Report to the World Bank on the Malaysian Venture Capital Industry^

by

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Kaley Lyons
Department of Human and Community Development
University of California, Davis
Davis, California 95616

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Martin Kenney#
Professor
Department of Human and Community Development
University of California, Davis
Davis, California 95616

&

Berkeley Roundtable on the International Economy
mfkenney@ucdavis.edu

^ Prepared for Shahid Yusuf and Kaoru Nabeshima of the World Bank by Kaley Lyons and Martin Kenney

Corresponding author

Venture capital is increasingly recognized as an important component of a number of entrepreneurial ecosystems around the world. Moreover, venture capital industries funding entrepreneurial firms have appeared in a number of nations, developed and developing, around the world. This report examines the history and current state of the Malaysian venture capital industry and compares it with the venture capital industries of two neighbor nations, Singapore and Thailand. Our assessment is both quantitative and qualitative, as we examine the history of the Malaysian VC industry so as to understand the context for current performance and future possibilities.

There are, roughly speaking, two types of venture capital clusters. The first and most commonly perceived clusters of venture capitalists are those that are intimately intertwined with clusters of technology firms, as is the case in Silicon Valley, Boston, Israel, and Beijing, which we term "technology" clusters. There is, however, another cluster that Richard Florida and Martin Kenney (1988) termed "financial" VC clusters such as New York, London, Hong Kong, and, to a significant degree, Singapore. These financial clusters have only a limited number of local portfolio firms, but have many VC firms managing large pools of capital. Generally speaking, the goal of policy makers has been to launch venture capital initiatives as part of a more comprehensive strategy of encouraging the development of technology clusters, though in the case of Singapore and Hong Kong, what they, in fact, have developed has a greater resemblance to financial clusters than a Silicon Valley-like cluster with a myriad of small startups exploiting new technologies.

Unfortunately, in historical terms, technology clusters have NOT been sparked by pools of venture capital, but rather by technology-based entrepreneurship that provided a persistent flow of investment opportunities. In each of these cases, entrepreneurship took off first, and venture capitalists were attracted to the region or simply emerged sui generis. The successful investments, in effect, made the venture capitalists. Often the earliest successes in these entrepreneurial regions did not have investment from organized venture capital. Interestingly enough, there are few, if any, regions where

the creation of venture capital firms by policy makers, absent significant prior entrepreneurial activity, has been successful in igniting entrepreneurship or creating successful venture capital firms.

This report begins with a brief description of the operation of venture capital and a stylized model of how technology-based venture capital as an industry has evolved in other locations. The second section provides an historical perspective on venture capital investing in Malaysia and Southeast Asia, more generally. In the third section the contemporary Malaysian venture capital industry is described and analyzed. This is followed by a comparison of the Malaysian experience with its two closest neighbors, Singapore and Thailand. The fifth section examines Malaysian government policies to encourage venture capital investment and these are briefly compared to those of Singapore and Thailand. In the concluding section the state of the Malaysian VC industry is summarized, and it is suggested that at this time, more VC is not as important as long-term investment in creating capable technical entrepreneurs and improving the legal and social environment for entrepreneurship.

I. Venture Capital as a Practice and Industry

Professional VC firms are the subject of this paper and, as far as is practicable, buyout (BO) and angel investors are omitted from our analysis. Private equity firms are organizations investing in firms with the aim of later selling this equity at a higher price to capture the capital gains. Venture capital is a subset of private equity firms. We treat private VC as the ideal type, but recognize that in the case of Malaysia, corporate and government-affiliated venture capital are large sectors of the entire industry. The few corporate venture capital firms that have any long-term track record of success are Intel, Siemens, and Nokia. Interestingly enough, banks have proven to have even less long-term success as sources of venture capital, likely because the discipline of equity investment is so different from that of lending money. The success rate of government-funded VC organizations has been even more dismal, though certain government programs, in particular, the Israeli Yozma scheme have been very successful, in large measure,

because the program was structured to ensure that private incentives were securely protected from government interference.

To be entirely clear, the creation of a VC industry will not lead to significant employment, the goal is for the VCs to invest in fledgling firms that will grow and thereby create employment and wealth. A private VC firm is a small financial services professional organization (usually employing less than 30 persons total including clerical help) that functions primarily to: (a) assess business opportunities; (b) provide capital; and (c) actively engage, monitor, advise and assist the firms in its portfolio [i.e., those firms in which venture capital has been invested]. By investing, the venture capitalist accepts a substantial tranche of illiquid equity that converts their status to something like a "partner" to the entrepreneur. The goal of the venture capitalist is not only to increase the value of that equity, but to eventually monetize the investment through a liquidity event such as an initial public stock offering or sale to another investor so they can reap the results of their investment. The final way of "reaping the reward" is firm failure and bankruptcy. In all of these scenarios, the venture capitalist "exits" the investment (i.e. ends their ownership role in the firm). This is necessary to complete the process because the VC firm's investors (the dominant organizational form is a venture capital firm managing one or more limited partnerships whose capital is contributed by institutional investors or wealthy individuals) must be paid by liquidating the holdings. In environments in which exit (either locally or internationally) is impossible, venture capitalists cannot invest.

The economics of venture capital are characterized by high risk and high returns. Investing in young firms is risky with many failing and becoming total losses. The compensation for the failures comes from investments that yield 10, 20, or even 100 times the initial capital invested by the venture capitalists. This asymmetric return profile means that venture capitalists only invest in firms offering the opportunity for extremely large returns. Since VCs invest in a number of firms, large successes are used to offset the failures. Venture capitalists are industry sector agnostic, but as a generalization, during the last five decades, the sectors most often generating such opportunities are the information and communication technologies.

The biomedical fields are the only other ones with a long history of good returns. The final area where there has been a steady, though much lower rate, of fundable opportunities has been retail. Of course, many other investment fields, such as energy in the 1970s (today again), superconductivity, and, possibly, now nanotechnology, have come and gone with minimal returns.

What the previous paragraphs suggest is that if there are few opportunities for high-reward investing, then it will be difficult to have a dynamic VC industry. Research has shown that regions and universities having legacies of successful entrepreneurship generate still more entrepreneurship. The previous paragraph described the industries within which venture capital has found significant success. As a generalization, the source of new firms differs by technologies, but, in general, these firms have not been from manufacturing, but rather from R&D where the new opportunities have emerged. In the IT industries, the preponderance of the successful investments have emerged from existing firms at the technological cutting edge, but global-class elite universities have also been an important source. In the case of the biomedical area, research at elite universities has been the largest source of fundable opportunities. For locations without the preconditions for VC investing, encouraging a successful VC industry will require a preparation of the preconditions for successful technology entrepreneurship by building or attracting high-level R&D facilities and building globally cutting-edge research universities (Avnimelech et al. 2005). Put simply, at the early stages of creating a high-technology entrepreneurial region, investment in raising the educational and research potential of regional universities is probably of greater importance than providing VC for non-existent or relatively low-quality entrepreneurs.

Operationally, venture capitalists invest only after rigorous reference checking (a.k.a., due diligence); and, in return for capital, the venture capitalist receives equity and a seat on the board of directors from which to actively monitor and assist the firm's growth. After investment, the ideal-typical VC firm provides assistance ranging from practical needs such as providing advice on issues a fledgling firm might encounter, introducing contacts, and

assisting in securing needed executive talent, to more abstract ones such as providing "legitimacy" (Aldrich and Fiol 1994) to helping overcome "liabilities of newness" (Stinchecombe 1965).

II. A Historical Perspective on Southeast Asian VC[1]

Of the Southeast Asian nations, Singapore has had the greatest concentration of venture capital, the most supportive government, and a significant base of electronics expertise, particularly in terms of R&D. As another section of the report shows, Malaysia also trails Singapore in terms of university quality. Having said this, many entrepreneurial Silicon Valley firms have operations in Malaysia. In other nations, particularly Israel but also Taiwan, such manufacturing operations were the initial basis for transferring skills to the local environment. In relative terms, Malaysia has the advantage of close connections to Silicon Valley. From this one might expect that Malaysia would have been able to attract foreign investors and nurture a flourishing domestic venture capital industry. However, this has not occurred.

The Malaysian venture capital industry was established in 1984 with the formation of Malaysian Ventures Std. Bhd. by the Singaporean firm Southeast Asia Venture Investment (SEAVI), which was a joint venture with Advent International. According to Boocock (1995: 380) Malaysian Ventures had intended to invest in electronics, plastics, and ceramics, but ended up investing in "more conventional resource-based ventures in, for example, rubber products and furniture." In 2002 Malaysian Ventures/SEAVI had one partner in Kuala Lumpur, but the investment decisions were being made in Singapore. The only other major international venture capital firm operating in Malaysia is a branch of the Walden Group, BI Walden Management. It has three funds in Malaysia with a total paid-in capital of approximately $26 million. Gradually, other venture capital funds were formed, and in 1999 there were 28 venture companies operating in Malaysia. The Malaysian

[1] This section modified from *Scattering Geese: The Venture Capital Industries of East Asia: A Report to the World Bank* by Martin Kenney, Kyonghee Han, and Shoko Tanaka.

Venture Capital Association was established in 1995 and by 2001 had grown from 13 to 15 members. Today MVCA's membership has increased to 26 firms.

The total capital available was $667 million in 1999, which, though substantial, was small compared to the more wealthy nations in Asia. The sources are revealing as 45 percent came from government agencies, 30 percent from corporations, 17 percent from banks, and 5 percent from insurance companies. Since the government controls the largest banks and many of the corporations, its role is probably even larger (AVCJ 2001: 122). Moreover, these percentages do not include the large loan and grant programs for small and medium enterprises managed by the government. In effect, the government's presence was pervasive. From the perspective of a Western venture capitalist based in Singapore, Malaysia suffered from the government crowding out private investors (personal interview 2001). In addition to providing capital, in the 1990s the Malaysian government offered tax incentives for venture capital investors, however Boocock (1995: 381) in one survey of venture capitalists showed there was evidence that they did not even bother to claim them, due to the bureaucratic difficulties.

In the 1990s, VC investment decisions were affected by ethnic policies requiring that non-Malay firms listing on the Malaysian stock exchange be significantly diluted. This policy was probably meant to discourage entrepreneurship by other ethnic groups. Obviously, this would be a significant incentive for entrepreneurial non-Malays to form their ventures abroad. Oddly enough, while many nations were trying to recruit entrepreneurs, the Malaysian government was encouraging them to leave. Such policies worked to discourage entrepreneurship. It is possible that these individuals could be transformed into an asset, if they could be convinced to return or even to assist in creating a more favorable environment.

There are significant obstacles to the growth of venture capital in Malaysia. Though the infrastructure is excellent, many general government policies have had unintended side effects. For example, the government decision to impose foreign capital controls in 1997-1998 discouraged foreign

investors including venture capitalists (AVCJ 2001: 118). Paradoxically, the government efforts to encourage entrepreneurship also created problems. For example, government programs to provide easy capital to startups has had the effect of crowding out private investors. This would not be such a problem except that government monies also distorted entrepreneurs' perceptions. A second problem was the existence of various ethnic affirmative action programs that channel investment not necessarily toward the best deals, but rather had a social welfare goal. The U.S. history indicates that programs with ulterior motives, such as channeling investment toward certain groups or regions as was the case of ill-performing Minority Enterprise Small Business Investment Corporations (MESBICs) or the various state and local venture capital programs targeted not solely at capital gains, have marginal performance (Florida and Smith 1993). Such institutional obstacles retard the success of indigenous venture capital and discourage foreign investment.

