

## 7 ARE JAPANESE MULTINATIONALS DIFFERENT?

### TECHNOLOGY TRANSFER IN THE ASIAN REGION

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#### A ROSE BY ANOTHER NAME

The origins of industrial might can start with a simple act of theft. The technology which built the textile industry in the New England states of America arrived surreptitiously by way of a few opportunistic English craftsmen. Lessons learned by examining the development literature are that while it is often difficult to decide what to produce, it is equally difficult to figure out how to produce it.<sup>1</sup> Part of the problem may lie with the institutions needed to facilitate essential transfers. These may provide inadequate incentives to import, make use of, and sufficiently improve key technologies.<sup>2</sup>

For development to occur, technology must move from the haves to the have-nots. As Chew and Chan (1992, p. 111) notes, “[a]lleviating mass poverty and deprivation necessitates closing the existing technological gaps.” How this should occur is far from obvious. Theft has been a long, if not always honourable tradition, a means adopted early on and retaining increasing popularity. Historically, the fight to protect intellectual property has largely pitted developed economies against the more numerous swarms of developing ones. China has begun only recently to crack down on counterfeit software, CDs and DVDs as moves to protect its own burgeoning intellectual property sector. Not too many years past, factories owned by the People’s Liberation Army churned out large numbers of CDs in a lucrative attempt to expand its revenue base.

Where outright theft proved too slow and generally too inadequate, governments periodically have intervened to facilitate requisite levels

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<sup>1</sup> Hausmann and Roderick (2002) has pointed out the haphazard process by which a country discovers its comparative advantage. Why for instance should Bangladesh export hats while Pakistan churns out bed-sheets for overseas markets?

<sup>2</sup> Lall and Pietrobelli (2002) usefully apply this starting point in making sense of the consistently poor performance demonstrated by most African manufacturers.

and types of technology transfers. To modernize rapidly a still feudal economy, the Meiji era government initiated essential flows of western technology. This represented a policy expansion rather than a clear departure from strategies pursued by the Tokugawa shogunate during the last days of the *bakumatsu*. Our interest lies in neither of these two options but in those transfers that have come about voluntarily through private initiative, whether by individual or corporate impetus. These largely flow directly from attempts to grasp business opportunities provided by overseas markets, whether in the realm of production or sales.

The rising tide of trade, and the increasing activity of multinational corporations makes us increasingly aware that the role they play in transferring technology is still a widely disputed area in both economic and business literature. The problem lies in the variety and combination of chosen approaches. Clear differences are obvious. The difficulty lies in accounting for the alternatives pursued and evaluating their economic impact. Country-specific constraints must influence the different choices made by these corporations, but not necessarily in the same way. In some cases these reflect governmental policy, or are specific to either the geography or capabilities of the host country. With all of these influences remaining distinctly external to multinational decision making, differences in adaptation must flow from the characteristics of a specific company. In the 1980s, firms such as Mitsubishi ran into problems by mechanically transferring structured labour systems to the US while ignoring legal and conventionally accepted treatment of women workers. Ethnic affirmative action policies necessarily restrict the personnel policies that multinationals resident in Malaysia choose. These limitations are common to all overseas investors, but we would not necessarily expect to see the same responses, given a foreign investment sector rich in diversity.

Our interest then lies more in distinguishing the decisions that individual multinationals make, while abstracting away from specific host country characteristics and other similar circumstances that face them all. That multinationals must necessarily transfer some level of technology is close to definitional. In practical terms, overseas markets require installing some type of corporate subsidiaries. An attempt to exploit promising opportunities means a decision concerning the nature of such technologies and the methods by which they are to be transferred. What then are the best ways for multinationals to achieve their goal? We can easily observe differences in the manner in which multinationals attempt technology transfer. Some choose to employ local labour at even senior levels, indoctrinating trainees via an educational spell at

corporate headquarters. Others may rely largely on key expatriate personnel, a technological transfer in the form of human capital. Machinery is frequently the physical counterpart to these transfers. In a parallel fashion, multinationals can choose between importing all essential material inputs, or outsourcing a large proportion locally. Uniquely, the Japanese multinationals sometimes opt to transfer not only essential capital equipment, but also an array of familiar domestic suppliers in a more vertical version of the ubiquitous 'convoy system'. Observed differences however, cannot determine a priori the significance of any of these alternatives.

Multinationals clearly can be distinguished based on their distinct objectives, organizational structure and inherent capabilities. If these differences play only a relatively minor role in determining the form that essential transfers take, we might expect differences in technological outcomes to derive more from external sources. Our brief investigation evaluates the why and the how of whether such potential differences in technology transfers do exist. In other words, given the same set of environmental constraints, do multinationals make recognizably different decisions regarding such transfers? This is only of any passing interest if we can establish a significant relation between deviations in these strategies and variations in economic impact. This could begin to suggest to a host country which multinational approach to encourage. It similarly would provide a useful insight for corporate planners. If instead, outcomes tend to be unrelated to corporate characteristics, it might be wiser to adopt a radically different approach to analysing technology transfer.

To understand what increases the chances for successful transfer, it is first necessary to trace out the relationship between different approaches and different outcomes. One area that may be crucial and capable of explaining these variations lies with the differences between the transferring sectors. Hotel chains and car manufacturers may have starkly different capabilities and objectives when expanding into a new market. A more precise analysis should hold fixed, not only countries, but relevant sectors as well. If we look at multinational car corporations operating in the same country, do we discover that there are no important differences? If there are, how are they to be explained? Our intent is to look at some preliminary evidence to see if there is any justification for continued investigation. To make such differences stand out even more, we compare Japanese multinationals operating in the same country and sector with those of Western multinationals. Here we follow a rich literature<sup>3</sup> that

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<sup>3</sup> Aoki (1990), Dore (1986), Abegglen and Stalk (1985) and other authors too numerous to list have all insisted upon this point.

claims Japanese firms, and thus multinationals, are clearly distinguishable from any of their Western counterparts. They are said to have different objectives, structures and capabilities, exactly the decision-based differences that we are trying to explore. Failure to find any supporting evidence will throw doubt either on whether such differences really exist, or whether these differences have much of an impact on outcomes.

