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“FDI Accelerates Indonesian Automotive Cluster: The Challenge and
Complexity in Managing Technology in Extended Automotive Global
Production“

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1. Introduction

It was argued that the large automotive multinationals would tend towards increasingly internationalized production networks. Each company would produce a pool of strategic components (engine, suspension system, gearbox) from plants established anywhere in the world, to produce parts at the most efficient scale possible. Other components would be bought in from outside suppliers at a low price because of the quantities required.

Because of the uniform basic design of car industry, thus competition would be based on price, and thus production technology and manufacturing location would be characterized by very large economies of scale at labour-cost locations. In order to keep costs and prices down, a geographical shift of production from the major markets in developed countries to a cheaper labour-cost location in newly industrializing countries was envisaged.

Some scholars (Womack *et.al* 1990, Kenney & Florida 1993, Florida *et. al* 1998, Rutherford 2000) predict that the economy will emerge as globalization and direct competition between different productions systems lead to survival of the most efficient economies, particularly for the Japanese automotive MNEs context. Under these circumstances, inward automotive FDI serves a transmission vehicle for the best practices of the investing regions.

In addition, Raymond Vernon (1996) cited that the auto industry as an example of a mature industry after standardization of engines, chassis, and components. Furthermore, the new production hardware and new flexible methods of organizing production pioneered by the Japanese have emerged as a result of higher oil prices and environmental concerns to generate a whole range of product and manufacturing innovations (Ichiro 1991). Therefore, in 1970 the mature of auto industry seemed ripe for diffusion to developing countries in line with product-cycle predictions. Additionally, as a result of the Asian expansion by the Japanese FDI, the potential for auto production by developing countries gave the impression when ASEAN-4 (i.e. Thailand, Indonesia, Malaysia, and The Philippines) initiated their automotive efforts in the late 1960s and early 1970s (Hideki 1988, Doner 1991, Han 1994)

In line with that, the dominance of ASEAN-4 auto markets by Japanese has been accompanied by an extensive growth of Japanese manufacture, assembly, and parts production in the region (Hatch & Yamamura 1996). For that reason, the Japanese are at the leading edge of technological and competitive development in the industry, particularly ASEAN-4 whereby has been a major overseas focus of the Japanese rivalry to encourage the automotive product cycle further. In view of that, as technologically imposing factors affecting the ability to exploit this potential, the exploration of MNEs in the automotive industry is the expanded benefit expected by the host country.

In the case of Japanese automotive makers, global-local manufacturing has been an important strategy as part of their expansion. Take the case of Toyota and Honda, where they have built up their global local parts sourcing along with opening new plants in various selected host country in developing countries with the complexity high levels of parts localization, which is essential for efficient just in time manufacture (Dicken 1988, Doner 1991, Dicken 1992, Dicken 2003). Additionally, Asia (including ASEAN) is perhaps the most suitable site in the world for Japanese expansion in the automotive industry. Besides the fact that it is right next to door to Japan, the region is still developing. Wage levels are rising quickly, but remain low compared to those in the developed world. What is more, at the same time, Asia is filled with 'developmentalist-minded' governments that are eager to have their economies leavened not only by Japanese capital and technology, but also by Japanese guidance on government intervention and industrial organization (Dicken 1988, Hatch & Yamamura 1996, Borrus 1992, Dicken 2003)

As a result, the automotive industry in Indonesia is now seeking to regionalize the dense web of mutually reinforcing ties-between government and business, business and business, and management and labour. In other words, cooperation is the principle that informs Japanese automotive makers with the host country. The long-term contractual relation and integration in keiretsu between Japan and the host country is a long term contracting. Because of the complexity in contracts which might impose the high cost in transforming, monitoring, and enforcement (Lindsey 1985, Doner 1991, Chen 1996).

Although most neoclassical economist view that Japan is really 'doing nothing extraordinary' at all in Asia and ASEAN (Aoki 1988, Miyakawa 1991, Mair 1994, Ernst 2000), however, this research intend to demonstrate that Japan is not only plugging into the region's economy energy but also transforming and promoting the host country in technology-based production alliance in the automotive sector.

2. Four Wheel Market in Indonesia Following the Economic Crisis in the Late 1990s: A Lucrative Opportunity for the Japanese and another Car Makers

The automotive industry in Indonesia and Southeast Asia region has been increasingly integrated across international boundaries. Indonesia has been trying hard to get back on the right track after being devastated by economic crisis in the late of 1990s (Gaikindo 2007). Therefore, an open trade policy by Indonesian government ensures that there is a major industry rationalisation in this sector. For instance, an open foreign investment regime combined with effective industrial extension programme and measures to promote technology transfer from foreign to local parties, will facilitate continuous improvement in supply-side capacities.

Accordingly, the recovery of the automotive sector is due to government's strong commitment in promoting conducive business climate through automotive policy and industry. The government of Indonesia has been improving its policies on automotive sector which is in this sense hopefully will be supportive to the implementation of the regional and multilateral arrangements in effect. As a result, the industry could look

forward to becoming one of Indonesia's prime movers in manufacturing, but with much improved efficiency and a growth path.

In conjunction with that, since the survival period after economic crisis in the late 1990s, car manufacturers across the globe have been competing in Indonesia. The international players have power over 90 % of the market, with the rest shared by the Japanese, US, European and Korean. Like several other regional markets, Japanese manufacturers have the lion's share of sales. As in 2004, Japanese brands (i.e. Toyota, Mitsubishi, Suzuki, Isuzu, Daihatsu, Honda, Nissan, Hino and Mazda), locally manufactured or imported, accounted for 81.5 % of passenger-car sales. For that reason, car makers have been also expanding their existing production capacity to meet demand and exploit the market potential, suggesting potential for even more growth.

An additional magnetism is the opportunity presented by the ASEAN Free Trade Area (AFTA). This was established in January 1992 to eliminate tariff barriers among the Southeast Asian countries and to integrate their economies into a single production base, creating a regional market of over 500 million people with a combined gross domestic product (GDP) of \$682.4 billion. Accordingly, under the 1992 of AFTA regulation on the automotive, tariffs were cut, including those on cars, to between 0 and 5 % by 2003. Provided a car has a minimum local content of 40 % from any Association of Southeast Asian Nations (ASEAN) countries; hence, a car maker has to pay just 5 % duty when exporting to member countries of the grouping.

The dominance of Japanese car makers in Indonesia has its long continuous presence with a long experience both in sales and in distribution, purposely for Toyota. In addition, Toyota Indonesia has increased the annual production capacity of its Innovative International Multipurpose Vehicle (IMV), the Toyota Innova MPV, from 70,000 vehicles to around 100,000 vehicles by the end of 2005. The expansion will set it back around \$40 million. As it has been mentioned by the Toyota Indonesian representative as follows:

“Toyota in Indonesia will defend its position as the leading auto maker with the sales growth up to 34 % along with the progress of Indonesian economy post economic crisis. However, Toyota must also be cautious of the market thread such as the rise of global oil which has implication to the price of raw material and several components. Despite this thread, Toyota is still optimistic to sell 500.000 units in 2008. In 2008 and 2009, Toyota Indonesia has intended to be the base for Toyota Motor Corporation Japan in producing low cost car for Asia Pacific Rim. Also, Toyota Indonesia will introduce a hybrid car (i.e. Toyota Prius) for Indonesian market as a commitment to the green environment” (Author's interview 2007)

Along with that, in 2006, Daihatsu will invest around \$10 million to increase its annual production capacity for the hot seller Xenia/Avanza, jointly developed with Toyota, from 78,000 vehicles to 114,000 vehicles. The model sells as the Xenia under the Daihatsu brand and as the Avanza under the Toyota brand. Moreover, several Toyota models, including the Corolla, Hilux, Soluna, Kijang, Camry and Avalon, have been sold to a number of export destinations, including Thailand, Malaysia, the Philippines, Taiwan, Vietnam, South Africa, Australia, and India. This has proved that Toyota as the Japanese auto giant has done well in Indonesia. For instance, in

February 2005, Toyota had a 31.7 % market share with 13, 899 vehicles sold, compared with 10,717 units sold in 2004 (Toyota 2007).

Another Japanese brand, Nissan has tripled its annual capacity in Indonesia by 2007, from 12,000 units to 40,000, and made mass-produce a global car in Indonesia and other plants in Asia for markets in Asia, the Middle East and Central and South America. Additionally, Suzuki, whose cars accounted for 83 % of total sales in 2005, has launched the export campaign for its new APV multipurpose, compact minivan. The vehicle jointly developed by Suzuki Japan and Suzuki Indonesia in 2004. Furthermore, there are plans to make Indonesia the production base for worldwide sales of the Suzuki. Subsequently another Japanese maker, Honda, has been manufacturing the CR-V sports utility vehicle (SUV), Stream MPV and Jazz compact cars in Indonesia. The Stream is exported to Thailand.

Nevertheless, despite the dominance of Japanese, South Korean's Hyundai and KIA are also considering setting up a production base in Southeast Asia to take advantage of AFTA, though there has been no confirmation yet that Indonesia has been shortlisted. Honda assembles the CR-V sports utility vehicle (SUV), Stream MPV and Jazz compact cars in Indonesia. The Stream is exported to Thailand.

In the same way, BMW manufactures most of its 3 Series and 5 Series sedans in Indonesia and exports the BMW 530i to Thailand. In the tighter premium-car sector, where a total of 4,315 cars were sold in 2005, BMW has the lion's share of the market with 46.8 percent, while Mercedes has 30 percent. The market for these cars reflects the high importance placed on status, with many buyers already owning one or more cars.

Furthermore, Volvo also has introduced two new models in Indonesia. The more luxurious of the two, the S80, costs about Rp 530 million, but Volvo's main hopes against BMW, Mercedes-Benz, Toyota and Honda, which are also planning to introduce new models for the premium market, rest on its newly launched S60 sedan. Volvo is confident the S60 will boost sales and hit BMW where it hurts.

Other car makers are likely to follow suit, though completely built-up cars, such as those in the premium range, will be less influenced by the steel price hikes. Though price increases are expected to kick in after existing inventories are sold, it is predicted that overall car sales will be about steady in the next few years.

With the inception of a free market under the auspices of the Association of Southeast Asian Nations (ASEAN) Free Trade Agreement (AFTA), regional manufacturers are hoping to do better with sales to neighbouring countries. Under the 2003 AFTA agreement, the six founding members of ASEAN - Indonesia, Singapore, Malaysia, Thailand, the Philippines, and Brunei - will reduce import duties on automotive parts and supporting components to between 0 and 5 percent.

None of the member ASEAN country has a market big enough to give the economies of scale needed to justify major manufacturing investments. But the complete liberalization of the region's automotive sector by the full-scale implementation of AFTA cranks up the stakes. ASEAN states have agreed to remove import duties altogether by 2010 for the five founding members of the grouping (Indonesia,

Malaysia, the Philippines, Thailand and Singapore) and by 2015, for new members Brunei, Vietnam, Laos, Cambodia and Myanmar as well. Accordingly, as trade barriers tumble, the ASEAN market, with 10 countries and around 511 million consumers, becomes even more appealing.

The car makers in Asia are optimistic based on the current development in the car industry. Emerging market, particularly in Indonesian, presents the main opportunity for long-term car sales growth and will boost the global car market to over 60 million units by 2009. The prospects for car market growth in Asia are particularly positive and the Pacific Rim countries are forecast to make an additional 5 million units for the world market by 2009.

Nevertheless, there are bumps in the road ahead. Soaring steel prices stemming from China's insatiable demand have prompted some of Indonesia's car makers to warn of increased prices to come. At some \$630 per ton, the price of steel, which is needed for 70-80 percent of car components, has more than doubled since December 2004.

