capital industry.

The SBIC program experienced serious problems almost immediately. Starting in 1965 Federal criminal prosecution was necessary to rectify SBIC corruption. By one estimate, "nine out of ten SBICs had violated agency regulations and dozens of companies had committed criminal acts" (Bean, 2001). Despite the corruption, something valuable also occurred. Particularly in Silicon Valley, several individuals used their SBICs to leverage their personal capital, and they were so successful that they were able to reimburse the program and raise institutional money to become formal venture capitalists. The SBIC program accelerated their capital accumulation, and as important, government regulations made these new venture capitalists professionalize their investment

activity, which had been informal prior to entering the program. Now-illustrious firms such as Sutter Hill Ventures, Institutional Venture Partners, Bank of America Ventures, and Menlo Ventures began as SBICs.

The historical record also indicates that government action can harm venture capital. The most salient example came in 1973 when the US Congress, in response to widespread corruption in pension funds, changed federal pension fund regulations. In their haste to prohibit abuses, Congress passed the Employment Retirement Income Security Act (ERISA) making pension fund managers criminally liable for losses incurred in high-risk investments. This was interpreted to include venture capital funds. The result was that pension managers shunned venture capital, nearly destroying the entire industry. This was only reversed after active lobbying by the newly created National Venture Capital Association (NVCA) in 1973 (Pincus, 2000; Stultz, 2000). Only in 1977 did they succeed in starting a process of a gradual loosening that was completed in 1982 (Kenney, n.d.). The reinterpretation of these pension fund guidelines contributed to a flood of new money into venture capital funds.

In a sense, since the mid-1980s the development of the US venture capital industry has become a process of formalizing the institutions, a process that was even manifested in the contracts between venture capitalists and entrepreneurs (Suchman, 2000). After the mid-1980s, the institution of venture capital had become a part of the US NIS with its own industry association, practices, and routines. So, in the United States venture capital as an institution emerged from an organic trial-and-error experimental process prior to maturing into today's powerful institution for the encouragement of new firm formation. In this process, the government played a limited and contradictory role.

Since the mid-1980s there has been much interest in the transference of institution of venture capital to other countries. Important proponents of this transfer were the International Finance Corporation and various bilateral and multilateral development organizations including the Asian Development Bank, the West German Deutsche Entwicklungs Gesellschaft (DEG), and the British Commonwealth Fund among others (Kenney, n.d.). Their *modus operandi* was to invest in venture capital firms dedicated to funding start-ups in various nations. Though these organizations were not significant for the establishment of venture capital in Taiwan and Israel, foreign investors did play an important role in those two countries.

The two most successful adopters of US-style venture capital practice are Taiwan and Israel, in both cases the national governments played a significant role in encouraging the growth of venture capital (see, respectively, Autler, 2000; Kenney, Han, & Tanaka, 2001). There are a number of similarities between the two countries. They are smaller countries closely allied with the United States, that have sizable numbers of their citizens in the United States. Both governments have relatively good economic records and operate with a minimum of corruption. Both are also "national defense" states. Importantly, in both countries the government developed policies that allowed its venture capitalists to benefit financially from their successful investments. Yet, despite these similarities, there are also a number of differences between the industries in the two.

The Israeli venture capital industry is closely related to the United States. The first venture capital investments in Israel were made by the well-known US venture capitalist, Fred Adler, who began investing in Israeli startups in the early 1970s (Adler, 2000; Autler, 2000, p. 40). In 1985, a former Commander of the Israeli Air Force Dan Tolkowsky, joined with partner Fred Adler to form the first Israeli venture capital fund, and it was capitalized at $25 million with much of the investment coming from the United States. The US connection was built upon Israeli and American Jewish networks that were able to mobilize large sums of capital and political support in the US government. Israel had three important sources of entrepreneurs: the military research establishment, its universities, and already existing firms. Moreover, there was a constant flow of entrepreneurs between the United States and, especially, Silicon Valley and Israel. In addition, Israeli firms had begun listing on the NASDAQ in the 1980s, so the Tel Aviv stock market was not the only exit route.

The creation of a venture capital industry (rather than a few firms) would wait, however, until the 1990s, when the Israeli government created a government-funded organization, Yozma, meant to encourage venture capital in Israel. Yozma received $100 million from the Israeli government. It invested $8 million in 10 funds that were required to raise another $12

million each from "a significant foreign partner," presumably an overseas venture capital firm (Autler, 2000, p. 44). Yozma also retained $20 million to invest itself. These "sibling" funds were the backbone of an industry that in 1999 invested in excess of $1 billion during 2001 in Israel (PriceWaterhouse, 2001). So, initially venture capital investing in Israel was entirely undertaken by the private sector (though often the investments were in spin-offs of public research). But, the government Yozma program created a hybrid of private investment with government support that supercharged the growth of venture capital. The critical point is that private venture capital existed before government involvement, as was true in the case of the US SBIC program. In the late 1990s government support became less significant. The government was able to play such a powerful catalyzing role, because there were supportive environmental conditions, and private-sector venture capital had already emerged. In other words, government support did not create the industry, but had an effect on its growth. In the case of Israel, the institution of venture capital was largely an unproblematic transfer from the United States.

The creation of the Taiwanese industry differs significantly from the Israeli case in some important respects. Taiwan did not have the same level of high-technology research as Israel as it was a developing country. Nor did it have the same level of relationship to the financial and academic elite in the United States that Israel did. There were, however, a large number of successful Taiwanese and other Chinese scientists and engineers in the United States that it could and did draw upon (Saxenian, 1999).

The inception of the Taiwanese venture capital industry can be traced directly to governmental initiative. In 1983 the then Finance Minister, Li-Teh Hsu, and a former Finance Minister K.T. Li took a study trip to the United States and Japan to study how new high-technology firms were formed, after this they decided to create incentives to catalyze the creation of a venture capital industry in Taiwan (Saxenian, 1998; Shih, 1996, p. 282). In 1983 legislation was passed giving attractive tax incentives to individuals willing to invest in professional venture capital firms. The most important feature of the 1983 legislation was an up to 20% tax deduction for Taiwanese individuals provided they maintained their venture capital investment for at least two years. One interesting and important feature of this effort was that the Taiwanese venture capitalists were not forbidden from investing abroad as long as a benefit to Taiwan could be shown.

Despite the attractive benefits, investment grew only gradually. The first venture capital firm in Taiwan was the Acer subsidiary, Multiventure Investment Inc., which was formed in November 1984 and made its first investment in a Silicon Valley startup that year (Shih, 1996, p. 35). But the venture capital fund that received the most attention was formed by H&Q. The key person was Ta-Lin Hsu, a former executive in IBM's San Jose Laboratories. H&Q Taiwan recruited investment from major Taiwanese industrial groups and had a total capitalization of roughly $25 million (Sussner, 2001). Its first investment was in the Taiwanese subsidiary of Data Corporation, a Santa Clara manufacturer of disk drive controllers and floppy disks (Kaufman, 1986, p. 7D). In 1987, the San Francisco-based Asian-American venture capital firm, the Walden Group became the other important early foreign venture capital fund to invest in Taiwan. Its first two investments were in Northern California (Besher, 1988, p. C9). This fund evolved into the Walden International Investment Group. Notice that both H&Q and Walden's first investments were in Silicon Valley and this set the binational investment pattern that characterizes the Taiwanese venture capital industry. There is an important difference between Taiwan and Israel, in the that Taiwan received little outside capital, whereas Israel was much more successful in attracting overseas capital.

The Taiwanese venture capital industry differed from that in Israel and in the United States in one very significant way. Namely, Taiwan, quite simply, did not have the world-class research capability of these other two countries. But, it honed its manufacturing expertise and found that its firms could grow very rapidly providing contract manufacturing services to US firms. The Taiwanese strategy was to enter product markets that had not yet been commoditized and transform them into commodities as it recently has done in notebook computers. Success in these markets made it possible for the Taiwanese firms to grow rapidly and conduct initial public offerings on either the Taiwan Stock Exchange or on NASDAQ. In addition, Taiwanese venture capitalists invested between 20% and 30% of their capital in Silicon Valley, especially in firms started by Chinese engineers, thereby diversifying their portfolio.

In this brief discussion it is impossible to describe fully the differences between the organization and operation of the Taiwanese venture capital industry and that of the United States and Israel. [7] Even the investments are different, however, because Taiwanese venture capitalists invest in manufacturing firms. In contrast to the other two countries, the Taiwanese government continues to closely regulate the venture capital industry. Taiwanese venture capitalists are organized as operating firms compensating investors through dividends, rather than operating as partnership managers giving investors distributions. Thus in the case of Taiwan it is possible to say that the institution of venture capital was hybridized to fit into the environment.

The Israeli environment resembled the United States far more than it did Taiwan, and thus there was less need to change the institutional parameters of the venture capital industry when it was transferred. But, in both countries there were strong connections to Silicon Valley that made the transfer of the social technology of venture capital investing possible. Not coincidentally, venture capitalists in both countries also used these connections to invest in Silicon Valley deals. The governments in both countries played a significant role in catalyzing the development of the venture capital industry. Curiously, in historical terms both countries had had bank-centered financial systems, but this changed roughly along with the development of the venture capital industry.

