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Foreign Direct Investment and Intellectual Capital Formation in Asia

by

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1. Introduction

There is little argument that foreign direct investment (FDI), primarily in the form of multinational corporations (MNCs), has played an important if not leading role in the economic growth of Southeast Asia. Less clear, however, is the impact FDI has had on the formation of human capital—especially the knowledge and skills found in the workforce of the local economy. The primary purpose of this paper is to begin to explore in more detail this relationship between FDI and skills development, particularly for the developing countries of Southeast Asia. A second and related objective of this paper is to propose a research and methodology framework based on this preliminary analysis that might be used to rigorously and systematically address the theoretical and empirical relationships between FDI, the formation of technically advanced skills and knowledge, the subsequent transfer, assimilation, and application of those skills in the local economy, as well as the broader impact of changing skill levels on society in general.

Admittedly these relationships are complex at best.\(^1\) From a cross-sectional perspective at least three dimensions exist, all of which are interrelated. First, to what extent do MNCs contribute to the formation of human capital, and is this capital, if formed, transferred from foreign firms to local enterprises? Second, how does FDI impact state policies for education and training in general and vice versa? What are the aims of the education and training system? Is the system used to support development strategy or other ends? Where supportive, do states design policies to create skills that can then be used to attract FDI or to leverage FDI once it exists, or both? And finally, does FDI-induced demand for skills interact with labour and skills supplied by both the state and MNCs to affect wage and, ultimately, income inequality?

Further complicating the analysis is the fact that these three dimensions must be considered longitudinally as well. Due to both domestic and international factors, the way industrializing countries have utilised FDI in their development strategies has changed

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\(^1\) Which perhaps explains the current lacuna in the literature on the subject.
dramatically over time.\textsuperscript{2} These changes have been particularly evident over the last 30 years or so.

Although these issues apply to developing economies throughout the world, I restrict my analysis to the countries of Asia, for several reasons. First, it is widely held that Asian economies have leveraged FDI for economic growth much more effectively than other regions of the world (see, inter alia, Zhang, 2001). Thus, there may be significant policy lessons that can be learned from the “East Asian” developmental experience and applied to other countries. In many respects, however, this regional perspective is overly coarse. In reality, Asia is not a large homogeneous bloc wherein FDI has been used equally effectively, or even similarly. Rather, significant political and economic differences exist between the countries and sub-regions of Asia.\textsuperscript{3} Understanding the variation between these regions may do more for our understanding of how FDI influences economic development than prior, more regionally based, comparisons. Because FDI is much more prominent in the growth strategies of Southeast Asian nations, I concentrate my comparative focus on this region.

The remainder of the paper will be as follows. I begin in section two by constructing an analytical framework based on changing patterns of FDI usage over time. These changes, primarily driven by exogenous factors, have changed the ends for which FDI has been employed. Next, within this dynamic international context, I explore the role of FDI in the development strategies of Asian countries. In particular I analyse the means employed and the differential performance among various East and Southeast Asian governments in not only attracting FDI, but in leveraging that FDI to meet nationalist developmental objectives. While trade and investment policies form an important core of this analysis, I also look at general education and training policies and the extent to which they integrate with broader development strategies. Using the general analysis in section three as a foundation, I examine in section four both the theoretical and empirical relationship between FDI and intellectual capital formation and dissemination. Do knowledge and skills lead to FDI or the reverse? Also, what is the impact of rising skills, wages, and the demand for skills in the local economy on income equality? In the fifth section I examine the extent to which government intervention can develop and/or foster the

\textsuperscript{2} While it is beyond the scope of this paper, it bears mentioning that these changes also impacted the relative balance of bargaining power among the various actors, primarily the state and private firms.

\textsuperscript{3} Booth (1999) argues, for example, that Southeast Asia differs dramatically from Northeast Asia on a variety of dimensions, including skills and knowledge development.
relationship between FDI and intellectual capital formation or hinder and/or destroy it. Particularly important to this analysis are linkages connecting general education and training policies and institutions both to the private sector as well as to development strategies more generally. Finally, based on the forgoing analysis, I conclude by drawing tentative conclusions and suggesting a research framework and methodology within which to conduct detailed country case studies on the interaction between FDI and intellectual capital formation. As part of this proposal I make recommendations, based on the proposed methodology, for selecting a particular set of cases for further study.

2. The Changing Role of FDI

Influenced primarily by changes in the international political economy, the way developing countries have leveraged FDI for economic growth has evolved and changed over time. Not only have these changes influenced the ends for which FDI has been employed, but they have also impacted the relative bargaining position of the actors involved, primarily states and firms. For the sake of analysis I have designated three broad periods in the usage of FDI. These three periods correspond, at least heuristically, to broad general trends in the use of FDI. Nevertheless, the reality of historical change in FDI usage has been more evolutionary than revolutionary. Thus, there is tremendous overlap and diversity among the three periods. With this caveat, I begin with the earliest.

Before 1970, FDI was viewed almost exclusively as a means of transferring technology from developed to developing countries. Therefore, FDI was seen primarily as a means of developing local industries. For example, Japan, Korea, and Taiwan pursued limited FDI within a development strategy of creating and nurturing local infant industries (see Johnson, 1982; Samuels, 1994; Westphal, Kim, & Dahlman, 1984). On the other hand, in Southeast Asia FDI was also sought for technology but, with the exception of Singapore, it was usually in the form of equipment to exploit natural resource sectors as opposed to nurturing local industry (see Sieh & Yew, 1997). In both cases FDI during this period was quite limited\(^4\) and took the form of joint ventures, partnerships, and other equity investment. Rarely did foreign investors have controlling

\(^4\) See the World Bank Development Indicators, 2001, for relative levels of FDI during this period.
interests over the assets in which they had invested.\(^5\) For example, FDI played only a very minor role in Korea’s industrialization and technological development (Evans, 1995). In fact, until 1981 FDI comprised only 5% of total gross investment in Korean manufacturing.\(^6\) Instead of relying on FDI for technological development, licensing played a much more important role (Westphal et al., 1984).

Despite the similarities in size and form of FDI, however, the objectives for, and hence the responses to, FDI differed among the countries of Asia. Since Japan, Korea, and Taiwan sought to localise technology inherent in FDI, they created strong education and training institutions to develop the necessary human capital to assimilate, indigenise, and transfer technology to the local economy (see Ashton, Green, James, & Sung, 1999). On the other hand, since Malaysia, Thailand, Indonesia, and the Philippines sought capital to exploit latent natural resources, much less emphasis was placed on technological transfer. Hence, the education and training systems were not intended, and therefore not designed, to support or leverage this investment (Fong & Hill, 1992; Ritchie, 2001b).

In other early “late” developing economies, such as Brazil and India, FDI during this initial period was more apt to take the form of MNCs than in East or Southeast Asia. Even so, FDI was still closely regulated in terms of technology transfer, share of ownership, sectors, markets, and performance (Evans, 1995). Although the objectives for FDI in these states were more similar to those of East Asia, the outcomes were mixed, often depending on state and sector. For example, in India the state had little success in linking education and training policy to MNCs (see Evans, 1995). In contrast, Brazil created the Institute of Aeronautical Technology and the Centre for Aeronautical Technology in conjunction with MIT to produce a deep pool of aeronautical engineering talent and a successful (eventually) aircraft industry.\(^7\) And yet, when it came to computers or automobiles it was unable to do the same.\(^8\)

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\(^5\) Before independence in Malaysia the British owned large segments of the primary product producing economy, including rubber plantations and tin mines. After independence, however, most of these operations were nationalised or purchased in the name of the Bumiputra, or indigenous inhabitants (primarily Malays).

\(^6\) Since 1987, however, FDI has increased dramatically, although it remains substantially less than other developing countries of Asia (Kim, 1997).

\(^7\) See also [http://www.undp.org/tcdc/bestprac/scitech/cases/st3braz.htm](http://www.undp.org/tcdc/bestprac/scitech/cases/st3braz.htm).

\(^8\) Evans (1995) provides an extensive historical account of the development of the computer industry in both Brazil and India.
This minimal, highly controlled use of FDI and its coordination with domestic education and training systems corresponded to “technonationalist” development strategies,\(^9\) which Samuels (1994) defines as strategies designed to extract foreign technology, transfer it to key local firms, and ultimately to disseminate it widely throughout the local economy.\(^{10}\) Obviously the first key to such a strategy is developing local industries capable of absorbing, assimilating, and improving upon foreign technologies. But the strategy also requires intermediate actors—usually state institutions\(^{11}\)—to organise, supervise, and often broker the linkages between local firms and foreign capital. In almost every case, government actively intervened to create “hot house” development environments through trade barriers and other subsidies to shield these infant industries as they “ramped” up the technological curve. Where foreign and local capital joined forces, foreign capital was always subordinated to local capital and the venture was closely supervised by the state (Amsden, 1989; Evans, 1995; Johnson, 1986; Wade, 1990).

Although technonationalist FDI strategies continued to dominate, the objectives and means surrounding FDI began to change in the late 60s. First, from the late 60s to early 80s the flow of FDI grew steadily. Pure capital flows, especially from Europe, increased dramatically, which allowed countries to use FDI first for capital needs and secondarily, if at all, for technology transfer. Second, in addition to raw capital, some countries—beginning with Singapore and quickly extending throughout Southeast Asia—began encouraging FDI as a means of addressing other issues, such as unemployment. Third, while it was still possible to pursue Listian development strategies, some countries instead chose to implement more technoglobalist strategies, albeit to differing degrees. Singapore, for example, based its development strategy on becoming an integral cog in the international production networks of foreign-controlled industries. Clearly, trade and financial liberalisation are an important component of this strategy. In contrast, Malaysia and Thailand began to encourage MNCs to

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\(^9\) Although clearly much more successful in East Asia and perhaps within selected industrial sectors in Brazil.  
\(^{10}\) In general “techno” nationalist strategies differ from more traditional “Listian” nationalist development strategies only in that they are primarily concerned with relocating technology from foreign sources into the domestic economy as opposed to simply creating local manufacturing enterprises. That is, the focus is specifically on upgrading the local industry with the technological frontier as the ultimate goal.  
\(^{11}\) Chalmers Johnson (1982) argues that the main coordinating organization in Japan was the Ministry of International Trade and Industry (MITI). Wiess (1995) suggests that Korea’s Economic Planning Board (EPB) functions very much like Japan’s MITI. In addition, institutions like the Korean Institute for Economics and Technology (KIEL) and the Korean Trade Promotion Corporation (KOTRA) assist in this effort. For Taiwan the relevant institutions are the Council for Economic Planning and Development (CEPAD) and the Industrial Technology Research Institute.
locate in tightly controlled export enclaves while continuing to protect local industry, thus pursuing a dualistic combination of technoglobal and technonational development strategies (Felker, 1998).