Along with the progress in the dominant FDI car makers, the domestic manufacturers mostly the component makers have been working together as their tier 1 and tier 2 in supply-chain. The growth of auto manufacturing industry in Indonesia has been stimulating the components-manufacturing industry started as far back as 1974. It was when policies enforcing the sourcing of local components were passed. Then in 1979, a deletion programme was implemented that banned the import of universal components, requiring car makers to source these parts from local companies.

Furthermore in 1983, even more restrictions were placed on the imports of certain main components, ensuring further growth in the manufacturing of automobile components. Because of the 1983 regulation, about 200 separate components have been made locally. Exports of these components, more or less static at around \$650 million to \$700 million for the past three years since 2005, whilst sales to the domestic market were top \$13.7 billion. Exports were declined since late 1990s on the back of increasing production costs and the steady strengthening of the rupiah against the US dollar.

Nevertheless, the lack of a sensible tax-incentive policy has weakened competitiveness. Although the government allows a refund of import duties for raw materials to car-component makers if they use the imported materials to produce goods for exports, most exports are done through a third party, which means there is no reimbursement of the import duties. One of the biggest players in the sector, Astra's Otoparts, sells mainly to the Middle East but is now considering the possibility of exporting to countries in the South American region. Currently, the company's exports, mainly car batteries, account for almost a quarter of its total revenue.

3. Global Production Network, Knowledge Diffusion, and Local Capability Formation: The Case of Indonesian Automotive Industry

Indonesia (and another Asian countries) in which Japanese MNEs automotive take place are able to take advantage of an emerging production alliance that links Japan's large scale and high technology MNEs as the host nations. Despite the long trajectory

over decades to swift from being dependent host country in 1990s by importing up to 90 % of their parts and material and now Indonesia has become the exporter to another international market including Japan itself (Sugiyama 2000, ADB 2005). Overall the evidence suggests that Japanese auto manufacturers in Indonesia have begun at least at the margin to reduce their overwhelming reliance on the parent company in Japan.

The inclination of Indonesian automotive dominated by the auto Japanese, also has triggered growing number of the local suppliers used by Japanese auto manufacturers, although they are 'still' Japanese affiliates. In this case, it is not possible to uncover this fact by examining the purchasing patterns of individual firms. Therefore, there is another dark side of the rise in the host country's production (West 2000). In view of that, it is then argued that increased local procurement not necessarily means increased business opportunity for domestically owned suppliers as it has been confirmed in the interview with Indonesian-Japanese auto part makers as follows:

“In the real story, there was an overwhelming tendency from the big name Japanese car makers in Indonesia to buy parts from Japanese affiliated companies in Indonesia. The move towards procuring parts from the local has progressed only in the forms of Japanese parts manufacturers establishing local production base. Therefore, we are lucky enough to have the strong ties with subcontractor plants and therefore we can be part of their keiretsu” (Author's interview 2007)

Japanese subcontractors did not begin to invest heavily in Asia until the early 1970s, when host government adopted 'local content' rules requiring foreign firms to use more locally produced parts and materials. Government in Southeast Asia, in particular, hoped such local content policy would benefit domestic parts producers. Nevertheless, in most cases, they did not (Hatch and Yamamura 1996). Instead, Japanese car manufacturers for example simply responded by coaxing long-time suppliers in Japan to follow them into Asia (Doner 1991). Therefore, the level of competition between local-Japanese alliance firms and purely local firms are tough. The local firms in many cases have been thriving to survive in tough market to win the supplier contract from the Japanese car manufactures. Purely Indonesian auto part firms have assured it as follows:

“It is like being a step-child in the Japanese auto family and it is an on going concern. Of course, there is fairness in bidding process of a new car project from Japanese carmakers; however, the preference is always be the priority of Indonesian-Japanese firms, not 100% local firms like us. Therefore, we must show our best performance to compete with them; otherwise, we will not survive in this tough game. Another down side effect is the ability to enhance technological capability. For them, it is not a difficult case as they belong to Japanese keiretsu so that they can have training and upgrading skill as part of supplier scheme. But for us, we must do it by ourselves alongside limited market both in the local and internationally” (Author's interview 2007)

In view of that, all these investment and tie-ups is nothing less than the regionalization of Japan's vertical or supply keiretsu. In this way, Japanese high technology and high-volume MNEs have been able to replicate the core of their

quasi-integrated production regimes to reduce transaction costs and if regionalized might come to generate efficiencies for many years.

These are difficult problems but hardly insurmountable. What truly stunts the growth of local suppliers is the fact that Japanese MNEs in this region are building a tight network of dedicated suppliers from Japan, but a far looser, or wider, network of domestically owned suppliers. In other words, they are employing what some call 'market sharing agreements' and others call 'multiple sourcing'-a practice in which large assembly firms purchase the same or similar product from different suppliers at different times.

Market sharing agreements, which MNEs thrust upon their suppliers and subcontractors, act as deterrent to industrial upgrading. The quantities ordered from each supplier are enough for minimum production runs but insufficient for higher volumes where scale economies can be derived by better technology, rationalised production lines, and improved management techniques. Deliberate sourcing policies such as the ones pursued Japanese companies provide no incentives for industrial deepening or upgrading by local firms.

Accordingly, as more and more Japanese subcontractors respond to home and host government incentives by investing capital or licensing technology in Asia, native suppliers seems to get less and less action. They finally begun to sound off, bending the ears of government officials throughout the region (Odaka 1983, Hatch & Yamamura 1996).

Protests though have not paid off. To get a piece of the action, local suppliers often must swallow hard and relinquish control to Japanese managers by entering into a joint venture or technical tie-up. However, try as they might, local business people cannot always convince Japanese business to tie the knot (Okada 1983, Sugiyama 2000). To some extends, Japanese automakers offer a variety of reasons to explain their strong preference for Japanese transplants rather than native suppliers. For instance, local suppliers cannot or will not keep up with their delivery schedule, causing them to shut down assembly lines as they wait for shipments of needed inputs. This is obviously no way to run a JIT production system. Still others complain loudly that local suppliers, left on their own, quiet often fail to meet their minimum standards for quality, this has become a leading gripe.

It is difficult, if not downright impossible, for local suppliers to keep pace with Japanese assemblers and Indo-Japanese joint firms that are making what have been described as day to day innovations, or frequent changes in production or process technology originating in Japan. As a consequence, rather than just wringing their hands, several Japanese MNEs are trying to help local suppliers meet their expectation. For example, Toyota with its *jishuken* activity has been helping the suppliers for both the automotive and related industry (Toyota 2000). Toyota Indonesia has been using its *jishuken* learning group and Toyota way for the Toyota group supplier in tier 1 and tier 2. Consequently, the suppliers who have been trained in Toyota must share the knowledge they learnt for another suppliers in tier 2 and tier 3 who has no direct access to be in Toyota's *jishuken*. It goes to motorcycle case, whereby Honda has been using Honda learning centre in Indonesia as an incubator

for sharing the ideas and difficulty in up-grading technology in motorcycle case (Honda 2004).

Additionally, in the quest for efficient supply networks, Japanese automakers in Asia are doing something that American manufacturers would never dream of doing so (Hatch & Yamamura 1996). They are teaming up to form what could be considered 'super keiretsu'. For instance, Toyota and Daihatsu have agreed to use some common components for the family wagon car for Asian market. In addition, Suzuki and Mitsubishi Motors also agreed to produce joint truck programme. Like wise in Thailand, Toyota, Nissan, and Isuzu have begun to collaborate on the production of cylinder blocks for diesel engines. This cooperation was designed partly to satisfy demands for ASEAN market and partly to maintain Japanese domination of the local market.

The automakers in this region are trying to build keiretsu-like supply networks in Asia to promote technical cooperation and improve the quality of locally produced car. As it has been mentioned by Toyota Indonesia representatives as follows:

“To compete against American and European producers, we need to find the way to reduce costs even further by teaming up with another Japanese 'friends'. Along with that, the intention to produce joint product is intended to strengthen Japanese market share in Asia”
(Author's interview 2007)

Honda highlights this principle in its procurement and purchasing forms and distributes to local firms that indicate interest in selling parts and materials to Honda.

“When a company becomes a supplier to Honda, we expect that company to become supplier for the long term. This will require sincere effort and commitment resulting in recognition as a reliable supplier. Continuing efforts will be expected in areas such as short term parts development, commitment to zero defects, on time deliveries and the ability to respond quickly to solve quality and other problems”
(Author's interview 2007)

For non-Japanese firms, this principle seems hard. Therefore, it is the fact that local suppliers always face an uphill battle in trying to establish credibility. Thus, a business relationship with large Japanese MNEs is remained tough (Kasahara 2004).

In view of that, it is argued that Japanese developmentalism through Japanese FDI in the automotive in Asian and particularly in Indonesia, however, has generated benefit to this region (Doner 1991, ADB 2005, UNCTAD 2007). Under this 'developmentalism', innovating manufacturers in the automotive industry rapidly increased their productive capacities, turned to exports, and began achieving dynamic technological efficiency (Sugiyama 2000). Along with the largest firms created and maintained keiretsu networks-the quasi-integration of subordinate firms by dominant firms to increase the international competitiveness of Japanese high-tech industries.

For Indonesian auto firms, the benefit of developmentalism via quasi-integration is large, particularly in the early stage of network formation (Odaka 1988, Kayaka 1991, Kasahara 2004, Ministry of Trade and Industry Republic of Indonesia 2005). That is

when these firms receive invaluable infusions of capital, technology, and managerial guidance; the Japanese government-business network is contributing. Even though there is still unequal cooperation, the production alliance now emerging in Asia is still in its early stages; the benefit it is producing for Asian economic growth still exceed the costs it is imposing (Yeung 2000, Schmitz 2000, Terry 2002, Wolf 2004).

Additionally for the Indonesian auto firms, there is mechanism which Indonesian (and Asian auto firms) may become stuck (Soesastro 1989, Doner 1991, Sugiyama 2000). It has to do with asset specificity, since most of the physical and human capital of the subordinate firms is dedicated to maintaining its relationship with dominant parent companies, the subordinate firms are exposed to constant demands regarding price, quality, and time. The parent companies, in other words, are able to squeeze the subordinate firm as it strives to increase its profitability and international competitiveness. The subordinate firms often have little choice but to 'bow' the pressure if it wishes to maintain the value of its assets and continuing benefitting from its ongoing relationship with the dominant partners. This case is indeed a reflective of what has happened in the case of indigenous auto part companies in the host country who are not part of Japanese automakers neither first tier nor second tier. The unequal bargaining power among the indigenous auto part firm is the problem in the tight auto industry. If they do not belong to the Japanese keiretsu, it is hard to penetrate crowded market, which is Japanese in control (Doner 1991).

It must be acknowledged that Japan is moving to quickly to stake its claim to Asia as Pax Niponica or East Asian mutual benefit zone (Hatch & Yamamura 1996, Ozawa 2005) dominated by Japan. In fact, despite the lure of Japanese capital and technology, and despite the attractiveness of the Japanese model of economic development, there are growing numbers of signs that Asians are not comfortable with their subordinate role in the production alliance now taking shape in the region. Japan is supposed to be the engine of growth and supporting the region's path dependency (Terry 2002, Kasahara 2004, Ozawa 2005).

In addition, Indonesian auto firms might find themselves stuck in a subordinate position if Indonesian government becomes captives of Tokyo (Doner 1991, Hatch & Yamamura 1996, Sugiyama 2000, Ozawa 2005). Therefore, it might be the case that Indonesian government adopting policies that benefit Japanese capital more than local capital. The next result is Indonesia will become like subordinate firms in the Japanese production alliance particularly in the automotive industry; technologically dependent on Japan that they only be called captive economies (Sekiguchi 1983, Soesastro 1989, Woo-hee 1992).