For foreign venture capitalists, it is necessary to receive permission from the government to make investments. In the early 2000s, a venture capitalist based in Singapore interviewed by Martin Kenney stated that they had examined a deal in Malaysia, but that the approval process was so slow and cumbersome that it was decided that it was not a productive use of their officers' time and they abandoned the deal. Given that most venture capital firms are more constrained by time than money, time-consuming bureaucratic approval processes definitely discourage venture capitalists. As venture capitalists discuss these difficulties among themselves, a nation receives a reputation that is difficult to overcome in the future.

The final obstacle to the emergence of a vibrant venture capital community in Malaysia has been a dearth of investment opportunities. Even though there are many Silicon Valley firms operating in Malaysia, there have been only a limited number of spin-offs (Jomo et al. 1997). Moreover, the Malaysian universities have not been highly rated and have not been the source of many spin-offs. One

venture capitalist based in Singapore and interviewed in the early 2000s, stated that Malaysian universities were not as good as Singapore's and he believed that this was one of the reasons that there was little happening in Malaysia in terms of startups (Name withheld). Unfortunately, there is no evidence that Malaysian universities have been able to raise their global status.

In 1999, the largest numbers of venture capital recipients were in the light manufacturing, electronics, information technology, and heavy manufacturing industries. The outcomes of Malaysian investment are difficult to gauge, as there are no performance measures, though in most nations, government over-involvement has rarely led to success. One possible measure could be the number of firms listed on the MESDAQ, the newly formed exchange with looser listing requirements for smaller companies. As of March 2001 there were three firms listed. This number has grown significantly, however, and there are now 126 firms listed as of October 2007. Malaysia has some of the attributes necessary to establish a venture capital community. However, there are also many obstacles. In contrast to the Singaporean and Hong Kong governments, the Malaysian government seems to work at cross-purposes when it comes to venture capital.

III. The Structure of the Malaysian Venture Capital Industry

IIIa. VC Firms/Funds

At the end of 2003, the amount of VC under management in Malaysia was $557.4 million, and continued to increase to $596.3 million by the end of 2004. Of these funds, the Malaysian government provided 42.5 percent. The total investment (including divestment activities) was $278.4 million at the end of 2004, with $233.6 million from local sources and $44.8 million from foreign sources. At the end of 2004, there were 38 venture capital companies/funds operating in Malaysia, venture capital fund

management companies totaled 34, and a total investment portfolio of 34 firms. These numbers have continued to increase in Malaysia, in part due to the government's emphasis on expanding the industry.

A compilation of data from several sources suggests that 49 venture capital firms now currently operate in Malaysia[2]. Of the 42 domestic VC firms, approximately 8 are government owned or operated, 8 are bank subsidiaries, 13 are private firms investing their own capital, 6 are corporate subsidiaries or affiliates, and 7 firms fall into some other category or no information can be found for them. A number of these firms build their portfolio only from companies located in Malaysia, but the majority of the firms also invest internationally. The most popular industries for VC investment in Malaysia include: ICT, consumer services, manufacturing, and Life Sciences. The Government of Malaysia, however, wants to specifically encourage investment in pharmaceutical and biotechnology companies. In the mid-1990's, the "Malaysian government launched a series of biotechnology initiatives . . . to strengthen the scientific infrastructure, promote commercialization, and provide investment capital" (Yuan 2007). Aside from creating collaboration programs between Malaysian and American scientists, the government launched the Malaysian Life Science Capital Fund to achieve this goal, expecting to raise $200 million, with $140 million for investment in 20 companies, with an average outlay of $7 million (Yuan 2007). The success of these initiatives remains to be seen.

The major domestic venture capital funds active in Malaysia are linked to the national government, either directly or through companies set up by the Minister of Finance. The most active investor is the Malaysian Technology Development Corporation Sdn Bhd, which was established in 1992 by the Government of Malaysia. It has $263.7 million under management and has six different private equity funds. As of 2006, MTDC has invested upwards of RM150 million in high-tech firms

[2] While a total of 49 venture capital firms were found to exist in Malaysia, no statistics or other information could be found for many of them, even after searching a number of databases and the Internet. We believe that a number of these firms are inactive.

located both domestically and abroad. Many of the companies receiving investment from MTDC have listed successfully on Bursa Malaysia, the local exchange. MTDC also manages the government launched life sciences venture capital fund, the Malaysian Life Sciences Capital Fund (MLSCF), which it co-manages with Burrill & Co., a life sciences merchant bank located in San Francisco. In June 2007, MLSCF announced that it had invested in seven firms, one of which was developing a technique for extracting bio-butanol from palm oil, another manufactured medical devices for cancer treatment, and the other five worked on diagnostics and therapeutic drugs (MIDA 2007). The bio-butanol and cancer treatment device firms were located in the U.S., but one was moving its manufacturing operations to Malaysia and another had a design and manufacturing facility in Penang.

Malaysian Venture Capital Management (MAVCAP) is one of the most important domestic players in Malaysia's venture capital industry with $158.3 million currently under management. MAVCAP was incorporated in April 2001 and is wholly owned by the Minister of Finance, Inc., which allocated RM500 million to the firm upon its inception. MAVCAP is "committed purely to the technology sectors and will invest in a mix of local and overseas businesses to bring together a successful blend of technologies and entrepreneurial skills" (2007). Though emphasizing IT, its portfolio of 32 firms is an amalgam including firms providing outsourced services, wood products, biodegradable packaging software, a contract manufacturer of herbal-based skin care and health food products, and even one undertaking the pilot production of earthworms to produce protein-substitute feedstuff from earthworm meal. Though the preponderance of its investments is in Malaysia, it has portfolio firms in Australia, India, Singapore, and Vietnam.

Mayban Venture Capital Company Sdn Bhd is the subsidiary of the commercial bank Maybank. Although noticeably smaller than the previous two VC firms mentioned, it is still a significant VC player in Malaysia with $90 million currently under management. Maybank also recently launched

Mayban-JAIC Capital Management, in cooperation with Japan Asia Investment Company Limited (JAIC), Japan's largest independent venture capital company. The Maybank Group is the largest banking group in Malaysia and has numerous subsidiaries involved in all aspects of finances.

The most active venture capital firms in Malaysia are government affiliated. According to firm websites, investment is primarily directed toward the technology sectors, but raw data collected from the Thomson VentureExpert database shows that this is not the case each year since 1995. Figure One shows the number of deals per year made in each of four industries, Medical, IT-Internet, IT-Non Internet, and Other, which is primarily made up of investments made in Non High Technology sectors, such as consumer services and manufacturing. The data shows that the Internet bubble from 2000 to 2003 greatly increased the number of deals in the Information Technology sector compared to other sectors, but prior to 2000 and after 2003, the majority of deals occur in the category of Other. If Malaysia's venture capital investments were focused in High Technology sectors, which is ideal for establishing a successful VC industry, this would be apparent in the data, but this is not represented in the VentureExpert database.

We had a concern about the reliability of the VentureExpert, so we downloaded all the portfolio investments listed on the MAVCAP and MTDC websites to check the validity of the data in Figure One. Unfortunately, as Table One shows, what we found was that the data for MAVCAP suffered from an approximately 30 percent underreporting and MTDC investments were dramatically underreported. Where MTDC had made 13 total investments, VentureExpert reported only three. Moreover, the MAVCAP and MTDC websites did not provide a complete listing of all of their investments probably because some of the firms were no longer in their portfolio (see Table Two for a complete comparison of the two data sets in the case of MAVCAP). We are unsure how generalizable this is to the rest of the Malaysian VC investment

data derived from VentureExpert, but it does show that reporting from Malaysia has difficulties. We believe that the venture capital firms in Malaysia should be encouraged to report their data to the international data collection organizations such as VentureExpert. This would provide better data for international investors, possible limited partners, and is one aspect of being a globally connected venture capital firm. In terms of investment areas, it suggests that there is somewhat greater underreporting of Non Technology Ventures.

When we included all of the firms from the websites and VentureExpert, we found a change in the investment pattern from that reported in Figure One. In Table Three the cumulative investment sectors for 1990, 1995, 2000, and 2007 are displayed. The additional data shows not only that there are more investments than those reported by VentureExpert, but also more non-technology deals. Though we did not track down the fate of the deals, we believe it is likely that many of the Internet deals resulted in bankruptcies. There are other concerns that come out of this discovery of faulty data as well. If MAVCAP and MTDC, two of the most active firms in Malaysia, are not fully represented then there is reason to believe that other VC firms in the country are misrepresented as well. Therefore the data cited from the Thomson VentureExpert database must be taken with caution. Although it may represent general trends of investment in Malaysia and show that the industry is still in need of development, it does not properly characterize detailed occurrences as it is able to do in nations with a more developed VC industry. The responsibility for underreporting may not be the fault of VentureExpert, since the data is largely self-reported.

IIIb. Portfolio Companies

The portfolio companies receiving investment in Malaysia vary widely. The majority of companies do not receive capital until they are past their seed and early stages. Capital has come from international VC firms as well as domestic ones. The majority of investments from international firms have come from Singapore, Hong Kong, Japan, and, to a lesser extent, the US and mainland China. Firms in London and South Korea have also reportedly invested. According to our calculations which, as described above, continue to be an undercount, Malaysian VCs have invested in 118 firms.

Firms in Information Technology have had the greatest success securing financing. What is most remarkable is the volatility of investment with dramatic shifts in the sectors receiving investment. Of course, VC investment volatility is evident in other nations, but there is a sufficient annual volume to justify the existence of VC firms. For many of the VC firms, their long periods of inactivity suggest that they may be only part-time investors, a situation that suggests difficulty in developing high levels of expertise.

The global Internet bubble affected Malaysia and encouraged investment, though with a slight lag. Similarly, the collapse of Internet investment lagged the rest of world. In Malaysia the Bubble ended in 2003, and since then the number of Internet deals dwindled and almost disappeared. Non-Internet IT startups also peaked in 2003. Since then the Non-Technology deals have grown the most rapidly. The overall picture then is that two government funds, MAVCAP and MTDC, are the most active investors, while most of the other firms are less active (though one should be cautious because the best data available from VentureExpert has problems of significant underreporting).

Private VC firms ultimately are judged on only one criterion, their returns. For private VCs, employment creation and other social benefits are of no significance at all. Successful "exits," either through initial public stock offerings or mergers, are of primary importance. After the exit the ultimate fate of the firm is of little importance – this is a reason that strict and transparent regulation of security

markets is of great importance. Otherwise, "venture capitalists" and other less savory characters might be tempted to float low-quality firms, which if launched in sufficient numbers, could destroy the market, and, of course, the ability to exit with a public offering. For this reason, honest and strict regulators are of critical importance.

IIIc. Exits

Securing data on exits by VC-financed firms in Malaysia is difficult because of the lack of data collected by international organizations. In Table Four, we provide data from VentureExpert and other sources on the venture-funded Malaysian firms that have had successful exits. As the data shows, we found no mergers. With the exception of the Cyber Village listing on the Singapore Exchange, all the other firms were listed on the MESDAQ. Of the ten listings, apparently only two have been delisted, which suggests that the firms are surviving, though upon examination of the websites many were out-of-date suggesting that the firms are only marginally successful. Clearly, none of these firms could list on a market such as the U.S. NASDAQ, so even if these did constitute exits, it is unlikely that an elite international VC would be interested in such types of firms.