By the early 1980s several changes in the international system again impacted not only the way FDI was used in developing countries but its sheer volume. A dramatic rise in supply and demand of FDI, especially in Asia, can be traced to both “push” and “pull” factors. On the push side, several important changes led firms in developed countries to seek to “internationalise” their production networks. According to Dunning (1998), three gradual changes in the world economy account for increasing outward FDI.

First, foreign firms are venturing into other countries in search of “location specific assets” (Dunning, 1998). While these assets include natural resources, local markets, and physical plant and assets, intellectual capital is becoming the most important.12 While the chief location specific asset in developing countries has most often been low-wage labour, pockets of technically specific skills and knowledge critical to the success of certain industries have emerged.13 Second, substantial progress in transportation and communication technologies as well as dramatic increases in trade and investment liberalization has made international economics much more cost effective than in the past (UNCTAD, 1997). But beyond cost, new technologies make new ways of organising business possible. Just-In-Time manufacturing, extended production networks, increased outsourcing, and other management and manufacturing innovations became possible. Finally, growing technological sophistication is driving companies toward collaborative ventures to meet individual corporate objectives.

But no matter how intense the push factors in developed countries, without changing domestic views on the part of developing countries, the observed increases in FDI would not have been possible. In the prior two periods, developing countries frequently viewed FDI suspiciously and although FDI often embodied needed foreign technology, few governments were willing to pay the price of unfettered access, which they perceived as a complete sacrifice of local industry. Nevertheless, by the mid 80s most developing countries, at least in Southeast

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12 Dunning (1998) argues that intellectual capital has replaced physical capital as the key wealth-generating asset in most industrial economies.
13 McKendrick, et. al. (2000), explain how Singapore has developed process engineering capacity specific to the set-up and tear-down of manufacturing processes for the hard disk drive industry. Since labour costs compose only a tiny fraction of the overall cost of the drives, time-to-volume considerations far outweigh labour costs alone. Thus,
Asia, had begun to rapidly liberalise their trade and investment regimes in response to exogenous changes in the international system.

First, the global debt crisis in the early 1980s impacted liberalisation of FDI in two important ways. Since debt capital was increasingly difficult to find during this period, the crisis prompted countries to look for alternative sources of development funds. By switching from debt to FDI, developing countries realised a potentially plentiful and much less volatile capital source, which could be used to balance loan and equity capital in private investment without the heavy drag of debt service (Noorbakhsh, Paloni, & Youssef, 2001).

But just as the availability of debt financing was diminishing, the ability of developing countries to qualify for debt financing was also deteriorating. In Southeast Asia, for example, the global slowdown precipitating the crisis led to declining balance of payments, increasing unemployment, weak domestic demand, and diminishing foreign assistance. In response, the governments of the region responded by liberalising trade and investment regimes in order to attract FDI, especially MNCs. For example, Thailand liberalised tariffs from 63% in 1974 to 39% in 1987 for import competing products and from 77% to 55% for non-import competing products. During the same period of time export tariffs were reduced to zero (Ramstetter, 1997). In addition, needed emergency funds to help deal with the short-term exigencies caused by the crisis could largely be secured only from international sources such as the World Bank and IMF, and then only on condition of trade and financial liberalisation.

<table>
<thead>
<tr>
<th>Country</th>
<th>Millions of US Dollars</th>
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<tbody>
<tr>
<td>Indonesia</td>
<td>23 684</td>
</tr>
<tr>
<td>Malaysia</td>
<td>35 177</td>
</tr>
<tr>
<td>Philippines</td>
<td>8 379</td>
</tr>
<tr>
<td>Thailand</td>
<td>17 177</td>
</tr>
</tbody>
</table>

Source: World Bank Development Indicators, 2001

The capacity to rapidly take new products from design to volume production dramatically increases yield and hence, profits.
Second, coincident with the economic downturn in Southeast Asia, developed countries, especially Japan, were experiencing strong balance of payments and increasing pressure to revalue their currencies upward. In response, Japan significantly re-valued the Yen at the Plaza Accords of 1985. A stronger Yen simultaneously made production in Japan more expensive while lessening the costs of production overseas. Coupled with currency devaluations in Southeast Asia, the result was a tremendous outflow of capital from Japan into all of the capitalist countries of Southeast Asia (United Nations, 1998).

Table 2: Foreign direct investment, net (BoP, current millions of US$)

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>-6 650</td>
<td>-20 089</td>
<td>-122 447</td>
<td>-124 576</td>
<td>-99 883</td>
</tr>
<tr>
<td>China</td>
<td>2 053</td>
<td>9 081</td>
<td>68 168</td>
<td>191 684</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>225</td>
<td>-51</td>
<td>-132</td>
<td>-3 407</td>
<td>75</td>
</tr>
<tr>
<td>Malaysia</td>
<td>2 211</td>
<td>5 653</td>
<td>3 993</td>
<td>20 861</td>
<td>18 109</td>
</tr>
<tr>
<td>Thailand</td>
<td>371</td>
<td>1 412</td>
<td>3 412</td>
<td>8 561</td>
<td>18 593</td>
</tr>
<tr>
<td>Philippines</td>
<td>318</td>
<td>196</td>
<td>1 945</td>
<td>3 455</td>
<td>6 259</td>
</tr>
<tr>
<td>Indonesia</td>
<td>872</td>
<td>2 211</td>
<td>7 499</td>
<td>10 619</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>1 501</td>
<td>6 404</td>
<td>10 509</td>
<td>15 297</td>
<td>12 260</td>
</tr>
<tr>
<td>India</td>
<td>208</td>
<td>1 186</td>
<td>2 441</td>
<td>13 139</td>
<td></td>
</tr>
</tbody>
</table>


Third, beyond these initial crisis-induced pressures for liberalisation, pressures for long-term economic liberalisation also increased. World trade agreements, both bi- and multi-lateral, reflect the liberal ideologies of the 1st and 2nd Washington Consensuses, the World Trade Organization, the World Bank for Reconstruction, and the International Monetary Fund to reduce barriers to trade and capital flows. The result has been a steady reduction in the aggregate worldwide level of formal tariff barriers (Evans, 1995).

In response to the complex economic environment spawned by these macro-level changes, developing countries have afforded FDI an expanded position within their developmental strategies. As an example, developing countries are relying on FDI to meet needs for technology transfer, pure capital flows, employment, and foreign exchange. Accordingly, the
amount of FDI in the developing world has mushroomed over the last 25 years (see Table 2). In addition, since 1980, and especially in the 1990s, trade and investment liberalisation has led to a “remarkable level of de facto convergence of government policy approaches towards FDI among countries from all regions” (UNCTAD, 1994:286, quoted in Noorbakhsh, et. al., 2000:1593). As FDI expands, its form has changed fundamentally. Instead of joint ventures and minority partnerships, the bulk of FDI—even in countries that initially preferred technonationalist development strategies—now takes the form of wholly owned subsidiaries of foreign MNCs.

Increasing liberalisation, however, has stripped developing governments of policy tools once used to protect fledgling industries and foster technology transfer and skills development (see Doner and Ritchie, forthcoming). The challenge in this new global environment, then, is to leverage the higher levels of technology in foreign MNCs to create local technological capacity, even when the range of policy tools available to governments to require MNCs to share their technology with the local economy seems to be narrowing significantly. In a rapidly liberalising global economy, leveraging foreign technology to create local technological capacity requires, at a minimum, expanding and deepening the knowledge and skills of a nation’s work force.14

Significantly, one of the few areas over which governments retain broad control is the education and training system.

So far, however, the relationships between the formation of knowledge and skills and FDI have been opaque and therefore not well understood. This is true even in Asia where FDI is generally thought to have been a successful driving force behind rapid economic development (Zhang, 2001). Some suggest that the rapid economic growth in Asia was the result of MNCs utilizing pre-existing stocks of intellectual capital as the basis for highly efficient manufacturing operations in the host country (Noorbakhsh et al., 2001). There has been much less said, however, about whether MNCs facilitate skills and knowledge formation as well as technological spillovers and externalities in the host country, and if so, how. As most “late, late” industrializing countries must implement development strategies embedded within the global economy as opposed to protected from it, this latter question seems especially pertinent. And lastly, while FDI has assumed an expanded role within the growth strategies of developing countries, there is

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14 See the endogenous growth literature, in particular Romer (1986; 1994) and Grossman and Helpman (1991). Despite the importance of activities such as education and training and research and development to overall economic development, other issues such as transparency (good governance), shareholder rights, intellectual property rights, judicial independence and so forth are also critical.
little understanding of whether the FDI-led development of the past two decades in Southeast Asia has impacted the supply and demand of skills in such a way as to create pressures for widening wage differentials and income inequality.

In the following two sections I begin to address these issues. First, in section three, I examine the policies of specific Southeast Asian countries to attract and leverage FDI. Then, in section four I try to unravel the connection between government education and training policies, FDI, and human capital development.

3. Government Policies and Inward FDI

Reflecting the international and domestic changes noted above, the capitalist countries of Southeast Asia have consciously chosen to pursue more “technoglobalist” developmental strategies (Doner & Ritchie, Forthcoming). Rather than protect infant industries from global competition, globalist strategies focus on accessing foreign technology by becoming embedded in the global economy. But in addition to technology acquisition, countries implement globalist development strategies to address employment needs and generated foreign exchange. Of these countries, however, only Singapore approaches the ideal type globalist economy with the remaining countries scattered across a continuum of openness to FDI and local industry protection. This continuum, however, may not be linear or even two-dimensional. For example, where countries have combined liberal FDI policies with a restrictive domestic trade regime a “dualistic” economy has resulted with a liberal, foreign-dominated, export-oriented enclave functioning alongside, but distinct from, a protected, import-substituting domestic economy (Felker, 1998).