With this in mind, there are some concerns to be taken into consideration by Indonesian government to ensure Indonesian economy do not become captive members of a Japanese production alliance, also for another MNEs globalization attack that is Indonesia (and ASEAN region) must do more to increase their own technological capacities (UNCTAD 2007). This means investing wisely in education, training, and creating stronger links between public research facilities, particularly universities and private industry. In this case, this research can argue that as part of social corporate responsibility (CSR) the automotive firms have embraced academia by establishing auto academia in Jakarta and auto learning centre for engineers and the auto community (Toyota 2007).

Nevertheless, Indonesian government has followed the example of Japan in the 1950s and 1960s by reviewing technology agreement before they are signed (Miyakawa 1991, Hatch & Yamamura 1996, Chen 1996). Although this might discourage some foreign firms from promoting tie-ups in the first place, and thus might reduce overall opportunities for technology transfer, Indonesia is convinced that an effective review programme would improve the bargaining position of local firms, allowing them to gain better agreements with fewer restrictive provisions. This initiative has been stated in the FDI agreement when the MNEs must transfer their technology and benefit for the local community in comprehensive ways (economy, social-cultural, education, technology). Subsequently, although Indonesian government has adopted measures designed to promote supporting industries, they have often ended up assisting to foreign MNEs to establish domestic facilities rather than domestically owned supply firms (Doner 1991, ADB 2005, UNCTAD 2007).

The impact of FDI automotive location on the regional economy in Indonesia has been thought to be mainly in line as a host country. In learning region perspective, the impact, however, can be divided into two: positive aspects and negative ones. The nature of the positive impact can be set out as follows:

Firstly, the movement of Japanese MNEs in the automotive industry into a regional economy increases employment levels in the region. However, this research is not focusing on the impact on the employment productivity. Instead, this research has been more focused with the development of the automotive production in Indonesia. Therefore, since the development has resulted in significant progress, it has long been a presumption for continuing regional policy and local authority economic initiatives (Sugiyama 2000, ADB 2005).

Secondly, the location of Japanese FDI in the automotives, which is spreading across Java region, it has been providing this region with an opportunity for contact and catch-up with new technology and innovation in the automotive and, therefore has enhanced the indigenous growth both in four-wheel and two-wheel case studies. Although, to some extends, the level of R&D facilities in this region has been in progressed but Japanese automakers generally introduce, and transfer to a step higher technology and more innovative products to the region than before (Doner 1991, Sugiyama 2000).

Thirdly, Japanese automotive affiliates, by using the products of indigenous firms, will enable local firms to expect increased scale of economies and this will bring about a further increase in indigenous invention and innovation (Han 1994, Terry 2002).

And fourthly, overseas inward investment tends to have multiplier effects in this region through increased inter-industry linkages. Either through direct investment and attraction of component suppliers from local or through the purchase of labour and intermediate products, Japanese FDI plants in the automotive generates substantial effects in the regional economy in Indonesia and surrounded regions (i.e. ASEAN and Asia Pacific) (Doner 1991, UNCTAD 2007)

Nevertheless, it is difficult to draw a firm conclusion about whether a MNE location will be beneficial or malign to the regional economy without taking into account all

the costs and benefits caused by the attraction of the investment. Since the inward overseas investments to a region are an integration of widely diverse economic interest, only through focusing on the complexity of products and process of investment flow, it can be unambiguous understanding of investment role in the regional economy (Han 1994, Doner 1991, UNCTAD 2007).

Accordingly, the negative aspect of Japanese FDI automotive investment in Indonesia are resulted in the increased external control into a region, and, thus, a branch plant economy or a loss of structural autonomy (Soesastro 1989, Doner 1991, Okada 1993, Sugiyama 2000) for instance, the reduction of local linkage, diminishing R&D activities and skilled labour employment and prevention of local initiatives. In a similar vein, the vulnerability of the host country economy to international demand and supply conditions resulting from MNEs activities based on the global condition.

4. Knowledge Transfer from Toyota Motor Corporation (TMC) Japan to Toyota Motor Manufacturing Indonesia (TMMIN): The Case Study

International technology transfer has been covering the process of the economic relationship between a transferor (i.e. TMC) and a transferee (i.e. TMMIN). In addition, it might include the whole series of related issue, such as the relevant national policies and legal framework of the nation. Furthermore, technology transfer has played significant international trade and increased the involvement of different countries in the flow of goods and service across the national boundaries.

In addition to general economic benefits to their respective home societies in terms of export promotion, increased job opportunities, and technology advancement, technology transfer transactions also generate economic rents that both the transferor and transferee may share. However, like other forms of international business, technology transfer not only brings particular benefits but also some costs to the participants. Those benefits and costs vary a great deal for transferors and transferees, depending upon the channels selected for the transfer.

In consequence of different nature and developmental reasons, technological advances in different countries have always been uneven. This uneven nature of technological progress throughout the world provides the very basis for technology transfer. Accordingly, in the past few decades, international technology transfer has multiplied rapidly. Technology trade has not only formed an independent market, but also become a significant part of international economic relations. Export of technology and relevant experience has become a distinct trademark of MNE business worldwide.

The successful conclusion of negotiations with the signing of a contract only marks the beginning of a continuing relationship between the transferor and transferee. Transferring technology from one company to another is not often a one-time, single act, but rather an ongoing process. Therefore, technology transfer agreement should be a mutual commitment to work together for the benefit of both sides. Accordingly, a good technology transfer arrangement is a long-term and cooperative venture.

In studying the automotive industry, inevitably the technology is characterized by a specific knowledge base. The automotive sector in which innovation is quiet rapid,

sectoral boundaries are not static, but change over time. Knowledge and basic technologies constitute major constraints in the full range of complexity in the automotive sector. Links and complementarities among artefacts and activities also play a major role in defining the real boundaries of this sectoral system.

Building the industry in this sector is complex, because the product itself is complex. A car has some five thousand components (excluding child parts), which can be disassembled into over twenty thousand individual pieces. Therefore, this complexity makes cars expensive and thus they do not sell when per-capita income levels are low. On the supply side, production of car requires the simultaneous growth of supporting industrial activities such as the manufacturing and processing of raw materials and the supply of various parts and components.

Technology transfer in the automotive sector by its nature is a very complicated process, which may involve multiple players. Because the technology normally does not have a clear-cut market value and the negotiation process is characterized by a bilateral monopoly. Therefore, the bargaining process can be intricate and difficult, with each participant trying very hard to increase its shares of the economic rents. Accordingly, trust and cooperative spirit are indispensable for an agreement to be doable in the long run.

To be clear, technological knowledge in terms of the automotive sector in Japanese characters can be classified into two broad categories: capital-embodied and labour-embodied (Odaka *et.al* 1988). Capital-embodied technology is intrinsic to various production processes such as casting, forging, metal-cutting, welding, pressing, etc.

Additionally, the technologies are related to process and quality controls. On the other hand, labour-embodied technology includes (1) skills and know-how in the operation of specific processes, (2) the ability to understand capital-embodied technology, which is the ability to maintain and repair machines and equipment (this is applied for elementary level of employees), and (on more advanced level) the ability to devise alternative processes and equipment in response to various economic and engineering needs, (3) the capacity to design or redesign products, processes and plants, and (4) the ability to innovate and to develop new production techniques.

In Southeast Asia region particularly Indonesia, foreign direct investment (FDI) from Japanese car producers has played crucial role for developing knowledge and technology in the automotive industry (Chen 1996). Nowhere in the world is the influence of transferred Japanese technology greater than in Southeast Asian region (Chen 1996:7). For Japan, Indonesia has always been crucially important source of raw materials and cheap labour for its dynamic manufacturing industry.

Additionally, Indonesia has become not only springboard for Japanese products to West European and North American markets, but also itself one of the fastest growing markets for Japanese products. Japan's technology transfer through FDI to Indonesia has been designed to strengthen and develop its ties with this country. As it is mentioned by the TMMIN representative in the following quotes:

“Indonesia has great potential to be base for TMC for its base to produce low cost car, regardless of the other rivalry countries such as China,

Brazil and India. However, the realisation of doing this investment has not been officially announced yet, as the feasibility study has been underway. Despite the hegemony of TATA which produced Nano along with Hyundai, Toyota wants to start the low cost car project by 2010 or 2011. Accordingly, it is expected that Indonesian government keeps improving its infrastructure including car port “(Author’s interview 2007)

In the automotive industry, the transfer technology is commonly happening between the parent company (i.e. TMC) and the host company (i.e. TMMIN). The process itself does take time as it is not simply technology per se but also involves human interaction which leads to the absorptive capacity (Cohen & Levinthal 1990), as it is mentioned by the Toyota Indonesia engineers as follows:

“When we started working in the actual plants of Toyota, it is not a trouble-free work place. The learning process would begin since the first time we joined the company and it would be a never ending journey. The training for a new engineer will take about three months and six months for operator under the probation scheme and it will then be examined by the supervisor and line manager to continue for a permanent contract. It is very challenging work place and sometimes it is a stressful situation. However, once we achieved the target, it is rewarding place to be “(Author’s interview 2007)

The nature of the technology that Japan transfers (i.e. Toyota) to advanced industrialized countries is fundamentally different from that of the technology transferred to Indonesia as a developing country. Technology transferred to the advanced industrialized countries largely consists of patented high-level technology, while transferred to the developing countries is mainly modernization experience and skills closely related to standardized production methods.

The scope of a typical technology transfer contract usually covers production, management, and marketing. The various production activities that Toyota Motor Corporation has transferred to Toyota Indonesia include: material selection, selection and installation of equipment, plant layout, assembly methods, machine operation, training of personnel, maintenance techniques, provision of technical data, quality and cost controls, and inventory management (TMI 2007a, TMI 2007b). The following quote is addressing the nature of technology transfer in Toyota Indonesia, mentioned by the Toyota Indonesian engineers:

“The learning process as stated in Toyota Production System (TPS) has become the fundamental foundation for Toyota Motor Corporation to transfer technology to Toyota Indonesia. However, it is not about the higher level in R&D, but it is part of continuous improvement / *kaizen* in product development because of market demand and customer. The final decision in R&D is a managerial level decision between CEO/Production Manager in Indonesia and CEO/Production Manager in Japan” (Author’s interview 2007)

In general, one notable motive for many Japanese car producers to select direct investment as a transfer vehicle was derived from the nature of the transferred technology. For along time, Japanese car producers almost exclusively transferred

general know-how and industrial experience. The transfer of this type of technology entails long-term involvement by the transferor in the production and management activities in the host country. Moreover, technology recipients tend to require foreign investors to be involved in the initial stage of production. Many developing countries do not usually recognize the economic value of industrial expertise and tend to regard as a free service that should accompany the purchase of machinery and equipment. Therefore Japanese car producers found it necessary to obtain sufficient compensation for their technology through capital ownership and direct management of their foreign investment (Ozawa 1981:40).

As most technology transferred by Japanese car producers to Indonesia is related to labour-intensive industries, labour training occupies a prominent position in the Japanese strategy of technology transfer. For this reason, on-the-job training (OJT) has been considered by some as Japan's 'inner mechanism of technology transfer' (TMI 2007a, TMI 2007b). OJT not only provides technical and administrative knowledge to the employees, but also coaches them how to have higher motivation and better discipline so that the process of never-ending quality improvement (i.e. *kaizen*) can be fulfilled. Unlike European and American companies, which utilize written manuals and detailed job description, Japanese car producers support their production management methods and their technical training all the way through OJT.

