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VENTURE CAPITAL IN ASIA

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Venture capital is broadly acknowledged as being an important constituent of a mature habitat for high-technology entrepreneurship as practiced in Silicon Valley (Lee et al. 2000). Each chapter in this book has examined the significance of venture capital in the economies of the regions under discussion and its particular place in the regional habitats for innovation that have appeared. As with other institutions, in each habitat the venture capital industries have differing operational characteristics, different relative mixes of national and international venture capital participation, and different investment patterns and targets. When considering and comparing these nations, it is useful to have one ideal-typical case to use as a standard of comparison. For this reason and because reproducing the Silicon Valley experience is the goal of many economic planners in Asia and around the world, this chapter uses Silicon Valley as the template for comparing the other venture capital industries.

The venture capital industries of six nations examined in this book China, India, Japan, Korea, Singapore, and Taiwan—share certain resemblances and significant differences. As we shall show, the national industries differ on a number of dimensions, one of which, the direct relationships to Silicon Valley, we shall highlight in our discussion of Transpacific connections. The development of venture capital in each nation was evolutionary and had path-dependent characteristics.' Further, this chapter argues that, though venture capital can provide a catalytic function for the growth of a high-technology habitat, this catalysis is not automatic. As with any transplanted institution, venture capital can contribute to transforming its environment, but, conversely, it can be transformed by the environment to the point at which it no longer resembles the institution in its original environment. In Asia, both

outcomes have occurred. This diversity of outcomes is a fascinating result for those interested in the transfer and diffusion of institutions and institutional practices (Guillen 2001).

The general belief is that the awareness and interest by businesspersons and policy makers in Asian nations in venture capital is rather new or, at least, has only occurred since 1980. This belief is erroneous. As early as 1951, only six years after the first U.S. venture capital firm —American Research and Development—was formed, a director of Nomura Securities visiting New York was quoted by the *Wall Street Journal* ("Japan's Recovery" 1951) as saying that Japan suffered from a scarcity of venture capital. Fifty years later, each Asian nation studied in this book has a venture capital community, although a great disparity exists in the level of development, practices, and sophistication of venture capitalists.

To orient the chapter, we begin by describing venture capital as a practice in Silicon Valley and sketching the birth and development of venture capital in the Silicon Valley habitat. The examination of the evolution of venture capital in Asia follows. For ease in understanding the differences between these nations, the venture capital industries are separated into four groups: (1) Japan and the Republic of Korea; (2) China; (3) Taiwan; (4) Singapore; and (5) India. In the penultimate section, we discuss the international linkages that these Asian venture capital industries have. The conclusion reflects upon the effect that the Silicon Valley experience has had on the growth of venture capital in these Asian nations and the future evolution of the venture capital industry and its relationship to these habitats.

VENTURE CAPITAL DESCRIBED

The common operational definition of venture capital is the distillation of a practice that was pioneered in Boston in the 1950s, developed in Silicon Valley beginning in the 1960s, and became routinized in the 1980s. The U.S. practice is relatively easy to define because venture capital and private equity are considered distinctly different — a distinction that does not hold true in some parts of the world. For example, both the European Venture Capital Association (EVCA) and the *Asian Venture Capital Journal* combine venture capital and private equity investing. As a professional investment activity, venture capital is an older practice than private equity (although it is possible to argue that today's private equity resembles the traditional role of Wall Street financiers or English merchant banks —that is, using capital to organize and reorganize firms and industrial sectors). In practice it also differs inasmuch as venture capitalists support fledging firms, whereas private equity investors

practice financial engineering. For much of the world, however, private equity and venture capital are combined both statistically and in the minds of policymakers, though we shall see that in India, Singapore, Taiwan, and, increasingly, China, venture capital is the dominant practice.

Classic venture capital investing requires business opportunities that have the potential for annualized capital gains of greater than 30 to 40 percent, because investments in seed or early-stage firms experience significant failure rates (that is, bankruptcy or negligible growth) of at least 50 percent. The successful investments must compensate for the failures and return a higher rate than less risky investments. When such opportunities do not exist, venture capital organizations are difficult to sustain. Venture capitalists cannot survive by funding firms that do not appreciate rapidly. For this reason, venture capitalists cannot evaluate investments on the basis of social goals such as reducing unemployment, increasing research and development (R&D), or building a community's technological or tax base. The sole relevant criterion is the potential for large capital gains. The only industries that have consistently offered such levels of return are the information technologies (IT) and the medical fields.

In return for investing, venture capitalists demand a significant equity stake in the firm and seats on the board of directors from which they monitor the firm. Each investment is staged, and the entrepreneurs are given milestones to be achieved prior to receiving another tranche of funds. Experienced venture capitalists provide more than just money, which is a salient difference between venture capitalists and passive investors. They actively monitor, assist, and even intervene in their portfolio firms. Given this intimate involvement, a venture capitalist's experience, connections, and ability should contribute to their portfolio firm's growth. The objective is to leverage this involvement to increase the recipient firm's probability of success. This involvement extends to ad hoc assistance in a variety of functions, including recruiting key persons; providing advice; and introducing the firm's officers to potential customers, strategic partners, later-stage financiers, investment bankers, and various other contacts (Bygrave and Timmons 1992; Florida and Kenney 1988a, 1988b; Gompers 1995). It is this involvement that differentiates venture capitalists from other funding sources.

Since the venture capitalist is investing to secure capital gains, investments are liquidated through bankruptcy, merger, or an initial public stock offering (IPO). For this reason, venture capitalists are temporary investors and, in most cases, are members of the firm's board of directors only until the investment is liquidated.' For the venture capitalist, the firm is a product to be sold, not retained. Nations that erect impediments to any exit paths (including bank-

ruptcy) handicap the development of venture capital. This does not mean that such nations cannot have venture capital, only that it is less likely to thrive.

In the United States, the predominant institutional format is the venture capital firm operating a series of partnerships called *funds* that raise money from wealthy individuals, corporations, pension funds, foundations, endowments, and various other institutional sources. The general or managing partners are the professional venture capitalists, whereas the investors are passive limited partners. The typical fund operates for a set number of years (usually 10) and then is terminated. Normally, each firm manages more than one fund; one fund is usually fully invested, another one is being invested, and a third is in the process of being raised. The limited partnership form is common in most of Asia (except Taiwan), but many other forms, such as bank-based and corporate venture capital firms, are also extant.

A successful venture capital industry is not easy to create. Of the 36 nations with a national venture capital association, fewer than 15 have industries of any significance. As an institution, venture capital is quite fragile and requires a number of preconditions for emergence and growth (Avnimelech et al. 2005). In contrast to much of the financial literature, we believe that the most important single factor for explaining the development of a vibrant venture capital industry is the availability of investments capable of providing sufficiently large returns to justify the high risk. In other words, there must be a sufficient supply of opportunities capable of supporting a community of venture capitalists. If the number and quality of venture capitalists is insufficient, a downturn in the economy and the failure of a few venture capital firms could lead to the collapse of the industry. In other words, without a sufficient number of deals, it might be possible to establish a venture capital industry, but the industry would not be sustainable.

Context is also important. There should be a relatively transparent and predictable legal system that offers some protection to investors. If foreign investors are to be encouraged, then currency convertibility is important. It is also necessary that a portion of the labor force be well educated and capable of managing start-up firms, and willing to leave existing employment for a start-up. Some of these conditions appear to be missing or incomplete in a number of East Asian countries. Finally, there are cultural attributes of the local habitat that are required. For example, entrepreneurs must be willing to sell significant amounts of equity to the venture capitalists and be prepared to share control. A vibrant venture capital industry cannot be created in the absence of the appropriate context, though as we have argued elsewhere that these conditions also can co-evolve with a fledgling venture capital industry (Avnimelech et al. 1995).