We will conduct only the most initial of investigations, an attempt more to set an agenda than to offer a definitive judgement. In this paper we are specifically interested in determining whether the distinction between Japanese and western multinationals is worth pursuing. Constrained by limited information, we realize that while we can set the direction for future research, we will inevitably fail to provide anything of further value without jumping to unwarranted conclusions.

#### THE RATIONALE BEHIND COMPARING JAPANESE AND WESTERN MULTINATIONALS

Once the West gave serious recognition to Japan's rapid postwar economic recovery, a type of academic gold rush developed to explain how it could have occurred and what lessons were to be learned. One assertive stream of this analysis insisted that Japan had devised a new formula for ensuring economic growth. Ironically, these same supposed differences subsequently became the basis for analysing Japan's catatonic economic performance of the last ten years. Just as anything Japan did differently was fingered as contributing to Japan's success, so those very same differences are held responsible for any perceived economic failures.

The main areas of focus have been:<sup>4</sup>

- government intervention
- industrial organization
- management
- labour
- finance

This line of thought has been extended to include Japanese multinationals and the way in which they transfer technology overseas. Making this leap is in some ways irresistible. One starts by emphasising vital differences

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<sup>4</sup> These distinguishing characteristics may hold to a lesser extent in more recent times. However, what limited evidence we have usually concerns overseas investment initiated over the past two decades. During this period, most Japanese firms had not yet seriously entertained any ideas of radical restructuring.

between Japanese firms and Western firms. These are important because they lead to different corporate capabilities and objectives. The decisions that flow from these differences should vary significantly. If we accept that these characteristics have sufficient impact, then we would not be surprised to discover that such distinguishing traits manifest themselves in terms of technology transfer.

The three obvious areas of immediate interest when discussing technology transfer must lie with labour relations, management and industrial structure. If any defining characteristic does make a difference, any or all of these three are most likely to have a clear impact in the way in which a Japanese firm chooses to transfer technology overseas in regard to both human and physical capital. We focus on the defining characteristics of large corporate enterprises. These normally comprise the bulk of all Japanese firms investing directly overseas.

Foreign firms venturing abroad all have some responsibility for selecting the type of training and ongoing instruction suitable for local employees. Even shifting that decision to a local contractor represents a choice. As emphasized throughout much of the literature<sup>5</sup>, Japanese labour relations emphasize low risk flowing from secure jobs. The assumption that employees will enjoy a lengthy job tenure determines the nature of training conducted. In contrast, Anglo/US corporations assume a sizeable turnover in staff. Any investment in human capital automatically will have a shorter payback period. Longer payback periods encourage more implicit training methods based on personal, rather than bureaucratic relations. Crucial information flows are horizontal and informal (Aoki 1990) rather than vertical and mandated.

Management in these firms mirrors dominant labour practices. Responsibility and thus risk is more diffused than is evident in a typical Anglo/US corporation.<sup>6</sup> Looser accountability, to outside, independent shareholders allows a more long-term focus. Patient investment should

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<sup>5</sup> To provide one simple example: Kazuo Koike (1984, 1994) has suggested that Japanese firms are run primarily for the sake of their employees rather than their shareholders. Employment is thus assumed to be secure (the loosely defined 'lifetime' employment assurance). With this the case, training will not only be firm-specific but largely implicit. Informal transfer from senior to junior employees will be the rule. Formal manuals are irrelevant as secure jobs promote the transfer of corporate knowledge from one generation to the next.

<sup>6</sup> Many European firms (German for instance) fall somewhere between the two extremes of the US and Japan. These European alternatives are temporarily ignored in order to draw clearer distinctions.

prevail over those yielding more rapid, short-term gains (Dore 1986). Consensus decision making (*nemawashi*) rather than individual initiatives are the norm (Aoki 1990). Such an approach assumes a fairly homogenous pool from which management is drawn.<sup>7</sup> The need to bring everyone on board, combined with measured rewards and advancement, inevitably retards decision making. This creates a management system more attuned to gradual improvement than to radical restructuring.

The organisational structure of the Japanese firm has long been linked with the *keiretsu*, the post war recreation of the *zaibatsu* that defined and dominated Japanese industry. Born out of the necessity of conserving capital while reducing risk, the *keiretsu* serves the multiple purposes of quasi-integration (needed to facilitate inter-firm coordination), corporate governance, as well as the security of management tenure required to achieve long term objectives (Gilson and Roe Mark 1991, p. 876). The mutual obligation borne by each *keiretsu* member harks back to Japan's Samurai heritage. It involves a high level of trust and dependency amongst the respective *keiretsu* members. This is especially true with vertical arrangements, where contractual relationships are largely closed to outsiders.<sup>8</sup>

#### THE JAPANESE APPROACH TO FOREIGN DIRECT INVESTMENT

Explanations should never be shy of stating the obvious. Japan, as a country, does not make foreign investments any more than it competes against foreign countries. This falls rather to specific Japanese multinationals. An understanding of their corporate behaviour may ultimately shed light on the way in which technology transfers occur. Since the 1970s, when Japan shifted from developing to developed status, direct foreign investment has shown a steady trend upward, driven by limited domestic opportunities and the need to seize openings abroad.<sup>9</sup> The great boost came during the post Plaza agreement bubble period. With the JPY

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<sup>7</sup> 'If a nail sticks up, hammer it down' is a thought less likely to be accepted (at least explicitly) in European or North American countries.

<sup>8</sup> We speak of postwar norms rather than any current changes in corporate structure.