## 3. THE GENERAL INDIAN ENVIRONMENT

From its inception, the Indian venture capital industry has been affected by international and domestic developments; its current situation is the result of the evolution of what initially appeared to be unrelated historical trajectories. The creation of a venture capital industry in India through transplantation required the existence of a minimal set of supportive conditions. They need not necessarily be optimal, because, if the industry survived, it would likely set in motion a positive feedback process that would foster the emergence of successful new firms, encourage investment of more venture capital, and support the growth of other types of expertise associated with the venture capital industry. In other words, if the venture capital industry experienced any success, it could entrain a process of shaping its environment. In contrast to Israel and Taiwan, India would have to experience a hybrid of Interactions (c) and (d) discussed in Section 1, if venture capital was to thrive. It would have to change its environment to allow the sustenance of a venture capital industry and the societal institutions would have to modify themselves. Venture capital could begin with a suboptimal though minimally sustainable set of conditions, the venture capital industry could take root and shape its environment to a more optimal situation, while the institutions themselves would also need to change.

Small and medium-sized enterprises have a long history and great importance to India. The leaders of the Independence movement were supporters of small businesses as an alternative to "exploitation" by multinational firms. Yet, despite the emphasis upon and celebration of small enterprises, the Indian economy was dualistic. It was dominated by a few massive private sector conglomerates, such as the Tata and Birla groups, and various nationalized firms, even while there was an enormous mass of small shopkeepers and local industrial firms. As anywhere else, these small firms were in traditional industries and were not relevant to the emergence of venture capital, but they do indicate a culture of private enterprise. This entrepreneurial propensity also has been demonstrated by the willingness of Indians emigrating in other countries to establish shops, restaurants, hotels and enterprises of all sorts.

Indians valued education very highly at least since the colonial era. After Independence, the Indian government invested heavily in education, and Indian universities attracted excellent students. In the 1960s, the Ford Foundation worked with the Indian government to establish the Indian Institutes of Technology (IIT), which adopted MIT's undergraduate curriculum. These Institutes and other top Indian educational institutions very quickly became the elite Indian engineering schools with extremely competitive entrance examinations and to which only the best students could gain entry. Excellent Indian students were in demanded by overseas university graduate programs, generally, and in engineering, particularly. After graduating from overseas programs, many of these Indian students did not return to India. Many other Indian graduates remained in India, working in the large family conglomerates,

the many Indian universities, and various top-level research institutes such as those for space research (Baskaran, 2000). This meant that there remained in India a large pool of capable engineers and scientists that were underpaid (by global standards), and potentially mobile.

Despite these strengths, India had many cultural rigidities and barriers to entrepreneurship and change, beginning with an extremely intrusive bureaucracy and extensive regulations. Until recently the labor market was quite rigid. For well-educated Indians the ideal career path was to enter the government bureaucracy, a lifetime position; enter the family business, which was then a lifetime position; or join one of the large conglomerates such as Tata and Birla, which also effectively guaranteed lifetime employment. The final career path was to emigrate; not surprisingly, among the immigrants were many seeking better opportunities and release from the rigidities at home. In summation, the institutional context discouraged investment and entrepreneurship. The next sections examine the features of the Indian economy that would evolve to make the creation of the Indian venture capital industry possible.

## 4. THE INDIAN FINANCIAL SYSTEM

India has a large, sophisticated financial system including private and public, formal and informal actors. In addition to formal financial institutions, informal institutions such as family and moneylenders are important sources of capital. India has substantial capital resources, but as Table 1 indicates, the bulk of this capital resides in the banking system. In the formal financial system, lending is dominated by retail banks rather than the wholesale banks or the capital markets for debt. The primary method for firms to raise capital is through the public equity markets, rather than through private placements.

### (a) *The banking system*

Prior to independence from Britain, the banking system was entirely private and largely family-operated. In the pre-war period, the family-run banks often invested in new ventures. After Independence, the Reserve Bank of India (RBI) and the State Bank of India were nationalized, with the State Bank of India continuing to play the role of banker to government agencies and companies. Then, in 1969, the next 14 largest banks were nationalized. With the State Bank of India, the state controlled 90% of all bank assets. The nationalized banking system became an instrument of social policy. During 1969–91, the financial position of the banks progressively weakened, due to loss-making branch expansions, ever-strengthening unions, overstaffing, and politicized loans. Until 1991, depositors were reluctant to use banks because although their savings were safe, the government set deposit interest rates below the rate of inflation. By 1991, the entire bank system was unprofitable and nearing collapse. [8]

The socialized banking system had other perverse effects. For example, although the bank managers were civil servants and very risk-averse, they could offer below-market interest rates. This created excessive demand for funds, but, quite naturally, bankers extended the loans to their safest customers. These were primarily the large firms owned by the government, which operated the largest steel, coal, electrical, and other manufacturing industries. The other large bank borrowers were the giant family conglomerates such as the Tata and Birla group. This increased the group's economic power, but did not lead to economically efficient decisions about how to deploy capital.

Table 1. *The disposition of indian capital resources and their availability for venture investing in 1996–97*

| Type of funds | Billions of rupees | Percentage of total | Percentage permitted for venture capital investment |
|---|---|---|---|
| Currency and bank deposits | 634.90 | 50.1 | Up to 5% of new funds, since April 1999 |
| Government securities | 116.36 | 9.2 | None |
| Life insurance funds | 156.36 | 12.3 | None |
| Pension funds | 262.48 | 20.7 | None |
| Privately held shares and debentures (including mutual funds) | 96.34 | 7.6 | Some |
| Total | 1266.44 | 100 | None |

*Source*: Statistical Outline of India 1988–99 (1999).

Small firms were starved for capital. Thus the Indian banks provided no resources for entrepreneurial firms.

### (b) *Equity markets*

The first Indian stock markets were established during the British Raj era in the 19th century. During the early part of the 20th century, Indian equity markets actively financed not only banking, but also the cotton and jute trades (Schrader, 1997). In 1989 there were 14 stock markets in India, though Bombay was by far the largest (World Bank, 1989). The socialization of the economy and particularly banking after independence reinforced the strength of the stock markets as a source of capital, and by the 1960s, India had one of the most sophisticated stock markets in any developing country.

There were several reasons for the growth of the Indian stock market. Motivated by its egalitarian principles, the government supported the stock markets as an instrument for reducing the concentration of ownership in the hands of a few industrialists (an outcome of the government policy of providing below-market interest loans to the large family conglomerates). Second, the government industrial licensing policy instituted in 1961 meant that businesses had to apply for government permission to establish new ventures. Permissions were given only in the context of the Soviet-style national plans for each sector. There was a strong element of favoritism in who received permission. Most important, due to government central planning controls, shortages were endemic, and thus, permission to produce was a guarantee of profits.

The distortion these policies created by encouraging concentration were meant to be offset by RBI stipulation that private sector borrowers could not own more than 40% of the firm's equity if they wished to receive bank finance. In 1973 the government required all foreign firms to decrease ownership in their Indian subsidiaries to 40%. Faced with a choice between selling stakes privately and listing on the stock exchanges, most firms chose the latter and issued new stock, which led to a large increase in public ownership of such companies. So, to raise money the private sector became reliant on stock markets. Investors, large and small, readily financed ventures since the shortages induced by the planning system guaranteed a ready market for anything produced. Curiously, the retention of 40% of the equity by the core investors meant that in reality they controlled the firm.

The 40% regulation did not liberalize the markets as much as one might expect. Because loans were also necessary for firms and this required collateral in fixed assets, new entrepreneurs were restricted to sectors with asset-heavy projects. This disadvantaged the service sector, resulting in even greater concentration, and equity markets focused on financing low-risk projects. Moreover, the public's enthusiasm for firms operating within a licensed industry meant that it was difficult for other new firms to secure capital through listing on the stock exchanges.

In 1991, as part of a large number of financial reforms, the Securities and Exchange Board of India (SEBI) was created to regulate the stock market. At the time, there were 6,229 companies listed on all the stock exchanges in India (RBI, 1999, p. 16). The reforms and loosening of regulations resulted in an increase in the number of listed companies to 9,877 by March 1999, and daily turnover on the stock exchanges rose to 107.5 billion rupees (US$2.46 billion) by December 1999. One reform was the removal of a profitability criterion as a requirement of listing. To replace the profitability requirement, it was stipulated that a firm would be de-listed if it did not earn profits within three years of listing. This reform meant unprofitable firms could be listed, providing an exit mechanism for investors. Not surprisingly, there was a dramatic increase in the listings of firms, many of which could be considered as high technology.

In terms of experience, India contrasted favorably with most developing countries, which had small, inefficient stock markets listing only established firms. Even in Europe, until the creation of new stock markets in the mid-1990s, it was extremely difficult to list small high-technology firms (Posner, 2000). But, although these stock markets provided an exit opportunity, they did not provide the capital for firm establishment. Put differently, accessible stock markets did not create venture capital for startups; they merely provided an opportunity for raising follow-on capital or an exit opportunity.

### (c) *Other institutional sources of funds*

India has a strong mutual fund sector that began in 1964 with the formation of the Unit

Trust of India (UTI), an open-ended mutual fund, promoted by a group of public sector financial institutions. Because UTI's investment portfolio was to consist of longer-term loans, it was meant to offer savers a return superior to bank rates. In keeping with the risk-averse Indian environment, initially UTI invested primarily in long-term corporate debt. But, UTI eventually became the country's largest public equity owner as well. This was because the government controlled interest rates in order to reduce the borrowing costs of the large manufacturing firms that it owned. These rates were usually set well below market rates, yet UTI and other institutional lenders were forced to lend at these rates. In response, firms started issuing debt that was partially convertible into equity in order to attract institutional funds. By 1985, the conversion of these securities led to UTI becoming the largest owner of publicly listed equity (UTI Annual Report, 1985). By 1991, the equity portion of the UTI portfolio had grown to 30% (UTI Annual Report, 1991). In 1992, in tandem with banking sector reform, permission to form privately-owned mutual funds (including foreign-owned funds) was granted, leading to a gradual erosion in UTI's then-dominant market share.