The first professional venture capital firms were established in Boston and New York in the immediate aftermath of World War II (Florida and Kenney 1988b). Prior to 1957, in the San Francisco Bay Area there were informal investors willing to invest in small firms, though there is no evidence to indicate that there were a greater number of these investors in the Bay Area than in other regions with relatively sophisticated financial markets. The first professional venture capital firm in the Bay Area was a limited partnership — Draper, Gaither, & Anderson —which was formed in 1958. In the prior year, Arthur Rock, then based in New York, had assisted in the funding of Fairchild Semiconductor. Also, in San Francisco, there were a number of young men who were actively investing personal funds in technology start-ups.

In 1958 the U.S. federal government passed the Small Business Investment Corporation (SBIC) Act, providing matching federal funds on a two-to-one basis for anyone willing to invest $150,000 or more in an SBIC. This offer convinced a number of the informal investors to form SBICs, thereby formalizing their angel investment activities. The SBIC program increased the number of venture investors nationally and had a significant impact in the Silicon Valley region. In 1962, a number of local SBIC participants formed the Western Association of Small Business Investment Corporations (WASBIC). WASBIC was, for the most part, an organization that hosted social functions where the members and guests presented and discussed possible deals. In 1969, the WASBIC officially changed its name to the Western Association of Venture Capitalists, which was the first organized venture capital association in the world.

The non-SBIC venture capital industry also was expanding along with an increasing number of start-ups. For example, in 1961 Arthur Rock moved from New York to the Bay Area to join Thomas Davis, who left the Kern County Land Company to form the second Bay Area limited partnership, Davis & Rock (D&R). D&R was important in two ways: First, it was very successful, and during the next six years it returned to investors $100 million on their initial investment of $3 million (Kenney and Florida 2000). This had a powerful demonstration effect, and, quite naturally, attracted more venture capitalists and investors. Second, D&R's investors included Gordon Moore, Eugene Kleiner, Robert Noyce, and other entrepreneurs. This created a commonality of interest between the financiers and successful entrepreneurs that exists to this day. In addition, a number of entrepreneurs and corporate managers who had become wealthy from their start-ups decided to become venture capitalists. They brought with them technical and managerial expertise that the finance-oriented East Coast venture capitalists often did not have.

The 1970s were difficult for macroeconomic reasons and for reasons specific to venture capital. The early 1970s were plagued by social unrest related to the Vietnam War and an oil crisis–induced recession. These and other troubles depressed the stock market. More directly troubling was the passage by the U.S. Congress of the Employment Retirement Income Security Act (ERISA) in 1974, which mandated criminal penalties for pension fund managers who lost money in high-risk investments. Legal experts interpreted ERISA to include venture capital as a high-risk investment. The response was a cessation of institutional investment and the onset of the most difficult period in the history of U.S. venture capital. However, only slightly more than two years later, thanks to a major lobbying effort, the stringent ERISA interpretation began to be loosened to permit investment in venture capital limited partnerships. Gradually, institutional investors came to consider venture capital an asset class worthy of including in their portfolio, and the U.S. government began to see venture capital as an important institution.

Despite the economic difficulties of the 1970s, technological investment opportunities centered in Silicon Valley continued to emerge; some of which would, in retrospect, reshape the economy and create enormous wealth. For example, Intel introduced the microprocessor, making personal computers possible; the Xerox Palo Alto Research Center pioneered workstations and Ethernet; and Bay Area universities were leaders in pioneering the new recombinant DNA techniques. These formed the basis of new investment opportunities for Silicon Valley venture capitalists. For example, in 1976, Genentech and Apple Computers were established. Genentech is particularly interesting, because the initial investment by venture capitalists financed the demonstration and validation that molecular biology could have commercial applications (Kenney 1986). Apple Computer secured its first angel funding in 1977 and received its first venture capital investment in 1978. The computer networking business also began in Silicon Valley with the creation and funding of Ungermann-Bass and 3Com in 1979 (Burg 2001). On October 14, 1980, Genentech went public at $35 per share and soared to $89 per share, and on December 12, 1980, Apple Computer went public at $22 and closed at $29 per share. The difficult IPO market had vanished, and the difficulties of the 1970s were past.

In the 1980s, the Silicon Valley venture capital industry matured, and its practice became increasingly routinized. From this point forward, Silicon Valley would invariably receive between 30 and 35 percent of total venture capital investment in the United States. This routinization occurred in other ways. For example, Mark Suchman (2000), found that by the middle of the 1980s investment contracts between entrepreneurs and venture capitalists had become more standardized, indicating a routinization in the relationship between

venture capitalism and entrepreneurs. One key law firm advocating this standardization was the Palo Alto–based firm Wilson, Sonsini, Goodrich & Rosati. In organizational terms, an ideal-typical Silicon Valley venture capital firm was a limited partnership whose limited partners were institutional investors and the venture capital funds were invested overwhelmingly in electronics, with smaller sums devoted to the biomedical and biotechnology fields. Further, non–Bay Area firms wanting to invest in Silicon Valley deals could no longer wait to be approached for later-stage investments. The success of the Silicon Valley venture capitalists and their use of the limited partnership for fund raising meant they could raise sufficient capital to support their portfolio firms. To participate in good Bay Area deals it was necessary to have a branch office in the region, and East Coast firms established branches in the region. Naturally, this reinforced the Bay Area venture capital industry.

The habitat also evolved. Beginning in the early $1_9$8os with the opening of the $_3$000 Sand Hill Road office complex dedicated to venture capital offices, there was an exodus of venture capitalists from San Francisco to the Palo Alto area. Proximity to the firms and entrepreneurs was increasingly vital. By the late $1_9$8os, the Silicon Valley venture capital industry had, in terms of organizational form and practice, matured. However, the size and the number of venture capitalists in Silicon Valley continued to grow. Informal codes of behavior also emerged as entrepreneurs learned how to prepare and present their business plans and what to expect in the venture capitalist-entrepreneur relationship. By the end of the $1_9$8os, venture capital as a mature institution dedicated to the support of high-technology entrepreneurship and functioning as a central actor in the Silicon Valley habitat was firmly established. It had become a model that policy makers and advocates of entrepreneurship in the United States and around the world were keen to emulate.

INTERNATIONAL COMPARISONS

The venture capital industries in these East Asian nations have different evolutionary trajectories, and in each nation government agencies have played a significant role.' As an institution, venture capital differs substantially in each of these environments because it is shaped by the political, social, and economic institutions within which it is embedded. Each political economy thus has a venture capital industry that is shaped by the local economy and that differs significantly from the venture capital industry in other economies.

Given the dramatic differences in the stage of development and the size of these economies, it is not surprising that the size of the venture capital industries should also differ. These national differences are substantial, as Table io.i.

TABLE 10.1

National Venture Capital Pools-Selected Nations in Asia and the United States (nominal U.S. $ millions)

Year	United States	China	India	Japan	Korea	Singapore	Taiwan
1991	30,100	n.a.	93	15,352	1,547	868	412
1992	30,300	878	113	16,028	1,629	896	470
1993	31,600	1,422	149	17,750	1,687	1,013	508
1994	35,300	2,384	243	17,750	1,902	1,833	562
1995	40,200	3,458	281	14,851	2,567	3,164	696
1996	48,900	3,612	784	11,254	3,224	3,981	1,336
1997	65,100	3,500	1,016	7,722	1,857	4,468	1,913
1998	90,900	3,112	1,053	12,513	2,995	5,258	3,598
1999	142,900	3,735	1,826	21,729	4,986	7,791	4,447
2000	209,800	5,201	2,891	21,138	6,020	9,286	5,852
2001	256,900	6,044	2,442	21,515	6,251	9,754	6,261
2002	258,500						4,337
2003	257,500						5,038

SOURCE: NVCA, *National Venture Capital Association Yearbook,* various years; AVCJ, *Guide to Venture Capital in Asia,* various years; Taiwanese Venture Capital Association, various years.