Additionally, in order to establish common ground for bargaining, Toyota Motor Corporation (TMC) and Toyota Indonesia (TMMIN) have to close the gaps in their ceiling and floor price offers. This process is further complicated by some specific factors, for instance governmental regulations, political and business risk, levels of competition for technologies, and so on. Therefore, both TMC and TMMIN have to pay attention to the appropriateness of the transfer. Technology appropriateness has both macro and micro dimensions. The macro dimensions comprise such issues as the impact on employment and shifts in the overall balance of power among the nations involved. The micro dimensions deal with the direct impacts upon the participants of technology transfer.

Moreover, Japanese car producers (i.e. Toyota) have different approaches towards technology transfer. Most Europeans and American companies will pull back their technical advisers when the factory runs smoothly; and the local employees will only need to follow manuals carefully. On the contrary, in Japanese automotive affiliated companies, technical advisers tend to stay even after a good operation has been achieved. They will continue to train the employees step-by-step in productivity and quality control, maintenance and repair, utilization of new production methods and new technology, as well as other production-related skills.

There are a number of reasons for the Japanese to adopt such an approach (Hieneman 1985:63). First and foremost, the technologies transmitted by OJT are basically know-how or experience related to well-proven and standardized production techniques. As technologies in the automotive are the type which cannot easily be transferred both in the form of industrial equipment or through blueprints or operating manuals, instead it can be better transferred through personal communication between employees and managers at all levels. However, for most Japanese expatriates the language barrier poses a particular difficulty in communication, as most of them do not have a sufficient training in local languages and their constant job rotation makes language

learning even more difficult. This problem may help explain why Japanese managers tend to like the 'learning by doing' approach in transferring technology rather than depending on comprehensive manuals that a large number of employees may have trouble understanding.

Additionally, by adopting OJT, Toyota expects to improve technology at the shop floor level. As technology continually progress to a higher level, it can hardly be written into the manual thoroughly (Womack *et.al* 1990). For Toyota, there should be no end to technology improvement as Toyota wants to be always moving forward to technology. Technological process is considered as a dynamic and incremental process, and must be pursued by all members of the organization rather than only by engineers. Therefore, Toyota employees on the shop floor are also involved in the activity of technological improvement. This conception is clearly manifested in the quality control that symbolizes the unique strength of Japanese production management. The Japanese excel in continuing to improve the quality of their products, the process commonly called *kaizen*. The effect of such incremental innovation is highly visible when the product or technology is standardized.

In addition, the heavy reliance of Toyota on 'transfer through people' is also closely related to their emphasis on FDI as a major channel of transfer. There is usually a strong linkage between a supplier company's willingness to be involved in the training of the local employees and its financial stake in the recipient. In the case of licensing and technical cooperative arrangement, training programmes are much less significant. For example, large number of trainees have been sent to Japan for technical instruction under various programme sponsored by the parent companies and the Japanese International Cooperation Agency (JICA) (TMiA 2007).

Nevertheless, despite relatively evident accomplishment in technology transfer by OJT, the transfer of technology from TMC to TMMIN has not been trouble-free. The manner in which most Japanese car producers handle technology transfer has also been criticized by locals as reflecting the Japanese unwillingness to teach more sophisticated technology to the local people. Seeing that Japanese managers have tended to show insufficient confidence in local employees and consider it appropriate to design and develop new products at the headquarters research centres in Japan. Therefore, Japanese car producers tend to transfer technology that is necessary mainly for routine operations. Furthermore, the heavy reliance on OJT or on the Japanese technician's experience sometimes causes serious misunderstandings between employees and managers.

Even in OJT, Toyota has encountered a serious problem, which is mainly the relatively high rate of turnover of the trainees once they return to their respective companies in Indonesia. Lifetime employment is not part of indigenous traditions and the commitment of employees to their companies is much less than that of the Japanese. When skilled employees return home, they are usually in high demand in the job market and find it hard to reject more lucrative offers from other companies.

Responding to this negative side, since the beginning of the 1980s, Toyota has made increasing efforts to deal with the problems accompanying their technology transfer and direct investment to Indonesia. As a result, Toyota has begun to examine the applicability of its management system and the possibility of a higher degree of

localization and decentralization. With further diversification of production from purely labour-intensive industries to more complicated manufacturing processes, pressure has built up to expedite higher-level technology transfer. Finally, there is a mutual benefit based on understanding of the actual depiction from the shop floor to managerial decision making. Indonesian government has agreed this initiative as part of the FDI agreement and the support to spur innovation into local automotive industry.

Accordingly, in the automotive industry, Japanese car producers, notably Toyota, is currently the main source of mature technology transfer to Indonesia. Industrial expertise and knowledge have been the primary transfer while foreign direct investment constitutes the most widely used transfer channel. Traditional Japanese OJT management has commonly been used to assure success of the transfer process.

As a result, the process of transfer is beneficial for Toyota and its host country, since Toyota needs to shed some of its traditional industries in order to promote high technology and service-based industries. On the other hand, the continued flow of technology and investment from Japan to Indonesia will not only contribute to growth of industrialization but also help generating Indonesian economy in the booming Pacific Rim.

The initial advantage may be required through small, seemingly insignificant events and the triumphant variant is not necessarily the technically superior or more efficient one. Its dominance might be based purely on the fact that it was the first to gain wider acceptance in the marketplace, which many supplying business, distribution networks, supporting technologies and users, and a large community of users and developers, all converged on its design in particular automotive industry.

Consequently, the parameters of deep competitiveness in manufacturing and in product development are the key for TMC to transform TMMIN. As Toyota has been known as one of the pioneer in production system; hence, it is essential to underpin the importance of capability building in the production line in Indonesian base. TMMIN has focused mainly on the efficiency of people and equipment in production process in transmitting accumulated design information to raw materials and to work in process. TMMIN's employees strive to raise that rate by equipping employees with multiple skills and by putting the multiskilled employees in charge of multiple tasks along with focussing mainly on reducing unproductive time in their efforts to shorten lead time. Aggressively in keeping material items out of the warehouse and in the production flow. Toyota's just in time production synchronizes the processing of small lots throughout the manufacturing sequence (Liker & Meier 2006). That maintains a nearly continuous transfer of design information to the material and thereby converts the material swiftly into finished products.

In conjunction with the philosophy of eliminating waste, the cost reduction purpose is to secure the company profit and continues the operation so that it can contribute to the employees, shareholders, community, and the country. Then, to achieve cost reduction, Toyota had used TPS in its *monozukuri* (i.e. manufacturing) as well as QCDSM (Quality, Cost, Delivery, Safety, and Morale).

Based on TPS, TMMIN has identified the following seven major types of non-value-adding waste in business or manufacturing processes, these following steps should be accompanied by the 14 Toyota Way Principles (Liker & Meier 2006, Liker 2004, Ohno 1988):

1. *Overproduction*

Producing products for which there are no orders, which generates such wastes as overstaffing and storage and transportation costs because of excess inventory

2. *Waiting (time on hand)*

Employees merely serving to watch an automated machine or having to stand around waiting for the next processing step, supply, part, or just plain having no work because of stock outs, lot processing delays, equipment downtime, and capacity bottlenecks

3. *Unnecessary transport*

Carrying work in process (WIP) long distances, creating inefficient transport, or moving materials, parts, or finished goods into or out of storage or between processes

4. *Over processing or incorrect processing*

Taking un-needed steps to process the parts. Inefficiently processing due to poor tool and product design causing unnecessary motion and producing defects

5. *Excess inventor.*

Excess raw material, WIP, or finished goods causing longer led times, obsolescence, damaged goods, transportation and storage costs and delay

6. *Unnecessary movement.*

Any wasted motion employees have to perform during the course of their work

7. *Production of defective parts or correction.*

Repair or rework, scrap, replacement production, and inspection mean wasteful handling, time, and effort

Subsequently in Toyota's lean manufacturing, a cell consists of a close arrangement of the people, machines, or workstations in a processing sequence (Womack *et. al* 1996, Fujimoto 1999, Sobek 1998, Ohno 1988). Cells are created to facilitate one-piece-flow of a product or service, through various operations (e.g. welding, assembly, casting).

In addition, the ultimate goal of lean manufacturing is to apply the ideal of one-piece-flow to all business operations, from product design to launch, order taking, and physical production. Therefore, optimizing design information in product development is crucial thing in the production line. Toyota's success in shortening lead time in product development has raised their accuracy in targeting demand. Also,

raising productivity in product development has enabled Toyota to conduct development projects. Higher productivity increases the number of projects that are possible with the same allocation of funding, engineers, material, and other resources. That has enabled Toyota to serve a greater of demand and to address the growing diversity of demand more comprehensively (Sobek 1998, Ohno 1988).

Toyota has also increased the effectiveness of their development projects by using generally small project teams. Assigning broad-ranging responsibilities to the team members gives each member a broad perspective on the project. That improves communication and efficiency hugely in conducting product development.

Further increasing the effectiveness of product development, Toyota has invested the immense power in the product managers. Those managers wield authority over the entire sequence, from developing product concepts through translating the concept into detailed designs to putting them into mass production. They are as proficient in the language of the consumers and of salesperson as they are in the technical lingo of engineers and designers.

Also characterizing product development at Toyota is close communication between the product designers and their counterparts in production engineering, on the plant-floor, and elsewhere in their companies. That communication begins in the earliest stages of conceiving vehicle models. The participation of production people in those stages help and allows for shaping designs to facilitate efficient assembly. It also allows for starting work on production equipment and plant layouts for manufacturing the new vehicle models while the models are still in development.

Toyota and another Japanese car producers have built integrated manufacturing system in which (1) the percentage of time of raw material and work in progress spend actually receiving value-added information is high, (2) the percentage of operating and working time that equipment and employees spend transferring value-added information to raw material and to work in progress is high, (3) the accuracy of the information transfers is high. These three strengths are manifest in short time lead times, high productivity, and high quality (Ohno 1988).

In extreme case, during the difficult time in the late 1990s due to Asian economic turmoil, TMMIN has experienced to respond to a decline in demand for a model by reducing the number of people on the production line and broadening the range of tasks handled by each person. When demand for a model increases, TMMIN can deploy more people on the line and narrow the range of tasks handled by each individual. Accordingly, the versatility-human and mechanical- is the result of investing in employees and equipment with more information than they require for any individual task (TMib 2007).

For decades, Toyota was doing just fine in applying and improving TPS on the shop floor in daily bases without documenting TPS theory (Liker 2004). Workers and managers were constantly learning new methods and variations on old methods through actual practice on the shop floor. Communication was strong in what was a relatively small company, so that best practices developed within Toyota spread to other Toyota plants and ultimately suppliers. Nevertheless, as the practices matured

within Toyota, it became clear that the task of deliberately teaching TPS to the supply base was never ending.

The employees who understood the culture behind TPS must follow the real work of implementing lean. They were not contributing to the continuous improvement of the system or improving themselves. In Toyota Way, it is the people who bring the system to life, working, communicating, resolving issues, and growing together. From the first look at excellent companies in Japan practicing lean manufacturing, it was clear that the workers were active in making improvement suggestions. Nevertheless, the Toyota Way goes well beyond this; it encourages, supports, and in fact, demands employee involvement.

The Toyota Way means more dependence on people, not less. It is a culture, even more than a set of efficiency and improvement techniques (Liker 2004, Ohno 1988). Toyota depends upon the workers to reduce inventory, identify hidden problems, and fix them. The workers have a sense of urgency, purpose, and teamwork because if they do not fix it there will be inventory outage. Accordingly, on a daily basis, engineers, skilled workers, all involved in continuous problem solving and improvement, which over the time trains everyone to become better problem solvers.

One lean tool to accommodate this teamwork is called 5S (sort, stabilize, shine, standardize, sustain), which is series of activities for eliminating wastes that contribute to errors, defects, and injuries. In this improvement method, the fifth S, sustain is arguably the hardest. It is the one that keeps the first four S's going by emphasizing the necessary education, training, and rewards needed to encourage workers to properly maintain and continuously improve operating procedures and the workplace environment. This effort requires a combination of committed management, proper training, and a culture that makes sustaining improvement a habitual behaviour from the shop floor to management.