<sup>9</sup> It is true that in the last few years, as the reality of the Japanese economic picture hit home, foreign direct investment has markedly declined. In 1997, as the Asian crisis hit, such investment stood at 6.6 trillion JPY. By 2001 the total had shrunk to 4.0 trillion JPY.

appreciating 46 per cent between 1985 and 1987, Foreign Direct Investment (FDI) consequently came close to tripling between 1986 and 1989. Yet another surge came during the mid 1990s as financial institutions sought to clean up their balance sheets by pouring money into the booming Asian economies.

As previously pointed out, multinational investment inevitably involves at least a minimal amount of technology transfer. A complete absence would be equivalent to a form of passive investment in existing local production. Much of any previous analysis has focused on the seemingly easier challenge of determining the degree to which technology transfers have taken place. But in some sense the methods by which multinational corporations accomplish their goals must influence transfer decisions. It doesn't stretch the imagination to conceive some determinant link between the way in which a firm may choose to accomplish a transfer and both the level and quantity of that transfer itself.

The tools available for technology transfer present a range of options to the multinational corporation. Technology can be passed to the recipient in physical form. Capital equipment is its most obvious physical manifestation, but printed information is equally important. Blueprints allow machines to be built, and technical manuals explain the methods of operating machines, as opposed to their design alone. Complementing this process is the training of local personnel who will operate the plant on site. This often involves a transfer of expatriate personnel to a foreign subsidiary, both to interpret printed material for those being trained, and to operate the plant whilst that training occurs. Reverse flows of personnel, of local labour back to the home country for intensive in-house training, is a less common variant. Reliance on local labour may be extended to such a degree that some or many R&D tasks may be delegated to the relevant subsidiary. This is more likely to be the case when R&D is largely adaptive, aiming to acclimatize a firm's technologies to local conditions. The multinational may choose (or be compelled by governmental requirements) to transfer technology. Corporate marriages or alliances of this type require the overseas investor to surrender some of its discrete existence. A deliberate decision to work in conjunction via a local joint venture, or to subcontract part or all of the manufacturing process to local partners dominates corporate strategy. Taking this path necessitates developing local skills outside the immediate confines of the foreign multinational. Otherwise, passive investments would serve as an adequate substitute.

We can summarize the methods of technology transfer in the following ways:

Table 7.1: Modes of Technology Transfer

|                                     |   |
|-------------------------------------|---|
| <b>Type 1 – Physical Transfer</b>   | Embedded in capital equipment                     |
|                                     | Explained in blueprints and manuals               |
| <b>Type 2 – Human Capital</b>       | Expatriates in host/set-up phase                  |
|                                     | Expatriates in host/long-term residency           |
|                                     | Local labour/training in higher skills            |
|                                     | Local labour/temporary repatriation to home plant |
| <b>Type 3 – Inter-firm Transfer</b> | Subcontracting to local firms                     |
|                                     | Transfer to joint venture partners                |
| <b>Type 4 – Group Replication</b>   | Subcontracting to expatriate firms                |
| <b>Type 5 – In-house Production</b> | Full vertical integration in the subsidiary       |

This tabulation is definitional and is not intended to imply that all these methods are mutually exclusive. Very often they are mutually interdependent. Clearly the physical transfer of machinery will normally require training local labour to make it viable. But a multinational corporation does possess choices in emphasizing a particular type of transfer while involving complementary types only to a lesser degree. Subcontracting to local firms as opposed to replication of the home *keiretsu* network can involve either a mix of the two or a complete reliance on either alternative. The standardization of information within a manual or an instruction book represents a distinct alternative to a training period in the corporate home base.

Given the range of possibilities open to any multinational, our aim then is to see if the characteristics of a corporation itself significantly influence the type of transfer made and the way in which that transfer is accomplished. Since as we have seen, there is a long tradition claiming discernible and important differences between Western and Japanese corporations, we first examine the behaviour of Japanese corporations before subsequently comparing them with relevant Western competitors.

It is true that most foreign investment flows from one developed economy to another (see Figures 7.1a, 7.1b). Japan in this regard is little different. This is quite natural since most investment of this type seeks to seize opportunities provided by a particular domestic market. Demand in a developed market is simply going to be greater, even if competitors are inevitably more numerous as well. In contrast, direct investment in a developing country is more likely to exploit a characteristic country



resource.<sup>10</sup> This may be something equivalent to mineral wealth or simply cheap labour. In the latter case, foreign direct investment may serve more as an export base than the basis for satisfying domestic demand. These more closely resemble the foreign ex territorial concessions ceded by China circa 1900. Such direct investments are based in, rather than operate as part of, the host country.

Figure 7.1a: (*The Economist*, 19 September 2002)

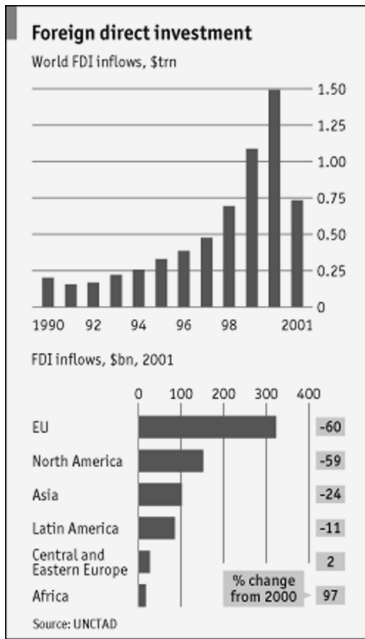
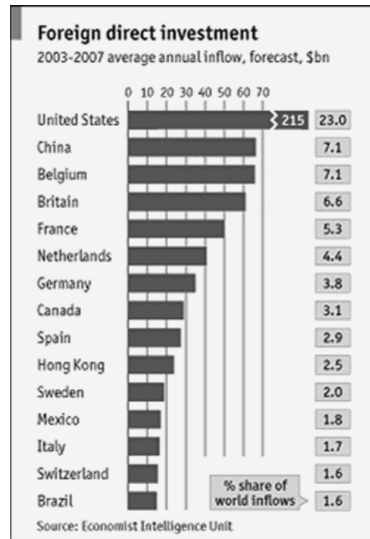