Until April 1999, mutual funds were not allowed to invest in venture capital companies. Since then, the mutual funds have been allowed to commit up to 5% of their funds as venture capital, either through direct investments or through investment in venture capital firms. But, the mutual funds have not yet overcome their risk-averse nature and invested in venture capital, either directly or indirectly through investment in venture capital funds. Certainly, should the mutual funds decide to invest directly in firms, there would be operational issues regarding the capability of mutual funds to perform the venture capital function.

The largest single source of funds for US venture capital funds since the 1980s has been public and private sector pension funds. In India, there are large pension funds but they are prohibited from investing in either equity or venture capital vehicles, thus closing off this source of capital.

In summation, prior to the late 1980s, though India did have a vibrant stock market, the rigid and numerous regulations made it nearly impossible for the existing financial institutions to invest in venture capital firms or in startups. Nearly all of these institutions were politicized, and the government bureaucrats operating them were risk-adverse. On the positive side, there was a stock market with investors amenable to purchasing the equity in fairly early-stage companies. It was also possible to bootstrap a firm and/or secure funds from friends and family—if one was well connected. But, no financial intermediaries comfortable with backing small technology-based firms existed prior to the mid-1980s. It is safe to say that little capital was available for any entrepreneurial initiatives. An entrepreneur aiming to create a firm would have to draw upon familial capital or bootstrap their firm.

## 5. THE INDIAN INFORMATION TECHNOLOGY INDUSTRY

A viable venture capital industry depends upon a continuing flow of investment opportunities capable of growing sufficiently rapidly to the point at which they can be sold yielding a significant annual return on investment. If such opportunities do not exist, then the emergence of venture capital is unlikely. In the United States and Israel such opportunities occurred most regularly in the information technologies. Moreover, in every country, with the possible exception of the United States, any serious new opportunity has to be oriented toward the global market, because few national markets are sufficiently large to generate the growth capable of producing sufficient capital gains.

Since Independence, the Indian government strove to achieve autarky, and the protection of Indian markets and firms from multinational competition guided nearly every policy—the information technology industries were no exceptions. For example, in the mid-1970s, the Indian government demanded that IBM reduce the percentage ownership of its Indian operations to 40%, but IBM refused and left India in 1978. After this the government gave the state-run Computer Maintenance Corporation "a legal monopoly to service all foreign systems" (Brunner, 1995 quoted in Lateef, 1997). IBM's retreat released 1,200 software personnel into the Indian market, and some of these established small software houses (Lateef, 1997). The protectionist policy had benefits and costs. The benefit was that it contributed to the creation of an Indian IT industry; the cost was that the industry was backward despite the excellence of its personnel. After IBM's withdrawal, there was little further interest by multinational firms in the Indian market. Due to this lack of

foreign investment and despite the presence of skilled Indian personnel, India was a technological backwater even while East Asia progressed rapidly.

In 1984, in response to the failure of the government-run computer firms and the success of private firms such as Wipro, HCL, and Tata Consultancy Services, the Indian government began to liberalize the computer and software industry by encouraging exports (Evans, 1992). This was particularly timely because there was a worldwide shortage of software programmers. In 1986, Texas Instruments received government permission to establish a 100% foreign-owned software subsidiary in India. The capabilities of the Indian personnel, which was due, in large measure, to a wise decision in the 1960s by the government to increase its investments in education, soon attracted other foreign software engineering operations to India. Contemporaneously, entrepreneurs exploited the labor cost differential to ''body-shop'' Indian programmers overseas. By 1989, this accounted for over 90% of software revenues (Schware, 1992 cited in Lateef, 1997). The body-shopping and the foreign-owned engineering operations provided a conduit through which Indian engineers could learn about the cutting-edge software techniques and developments in the West and particularly Silicon Valley. These activities created a network of contacts and an awareness of the state-of-the-art in global computing and software technology. The center of this activity was the South Indian city of Bangalore (Mitta, 1999).

By the early 1990s, Indian firms also began the development of a market for off-site contract programming. This market grew impressively in the 1990s, as shown in Table 2. Moreover, the percentage of on-site contract programming revenues fell from 90% in 1988 to 45% in 1999–2000 (Nasscom, 1998). But, because an additional 35% of work is off-site contract programming, low value-added services remain dominant. High value-added ''next-stage'' businesses, including turnkey projects, consultancy and transformational outsourcing make up the balance, and branded product development for the export market is negligible. A few of these firms, particularly Infosys and Wipro, grew to be quite large both in terms of manpower and revenue. They were successful on the Indian stock market in the 1990s, and in the late 1990s they listed their stock on the US NASDAQ. Interestingly, in contrast to Taiwan, Korea, and, increasingly, China, the Indian hardware sector remains negligible, although there have been a few notable recent successes, such as Armedia and Ramp Networks.

One small conglomerate, Wipro, established an IT spin-off business in Bangalore in 1980, and grew to become the most highly valued Indian IT company. Another leading Indian firm, Infosys, was founded 1981 and listed on the US NASDAQ. In August 2000 its valuation reached nearly $17 billion. These and other

Table 2. *Domestic and export sales of the Indian IT industry, 1994–99 in US$ millions*

| | 1994–95 | 1995–96 | 1996–97 | 1997–98 | 1998–99 | 1999–2000 |
|---|---|---|---|---|---|---|
| *Software* | | | | | | |
| Domestic | 350 | 490 | 670 | 950 | 1,250 | 1,700 |
| Exports | 485 | 734 | 1,083 | 1,750 | 2,650 | 4,000 |
| Total | 835 | 1,224 | 1,753 | 2,700 | 3,900 | 5,700 |
| *Hardware* | | | | | | |
| Domestic | 590 | 1,037 | 1,050 | 1,205 | 1,026 | 1,450 |
| Exports | 177 | 35 | 286 | 201 | 4 | 86 |
| Total | 767 | 1,072 | 1,336 | 1,406 | 1,030 | 1,536 |
| *Peripherals* | | | | | | |
| Domestic | 148 | 196 | 181 | 229 | 329 | 435 |
| Exports | 6 | 6 | 14 | 19 | 18 | 27 |
| Total | 154 | 202 | 195 | 248 | 347 | 462 |
| *Other* | | | | | | |
| Training | 107 | 145 | 183 | 263 | 302 | 400 |
| Maintenance | 142 | 172 | 182 | 221 | 236 | 263 |
| Networking and other | 36 | 710 | 156 | 193 | 237 | 310 |
| Grand total | 2,041 | 2,886 | 3,805 | 5,031 | 6,052 | 8,671 |

*Source*: http://www.nasscom.org 2001

successes demonstrated that firms capable of rapidly increasing in value could be formed in India. This is despite the fact, as Arora and Arunachalam (2000) note, that the development of globally distributed packaged software programs, which is the source of the greatest profits, has not occurred. Indian software firms have an assured market for their contract programming work and, therefore, little incentive to take the risk of developing software packages (Naqvi, 1999). Finally, the largest firms, perhaps due to their visibility in overseas markets through their branch offices, have leveraged their manpower resources to better advantage than small firms have, leading to an erosion in the share of small firms (Naqvi, 1999).

By the early 1990s, India had an information technology industry that centered on software and drew upon the large number of relatively skilled Indian engineers. [9] The Indian IT industry was growing quickly, and newly formed firms had entered the industry; however, the opportunities had not yet led to the creation of any information technology-oriented venture capital firms. In addition, at the time there were not yet any knowledgeable information technology industry veterans in India who also had experienced the startup and venture capital process first hand. In Silicon Valley, however, an entire cadre of Indians was emerging who had such experiences.

## 6. NONRESIDENT INDIANS (NRIS)

From the 1950s onward, bright, well-educated Indian engineers attended US universities and remained to work in high-technology firms. In the 1960s and 1970s, this was considered a "brain drain." It seems likely, however, that even if these engineers had returned to India, there would have been few opportunities for them outside of government research organizations and the corporate research laboratories for firms such as Tata and Birla. For this and other reasons, many Indians remained in the United States and secured employment in universities and corporations, including Silicon Valley electronics firms.

Initially, these Indian engineers joined existing firms, but not surprisingly they were not immune to the attractions of entrepreneurship, especially in Silicon Valley. The first noteworthy group included Kanwal Rekhi, who cofounded Excelan, a data networking firm, with three other Indian engineers in 1981. Excelan later was purchased by Novell, leaving Rekhi and the other engineers with enormous capital gains. Another early entrepreneur was Vinod Khosla, who in 1982 had co-founded Daisy Systems, and was a driving force in the establishment of Sun Microsystems. After leaving Sun, he joined the prestigious venture capital firm, Kleiner, Perkins, Caufield and Byers. Yet another Indian engineer, Dalal (2000), cofounded Metaphor in 1982, Claris in 1987, and in 1991 joined the top-tier venture capital fund, Mayfield Fund. Another successful early Indian entrepreneur was Suhas Patil, who cofounded Cirrus Logic in 1984. These NRIs not only were successful entrepreneurs, but they soon began investing in yet other startups.