NOTE: All Asian statistics combine venture capital and private equity.

indicates. From the time series we present, it is clear that during the last decade there has been significant growth in the venture capital industries of every country studied with the exception of Japan.

In keeping with the great differences between these nations, not surprisingly, the sources of funds vary, and there are some striking differences between the United States and all of the Asian economies. The first difference is that in the United States a large number of nonprofit institutional funding sources, such as university endowments, foundations, and pension funds, have long-term capital appreciation goals and will commit up to 5 percent of their capital to alternative investments. The second difference is that a number of the Asian governments are willing to invest directly in venture capital, whereas the U.S. government has not recently done so,[4] as evidenced in the aggregate statistics on sources of funds committed to venture capital (see Table 10.2).

In all the Asian nations, industrial corporations are the largest source of funds, whereas in the United States, industrial corporations have committed little to the private venture capital funds (though some such as Intel do have significant venture capital subsidiaries). The differences are great. For example, in Taiwan industrial commitments constituted 5 $_3$ percent of the total commitments to venture capital, an achievement no doubt fueled by a zo percent tax rebate. In the case of Japan, and perhaps China, the total contribution by pension funds is partially attributable to U.S. pension funds' investing in Asia. Endowments and foundations were negligible sources of funds in Asia. In contrast,

TABLE 10.2

Sources of Venture Capital Commitments in Asia and the United States, 2000 (%)

Economy	Corporations	Individuals	Banks	Insurance Finns	Pension Funds	Government	Other
China	41	3	18	18	12	7	1
India	48	7	21	8	10	5	1
Japan	48	2	25	13	9	2	1
Korea, Republic of	45	2	23	12	6	10	2
Singapore	37	5	16	12	9	20	1
Taiwan	58	9	14	10	4	4	1

	Corporations	Individuals	Financial and Insurance Firms	Pension Funds	Endowments and Foundations	Other
United States	3	11	22	37	20	7

SOURCE: For Asian economies, Asia Venture Capital Journal (AVCJ 2002); for the United States, NVCA (2001).

they provided zo percent of the U.S. total. In all of the Asian economies, the government had some role in providing capital to the venture capital industry, and in Singapore, the government was the second-largest investor.

Japan and Korea

Japan and Korea share somewhat similar insertions into the global economy and have somewhat similar industrial structures.' And yet, in contrast to Korea, Japan had a much more vibrant small-firm manufacturing sector, whose genesis can be traced to the Tokugawa Shogunate (Amsden 1992; Nishiguchi 1994). Korea, until the 1980s, was a harsh military dictatorship in which the government actively determined the direction of the economy through direct intervention and massive subsidization. Only in the 1980s did this dirigiste style of economic planning gradually loosen and give way to a market-driven economy. However, the chaebol-centered nature of the economy (which revolves around conglomerates of many companies clustered around one parent company) continues to this day. The massive government involvement in all parts of the Korean economy and the national venture capital industry means that although the economies are similar on many dimensions. Japan experiences less government involvement.

Japan was the first Asian nation to take an interest in venture capital. In 1963, the Japanese government authorized the use of public funds to create firms like the U.S. SBICs, establishing one firm in each of three cities Tokyo, Nagoya, and Osaka. Through March 1996, these three firms cumulatively

invested 69.2 billion yen[6] in 2,500 companies, of which 78 had had public stock offerings. These firms supported some existing small and medium-sized enterprises (SMEs) by providing stable, long-term capital, but they funded few start-ups (Niimi and Okina 1995) and never catalyzed the creation of an entrepreneurial habitat.

The first fully private venture capital firms were created in the early 1970s. In 1972, Kyoto Enterprise Development (KED), whose express model was American Research and Development, the first U.S. non-family-funded venture capital firm, was established through investments by 43 prominent Kyoto companies. However, KED failed and was liquidated only four years later (Ono 1995). Contemporaneously, in Tokyo the Nippon Enterprise Development was formed by a group of 39 firms. In 1973, Nomura Securities and 15 other shareholders established Japan Godo Finance, which was the precursor to the present JAFCO. Between 1972 and 1974, other important financial institutions, including major banks (such as Sumitomo, Mitsubishi, and Daiichi Kangyo) and major security firms (such as Yamaichi and Nikko), formed venture capital subsidiaries. This first wave ended following the 1973 oil crisis, when the number of investments declined and the industry stagnated. Of the eight firms formed during this period, six have survived.

In the 198os, new initiatives to spark the venture capital industry were launched. From 1982 to 1984, the city banks, securities firms, and regional banks formed 37 new venture capital subsidiaries. Whereas the goal of Silicon Valley venture capitalists is to fund new firms, the Japanese venture capitalists meant to use their "venture investments" to build relationships with small and medium-sized firms in an effort to sell them other services. Furthermore, the Japanese venture capitalists did not seek capital gains; rather they wanted to develop long-term banking relationships with their portfolios firms. Given these goals, due diligence did not have to be overly rigorous. Although organizationally the Japanese venture capital firms operated as subsidiaries, in 1982, JAFCO introduced the limited partnership format (Hamada 1999, pp. 38–41). This created a superficial resemblance to Silicon Valley practice, but it did not change the modus operandi. The venture capital boom soon subsided due to a recession in 1986 and 1987, and activity declined substantially.

Beginning in the mid-1990s, interest in the role of venture capital returned due to the technology boom in the United States. This time, however, the renewed interest coincided with heightened concern on the part of Japanese industrial and government leaders about the continuing stagnation of the economy. So to facilitate new business creation and start-ups in knowledge-intensive and high-technology industries, the Japanese government created new incentives. For example, in 1995 SMEs were made eligible to receive

financial as well as informational support from the government. New laws simplified the process for forming venture capital firms, and another wave of regional banks and corporations established venture capital affiliates. This time a number of independent venture capital firms were formed as well.

The emergence in the mid-1990s of Softbank and other Japanese firms as funders of new firms was a significant change in the availability of funding for start-ups. Softbank originally was a Japanese software distribution firm owned by Masayoshi Son, who had made early investments in U.S. Internet start-ups, including Yahoo!, Geocities, and E*Trade. When those firms went public, Softbank reaped enormous capital gains, some of which was recycled into hundreds of Japanese Internet start-ups, as well as into other start-ups around the world. By January 2001, Softbank had invested $8.8 billion in more than 600 start-ups (Softbank Investment 2001). Softbank was not alone; a number of other Japanese firms such as Hikari Tsushin plunged into venture investing in Internet firms. Moreover, the existing venture capital firms switched from providing loans to established firms to investing in equity in start-ups. The accompanying stock market bubble made it easy to undertake public stock offerings, and many firms went public on two new Japanese markets, which were created to ease the listing of SMEs. In the collapse of the tech bubble, Japanese venture capitalists such as Softbank experienced enormous losses. Since then, there has been little investment in start-ups.

It is fair to say that there was a moment in 1999 and early 2000 when it appeared that a habitat for entrepreneurship similar to Silicon Valley might emerge in Japan, particularly in the Shibuya district of Tokyo (then called "Bit Valley"). Unfortunately, the bursting of the Internet bubble took most of those start-ups with it. But there are a few larger points to be recognized. First, as a generalization this start-up boom did not include firms with deep technical expertise or attract the best young engineers from Japanese university engineering departments or from the established electronics firms. Second, few of the Japanese venture capitalists were technically savvy former entrepreneurs or experienced managers. Third, the other constituents of the habitat such as experienced lawyers and accountants along with the myriad of other support network constituents never existed in Japan. As a result, when the downturn came, few start-ups were able to survive; like the New York phenomenon of "Silicon Alley," the "Bit Valley" habitat simply disbanded.