Figure 7.1b: (*The Economist*, 12 April 2003, p. 89)



We focus entirely on developing economies. These provide a reasonable opportunity to judge, in a preliminary fashion, whether multinationals of different countries do approach technology transfer in a characteristic manner. Transfers in these cases often can be presented with greater

<sup>10</sup> China provides a mix of both motivations. While direct foreign investment initially aimed at export (guided by cheap labour as well as government restrictions), the growing wealth of the Chinese market, as well as the numbers involved, has made the domestic market of increasing importance whether or not such strategy has yet to prove profitable. For more than a century western traders and manufacturers have looked on China and thought, "If I can just sell one bar of soap to half of the Chinese population".

contrast, given the technological differences between the respective economies. Developing countries also play host to a variety of potentially distinguishable multinational firms, all of which invest in a given set of viable markets. This could represent car companies, all of which invest in China to serve the domestic market and to provide an export base to overseas markets. Any discernible variance in technology transfer would provide a clearer background for our investigation.

Sampling along national lines provides a fruitful investigative path, given our objectives and methodologies. Japanese firms have invested in a number of developing countries. Asia in particular serves as an opportune target, given the size of the investment in that region in comparison to other emerging markets (see Figure 7.2). With so many Asian countries acting as investment recipients, focusing on Indonesia, Thailand and Malaysia is useful (see Table 7.2), not only because they represent major sites of Japanese foreign direct investment, but because these countries have represented magnets for foreign flows from western sources as well (see Figure 7.3).<sup>11</sup> These three countries all possess a sufficient number of different characteristics to make our examination more robust. This permits us to explore whether there are material differences in Japanese approaches regardless of national constraints. In this way we can indicate that such differences are not country specific.

*Table 7.2: Japanese FDI Destinations (Percentage Breakdown of Total)*

| Period  | Indonesia | Malaysia | Thailand | Singapore | China |
|---------|-----------|----------|----------|-----------|-------|
| 1953-73 | 36        | 9        | 7        | 8         | 0     |
| 1982-85 | 26        | 7        | 5        | 18        | 4     |
| 1986-90 | 11        | 8        | 12       | 16        | 9     |
| 1991-92 | 23        | 13       | 12       | 11        | 14    |

Source: Ministry of Finance.

For the same reasons, we limit our attention to two market sectors. Three countries and two sectors clearly provide only an impression of Japanese overseas investment rather than anything approaching a complete picture. To progress any further requires a much more intensive examination of a number of additional sectors and at least a few other countries. Our limited data reflects our objective in devising an agenda for research, rather than presenting a conclusive study. At most we will be able to design a testable hypothesis, which carries with it a high degree of plausibility. Doing so may

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<sup>11</sup> This attraction has noticeably lessened following the Asian meltdown of 1997. Indonesia in particular has felt this impact.

Figure 7.2: (*The Economist*, 2 May 2002)

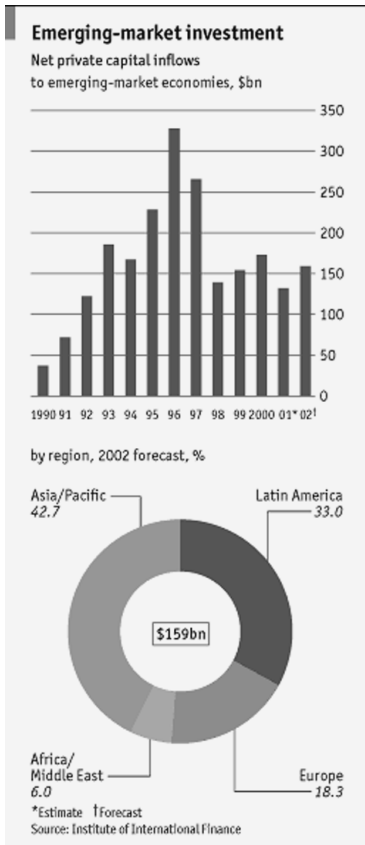
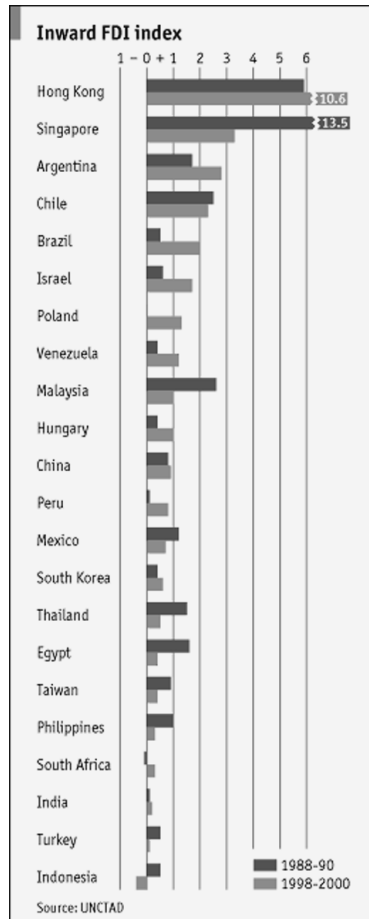


Figure 7.3: (*The Economist*, 20 September, 2001)



The United Nations Conference on Trade and Development's inward FDI index measures foreign direct investment relative to a country's share of global GDP, employment and exports. Index numbers with values greater than one, show countries that are especially appealing to foreign investors.

alleviate some of the unnecessary muddle that has been clinging to fundamental questions surrounding Japanese foreign investment.