IV. Singapore, Thailand and Malaysia Compared

When compared with Thailand, Malaysia has performed very well. In contrast, when compared to Singapore, Malaysia's performance has been less impressive. As Figures Three and Five indicate, Thailand lags Malaysia significantly. It is fair to say that there is almost no VC industry in Thailand and a small one in Malaysia. Singapore does have a VC industry, but we are unsure if it is possible to say that there is a strong entrepreneurial ecosystem in Singapore. In the following discussion we compare the three nations.

Thailand is a large and quite rich nation. However, the environment for venture capital investing is difficult. One obstacle is that Thai is a unique language only used in Thailand and English-language competency, though good among the educated, is not strong as a nation. The Thai legal and financial systems are closer to those of Continental Europe, rather than the Anglo-American system. In terms of transparency, corruption, and a predictable legal system, Thailand lags both Singapore and Malaysia. Thailand also suffers from political and economic instability that hampers risky investment. These combine with a relatively weak university system and little corporate research to ensure that Thailand is not an attractive environment for VC investing.

VC in Singapore was first established in 1983 when Boston-headquartered Advent International formed the first venture capital fund in Singapore, South East Asia Venture Investment (SEAVI) with investment from the IFC. In 1985, Advent International subsumed SEAVI. Advent International/SEAVI was moderately successful and continues to operate. In the first fifteen years, the Singaporean venture capital industry grew only fitfully, and in 1993 the Singaporean Venture Capital Association (SVCA) formed – an event that provides some evidence of at least a small community. In 2001 the SVCA listed 21 full members. In 1986 the Stock Exchange of Singapore opened the SESDAQ, which had less stringent listing requirements and thus provided an exit opportunity. In late 2000, SESDAQ listed more than 60 firms and by 2007 this had increased to 199 firms. Despite the fact that the SESDAQ does offer an exit strategy, the low volume and relative illiquidity makes it only marginally attractive.

The Singaporean venture capital industry is largely a government creation. Since the late 1990s, the government has used many incentive schemes to encourage foreign VC firms to locate branches in Singapore and encourage the formation of indigenous firms. One of the largest firms is Vertex Management, which is a spin-off from Singapore Technologies (ST), a former government-owned

industrial conglomerate. However, today Vertex is a global firm with branches in many nations. In 1999 the Singaporean government launched its Technopreneurship Program, a massive effort meant to encourage high-technology entrepreneurship. The program contained a large number of initiatives, though this report only examines those directly related to the creation of a venture capital industry. For the venture capital industry, the most important feature of the Program was the Technopreneurship Investment Fund (TIF) that received U.S. $1 billion to invest in venture capital funds. The success of this fund-of-fund is unclear, but there can be little doubt that the massive allocation of funds has reinforced Singapore's status as the dominant VC power in Southeast Asia.

Beginning in the late 1990s, the Singaporean government invested enormous resources in an ambitious and far-reaching plan to establish a venture capital industry, both to make Singapore an Asian center of the VC industry and to kick start a local entrepreneurial environment. The plan combined various supply-side measures in terms of encouraging high-technology entrepreneurship from its universities and research institutes and tried to attract foreign venture capitalists. It also invested in domestic venture capital firms to create a local venture capital pool. Moreover, though the SESDAQ is a weak exit market, it is larger and considerably more successful than the MESDAQ in enticing foreign IPOs. It has a legal environment that is quite conducive to the venture capital process. And yet, despite these efforts, the deal flow remains comparatively weak.

So while Singapore has a venture capital industry, Thailand is far from achieving that and Malaysia rests in the middle. The government of Singapore has been active in establishing a thriving VC industry, partly through their intense focus on investing in information technology, as soon as it was realized as the driving force behind the new global economy. As of September 2007, Singapore boasts over 175 VC firms in country and an increase in venture-backed firms from 894 in 2005 to 943 in 2006

(Lee Yi Shyan 2007). Malaysia's numbers are nominal in comparison. In addition, Singapore's VC firms currently manage over $19 billion, far more than either Malaysia or Thailand.

The current status of the industries in the three nations has changed dramatically from the early 1990's, when the number of deals and amount invested in Malaysia, Thailand, and Singapore were roughly comparable. Since 1995, however, Singapore has grown more rapidly than either Malaysia or Thailand in terms of deals and dollars invested. This is because Singapore successfully reinforced its role as the Southeast Asian financial center. Figures Two and Three show the number of venture capital deals that occurred in each of the three nations between 1990 and today.[3] As reported by VentureExpert, with the exception of 1994 and 1997, Singapore has had more venture capital deals every year since 1990, with the most drastic difference in 2000. Malaysia is far behind Singapore in terms of deals and in this way more resembles Thailand.

While the trends in Figures Two and Three look very similar, they differ significantly in the number of deals per year. When all stages of investment are included, Malaysia had 20 VC deals in 2000, the largest amount recorded since the data began being recorded in 1990. However, when only deals in the seed and early stages are included, Malaysia peaks at 5 deals in 2000 and repeats this in 2001. This significant difference occurs in Thailand and Singapore as well. Singapore's peak at 67 deals drops to 20 when only seed and early stages are taken into account. Thailand lags far behind both nations, with a record high of 14 deals in 2002; two years after Malaysia and Singapore peaked. The figure for Thailand drops to only three deals, however, when only investment in seed and early stage companies is included.

The same patterns occur in regards to the sum of venture capital invested each year since 1990. When all industry stages are included, Malaysia and Thailand are close in comparison, but the pattern of investment shifts dramatically when only discussing capital invested in companies in the seed and early

stages. The graph shows that Malaysia overall has been better at investing in earlier stages than Thailand. In 2001, the height of Malaysia's seed and early stage investing, $55.92 million was reportedly invested. Strangely enough, Thailand reached its peak in 1996, investing $14.41 million into companies seeking venture capital. Still, these numbers pale in comparison to Singapore, where seed and early stage investing reached its peak in 1998 at $93.62 million. Another important point is that Malaysia's peak year is an outlier in its investing since 1990, while Singapore has had a number of years nearing $100 million, showing that Singapore truly has a global class VC industry.

In terms of domestic Malaysian VCs, they are more reluctant to provide seed capital because of risk-averse attitudes and "the lack of groundbreaking technology in Malaysian technology firms" (Ariff and Abubakar 2002). Financing for startups in Malaysia was at a high of RM 81.1 million in 1997, but dropped drastically to just RM 7.3 million in 1999. Although the amount of capital decreased, the number of VC firms increased from 20 in 1995 to 30 in 1999 and continues to increase today (Ariff and Abubakar 2002). Early in the venture capital industry's history in Malaysia, 1996-1999, a total of RM 726 million was invested, but 70.8% was in the manufacturing sector, quite a different focus than the investing that occurs in nations with a thriving venture capital industry.

In addition to financing instability, the number of startups each year in Malaysia also varies widely. According to the Ministry of Entrepreneur Development, 43,238 startups were established in 1995, but this number dropped to 18,825 in 1998, presumably because of the Asian economic crisis. Startup establishment is on the rise again, however, with 27,756 in 1999 and 16,155 in only the first six months of 2000. These numbers represent the trend in Malaysia of annual startups, but are not comprehensive because not all businesses are required to register with the Ministry of Entrepreneur Development. While the number of startups ranges in the tens of thousands, as reported by the Malaysian Securities Commission (SC), "the number of investee companies benefiting from VC funding

[3] The data in the early 1990's may be significantly underreported.

rose to 461 [in 2006], a 21.3% increase from 380 in 2005" (Fong 2007). Though growth is being seen, this number is still far from reaching the majority of startups. In addition to an increase in the number of startups and the number of companies receiving VC funding, new funds are also increasing significantly. In 2006, new funds increased to RM 715 million from RM 323 million in 2005 (Securities Commission 2007). Government agencies contributed approximately 40.73 percent of these funds while local corporations were responsible for another 37.59 percent. This rapid growth in funds shows that there is available capital in Malaysia, but that there may be a lack of qualified startups to invest in.

The lack of increasing venture investments in Malaysia, at least on the part of foreign venture capital firms, may be due in part to wariness and misunderstandings between Malaysian entrepreneurs and Western investors. In early 2004, there was still "no history, no culture, of venture capital investing in Asia," according to Raffi Amit, Wharton Professor of Management and Entrepreneurship. The situation is worsened because "Asian entrepreneurs are not too familiar with the practices and norms that U.S. venture capitalists expect" (2004). Creating an entrepreneurial ecosystem and a venture capital industry in Malaysia that is eager to develop on a global scale requires more than a few government policies.

IVa. Comparing the Three Nations

When comparing the three nations, really the only meaningful comparison is between Malaysia and Singapore. It is our belief that the center of the Southeast Asian VC industry is now locked into Singapore and there is nothing short of serious economic or political unrest or a massive swelling of global-class entrepreneurship or entrepreneurial opportunities, such as has occurred in China that is forcing Hong Kong VCs to move to Beijing and/or Shanghai, that could "unlock" this spatial arrangement. We do not foresee any such development in the next decade. Parenthetically, we would

note that the rise of China and India suggests that over time Singapore will decline in global importance as a VC headquarters; however the challenge will NOT come from any of its ASEAN neighbors, but rather from China and India.

Singapore had many historical advantages over Malaysia that resulted in its rise to dominance. Some relate to Malaysia's ethnic and educational policies that encouraged the Chinese entrepreneurs to emigrate to other nations. Though these have been muted more recently, the damage is already done. Singapore also quickly secured a role as the regional multinational firm headquarters and R&D centers providing higher skill-level activities. This was reinforced by far better universities, which have received significant and sustained support from the government. This combined with the fact that the first and largest VC firms in the region were first located in Singapore created an insurmountable advantage.

V. Malaysian Government Policies

The current priority of the Malaysian government is for the country to become a complete knowledge-based economy by 2020. Growing the venture capital industry is one way to accomplish this. The government has thus far played an active role in promoting the growth of VC in Malaysia through tax incentives, the creation of and direct funding to VC firms, and establishing a policy to bring professionals working abroad back to Malaysia.

Although tax incentives specific to the VC industry have been in place since the 1990's, they are not often taken advantage of because of the tedious bureaucratic process involved. When introduced, the order stated that "a VCC was exempted from payment of income tax for a period of ten years of assessment or the years of assessment equivalent to the life of the fund, whichever is the lesser" (Malaysia Treasury 2007). Since then a few minor changes have been implemented, but the tax policies

are generally the same today with the same goal they began with: to promote venture investing in Malaysia. The success of these policies in the encouragement of investment is difficult to gauge, however.

Under the Ninth Malaysia Plan, the government has allocated RM 1.6 billion for venture capital and has also granted 10 years of tax exemption to venture capital companies "investing at least 50 per cent of funds in seed capital" (Securities Commission 2007). The Malaysian Venture Capital Development Council was also created in January 2005 to act as a "one-stop agency to ensure a coordinated implementation of strategies and initiatives for the development of the venture capital industry" (Securities Commission 2007). While the government is actively working for the expansion of Malaysia's VC industry, this can also be seen as a hindrance to its success.