Korean interest in venture capital is more recent than that of Japan. The first Korean experiment in developing venture capital was in the 1970s. As discussed in Chapter 6, in 1974, the Korean government created what it termed a "venture capital firm," Korea Technology Advancement Corporation (KTAC). KTAC's funding came from government research institutions, and its

objective was to be an intermediary financial institution that assisted in the transfer of research results from government-supported research institutes to technically competent SMEs. By U.S. standards, KTAC could not be considered a venture capital firm, but rather some type of technology transfer organization. In contrast to what took place in Japan and Korea, the early efforts were direct government initiatives.

In 1981, the Korean government returned to the goal of creating venture capital, with the incorporation of the Korea Technology Development Corporation (KTDC) under a special law aimed at funding industrial R&D and its commercialization (KTB 200.[7] Once again, this "venture capital" firm KTDC did not operate like a Silicon Valley venture capital firm; rather it was yet another technology commercialization intermediary (Choi 1 9 8 7, 3 52). Then in 1982, following a Japanese model, the Korean Development Investment Corporation (KDIC) was formed as a joint venture between seven Seoul-based short-term financing companies, a number of international development institutions, Westinghouse, and JAFCO (KDIC 1986).[8] KDIC was organized as a limited liability venture capital firm, with the purpose of fostering and strengthening Korean technology-oriented SMEs through equity investment or equity-type investments. In 1984, yet another venture capital firm, Korean Technology Finance Corporation, was established by the Korea Development Bank.[9] Of these, only KDIC emphasized equity investments and was not an arm of a government agency. Put simply, KDIC was the beginning of Korean private venture capital.

Despite the previously organized firms, there still was little true venture capital investing. To address this problem, in 1 9 86, the government enacted the Small and Medium-Size Enterprise Start-up Support (SMESS) Act to support the establishment and growth of small enterprises. Also in 1986, the New Technology Enterprise Financial Support (NTEFS) Act was promulgated to support the four earlier venture capital organizations (AVCJ 1992). With these two laws, the Korean venture capital firms were divided into two types, each having different roles and characteristics. The first four venture capital companies were now called "new technology enterprise financial companies" (NTEFC). Though NTEFCs were permitted to invest their funds with less government oversight; they were required to provide consulting services to the government, especially with respect to directing government funds to SMEs.

As creations of the government bureaucracy, the venture capital firms were burdened with restrictions. The firms covered by the SMESS Act were required to invest in start-up and early-stage enterprises that were fewer than five years old. This reflected the interests of the Ministry of Trade and Industry (MTI), which administered the SMESS Act, and the Ministry of Finance (MOF), which administered the NTEFS Act. Because of the restrictions, the SMESS

Act venture capital companies under MTI administration were in a disadvantageous position. Han-Seop Kim (2001), who was a director in KTB at that time, said, "SMESS Act venture capital companies were so restricted, because they were at the boundary of the financial industry that traditionally had been under MOF administration." This situation would be further complicated in 1992, when KTDC, the largest NTEFC, was transferred to the control of the Ministry of Science and Technology and changed its name to Korea Technology Banking Corporation (KTB)." The predictable result of these bureaucratic machinations was confusion, overlap, and ineffectiveness.

To increase Korea's technological capabilities the government rapidly increased the amount of targeted funds, which the NTEFCs helped direct. The result was that the NTEFCs expanded rapidly. However, these targeted funds were in the form of loans because the government was not interested in equity. The passage of the SMESS Act sparked the formation of many new venture capital firms, and in 19$_9$0 there were 5$_4$ new venture capital firms. Though meant to operate like Western venture capital firms, most investments were loans. In the early 1$_{99}$os, the inexperienced professionals in these firms, characterized by their lack of ability to conduct serious due diligence and assist their portfolio firms, contributed to the failure of the portfolio firms and of the venture capital firms themselves. In response to the difficulties, the venture capital firms tightened their investment criteria.

In August 1$_9$9$_3$, to counteract this investment slowdown, the government loosened regulations and expanded the range of the industries permissible for investment, extended the age limit for investment-eligible firms from under five years old to under seven years old, and removed the investment ceilings for fund investors. With the 1 $_{994}$ economic recovery and the reduction of regulations, investment once again increased, although it remained subdued until the tech boom arrived.

Venture capitalists continued to agitate for change, and the problems with the industry became apparent. Therefore, the Korean government created yet more incentives for the venture capital industry by changing a number of laws to promote innovative small firms. Also, in 1 $_{997,}$ the government launched its own venture capital funds and established a program to provide matching funds for venture capital limited partnerships. In August 1 $_{997,}$ the government permitted pension funds to invest up to io percent of their capital in venture capital partnerships. In May 1$_9$98, the restrictions on foreign investment in Korean venture capital partnerships were lifted, and tax benefits for venture capital were increased. In addition, measures were adopted to increase tax benefits for venture capital partnerships. Those efforts catalyzed the establishment of a number of limited partnerships.

As noted in Chapter 6, two habitats were created roughly simultaneously, "Teheran Valley" and "Daeduk Valley." Daeduk, the government-created science and technology center, has attracted little venture capital investment and is unlikely to do so in the future. Teheran Valley, a cluster that emerged spontaneously, appears to have experienced greater success in moving toward the creation of a habitat replete with local venture capital investors. However, the collapse of the high-technology boom has had a severe impact on both habitats.

In both Japan and Korea, the development of a Silicon Valley–type venture capital industry appears elusive. The entrepreneurship that was sparked by the tech boom may be forgotten in the aftermath of the collapse. In both nations, policy makers have found it difficult to create a policy mix conducive to creating an entrepreneurial habitat. Some of the problems are social. For example, potential entrepreneurs in large organizations are unwilling to bear the risk of resigning to establish smaller firms. As Chapters 2 and 6 indicate, the local venture capitalists are, for the most part, relatively inexperienced in the process of forming new firms and are more comfortable investing in or providing loans to established firms. Moreover, given the recent downturn, it seems likely that the venture capitalists' skills and experience may not improve in the future. The difficulties venture capital has had in taking root in both Korea and, especially, Japan seems to be intimately linked to the overall configuration of those societies and their political economies.

Taiwan

The inception of the venture capital industry in Taiwan can be traced to a concerted government effort to create a Silicon Valley–like habitat. The strategy adopted by Taiwanese government officials was quite different from that adopted in Korea. In 1983, after officials and businesspeople from Taiwan made a study trip to the United States and Japan, the government passed legislation providing attractive tax incentives to individuals who were willing to invest in professional venture capital firms. The core of the 1983 legislation was a tax rebate of up to zo percent for individuals who maintained an approved venture capital investment for at least two years. To qualify, the investment had to be made by a venture capital fund approved by the Ministry of Finance (Asian Technology Information Program 1998; Republic of China Ministry of Finance 1996, pp. 9–10). In a prescient move, the law allowed investment abroad in firms that might benefit Taiwan. In the vast majority of these cases, the investment was in the United States, where a number of Taiwanese expatriates worked in Silicon Valley. In 1991, the statute was revised to allow corporate investors the same 20 percent tax rebate, dramatically increasing the amount of capital

available for venture capital when corporations rushed to secure the rebate (Liu 2001).

The tax rebate was by far the most important incentive, but there were others including making 80 percent of the venture capital firms' investment income tax exempt in the current fiscal year, thereby providing a grace period of one year. In addition, those choosing to reinvest the earnings garnered from a venture capital investment were allowed to deduct the venture capital income from their tax return in that year. This provision encouraged the investors to reinvest their earnings, thereby expanding the capital pool.