The two sectors we do explore represent leading Japanese exports. For that reason they must necessarily consist of advanced technologies allowing Japan to compete internationally. As regards our first country Thailand, the greater part of the evidence is drawn from the so-called 'new wave' of Japanese investment after the beginnings of *endaka* in 1986. This coincided with a loosening of the Thai Board of Investment restrictions on foreign ownership. Japanese companies specifically used Thailand as a springboard for third-country exports. Consumer electronic and electrical goods (a broadly defined sector ranging from electric fans to batteries, but with television appliances playing a large part) represent a pre-existing, that is pre-*endaka*, sector but one which experienced substantial new investments in the post-*endaka* era.<sup>12</sup>

Like semi-conductors, electronics would seem superficially to promise a complex degree of technology transfer. Uninformed observers assume an industry characterized by high technology content. This represents a common misperception of the underlying dynamic of direct foreign investment. When transplanted to developing countries, manufacturing is frequently limited to pure assembly procedures, with a technology content not much higher than that of any other electronics industries. The degree of technology involved can be roughly gauged from the workforce utilized. Corporate employers may rely heavily on an unskilled or semiskilled, often female, workforce.<sup>13</sup>

#### THAI ELECTRONICS INDUSTRY

The Thai electronics industry provides a reasonable model for Japanese foreign direct investment. We choose to discuss this countrywide sector first and at much greater length because it provides a general model for subsequent examples. This industry has moved in the post-*endaka* period

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<sup>12</sup> Aggregation problems will inevitably be present; in particular, degree of localization when sourcing inputs will be a significant indicator of technology transfer. It varies widely within this broadly defined sector, ranging from over 90 per cent for refrigerators to barely 35 per cent for televisions.

<sup>13</sup> Developed countries often situate similar fabricating plants to less prosperous regions of their home country. The technology transfer methods are often quite similar to those employed in foreign lands. 'Some years ago an engineer at a plant in South Portland said, "Our company came to Maine, quite frankly because we knew there was a large force of women with nimble fingers and soft brains. Such a person is perfect for the assembly line work in a semi-conductor plant"' (Bolte 1980, p. 12).

towards electronic components rather than consumer electronics. In turn the emphasis has shifted towards exports, rather than the domestic market. While in the course of the expansion, wholly-owned Japanese ventures declined (a trend already evident by 1988, when they comprised only 30 per cent of the total), majority owned projects rose to 45 per cent by the early 1990s. Despite the existence of joint ventures (often only alliances between Japanese firms and their Japanese Singapore-based subsidiaries), expanding investment has left these investments largely under Japanese control.

The nature of technology transfer has also changed in the wake of the appreciation of the JPY. Prior to 1986, Japanese transplants could be content with assembly of products from components imported from the home economy. One result of *endaka* was to shift even the more sophisticated and less labour-intensive stages of production to overseas subsidiaries. As could be expected, during this period, the flow of substantial technology transfers increased. It therefore provides a vignette of Japanese technology transfer habits and procedures.

The picture that emerges is one in which Japanese principles of management; including labour relations and preferred production processes appear to impact systematically on types of technology transfer. This occurs during the early stages of foreign direct investment. Subsequently, it appears that the familiar systems are modified or even abandoned in the face of economic and other conditions facing the subsidiary. Even the norm of employing a high proportion of Japanese expatriate engineers to conduct plant installation, ongoing maintenance, and the training of local staff evolves. The high cost of supporting overseas Japanese staff causes a distinctive shift to local staff (trained initially in Japan) (Takeuchi 1991). Only a small number of expatriates remain, strictly limited to senior management.

A simple manifestation of these practices is the tendency to take the complex of subcontractor networks surrounding the core firm in Japan, and replicate them in the host economy. This leads to a closed production system with limited demand for inputs from local firms. Japanese firms operate in the previously described exterritorial manner. This is still a method of technology transfer, despite drastically limiting the extent of that transfer within the host economy (our interest here is on the how not the how much). The multinational certainly transfers technology to its overseas subsidiary, even if it constrains the amount of technological diffusion permitted beyond the walls of the firm itself. The Japanese firm faces the problem of establishing a viable system in a new environment. It solves that problem by, at least initially, replicating the familiar quasi-vertically integrated production system existing in its home base. A network of satellite contractors surrounds the subsidiary in the host economy, exactly imitating the characteristically domestic structure.

We suggest that the investment of these subsidiaries in local human capital may provide a more reliable indicator of how subsequent technology transfer will progress. The establishment of production facilities in a technologically less developed host will inevitably lead to a reliance on imported capital equipment, and at least initially, an inability to secure local firms with the capacity to supply inputs. Technology transfer by interacting with local firms will be a longer-term process. However, the potential for transfer arises almost immediately as regards local labour.

Emphasising on-the-job training and *kaizen* processes partially explains a part of the diminished role for printed materials such as technical manuals, and the corresponding extended role for expatriate technical personnel. The Japanese expect to impart technical knowledge by shop floor experience rather than by printed manuals. Initial work practices and techniques are enhanced by experience, a process in which expert expatriates continue to participate and assist.

A reluctance on the part of Japanese multinationals to depend upon locally accessible training manuals may reflect Japanese habits of frequent model changes, dictated both by Japanese flexible production principles and by the limited size of the Thai market. Japanese investment is also most prevalent in more rapidly changing sectors of the economy.