As of October 2004, approximately 10,000 Malaysian professionals were working abroad. The government instituted a program in which the workers can apply to return home and be guaranteed their foreign salary in order to attract highly skilled professionals back into the country. By August 2004, 650 applied to return home and 250 applications were approved (Migration News 2004). While Malaysia experiences a great influx of less skilled Indonesian immigrants looking for work, the country has found it difficult to retain highly skilled professionals. As of 1990, 29.4 percent of Malaysians with a Tertiary level of education had immigrated to OECD countries. In a country with a low proportion of highly educated workers, this has a significant negative impact. The government encourages those who have immigrated to return through initiatives such as guaranteeing wages similar to what they earned abroad. However, this has attracted only a limited number of professionals to return.

While the governments of Malaysia and Singapore have been actively pursuing a successful venture capital industry, Thailand practices a much more lenient approach. In 2000, the Thai government began investing in several VC funds, but it lacks tax incentives to promote the industry's

growth. Currently, most venture capital and private equity funds in Thailand are managed by international firms and prefer to invest in expansion or mezzanine stage companies (TVCA 2002). Thailand's VC industry is currently grossly underdeveloped, while Malaysia is actively pursuing expansion in the industry, and Singapore has been able to reach a level far above the other two Southeast Asian nations.

Va. Khazanah and Temasek

Both Malaysia and Singapore have established national organizations to invest both for profit and to achieve national objectives. The organizations are respectively, Khazanah and Temasek. It is difficult to compare the two, but Temasek is much older having been established in 1974, and although Khazanah was already established, in 2004 it experienced a major managerial reorganization. In effect, Khazanah Nasional is the strategic investment scheme set up by the Government of Malaysia and is headquartered in Kuala Lumpur. According to its website, Khazanah seeks to create sustainable value, raise national competitiveness, and cultivate a culture of high performance through legacy investments, new investments both in new sectors and across borders, and human capital management through active leadership.

One of Khazanah's main goals is to improve national competitiveness, especially in a world of increasing globalization. The new mandate given to Khazanah by the Prime Minister focuses on management of Government-Linked Companies (GLCs). Khazanah monitors the GLCs, but is meant to not be involved in every day management. According to the website, "The GLC transformation program is part of an ongoing effort by the government to drive the development of and grow the Malaysian economy by enhancing the performance of the companies under its control." Khazanah has a wide variety of investments and will invest in new

sectors and markets that it deems important for national development. Khazanah has an eclectic portfolio and includes investments in finance, telecommunications, utilities, communication services, information technology, and transportation. This Sovereign Wealth Fund, as with Temasek, makes investments not only in Malaysia, but also internationally. It has also provided seed capital to venture investors intending to invest in Malaysia. At this time, Khazanah's website lists 45 portfolio companies, 23 of which are public (listed in Appendix Two).

With regard to VC investing, Khazanah has invested in far fewer VC firms than did the Singaporean government, which may have invested up to $1 billion; much of it at the height of the Internet Bubble (see Kenney et al. 2002 Table S1) when it made over 30 investments in venture capital firms around the world. Though it is likely that the Singaporean decision to make the bulk of these investments in 1999-2000 was unfortunate and possibly unprofitable, there is also certain to have been some learning. Evaluating the Singaporean government's experience funding VC is quite difficult because a number of entities were involved and because of the lack of returns data. Through these investments Singapore was able to ensure its place as the VC location of choice in Southeast Asia, whether there is a similar opportunity for Malaysia to use government monies to attract VC firms seems dubious, as Singapore has the advantage of close relations with China and India, though in both of these nations it seems likely that Singapore and Singapore-based VC firms will be reduced to relatively passive investors exporting capital to these locations because VC firms, whether foreign or indigenous, based locally will be required to find deals.

We believe that Khazanah is handicapped in three ways: First, it is late and the VC center in Southeast Asia will be Singapore due to its already entrenched advantages. Second, the lack of significant deals in both nations is unlikely to change soon. Given the population size, wealth,

and education and relative attractiveness of both Singapore and Malaysia, a strong flow of global-class deals is unlikely. Third, neither Malaysia nor Singapore will be able to retain powerful offshore advantages in servicing either China or India, as venture capitalists are finding it necessary to move operations to those nations so as to be completely embedded in the local entrepreneurial ecosystems.

Vb. Government Involvement Summarized

Because VCs cannot be motivated by externalities such as employment creation, government's may find it in their interest to support VC investing with subsidies regardless of the financial returns or at some hurdle rate lower than that required by private investors. This is a major justification for government support of VCs either through subsidies to private firms (presumably to lower their hurdle rate) or the establishment of government VC firms. There are a number of potential traps posed by government support for the VC industry. The traps most mentioned in the literature revolve around inferior returns or even losses due to incompetent professionals, bureaucratic overhead in terms of costs and speed of decision making, bad investment timing as governments usually enter the industry during booms, and other issues related to adverse selection and information asymmetries. However, the trap that most concerns us is the fact that government-funded or -subsidized VC firms may crowd out private VCs, thereby retarding their emergence and growth. The result may be a suboptimal government-supported VC industry, which if operational for a relatively long period might also lead to the creation of portfolio firms that need not compete in real markets, because their true customer is the entity subsidizing them. The "entrepreneurs" in such an environment are those most skilled at securing government subsidies, not at creating significant new firms. True entrepreneurs are likely to opt to leave such environments and find more commercially driven environments.

VI. Concluding Remarks

In Malaysia the venture capital industry is still quite immature. Unfortunately, this immaturity is probably not directly amenable to policy initiatives. At this time, many of the typical preconditions for a successful venture capital industry do not exist. Consider the other important missing conditions: First, we were unable to identify any entrepreneurial startups that yielded high-multiple exits either through merger and acquisition or stock market issues. The importance of successful exits is impossible to exaggerate as they serve as examples to other entrepreneurs, give VCs experience and confidence, put a nation on the global investor's map, and provide capital gains to investors.

Second, Malaysian universities have had difficulty in building their research capability to anywhere near global-class (an unfortunate fact for nearly all Asian nations). This is a problem for the development of the VC industry in two ways. Weak research universities do not generate the types of university technology that can be directly or indirectly commercialized. Successful VC industries are often closely linked to universities and a number of successful companies have been formed through these relationships. The three most dynamic entrepreneurial ecosystems in the world, Silicon Valley, Boston, and Israel, benefit from very high quality universities within the region.

The difficulty of the Malaysian situation is shown by the fact that in the Shanghai Jiao Tong University Academic Ranking of World Universities based on several criteria, including quality of faculty, research output, quality of education, and performance vs. size, Malaysian universities have not performed well. According to the most recent rankings, published on August 15, 2007, not a single Malaysian university places in the top 500 world institutions (ARWU 2007). It is important to note that no Thai or Indonesian universities were in the top 500 either. Singapore, however, has two reasonably highly ranked universities. National University of Singapore and Nanyang Technology University were

found among the top institutions, though there was a great disparity between the two. National University Singapore was placed between the top 100-150 world institutions, while Nanyang Tech University ranked between 304 and 402. Absent at least a few elite universities, Malaysia is likely to be unable to produce talented entrepreneurs necessary to attract VC investment.

Third, in contrast to China, and, increasingly, India, Malaysia does not have an extremely large and rapidly growing market that attracts venture capital investments in firms for the domestic market. It should be noted that a number of the more successful VC investments do significant business with Malaysian government or government-owned firms, but this market is simply not large enough to create a major global-class firm. This suggests that the domestic market will not be able to function as a test bed from new entrepreneurial ideas. Of course, this need not be an insurmountable obstacle, as small nations such as Israel, Taiwan, and Sweden have been good locations for VC investing. This suggests that like Singapore and Hong Kong, Malaysia must develop outward-looking entrepreneurs and VCs.

Fourth, though there are some Malaysians in the global high-technology industries, they do not constitute a strong and self-conscious cadre that can be called upon to help at home. This is unfortunate because such persons could be valuable as advisors and even as managers of VC funds. In Taiwan, Israel, and, more recently, India these individuals were important in the maturation of their VC industries (China is a less clear case of such transnationalism). It is unrealistic to expect Malaysian VC firms to have many technology- and entrepreneurially-savvy professionals given the relatively few entrepreneurial firms that have been formed, but undoubtedly having such veterans would be valuable. The efforts to mobilize these individuals, particularly those abroad, do not appear to have yet experienced great success.

The quantitative data suggests that there is sufficient VC available in Malaysia, but that there are not a sufficient number of deals. From our data, there does not appear to be any industrial sector

providing a consistent flow of investible deals. The most consistent domestic investors are MAVCAP and MSC Venture Corporation, a subsidiary of the Multimedia Development Corporation set up by the Malaysian government. From a global perspective, unfortunately bank and government venture capital firms have not been the most successful investors, and these have been the most active in Malaysia. Foreign firms from Singapore, Hong Kong, Japan and a limited number of other nations have invested in Malaysia. This can be a positive development if they transfer or provide otherwise inaccessible resources, assets, or advice. Our analysis shows that the bulk of the foreign venture capital investment in Malaysia comes from Singapore, which is a regional financial center. As Singapore has also had only a limited amount of success creating entrepreneurial firms, it is unlikely to provide the unique resources that might come from technology cluster-based VCs. Our data provides little evidence for any advantages Malaysia may have in encouraging VC investment.

Among Southeast Asian nations, Singapore has had the greatest success in creating a venture capital industry. Though there have been no dramatic exits by Singaporean firms, Singapore has successfully become what Florida and Kenney (1986) termed a finance-oriented venture capital complex. Through the use of various incentives, Singapore built a role as an offshore location for venture capital and private equity firms operating in Southeast Asia and the Indian Subcontinent. Singaporean firms have also experienced success in investing in China. Singapore has invested significant funds in its research institutes and universities, and today they are the best in Southeast Asia. Some university and research institute spinoffs have been funded, but as of 2007 there have been no strong exits. Should Malaysia decide on a strategy of venture capital development, it could choose the Singaporean financial complex strategy, which could be executed quickly, but, in and of itself, would not create an entrepreneurial ecosystem or technology-based VC complex. Choosing to try to create a technology-based complex would be a far longer term strategy and would entail a drastic build-up of the universities as research and graduate studies institutions. A side benefit of this, regardless of whether an

entrepreneurial ecosystem came into being, would be an even more highly educated workforce – a social benefit in and of itself.

There are some policy initiatives ranging from mild to radical that could be considered. The mildest of these is to make illegal employment contract non-compete clauses. The academic literature suggests that California's exceptionalism in outlawing of non-compete clauses has had a substantial positive effect on entrepreneurship. Malaysia might follow California's example. More radical would be a decision to loosen intellectual property protection in fields such as the information technologies and biotechnology in the hopes of encouraging entrepreneurship. Of course, there would be substantial costs associated with such a radical decision. The point, of course, is to consider policies that are outside the norm of government action such as more subsidies to policy initiatives that have shown little likelihood of succeeding such as technology parks, incubators, public venture capital, large and never ending subsidies to entrepreneurial firms, university technology transfer offices at universities that have no technology to transfer, Bayh-Dole-like legislation, and the myriad other nostrums that have, for the most part, failed in the developed world. National, provincial, and local governments around the world show a lemming-like tendency to follow these prescriptions delivered by developed nation and international agency functionaries and academics with little consideration of the true situations. In some cases, the slavishness with which these suggestions have been followed appears to be the product of a pathology similar to cargo cult worship where buildings and funds are formed but the actual results are disappointing.