Quite naturally, the NRIs remained in contact with family, friends, and classmates in India. Moreover, by the late 1980s, the success of the NRIs came to the attention of Indian policymakers. Even while concern about the brain drain continued, policymakers recognized that it would be impossible to retain such highly skilled individuals if there were no opportunities for them in India. NRIs wished to assist India: they visited India and discussed their experiences in the United States, and expressed a willingness to invest in ventures their friends and classmates might launch in India. They quickly discovered, however, that it was not so simple to transform their willingness to invest capital into the reality of a reasonable investment. But this initiated a process through which the NRIs were re-conceptualized from being "defectors" to being a potential source of knowledge, connections, and even capital (Saxenian, 1999).

From the perspective of creating venture capital, India had a stock market that with minimal effort could handle public stock offerings from fledgling high-technology firms. There was also a growing IT industry with some firms that experienced extremely fast growth. There was also a cadre of Indians familiar with the operation of the US Silicon Valley, and there were sufficient skilled engineers in India to staff startups. In other words, by 1990 the environmental preconditions for the successful establishment of a venture capital industry were in place.

## 7. VENTURE CAPITAL IN INDIA

In the early 1980s, the idea that venture capital might be established in India would

have seemed utopian. India's highly bureaucratized economy, avowed pursuit of socialism, still quite conservative social and business worlds, and a risk-averse financial system provided little institutional space for the development of venture capital. With the high level of government involvement, it is not surprising that the first formal venture capital organizations began in the public sector. As in the case of Israel and Taiwan, from its inception Indian venture capital was linked with exogenous actors, public and private. In India, one of the most autarchic economies in the world, both the development of venture capital and the information technology industry have been intimately linked with the international economy.

The earliest discussion of venture capital in India came in 1973, when the government appointed a commission to examine strategies for fostering small and medium-sized enterprises (Nasscom, 1998). In 1983, a book entitled *Risk Capital for Industry* was published under the auspices of the Economic and Scientific Research Foundation of India (Chitale, 1983). It showed how the Indian financial systems' operation made it difficult to raise "risk capital" for new ventures and proposed various measures to liberalize and deregulate the financial market. Oddly, this book never mentioned venture capital *per se*. Though this and other books did not have immediate results, they were an indication of a political discussion of the difficulties India had in encouraging entrepreneurship and the general malfunctioning of the Indian financial system. Venture capital would become one small part of this larger discussion.

### (a) *The first period, 1986–95*

Indian policy toward venture capital has to be seen in the larger picture of the government's interest in encouraging economic growth. The 1980s were marked by an increasing disillusionment with the trajectory of the economic system and a belief that liberalization was needed. A shift began under the government of Rajiv Gandhi, who had been elected in 1984. He recognized the failure of the old policy of self-reliance and bureaucratic control. The policy toward venture capital should be seen in this larger movement.

Prior to 1988, the Indian government had no policy toward venture capital; in fact, there was no formal venture capital. In 1988, the Indian government issued its first guidelines to legalize venture capital operations (Ministry of Finance, 1988). These regulations really were aimed at allowing state-controlled banks to establish venture capital subsidiaries, though it was also possible for other investors to create a venture capital firm. There was only minimal interest, however, in the private sector in establishing a venture capital firm (Ramesh & Gupta, 1995).

The government's awakening to the potential of venture capital occurred in conjunction with the World Bank's interest in encouraging economic liberalization in India. So, in November 1988, the Indian government announced an institutional structure for venture capital (Ministry of Finance, 1988). This structure had received substantial input from the World Bank, which had observed that the focus on lending rather than equity investment had led to institutional finance becoming "increasingly inadequate for small and new Indian companies focusing on growth" (World Bank, 1989, p. 6). In addition, "the [capital] markets have not been receptive to young growth companies needing new capital, making them an unreliable source for growth capital" (World Bank, 1989, p. 8). Though the exact sequence of events is difficult to discover, some measure of the impetus for a more serious consideration of venture capital came from the process that led to the 1989 World Bank study quoted above. Noting that the government's focus until then had been on direct involvement in research and development (R&D) activities through its own research institutes, in technology selection on behalf of industry, and promoting of technological self-reliance within Indian industry, the 1989 World Bank report described approvingly a new trend in government thinking toward shifting decision making with respect to technology choice and R&D to industry (both private and public) and a more open attitude toward the import of technology. The World Bank was keen to encourage this shift. The 1989 World Bank (1989, p. 2) report noted that "Bank involvement ... has already had an impact on the plans and strategies of selected research and the standards, institutes and, with support from the IFC, on the institutional structure of venture capital."

Making the case for supporting the new venture capital guidelines with investments into Indian venture capital funds (a first for the World Bank), the World Bank calculated that demand over the next 23 years would be around $67–133 million per annum, and it

proposed providing a total of $45 million to be divided among four public sector financial institutions for the purpose of permitting them to establish venture capital operations under the November 1988 guidelines issued by the Government of India. (One of these operations, TDICI, slightly predated the guidelines, having been established in August 1988.)

The venture capital guidelines offered some liberalization, but not everything the World Bank wished. The most important feature of the 1988 rules was that venture capital funds received the benefit of a relatively low capital gains tax rate (but no pass through), i.e., a rate equivalent to the individual tax rate, which was lower than the corporate tax rate. They were also allowed to exit investments at prices not subject to the control of the Ministry of Finance's Controller of Capital Issues (which otherwise did not permit exit at a premium over par). A funds' promoters had to be banks, large financial institutions, or private investors. Private investors could own no more than 20% of the fund management companies (although a public listing could be used to raise the needed funds).

The funds were restricted to investing in small amounts per firm (less than 100 million rupees); the recipient firms had to be involved in technology that was "new, relatively untried, very closely held or being taken from pilot to commercial stage, or which incorporated some significant improvement over the existing ones in India." The government also specified that the recipient firm's founders should be "relatively new, professionally or technically qualified, and with inadequate resources or backing to finance the project." There were also other bureaucratic fetters including a list of approved investment areas. Two government-sponsored development banks, ICICI and IDBI, were required to vet every portfolio firm's application to a venture capital firm to ensure that it fulfilled the right purposes. In addition, the Controller of Capital Issues of the Ministry of Finance had to approve every line of business in which a venture capital firm wished to invest. In other words, the venture capitalists were to be kept on a very short leash.

Despite these constraints, the World Bank supported the venture capital project, noting that

> the Guidelines reflect a cautious approach designed to maximize the likelihood of venture capital financing for technology-innovation ventures during the initial period of experimentation and thereby demonstrate the viability of venture capital in India. For this reason, during the initial phase, the Guidelines focus on promoting venture capital under the leadership of well-established financial institutions (World Bank, 1989).

Interestingly, the US experience had shown that such highly constrained and bureaucratically controlled venture capital operations were the least likely to succeed. Nonetheless, four state-owned financial institutions established venture capital subsidiaries under these restrictive guidelines and received a total of $45 million from the World Bank.

The World Bank sought to ensure a level of professionalism in the four new venture capital funds, two of which were established by two well-managed state-level financial organizations (Andhra Pradesh and Gujarat), one by a large nationalized bank (Canara Bank) and one by a development finance organization (ICICI). The World Bank loaned the money to the Indian government that would then on-lend it at commercial rates to these institutions for 16 years, including a seven-year moratorium on interest and principal repayments. The venture capital funds were expected to be investing principally in equity or quasi-equity. Some monies were allocated for training personnel through internships in overseas venture capital funds.

This was an innovative project for the World Bank. The report noted (1989, p. 42) that "this is the first experience of this kind in India or in the Bank." To protect itself, the Bank agreed to engage in "substantial supervision." The World Bank would (1989, p. 31) "Review and approve initially nearly 30 investments (made by the venture capitalists) ... In addition, during supervision missions, Bank staff would review and comment on additional projects before they are approved." Each venture capitalist would have to submit semiannual progress reports detailing (1989, p. 33) "prospects, risks, and reasons for choice of financial instruments." The venture capitalists agreed with the World Bank that they would operate under the following operating guidelines: (i) the primary target groups for investment would be private industrial firms with above-average value-added in sectors where India had a comparative advantage, and protected industries would be avoided; (ii) the quality and experience of the management was key, along with the prospects of the product; (iii) the portfolio return should

be targeted to be at least a 20% annual return; and (iv) no single firm should receive more than 10% of the funds, and the venture capitalist would not own more than 49% of an investee's voting stock. It is interesting that, in its spirit, the World Bank's funding was similar to that of the US SBA's funding of SBICs. [10]

In 1988, the first organization to actually identify itself as a venture capital operation, Technology Development and Information Company of India (TDICI), was established in Bangalore as a subsidiary of the Industrial Credit and Investment Corporation of India (ICICI), India's second-largest development financial institution (at the time, it was state-owned and managed). ICICI had already had an interest in venture capital investing beginning in 1984. It started a small investing division at its Mumbai headquarters in 1985 that focused upon unlisted, early-stage companies (Nadkarni, 2000; Pandey, 1998). This division was run by Kiran Nadkarni, who later went on to become TDICI's second president. As an ICICI division, its venture capital activities were circumscribed by the laws of the time. Learning from responses to similar restrictions in Korea, Nadkarni (2000) and ICICI Chairman Vaghul implemented a novel instrument for India, termed the "conditional loan." It carried no interest but entitled the lender to receive a royalty on sales (ICICI charged between 2% and 10% as a royalty). They would typically invest three million rupees in a firm, of which one-third was used to buy equity at par for about 20–40% of the firm, while the rest was invested as a conditional loan, which "was repayable in the form of a royalty (on sales) after the venture generated sales." There was no interest on the loan. The problem with this scheme is, however, that the loan did not provide capital gains (Pandey, 1998, p. 256).