Regardless of where they fall on the global/national continuum, all of the Southeast Asian countries have aggressively sought to encourage FDI, although the reasons for doing so and the means employed vary. Each country in the region has liberalised restrictions on investment in general while also implementing specific and aggressive incentives to attract FDI, especially in the form of MNCs. But perhaps even more important to prospective investors, each country has addressed issues of political and macroeconomic stability, infrastructure, industrial relations, and bi- and multi-lateral economic relationships, albeit to different levels. The result has been a tremendous surge in FDI for all of the countries. Remarkably, the overwhelming bulk of that investment in all of the countries of Southeast Asia has been in electronics, which accounts for a
high of 80.2% of finished goods in exports for Indonesia to a low of 64.8% in Thailand (see Table 3).

**Table 3: Electronics and FDI, 1996**

<table>
<thead>
<tr>
<th></th>
<th>Singapore</th>
<th>Indonesia</th>
<th>Malaysia</th>
<th>Thailand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exports of Electronic Products ($ millions)</td>
<td>34 262</td>
<td>1 665</td>
<td>14 768</td>
<td>6 387</td>
</tr>
<tr>
<td>Share of Finished Goods in Exports (per cent)</td>
<td>67.1</td>
<td>80.2</td>
<td>65.3</td>
<td>64.8</td>
</tr>
<tr>
<td>Imports of Parts as a Percentage of Exports of Finished Goods</td>
<td>32.7</td>
<td>26.7</td>
<td>38.5</td>
<td>60.1</td>
</tr>
<tr>
<td>Imports of Parts as a percentage of Total Exports</td>
<td>21.9</td>
<td>21.4</td>
<td>25.2</td>
<td>39.0</td>
</tr>
</tbody>
</table>

Source: (OECD, 1999b)

Ultimately, however, the important variation may not be in how FDI is coaxed into a country or even the quantity or sectors targeted, but the ability of each country to leverage that FDI to meet nationalist developmental objectives. In the remainder of this section I evaluate the policies countries in Southeast Asia use to attract and leverage FDI, starting first with Singapore.

**Singapore**

While independence in 1959 from the British brought political self-determination, it also engendered tremendous economic vulnerability. Although merger with Malaysia in 1963 reduced this vulnerability somewhat by expanding the local market and making import substitution policies practical (Rodan, 1989), the union was short-lived. Making matters worse, shortly after final separation with Malaysia in 1965, the British withdrew its military forces, which had accounted for almost 30% of the domestic economy (Schein, 1996). With unemployment growing and the entrepôt sector unable to absorb the excess labour, the government aggressively turned to FDI to address its economic woes.

Even though the government, led by the People’s Action Party (PAP), had bet heavily on an economic strategy the success of which hinged on political unification with Malaysia, it had also been preparing to “go it alone” should the union fail. In 1961 the government created the Economic Development Board (EDB), modelled after a similar institution in Israel.\(^{15}\) When political union with Malaysia failed, Singapore launched an aggressive campaign to woo foreign investors to set up locally based manufacturing operations.

\(^{15}\) Much of this description of the early history of the EDB comes from Schein (1996) unless otherwise noted.
Initially the Singapore government focused on attracting labour-intensive manufacturing operations to address the country’s astronomical unemployment rates (Ritchie, 2001b). To streamline the investment process, the PAP empowered the EDB as a “one stop investment shop” which greatly reduced the red tape traditionally associated with FDI. Furthermore, the government liberalised virtually every aspect of trade and investment. Foreign firms could have 100% ownership, import foreign workers and materials, and gain equitable access to local capital. At the same time, the EDB would make all the necessary arrangements on behalf of their foreign clients including securing licenses, building real estate, developing human resources, and providing tax and other financial incentives. The results have been astonishing. From $140 million in 1972, FDI has risen to a high of over $7 billion in 1998 (World Bank, 2001).

But Singapore has done more than simply attract large amounts of FDI to offset short-term economic vulnerability. Instead, Singapore took important steps to upgrade its industrial structure. First, concurrent with the early stress on FDI in the late 60s for the sake of employment, the government overhauled the education and training system to meet the demands of international business. As part of this process the government selected English as the medium of instruction, established minimum levels of mandatory education to 12 years, and explicitly tied vocational education, especially at the tertiary level, to specific industrial sectors (Ritchie, 2001b).

Second, the government implemented incentives for MNCs to upgrade their operations. By the mid 1970s Singapore had addressed its unemployment problems by attracting MNCs involved in low-skill, low-wage, and labour-intensive manufacturing. By 1979 the economy was experiencing labour shortages associated with full employment. In response, the government reoriented its focus for attracting FDI from low-skill and labour-intensive industries to high-skill and capital- and knowledge-intensive industries (SDF, 1999). Probably most important, the

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16 Unemployment was not only a short-term economic problem: since labour was the primary political constituency it was also a long-term political priority.
17 A partial list of EDB incentives include financial inducement for the following: first to market (pioneer status); expand current operations; increase initial investment (re-investment); establish headquarters (OHQ); export services; upgrade technologically (post-pioneer conditions); invest venture funds; provide warehouse and container services; provide international consulting services; acquire foreign capital; create research and development capacity; train and educate workers; and participate with public research institutes (Abraham, 1988). For the specific monetary components of these incentives, please see Lim (1991) and (Ritchie, 2001b).
18 Lee Kuan Yew argues that educational reform was the single most important ingredient in Singapore’s subsequent success (see Schein, 1996).
government implemented the Skills Development Fund to encourage firms to participate directly in training.

Finally, the government created incentives for MNCs to mentor local firms into world-class suppliers, especially for technologically intensive industries. As part of this effort in 1986 the EDB implemented the Local Industry Upgrading Program (LIUP). In this program the EDB enters into remunerative contractual relationships with MNCs to allow experienced engineers to be seconded to work with the EDB as an LIUP manager. The LIUP manager works with engineering and technical employees of a local firm to create necessary technology and skills for the local firm to become a supplier to the mentoring MNC. Over time this program has contributed to a robust, technologically competent, local supplier base.

As a result of these steps, Singapore has been able to transition out of low-wage, labour-intensive industry into more capital and knowledge-intensive industries. For example, Singapore has become the regional hub for high technology electronics manufacturing and petrochemicals and has developed a strong base of local producers, suppliers, and manufacturers in these industries (McKendrick, Doner, & Haggard, 2000).¹⁹ FDI also supports a nascent, but growing, bioscience industry (NSTB, 1999). And, in addition, Singapore has become the regional headquarters and operations location for numerous corporations in the electronic, petrochemical, and financial sectors. This evidence argues that early FDI in low-wage, labour-intensive industries need not set a path-dependent precedent for a low-skill equilibrium.²⁰

**Malaysia**

In many ways Singapore and Malaysia share a similar history. But after independence, a fractured ethnic structure made it necessary for government to implement economic policy that simultaneously emphasised economic growth and redistribution. Initially the government did not view FDI as critical to its economic strategy. However, it soon became clear that some FDI was necessary to develop Malaysia’s many natural resource-based industries (Lim & Pang, 1991). Accordingly, in 1958, Malaysia implemented a pioneer ordinance that granted a 2-year tax exemption to any firm setting up manufacturing operations in Malaysia. In 1965 the Federal

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¹⁹ Electronics include, among other things, hard disk drives, multimedia computer add-on cards, computers, tape drives, and semiconductors.

²⁰ See Fingold (1991) for a discussion of low- and high-skill equilibriums.
Development Authority Act was passed which paved the way for the creation of the Malaysian Industrial Development Authority (MIDA) in 1967 (United Nations, 1998).

In spite of these policies, FDI outside of the country’s primary commodity sectors was minimal; what did exist was channelled into import substituting industries. (Sieh & Yew, 1997). Although the Investments Incentives Act of 1968 extended incentives beyond pioneer firms, the bigger economic focus was on creating an economically redistributive New Economic Policy (NEP), which was implemented three years later. The NEP was created to restructure the economy along ethnic lines and had two important consequences. First, like in Singapore, the government overhauled the education system. But instead of orienting education around the economy, it was restructured primarily around political objectives (Ritchie, 2001b). As a result, the education system was only poorly connected to either local or foreign firms. And second, the government took active steps to protect domestic industry from international competition, especially in strategic industries such as autos, textiles, and a host of heavy industries.

The government’s strategy of redistributing economic wealth through import substitution ran aground during the second oil crisis of the late 70s and the worldwide debt crises of the early 80s. In response the Malaysian government shifted its focus from import-substitution to export-oriented FDI, elevated FDI to the front of its developmental strategy, and dramatically liberalised its investment regime. As part of this restructuring the government implemented the new Promotion of Investment Act of 1986 replacing the old investment act of 1968, liberalised exchange controls in 1987, and completely revamped the MIDA in 1988 to function more as a “one-stop” investment shop after the EDB model in Singapore.21 While ethnic redistribution and equality remained important objectives, they were no longer pursued at all costs.

As a result, FDI in Malaysia has grown from RM3.8 billion in 1983 to RM19.9 billion in 1994 (United Nations, 1998:111). But despite this tremendous cumulative increase in FDI, Malaysia has been much less successful than Singapore in upgrading that FDI over time. Although the industrial sectors have changed from primary commodities to high-end

21 Even though the institutional structures may be similar, MIDA’s performance falls short when compared to the EDB. In particular, although the MIDA acts to facilitate the flow of FDI, it does not have the same autonomous decision making power of the EDB. Thus, approvals, licenses, and other incentives must be coordinated with various other ministries including finance, human resources, international trade and industry, and so forth.
electronics, the jobs remain low skilled and labour-intensive for several highly endogenous reasons. First, the education and training system has not developed a pool of highly skilled labour. Second, most MNCs limit their Malaysian operations to lower-end assembly and packaging. Since the level of technology within the MNCs in Malaysia is much lower than it is in Singapore, there is less technology to transfer, fewer items to source from the local economy, and a much lower demand for skills in the local work force (Lall, 1999). In the end, most suppliers are capable of providing only low-tech products such as plastic casings, packaging for silicon chips, solder for joints, spare parts, simple tools, lubricants, and so forth (Sieh & Yew, 1997).