Another pathology in the field of venture capital policy is a belief that the entry into the newest technological fad in the U.S. and Europe is a solution to a lack of entrepreneurship or fundable businesses. Governments chase the newest technologies, be it biotechnology, stem cells, superconductivity, or, today nanotechnology, often investing large amounts in technologies and sectors;

many of which soon fade away. In these cases, the government often has institutions and personnel that it must continue to fund or phase out admitting a large mistake, something that few governments are willing to do. In effect, the government is trying to choose winning technologies without having the expertise to evaluate the often hyperbolic claims by interested scientists that are then further exaggerated by the press. Whereas private VCs will make a few pioneering investments that they can afford to lose, if they see little return, governments move far more slowly and once in motion find it difficult to write off losses and move to another field. Unfortunately, only seldom does technology prove to be amenable to successful investing, but private VCs understand this all too well.

Malaysia is in the preconditions phase when it is necessary to develop the institutions and entrepreneurial skills to generate good investment opportunities. Without a significant number of good investment opportunities it is unlikely that Malaysia will be able to create a strong VC industry. In our estimation, in this preconditions phase, long-term efforts to raise the overall technical level of the population combined with significant investment in a few national universities in an effort to improve their overall status in the global higher education scene should have the highest priority. The level of research across the sciences and engineering should be improved dramatically, but this can only occur with a long-term commitment of a decade or more. Moreover, this commitment will have to be accompanied by an international peer review process for the research grants. Also, the government should consider whether there are legal impediments to entrepreneurship, such as enforceable non-compete agreements, strict bankruptcy laws, and unfavorable tax laws, and take actions to dismantle them.

In 2007, though there is some VC investing underway in Malaysia, there is little to suggest that there are deals capable of sustaining a dynamic private VC industry or enticing international VCs to invest. Providing more VC is unlikely to improve the lack of deals, so governmental efforts should

focus on improving the deal flow, which is a function of capable entrepreneurs and a munificent ecosystem. Put differently, creating an entrepreneurial ecosystem within which private VC can thrive is a long-term project that will require sustained and careful strategizing based on monitoring and reacting appropriately to the changing needs of the ecosystem.

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TABLES AND FIGURES

Table One: Portfolio Companies by Industry for MAVCAP and MTDC

Portfolio Company Industry	MAVCAP data from Website	Venture Expert data for MAVCAP	MTDC data from Website	Venture Expert data for MTDC
Information Technology	21	18	0	0
Biotechnology	2	1	7	2
Non IT (other)	9	6	6	1
Total	32	25	13	3

Compiled by authors from VentureExpert and MAVCAP and MTDC websites

Table Two: VentureExpert MAVCAP Website Comparison by Firm

Firm Name	Source
AATOMO Board Manufacturing (M) Sdn Bhd	Mavcap Website
Ample Effect Sdn Bhd	Mavcap Website
Bubble Motion (M) Sdn Bhd (Divested)	Mavcap Website
CallTime Solutions	Mavcap Website
DeltaKnot Sdn Bhd	VentureExpert
dotERP Sdn Bhd	VentureExpert
Eco Packaging Sdn Bhd	Mavcap Website
Elemental Ventures Sdn Bhd	Mavcap Website
Enlighten Innovation Solutions Sdn Bhd	Mavcap Website
Everyone's Linux Pvt. Ltd (ELX)	Mavcap Website
Fyto Elegance Sdn Bhd	VentureExpert
GameBrains Sdn Bhd	Both
Gigantic Acres Sdn Bhd	Mavcap Website
Global Cybersoft (Vietnam) Inc. (GCS)	Mavcap Website
GPRO Technologies Bhd.	VentureExpert
Grenidea Technologies Pte Ltd	Both
HDOX Bioinformatics Pte. Ltd (Divested)	Mavcap Website
IBG Ventures Sdn Bhd	Mavcap Website
iNavigate Sdn Bhd	VentureExpert
Infinite Tests Solutions (M) Sdn Bhd	Mavcap Website
iNix Technologies Sdn Bhd.	VentureExpert
Innotive Corporation	VentureExpert
ISS Consulting (M) Sdn Bhd	Mavcap Website
IT Surplus	VentureExpert
JobStreet.com Pte., Ltd.	VentureExpert
Leinet Technology Berhad	Mavcap Website
Masers Digital Sdn. Bhd	Mavcap Website
Meetrix	VentureExpert
MEMS Technology	VentureExpert
Menara Axis Sdn. Bhd	Mavcap Website
New Paradigm Technologies	VentureExpert
Norhtec Corporation Inc.	Mavcap Website
NTI International	Mavcap Website
NuSuara Technologies Sdn Bhd	Both
Payment Transaction Technologies Sdn Bhd	VentureExpert
Phytes Biotek Sdn. Bhd. (PHYTES)	VentureExpert
Polarizone Technologies Sdn. Bhd	Mavcap Website
Printelli Sdn Bhd	Mavcap Website
QubeConnect Sdn Bhd	Mavcap Website
Resolv Technologies Sdn Bhd	Mavcap Website
Sage Interactive Sdn. Bhd	Mavcap Website
Sigmax eServices Sdn. Bhd.	Both
Solar Skyline Sdn Bhd	VentureExpert
Station Network (M) Sdn Bhd	Mavcap Website
Strategic Benchmark Sdn. Bhd (SB/TIketbas)	Mavcap Website

TGN Datawork	VentureExpert
Undisclosed Company	VentureExpert
Undisclosed Company	VentureExpert
UnrealMind Interactive Sdn. Bhd.	VentureExpert
Vasunas Pte Ltd.	Both
Virtual Applications Technologies	VentureExpert
Wireless People (M) Sdn. Bhd	Mavcap Website

Compiled by authors from VentureExpert and MAVCAP

Table Three: Cumulative Deals in Malaysia by Sector, 1990-2007

Cumulative Number of Firms Receiving Investment by Sector*				
	1990	1995	2000	2007
Medical	0	1	5	9
IT-Internet	0	0	14	26
IT-Non Internet	0	0	7	39
Non Technology	1	5	26	44
Total	1	6	52	118

Compiled by authors from VentureExpert and various websites

Firm	IPO Date	Status*	Listing
Cyber Village SB	8/24/2001	Operating	Singapore Exchange
ETI Tech Corporation	3/28/2006	Operating	MESDAQ
GPRO Technologies SB	6/2/2004	Operating	MESDAQ
Media Shoppe SB	12/8/2004	Delisted	MESDAQ
MyEG Services SB	4/13/2005	Operating	MESDAQ
REDtone International SB	1/9/2004	Operating	MESDAQ
Viztel Solutions SB	7/23/2004	Operating	MESDAQ
iNix Technologies SB	9/13/2004	Operating	MESDAQ
UnrealMind Interactive Sdn Bhd	6/30/2004	Delisted	MESDAQ
MEMS Technology	8/11/2004	Operating	MESDAQ

Compiled by authors from VentureExpert and various websites

* No longer listed on exchange, though firm may still have website.

Figure 1: Number of Deals in Malaysia in each of four industries, 1995-2007

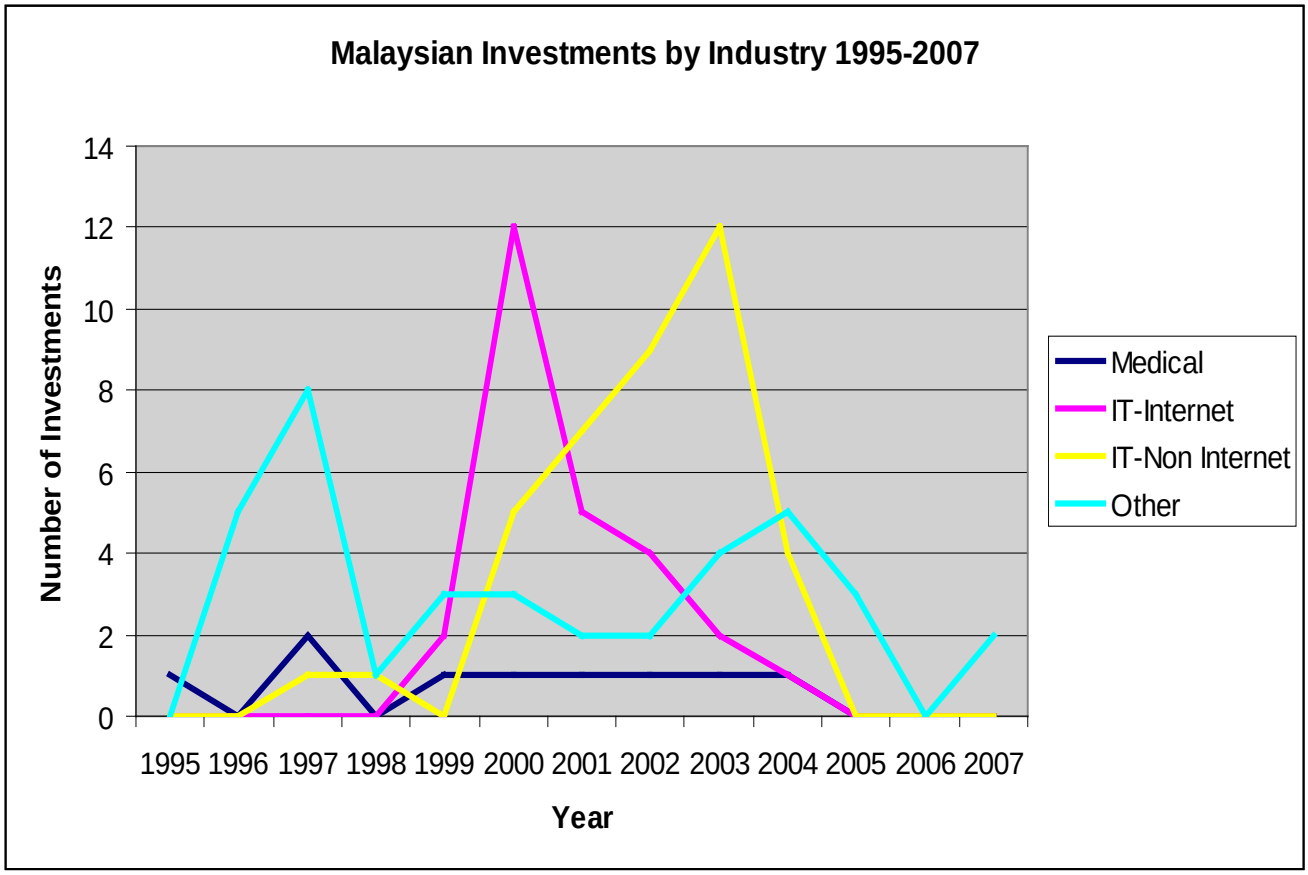


Figure 2: Number of Deals in Malaysia, Singapore, and Thailand, including all stages, 1990-2007