In view of that, TMMIN has been training their employees to monitor the quality of their work while processing material, and they have designed equipment and systems to detect irregularities immediately and to stop when problem occur to prevent defective items from progressing into the following process. Here again, Toyota has improved its manufacturing performance by investing people and equipment with the capacity for handling multiple task-inspection, as well as processing.

In addition, to apply the Toyota Production System as the basic philosophy on the shop floor within Japanese plants can be done gradually over the last three decades. The hardest time has had been faced by Toyota to develop its production system and across the enterprise-in sales, product development, and design-to be efficient automaker. In addition to knowledge transfer, Toyota did take the first steps to spread the lean by diligently teaching the principles of TPS to their key suppliers. This moved its isolated lean manufacturing plants toward total lean extended enterprises-when everyone in the supply chain is practising the same TPS principles.

However, the challenge to spread TPS globally within another Toyota's plants is an ongoing journey. In order to expand its global sourcing as well as market, Toyota has relocated its transplant in overseas. Therefore, TPS which is defined as Operations Management System to achieve goals of higher quality, lower costs, shortest lead time

via engaging people, could be done effectively only with the right management and the right philosophy-the basic way of thinking. Furthermore, TPS along with other technical tools often associated with lean production-JIT, *jidoka*, *heijunka*, are just the technical tools, not a lethal weapon for sustaining the success of the Toyota Way's implementation.

The lengthy process of technology and knowledge transfer has been an on-going agenda for TMMIN. As a result, Toyota Indonesia has striven to continuously improve the quality of their products to fulfil local and international standard in its commitment to be the best in the fields. Since 1987 up to 2007, Toyota Indonesia has been awarded the 'Triple Crown', the top seed sales for passenger vehicles, commercial vehicles, and both.

In 1981 Toyota's total sales already passed 200.000 units and in 1989 Toyota Indonesia's total unit sales reached the 500.000 marks, a big step toward achievement of the breakthrough one million unit marks in 1996. The success cannot be parted from the support of Toyota Indonesia's main dealers that can be found throughout the nation, enabling the customer everywhere in Indonesia to purchase and maintain Toyota Products.

In Toyota Indonesia's bid to become a leader in the free trade era, Toyota Indonesia will continue to export its vehicle in CBU (completely build-up unit) and CKD (completely knocked down unit), engines and production tool series. Toyota Indonesia started exporting in 1987 to several Asia-Pacific countries, even managed the export to Toyota home country in Japan. In 2004 Toyota Indonesia exported Toyota Avanza, a collaboration product between Toyota and Daihatsu in Indonesia, to ASEAN (Association of Southeast Asian Nation) countries in CBU and CKD. The export marks Toyota Indonesia first big CBU export which closely followed by Kijang CBU. These as well as exporting production tools such as welding jigs and press dies since 1987 prove that Toyota Indonesia's quality meets other local customer requirements and achieves high international standards (Toyota 2000).

Additionally, Toyota Indonesia believes that human resource is the key success for a company's business. Therefore, Toyota Indonesia sends its employee to numerous training both in Indonesia and overseas to develop the human resource quality. Accordingly, Toyota Indonesia has tried to integrate Toyota Way into 4P Model for its organization based on guidance and on going instruction from the mother company:

- 1. Philosophy.** The company is a vehicle for adding value to customer, society, the community, and its associates
- 2. Process.** When leaders follow the right process they will get the right results, including long-term cost-reduction and quality improvement
- 3. People and Partners.** Add value to an organization by challenging its people and partners to grow and become more skilled and confident
- 4. Problem solving.** Continuously solve root problems to drive organizational learning

Even so, implementing the Toyota Way outside of the Japan is another challenge for Toyota as Toyota has been relocated its manufacturing and assembling plants globally. Therefore, learning the path dependencies of managerial and manufacturing technology is deliberately important to understand the trajectory in Toyota Production System supported by suppliers and partners. Accordingly, Toyota Indonesia perceives this matter as a complex issue and there are multiple parts to answer it (Liker & Meier 2006)

5. Commencing Technology Transfer to Knowledge Transfer: Learning Aspect from Knowledge Network in the Automotive Sector

The Japanese automakers have intensified their FDI in Indonesia and other countries in ASEAN region. The propelling question remained is can the Japanese manufacturing system and its associated management techniques really be operated abroad? The answer cannot speak for every Japanese automotive company. However it can be said that in accordance with Toyota's and Honda's experiences the process of global local technology transfer can be done gradually, although there is still dark side of the Japanese secrecy in their pace of technology transfer particularly in the early 1980s until the late 1990s (Aoki 1988, Borrus 1992).

In line with Japanese understanding of knowledge as primarily 'tacit'—something not easily visible and expressible; hence, most of the Japanese automakers segment tacit knowledge into two dimensions (Mito 1990, Nonaka & Takeuchi 1995). Firstly is the technical dimension, which encompasses informal and crafts in the term know-how. Secondly is cognitive dimension consisting of mental models, beliefs, 'credo', and perceptions and it is shaped by the surrounding environment. Thus, Japanese auto firms have come to realize that tacit knowledge cannot be easily communicated as they believe that knowledge will also embraces ideals, values, and emotion along with images and symbols. These soft and qualitative elements are significant to an understanding of the Japanese view of knowledge.

Take the example of Toyota; the process of knowledge transfer has been started from technical capability. As they believe that this process involves transferring through people by OJT. For this reason, on-the-job training (OJT) has been considered as Japan's 'inner mechanism of technology transfer' (TMI 2007a, TMI 2007b). OJT not only provides technical and administrative knowledge to the employees, but also coaches them how to have higher motivation and better discipline so that the process of never-ending quality improvement (i.e. *kaizen*) can be fulfilled. Unlike European and American companies, which utilize written manuals and detailed job description (Nonaka & Takeuchi 1995), Japanese support their production management methods and their technical training all the way through OJT. However, it is often said that compared to American and European MNEs (in the automotive industry), those of Japan concentrate their R&D function and high technology production in the home country rather than allocate these functions to suitable host countries (Franko 1983, Dicken 1992, Ozawa 2005).

Back in the early 1980s, Asia and Latin America had come to take a substantial part of overall Japanese MNEs' activities and FDI, which (at that time) are characterized by low-costs, fast-growth, and an export-oriented economy (Dicken 1988). Therefore,

those regions have been playing important foreign sites for Japanese MNEs (Franko 1983, Billet 1990). Indeed, Japanese MNEs have invested in large number of developing countries to take advantage of the abundant raw materials and cheap cost labour forces in these countries and to export the manufactured products made there either to major markets direct or to other plants of their own to make them into finished products (Dicken 1992 pp. 78-81).

In view of that, to comprehend the nature of Japanese FDI is considerable to distinguish the classification of their FDI and knowledge diffusion in the beginning of their globalization engagement. This classification is based on Japanese FDI destination as an appropriate approach to explaining both traditional global strategy of Japanese MNEs and the recent shift in the pattern of Japanese FDI all over the world (Dicken 1988 pp. 646-650). FDI in Japanese MNEs perspective (including the automotive makers), is classified into two kinds, namely developing country-oriented FDI and developed country-oriented FDI. For a substantial period, Japanese economy has depended on its maintenance and growth upon external trade with foreign countries; hence, it has been an export-oriented economy. During the process, the necessity to utilize cheap labour force and natural resources in neighbouring countries has been widely recognized (Han 1994). As a result, they have been able to establish a well-formed network of production alliances that include these Asian countries.

In contrast, for Japanese MNEs (including the automotive industry), developed countries, such as the US and European countries, had been considered initially only as the markets for completed products rather than as either the providers of resources of the sites for production plans (Dicken 1988, Dicken 1992). This connotes that there was a sharp distinction between the production and marketing functions in Japanese industry; hence, production created in Japan and in the neighbouring Asian countries whereas marketing in the developed European countries and the US.

In consequence, in these 'beginning' motives there has been fundamental dissimilarity in the two kinds of FDIs. The Japanese FDI in the Asian developing countries has been aimed at obtaining access to cheap labour and natural resources and at improving the value-added and sophistication of the Japanese domestic economy and its industry by transferring 'low technology industry' to these countries. In contrast, the Japanese FDI in developed countries has been in the main motivated deliberately to avoid the growing trade barriers in these market countries (IBJ 1989 pp. 16-18).

Subsequently, Japanese MNEs (including the automotive) in developed countries are also differentiated from those in developing countries by their superiority in technology (Han 1994, Chen 1996). In developing countries, the issue of technology has two sides. In one side, there is no doubt about the dominance of Japanese auto companies in technology; however, how and to what extent this excellent technology can be transferred to host country-owned businesses is the major issue of concern to these developing countries. Equally, however, by combining with the cheap labour and resources of the host countries, Japanese products, even though they are made by low-level technology in these countries are still able to be more than competitive in the international market (Miyakawa 1991, Kodama 1994).

In developed countries, on the contrary, where indigenous companies possess their own higher technology, the possessions of more advanced technology appears to be

critical for the success of the Japanese subsidiaries (Han 1994). Moreover, Japanese companies are placed at a relative disadvantage in securing low cost labour and materials; hence, the Japanese subsidiaries in developed countries tend to equip themselves with higher technology than is the case of those in developing countries.

Ultimately, another kind of difference between the two is found in the type of division of function. Japanese companies operating in the developing countries decide the division of labour in those Asian countries. On the contrary, those subsidiaries in developed countries tend to be managed more independently from headquarters and to show the division of labour appropriate to the specific, higher technology and complete products made.

Nevertheless, those argument about ‘the old wave of Japanese FDI’s particularly in developing countries in ASEAN-4 has been changed (Ichiro 1991, Miyakawa 1991, ADB 2005, Ozawa 2005). In other words, in investing directly in ASEAN-4, Japanese MNEs have shown tendency to place their plant sites in the lucrative market countries where their products have already dominated particularly in Indonesian market (i.e. Japanese car and motorcycle posses lion share in the Asian and ASEAN region compared to the US and European automotive products).

In short, this changing pattern of Japanese FDI from both developing country and developed country oriented which encompasses the changes in management style, technology level, and organization structure. However, it seems to be insufficient to explain overall changes in the global strategy of Japanese MNEs (including automotive) simply in the context if the drastically changing world economy, which is often called ‘post-fordism’ and is characterized by flexibility and diversification as described in the case study of Toyota and Honda. Therefore, in interpreting the empirical evidence of the recent automotive industry it must be envisaged by understanding the beginning of Japanese FDI classification to find comprehensive understanding of the Indonesian (including ASEAN and Asia) automotive development.

Since Indonesia is still treated as a developing country for Japanese technology transfer; hence, it is difficult to measure the process rather than to understand the process, in part because the term itself is vexingly vague and it is quiet complex and long-term commitment process, as it comprises the macro and micro dimensions (Okada 1983, Ichiro 1991, Chen 1996). Macro dimensions such issues as the impact on employment and shifts in the overall balance of power among the nations involved, the micro dimensions deal with the direct impacts upon the participants of technology transfer. As confirmed by both Japanese representatives from Honda and Toyota in Indonesia as follows:

“By coupling our increased standardized products to meet growing demand and pressure in the global consumer preferences with global sourcing, manufacturing, and shipping systems, Japanese firms must be proficient to transform and to move towards integrating their core activities-production, finance, technology, management, human resources, and marketing-into our global network” (Author’s interview 2007)

Consequently, in this research, technology transfer is defined to signify the method, knowledge, and skill used to improve and enhance the production and distribution of goods and services in the automotive. As a result, it can be embodied in different forms: the machinery used in production or distribution; the manuals detailing business procedures; or the minds of technicians, engineers, and managers who design and execute those procedures. For this reason, it might be seen that technology transfer is nothing more than the movement of such a method, knowledge, or skill from one country to another.