Like Singapore, the government has taken a multidimensional approach to these problems. First, in 1993, the government implemented the Human Resource Development Fund (HRDF) as a grant-levy education and training fund. Second, the government has also implemented a program to develop local industry. Created in 1986, this “vendor development” program functions very much like the LIUP in Singapore. But, rather than provide firm-specific incentives, the Ministry of International Trade and Industry (MITI) provides general tax breaks for MNCs willing to participate in its subcontracting exchange program. However, Malaysia has been much less successful in actually linking foreign MNCs with local suppliers, although this varies by industry and location.

Finally, in spite of liberalisation and the tremendous growth of FDI in general, the underlying tendency to separate FDI from the local economy persists. To exploit FDI for employment, technology, and foreign exchange without exposing local industry to outside competition, the government sought to encourage export-oriented industries to locate in specified

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22 While early FDI was associated with commodity exports, such as rubber, tin, and oil, over 65% of current manufactured exports are high-technology computer and consumer electronic products (WB Development Indicators, 2001).
23 Even here the quality of the solder was reported to be insufficiently high for most uses (Sieh & Yew, 1997).
24 Although this is true generally throughout Malaysia, Penang is again the exception. Here a small but growing agglomeration of technically advanced suppliers has emerged on the island and across the Penang Bridge on the mainland.
25 Salleh notes that as of 1995, only 18 firms had made inquiries into subcontracting through the subcontractor exchange (1995). This may reflect the nature of the protected Malaysian market, but it may also reflect a general resignation of local firms to ever reaching the quality and technological levels required by foreign MNCs.
26 Sieh and Yew (1997) rightly point out that the automobile industry sources 30% of their inputs locally while the electronics industry sources 14% despite the fact that electronics have been there longer. It should be pointed out, however, that the automobile companies are Malaysian while the electronic firms are not. As the automobile industry moves toward liberalization in 2005 under the terms of the regional AFTA agreement, the amount of
export processing zones (EPZs), where to qualify for 100% ownership at least 80% of the finished product must be exported (Salleh, 1995).\textsuperscript{27} Ironically, it is not clear whether the federal government in Kuala Lumpur initially recognised the real value of the EPZs or how FDI might support ethnic politics. In response to the global recession of the early 80s, the federal government relocated the country’s primary port facilities from the Chinese-dominated state of Penang to the town of Klang, just outside of Kuala Lumpur. To survive, the Penang state government petitioned the federal government for EPZ status, which was granted. Penang then created the Penang Development Corporation, which aggressively solicited MNCs to set up manufacturing and assembly operations on the island. In many ways it was Penang’s early success that motivated Kuala Lumpur to establish EPZs in many of the country’s other states.

**Thailand**

By the early 1950s Thailand had begun to earnestly court foreign investment, especially from the US. In 1954 the government created the Board of Investments (BOI) to attract and channel additional capital into the Thai economy, both to address balance of trade problems and kick-start the sagging industrial sector by addressing the investment-savings gap (OECD, 1999a). Unlike the MIDA or EDB, however, the BOI was initially concerned with generating investment in general, local and foreign (Tambunlertchai & Ramstetter, 1991). To the extent that foreign capital was sought, preferences were given to projects with high export potential, those that would locate their operations outside of Bangkok, and those capable of creating a large number of jobs and new technology in key sectors, such as automobiles and electronics (Ritchie, 2001b). To create conditions favourable to foreign multinational corporations, the Sarit government suppressed labour by banning strikes and forcibly dissolving unions, allowed 100% foreign ownership, allowed MNCs to purchase land, exempted MNCs from taxation, and allowed firms to bypass immigration laws to bring foreign technicians into the country (Anderson, 1998).

The intensity with which the BOI pursued these objectives changed, however, in the early 1980s. As with the other Southeast Asian countries, economic strategy in the mid 1980s was locally sourced inputs is likely to plunge (see “Out of the drivers seat. Far Eastern Economic Review, August 17, 2000, p.46.

\textsuperscript{27} In 1971 the government passed the Free Trade Zones Act to create special economic zones to house foreign MNC’s manufacturing operations. Businesses located in these zones are not subject to the import taxes levied on the rest of the local economy. However, these same companies are restricted to exporting the bulk of their product.
concerned with economic recovery from a severe downturn. Whereas the government had viewed FDI somewhat ambivalently in the past, it now looked to FDI as a key policy tool to recapture earlier growth rates. This shift in attitude toward FDI marked a transition point away from import substitution-led growth to a more export-oriented development platform (Akrasanee, 1988). In spite of this shift, however, Thailand’s interest in FDI has remained first on employment and foreign exchange and only secondarily on learning and technological development. This primacy of employment over strategic industrial development persists to this day (Ritchie, 2001b).

Responding to the economic downturn of the mid 80s, Thailand moved aggressively to shore up the local economy. First, the government devalued the Baht twice, once in 1981 and again in 1984. A lower Baht encouraged FDI and exports simultaneously by reducing operating costs, especially wage costs, which made Thai goods more price competitive on the world market. At the same time the BOI reduced requirements on capital mobility and ownership and instituted additional tax incentives—for pioneer status, research and development, and training—to attract export-oriented manufacturing firms. Using ownership as an example, if the project’s target is the local market, only minority ownership is allowed. If more than 80% of the product will be exported, 100% ownership is allowed.

Ramstetter (1997) identifies the rapid rise of FDI during the late 80s and early 90s as a response to both world market conditions and domestic policy. From 1988-1993 the ratio of FDI to GDP increased from an average of 0.6% over the period of 1970-1987 to 2.0%. Total fixed private investment rose from 20-32% and merchandise exports rose from 19 to 28% of GDP. Most of the change was concentrated in the manufacturing and export sectors: FDI in the manufacturing sector rose from 1.0% of GDP in 1970-87 to 3.3% in 1988-93. Merchandise exports as a per cent of GDP rose from 58% to 83% over the same time periods. Growth followed suit as GDP rose from 6.5% average growth to 10.2% in the respective periods. As FDI rose, government began in the late 80s and early 90s to redirect investment away from Bangkok and into the rest of the country. Instead of ethnic divisions driving equality issues as in Malaysia, the concern was centred on the growing split between urban and rural. Nevertheless, while the urban/rural cleavage was important to policy makers, it was aggressively pursued only during times of plentiful foreign investment; as with Malaysia, when funds are scarce the objective takes a back seat.
Unlike Singapore, and even Malaysia to a lesser extent, Thailand did not target particular sectors in its investment strategy. Instead, Thailand liberalised restrictions on investment in general and made investment decisions based not on technology content, potential for spillovers, or compatibility with existing industries but on the potential impact on employment.\textsuperscript{28} Even so, several agglomeration economies have emerged in automobiles along the Eastern Seaboard, hard disk drives and components primarily in Bangkok and the northern city of Chiang Mai, and consumer electronics in Bangkok. Even so, there has been little upgrading in these industries over time and even less development in local firms.\textsuperscript{29} The primary problem, as in Malaysia, is that in spite of the tremendous inflow of FDI during the 80s and 90s, correspondingly little has been done to encourage linkages between foreign MNCs and local firms. Although the BOI created the BOI Unit for Industrial Linkages and Development (BUILD), the program never became more than a matchmaking service. As late as 2000, the BUILD was focused on introducing local firms to MNCs rather than systematically encouraging MNCs to mentor and contribute to the development of local firms. Likewise, the Thai government was never able to restructure education around economic imperatives or create structured incentives that required industry, both foreign and domestic, to participate directly in education and training (Ritchie, 2001b).

**Indonesia**

Like the other countries of the region, Indonesia’s early economic strategy was based on import substitution industrialization and was funded, in large part, by a rich natural resource endowment. However, to exploit this endowment it was necessary for Indonesia to import foreign capital, which it received as both official loans and direct investment (Saad, 1995). To encourage an inflow of foreign investment into primary commodity sectors, Indonesia passed its first foreign investment law in 1967, which provided certain incentives for FDI including granting business licenses and import duty exemptions on capital goods and equipment. The tepid response of foreign capital to these early initiatives, however, reflected the Indonesian government’s initial ambivalence and illiberal stance toward FDI, especially in the manufacturing sector. Since oil exports provided sufficient foreign exchange, foreign investment was seen as at most a supplemental source of development capital (Pangestu, 1997). Thus,

\textsuperscript{28} Personal communication.
instead of export-oriented industrialization, Indonesia’s overall development strategy remained firmly fixed on import substitution and infant industry protection longer than any of the other countries in the region.30

The government’s approach to FDI began to change, however, when oil prices fell in the early 1980s. In response to newfound needs for development capital, the government initiated a complete overhaul of the country’s investment and trade regime (Pangetsu, 1991). Even so, change was slow and early uptake, like in the Philippines, was marginal at best.

Indonesia interpreted this apprehension on the part of MNCs to invest to a weak system of laws. Accordingly, the government passed copyright, trademark, and intellectual property protection laws beginning in 1982 and continuing until 1987. At the same time the government liberalised currency controls allowing for complete capital mobility. In 1985 the government extended export credits, loosened immigration laws, waved import duties, and provided limited foreign access to the Indonesian market (Az, 1988). Also, like Thailand, Indonesia implemented incentives to attract FDI to less populated regions of the country. Although Indonesia has myriad ethnic divisions among a geographically segmented archipelago, the division between urban and rural, and especially between Java and non-Java is even more distinct. To address this problem, the government formally extended investment incentives to draw investment into regions other than Java. Even so, the official priority for more equal distribution of FDI is dependent on availability and quickly diminishes in importance in times of scarcity.

But despite liberalising the investment regime in general, Indonesia was slow to change the all-important restrictions on ownership. As late as 1988, FDI was still only allowed in the form of joint ventures, although if the venture’s capital requirements were in excess of $10 million and if 65% of greater of its production was for export then only 5% Indonesian ownership was required (Az, 1988). Also, infant industries continued to be protected behind a high wall of trade tariffs. In 1993, the government further liberalised the investment regime by making licenses more easily attainable and reducing import tariffs (Saad, 1995).31 But probably most important, in 1994 Indonesia finally allowed 100% ownership and opened new industrial

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30 To illustrate, the effective rate of protection in 1975 was 121% for all importable goods and 224% for consumer goods (Saad, 1995).
31 To illustrate the benefits of these moves, Saad (1995) notes that with the new changes a firm could expect to receive an import license within 17 days instead of the former 42-day process.
sectors to foreign competition, such as power generation and telecommunications, which had hitherto been restricted (Pangestu, 1997).