Alternative explanations interpret the lack of printed materials and corresponding reliance on Japanese technicians as indicating a Japanese reluctance to engage in technology transfer unless unavoidable. A common accusation insists that Japanese foreign direct investment has been geared to prevent, rather than assist, technology transfer. This is arguably unsurprising. Any rational optimising firm will seek to prevent technology diffusion where its implications can include a profit-reducing osmosis of key technologies to potential competitors. But this analysis seems more motivated by general paranoia (sometimes justified) of Japanese motives than any convincing evidence. Such an explanation fails to account for the presence of similar structures in the home base of these same multinationals. Establishing overseas facilities inevitably involves transferring some production technologies. The methods chosen by Japanese overseas firms replicate, to some extent, the training methods used at home. Factory floors of both Japanese and overseas branches disdain the use of manuals. The observed norm is training devices such as quality circles. We can only conclude that the subsidiary is set up initially to mirror many of the same technology implantation techniques used at home. The absence of printed materials is a manifestation of corporate methods, rather than a technique for keeping local labour in the dark. Distinctly Japanese labour relations prevail in the subsidiaries, such as reduced distinctions between management and blue collar workforces

(common eating areas and the like). To some degree at least the Japanese firm appears to apply the same methods of technical training that it uses in Japan to the task of technology transfer to its overseas subsidiaries. Supportive evidence can be found in the practice of transferring local labour back to Japan for purposes of immersion in the home production environment. This reinforces transfer of distinctive production techniques.

The Japanese view technological development in a somewhat idiosyncratic manner. Technological progress is dynamic and incremental. The implication flowing from this stance is that progress can only be pursued successfully by all members of an organization. It is not a job reserved solely for specialized labour like engineers. Japanese workers on the shop floor are deeply involved in the activity of technological improvement (Kimbara 1991, pp. 163–64). Translated overseas, the implicit nature of training dominates with little recourse to static manuals or texts.

The common use of this training strategy does not necessarily imply a superiority in Japanese methods of technology transferral, vis-à-vis those of Western multinationals, either from the point of view of the host economy or that of the profit maximizing firm. A firm's capacity and skill base largely affects its decisions. Such strategies do not necessarily lead to success given the altered social and economic circumstances of a host economy. Subsequent modification of home country practices indicates the necessity, if not always the enthusiastic willingness, to modify past practices to meet new circumstances.

The most powerful indication of this is a tendency amongst subsidiaries to move to substantial in-house production of inputs, to supplement and sometimes even replace the already noted utilization of Japanese subcontractors. This reflects the high cost of maintaining this transplanted *keiretsu* structure and the pressure to meet local content requirements (Shiowattana 1991, p. 190). Japanese multinationals seem to prefer in-house production, seeming to despair of local contractors ever meeting their quality requirements.<sup>14</sup> This degree of vertical integration is a significant departure from standard domestic practices of relying on quasi-vertical integrated networks of suppliers (*keiretsu geisha*).

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<sup>14</sup> The degree to which these Japanese firms opt to use local contractors should also be judged on a relative basis. Compared with either similar Japanese investment in the US or Europe, more use is made of local suppliers in the Asian market. Urata (1993, p. 287) suggests that this is due to the longer history of such Asian investment. This would lead us to expect that over time not only imported *keiretsu* arrangement would be abandoned, but vertical integration would be also somewhat reversed.

Japanese firms fall back on familiar domestic patterns to transfer technology. This is a default model rather than an unquestioned imperative. Given sufficient experience in a host country, such patterns may be modified or even abandoned. An initial phase of substantial reliance on past proven methods may evolve into practices quite at odds with those evident in the Japanese core firm.

#### MALAYSIAN ELECTRONICS INDUSTRY

A typical Japanese subsidiary is a majority or entirely owned operation often directed to the domestic market. As an assembly plant the level of technology transfer remains limited. Again there is a heavy use of immersion training of Malaysian employees in home factories. This seems to reinforce the basic labour relations, which typify most Japanese firms. As noted by Thong (1991, p. 141), if we consider such typical Japanese labour practices as enterprise unions, lifetime employment, promotion routines, lay-off practices, *ringi seido*, grievance handling or quality circles, only training practices are typically found to dominate these Japanese subsidiaries. If ever introduced, the other known characteristics of Japanese labour relations have either withered away or lingered in only a few scattered firms. Clearly training is the major vehicle for transferring and developing core levels of human capital. Given this essential role, Japanese firms will be most reluctant to surrender proven strategies. Only the strongest country-specific counterweights can undercut the logic of continuing with the status quo. Any clear evolution away from this pattern would become evident only after a number of years.

... such human relations have loosened little by little in the course of recent rapid economic development, and we today find the old-style personal relationships only in exceptionally progressive branch factories in the countryside of Japan or in successful joint ventures in developing countries (Yasuda 1991, p. 284).

We find that expatriate management characterizes these firms. English rather than Japanese would be the usual second language amongst potential Malaysian hires. Difficult communications within a highly centralized multinational structure would add needless impediments in carrying out top-down decrees. The expatriates themselves are usually Japanese moving up the ordained promotion hierarchy before being brought back to headquarters in Japan. "Japanese companies have to send more expatriates to work as interpreters between the headquarters and local management." (Kawabe 1991, pp. 264–65), meaning that they need to be skilled in the political dynamics behind each centrally decreed decision,



itself often the product of the *nemawashi* process at headquarters. The contrast with Western multinationals is clear. Senior managers there represent a virtual United Nations of possibilities. This glass ceiling in Japanese multinationals can clearly cause problems over time. Local managers may grow to resent what they see as an arbitrary limitation set on their careers. This in turn can discourage the more promising of the locals from choosing Japanese rather than Western multinationals.

Japanese-style business management is often not well accepted by white-collar workers in the offices because of the seniority system, the vague decision-making process, and unclear job descriptions. Contrasted with production management, which easily shows the results numerically, the performance of business management is not clearly visible, and it is influenced by such cultural factors as the values and attitudes of the society (Sato 1991, pp. 285–86).