In its first year, the division invested in seven such deals, of which three were in software services, one in effluent engineering, and one in food products (a bubble gum manufacturer). Being a novel institution in the Indian context, as Nadkarni (2000) noted,

> There was no obvious demand for this kind of funding and a lot of work went into creating such deals. Our objective was not purely monetary but to support entrepreneurship. We searched for deals that would earn us 2–3 percent above ICICI's lending rate. It was initially just a one-person operation [he] and then another person joined the team. Looking back, there was no sectoral focus, so it is remarkable that we invested so much in Information Technologies.

Their primary task was identifying good firms and making sure they were properly financed, although they provided little input on setting corporate strategy, business development ideas, or recruitment, as this was not part of the mandate. There were some missed opportunities. For example, Infosys, then a fledgling startup, had approached ICICI, which was managing PACT, a USAID project meant to fund cooperative research between US and Indian firms, for funding a medical diagnosis project. ICICI rejected Infosys' request, however, because the project was deemed too risky.

In 1988, the ICICI division was merged into the newly formed TDICI in Bangalore, which was an equal joint venture between ICICI and the state-run mutual fund UTI. The primary reason for creating the joint venture with UTI was to use the tax pass-through, an advantage that was not available to any corporate firm at that time other than UTI (which had received this advantage through a special act of parliament). Hence, while the investment manager for the new funds was TDICI, it was a 50/50 partnership between ICICI and UTI, and the funds were registered as UTI's Venture Capital Unit Schemes (Vecaus). Vecaus I, established in 1988, had a paid-in capital of 300 million rupees. Founded in 1991, Vecaus II had a paid-in capital of one billion rupees.

Another reason for forming TDICI was that venture capital investments were too small relative to ICICI's own portfolio to be worth managing. Furthermore, ICICI did not have the flexibility or the ability to evaluate venture investments. For example, Praj Industries, an effluent engineering firm funded by ICICI, used its funding to build a demonstration unit for a sugar cooperative, but delays in project implementation led to a delay in the unit's completion until after the sugar harvesting season ended. This meant that the demonstration unit would not receive raw material for another year. The ICICI investment committee was not equipped to deal with such delays (Nadkarni, 2000).

Rather than remaining in Bombay where ICICI was headquartered, TDICI decided to open its operations in Bangalore. The reason for this was that by 1988, when TDICI was prepared to begin serious investing, interest in technology had increased due to the success of multinationals such as Texas Instruments and Hewlett Packard that were operating in Bangalore. In addition, the TDICI managers

wanted to escape from ICICI's large-firm culture. TDICI had to decide between Pune and Bangalore, both of which were emerging as technology centers. Bangalore was chosen because the Indian software firms such as Wipro, PSI Data, and Infosys were based in Bangalore (Nadkarni, 2000). Moreover, Bangalore was the beneficiary of an earlier decision by the Indian government to establish it as the national center for high technology. The research activities of state-owned firms such as Indian Telephone Industries, Hindustan Aeronautics Limited, the Indian Space Research Organization (ISRO), and the Defence Research Development Organization, along with the Indian Institute of Science (India's best research university), were centralized there.

TDICI's Vecaus I assumed ICICI's venture capital investments, then valued at 25 million rupees, and invested in several successful information technology firms in Bangalore. Its first president, P. Sudarshan, was an 18-year veteran of the Indian Scientific Research Organization and had headed their technology transfer division. Nadkarni was the head of the venture capital division and became the TDICI president in March 1990. Several established software firms received funds from TDICI, including Wipro for developing a "ruggedized" computer for army use. There were several successes, including several firms which went public, such as VXL, Mastek Software Systems, Microland, and Sun Pharmaceuticals. From its inception through 1994, the fund had an inflation-adjusted internal rate of return of 28% (before the compensation of the venture capitalists), despite several mistakes, such as initially funding several import-substitution products that were negatively impacted by a lowering of import tariffs. [11] Moreover, initially TDICI saw itself as an organization funding technology ventures, and did not focus as directly upon commercial objectives, thus it made investments in interesting technology and not, perhaps, the best business opportunities (Pandey, 1998, p. 258). There also were organizational failures, the most important of which was allowing relatively junior recruits to filter the deals before the senior professionals saw them. As a result, several high-quality potential investments were missed. Vecaus I made 40 investments to be managed by seven professionals. In retrospect, Nadkarni (2000) believed that was too large a number. By 1994, the difficulties created by the institutional ownership in the management and funding of TDICI began to tell on staff morale, and the performance of the fund's new investments was relatively poor.

Despite its difficulties, TDICI was the most successful of the early government-related venture capital operations. Moreover, TDICI personnel played an important role in the formalization of the Indian venture capital industry. Kiran Nadkarni established the Indian Venture Capital Association, and was the Indian partner for the first US firm to begin operations in India, Draper International. In addition to Nadkarni, TDICI personnel left to join yet other firms. For example, Vijay Angadi joined ICF Ventures, a fund subscribed to by overseas investors (ICF Ventures, 2001). In addition, a number of TDICI alumni became managers in Indian technology firms. So, the legacy of TDICI includes not only evidence that venture capital could be successful in India, despite all of the constraints, but also a cadre of experienced personnel that would move into the private sector.

There were other early funds. For example, in 1990, Gujarat Venture Finance Limited (GVFL) began operations with a 240 million rupee fund with investments from The World Bank, the UK Commonwealth Development Fund, the Gujarat Industrial Investment Corporation, Industrial Development Bank of India, various banks, state corporations, and private firms (GVFL, 2001). GVFL was established with a handicap, namely it was meant to invest in the State of Gujarat. Although its returns were not high, it was sufficiently successful so that in 1995, it was able to raise 600 million rupees for a second fund. Then in 1997 it raised a third fund to target the information technology sector.

As with the other firms, GVFL's investment targets shifted through time. As Table 3 indicates, in 1995 there were fewer food and agriculture-related firms and a greater emphasis on information technology than in 1990. The 1997 fund invested exclusively in information technology, discovering what US venture capitalists had learned 40 years earlier, namely that only fast-changing industries in which large returns are possible can justify venture investing (Kenney, n.d.). As with other firms, GVFL was restricted in the financial instruments it could use and, as a state institution, they were under pressure to invest in the state of Gujarat. Even more than TDICI, GVFL lacked professional expertise. In 1998, the president of GVFL estimated that ultimately he would be able to

Table 3. *Gujarat venture finance limited investments in 1990 and 1995 funds*

| Firm name 1990 | Industrial field 1990 | Firm name 1995 | Industrial field 1995 |
|---|---|---|---|
| Premionics India | Filtration membranes | Computerskill | Specialized printing |
| Saraf Foods | Dried fruits | Srinisons Cables | Auto wiring |
| Systech | Flight data acquisition Systems | Lokesh Machines | Machine tools |
| Ajay Bio-tech | Bio-fertilizers | Mark Walker Opticals | Designer optical frames |
| Colortek | Liquid colorants for plastics | Apex Electricals | High rating transformers |
| Agrochem | Tocopherol from fatty acid | Akshay Software Technologies | Turnkey software |
| Lactochem | Lactic acid from molasses | Minda Instruments | Auto panel instrument clusters |
| Cals | Wide area networking | Indus Boffa Brakes | Disk brake pads |
| TIPCO | Thermoplastic | Nexstor India | Hardware system manageability product |
| Madhusudan Ceramics | Glazed tiles using new firing process | 20 Microns | Micronized minerals |
| | | Radiant Software | IT training & software |

*Source*: GVFL (2000).

achieve a only 15% annualized return (Radhakrishnan, 1998)—a relatively weak return.

The other two venture funds had only modest success. The Andhra Pradesh state government formed a venture fund subsidiary in its AP Industrial Development Corporation (APDIC). As in the case of GVFL, it was mandated to invest in its state. Though located in a relatively strong high-technology region around Hyderabad, APDIC suffered from all the difficulties of state-operated venture capital funds and has also had a relatively low return. The final venture fund was the only bank-operated venture capital fund, which was a subsidiary of nationalized Canara Bank, CanBank Venture Capital Fund (Canbank). Canbank, which was headquartered in Bangalore, also performed only modestly. Despite their rather weak performance, all of these firms raised new funds and were able to continue their operations.

This first stage of the venture capital industry in India was plagued by inexperienced management, mandates to invest in certain states and sectors, and general regulatory problems. The firms' overall performance was very modest, and only TDICI could be considered a success. As mentioned earlier, such problems with government-sponsored venture capital are not unique. Venture capital investing is a difficult art. Government interference and limitations almost invariably increase the risks in an already risky enterprise, making failure more likely. Yet, from this disappointing first stage, there came a realization that there actually were viable investment opportunities in India, and a number of venture capitalists had received training.

(b) *The second period, 1995–99*

The success of Indian entrepreneurs in Silicon Valley that began in the 1980s became far more visible in the 1990s. This attracted attention and encouraged the notion in the United States that India might have more possible entrepreneurs. Figure 1 shows that the amount of capital under management in India increased after 1995. [12] Moreover, it also indicates that the source of this increase was the entrance of foreign institutional investors. This included investment arms of foreign banks, but particularly important were venture capital funds raised abroad. Very often, NRIs were important investors. In quantitative terms, it is possible to see a dramatic change in the role of foreign investors. Notice also the comparative decrease in the role of the multilateral development agencies and the Indian government's financial institutions. The overseas private sector investors became a dominant force in the Indian venture capital industry.