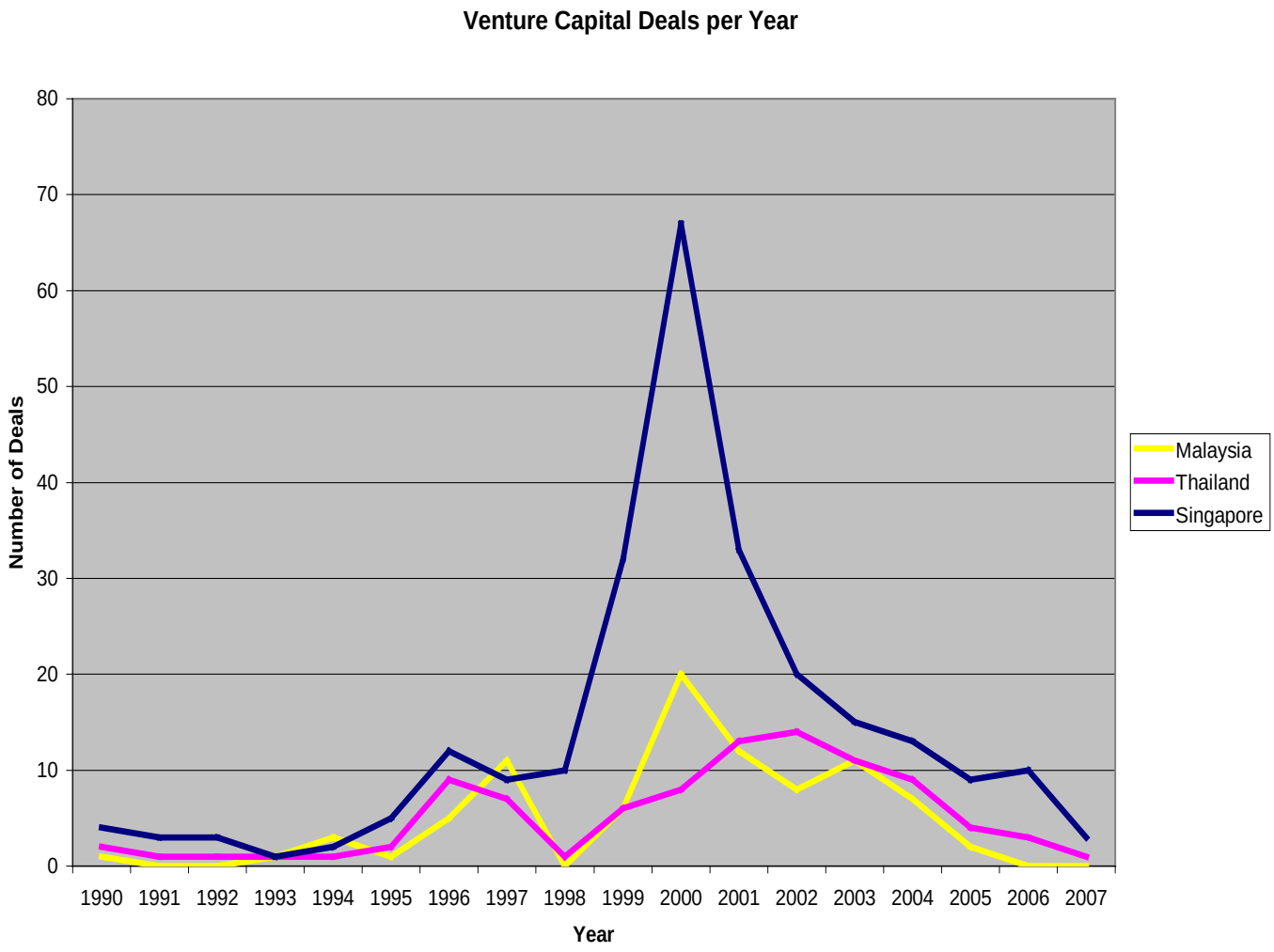


Figure 3: Number of Seed and Early Stage Deals in Malaysia, Singapore, and Thailand, 1995-2007

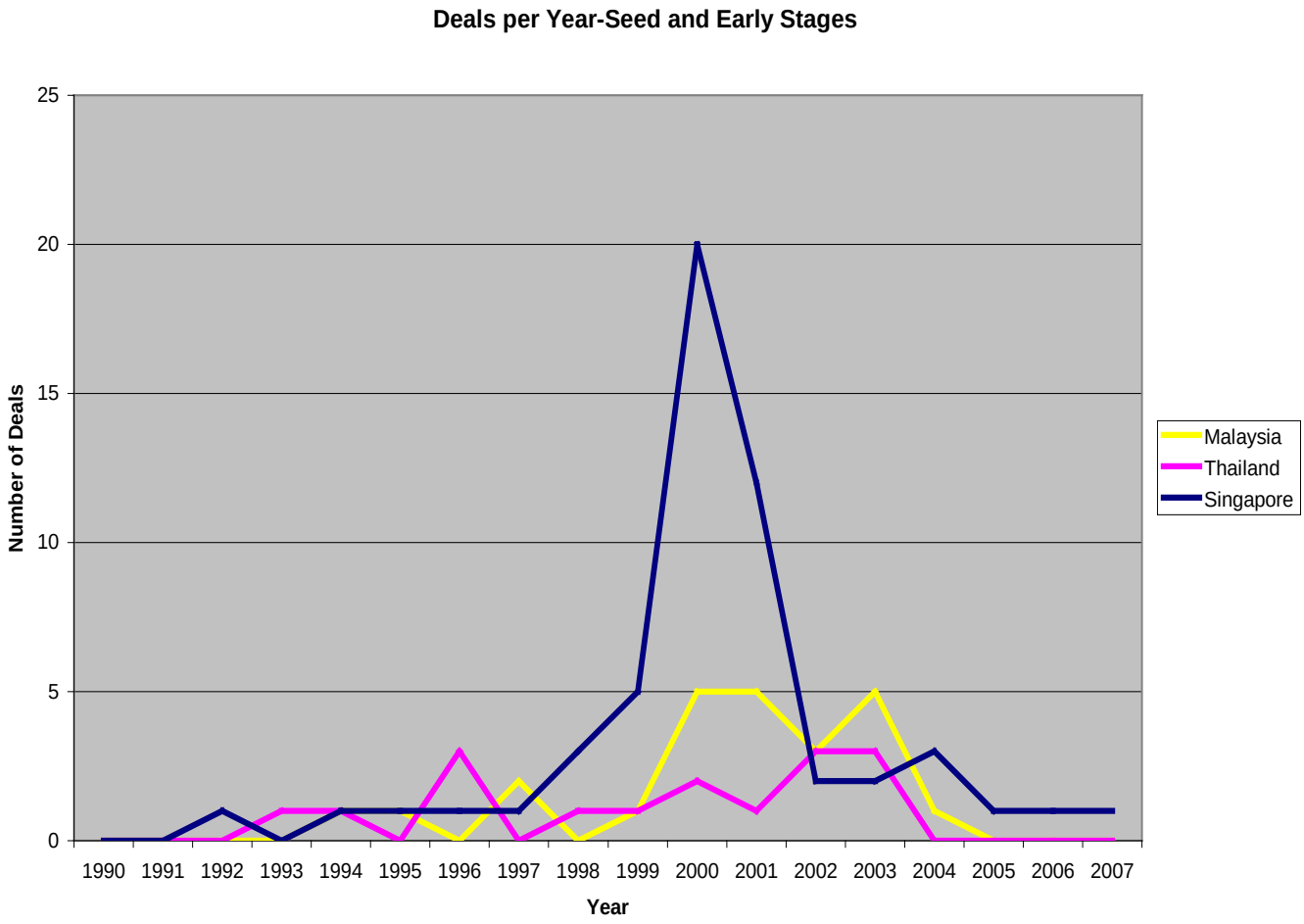


Figure 4: Amount Invested, in USD, in Malaysia, Singapore, and Thailand, including all Stages, 1995-2007

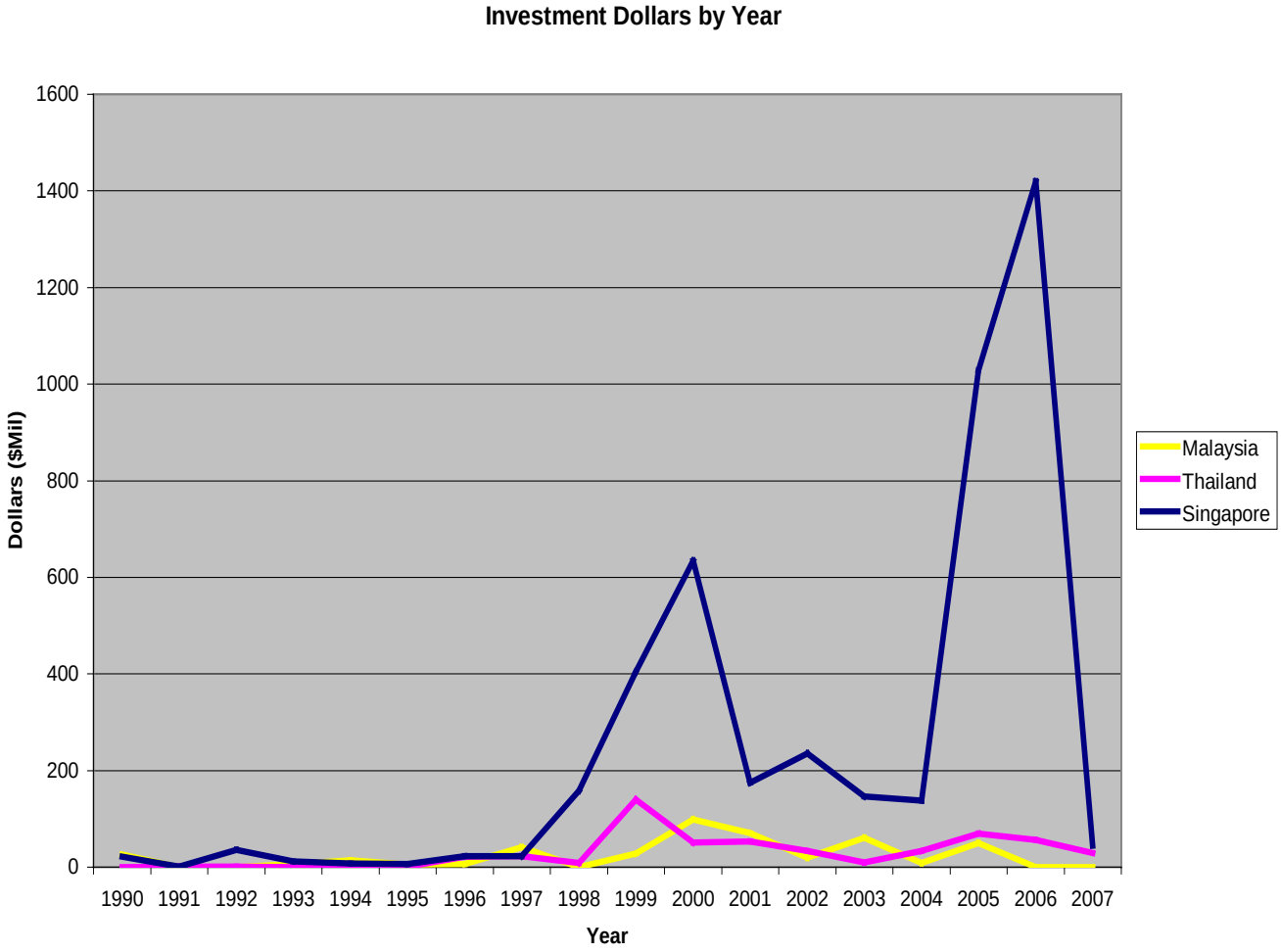
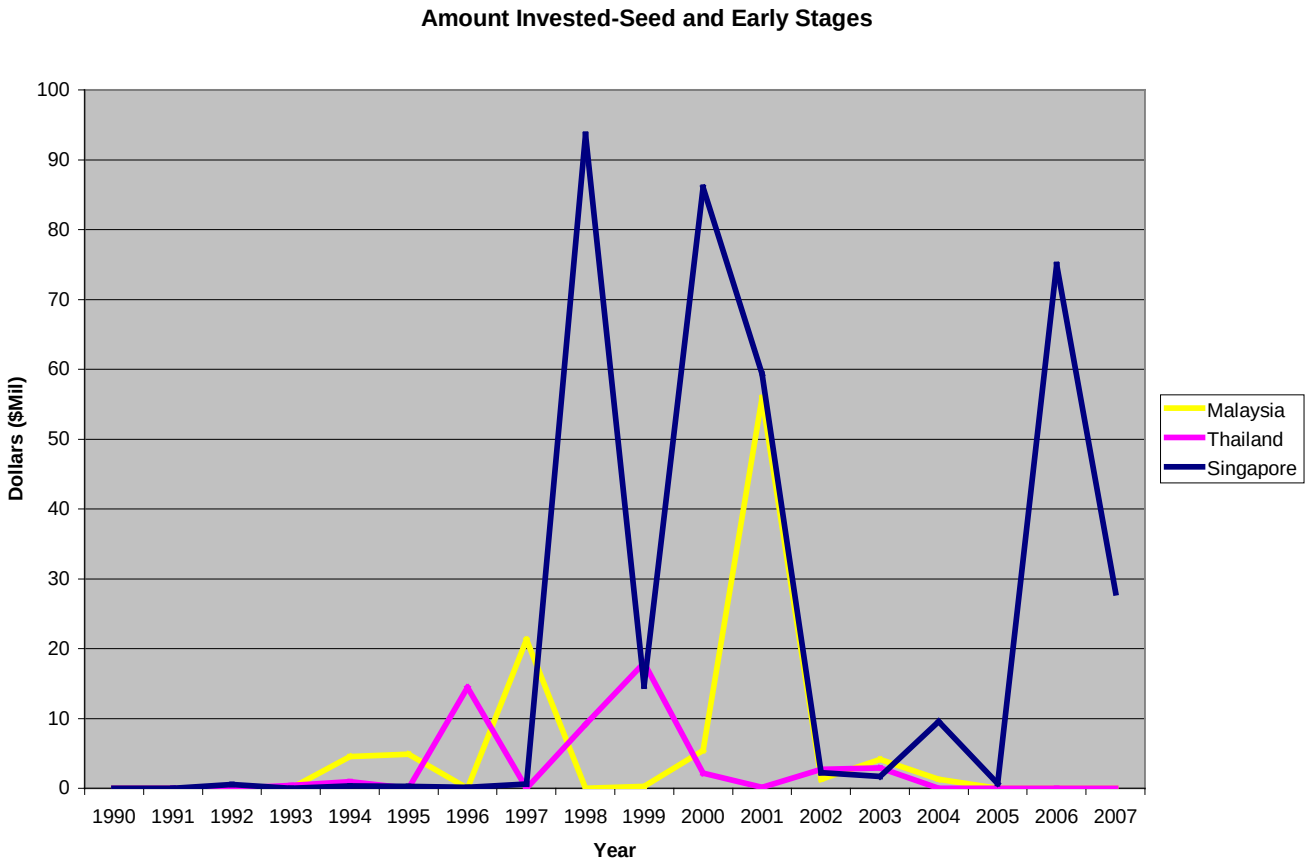