Nevertheless, Lindsey (1985) and Chen (1996) argue that the distinction between the *transport* of technology, which only suggests movement and the *transfer* of technology, which implies a degree of localization. Accordingly, it can be said that for an effective technology transfer to occur, it is argued that local firms as well as the human resource in the host country must be able not only to operate the imported technology, but to adapt and master it to suit local conditions. Therefore, it needs an understanding of the underlying nature of the imported technology, and thus a mastery of it, for instance, in the case of transferring the automotive engineering from Toyota Motor Corporation (TMC) to Toyota Motor Manufacturing Indonesia. Both Japanese engineers and Indonesian engineers must adapt and incorporate the local value with the standardized TPS (Toyota Production System). This has been done by choosing OJT (on the job training) programme, an inner mechanism of technology transfer' for sharing the knowledge and mastering the engineering techniques from Japan to Indonesia¹.

Additionally, the nature of the technology that Japan transfers to advanced industrialized countries is fundamentally different from that of the technology transferred to Indonesia as a developing country (i.e. Toyota and Honda). Technology transferred to the advanced industrialized countries largely consists of patented high-level technology, while transferred to the developing countries is mainly modernization experience and skills closely related to standardized production methods, for instance the scope of a typical technology transfer contract usually covers production, management, and marketing (Doner 1991, Chen 1996, Sugiyama 2000).

What is more, the Japanese FDI in the automotive industry in Indonesia and ASEAN in general merely smart, rational, and entrepreneurial response to changing cost conditions in Japan (Hatch & Yamamura 1996). Furthermore, they appear to be more or less consistent with the pattern of comparative advantage. Being rational, therefore, direct investment from Japan has contributed to the economic development of host country, not only by promoting capital formation, production and employment, but also upgrading technological capability through technology transfer (Akamatsu 1962, Terry 2002, Kasahara 2004, Ozawa 2005). It is all part of a chain of unintended benevolence in which Japanese production causes Japanese economic growth, which begets overseas production in Indonesia (Asia in general), which triggers technology transfer, which links to local economic growth (Aoki 1988, Nakatani 1984, Gerlach 1992, Shujiro 1993, Hatch & Yamamura 1996, Chen 1996).

¹ Technological knowledge in terms of the automotive sector in Japanese characters can be classified into two broad categories: capital-embodied and labour-embodied (Odaka *et.al* 1988)

Nevertheless, the view that Japanese MNEs are ‘stingier’ than their Western counterparts are, it is cautiously contributed that Japanese TNCs (Transnational Corporation) behave differently (Yamashita 1991, Mair 1994, Hatch & Yamamura 1996, Ernst 2000). In fact, Japanese are shaped not only by market forces, but also by the distinctive set of institutions, policies, and norms that have evolved over the history of their society (Ozawa 1981, Sakiya 1982, Hieneman *et.al* 1985, Odaka 1988, Mito 1990). Furthermore, in Japanese business corporate society, there is an unusual amount of cooperation between firms (particularly those belonging to the same *keiretsu*, or enterprise group), between industry and government, and between labour and management. This cooperation allows firm to capture maximum gains from technological innovation and make the most efficient use of resources over time.

Therefore, without a clear understanding of Japanese-style cooperation, it is difficult to comprehend the actual impact of Japan’s deepening economic presence in Indonesia (and Asia) due to Japanese MNEs are trying to replicate their domestic system of networking in the region as a whole. Additional argument is by building keiretsu-like production networks that embrace and even smother local entrepreneurs, technician, and workers in Asia; Japanese MNEs lock the control of technology transfer up in the vertical-quasi integrated networks. In doing so, they are able to extract an unusually large share of the rent on the use of their knowledge (Chen 1996, Sugiyama 2000, Ozawa 2005).

Subsequent argument for the reluctance of Japanese MNEs for being ‘careful’ to anticipate the risk of spilling technology has been studies mainly in the electronic industry². In addition, Japanese companies in this industry are argued of being slower in the localization of managerial and technical personnel, slower in promoting them, and slower in training. In fact, they also appear more reluctant to set up design and R&D units in the host countries³. Even though they constantly transfer old technology to the Asian electronic industry, ‘new technology piles up’ in Japan; hence, year after year, the technological gap between Japan and another Asian electronic producers (i.e. South Korea, Thailand, Malaysia, and Indonesia) widens. This fact has been considered as not a mutual benefit in the electronic industry as if this trend continues; the Japanese economy will become even more dominant in this region⁴.

In view of that, it is assumed that Japanese MNEs in the electronic industry is acting bit different compared to automotive industry. In the electronic industry, it is argued that Japan due to the nature of industry, Japanese MNEs do not want to spilling their technology to unrelated firms outside of their keiretsu (Ernst 1994)⁵. It is argued that

² See detailed evidence of Japanese technology transfer in Electronic Industry in Hatch, W. and Yamamura, K. (1996) *Asia in Japan's Embrace: Building a Regional Production Alliance*, pp. 101-112. Cambridge: Cambridge University Press.

³ Dan Biers, “Matshushita Pioneers Effort to Localize”, *Asian Wall Street Journal*, 9 August 1994, p.4; Chia Siow Yue, “ Japanese Overseas Direct Investment in ASEAN and Asian NIES”, a research monograph, VRF Series No. 187, Institute of Developing Economies, Tokyo, February 1991, p.64.

⁴ See Christopher Freeman, *Technology Policy and Economic Performance: Lessons from Japan* (London : Pinter Publisher, 1987), pp. 31-54.; Richard Samuels, *Rich Nation Strong Army: National Security and the Technological Transformation of Japan* (Ithaca: Cornell University Press, 1994)

⁵ See detailed discussion about Japanese and the electronic industry in Asia in Hatch, W. and Yamamura, K. (1996) *Asia in Japan's Embrace: Building a Regional Production Alliance*, pp. 108-111. Cambridge: Cambridge University Press.

Japan's large, oligopolistic firms enjoy what is called relative asymmetries of access to trade and investment opportunities in their own and their partner's countries (Borras 1992). This asymmetry created by government policy and business practices, makes Japanese knowledge relatively difficult to appropriate. Ernst (1994) argues that the closed nature of Japanese regional production networks in electronic sector had constrained the opportunities for host country firms to develop their own technological and organizational capabilities that are necessary for continued upgrading of their production efficiency and product mix.

Other scholar suggesting that Japanese firms have an edge in cross-border alliances because their own knowledge base is context dependent or embedded in an established social system and thus relatively difficult to penetrate (Imai 1991, Woo-hee 1992). Japan is extra ordinarily eager to acquire technology, but loath to part with it, particularly if it is not part of FDI, the process of technology transfer will be different to FDI. Japanese MNEs who invest in non-FDI will transfer technology in two ways. They carry it with them when they invest abroad in new production facilities, or they license it to overseas firms. The technology transferred through licensing is often referred to as 'unbundled' technology because it does not come with a bundle of management resources that continues to exert control. In fact, even they share unbundled technology; Japanese firms appear to be extraordinarily cautious.

In many cases, they share only mature (older) or standardized technology (Hatch & Yamamura 1996). This is common phenomena in the electronic industry, which is labour intensive (Ernst 1994). In fact, in the sub-contracting case, Japanese firms in Asia tends to import parts from Japan or purchase them locally from Japanese suppliers who have set up their own factories in the region. Japanese firms form parts procurement networks and there is a wall that prevents technology from being transferred outside this network (Kiba & Kodama 1991, Imai 1991, Woo-hee 1992).

In contrast, the FDI (in the automotive industry) serves as a particularly effective mode of technology transfer (Ichiro 1991, Chen 1996, Honda 1991, Guy 1991, Toyota 2000). Moreover, it is argues that FDI in this sector is likely to bring about a more effective transfer than other channels since it involves a sustained relationship between the transfer and the transferee (Ichiro 1991, Guy 1991). This assertion, is based on the assumption that technology naturally diffuses through the training of local suppliers, who may be expected to meet higher standards of quality control, reliability, and speed of delivery and through the training of local managers and technicians, who eventually might move from foreign to local firms, transferring human capital with them (Hatch & Yamamura 1996). Nevertheless, at the beginning of the process, Japanese MNEs in the automotive industry were indeed able to block or constrict the technology diffusion, similar case to the electronic industry.

It has been argued that Toyota and Honda are stitching together the disparate economies of Indonesia as well as integrating them into a multilevel regional production alliance. Because of FDI development programme since 1990s, Japan has been increasing their trading with Asia particularly in the automotive industry. Consequently, high technology products, especially machinery components, have come to occupy an increasingly important share of that intraregional trade (Yamashita 1991, Mair 1994, Hatch & Yamamura 1996, Chen 1996, Ernst 2000, Toyota 2007, Honda 2007). Accordingly, by having subcontractors in their vertical *keiretsu*, they

enjoy the benefits of quasi-integration, including access to capital and technology. Subsequently, to varying extents, all Asian economies have used this Japanese production alliance to expand their manufacturing exports. On the other hand, they have become embraced by and dependent on Japanese capital and technology (Gerlach 1992, Hatch & Yamamura 1996, Chen 1996, ADB 2005).

In addition, to strengthen the Japanese production alliance, Toyota, the leading player in the car maker, and Honda, the leading player in the motorcycle maker, are enhancing their manufacturing plants in ASEAN-4 (Indonesia, Thailand, Malaysia, the Philippines) and East Asia into a more tightly integrated network (Honda 2007, Toyota 2007). This approach coincides with a plan by members of ASEAN to reduce duties on products gradually imported by one country from another in Southeast Asia. It is expected by the Toyota and Honda to reinforce a sort of intraregional division of labour and functional specialization. That means concentrating more on production of single products or parts in different factories in different countries and exporting most of the output to other markets.

In addition, Japan's major contribution to auto manufacture has been in process technology. More specifically, Japanese auto firms have exhibited an impressive ability to manufacture small numbers of different vehicles and models efficiently. Domestically, through just-in-time and *kanban* production, as well as the rapid modification of jigs and dies, Japanese auto firms produce nearly three times as many bodies and engines per unit as their U.S. counterparts (Toyota 2000, Sugiyama 2000). Whereas U.S. firms have concentrated on larger less developed countries markets, the overseas transfer of these innovations has allowed the Japanese to move into smaller, fragmented markets such as those found in the ASEAN region (primarily focus on Thailand, Indonesia, and the Philippines).

6. Fostering the Global-Local Alliance Formation for the Case of Indonesian Automotive: Innovation, Learning, and Network

The forces determining the spatial location of whole industries can be divided into two categories, internal and external forces. The internal forces mean the specific factors internal to industries, which cause factories in an industry to cluster or disperse such as organizational structure and external economies of scale (Dicken & Lyold 1990). The external forces of location are those of the area characteristic attracting the companies in an industry (Han 1994).

On the other hand, factors which influence the locational shift of manufacturing companies are also divided into two categories; push factors which make a company move from an existing site and pull factors which attract the company, which on the move. External forces and pull factors are likely to be related to geographical locations. Meanwhile, push factors tend to imply both geographical and non-geographical motives in industrial location.

This research argues that Japanese MNEs (in the automotive industry) push factors in Indonesia and ASEAN region are originate in Japan in the main. The wage cost increases in the home country, the difficulty in securing raw materials there and the necessity to secure foreign sales network (i.e. Japanese vertical-integration

alliances/keiretsu), and to access foreign market (Kiba 1991, Han 1994). Southeast Asia's early attraction for Japanese auto firms lay partly in the region's general growth (Doner 1991) and it is auto markets in particular. The ASEAN-4 played an important role in the industry's early stages which geographically is also made Southeast Asia a logical focus of early Japanese automotive expansion. Japan's proximity to, and war-time position as occupier of, Southeast Asia provided contacts and encouraged a view of Southeast Asia as a strategic buffer for Japanese firms (Smitka 1991, Borrus 1992).