In the United States, the venture capital industry is clustered in three specific regions (in order of descending importance): Silicon Valley (San Francisco Bay Area), New York, and Boston. It is significant to note that Silicon Valley and Boston are what can be termed "technology-related" venture capital clusters, while New York is a "finance-related" cluster (Florida & Kenney, 1988a,b). In India, as Table 4 indicates, there is also a clustering under way. During the last two years, Bombay and New Delhi dramatically increased their share of the venture capital offices. This resembles the US historical record, in some ways,

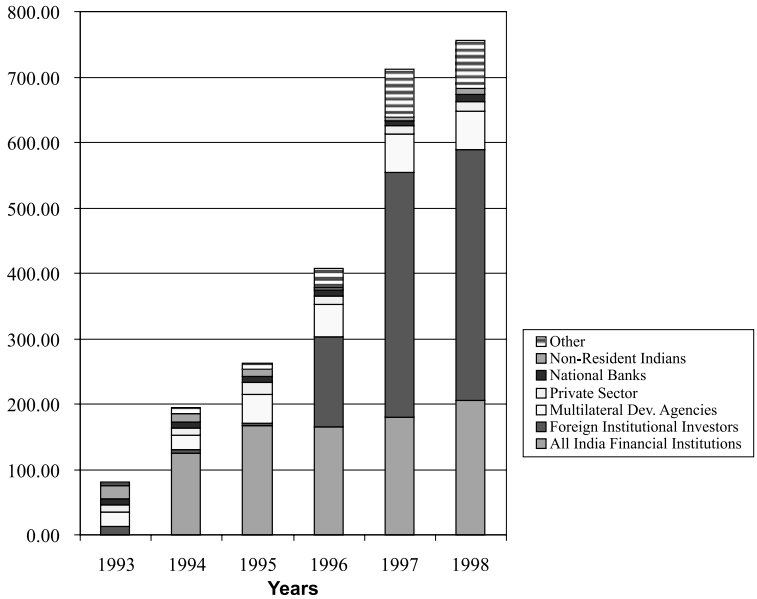


Figure 1. *Capital under management by the Indian venture capital industry by year in US$ millions. (Source: IVCA, various years.)*

Table 4. *The location of the headquarters of the members of Indian venture capital association 1993–98 and 2000*

| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2000 |
|---|---|---|---|---|---|---|---|
| Bombay | 4 | 3 | 2 | 4 | 5 | 6 | 31 |
| New Delhi | 3 | 3 | 3 | 2 | 3 | 4 | 10 |
| Hyderabad | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Bangalore | 2 | 2 | 2 | 5 | 5 | 5 | 8 |
| Ahmedabad | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Calcutta | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Pune | 0 | 0 | 1 | 1 | 1 | 1 | 2 |
| Chennai | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| Lucknow | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Total | 11 | 11 | 11 | 17 | 19 | 21 | 56 |

Where there was more than one office, only the headquarters was counted.
*Source*: Indian Venture Capital Association (various years), Nasscom (1998).

and also indicates the immaturity of the Indian industry. As late as 1998, Bombay, Bangalore, and New Delhi were comparable in terms of number of offices. In contrast to the United States, where Silicon Valley asserted its dominance as a technology center at the end of the 1970s, Bangalore had a smaller share of offices when compared with both Bombay and New Delhi, which are the financial and political capitals of India, respectively.

This apparent weakness of Bangalore is overstated, because the largest venture capital firms in capital terms, i.e., TDICI, Draper, Walden-Nikko, JumpStartup and e4e, are headquartered in Bangalore. In fact, Walden-Nikko closed its Bombay offices in 2000 to consolidate in Bangalore. The other important private venture capital firms, such as Chrysalis (Bombay) and Infinity (Delhi), have operations in Bangalore as well. In some cases, there were distinct reasons for locating in Bombay. For example, Chrysalis chose Bombay because of the internet boom, which was centered in Bombay. As in the case of New York's Silicon

Alley, this proved to be a strategic error. In the case of Infinity, it chose Delhi because the partners lived there. Another large venture capital firm, SIDBI, is based in Bombay because it is a subsidiary of a state-owned bank with corporate headquarters in Lucknow and Bombay. Moreover, Citibank's venture capital operation is headquartered in Bombay; but its portfolio consists mainly of private equity "salvage-type" deals and some internet startups. Many of the other Bombay venture capital operations are involved in what, in the United States would be considered financial engineering. Thus Bombay has a venture capital community that resembles the New York financial cluster.

The involvement of the overseas private sector in the Indian venture capital industry was a path-dependent experimental process. For example, in 1993, in an attempt to develop investment opportunities businesses in India, Vinod Khosla (2000) spent three years commuting between India and Silicon Valley. In 1996, he gave up, returning full-time to Silicon Valley, as he concluded that the Indian environment for venture capital development was inadequate.

Khosla was not alone. In 1993, Bill Draper, who had begun venture investing in 1959, returned to Silicon Valley from a series of positions dealing with development in the federal government and then the United Nations. In conjunction with a Stanford second-year MBA student, Robin Richards, Draper decided to begin venture investing in a developing country. After reviewing a number of countries, he decided that India's strength in software and English capabilities made it an ideal candidate. So, in 1995, he formed Draper International and recruited investments from a number of successful Silicon Valley entrepreneurs and investors of Indian descent (Draper, 2000). This would the first major overseas firm to begin investing in India. To head their Indian office, they attracted Kiran Nadkarni from TDICI.

Though Draper International would be the first, others soon followed. In late 1996, the Walden Group's Walden International Investment Group (WIIG) initiated its India-focused venture capital operation. The first fund, Walden-Nikko India Venture Co., was a joint venture between WIIG and Nikko Capital of Japan, investing in early and late-stage companies (WIIG.COM, 2000). In the late 1990s, many more venture capital funds established operations in India.

The formalization of the Indian venture capital community began in 1993 with the establishment of the Indian Venture Capital Association (IVCA) headquartered in Bangalore. The prime mover for this was TDICI's Nadkarni, who became its first president. There were nine members, the state-owned or managed ones being TDICI, GVFL, the Industrial Development Bank of India's venture capital division, RCTC, APIDC's venture capital division, and Canbank Ventures. The private members were Credit Capital Corporation, a joint venture with Commonwealth Development Corporation, headed by investment banker Udayan Bose, headquartered in Mumbai, Indus Ventures of Mumbai (started by T. Thomas, an ex-Unilever board member, and the Mahindra Group), Grindlays (later part of the ANZ banking group, subsequently purchased by Standard Chartered Bank), and the British venture firm 3i Corporation. Initially, the IVCA met only quarterly due to their geographical dispersion. Since the majority of the firms were subsidiaries of the Indian government agencies or banks and received funds from international development agencies, there was little real need to interact intensively.

IVCA had little success in addressing the main problem of most of its members, the absence of tax pass-through. The reasons for lack of success were twofold: First, the government did not understand the benefits of venture capital in economic development terms. This was a result, in large measure, of the lack of recognition of the potential of the Indian-owned portion of the software industry. Moreover, the venture capital industry was tiny with respect to the overall Indian economy, having committed funds of three billion rupees and disbursements of less than half that amount. Hence, they were unable to mobilize sufficient political pressure to motivate any liberalization. Second, the largest player, TDICI, had few reasons to demand changes in the regulations, because it was unaffected by them (and, perhaps, benefited by being able to attract funding away from its taxed brethren).

As late as 1999, the IVCA was still struggling to be an effective lobbying force. In fact, much of the most powerful lobbying for the Indian venture capital industry comes from the Indian information technology industry association NASSCOM. The IVCA does not even have a web site. The most authoritative web-based

information on the Indian venture capital industry is available from the NASSCOM site.

There are internal divisions also. According to one source, in 1999 approximately 80% of the total venture capital investments were derived from overseas firms (Singhvi, 1999). These foreign firms registered in Mauritius as a strategy to avoid the onerous regulations and taxes imposed by the Indian government—a mechanism that foreign securities firms seeking to invest in India had pioneered. [13] A Mauritius registry allowed tax pass-through, and since they did not have other issues, such as finding funds, they had little incentive to join IVCA or actively lobby the Indian government. IVCA thus was a vehicle for Indian venture capital funds seeking to obtain a level playing field with the foreign funds. In fact, in the past, differences within IVCA surfaced, with the overseas funds arguing for more regulation from the Foreign Investment Promotion Board, which has a liberal record, and less from the Ministry of Finance, which has a contradictory record. The domestic funds favored a single regulator, and they ultimately won this debate when the SEBI was formed. Still, the divisions in the IVCA prevented it from becoming an important player in the regulatory debates during the late 1990s.

Only in 1996 did overseas and truly private domestic venture capitalists begin investing. This increase in investment was accelerated by SEBI's announcement of the first guidelines for registration and investment by venture capital firms. Though these changes had a salutary effect, the development of venture capital continued to be inhibited because overall the regulatory regime remained cumbersome. The inhibition is partly expressed in the fact that as of December 1999 nearly 50% of the offshore pool of funds had not yet been invested (IFC, 1999).