Figure 5: Amount Invested, in USD, in Malaysia, Singapore and Thailand, including only Seed and Early Stage, 1995-2007



APPENDIX ONE: MAJOR VENTURE CAPITAL INVESTORS IN MALAYSIA

MAVCAP was incorporated on April 19, 2001 by the Government of Malaysia and was allocated RM500 million by the Minister of Finance Inc for investment in, nurturing and growing the technology sector and the investing and growing of the venture capital market in Malaysia. This firm is committed purely to the technology sectors and invests in a mix of local and overseas businesses to bring together a successful blend of technologies and entrepreneurial skills. The industries of focus are: Electronics, Information Technology, Internet, Semiconductor, Telecom & Networking, and Others

MAVCAP's portfolio includes the following firms:

AATOMO Board Manufacturing (M) Sdn Bhd
Ample Effect Sdn Bhd
Bubble Motion (M) Sdn Bhd (Divested)
CallTime Solutions (Pyxis Australia Pty Ltd & CallTime Solutions Limited)
Eco Packaging Sdn Bhd
Elemental Ventures Sdn Bhd
Enlighten Innovation Solutions Sdn Bhd
Everyone's Linux Pvt. Ltd (ELX)
GameBrains Sdn Bhd
Gigantic Acres Sdn Bhd
Global Cybersoft (Vietnam) Inc. (GCS)
Grenidea Technologies Pte Ltd
HDOX Bioinformatics Pte. Ltd (Divested)
IBG Ventures Sdn Bhd
ISS Consulting (M) Sdn Bhd
Infinite Tests Solutions (M) Sdn Bhd
Leinet Technology Berhad
Menara Axis Sdn. Bhd
Masers Digital Sdn. Bhd
Norhtec Corporation Inc.
NTI International
Nusuara Technlogies Sdn Bhd
arizone Technologies Sdn. Bhd
Printelli Sdn Bhd
QubeConnect Sdn Bhd
Resolv Technlogies Sdn Bhd
Sage Interactive Sdn. Bhd
Sigmax eServices Sdn. Bhd.
Station Network (M) Sdn Bhd
Strategic Benchmark Sdn. Bhd (SB/TIketbas)
Vasunas Pte. Ltd
Wireless People (M) Sdn. Bhd 32**

Malaysian Technology Development Corporation was set up by the Government of Malaysia in 1992 to spearhead the development of technology businesses in Malaysia. Its initial role was to concentrate on the promotion and commercialization of local research and invest in new ventures that can bring in new technologies from abroad. To date, MTDC has provided grants (under 8th Malaysia Plan) totaling RM44.83 million to 121 deserving local companies and participated in taking up equity stakes totaling more than RM150 million in more than 50 companies – both locally and internationally.

MTDC invests in early, developing and late-stage technology-based businesses as a way to manage risks. To further diversify risks, exposure is limited to around 30% equity stake in any investments. MTDC's portfolio companies include: 13***
Astino Berhad, AWC Facility Solution Berhad, Ecofuture Berhad, Globetronics Technology Bhd, Kotra Industries Bhd, Malaysian Vaccines and Pharmaceuticals Sdn Bhd, Malaysian Agri Hi-Tech Sdn. Bhd., Malaysian Bio-Diagnostics Research Sdn Bhd
Vivantis Technologies Sdn Bhd, MicroMedicare – Geneva, Switzerland; Advance Bio Med-Tools Sdn Bhd, Primera Biosystems Inc – Mansfield, Massachusetts, Zhulian Bhd

SpringHill Management Sdn Bhd is based in UK, but provides capital to firms in Malaysia that specialize in field of life sciences. The firm focuses on early stage investments and development capital. SpringHill is a private equity fund management company with interest in the drug development, pharmaceutical services, medical devices, diagnostics, and generics, super-generics and biogenerics sectors. SpringHill's investments in Malaysia have included Alpha Biologics, Progenix Research, GMX Biotech Malaysia, which is a joint-venture between GeneMedix plc, UK and the Penang Development Corporation for the manufacture of recombinant human insulin, and NCI Cancer Hospital.

Intelligent Capital is a Malaysian private equity and venture capital investor and was established in 2000. According to the website, it is the first Malaysian private equity and venture capital firm that successfully raised 100% of its funds from private individuals and corporations. Intelligent Capital invests in firms in the Asia Pacific Region, focusing on three sectors: Advanced Manufacturing, Communications, and Outsourced and Transition Services. Although Intelligent Capital does not usually provide seed funding, it invests in both early and later stage companies. The firm broadens its scope beyond financing to include strategic guidance, recruiting business development and partnering.

DTA Capital was founded in 1996 and is a domestic Venture Capital firm whose mission is to identify, invest and nurture Malaysian (and a limited number of foreign) businesses operating in the technology space, with a focus on the enabler space in the ICT, services and energy-related sectors, with emphasis on companies in the expansion stage. DTA Capital has completed a total of 15 investments valued at MYR61.6 million (at point of invest). Industry exposure includes properties, manufacturing (electronics, plastics, food products and building materials) and trading (hardware and white goods). Some current portfolio companies include Sage, polarizone, Wireless People, Vasunas, Global CyberSoft, Norhtec, Ticket2u.biz, Everyone's Linux, and NTi. In November 2001, the company, through its subsidiary, DTA Ventures Management Sdn Bhd (DTAV), secured an Information & Communication Technology Fund (ICT Fund) worth MYR25 million from Malaysia Venture Capital Management Bhd (also known as 'mavcap'). Since then, the Group has taken a strategic position to focus on venture capital after recognizing the gap in funding younger companies in Malaysia. The Group now consists of the holding company, DTA, and the wholly owned subsidiary DTAV.

FirstFloor Capital Sdn Bhd began in 1996 and is partner run and owned. It manages several venture capital and private equity funds, which consist of privately owned funds, FirstFloor Capital's funds, as well as institutional funds. FirstFloor's portfolio includes PMCare, Synamatix, Malaysian Genomics Resource Centre, Holista Biotech, Afoofa Solutions, Dataran Berlian, and Flare Studios.

BI Walden Management Ketiga Sdn. Bhd was established in 1990 and is headquartered in Kuala Lumpur. The company is a subsidiary of BI Walden, a US firm, and currently has RM33 Million under management and prefers investing in companies that are in the Early Stage or Late Stage/Expansion. Walden's industry preferences include Electronics, Information Technology, Internet, and Semiconductors. Their current geographical focus is within Malaysia.

Pembangunan Ekuiti Sdn. Bhd. is a subsidiary of Bank Pembangunan of Malaysia, which is owned by the Government through the Minister of Finance.

CIMB Private Equity Sdn Bhd is a subsidiary of CIMB Group, set up to provide equity capital to mature companies in most industry sectors seeking expansion capital, for restructuring purposes and fund buyouts.

Commerce Asset Venture Sdn. Bhd. is wholly owned by CIMB Group and classifies its investments into four categories: Information and Communication Technology, Advanced Manufacturing, Life Sciences, and Others. Commerce Asset Ventures currently manages more than RM 700 million worth of funds. The firm's portfolio consists of: dBix Systems, CMnet Dotcom, Insyncro (M), NasionCom, NexusEdge Technologies, Explorium (M), Opensys (M), Palette Multimedia, RK Komputer, Tricubes Computers, eWarna.com, D'nonce Technology, Dtex International, MetierView, Klotz Digital Asia, Radiant Range, Vector Holding, Good Way Rubber Industries, Malaysia Steel Works (KL), Flex-P Industries, Melela Steel Industries, Pentamaster Corporation, Upeca Engineering, Oilfield Pipeline Inspection, Tacara, Phytoprotein BioTech, My Gene BioTechnology, Sesama Equilab, Carotech, Sesama Medical College Management, Chaswood Resources, Inovatif Media Asia, Maxis Communications, NTPM Holdings, Prosakti, Syarikat Binaan Budi Sawmill, and Plus Expressways.