The first venture capital firm in Taiwan was an Acer subsidiary — Multiventure Investment. Inc. That firm was formed in November 1984 and made its first investment in a Silicon Valley start-up that year (Shih 1996, 35). However, the firm of the greatest significance was formed by the Silicon Valley investment hank Hambrecht and Quist (H&Q). H&Q launched its fund with investments from major industrial groups in Taiwan and from government-controlled banks and agencies (Kaufman 1986; Sussner 2001). H&Q's first investment was in the Taiwanese subsidiary of Data Corporation, a Santa Clara manufacturer of disk drive controllers and floppy disks (Kaufman 1986, 7D). This fund was the beginning of what would become H&Q Asia Pacific, which now operates throughout Asia. In 1987, the Walden Group — a San Francisco based venture capital firm that was owned by Asian Americans — established a fund called International Venture Capital Investment Corporation with investments from various private and government entities and citizens of Taiwan. This fund evolved into the Walden International Investment Group. Its first two investments were in Northern California (Besher 1988, C9). The venture capital firms in Taiwan learned-by-doing in Silicon Valley.

The 1990s were a period of rapid growth for the Taiwanese venture capital industry. There were benefits for Taiwan. Wang (1995) found that on venture capital investments from 1990 to 1992, the Taiwanese government collected 10 or more times the tax dollars it expended in industry support. Despite this apparently strongly positive cost-benefit ratio, the Taiwanese government eliminated the tax benefit in 2000. This was especially untimely, because the Taiwanese venture capital industry, like those in other nations, was hard hit by the collapse of the tech bubble and has found fundraising particularly difficult. The environment in Taiwan has become particularly severe, because China's emergence as the manufacturing center of the world is undercutting Taiwan's economy. Whereas Taiwanese venture capitalists previously invested in manufacturing operations in Taiwan, now, though in principle it is illegal, they are investing in China. The upshot is that they are investing less in Taiwan.

The last five years have been difficult for the Taiwanese VC industry as there are fewer domestic investment opportunities and VC firms continue to face internal political obstacles to investing in China. In policy terms, there has been a revision of the statute that originally provided tax rebates only for individuals so that corporations could also benefit (Liu 2001). Of course, the most significant factor was the success of the high-technology electronics industry in Taiwan, which became the world's largest producer of many components used in personal computers, peripherals, and electronic devices; the leading center for outsourcing personal computer assembly; and the location of the two largest semiconductor foundries in the world. These industries were the source of many spin-offs. Despite the current difficulties the venture capital industry in Taiwan has experienced, there is little question that it will survive the current downturn.

Singapore

Venture capital emerged later in Singapore than in Hong Kong. In 1983, South East Asia Venture Investment Fund, which was administered by Boston's Advent International, was established in Singapore with investment from the International Finance Corporation (Wang 2002). In 1983 and 1984, Singapore Technologies, a former government-owned industrial conglomerate, began informal investment in start-ups. In 1988, the venture investment activities of Singapore Technologies were spun off into a firm called Vertex Management, and it began investing globally, especially in Silicon Valley (Hock 2001).

In the mid-1990s, the government recognized that, because of rising labor costs, manufacturing could no longer be the driver for Singapore's economy. Its response was to launch an initiative to transform Singapore into a knowledge-based entrepreneurial economy. Policy makers believed that venture capital could assist in this transformation, and so the government used tax and various other incentives to attract venture capital firms from around the world, such as JAFCO, H&Q Asia Pacific, and 3i (Wang 2002). For this reason, the 1990s were a period of extremely rapid growth for Singapore's venture capital industry, and assets under management increased from U.S. $830 million in 1991 to U.S. $9.286 billion in 2000 (AVCJ 2001, 2002, 2003). The growth of venture capital in Singapore was encouraged by massive subsidies, such as capital investments in venture capital funds along with other incentives. The Technopreneurship Fund alone has invested approximately U.S. $1 billion from 1998 to 2003. Singapore's venture capital industry was heavily dependent on these subsidies, the majority of which were made in 1999, and it is almost

certain that Singapore has experienced enormous losses during the bursting of the Internet bubble.

Singapore's small size is a significant obstacle to the creation of a strong venture capital industry, because internally it can generate only a small deal flow. To overcome the lack of deal flow, the country established numerous programs to increase entrepreneurship. Singapore also is enhancing its role as a service center for entrepreneurs in the rest of the Southeast Asian region; however, these nations also have only limited deal flows. Moreover, Singapore-based venture capitalists must compete with the indigenous venture capitalists in those other nations. Singapore is striving to enhance its role as an offshore service center for venture capital investors in India and also China.

The government has fashioned a comprehensive strategy aimed at establishing a venture capital industry. Despite this effort, success is not guaranteed, because of the lack of local deals. Singapore's strategy of becoming a service center for India seems precarious because the Indian government will likely also wish to attract foreign firms. However, the Singaporean government has made a well thought out and deliberate plan to create a habitat capable of supporting a venture capital industry. It has judiciously invested resources in creating opportunities for learning the craft of venture investing from regions such as Silicon Valley. The continued maturation of Singapore as a venture capital center is by no means guaranteed.

China

From the early 1990s onward, China has hosted an enigmatic venture capital industry." Roughly speaking, the growth of the Chinese venture capital industry tracked the process of economic liberalization. The impetus for the development of the Chinese venture capital industry was government policy. In 1984, the National Research Center of Science and Technology for Development suggested that China establish a venture capital system to promote high technology (White, Gao, and Zhang 2002). Many of the earliest technology start-ups received capital from local government, universities in the case of spin-offs, and other organizational entities that anticipated the possibility of significant capital gains (Lazonick 2004). It was only in the late 1980s that the Chinese government allowed the formation of the first venture capital firm, which was a government-foreign joint venture. It was followed in the early 1990s by a proliferation of venture capital operations backed by state and local government. Because of the lack of experience, not only among the government officials but also among the entrepreneurs, nearly all of these early efforts failed (Oster 2001). In keeping with the general decentralization of decision-

making, there are three major centers of Chinese venture capital investment: Beijing, Shanghai, and Shenzhen. Each of these cities /regions has its own venture capital industry association. It was only in 2002 the Chinese Venture Capital Association was established.

Four distinct types of venture capital firms operate in China: local government firms, corporate firms, university firms, and foreign firms (White, Gao, and Zhang 2002). Of course, those are ideal types, and in practice there are permutations in each category. This proliferation of forms and formats can be understood in two ways. First, it can be understood as a large-scale experiment in which there is a search for the format or formats that will be most effective in the Chinese environment. The second possibility is that this experimentation indicates that the markets remain too difficult for any stable form to arise. At this time, only a few foreign venture capitalists have achieved sustained success.

Until 2001, monies from the government actors (most often the local and provincial governments) made up anywhere from 12 to 8o percent of the total venture capital invested (AVCJ 2001; *UltraChina.com* 2000). Apparently, the venture capital firms operated by the local and provincial governments have lackluster track records, though there is no English-language confirmation of this perception. The national government had abstained from venture capital investing until late 1999, when the Chinese Ministry of Foreign Trade and Economic Cooperation announced that it was establishing a venture capital fund *(ChinaOnline* 1999). It is very difficult to ascertain the success of the Chinese venture capital firms because reporting is not standardized.

With a rise in the number of successful listings and trade sales of venture capital-backed Chinese firms and the growth of firms like Huawai and Shanda, there has been a significant increase in foreign venture capital investing. Since 2003, the most significant growth in activity has been among the foreign venture capital firms. For example, as Table 10. 3 indicates, foreign firms were the most active investors in China in 2004. Of course, they have some important advantages over domestic firms in that it is easier for them to organize an offshore IPO. This is important because at this moment there are not yet any exit mechanisms in China.