The IVCA also has difficulties; as of December 1998, only 21 venture capital firms were registered with IVCA. Of these firms, eight are in the public sector and seven have received funds from multilateral funding agencies (IVCA, various years). The IVCA, though not yet able to present a united front, has continued to mature. If the Indian venture capital industry continues to expand and a regulatory framework that ends the benefit for offshore registration is enacted, then the IVCA will be able to present unified positions. This will enable it to become the voice of the Indian venture capital sector.

## 8. RECENT GOVERNMENT EFFORTS TO ENCOURAGE VENTURE INVESTING

In the late 1990s, the Indian government became aware of the potential benefits of a healthy venture capital sector. Thus in 1999 a number of new regulations were promulgated. Some of the most significant of these related to liberalizing the regulations regarding the ability of various financial institutions to invest in venture capital. Perhaps the most important of these went into effect in April 1999 and allowed banks to invest up to 5% of their new funds annually in venture capital. As of 2001, however, they have not made any venture capital investments. This is not surprising since bank managers are rewarded for risk-averse behavior. Lending to a risky, fast-growing firm could be unwise because the loan principal is at risk while the reward is only interest. [14] In such an environment, even if bankers were good at evaluating fledgling firms, itself a dubious proposition, extending loans would be unwise. This meant that since banks control the bulk of discretionary financial savings in the country, there is little internally generated capital available for venture investing.

The bureaucratic obstacles to the free operation of venture capital remained significant. There has been a confusing array of new statutes. The main statutes governing venture capital in India included the SEBI's 1996 Venture Capital Regulations, the 1995 Guidelines for Overseas Venture Capital Investments issued by the Department of Economic Affairs in the Ministry of Finance, and the Central Board of Direct Taxes' (CBDT) 1995 Guidelines for Venture Capital Companies (later modified in 1999). In early 2000, domestic venture capitalists were regulated by three government bodies: the Securities and Exchange Board of India (SEBI), the Ministry of Finance, and the CBDT. For foreign venture capital firms the Foreign Investment Promotion Board (FIPB) was required to approve every investment, and the Reserve Bank of India (RBI) had to approve every exit.

The stated aim of the Indian regulatory regime is to be neutral with regard to the risk profile of investment recipients. In sharp contrast to the United States, however, where a venture capital fund can invest in any industry it wishes, in India only six industries have been approved for investment: software, information technology, pharmaceuticals, biotechnology,

agriculture and allied industries. Statutory guidelines also limited investments in individual firms based on the firm's and the fund's capital. The result of these various regulations has been a channeling of venture capital investment toward late-stage financing.

Regulations regarding venture capital continued to be cumbersome and sometimes contradictory. Income tax rules provided that venture capital funds may invest only up to 40% of the paid-up capital of a recipient firm, and also not beyond 25% of their own funds. The Government of India guidelines also prescribed similar restrictions. Finally, the SEBI regulations did not have any sectoral investment restrictions except to prohibit investment in financial services firms. The result of these various restrictions was government micromanagement of investment, complicating the activities of the venture capital firms without either increasing effectiveness or reducing risk to any appreciable extent.

Impediments to the development of venture capital also exist in India's corporate, tax, and currency laws. India's corporate law did not provide for limited partnerships, limited liability partnerships, or limited liability corporations (LP, LLP, and LLC, respectively). Moreover, corporate law allowed equity investors to receive payment only in the form of dividends (i.e., no in-kind or capital distributions are allowed). Disclosure requirements were, however, consistent with best international practice. In the absence of seasoned institutional investors, advanced-country standards of investor protection that would normally be imposed by such investors have not developed. There was not even a self-regulatory group.

The general regulatory environment continues to hinder investment. For example, all investors in the venture capital fund had limited liability, and there was no flexibility in risk-sharing arrangements. There were no standard control arrangements, so they had to be determined by negotiation between management and investors in the fund. Moreover, Indian regulations did not recognize limited life funds, so in India it was relatively easy to terminate a trust, but this meant that the entire firm was closed rather than a specific fund within the firm. Therefore, each fund had to be created as a separate trust or company. This process was administratively and legally time-consuming. Terminating a fund was even more cumbersome, as it requires court approval on a case-by-case basis.

India's regulatory framework inhibits practices used in the United States to reward employees of startup firms. Currently, in India founders and employees can participate in employee stock option programs, if the firm is private, defined as those having less than 50 nonemployee shareholders. India's corporate laws allow for flexible risk sharing, control and exit arrangements between financiers and firm management, provided the firms in which they invest are private. But, for firms with more than 50 nonemployee shareholders, India's corporate law does not provide flexibility in using equity to reward employees. This is a significant handicap in recruiting and motivating high-quality management and engineering talent.

The restrictions on venture capital extend beyond the framework of corporate law. For instance, tax restrictions on corporations require that corporations paying dividends must pay a 10% dividend-distribution tax on the aggregate dividend. [15] On the other hand, trusts granting dividends are exempt from dividend tax. For venture capital the optimal environment would be a tax regime that is fiscally neutral. It is also important to be tax-competitive with other domestic uses of institutional and private equity finance, particularly the domestic mutual funds sector. In 2001, the tax code was still disadvantageous for the international venture capital investor. For example, earnings from an international venture capital investor are taxed even if it is a tax-exempt institution in its country of origin. [16]

Another significant impediment to developing a vibrant venture capital industry was India's foreign currency regulations. Even in 2001, the Indian rupee was nonconvertible. The lack of convertibility hampered venture capital inflows from offshore because specific, time-consuming governmental approvals from multiple agencies were required for each investment and disinvestment.

Just as the currency regime inhibited international venture capital firms from investing in India, domestic venture capital firms were not allowed to invest offshore. Synergistic investments in overseas firms that collaborate with domestic firms were next to impossible. The currency regime also frustrated exit strategies. For example, in early 1999 Armedia, an Indian manufacturer of high-technology telecommunications equipment, was in discussion with Broadcom, a US firm, about being acquired, and it also was seeking an investment from an Indian venture capitalist. But, since Indian

venture capital firms cannot own offshore shares, the deal with Broadcom would have had to be changed from a "pooling-of-interests" transaction to a cash acquisition. Broadcom, therefore, offered a significantly smaller sum to Armedia, because of the Indian venture capital firm's involvement. Fortunately for Armedia, it was able to obtain bridge funding offshore and did not have to use an Indian venture capital firm (Dave, 1999). The Indian legal and regulatory environment continued to inhibit venture capital investors from maximizing their returns.

### (a) *Current political debates*

An Indian venture capital industry is struggling to emerge and given the general global downturn, the handicaps existing in the Indian environment are threatening. As we have seen, many of the preconditions do exist, but the obstacles are many. Some of these can be addressed directly without affecting other aspects of the Indian political economy. Others are more deeply rooted in the legal, political, and economic structure and will be much more difficult to overcome without having a significant impact on other parts of the economy. A number of these issues were addressed in a report submitted to SEBI in January 2000 from its Committee on Venture Capital. SEBI then recommended that the Ministry of Finance adopt many of its suggestions.

In June 2000, the Ministry of Finance adopted a number of the Committee's proposals. For example, it accepted that only SEBI should regulate and register venture capital firms. The only criterion was to be the technical qualifications of their promoters, whether domestic or offshore. Such registration would not impose any capital requirements or legal structure—this is very important, because it would allow India to develop a legal structure suitable to its environment, while offering tax pass-through for all firms registered as venture capital firms with SEBI. This was an important achievement of the Committee's report. The proposed guidelines continued, however, to prohibit finance and real estate investments. Whether this type of micromanagement is good policy seems dubious. In addition, registered venture capital funds must invest 70% of their paid-in capital in unlisted equity or equity-related, fully convertible instruments. [17] Similarly, related-company transactions would be prohibited, and not more than 25% of a fund's capital could be invested in a single firm. In the United States most of these provisions are not law, but are codified in the limited partnership contracts and accepted as common sense. Rather than letting the market decide which venture capital firms are operating responsibly, the Indian government continues to specify a variety of conditions.

A number of suggestions were not accepted even though they would assist in the growth of venture capital. Many were related to the much larger general issues of corporate governance. For example, there was no change in the regulations regarding restrictions on currency nonconvertibility, providing employees more flexible stock-option plans, allowing domestic venture capital firms to hold equity in overseas startups, and regulations allowing greater flexibility in voting and dividend rights. Reluctance to adopt these measures is understandable, because they would strike at some of the fundamental issues of corporate governance in India. Thus they were seen as policy decisions that might set in motion a larger chain of events.

At the end of 2001, the Indian venture capital environment contained several unresolved issues. One important obstacle was the inability to pass through unrealized gains or losses through to the venture capital fund's investors through a direct distribution of stock or other securities unless the fund is organized as a trust. In the US, these "in-kind distributions" are the most common method of compensating investors. This method increases the return for socially beneficial tax-exempt organizations such as foundations and pension funds. Private individuals, of course, pay taxes. Allowing legal structures, such as limited partnerships, will enable such pass-through and encourage investment in venture capital funds.