However, we should expect some variance within the set of Japanese firms as well. Matsushita, more than most, stresses a distinct work ethic and management ethos (Thong 1991, pp. 143–44). It is difficult to see how this can be articulated in any sort of measurable technology transfer. Value-based strategies are not so easily transferable. Perhaps that explains the limited lasting power in attempting to transplant Japanese labour relations. Unlike Japan, training does not yield corporate loyalty. The sunk costs involved are much less likely to be recouped. This pattern will be especially strong if stated goals clash with specific country characteristics. Malaysian demand for sufficient family time dominates any more workaholic tendencies no matter what the stated work aims. The Malaysian tradition of early female retirement (age 45) clearly is at odds with standard Japanese promotion ladders (Thong 1991, pp. 144–45).

#### INDONESIAN MOTOR VEHICLE INDUSTRY

Lindblad and Suryo (2002) look at a number of Japanese firms in Indonesia including joint ventures involving motor cycles, car components, and motor cycle components. What is apparent here, as it is in most Japanese multinationals, is that senior management is inevitably expatriate Japanese. In many cases they may be the only expatriates employed. The motor cycle component firm includes only 5 expatriate senior managers out of a total workforce of 927<sup>15</sup> (Lindblad and Suryo 2002, p. 27).

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<sup>15</sup> In a similar fashion, the motor cycle company records 12 expatriates of the 6500 workers (Lindblad and Suryo 2002, p. 22) while the car component firm had only 5 out of a total of 300 workers (Lindblad and Suryo 2002, p. 24).

Though these firms are more labour intensive and evolve away from strict Japanese structures, the insistence on Japanese executives continues to dominate any significant drift away from head office principles. For the most part such managing directors are loyal lieutenants, unlikely to depart in unforeseen ways from head office initiatives. Local management would face a language barrier in most cases with the largely monolingual headquarters. In a highly centralized hierarchy this would needlessly add to the underlying transaction costs of requisite information flows (Chew et al. 1992, p. 119). Extending this argument, it is quite conceivable that the typical Japanese multinational wants on site management amenable to frequent and easy contact with the head office. Local, indigenous managers motivated by their own agendas and initiatives would not easily mesh in such a structure.

Lastly, all three firms widely employ the immersion strategy of sending local staff to Japan for periods of two to six months for intensive training with experienced Japanese workers. There has been an ongoing debate as to the motivation for such a widespread and extensive practice (In the motorcycle firm, 10 per cent of the existing staff had such stays in Japan). There can be two feasible reasons behind such programs. One is in line with an attempt to reinforce basic Japanese practices in foreign outposts. Local workers receive shock indoctrination at established factories in Japan and form the nucleus, together with an inevitable expatriate management, in spreading Japanese work practices and guarding against unwarranted drift. The alternative interpretation would view this as a mere stated premise rather than an actual motivation. The truth would lie in Japan's need for additional workers at bargain wages. During the bubble years, when labour supply became critical, such temporarily transported workers could solve corporate problems by ignoring immigration restrictions. However, the continued use of this strategy, despite falling labour demand in Japan, argues against this reasoning. No doubt corporate decisions have been motivated by both reasons in the past. What has changed over the years has largely been the relative strength of each cause.

All three Indonesian examples import their work practices directly from Japan. However there has been an inevitable drift away from a pure implementation strategy, driven largely by the underlying demands and constraints of the local market. If such departures were not common, there would be less of a need to continue the employment of expatriate top management and to insist on rotating local workers back to Japan for further training. We can tentatively conclude that the multinational's parent headquarters feels a need to control the pace of any such devolution away from the Japanese norm.

## COMPARISON WITH WESTERN MULTINATIONALS

Western multinationals, despite some differences, do tend to start, at least, with distinct strategies in their ventures away from national home bases. Training is more a matter of explicit hierarchies, rules and printed manuals. Less is left to personal dynamics reflecting a Western preference to spell things out. Turnover while not welcome is somewhat expected. Local managers will often be allowed more leeway in making strategic decisions. (Japanese managers overseas have been kept traditionally on a rather short leash.) Given that satellite suppliers never featured in their organizational structure, Western multinationals are more likely to contract out to low cost qualified firms whether domestic or foreign.

### THAI ELECTRONICS INDUSTRY

As we have remarked, the electronics industry is one where technology changes rapidly (though this may not extend to more mature products such as radios). The continuing update of technical manuals would become an expensive and somewhat futile task, with changes too rapid to incorporate. The limited scale of production in Thailand further exacerbates this problem. Small market size and low production runs enforce a policy of rapid switching between models in order to utilize spare capacity. The need to cover a multiplicity of models frustrates intentions to standardize procedures set down in a technical manual. This could be a plausible explanation of observed training procedures favoured by Japanese transplants. Plausible, but not convincing since the identical set of circumstances confronts Western firms operating in the same sector and market. Both the nature of the product, and the size of the market, do not seem to deter Western firms from both a greater substantial reliance on the printed word for training purposes, and on local technicians once the initial stage of training by imported experts has passed. As with the Japanese firms this reflects a distinctly different starting point.

### SINGAPORE ELECTRONICS INDUSTRY

We have not lost our geographical compass or proceeded unaware of late-breaking news regarding the political realities of the region. Singapore and Malaysia are far from identical. Though containing a sizeable ethnic Chinese population, political control remains with the Malays. The result of what could be a volatile ethnic mix has yielded more economic controls

in Malaysia than in neighbouring Singapore. Multinationals operating in Malaysia rather than Singapore should face more constrained choices. Perhaps this is one reason that Sony and Matsushita have chosen Singapore as the training centre for their Asian-wide operations. Lacking any external constraints, the expectations that training would closely adhere to home office conventions are not disappointed.

One clear difference comes in the existing skill base in a country like Singapore. This should create a greater reliance on local sources for skilled labour and essential technological inputs.

A higher level of education (in the host economy) may sometimes mean that it is easier to find local suppliers of advanced machinery and equipment – so that the needed machine technology can be imported in the form of blueprints, so that capital equipment imports can be low although technology transfers in general are high (Kokko and Blomstrom 1995, p. 465).