As indicated in Chapter *7,* investments in China are widely scattered among industries and locations, but since 2003 investment appears to be increasingly concentrated in Beijing, Shanghai, and Shenzhen and in technology sectors. Still, it is fair to say that a consensus does not yet appear to have formed as to what are attractive opportunities or what regions will yield an ongoing flow of successful deal exits. During the Internet bubble, the NASDAQ and the Hong Kong stock market opened to a number of Chinese start-ups. Western venture

TABLE 10.3

Import and Export of Venture Capital for Various Asian Nations, 2000 (%)

	Source			Destination		
Economy	Home	Asia	Non-Asian	Home	Asia	Non-Asian
China	56	17	27	81	17	2
India	10	21	69	92	5	3
Japan	76	20	4	82	7	11
Korea, Republic of	68	8	24	94	3	3
Singapore	30	31	39	16	67	17
Taiwan	82	6	12	78	9	13

SOURCE: AVCJ (2002).

capitalists that were attracted to the Chinese market had some important successes, such as Sina and Sohu. There were also successes such as the 2001 acquisition of Newave, a Shanghai semiconductor design house by IDT. This growth was temporarily blocked with the end of the tech bubble and was complicated by the disastrous performance of the Hong Kong Growth Enterprise Market. After 200$_3$, the situation shifted again as Chinese firms such as Shanghai Manufacturing Industrial Corporation, Shanda, Torn Online, and Techfaith Wireless successfully listed on the NASDAQ in 200$_4$ and 2005. In addition, some of the earlier Internet firms such as Sina and Sohu have done well, and there have been trade sales of firms to Chinese and foreign firms such as Lei Wei Jing to Torn Online. Sohu.com purchased Go2Map and CNET purchased the Chinese firm PCHome, to name only a few. Not only have these exits been successful, but they have encouraged further exits. Recently, a number of Chinese semiconductor fabless design firms were funded, and they plan to list on the NASDAQ in 2006. According to the Chinese venture capital consulting firm, Zero-2-IPO in 200$_4$, total venture capital investments in China reached $1 billion.

After years of procrastination, it is possible that the government will approve the opening of a NASDAQ-like second board in Shenzhen. If the Shenzhen board is successful, it will provide a new vehicle for small firms to raise capital and provide an exit vehicle for early investors. Of course, alternatively, it might be that the Shenzhen board will adopt the casino-like characteristics currently on display in Hong Kong and that have led the Chinese main board stock exchange to its disappointing performance. There are many positive signs that China's economy and technological abilities will continue to increase. Exit opportunities internally continue to be unpredictable, but exiting on stock markets in other nations is feasible if the firm has global appeal.

Despite the government's desire to see greater technological development and notwithstanding its efforts to make the environment favorable to foreign investment in high-technology start-ups, investors continue to be subject to the vagaries of the Chinese legal and political system. And yet, during this first phase, the firms that made profits were those that did Internet deals and were able to quickly list their investments on the NASDAQ. A more stable environment is necessary for the creation of an innovation hotbed.

In 2005, venture capital investment in China continues to expand; however, its ultimate long-term profitability has not been proven. For this reason, the ultimate fate of the Chinese venture capital industry is not yet certain. Given the growing market, the support by the government, and the likelihood that Chinese technology will continue to improve, there is reason to believe that China will become a successful hotbed for venture capital-financed innovation.

In terms of habitat creation, at this moment there are three important centers of venture capital activity—Beijing, Shanghai, and Shenzhen. Each of these has a different character and even differences in technological competency. In general terms, Beijing has been the technological center of China because of the numerous top-quality universities and research institutes. The earliest Chinese high-technology start-ups including Legend, Stone, and Founder, were established in the Zhonggcuancun area of Beijing. Even today, Beijing attracts venture capital funding in the software, Internet-related, and other technological fields. Shanghai has developed a specialization in semiconductors and is the location of many foreign venture capital firms, particularly those from Taiwan. Shenzhen is the first significant free trade zone and recently has begun a concerted effort to upgrade its technological base. Very important is the fact that a number of China's largest telecommunications equipment makers, particularly Huawei and ZTE, were established there. Interestingly enough, the Beijing, Shenzhen, and Shanghai venture capital associations were formed prior to the formation of the China Venture Capital Association. It is probably fair to say that all three regions now have formed habitats for new firm formation.

The linkages between Silicon Valley and China that run through Taiwan are fascinating. Taiwanese venture capitalists have the relationships, knowledge, and capital to perform this intermediary function. However, continued maturation of China and the instability of the Taiwanese political environment could result in the demise of this set of relations and a more direct relationship with Silicon Valley venture capital firms that have recently begun more active forays into China. In mid-200$_4$, an enormous $1.8 billion IPO of Shanghai Manufacturing Industrial Corporation (SMIC) took place. SMIC,

which has not been profitable, was backed by venture capitalists from around the world. The success of this and other public offerings in 200 4 promises to be very important for the future of the Chinese venture capital industry.

A summary of the state of the Chinese venture capital industry is difficult because there are so many different aspects, firms, and levels of government involved. Moreover, China is evolving so rapidly that any summary is immediately dated. Though not discussed to any extent in this chapter or in Chapter 7, there is the role of Hong Kong, which traditionally has been a "window" opening on China, where large institutional venture capitalists can operate in a developing-nation environment with legal transparency, There are the various indigenous venture capital organizations, public and private. Finally, there is the Silicon Valley, Taiwan, and China connection. This reinforces the fact that the Chinese venture capital industry is still in formation. The plethora of organizational forms described in the chapter and the large variety of investments in one sense can be seen as a strength in that there is much experimentation underway. China has enormous potential both in terms of the internal market and the use of the linkages through Taiwan to the United States, but success is not guaranteed.

India

The Indian venture capital industry is, like China's, a relatively recent phenomenon.[12] As in the case of China, in the early 1 9 8os the idea that venture capital might be established in India would have seemed unrealistic. Until the late 1 9 8os, the government had a strong grip on the economy, and large portions of the financial system were nationalized. Despite these obstacles, Indians were oriented toward technical and managerial education. The important changes began in the early 1 9 8os under Rajiv Gandhi, when a process of liberalization began. An important aspect of this liberalization was the willingness by the Indian government to permit export-oriented investment by multinational firms in the Indian economy. Much of this early investment came from U.S. information technology firms seeking access to low-cost Indian engineering talent. This was contemporaneous with a movement by a number of Indians who had received an education in the United States and then worked in U.S. high-technology firms to found their own firms, particularly in Silicon Valley. These developments prepared the ground for the emergence of an Indian venture capital industry.

The earliest discussion of venture capital in India came in 19 73, when the government appointed a commission to examine strategies for fostering small and medium-sized enterprises, but it was not until the 1 9 8os when concrete

efforts were made to encourage venture capital. Prior to 1988, the Indian government had no policy toward and little interest in venture capital. The government's awakening to the potential of venture capital occurred in conjunction with the World Bank's effort to encourage financial liberalization in India. In November 1988, the Indian government announced an institutional structure for venture capital (Indian Ministry of Finance 1988). This structure had received substantial input from the World Bank, which found 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, 6). A 1989 World Bank (1989, 2) report on India noted that "Bank involvement . . . has already had an impact on the plans and strategies of selected research and standards institutes and, with support from the IFC, on the institutional structure of venture capital." With the financial support of the IFC, four new venture capital funds were created: 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). This was an innovative initiative for both India and the World Bank (Dossani and Kenney 2002).

The World Bank also was meant to play an important monitoring role. The first venture capital organization formed — TDICI, which was an ICICI division —was prevented from taking equity in its portfolio firms so it adopted an instrument used in Korea, the "conditional loan." However, since it was a loan, TDICI could not receive capital gains (Pandey 1988, 256). Consequently, the venture capital firm was still prohibited from receiving the compensation that rewarded the risk of investing in a new firm. TDICI opened 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, which would provide an aspect of a prime high-technology habitat. TDICI chose Bangalore because the Indian software firms such as Infosys, PSI Data, and Wipro were based in Bangalore (Dossani and Kenney 2002). In addition, 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 Defense Research Development Organization, along with the Indian Institute of Science (India's best research university), were centralized there.