Kumpulan Modal Perdana Sdn Bhd is wholly owned by the Malaysian Ministry of Finance and was incorporated on May 16, 2001 to administer and manage the Venture Capital for Technology Acquisition (VCTA) fund. The firm's mission is to "spur technology development through venture capital by leveraging on international network leading to growth of Malaysian technology-based businesses." The firm has set up two overseas venture capital funds (Silicon Valley and China) and also operates one locally within Malaysia. The Malaysian fund invests in Pre-IPO and high growth companies. To date, Perdana Fund has invested in seven companies of which five are listed on the local bourse: Greenpacket, BSL Corporation, BCT Technology, eti tech, NextNation Network, expressAsia, and Red Hot. Internationally the firm invests in Silicon Valley and Chinese startups.

Malaysian Ventures Management Inc. Sdn. Bhd. is the private equity arm of the AmInvestment Group Berhad (AIGB).

MSC Venture Corporation Sdn. Bhd was established in June 1999 and is a subsidiary of the Multimedia Development Corporation, which was set up by the Malaysian government. MSC specializes in the Information Communication Technology (ICT) industry including but not limited to Internet companies, software developers, content creators and communication solution

providers. MSC Venture Corporation's portfolio includes: CypherEdge Inc., United Sino – Resources, SMS Hub, Infosation, Cosmos Discovery, and Farallon Medical Inc.

OSK Ventures International Bhd was established in 2000 and is involved in venture capital and private equity management through OSK Holdings Berhad. The firm's focus is in the Information & Communication Technology (ICT), Advanced Manufacturing and Biotechnology and Life Sciences industries. Its current portfolio companies include: eBworx, Nova MSC, Willowglen MSC, Infotech Alliance, Impressive Edge Group, INS Bioscience, Green Packet, and Finexasia.com.

Perbadanan Usahawan Nasional Bhd began on 17th July 1991. It is a wholly owned subsidiary of Yayasan Pelaburan Bumiputra (YPB), the coordinating body for investment activities with government agencies, Bumiputera companies and individuals. PUNB investee companies include:
AA Technologies Sdn. Bhd., Ableace Industries Sdn Bhd, AJ Food Industries Sdn Bhd, Alam Teknokrat Sdn Bhd, All Season Synergy Sdn Bhd, Altoraba Industries Sdn Bhd, Amalgamated Metal Builders (M) Sdn Bhd, Anggerik Laksana Sdn Bhd, Aseania Foilpack Sdn Bhd, B & Z Plastic Industry Sdn Bhd, Chow Foods Sdn Bhd, EB Granite & Marble Sdn Bhd, Econlink Sdn Bhd, El Hajj Products Sdn Bhd, Firgee Engineering Sdn. Berhad, FTMS Holdings (M) Sdn Bhd Global Odyssey Corporation Sdn Bhd, Hijjaz Music Entertainment (M) Sdn Bhd, Hospital Pakar An-Nur Hasanah Sdn Bhd, Ijima Industries Sdn Bhd, JWR Technology (M) Sdn Berhad, Kuantan No-Dig Construction Sdn Bhd, Logamahir (M) Sdn Bhd, Maxlane Sdn Bhd, Metraplas Industries Sdn Bhd, Modu Logic (M) Sdn. Berhad, Mont Kiara Dental Specialist Clinic Sdn Bhd, Orisystems Sdn Bhd, Pearl Manufacturer (M) Sdn Bhd, Qarira Packaging (M) Sdn Bhd, Resscom Technologies Sdn Bhd, Rotocraft Industries (M) Sdn. Berhad, Selapis Mutiara Sdn Bhd, Seri Serdang Optometrist Sdn Bhd, Sipro Plastic Industries Sdn Bhd, Strata Park (M) Sdn Bhd Tangkas Technology (M) Sdn Bhd, Tekno Logam Sdn Bhd, Top Range Product (M) Sdn Bhd, TW Food Industries Sdn Bhd, Veecan Management Sdn Bhd, Wesria Food Sdn Bhd, Xair Communication Sdn Bhd, Zanwa (M) Sdn Bhd

VF Capital Sdn Bhd was incorporated on October 26, 2004 and is a wholly owned subsidiary of Priharta Development Sdn Bhd (PHT), a private equity company. VF Capital focuses most of its investments in the information and communication technology, biotechnology and nanotechnology sectors. VF Capital is allocated an investment fund of RM50 million and currently has three investee companies: Technodex Berhad, Need Pty Ltd, and TheMembers Pty Ltd.

DBS HDM Capital Management Sdn Bhd currently has RM 50 Million in funds under management. DBS HDM Capital Management focuses on companies in the Late Stage/Expansion, Maturity/Expansion, and Consolidation stages and focuses on investing in Malaysia and other parts of Asia. The firm's preferred industries are: Biotech, Communication and Networking, Electronics, Information Technology, Medical Equipment and Devices, Semiconductors, Manufacturing, Food, Engineering and Other Services.

Ethos Capital Sdn Bhd is a RM200 million private equity fund based in Kuala Lumpur that invests in Asian companies.

Amanah Ventures Sdn Bhd is based out of Kuala Lumpur and has one fund of RM50 million under management. The company focuses on investments in Malaysia and industry preferences

include: Biotechnology, ICT, Advanced Electronics/Material/Engineering, Energy Base, and Emerging Technology.

Goldis Berhad (FKA: Gold IS Bhd) was incorporated in Malaysia on June 1, 2000 as a private company, but went public soon after. Goldis is an investment company with private equity investments in Malaysia and China and focuses on the Life Sciences, Water/wastewater treatment, Information Communications Technology (ICT) and Organic Aquaculture sectors.

MOL.com Berhad (FKA:Dijaya Enterprise Bhd.) was incorporated in Malaysia on February 9, 2000 as a private company but went public on April 29, 2002. MOL.com specializes in Internet media and e-commerce, leveraging on a network of physical outlets acting as physical media and cash-based payment collection centres for online transactions.
The company was found on the Thomson database as a VC firm with one fund under management-a direct investment fund with its first close on January 1, 2000 but no information regarding the size of the fund or investments were found.

Navis Investment Partners (Asia) Ltd. is a subsidiary of Navis Capital Partners, which was founded in 1998 to make private equity investments in buyouts, recapitalizations and financial restructurings in Asia. Through Navis Investment Partners (Asia) Limited, the firm manages several private equity funds, whose Limited Partners include a number of well-known US, European, Middle Eastern and Asian commercial and investment banks, pension funds, insurance companies, corporations, as well as a number of high net worth individuals and family offices. The geographic investment focus is in Australia, Hong Kong, India, Malaysia, New Zealand, Singapore, Thailand, China, Indonesia, and the Philippines.

Multimedia Development Corp Sdn Bhd is incorporated under the Companies Act of Malaysia and is owned and funded by the Government. Investment is done through MSC.

Ispring Capital is headquartered in Kuala Lumpur and carries out its venture capital activities through iSpring Venture Management Sdn Bhd, which is the fund manager for MAVCAP Technology Sdn Bhd. The fund was incorporated by MAVCAP as a venture capital investment holding company. Investments are primarily in Malaysia but also elsewhere. Capital is given to companies in the Electronics, ICT, Internet, Semiconductor, Telecom and Networking, and Medical and Health sectors. The particular area of focus is Wireless and eCommerce. Investment size ranges from RM500,000 to RM3.7 million. Ispring Capital boasts that, in 2001, it was one of only four independent venture management firms chosen by MAVCAP under its RM100 million outsourcing program.

PNB Nomura Jafco Management Sdn Bhd is the venture capital subsidiary of Permodalan Nasional Bhd (PNB), the state-owned capital investment company. PNB Nomura Jafco Management is a joint venture between PNB Equity Resource Corp Sdn Bhd (PERC) which holds a 51 percent equity stake and Jafco of Japan which holds the remaining 49 percent stake.

Transpac Capital has offices in Singapore, China, Malaysia, Hong Kong, Taiwan, and USA. Transpac Capital invests in the Asia-Pacific region in companies with high growth potential involved in private manufacturing and services. Transpac Capital was formed in 1989 through

the integration of Transtech Venture Management Pte Ltd of Singapore and Techno-Ventures Hong Kong Limited ("TVHK"). As of December 2000, the company managed US$820 million of capital in fourteen funds and special investment programs. To date, the Transpac Capital has invested in 202 companies in East Asia and the United States.

Other companies who have invested, but are not very active and/or no information can be found:
ISM Equities Sdn Bhd
China Venturetech Investment Corp
Optixlab Sdn. Bhd.
Reco Shahzan (M) Sdn Bhd
Technology Asia Ventures Sdn Bhd
Malaysia Debt Ventures Bhd
Ireka Venture Capital Limited
Rio Venture Sdn Bhd
PFM Capital Holding Sdn Bhd
CMY Incubator Sdn Bhd
Lembaga Tabung Haji
Expedient Equity
MIDF Amanah Venture Sdn. Bhd
ChemQuest Sdn Bhd
Kuwait Finance House (Malaysia) Berhad
Opus Capital Sdn. Bhd.
Banyan Ventures

Appendix TWO: Khazanah's Investments

PROTON (Proton Holdings Bhd) Public Listed
Miyazu Seisakusho Co., Ltd
Modenas (Motosikal dan Enjin Nasional Sdn. Bhd.)
CIMA (Cement Industries of Malaysia Bhd) Public Listed
Megasteel (Megasteel Sdn. Bhd.)
ACR (Asia Capital Reinsurance)
Bank Muamalat (Bank Muamalat Malaysia Bhd)
CIMB Group Public Listed
Lippo Bank (PT Bank Lippo Tbk) Public Listed
Valuecap (Valuecap Sdn Bhd)
Apollo (Apollo Hospitals Enterprise Ltd) Public Listed
International Medical University Malaysia
Pantai Holdings
Pharmaniaga (Pharmaniaga Bhd) Public Listed
Ho Hup (Ho Hup Construction Company Bhd) Public Listed
PLUS Expressways (PLUS Expressways Bhd) Public Listed
UEM (United Engineers (M) Bhd)
UEM Builders Public Listed
UEM World (UEM World Bhd) Public Listed
Opus International Group Plc (formerly known as Kinta Kellas Plc) Public Listed
Astro (Astro All Asia Networks plc) Public Listed
Telekom (Telekom Malaysia Bhd) Public Listed
Time (Time Engineering Bhd) Public Listed
Time dotCom (Time dotCom Bhd) Public Listed
XL (PT Excelcomindo Pratama Tbk) Public Listed
DRB-Hicom (DRB-Hicom Bhd) Public Listed
Parkson (Parkson Retail Group) Public Listed
Faber (Faber Group Bhd) Public Listed
Putrajaya Holdings (Putrajaya Holdings Sdn Bhd)
STLR (STLR Sdn Bhd)
Tradewinds Hotels and Resorts (Tradewinds Hotels and Resorts Sdn Bhd)
UDA Holdings (UDA Holdings Bhd)
Atlantic Quantum Sdn Bhd
BI Walden Ventures Ketiga (BI Walden Ventures Ketiga Sdn Bhd)
MTDC (Malaysian Technology Development Corporation Sdn Bhd)
Silterra Malaysia (Silterra Malaysia Sdn Bhd)
Spring Hill Bioventures (Spring Hill Bioventures Sdn Bhd)
Malaysia Airports (Malaysia Airports Holdings Bhd) Public Listed
MAS (Malaysian Airline System Bhd) Public Listed
Parkmay (Parkmay Bhd)
Penerbangan Malaysia Bhd
Pos Malaysia (Pos Malaysia & Services Holdings Berhad) Public Listed
Westport (Westport Holdings Sdn Bhd)
Shuaibah Phase 3 Independent Water & Power Project

Tenaga Nasional (Tenaga Nasional Bhd) Public Listed