Nonetheless, Japanese and US multinationals do take distinctly different paths. There is a much greater tendency for US firms to go native. Rather than a colonial outpost, these are subsidiaries of equal importance. It is hardly surprising that the US is not tempted to imitate the Japanese by bringing along a collection of camp followers. Each relies on the familiar, at least initially. US multinationals increasingly having eschewed vertical integration at home, and never being seduced by *keiretsu* type arrangements, will prefer to live off the land rather than burdening themselves with sunk costs in terms of a pre-existing gaggle of suppliers. This is perfectly consistent with the distinct propensity of US firms to depend on more explicit means of technology transfer in the form of blueprints, training manuals and the rest.

Electronics industry data (Wong 2002, p. 856) from Singapore does indicate that while 58.3 per cent of Japanese firms purchase inputs from transposed local networks of Japanese subcontractors, only 16.6 per cent of US firms use anything resembling transplanted networks.<sup>16</sup> Reinforcing this difference, 50 per cent of Japanese multinationals import from their home-based networks with only 8.3 per cent of their US counterparts choosing such an alternative. As Wong (2002, p. 857) points out, “US firms exhibited a higher propensity to engage in external sourcing, in-

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<sup>16</sup> Western suppliers often use their own initiative in overseas investment, not needing the umbrella of a national champion to risk foreign expansion. “Canadian small and medium enterprises invest or transfer their technology to developing countries ... through autonomous moves; they are not often subcontractors to large multinationals” (Niosi and Rivard 1990, p. 1536).

cluding a higher degree of willingness to try out local indigenous suppliers.”<sup>17</sup>

Not surprisingly, US multinationals rely on the external labour market, rather than needing to create a Japanese style internal market. Blueprints and training manuals necessary for local manufacture of capital equipment and physical inputs take the place of the implicit training methods that Japanese firms favour. More decentralized than their Japanese counterparts, the US relies on locals not only to operate the shop floor but provides indigenous management with the leeway to pilot the fate of overseas subsidiaries

#### MALAYSIAN ELECTRONICS INDUSTRY

Initially US subsidiaries are interested in the type of cheap labour required for low skill assembly tasks. Malaysian-owned counterparts can and do spend more on labour training during this initial reported period, circa 1980 (Fong, 1986, p. 73). What is not surprising is the shift to a greater reliance on local skills as the subsidiary becomes more established.

A striking case can be made for R&D. Initially almost all such work is restricted to corporate headquarters, both for Japanese and the US subsidiaries.

*Table 7.3: Origin of Research and Development in Malaysian Subsidiary (1980)*

| Degree of Dependence      | Country of Ownership |          |               |        |
|---------------------------|----------------------|----------|---------------|--------|
|                           | Malaysian            | Japanese | United States | Others |
| Complete Dependence       | 6                    | 15       | 16            | 11     |
| Partial Dependence        | 6                    | 6        | 2             | 2      |
| No Dependence             | 14                   | 0        | 0             | 0      |
| Total Number of Companies | 26                   | 21       | 18            | 13     |

Source: Fong 1986, p. 75.

<sup>17</sup> Wong (2002, p. 858) also notes that the Japanese do show signs of shifting away from reproducing their home base network of *keiretsu* suppliers. But unlike US firms, the tendency is to substitute local firms but to retain something of the same familiar network arrangement. There is also something of a suggestion that these local nominated firms even extend to becoming ersatz Japanese firms by adopting Japanese style labor practices. As expected European firms fall somewhere between these two extremes.

Over time R&D increasingly shifts to local Malaysian subsidiaries. A decade later, skills in Malaysia have developed to the point where Texas Instruments and Intel depend on local engineers to solve production problems arising in US plants. The same movement can be detected in Japanese firms but at a somewhat slower rate.

#### A FEW HIGHLY LIMITED CONCLUSIONS

When Japanese firms make an initial direct investment overseas, they simply fall back on what they know best. Strategically it makes sense to play to their perceived strengths when making inherently uncertain decisions. Technology transfer is done in much the same way as it has been done for a number of decades in their home base. We are not then surprised to note that investment, whether in human or physical capital betrays many of the characteristics we think of as belonging distinctly to Japanese firms. But the firms engaging in such overseas ventures tend to be those most internationally minded and based. The Toyotas, Sonys, Canons and others like them will be bearing the brunt of this investment. These are highly competitive firms, which is only another way of saying that they are flexible enough to adjust to changing economic environments in an effective manner. They are then not in any way doctrinaire enough to insist on maintaining systems of technology transfer that fail to meet corporate goals. In a longer time span, many of these firms, given experience with local constraints, do adjust their practices.<sup>18</sup> What we see is that firms operating in a specific country sector grow to resemble one another no matter what their corporate base may be. We would not expect to see Honda, producing in China, provide more of a contrast with Volkswagen or Ford than it would with Toyota, at least in terms of its technology transfer choices. However different starting points will tend to preserve some differences even after considerable modifications. For instance, approaches to labour relations seem too radically different to allow anything like complete convergence. Moreover, the country specific factors need to be sufficiently strong before they are able to overcome the

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<sup>18</sup> Sony, for one, adopts its labor practices to reflect the prevailing norms of its host country. When questioned (6 August 2000) the then managing director of Sony (Australia) made it quite clear that Sony did not feel constrained by Japanese traditions when operating overseas. Lay-offs, for instance, would be handled in accordance with Australian requirements rather than ruled by imported Japanese standards. The most successful multinationals often shed any distinctive national characteristics.

expected inertia of the status quo. Where such factors, for whatever reason, are weak, the resemblance of an overseas subsidiary to a home based factory remains strong. At this stage, we put this forward more as a hypothesis than a defensible conclusion. Evidence is still scanty, limited largely to anecdotal insights. However, our strongest indications are that such characteristics as country, sector, or purpose play a far more determinative role than the national base of the multinational.

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