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. Also, a number of TDICI alumni became managers in Indian technology firms or joined other venture capital firms. Therefore, the legacy of TDICI not only includes evidence that venture capital could be successful in India, despite all of the constraints, but it also provided a cadre of experienced personnel that would move into the private sector.

This first stage had difficulties as management needed to develop experience," and there were handicaps such as regulations regarding which sectors were eligible for investment, a deficient legal system, successive scandals in the capital market, economic recession, and the general difficulties in operating in the Indian regulatory environment. However, the success of Indian entrepreneurs in Silicon Valley became quite visible in the 1990s, and foreign venture capitalists began eyeing India as a possible location for investment. During the mid-1990s, the role of the multilateral development agencies and the Indian government's financial institutions declined, and the overseas private sector investors became a dominant force in the Indian venture capital industry.

The involvement of the overseas private sector in the Indian venture capital industry was an evolving process. Of critical importance was the 1993 decision by Bill Draper to form Draper International to invest in India; the Indian office was headed by Kiran Nadkarni, formerly of TDICI. Only in 1996 did overseas and truly private domestic venture capitalists begin investing. In late 1996, Walden-Nikko India Venture Co., a joint venture between WIIG and Nikko Capital of japan, began investing in early- and late-stage companies. Other foreign firms soon followed, especially as the tech bubble accelerated. Quite naturally, the collapse of the bubble had a severe effect on a number of the local Indian venture capitalists. However, the rise of the service offshoring phenomenon provided new impetus for venture capital investing in India.

The 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 the overall regulatory regime remained cumbersome. The inhibition was partly responsible for the fact that as of December 1999 nearly 5o percent of the offshore pool of funds had not yet been invested (Dossani and Kenney 2002). Despite the successes of the 1990s, the regulatory environment continued to be difficult.

In the late 1990s, the Indian government came to appreciate the potential benefits of venture capital in improving and upgrading the economy. In 1999, new regulations were promulgated to liberalize participation by financial

institutions in venture capital. However, there still were bureaucratic obstacles and a confusing array of new statutes limiting the freedom of operation to venture capitalists. The result of these various restrictions was micromanagement of investment by multiple government agencies, complicating the activities of the venture capital firms without either increasing effectiveness or reducing risk to any appreciable extent. Like China, India has cumbersome foreign currency regulations, and the most difficult of these is a lack of unfettered convertibility of the rupee.

It is very difficult for Indian venture capitalists to invest overseas. This is illustrated in Table 10.4 by the lack of top Indian VCs in China. This is in marked contrast to Taiwan, where Taiwanese venture capitalists were encouraged to invest overseas in firms that might assist in the development of the national economy. India cut off this type of learning for its venture capitalists. In the current environment Indian firms seeking to build their markets for business process outsourcing cannot receive funding from their venture capitalists to purchase a foreign firm. This limits the flexibility of Indian venture capitalists and their ability to assist fledgling Indian firms and thus provides an important advantage to the foreign venture capital firm.

If there are obstacles to Indian venture capitalists in globalizing, there are also obstacles for overseas venture capitalists. Currently, foreign venture capitalists require permission from the government for all investments and liquidations. Regulations also restrict the ability of Indian firms to trade their stock for that of an overseas firm, and it was difficult to sell an Indian firm to a foreign firm—an important restriction on venture capitalists for whom acquisition is an exit strategy.

The Indian venture capital industry has grown and experienced some maturation. The recent growth in business process offshoring to India has provided the venture capitalists with a number of successes such as the acquisition by Wipro of venture capital–funded Spectramind in 2002 for roughly $100 million and, in 2004, venture capital–financed Daksh was acquired by IBM for approximately $170 million. However, identifying the business areas that will generate the next generation of portfolio firms still remains a problem. An important consideration for the continued health of the Indian venture capital industry is whether a sufficient number of attractive deals can be discovered in the habitat to justify a vibrant venture capital industry. This is particularly true, because, unlike their counterparts in Japan, Korea, Singapore, and Taiwan, indigenous Indian venture capitalists cannot invest overseas.

Though Bangalore is the closest approximation to a Silicon Valley–like habitat, it has not yet become the dominant location for Indian venture capital investing. The Indian industry continues to be a mix of indigenous and

foreign firms, and though there have been some successful investments, it is not entirely certain that a sufficient number of attractive deals are available to create a robust industry.

THE GLOBAL CONNECTIONS

The venture capital industry is experiencing a dramatic globalization as opportunities proliferate in many nations. A number of venture capitalists have internationalized their investment practices. And yet, despite this globalization, the United States and, more particularly, Silicon Valley, remain the center of both venture capitalism and global high-technology industry. In terms of business models and economic development, Silicon Valley has near iconic status for Asian policy makers, entrepreneurs, and venture capitalists. The reasons include Silicon Valley's location on the Pacific Rim, the massive numbers of Asian nationals trained in U.S. universities, and the seemingly inexorable movement of Silicon Valley manufacturing functions to Asia that began in the 1960s (McKendrick, Doner, and Haggard 2000; Saxenian 1999).

Three links between Silicon Valley and Asia have been especially important. The first link is the human linkage provided by Asian students who remained in the United States and were employed by Silicon Valley firms. They were rapidly assimilated into the Silicon Valley business structure and soon began launching their own start-ups. Not surprisingly, they maintained close relationships with their friends and family in Asia. The second link was the Asian students and seasoned managers who returned to their various nations, either joining the Asian operations of Silicon Valley firms or establishing firms that subcontracted with Silicon Valley firms. The third link was the Asians who were trained in their home country and then joined the overseas operations of Silicon Valley firms. Each link was a conduit for information transfer and virtuous circles of learning. The repeated interactions that occurred on various levels created an awareness of what was occurring in Silicon Valley, not only in terms of the technical and managerial skills that blossomed there but also of the Silicon Valley entrepreneurial perspective.

The Taiwanese high-technology industries are the ones with the most explicit business ties to Silicon Valley. These ties can be traced to the efforts Taiwanese firms made to become subcontractors to the U.S. personal computer industry and then to establish semiconductor foundries that did chip fabrication for Silicon Valley firms. Venture capitalists in Taiwan use their ethnic connections and, more significant, their connections with Taiwanese contract manufacturers as leverage for participating in U.S. deals (Saxenian and Li 200 3). For example, they would offer to assist U.S. fabless semiconductor start-

TABLE 10.4

Top *Venture Capital Investors in China, 2004*

Rank	Firm	Nationality
1	SoftBank Asia Infrastructure Fund	Japan
2	IDG Technology Venture Investment	United States
3	Doll Capital Management	United States/Silicon Valley
4	CDH Investments	United States
5	NewMargin Ventures	China
6	Carlyle Group	United States
7	Warburg Pincus	United States
8	Legend Capital	China
9	Acer Technology Ventures Asia Pacific	Taiwan
10	Shandong High Technology Investment	China
11	Walden International	United States/Silicon Valley
12	Draper Fisher Jurvetson ePlanet	United States/Silicon Valley
13	JAFCO Asia	Japan
14	Intel Capital	United States/Silicon Valley
15	Shenzhen Capital Group Co.	China
16	Vertex China Investment	Singapore
17	China Science & Merchants Venture Capital	China
18	J.P. Morgan Partners Asia Pte.	United States
19	New Enterprise Associates	United States/Silicon Valley
20	3i	United Kingdom

SOURCE: Zero-2-11'0 (2005).

ups in negotiating production contracts with the silicon foundries in Taiwan. In this way, they offered more than money, thus creating value added for the start-up firm.