Certainly further liberalisation, especially with respect to ownership, boosted overall FDI. And yet, growth may have been higher had government policies and bureaucracies been more efficient and reform more timely. Pangestu (1997:219) describes how firms reported “unduly onerous” red tape, long processing delays, extended refund periods, and so forth. Ultimately, early ambivalence and subsequent sluggish reform ensured that Indonesia would remain a secondary site for FDI in the region.

That said, although not as rapid as Malaysia, Singapore, or Thailand, foreign investment in Indonesia has grown substantially: between 1986 and 1994 FDI grew from $300 million to $2 billion and in 1995 approved investment surged to $40 billion (Pangestu, 1997:196). However, only 32% of this investment was targeted for manufacturing, the bulk of which for low-skill, labour-intensive assembly of mostly consumer electronic products (OECD, 1999b). With the bulk of FDI going into non-manufacturing enterprises, the need to link foreign MNCs with local suppliers was initially very small. When U.S. and Japanese consumer and computer electronics firms did arrive, their low-end assembly operations—which supported higher-end design, assembly, and testing operations in Singapore—did not require significant linkages with local suppliers. Nor did the government actively provide incentives for foreign MNCs to upgrade their operations or help develop a base of local suppliers. Weak demand in the small MNC-led manufacturing sector for skilled labour coupled with oil-based economic security lessened priorities for educational reform and performance in the national education and training system suffered. As Tables 7 through 9 show, government policy has long neglected education, making industrial upgrading a difficult proposition. Without strong linkages between the foreign and domestic sectors of the economy, pressures for maintaining “export-oriented protectionism” have remained.33

32 If only the U.S. numbers are considered over 95% of FDI was targeted to non-manufacturing ventures.
33 This term was coined by Nipon Paopongsakorn and Belinda Fuller (1997) “Thailand’s development experience from the economic system perspective: Open politics and industrial activism.” In Toru Yanagihara and Susumu Sombommatu, eds., East Asian development experience: Economic system approach and its applicability. (Tokyo: I.D.E.).
Philippines

Unlike Malaysia and even Thailand, but more like Indonesia, the Philippines was not one of the primary targets for FDI in Southeast Asia. Indeed, for cumulative FDI inflows between 1990 and 1997 the Philippines ranks 40th among all countries and 18th among non-OECD countries (OECD, 1999a).

After the U.S. granted the Philippines independence in 1946, policies promoting import substitution industrialisation allowed for substantial investment into wholly owned foreign subsidiaries in industries such as textiles, pharmaceuticals, consumer electronics, automobile assembly, and food products (OECD, 1999a). During this time, the government, with the help of the U.S., completely overhauled the education and training system to mirror that of the U.S. The evidence suggests that educational performance in the Philippines has been strong, even matching that of Singapore in many respects. However, by the early 1960s and continuing through the mid 80s investment fell off dramatically, even recording net disinvestments in the mid 1970s. Declining FDI could be traced to inward development policies and a saturated local market. But equally stifling was a lack of transparency in the approval processes of the Board of Investment, inappropriate industrial targeting, lack of policy consistency, and setbacks in the reform process (ibid).

Beginning in 1980 FDI began to show small signs of growth improving from $236.4 million in 1980 to $268 million in 1983 (Alcantara, 1988). However, toward the middle of the decade political and economic crisis associated with Marcos’s ouster resulted in a decline of FDI. This declining trend reversed in 1987 due to a combination of previously mentioned international forces and a newfound aggressive government approach to attracting FDI. For example, in 1987 the Aquino government implemented the Omnibus Investments Code, which was designed to liberalise imports, privatise public industries, and provide investment incentives. These incentives included pioneer status, 100% ownership for manufacturing firms that export 70% or more of their product, and various other tax incentives for R&D and training. To promote these incentives the government dusted off and refurbished the Foreign Investments Assistance Centre (FIAC) as an EDB-like “one-stop shop” for FDI. As part of this reform effort, the Board of Investments (BOI) shifted from an earlier mandate of fostering specific, primarily import substituting industries to promoting broad industrial growth by generalising incentives across all sectors (Alburo & Gochoco-Bautista, 1997).
Such liberalisation has prompted a 10.6% surge in FDI between 1990 and 1992, which is up from a 9.7% average growth the decade before (Alburo & Gochoco-Bautista, 1997). While still paling in comparison to the other countries of the region, FDI has clearly become a leading driver of the post-Marcos economy. But despite the fact that many of the reforms implemented by the Philippine government imitated those taken by countries throughout Southeast Asia and that the timing of increasing FDI flows were roughly similar, the overall composition of FDI in the Philippines differs from any of its neighbours. Whereas the electronics sector is by far the largest recipient of FDI in the other countries, by 1995 the transport equipment and machinery sectors garnered almost half of the total FDI inflows into the manufacturing sector. Other prominent industries receiving significant FDI include chemicals, food processing, and petroleum and coal. Even so, the bulk of investment since this period has been in electronics, which now accounts for almost two-thirds of manufactured exports and seems destined to become the leading sector for FDI in the near future (OECD, 1999a).

The vast majority of post-1985 FDI, like Malaysia, has been channelled into EPZs, most of which is located in and around Manila. Although the Philippines does not suffer from ethnic fragmentation, they do have a pronounced disparity between urban and rural, and, as in Indonesia and Thailand, has implemented specific incentives to address the inequality of investment. But these steps are small. For example, tax credits are extended for two years for investment outside of metro Manila (OECD, 1999a). In the end, redistributive concerns make for influential political rhetoric, but rarely exert the same influence on economic policy.

Also like Malaysia, Thailand, and Indonesia, the MNCs locating in the EPZs are primarily engaged in low-skill, labour-intensive assembly. At first glance this appears odd given the high general education levels. But further inspection shows that while general education levels approach those of the developed countries, the actual base of knowledge and skills, for example the number of scientists, engineers, and technicians per million capita, is more akin to developing countries in general. One conclusion is that the Philippines suffer from tremendous brain drain where their best and brightest are leaving to work abroad. Labour-intensive industries demand lower skills. Lower skills reduce demand for higher education and training. Thus, the same low-skill equilibrium exists in the Philippines as in many of the other countries of the region. Aquino and Bolanos (1995) note that basic inputs such as packaging and plastic tubes can be sourced locally, but anything more complicated must be imported. Furthermore, they explain
that there is a dearth of technical education and training to develop skills in electronics and precision engineering. Again, MNCs have little need to link with local suppliers and, even if the demand existed, the skills do not exist in the local economy to make local firms viable suppliers to the MNCs.

**Table 4: FDI in Southeast Asia - Pre 1970**

<table>
<thead>
<tr>
<th></th>
<th>Indonesia</th>
<th>Malaysia</th>
<th>Philippines</th>
<th>Singapore</th>
<th>Thailand</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Selective</td>
<td>Selective</td>
<td>Open</td>
<td>Selective</td>
</tr>
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<td>Yes</td>
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<td>Yes</td>
</tr>
<tr>
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<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
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<td>No</td>
</tr>
<tr>
<td>Incentives</td>
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<td>No</td>
<td>No</td>
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</tr>
<tr>
<td>Export vs. Import Sectors Attracted</td>
<td>Export primary commodities</td>
<td>Export primary commodities</td>
<td>Export primary commodities</td>
<td>Export textiles, simple electronics, advanced electronic assembly</td>
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<td>Small</td>
<td>Small</td>
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</tbody>
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**Table 5: FDI in Southeast Asia - 1970-1985**

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<td>Selective</td>
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</tr>
<tr>
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<tr>
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<td>No</td>
</tr>
<tr>
<td>Incentives</td>
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<td>No</td>
<td>No</td>
<td>No</td>
</tr>
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<td>Export vs. Import Sectors Attracted</td>
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<td>Both primary commodities, automobiles</td>
<td>Export chemicals, advanced electronic assembly</td>
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<td>Relative Size of FDI</td>
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</table>

**Table 6: FDI in Southeast Asia – 1985-2000**

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<tbody>
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<td>Open</td>
<td>Open</td>
</tr>
<tr>
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<td>Yes</td>
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</tr>
<tr>
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<td>Export Automobiles, simple to moderate electronic assembly</td>
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<td>Export Chemicals, advanced electronics</td>
<td>Both Textiles, chemicals, automobiles, simple electronics assembly</td>
</tr>
<tr>
<td>Relative Size of FDI</td>
<td>Small</td>
<td>Moderate to Large</td>
<td>Small</td>
<td>Large</td>
<td>Small</td>
</tr>
</tbody>
</table>

In summary, although all of the countries of Southeast Asia have successfully utilised FDI to promote economic growth, only Singapore has been able to leverage MNCs and foreign technology to assist in upgrading its local industry. From this I draw two conclusions. First, basic skills are sufficient to attract FDI. But to upgrade industrially requires increasing skills, as the case of Singapore demonstrates. Even so, skills by themselves are an insufficient cause of industrial upgrading as shown by the case of the Philippines, although it may be in this latter case that the skills developed in the general education system did not match the needs of industry. Herein lies the real challenge: developing industrially related skills and providing sufficient incentives for firms, especially foreign MNCs, to both help create as well as use them. In the next section I look specifically at the influence MNCs have had on the creation of knowledge and skills in these countries as well as the greater social impact skill demand has had on income inequality.

4. FDI and Intellectual Capital Formation

There is a growing literature that explores the relationship between FDI and technical and scientific knowledge and skills. And yet, this literature is overwhelmingly concentrated on the impact intellectual capital has on FDI rather than the other way around. For example, Xu (2000) shows that in order to successfully transfer, absorb, and disseminate technology from MNCs, a minimum threshold of human capital levels must be achieved in advance of the multinational
ever setting up operations. Likewise, Noorbakhsh, et. al. (2001) find that levels of human capital, defined as accumulated years of secondary and tertiary education, are a significant determinant of FDI inflows (see also Wang, 1990). Moreover, human capital’s importance to FDI has increased over time. Perhaps even more critical for this paper, Florida (1997) argues that the globalisation of innovation is driven by technical factors, especially access to scientific and technical human capital. This suggests that the locus of technological development and firm-level innovation is found in a firm’s in-house R&D staff. The concomitant assumption is that in-house R&D departments depend on a preexisting pool of intellectual capital.