Product compatibility also played role. The product-cycle theory presumes that an innovating country will export to, and eventually invest in, markets similar to its own. In addition, the ASEAN markets constituted a testing and training ground for Japanese vehicles and personnel preparation for penetration of markets in advanced countries (Doner 1991, Dicken *et.al* 1995). Furthermore, in view of the auto industry's central role in Japanese manufacturing, pessimistic predictions for OECD market growth, and the assumptions of the importance of East Asia and the ASEAN-4 for Japanese firms will probably increase (Jonash & Womack 1985, Sugiyama 2000, Humphrey *et.al* 2000). Thus, Toyota, for example, the least international of the Japanese auto firms, moved to expand its ASEAN presence in the early 1980s as a response to declining demand and rising import barriers in Western auto markets (Toyota 2000).

More specific features of Japanese corporate strategies reinforce the impact of these long-term market considerations. Japanese auto firms incorporate long-range market concerns into long-term investment decisions. An extensive comparative study of Japanese and German auto firms operating in Indonesia concluded that the Japanese time frame for returns on investment is often ten to twenty years, much longer than those German counterparts (Doner 1991). Seeing that the emphasis of Japanese is on long-term market share and not short-term profits, therefore, this long-term investment perspective is strengthened by the Japanese view that investment in the individual ASEAN countries is necessary as footholds in Asia Pacific emerging region (Sugiyama 2000, ADB 2005, Ozawa 2005, UNCTAD 2007).

In addition, unlike push factors pull factors normally work to assist a company in deciding on one location among several alternative sites. For Japanese and Indonesian government, the captains of industry and government have been collaborating closely on sustaining the development and progress of the auto industry for both parties. However, from Indonesian point of view, in making this assertion, it is argued that Indonesia has both a bureaucratic authoritarian and a centre less state. The cooperation between government-business networks has been maintained slowly (Hatch & Yamamura 1996). It is referred as 'bureaucratic-industrial complex', while Indonesian's politicians have the final say on redistribution policies affecting special interests, bureaucrats more often than not get their way on larger or more long-run issues perceived to be in the national interest, such as foreign policy and economic planning (FAIR 1989, Doner 1991, ADB 2005).

On the contrary, in Japanese point of view, government has penetrated business and business has penetrated government through a process Richard Samuels (1987) calls 'reciprocal consent' as follows:

“In exchange for the use of public resources, private industry grants the state some jurisdiction over industrial structure in the ‘national interest’.
“Business enjoys privilege, systematic inclusion in the policy process, access to public goods, and rights of self-regulation. It reciprocates by agreeing to state jurisdiction in the definition of market structure and by participating in the distribution of benefits” (Richard Samuels 1987 p. 9)

In other words, Japan’s government-business network is a mutually reinforcing alliance of partnership that is capable of strong, decisive action so long as it hews to the established, conservative policy line (Tokunaga 1993, Kodama & Kiba 1994, Hatch & Yamamura 1996). Furthermore, Japanese government-business network has followed the line carefully in Asia, particularly in Southeast Asia, which has long been identified as critical to Japan’s national security. Consequently, it has tried to cultivate close relations with elites in the region, aimed at securing the political and social stability, as well as the liberal trade and investment policies, vital to Japanese capital (Sekiguchi 1983, Miyakawa 1991, Kiba 1991). In fact, the ‘trinity programme’ has been initiated known as ‘comprehensive economic cooperation’ with Southeast Asia⁶.

At the beginning, Japan’s economic cooperation policy in Southeast Asia was based on the need to secure a steady supply of raw materials and a low-cost production on the need to secure a steady supply of raw materials and a low-cost production base for textiles, electronics, and another labour intensive industry. However, in the mid-1980s, the ground beneath that policy shifted when dramatic appreciation of the yen undermined the international competitiveness of virtually all manufacturing enterprises that export from Japan (Hideki 1988, Mai 1991, Borrus 1992, Kodama & Kiba 1994, Ozawa 2005).

As a result, Japanese industry particularly exporting industry in the automotive began to see the region as an extension of its home base (Tokunaga 1993, Hatch & Yamamura 1996, Terry 2002). Because of that, the government-business network promoted new vision of Southeast Asia as integral parts of a Greater Japan, critically important links in an expanded Japanese production and exporting alliance (Hideki 1988, Kayoko 1991, Borrus 1992, ADB 2005). Furthermore, Japanese government-business believes the globalization of economic activity has made it impossible to push ahead with economic development within the limited framework of a country defined by strict national boundaries, particularly in the Asia-Pacific region as ‘one large economic zone and centre of the growth’ (FAIR 1989, UNCTAD 2007).

7. Forging the Automotive Industrial Production Networks and Macro Regional Integration in Japan and Southeast Asia

The automotive industry is not the only Japanese MNEs trying to outmanoeuvre one another in Asia. Alongside this industry, the electronic industry has also been following the rapid expansion of the Japanese FDI in Southeast Asia (Chow & Kellman 1993, Ernst 1994, Ernst & Kim 2002, Ginzburg & Simonazzi 2004).

⁶ Consider the title of MITI’s 1986 white paper on economic cooperation: Toward a New International Division of Labour: Promoting Aid, Trade, and Investment as One in International Cooperation

However, the limitation for this research is focussing on the automotive industry itself.

The Southeast Asian region in fact is a buzzing with a competitive energy that is more than a little reminiscent of the *katō kyōsō* (excessive competition) (Aoki 1987). Each automotive manufacturer enters this regional rat race, with high-volume technology investment for expanded production facilities, increase output, reduce costs, boost exports and grab larger shares of the global market. Thus, the Japanese automotive makers have been using the Japanese government through the administrative guidance (*gyōsei shidō*) to manage the competition in this region (Hatch & Yamamura 1996, Edwards 2002).

Additionally, another way of doing it is the basic channel, comes from the *keiretsu*, the firm's own network, which spreads out the cost and risk of doing business in a highly competitive and uncertain environment (Gwyne 1990, Guy 1991, Kasahara 2004, Ozawa 2005). The alliances that in Japan are called as *vertical keiretsu* that reflect what could be called as *vertical quasi-integration*-a unique form of cooperation that lies somewhere between vertical integration of transaction within a single firm and long-term contracting between a stronger and a weaker firm (Aoki 1987, Hideki 1988, Kodama 1994, Hatch & Yamamura 1996).

Afterwards, using this vertical quasi-integration, the firms with more bargaining power and have greater technological and managerial capacity as well as greater financial muscle involves itself intensively (FAIR 1989, Gerlach 1992). By being a parent company in the context of automotive industry, the firms with more bargaining power, will usually provide the subordinate local firms with one or more of the following:

1. capital (either equity or loan financing),
2. technology (through license, the export of machinery and parts, or the training of employees),
3. managerial know-how (usually in the form of expatriate managers and advisers),
4. a market for the subordinate firm's good (through direct play an active role in helping the subordinate firm devise plans for future investment, production, and marketing).

As a result, through vertical quasi-integration, the dominant firm maximizes the advantages of both integration and long-term contracting, while minimizing the disadvantages of both. The advantages for the sub-ordinate firm are the resources (i.e. capital, technology, managerial expertise, and a market) the dominant firm provides, but also the profits and wages earned over the life of the relationship. Moreover, it includes the prospect of a more promising, or more certain future than the available alternatives (i.e. operating independently or entering into a long-term contract with either a large local firm or Western multinational) (Doner 1991, Dicken 2003). It says that 'typical' Japanese MNEs in the automotive industry operating in Indonesia and ASEAN has demonstrated a willingness and ability to maintain such keiretsu-type relationship for long periods (Hideki 1988, Kodama 1994, Hatch & Yamamura 1996, Kasahara 2004). In fact, these multinationals have been able to take larger market

shares, and thus market power by achieving significant economies of coordinated intranetwork investment, production, marketing in competitive ways.

Nevertheless, it argues that in the case of long-established operational norm vertical keiretsu, Japanese subordinates and suppliers must meet the needs of their major Japanese business counterpart. Therefore, they must invest in highly specific job training for their employees and use precisely calibrated tools and dies for production (Chen 1996, Toyota 2000, Honda 2004). These are dedicated assets that under these terms (i.e. vertical quasi-integration in keiretsu), a subordinate in Indonesia can ill afford to shirk or do anything but exert its maximum effort to maintain the vertical-quasi integrated relationship. This is because it faces the very real threat that the dominant Japanese firm (i.e. parents company) will terminate the relationship, causing a drastic reduction in the value of the assets dedicated to the relationship (Doner 1991, Guy 1991, Hatch & Yamamura 1996).

Although the Japanese government has used its influence to flourish the economic trading in the multilateral agreement, however, Japanese automotive makers have supplied the actual bonding agents-capital and technology by themselves (Gerlach 1992, Sugiyama 2000). In fact, the alliance they have been used is more than the complex web of vertically integrated production networks spun across Asia and ASEAN, the dynamic region, by the many different high-technology firms seeking to expand their market power by capturing the returns on their investment in innovation (Chow 1993, Dicken 2003). The Japan is setting up 'an exclusive' Japanese market in which Asia-Pacific nations are incorporated trade of 'captive imports', such as products from plants in which Japanese automotive makers have invested for 'captive exports', such as necessary machinery, engine, and materials.

Along with FDI, Japanese automotive investment in developing Indonesia (and ASEAN) has different characteristics from Japanese automotive FDI in developed regions. For one thing, it is geared more to production capacity as many Japanese MNEs are using their Asian profits to boost the capacity of their production networks due to another year of loses at home (Jonash 1985, Miyakawa 1991, Toyota 2007, Honda 2007). Therefore, Japanese MNEs moved to restructure its global operations, pumping more money and manpower into ASEAN-4 and Asia by stimulating high technology manufacturers to consolidate and integrate the facilities (Aoki 1988, Gwyne 1990, Ministry of Trade and Industry Republic of Indonesia 2005) as Japanese believes that the countries of Asia are their natural partners to help Japan restore the profits (Nakatani 1984, Hieneman *et.al* 1985, Gerlach 1992, Shujiro 1993, Hatch & Yamamura 1996, ADB 2005).

For that reason, Japanese FDI in the automotive industry in Indonesia (and ASEAN) tended to match a host nation's comparative advantage and thus promoted trade. It was more efficient in promoting the growth of host country output than non-Japanese automotive makers (Gwyne 1990, ADB 2005, Ministry of Trade and Industry Republic of Indonesia 2005). The nature of this is asserted to be the dynamic trade-oriented nature of the Japanese FDI, which promotes the development of the industries in which the host country has an advantage (Hatch & Yamamura 1996). Therefore, in the initial stage of their expansion, Japanese has tried to make possible a more orderly transfer of technology due to its factor endowments (high on labour, low on specialized knowledge).

Nevertheless, many scholars have argued that Japanese FDI has been no more trade oriented and perhaps even less than any other country's FDI⁷. More importantly, they argued that the unique features of the Japanese investment would not last longer, that they reflected nothing more than a transitional stage in Japan's industrial and technological development. This argument was explained that Japanese-style FDI would come to resemble American-style FDI in the future (Florida *et.al* 1998).

That argument, however, could be the case of the Japanese electronic MNEs whereby the nature of industry is still relying heavily on intensive-labour rather than intensive technology (Erns 1994, Doner 1991, Ernst 2000, Ernst 2002). On the contrary, up till now Japanese automotive makers have been setting up 'a modern overseas plants' and have shifted their focus from labour and capital-intensive industries to more technology based and knowledge-intensive industries (Odaka 1988, Aoki 1988, Doner 1991, Ozawa 2005). Despite these changes, however, it cannot be conclude that Japanese FDI is the same as American or European FDI in the automotive sector. In the past, Japanese MNEs in the automotive are said not 'really' multinational in the same way as European or American MNEs. No matter how far they expand. They still hold fast to their membership in a Japanese alliance structure.