There are also obstacles for overseas venture capitalists—a seemingly unwise set of barriers to a country wishing to attract much-needed foreign capital and to create incentives for the continuing growth of the venture capital industry. Currently, foreign venture capitalists require permission from the RBI/FIPB for each investment and liquidation. The RBI's formula for disinvestment is based on physical asset value and benchmark price-earnings ratios, both of which are often irrelevant. For example, a firm that has primarily intellectual property but makes a loss may still be valuable, but Indian rules do not allow it to be valued properly. Finally, foreign and domestic firms cannot repatriate capital or earnings without

further regulatory involvement. There were restrictions on the ability of Indian firms to trade their stock for that of an overseas firm, and it was extremely difficult to sell an Indian firm to a foreign firm—something that was simple and common for venture capital-funded firms in Israel, Sweden, Canada, or the United Kingdom. Conversely, Indian venture capital funds today find it difficult to invest abroad, a significant handicap when it is considered that venture capital funds in nearly all other countries were not only allowed to invest abroad, but also did so to secure access to more deals and spread risk. The ability of Israeli venture capital funds to invest abroad, especially in firms established by expatriate Israelis, has been crucial to the dramatic growth of the Israeli venture capital industry. In effect, the lack of convertibility of the Indian rupee is a structural impediment.

Although published data on venture capital investment after the moderate liberalizations effected in 2000 were not yet available, there were indications that investment has increased, suggesting that further liberalization could elicit even greater venture capital activity. Unofficial figures gathered by SEBI and IVCA [18] showed that over $1 billion was invested in 2000, although the flow has substantially declined in the first two months of 2001 due to the global tightening of venture capital investment. Interestingly, because the overseas investors were not regulated by SEBI, it was difficult to be certain about the amount of investment. Foreign funds, in the absence of sensible regulations for overseas funds (as discussed above), have preferred the more bureaucratic but ultimately workable process offered by the FIPB. But, since the FIPB did not classify approvals by investment stage, all statistics are necessarily approximations.

## 9. CONCLUSION

In the introduction we argued that the transplantation of an institution could have four Interactions. In the case of Israel, Interaction (a), which was the successful transfer of the institution with little need to change the environment ruled. In the case of Taiwan, we argued that the institution of venture capital had to be changed, in some significant ways, i.e., Interaction (c). For India, we have argued that the environment itself has had to be and needs to continue being changed, i.e., Interaction (d). Of course, this is a much more profound process than either Israel or Taiwan has had to undergo. Interestingly, in India we believe that venture capital as an institution may actually need to be changed less than in the case of Taiwan, however this conclusion is not yet entirely verified.

Earlier patterns of growth or failure in venture capital industries in other countries and regions indicate that the evolution of venture capital seems to be either entry into a self-reinforcing spiral, such as occurred in Silicon Valley, Israel and Taiwan, or growth and stagnation, as occurred in Minnesota in the 1980s or Germany until recently (on Germany, see Woywode, 2001). In other words, should India wish to develop a high-technology industry funded by venture capital, then it will be necessary to continue improving the environment by simplifying and eliminating regulations that do not perform necessary functions such as consumer protection.

The venture capital industry is emerging in India as a result of internal and external factors. Should the venture capital industry be sufficiently successful to become self-sustaining, the Indian NIS will be altered. During the 1990s the dominance of government institutions and family-owned conglomerates in the Indian innovation system began to shift somewhat so that entrepreneurship began to play a larger role. Moreover, scholars have generally treated India as a largely self-contained NIS, but during the 1990s the NRIs became an increasingly important component of the NIS through their wealth, contacts, and political and economic influence. This would be interesting because most scholars have treated the NIS as a relatively fixed system.

The World Bank, with its agenda of decreasing government regulation, funded the creation of the first venture capital funds. Though these funds experienced limited success, they were the beginnings of a process of legitimitizing venture investing and they were a training ground for venture capitalists who later established private venture capital funds. It is unlikely that the venture capital industry could have been successful without the development of the software industry and a general liberalization of the economy. Of course, this is not entirely surprising, because an institution as complicated as venture capital could not emerge without a minimally supportive environment. This environment both permitted the

evolution of the venture capital industry and simultaneously allowed it to begin changing that environment and initiating a co-evolutionary dynamic with other institutions.

India still remains in a difficult environment for venture capital. Even in 2001 the Indian government remains bureaucratic and highly regulated. To encourage the growth of venture capital will require further action, and it is likely that the government will continue and even accelerate its efforts to encourage venture capital investing. The role of the government cannot be avoided: it must address tax, regulatory/legal and currency exchange policies, since many of these affect *both* venture capital firms and the companies that they finance. More mechanisms need to be developed to reduce risk if funds for venture capital must come from publicly held financial institutions managed by highly risk-averse managers.

India is an example of how purposive action in an environment replete with resources can have long-term impacts on the NIS. The ultimate fate of the Indian venture capital industry has not, as of late 2001, been decided. Even as it grew rapidly during the global Internet-fed venture capital boom of 1998 through early 2000, its continued growth is in no way guaranteed. If the earlier period provided the resources for constituting new firms, then the downturn beginning in February 2000 will be a stringent filter that will remove less viable competitors, in terms of venture capital-backed investments and many of the venture capital funds. Both the venture capital firms and the industry as a whole will be tested severely.

## NOTES

1. On path dependency, see Arthur (1994) and David (1986). For NIS, see Lundvall (1992) and Nelson (1993).

2. For a more general conceptualization, see Kogut (2000).

3. There is now a proliferating literature on the economics of the venture capital industry. See, for example, Gompers and Lerner (1999) for a guide to this body of work. Economists have attempted to apply principal-and-agent theory, information assymetry perspectives, game theory, and a variety of other models. In each of these there seem to be flaws. For example, in the venture capital–entrepreneur investment decision, there is a question of which party is less informed. Traditionally, the venture capitalist is considered to not know what the entrepreneur knows. But, the entrepreneur also does not know whether the venture capitalist will perform all the assistance functions promised during the negotiation. Thus, the information is asymmetrical on both sides. Similarly, it is usually the firm's manager who is the agent of shareholders, who are assumed to start a firm and then search for a manager to run it. The agency problem arises because managers may take decisions that will reduce firm value because of their personal goals, e.g., taking overly risky investment decisions because management benefits from the upside of such decisions but not from the downside of failure. In the venture capital–entrepreneur relationship, the agency relationship is unclear. It is the entrepreneur who starts a firm and searches for a financier while retaining a substantial portion of the firm. The financier (venture capitalist) also brings operating experience to the relationship. Both parties, therefore, have options to undertake operating actions that can affect firm value. Thus, the entrepreneur cannot simply be assumed to be the venture capitalist's agent with the possibility of undertaking actions that will reduce shareholder value. Rather than enter these theoretical discussions, we focus upon the actual path-dependent development of the venture capital industry.

4. There are, of course, many important venture capital firms headquartered in other regions. Moreover, in the United Kingdom, the very important firm, 3i, which as part of its remit invested in new firms, was formed in the immediate postwar period. More recently, there has been a proliferation of specialist venture capital firms. For example, there are funds that specialize in retail ventures. Some of the largest venture capital funds, such as Oak Investment Partners and New Enterprise Associates, have partners devoted to retail ventures, though their main focus is IT. So, there is significant diversity in the venture capital industry (Gupta & Sapienza, 1992).

5. There is significant evidence to support Black and Gilson's observation regarding the relatively greater vitality of the venture capital industry in stock market-centered economies. But, their reasoning that a public market offers entrepreneurs an opportunity "to reacquire control from the venture capitalists by using an initial public offering" is odd. There are no cases known where the entrepreneurs have reacquired control at the IPO. In fact, the true reason is nearly the converse of Black and Gilson's assertion. At the IPO, the entrepreneur can also

begin to cash out, thereby surrendering control. After a successful IPO, however, the entrepreneurs, in most cases, have achieved enormous capital gains on their low cost founder's stock.

6. For example, a recent study found that Brazil has one of the highest rates of entrepreneurship in the world, but it also has almost no venture capital to speak of (Reynolds, Hay, Bygrave, Camp, & Autio, 2000).

7. For a more complete discussion, see Kenney (n.d.).

8. According to a 1991 RBI report, the gross profit (before provisions on bank assets and taxes) had come down to 1% of assets (a healthy norm would be about 1% for profits after provisions and taxes). Moreover, approximately 25% of the total loans were bad.

9. Here we use the term "relatively skilled," because Indian postgraduate training was not as good as the training in the best US graduate schools. Put differently, the Indians who were trained in the elite US schools may have been closer to the cutting edge of engineering.

10. Though we could find no direct evidence of interaction, it is likely that the World Bank personnel were very much aware of the structure of the SBA and its initial problems.

11. Here they ignored the World Bank's suggestion that they avoid protected industries.

12. The last available information from IVCA is 1998. The 1999 figures have not yet been released.

13. One of the authors of this paper, Rafiq Dossani, helped develop this mechanism when he was an investment banker.

14. It is true that in the United States, banks have never been an important source of venture capital, even through their SBIC subsidiaries. For the most part, a bank's core competencies are in evaluating and making loans. The problem with loans to small startups is that the capital is at high risk, so any interest rate would have to be usurious. Moreover, since the new firm is often losing money in its early days, paying interest and principal would drain money from the firm during the period when it most requires the money for investment.

15. The tax was to be raised to 20% in the tax proposals for the financial year beginning April 2000.

16. There is a loophole available to foreign investors, which is to register its fund in a country having a special tax treaty with India providing effective tax exemption, such as Mauritius or the Dutch Antilles.

17. The 70% rule would prevent financial firms that are investing primarily in listed firms, in which the risk-profile of investments could be substantially different from startups, from qualifying for tax pass-through.

18. From private conversations in February 2001 with SEBI's Executive Director L.K. Singhvi and IVCA President Saurabh Srivastava.

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