Such a view argues that in countries like Korea and Taiwan, which encouraged significant FDI only after developing a highly educated work force, the economic outlook is optimistic. But what about the countries of Southeast Asia in which there was a tremendous upswing in FDI before the formation of a significant pool of intellectual capital? In this scenario the important question becomes what influence do MNCs have on creating intellectual capital? That MNCs perform significant training is well documented (see ILO, 1981; Lindsey, 1986; Ritchie, 2001b). Also, the amount of training performed by MNCs appears to be much greater than training offered by local firms (Gerschenberg, 1987). For example, Abdullah (1994) argues that MNCs in Malaysia have been much more proactive toward human capital and technological development than have local firms. But even where MNCs train, the question of spillover remains: do skills and knowledge created within MNCs transfer to local firms?

Much of the economic literature bearing on this question adopts an explicit neoclassical position, and can be summed up in the following quote: “it is difficult to prevent knowledge from being transferred to the local employees of the firm who work with and observe the technical and managerial techniques of the firm…. After some initial learning period, the workers become capable of opening a rival firm, or of transferring their knowledge to new firms in related industries. This becomes a positive externality effect for the local economy arising from the presence of the multinational” (Markusen, 1991, p. 19). To the extent that the intellectual capital transferred from the MNC becomes part of the host country’s human capital, the MNC has permanently changed the factor endowment in that country (ibid: 16). Since these workers ultimately become a threat to their own firm, the firm has an incentive to limit the nature and scope of the technology it transfers to its subsidiary operation and an even greater incentive not to train its workers.
“Black boxing” this spillover process (see Fosfuri, Motta, & Ronde, 2001), however, is to ignore three important causal considerations. First, Becker (1964) shows that firms are most likely to engage in firm- and industry-specific training due to collective dilemmas of “free-riding”. Thus, while it may be true that MNCs provide extensive training, it is largely oriented toward creating firm-specific product and process skills and knowledge that are difficult if not impossible to use outside the firm. The Singapore hard disk drive industry provides a relevant example. Singapore workers are known in this industry for having the skills to quickly ramp up and tear down production processes associated with hard disk drives. While these skills are useful for other MNCs conducting large-scale manufacturing of high-tech products, it has limited applicability to the local Singaporean supplier firms in need of precision engineering and more general manufacturing process skills.

Second, and related to the first caveat, most MNC operations in foreign countries are only part of an overall production process. As a cog in a network of production activities, the technologies to reproduce an entire production chain do not exist in any one country. It would be impossible, for example, for an engineer highly trained in the production technologies for data storage products in Singapore to use her skills to start a competing hard disk drive company. Finally, simply transferring codified embodiments of technology is not sufficient to ensure formation of the tacit knowledge necessary to appropriately apply the new technology. As Scott eloquently explains, (1998), the knowledge and skills that make up technology can be divided into two component parts. The first, and most obvious, is techne, or the “specification of how knowledge is to be codified, expressed, and verified, once it has been discovered” (p. 320). Codified, or explicit, knowledge can be found in equipment, schema, processes, and other similar things that are organised from logical, verifiable, steps. “The systematic and impersonal rules of techne facilitate the production of knowledge that can be readily assembled, comprehensively documented, and formally taught, but they cannot by themselves add to that knowledge or

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34 Although I highlight these three considerations, there are certainly other issues that impact technological spillovers including levels of entrepreneurial talent, market size, access to markets, general business and management skills, and so forth.

35 Some might object that the engineer could use her skills to develop a competing production facility. But since the new venture duplicates the capacity of the former employer, it is farfetched to think that the former employer would ever use the new firm except when the market demanded excess capacity. Even here, if the needed extra capacity was deemed to be permanent, the firm would likely simply expand their own production. On the other hand, for the new firm to attract outsourcing contracts for other firms competitive with the former employer, it would have to substantially retool and create new production processes for other firms since no two storage products would be the same.
explain how it came into being” (Scott, 1998:320). The second, and much less obvious and measurable, is *metis*, or the tacit and implicit knowledge gained from experience and application. It is this second type that is more difficult to transfer and absorb. Drawing on empirical evidence from the FDI-driven economies of Southeast Asia supports a more complex understanding of MNCs and human capital formation. After almost two decades of manufacturing-intensive and export-oriented FDI four conclusions seem warranted.

First, unlike Northeast Asia, pre-existing stocks of technical and scientific intellectual capital, with the exception of Singapore (which I shall address below), are low. MNCs in Southeast Asia have addressed this shortage of trained human capital by providing extensive training for their employees. Pangestu reports that electronics firms in Indonesia feel that unskilled labour is available and highly trainable, unlike China. Even so, it is virtually impossible to meet the needs of more high-tech ventures for engineers, scientists, and technicians. Firms report hiring expatriates and then resorting to local training to fill the gap. A lack of high-level technical skills, however, conspires to keep MNC technology at a middling level, which simultaneously prescribes and proscribes the level of training Indonesian employees will receive (1997:219).

Similar conditions apply in the Philippines, Thailand, and Malaysia. In the Philippines, MNCs conduct in-house training as well as send higher-end workers overseas to the parent facilities for training and education. At the same time, many firms bring in expatriate technical advisors to assist with operations and management through Filipino middle managers (Aquino & Bolanos, 1995). Salleh reports that MNCs in Malaysia provide training, both in-house and through locally supplied training, such as at the Penang Skills Development Centre (PSDC). He further asserts, for example, “The semi-conductor industry has made possible the extensive accumulation of skills and know-how in assembly and test operations” (p151). And yet, with the exception of Singapore, whereas MNCs spend considerable resources conducting internal training, there is little effort to link that training with external public or private training initiatives. Thus, few training linkages exist between the host country’s education and training system and the education and training programs conducted by the MNC (Ritchie, 2001a).

Second, extensive MNC training has led to an increase in certain kinds of knowledge and skills within the local economy, but it’s unclear how rapidly these skills are disseminating to the local economy or whether the skills are appropriate to develop endogenous technological
capacity. Saad (1995) argues that although MNCs in Indonesia have effectively transferred technology through imported equipment and machinery as well as an inflow of managerial and production expertise, the question remains as to how effectively these skills and knowledge have been transferred to their Indonesian partners and employees. Since most technological transfer takes place through on-the-job training, the rate of transfer is slow.

Evidence in Malaysia and Thailand is that both countries have acquired significant operational and process skills and technology (Ariffin & Bell, 1999; Lall, 1999; Pupphavesa & Pussarungsri, 1995; Salleh, 1995). This “cumulated capability is evidenced by the reverse technology transfer of the production process expertise from several American-based firms to their parent or sister companies elsewhere” (Salleh, 1995:151). Likewise, Pupphavesa and Pussarungsri (1995) report that in their Thai study all local supplier firms gained a basic knowledge of product, quality control, and process technology from the foreign MNCs.

Third, however, is that these gains may be more illusory than real. That is, in spite of industrial transformation and growing process oriented knowledge and skills within the workforce, there are yet to emerge generalisable technical and scientific knowledge and skills embedded within local firms. Lall (1999), for example, argues that in Malaysia technical and scientific skills have remained embedded within the MNCs and are not spilling over into the local economy. Even when skills do spill over they are confined to low-level manufacturing process skills (Pupphavesa & Pussarungsri, 1995).36 Perhaps more problematic, Salleh (1995) argues that Malaysia has not acquired concomitant skills in product design and development.37 Instead, technological development is limited to a narrow range of processes and production technology, especially in packaging and testing. Beyond these very basic products and services, few local firms outside of Penang38 meet the quality requirements of the MNCs to become regular suppliers. The trend has been away from local sourcing and toward attracting existing supplier networks to relocate to the local economy. In the end MNCs account for needed inputs and final outputs and the local firms do not participate in the production network at all or in very technologically insignificant ways.

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36 The number of Thai firms in their study to achieve a mid-level understanding of MNC technologies was much more limited, and no firms achieved a high-level of proficiency.
37 This argument also accurately describes Thailand, the Philippines, Indonesia, and until recently, even Singapore.
38 In many ways Penang is the exception that proves the rule. Unlike the rest of Malaysia Penang is a small island with few natural resources, a majority Chinese population, and a Chinese-dominated local government. I have
To illustrate, only one MNC firm in Salleh’s study (p.150) actually has a formal R&D department and those that indicated they performed R&D limit their focus to process engineering. The bulk of technology is supplied by the parent company making only local adaptation of both process and product necessary. The fact that most R&D is done outside of Malaysia lessens the need for local technological capacity. But, in a vicious cycle, since Malaysia has poor stocks of intellectual capital there is little capacity to increase R&D activities even if the demand were present.

The same problem exists in virtually all of the Southeast Asian countries. Arnold, et. al., (2000) point out that the R&D currently performed by Thai businesses lags 10-15 years behind where Korea was during the 1980s when Korea was at a similar level of manufacturing and industrial development. To “catch up” to where Korea was in 1980, Thailand would have to increase business-level R&D by 20 times. In Indonesia Saad argues that the chief problem has been low absorption capacity due to low education levels and an absence of significant R&D activities, both public and private, within the local economy. Maintaining an import substitution growth strategy that prefers capital- and technology-intensive industries to labour- and knowledge-intensive industries exacerbates the wide gap between foreign technology and local capabilities (1995:212). Thus, for example, the Indonesian electronics industry continues to import a high proportion of its output, both for finished goods and intermediate inputs. In 1992 foreign consumer electronics firms reported importing 87% of inputs and domestic firms 80%. Higher technology MNCs assembling electronic components imported 94% of inputs. The average MNC imported 66% of its inputs from within intra-firm channels (Pangestu, 1997:215).