Singapore operates far more as a financial center, importing and then re-exporting capital as VC investments (see Table 10.4). One difference is that the government in Singapore has invested much of its own capital in a conscious effort to build international links. The central program was the Technopreneurship Investment Fund (TIF), which was established in 1999. TIF has invested U.S. $1 billion in venture capital and in related areas. As of zoo·, TIF had announced 45 different investments in venture capital firms headquartered in Canada, France, Germany, India, Israel, Sweden, Taiwan, the United Kingdom, and the United States. In addition to diversifying risks, this investment helped Singapore's government to collect information about venture capital practices globally. In return for the investment, these firms often agreed to open offices in Singapore. Singapore also boasted one of the most far-reaching venture capital firms, Vertex Management, which has offices abroad and invests globally.

Japanese and Korean venture capital firms also have operations abroad, and a number of the large U.S. and European private equity firms have operations

in Korea and Japan, though the latter are almost entirely devoted to private equity buyouts (Kenney, Han, and Tanaka 2002). Both India and China are almost entirely importers of capital, and their connections to Silicon Valley are as capital importers.

Venture capital in Asia is now globalized. One dimension of this globalization takes the form of trans-Pacific flows of capital. There is also a significant intra-Asian investment network. For example, the larger Japanese venture capitalists have operations throughout Asia. Another network is the informal Silicon Valley–Taiwan–China network. This fascinating network combines U.S. design capabilities and Taiwanese manufacturing prowess and venture capital with Chinese manufacturing costs. It may become one of the most significant global high-technology connections. One other possible international network could connect developed-nation venture capital firms in Singapore with start-ups in India, though the ultimate fate of this Singaporean initiative is still unknown. An often unnoticed aspect of the growth of the Asian venture capital industries was the effort by the International Finance Corporation (IFC) to establish a venture capital industry by investing in a number of pioneering firms in Singapore, Korea, China, and India. As vital as the provision of capital was, the efforts by the IFC to liberalize the markets in those various Asian nations to improve the condition for venture investing were probably even more significant. The IFC also invested in international venture capital funds that committed to investing in Asia in an effort to encourage capability transfer, within which Singapore also participates.

CONCLUSION

The venture capital industries in Asia have differing levels of development and quite different institutional characteristics. If one adopts a strict Silicon Valley definition of venture capital, then probably Taiwan, China, India, and, possibly, Singapore would qualify as having a venture capital industry. In terms of funding high-technology firms, Taiwan is clearly the Asian leader. However, if we accept local definitions of venture capital, then we can conclude that a sustainable venture capital industry exists in each Asian nation studied in the book. Venture capital in China continues to appear promising, though the industry remains immature.

Despite the existence of venture capital in Asia, to date no Asian venture capital firm has entered the first rank of global venture capital firms (which includes, but is not limited to, firms such as Accel Partners, Greylock, Kleiner Perkins Caufield & Byers, New Enterprises Associate, Sequoia Capital, Warburg Pincus, and Venrock). Leading Asian venture capitalists have attrib-

uted this gap to factors ranging from an endemic lack of experienced management to excessive regulation, problems in educational systems (especially at the postgraduate level), a need for better funding of research, and an unwillingness of entrepreneurs to cooperate and build firms (Hsu 1 999). These and other reasons have prevented Asia from creating venture capital firms that are leaders on the global stage. Neither has Asia, with the exception of Taiwan, given rise to a sufficient number of start-ups that would provide the extremely large returns necessary to justify the growth of vibrant, self-sustaining venture capital industries.

All Asian governments have played an important role in both creating the macroeconomic environment and providing support for the emergence of a venture capital industry. Taiwan is a textbook case for the ways in which the government can alter the risk-reward calculation. The 20 percent tax rebate created a powerful incentive, but it did not eliminate risk. Moreover, the government created relatively simple and transparent rules that aligned the incentives for the fledgling venture capitalists with the government's objectives. In marked contrast, the Korean efforts created a system that encouraged micromanagement by government bureaucrats and aimed at encouraging the venture capitalists to undertake financial activities for purposes other than maximizing their capital gains from equity investments. These rules and regulations led to the development of risk-averse venture capitalists who concentrated on extending loans rather than investing in equity.

More general issues concern every Asian economy. These include upgrading the research functions of their universities, ensuring a stable political and social environment, and providing for a functioning legal system. It may also be necessary to create strictly regulated "exit" paths for high-quality firms to encourage venture capital investing. This may not be easy, as many Asian and European nations created a new stock market or sections with loosened listing requirements during the Internet bubble. However, nearly all either began with low liquidity or, after the bursting of the bubble, dropped so precipitously that they now suffer from low liquidity. With such low liquidity, these new markets do not offer viable exit paths. Addressing the entire question of how to create a well-functioning stock market will be important to creating exits. This is not a question of "opening it and then they will come."

There can be no doubt that the U.S. venture capital model has been successfully transferred to certain nations, particularly Israel and Taiwan. Whether it is an appropriate model for all nations can be determined only after examination of a given nation's initial conditions and consideration of whether an appropriate habitat might evolve. Unfortunately, few other models have proven to be viable without an entrepreneurial environment based on high technology.

Thus far, there have not been many successful hybrid models —venture capital seems to be a fragile institution that does not hybridize well. The Asian economies that have been most successful in creating a venture capital industry are those with the closest human ties to the United States — namely Taiwan and Singapore. Also, these nations have largely adopted the U.S. model with specific changes to suit their environments. In each case, the governments developed policies that singled out venture capital as an important aspect of their efforts to mobilize entrepreneurship. India and China also have strong ties to the United States, and it is possible and, perhaps, likely that a viable Silicon Valley like venture capital industry will evolve in these two enormous nations.

Despite the many obstacles to creating a vibrant venture capital community, during the past two decades the industry has taken root in each of these countries. There are ample reasons to be optimistic about the prospects for venture capital in China. The current downturn is a major test for the industry in all of these economies, and it is likely that more firms will fail. Unfortunately, there may be little governments can and, indeed, should do to protect venture capital from failure. However, the venture capitalists and national venture capitalist communities able to survive without becoming wards of the government should be poised for substantial growth during the next recovery.

NOTES

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1. Nelson and Winter (1982); David (1986); Arthur (1994).

2. Exceptions do exist. For example, Arthur Rock, the lead venture capitalist in funding Intel, remained on the Intel board of directors for two decades. Donald Valentine, the lead venture capitalist in funding Cisco, continues on the board 15 years after the firm went public.

3. Some parts of this section are drawn from Kenney et al. (2004).

4. The Small Business Investment Research grants do provide monies for start-up research projects and thus perform a function superficially similar to that of venture capital.

5. For a discussion of Japanese venture capital using roughly the same sources, see Kuemmerle (n.d.).

6. At an average conversion rate of 15o yen to the U.S. dollar over this period, this amount would be in excess of U.S. $400 million.

7. In July 1992, KTDC was renamed the Korea Technology and Banking Network Corporation.

8. In 1996, KDIC changed its name to Trigem Ventures after it was acquired by Trigem Computer Inc., Korea's largest PC manufacturer. See http://www.tgventures.co.kr.

9. The Korean Technology Finance Corporation was renamed KDB Capital after it merged with the Korea Development Lease Corporation in 1999. At present, KDB Capital is a subsidiary of Korea Development Bank. See http://www.kdbcapital.co.kr.

to. For further discussion, see Kenney, Han, and Tanaka (2002).

It. This section draws heavily upon White, Gao, and Zhang (2002).

12. This section draws heavily on Dossani and Kenney (2002).

13. There is a saying in the U.S. venture capital industry that it takes $20 million in losses as part of the process of training a new venture capitalist.

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