Since the MNCs source their inputs from abroad and then export virtually 100% of their products, there is very little room for skill and knowledge transfer through forward or backward linkages. Only in Singapore and to a lesser extent Penang is there evidence of backward linkages, especially in printed circuit board manufacture and precision engineering services. But even here there are virtually no forward linkages, and entrepreneurial activity beyond the input sectors noted above is rare. Finally, low levels of technology and process-specific training in MNCs means that there are few spillovers through human capital flows between the foreign-led export sector and the domestic import substitution sector.

argued elsewhere that Penang’s unique combination of factor endowments provides economic incentives similar to those found in Singapore (Ritchie, 2001).
The final conclusion is a summary conclusion of my paper: FDI can supply the explicit knowledge, but tacit knowledge must be developed endogenously before foreign technology can be successfully transferred and absorbed in the local economy. Perhaps the most damning evidence behind this assertion is that after decades of producing silicon chips and hard disk drives, the most technically advanced country of the region, Singapore, which has a level of intellectual capital every bit as high as Korea and Taiwan, has yet to develop a single, 100% Singaporean-owned hard disk drive or chip manufacturing company.39

A significant problem is that the discreet, process oriented, and company-specific technologies found in the MNCs in this region are not sufficient foundations upon which to build local entrepreneurial firms. While it is true that the average Southeast Asian worker is more knowledgeable now than in the past, these skills are at best only transferable to other MNCs, and then only in the specific and narrow area of production in which the acquired skills and knowledge apply. Thus it is both difficult and unlikely that technology will transfer easily from the foreign to the local sector and by itself lead to new locally based entrepreneurial competition. Clearly, as the case of Singapore would suggest, something beyond the market is necessary to facilitate the formation of locally based technological capacity. Further examination of the Singapore case suggests that building indigenous technological capacity within a technoglobalist framework requires increased institutional capacity. In particular, the state must be an active participant in development processes, not as the dirigiste executive envisioned by traditional developmental state scholars, but rather as a facilitator of cooperative and linkage-based processes that connect together the public with the private and the foreign with the local.40

To illustrate, Seagate, the world’s largest disk drive storage company, initially set up operations in Singapore to assemble finished hard drives.41 Over the years the company’s operations expanded to include subassembly, test, and failure analysis (McKendrick et al., 2000). The company also expanded within the region, primarily to take advantage of lower wage rates in countries proximate to Singapore, notably Malaysia and Thailand. Over time a division of labour emerged among these three countries. Operations in Malaysia and Thailand assembled components to be used in assembling final drives in Singapore and Malaysia. The most

39 Singapore does sport several chip manufacturing companies that are joint ventures with Taiwanese and Japanese firms. But even here Singapore interests do not exceed 50%.
41 Unless otherwise noted, I draw the bulk of this discussion from prior work of mine (See Ritchie, 2001).
technically sophisticated drives, those used in file servers, were assembled in Singapore. Less sophisticated drives were manufactured in Malaysia.

Although the division of labour fit well with the current skills found within the labour pool of each country, there was concern in Singapore that eventually Malaysia and Thailand would develop the mid-level skills found in Singapore, and there would be nothing to keep Seagate from entirely relocating its operations out of Singapore. In response to this threat, the EDB began negotiations with Seagate to remain in Singapore. As it turned out, Seagate’s initial pioneer investment incentives were set to expire. But instead of offering Seagate an extension on the original incentives, or even sweetening the initial deal, Singapore struck a whole new package, a significant portion of which was aimed at developing research and development capacity in Singapore. In particular, the EDB offered to help fund the development of a fledgling R&D facility that Seagate had set up almost 10 years earlier, but that had as yet not developed the capacity to become one of Seagate’s main development facilities. By taking a direct funding role while also tying other investment incentives to the success of the R&D project, Singapore put considerable positive pressure on Seagate to make the venture a success. By 1997 Seagate’s Singapore development group had designed a product with a combined lowest cost highest performance in the market and which went on to become Seagate’s best selling drive at the time.42

Since then, the Singapore development group has become one of Seagate’s four main development sites. In contrast, it is the firm’s operations in Malaysia and Thailand that have been declining. Seagate has recently closed plants in both countries while opening up additional facilities in China. What has become clear is that Seagate’s investment strategy in Asia is driven by the need for high-end technical capacity in Singapore and low-end costs in China. Malaysia and Thailand have been unable to follow Singapore’s lead in connecting MNCs to local technological development and equally unable to compete with China in terms of wage labour rates. The result is that the high-tech sector in both countries is being squeezed on both ends. If both countries remain mired in technological mediocrity, the hard disk drive industry and others like it will relocate to other countries.

This is not to say, however, that globalisation is widening skill and wage inequalities. Clearly Singapore has been able to create high-level intellectual capital and raise wages in a

42 Author interview, Seagate, 2000.
globalist development environment. At the same time, both Malaysia and Thailand have also experienced growing wage levels (although whereas wage increases in Singapore are being driven by rising skills, the same is not true in Malaysia and Thailand). Despite wage increases, however, FDI does not appear to be worsening levels of inequality. As Figure 1 shows, with the exception of Thailand all of the countries of Southeast Asia experienced *declining* trends for inequality during the late 80s and early 90s when FDI increased most rapidly. However, there are so many potential explanations for this as to make any strong conclusions impossible. For example, rising skills in Singapore may not lead to inequality since the country is so small, education and training equally available to all, and most of the inhabitants work in an urban environment. In contrast, it may be that in the other Southeast Asian countries the demand for increasing skills by MNCs is minimal. Therefore, although wage rates have certainly climbed, the gap between wages in the MNCs and local firms is not wide enough to exacerbate current levels of inequality driven by ethnic and urban/rural cleavages.

Finally, the market appears, by itself, insufficient to transfer technical and scientific skills from the MNCs to local firms. I have shown elsewhere that a capable state must take the policy initiative to implement incentives leading to developmental linkages among key economic actors (Ritchie, 2001a). Perhaps least ambiguous of all is that this process of state involvement is as complicated as it is difficult to replicate. To duplicate the Seagate success with many other firms and industries in Singapore has required dense cooperative linkages both within the Singapore state and between the state and key economic actors, including business, labour, and academia. The way these linkages are fostered within one specific training initiative is instructive. To then compare these processes in Singapore with similar efforts in Malaysia and Thailand provides a structure within which to evaluate the effectiveness of state intervention in FDI-led developmental processes. It is to this task that I turn in the next section.
5. Government Education and Training Policy

Although all of the countries of Southeast Asia have made education and training a high priority in the wake of the recent financial crisis and subsequent global economic slowdown, the reality is that only Singapore has successfully developed a strong base of scientific and technical intellectual capital (see table 7).

Table 7: Science and Technology Indicators for Asia

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Indonesia</td>
<td>45</td>
<td>51.5</td>
</tr>
<tr>
<td>Japan</td>
<td>17</td>
<td>103.4</td>
</tr>
<tr>
<td>Korea</td>
<td>28</td>
<td>100.9</td>
</tr>
<tr>
<td>Malaysia</td>
<td>25</td>
<td>58.7</td>
</tr>
<tr>
<td>Philippines</td>
<td>39</td>
<td>77.5</td>
</tr>
<tr>
<td>Singapore</td>
<td>2</td>
<td>73.4</td>
</tr>
<tr>
<td>Taiwan</td>
<td>22</td>
<td>*</td>
</tr>
<tr>
<td>Thailand</td>
<td>33</td>
<td>54.1</td>
</tr>
</tbody>
</table>
At one level this is to be expected given that Singapore’s secondary and tertiary enrolments are higher than most other countries in the region. Even so, the Philippines has similar enrolments in both areas and Thailand has done reasonably well in tertiary enrolment suggesting that there is more to Singapore’s success that simply getting the public education system right (see tables 8 and 9).

Table 8: Secondary Education Enrolment for Developing Countries

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<tbody>
<tr>
<td>Brazil</td>
<td>26.3</td>
<td>33.5</td>
<td>35.4</td>
<td>38.4</td>
<td></td>
</tr>
<tr>
<td>Chile</td>
<td>47.4</td>
<td>52.5</td>
<td>66.9</td>
<td>73.5</td>
<td>69.5</td>
</tr>
<tr>
<td>China</td>
<td>46.2</td>
<td>45.9</td>
<td>39.7</td>
<td>48.7</td>
<td>65.8</td>
</tr>
<tr>
<td>Indonesia</td>
<td>20.0</td>
<td>29.0</td>
<td>41.3</td>
<td>44.0</td>
<td>51.5</td>
</tr>
<tr>
<td>Japan</td>
<td>91.8</td>
<td>93.2</td>
<td>95.4</td>
<td>97.1</td>
<td>103.4</td>
</tr>
<tr>
<td>Korea</td>
<td>56.3</td>
<td>78.1</td>
<td>91.6</td>
<td>89.8</td>
<td>100.9</td>
</tr>
<tr>
<td>Mexico</td>
<td>35.5</td>
<td>48.6</td>
<td>56.5</td>
<td>53.3</td>
<td>61.2</td>
</tr>
<tr>
<td>Malaysia</td>
<td>45.7</td>
<td>47.7</td>
<td>52.9</td>
<td>56.3</td>
<td>58.7</td>
</tr>
</tbody>
</table>

* This figure includes a substantial number of students pursuing degrees in medicine.
Table 9: Tertiary Education Enrolments for Developing Countries

<table>
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<tbody>
<tr>
<td>Brazil</td>
<td>10.1</td>
<td>11.1</td>
<td>11.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chile</td>
<td>14.8</td>
<td>12.3</td>
<td>15.6</td>
<td>28.2</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>0.6</td>
<td>1.7</td>
<td>2.9</td>
<td>3</td>
<td>5.3</td>
</tr>
<tr>
<td>Indonesia</td>
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<td>3.8</td>
<td>9.2</td>
<td>11.3</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>26.3</td>
<td>30.5</td>
<td>27.8</td>
<td>29.6</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>8.8</td>
<td>14.7</td>
<td>34</td>
<td>38.6</td>
<td>52</td>
</tr>
<tr>
<td>Mexico</td>
<td>10.2</td>
<td>14.3</td>
<td>15.9</td>
<td>14.5</td>
<td>15.3</td>
</tr>
<tr>
<td>Malaysia</td>
<td>4.1</td>
<td>5.9</td>
<td>7.3</td>
<td>11.7</td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>16.4</td>
<td>24.4</td>
<td>24.9</td>
<td>28.2</td>
<td>29</td>
</tr>
<tr>
<td>Singapore</td>
<td>8.4</td>
<td>7.8</td>
<td>13.6</td>
<td>18.6</td>
<td>33.7</td>
</tr>
<tr>
<td>Thailand</td>
<td>3.3</td>
<td>14.7</td>
<td>19</td>
<td>20.1</td>
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</tr>
</tbody>
</table>


As I alluded to in the prior section, one of the most important differences between Singapore and the rest of the countries of Southeast Asia has been the ability of the Singapore government to provide incentives for MNCs to participate in the creation of human capital in the general labour force. In contrast, the other Southeast Asian countries are content to let MNCs create human capital, to the extent they do, only for their firm-specific needs.

As with policies to attract FDI in general, the policies of each of the countries of Southeast Asia to leverage FDI to create human capital are, prima facie, similar. Each country has implemented tax subsidies for training and research and development expenses. Likewise, various programs exist to subsidise firms for sending their local employees to the firm’s home operations for training; programs also exist to bring experts from abroad into the country to
provide on-site training.\textsuperscript{44} Finally, most of the countries have, or are planning, to implement a skills development grant levy fund where firms are required to contribute to training fund from which participating firms can draw money to be used for training.

Despite the similarities among these policies, however, the implementation and outcomes vary widely, especially with the most important of these, the skills development funds. In Singapore the government created the Skills Development Fund in 1979 in response to stagnating wages and minimal amounts of training being conducted by MNCs. Initially the driving force behind the SDF was the Ministry of Trade and Industry (MTI) and the EDB. Subsequently, however, the SDF was positioned under the Productivity and Standards Board (PSB), another statutory board under the MTI. From the beginning, however, the SDF was created to incorporate a wide cross-section of interests in its operation.

For example, although the SDF is the primary responsibility of the PSB, the PSB does not implement the program alone. First, there is significant involvement from many different components of the government. The EDB provides critical information derived from firms on their required skill needs; the Ministry of Manpower (MoM) undertakes initiatives to develop corporate training centres built with resources from the SDF; the Ministry of Education (MoE) provides training facilities; and the National Trade Union Congress (NTUC) provides information and organises labour’s participation in education and training. Even within the PSB various departments participate: with help from the Ministry of Finance one department disburses the training funds while another department, more closely tied to the EDB, decides where the funds should be spent. Thus, the group making the funding decisions is not the same group dispersing the funds and vice versa.

Private actors play an even more important role as the directors of the program. The technical committee, the group responsible for the day-to-day functioning of the fund is comprised of a majority of private business leaders. Even the chair of the committee is from a private firm. These people are not incorporated simply for the government to extract viewpoints before technocrats formulate and implement policies in isolation from the private sector. Instead the private-sector actors are expected to take the lead in developing and implementing the policies. These dense interconnecting networks of participants creates a mechanism of checks and balances that makes it difficult to use the Fund inappropriately.

\textsuperscript{44} Unless otherwise noted, the information in this section comes from Ritchie (2001b).
The real key in integrating private firms, most of them MNCs, into the country’s education and training system may be the involvement of labour in initiatives like the SDF. After the fund had been in operation for a few years, the government realised that the firms were concentrating their training efforts on management and high-end employees. The NTUC went to the government and requested that a new fund be established to meet the needs of lower to mid-level employees. In response, the government requested that organised labour develop a program that would work within the existing framework. Accordingly, the NTUC created the Skills Redevelopment Program. To work, the new program enlisted funds from the SDF to pay for training, cooperation from the Ministry of Education to provide training facilities in the country’s Institutes for Technical Education, assistance from the Ministry of Manpower for funds to reimburse businesses for time employees were off the job being trained, and participation from private firms to deal with temporary employees and understaffed shifts while employees were being trained. In the end, broad, crosscutting cooperation led to a tremendous surge in low to mid-level training and the program was a resounding success.

Like Singapore, Malaysia also has a skills development fund. Created in 1993, the Human Resource Development Fund (HRDF) began collecting a 1% levy on the wages of labour in firms greater than RM 50 million. But whereas the Singapore SDF has realised participation rates of 100% of firms larger than 10 employees, participation in the Malaysian fund is much less. One visible difference in the two efforts is the amount and kind of participation by actors outside the government. Unlike Singapore, the HRDF engages private business leaders in a consultative rather than participative role. Private actors are poled for their opinions and insight, but the actual formulation and implementation of the policies are done without their direct involvement. Also, the range of input is much narrower and does not include, to the same degree, input from foreign MNCs. And while the MNCs participate in the Fund as required by law, the spillovers between MNCs and local firms is much less than in Singapore.

Unlike Singapore and Malaysia, the other countries of the region have yet to implement a true skills development fund. Thailand implemented what it called a Skills Development Fund, but without mandatory involvement of private firms, the fund soon devolved into a rotating student loan organization. Unfortunately, Thailand has been unable to overcome the vested interests of a relatively strong private sector (see Felker, 1998) that is opposed to forced levy-grant training schemes. Without the involvement of MNCs in the country’s education and
training system, there has been little connection between them. For example, after spending $153 million to upgrade technical education programs in the Ministry of Labour and Social Welfare’s training institutes, the largest technology company in the country, Seagate, reported that not one of its employees had been through the training in the two years since its inception.45

Even organizations that were ostensibly created to facilitate cooperation between foreign MNCs and the local Thai economy have not fared well. For example, the Thai-Japan Technology Promotion Association was created to facilitate technology transfer from Japan MNCs to local Thai firms through technical education and training. In fact, however, the agency’s chief function has been to provide Japanese language training for Thai managers working in Japanese firms and Thai language training for Japanese executives working with Thai employees.

6. Conclusion

Although complex and often unwieldy, the foregoing discussion seems to warrant several very tentative conclusions. First, the international political economy has changed over the last 30 years. Increasing pressures for trade and investment liberalisation have made mercantilist development strategies increasingly difficult to implement successfully. As countries seek to integrate their economies more tightly into the global economy, FDI commands an ever more important developmental role. But while country-specific financial incentives certainly matter, in this environment policies aimed at political and macroeconomic stability, a relatively well-educated (but not necessarily highly skilled) inexpensive work force, and capital friendly ownership laws may do as much to stimulate inbound FDI as anything.

Nevertheless, it should be clear from the foregoing discussion that the minimalist, neoclassical assumption that the mere existence of FDI will eventually result in the transfer of technical and scientific skills into the local economy is not empirically supported. In fact, if not for Singapore, one might conclude that it is impossible for developing countries to leverage MNCs to create national technological capacity in local firms.

Third, MNCs locate in developing countries to take advantage of assets that already exist in the local economy. Thus, a pool of skilled human capital certainly encourages in-bound FDI, but, since MNCs might only be looking for low wages, it is not necessary. At the same time,

45 See “Laboring under a misapprehension”  Bangkok Post, June 17, 1998.
increasing skills are necessary but not sufficient to cause industrial upgrading. For example, while MNCs do conduct training of their own, few skills seem to transfer to local firms without heavy state intervention. The result is that many countries get stuck in a “low-skill” equilibrium or trap. In this case, neither supply nor demand is sufficient to “break out”.

One is tempted to conclude, then, that FDI will be most beneficial if it comes after a developing country has created a sufficient pool of local human capital. If true, a developmental model akin to that implemented by Japan, Taiwan, or Korea would be more appropriate for the countries of Southeast Asia. That is, first develop a strong base of technological capacity in local firms through extensive licensing, cooperative development between the state and private actors, widespread education and training at all levels, and publicly-funded research and development all under an umbrella of local market and capital protection. And yet, for the reasons outlined above, these more mercantilist development options are becoming increasingly difficult, if not impossible, to implement.

But to upgrade technologically within a “technoglobalist” development paradigm requires an increase in the technological content of MNC operations and a simultaneous increase in industry relevant intellectual capital. To foster both together requires increasing institutional sophistication, especially on the part of the state. Rather than simply retreat to the sidelines to function as the game’s referee, the state must strategically coordinate the interaction between key economic actors in such a way as to stimulate deep and crosscutting developmental linkages to facilitate information flow, increase vested interests through participation (as opposed to simply consultation), improve crosschecked monitoring and implementation all while maintaining appropriate autonomy from distributional interests. This role is dramatically different from the theoretical role of the developmental state or neoclassical state. Rather than lead investment and ameliorate risk, the state must now encourage, facilitate, and coordinate the formation of intangible assets. Whereas the state can often amass the capital and reduce risk sufficiently to build dams, roads, and other physical infrastructure, creating the skills and knowledge that underlie scientific and technical capacity is a different proposition altogether.

**Proposed Research Framework and Research Methodology**

Perhaps the best way to understand how Singapore has been able to integrate FDI and MNCs into their developmental strategy is to trace, over time, the key policy decisions that led to
the strong intra-public and public-private linkages so crucial to skills development and technological transfer. Likewise, showing where the other countries of Southeast Asia neglected these decisions or made other choices will help clarify when and where specific actionable policy matters. Important to these processes will be each country’s institutional system of innovation, especially as it relates to the formation of broad public-private linkages. Once specified, it is possible to compare these historical processes cross-nationally, which will provide a degree of control upon which further causal conclusions can be drawn.

I would propose that the analysis begin with Singapore and Southeast Asia. Of all the developing regions in the world, Singapore has been the most successful in attracting FDI. But equally important to a comparative study, the variation among the countries of the region is significant, thereby providing some leverage on the questions we seek to answer. Second, the region boasts the only country that has fully integrated FDI into its development strategy and successfully leveraged the technology within the MNCs to reach national development objectives. Thus, in addition to variation on the independent variable, the region also exhibits variation on the outcomes. Finally, limiting initial analysis to a single region helps hold constant other alternative explanations.

In the end, however, comparing processes and institutional systems across a limited number of cases in the same region will result in tenuous conclusions at best. Two options exist to help generalise any conclusions drawn from the initial studies. First, once causal patterns have been established for Southeast Asia, conclusions could be tested with further case studies such as Mexico, Brazil, Chile, and/or other countries in Latin America, the Middle East, and Africa. Alternatively, large N statistical analysis might be conducted using worldwide data from the OECD, World Bank, IMF, or other national and international sources. Obviously, conducting such tests depends on the ability to specify measurable variables and gather high-quality data for a sufficient number of cases. On the other hand, expanding the number of case studies is relatively both expensive and time consuming. Ideally, since both efforts provide different types of evidence, we would do both.
References