In reality there are hopeful signs that Japanese automakers in the early 1980s are now making progress toward 'localization' by purchasing more of their parts from the local suppliers in the host country (Kenney and Florida 1993). This pattern has been changed since 1970s in order to accelerate catching-up process for the automotive industry in ASEAN and Asia region (Hieneman *et.al* 1985, Mair 1994, Ernst 2000, ADB 2005). They are no longer continuing to import the most sophisticated auto parts and electronic component from Japan. In fact, they have been transforming the local supplier and established joint ventures between Japanese-affiliated part manufactures with the local firms. Although in the beginning, Japanese affiliates still employ large number of expatriates in management positions but it has been reduced gradually with the local manager along the trajectory. Clearly, it is not an easy task for them as Japanese representative in Indonesia has mentioned it:

“We felt under increasing pressure from both local government and employees and from third parties, such as Japanese government, to transfer technology, localize management, decentralize control, and 'de-Japanese' authority. Yet, we believe that this process would put our operations at risk and would therefore be carried out in comprehensive ways including the cross cultural management issue” (Author's interview 2007)

In response to that, therefore, Japanese automotive makers must devise its own model of global expansion strategy, a model in which the various members of a high-technology production alliance namely government and business executives, parents firms and subcontracting firms, management and labour, in order to maximize the benefits of innovation and to reduce transaction costs. That model is taking shape in ASEAN today to achieve dynamic technological efficiency.

⁷ See for example, Tien-Chen Chou, "American and Japanese Direct Foreign Investment in Taiwan: Comparative Study", *Hitotsubashi Journal of Economics*, Vol. 29 (1988); Jung Taik Hyun and Katherine Whitmore, "Japanese Direct Foreign Investment: Patterns and Implications for Developing Countries", The World Bank, Industry and Energy Development Working Paper, Industry Series Paper1 (February 1989)

Back in the late 1950s, Japanese investment in East and Southeast Asia was designed almost exclusively to extract raw materials for the home market. Firms in labour and capital-intensive industries shifted some of their production to the region in the 1960s and 1970s, when wage rates, land prices, and environmental regulations in Japan began to pinch their domestic operations. Thus, these manufacturers had another motive namely, to continue to supply markets that host governments in Asia had begun to protect (Sekiguchi 1983). It was the ‘old wave’ of Japanese FDI. The ‘new wave’ of Japanese FDI is to enhance the global reservoir of existing technology by forging tighter ties with sub-contractors including investment in R&D and begin producing an even menu of richer menu of goods in the automotive products.

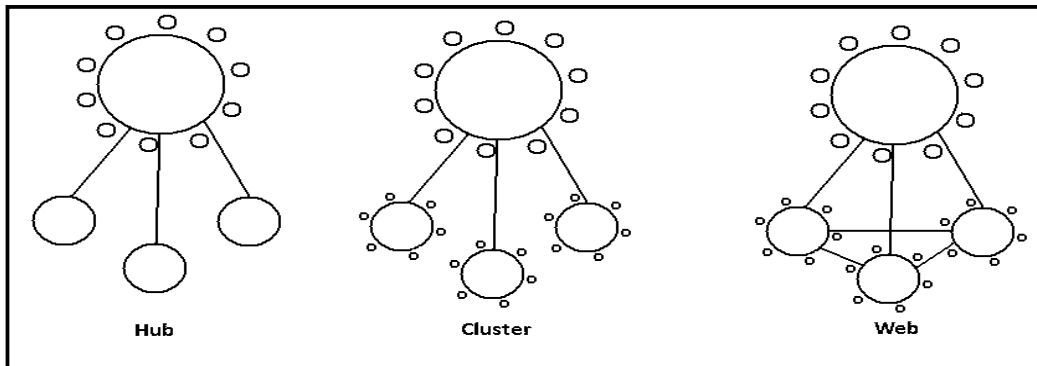
Additionally, Indonesia (and ASEAN) has become attractive outlets for Japanese automotive makers for manufacturing and exporting activity base. Nevertheless, cheap labour was not the main attraction to drive Japanese to this region. The fact that cost considerations by enlarges. Japan has become ‘mature’ economy and high-technology firms using highly automated production systems (Nakatami 1984, Soesastro 1989, Gerlach 1990, Miyakawa 1991) undertake an increasingly large share of its overseas manufacturing activity-in ASEAN and elsewhere. Automation has dramatically reduced the need for-the low-cost production workers, while increasing the need for skilled workers.

Subsequently, Japan’s automotive makers are investing in ASEAN for strategic purpose, namely, to achieve economies of scale, scope, and networking by capitalizing on the region’s deepening vision of labour; in other words, to secure a ‘strategic distribution’ of management resources and production activities (Dowling & Cheang 2000, Ernsts *et.al* 2000). Japan views Asia (including ASEAN) as one integrated but technologically stratified economy, an extension of their domestic base to pursue a global corporate strategy. In the automotive context, they are building regional production networks by laying the foundation for such networks in the early 1980s (Soesastro 1989). This fact has become painfully obvious to those in East and Southeast Asia as it has been mentioned by Soesastro (1989) as follows:

“Willing or not, the ASEAN economies have become an integral part of a production structure that is emerging in the Pacific region, with Japan as its core”

As the set of connections has evolved, the production network built by Japanese automotive MNEs in Asia (including ASEAN) has assumed at least three different forms, represented schematically in **Figure 1 the Evolution of Japanese Network in Asia**.

Figure 1 the Evolution of Japanese Network in Asia



Source: Hatch & Yamamura (1991)

The earliest type, which can be called the hub network, is a collection of regional affiliates that tie themselves closely to the parent firms in Japan but do not interact much, if at all, with one another. Many of these affiliates are joint ventures with well-connected business group in the host nation, which a former Toyota executive has appropriately labelled 'local capital umbrellas' (Sato Ichiro in Richard Doner 1991 p.80). Even in the case when Japanese partners control day-to-day management of the regional affiliate, this is accomplished in different ways. For instance, 'the local capital umbrella' may agree to utilize as a dummy shareholder, a partner only on paper or the two sides may sign a 'basic agreement', turning over all but a few limited responsibilities (i.e. labour relations and local marketing) to the Japanese partner. Alternatively, the Japanese partner may win advantage by securing a loan to finance the local partner's equity interest (Okada 1983, Okada 1985).

In addition, typical joint venture in a hub network in the beginning was a 'screwdriver operation', which does little more than assemble parts imported from Japan. However, it has been changed over the time towards the catching-up process in the auto technology in this region as it has been explained in Toyota and Honda case study in Indonesia. In Toyota case, the path dependence of technological trajectories has been developed along with TPS (Toyota Production System) and Toyota Way; whereby in Honda case, the technological capability has been enhanced through NH Circle and the R&D facility in motorcycle.

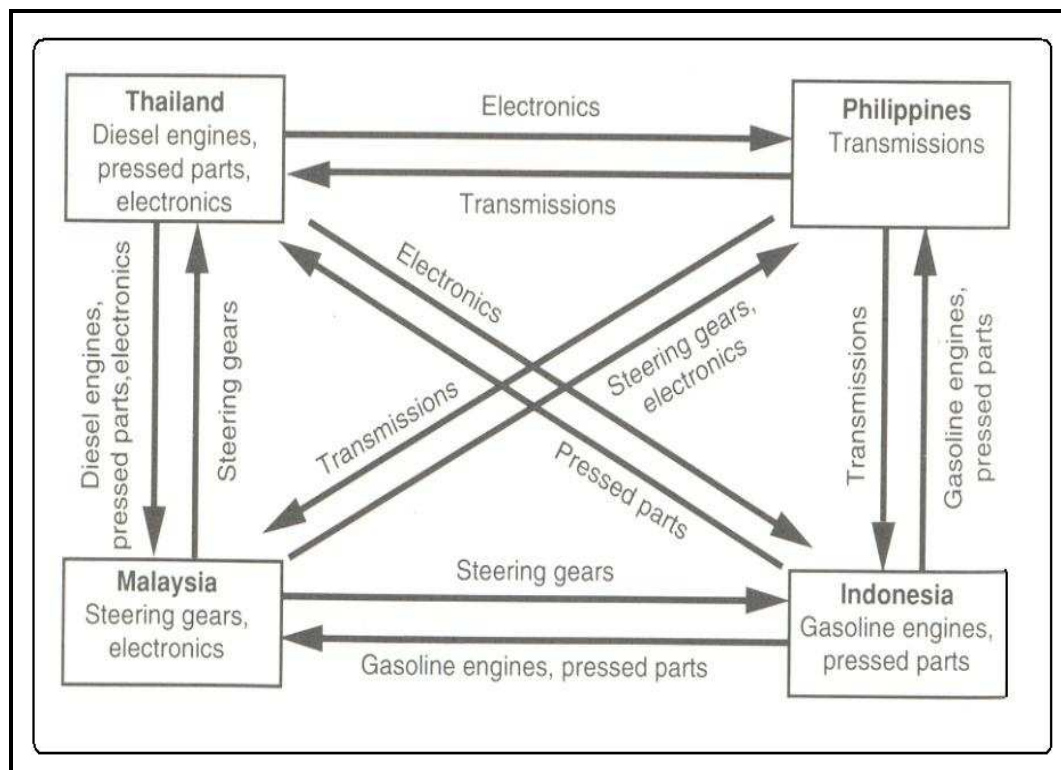
As the 1980s went on, to remain competitive, Japanese automotive makers had to begin purchasing locally produced parts. They had to build a new kind of network, a cluster network, based on a dense set of interfirm relationships. Most of the big assembly firms managed to persuade their Japanese subcontractors to pack up and move to Asia or signing technology license agreement with domestically owned suppliers in the region. It happened in the case of Honda, in which Honda used its self-reliance spirit to energize its own keiretsu to expand in Indonesia (Mito 1990, Mair 1994, Honda 1991). Similar case to Toyota, with its big influence in the automotive network, Toyota has managed to expand its vertical integration in ASEAN region to supply their plants in Indonesia.

As they turn more and more to ASEAN as a base site for export-oriented manufacturing cluster, Japanese automotive makers in the 1990s were building a third and even more comprehensive type of network, which can be called as a web network

(Soesatro 1989, Miyakawa 1991, Ichiro 1991). In the case of Toyota and Honda, as it has been suggested, they have been setting up a web network across the Asia. And many other Japanese MNEs are doing so as well. Spun together by intraregional and intragroup trade, this type of vertically integrated network serves to unite the scattered children of Japanese parents. Affiliates assemble high-tech parts and less sophisticated component both from Japan and other affiliates in the region. Accordingly, manufacturing activities are strategically placed in technologically appropriate sites according to a firm's own division of labour (Borras 1992).

In view of that, Japan's automakers are no less ambitious. Toyota, for instance, is a mass-producing gas engines in Thailand, diesel engines in Indonesia, steering parts in Malaysia, and transmission in the Philippines (see **Figure 2**).

Figure 2 Toyota Motor Networks ASEAN-4



Source: Toyota Motor Corp. (2000)

It has established regional trading centre in Singapore (i.e. Toyota Tetsu), which coordinates the movement of the automotive parts between Toyota affiliates throughout Asia. The affiliates are expected to assemble these standardized parts into finished cars and trucks (Hatch & Yamamura 1996, TMC 2000). Toyota Indonesia's representative has confirmed it as follows:

“In order to thrive in the fierce of auto competition, the managers must learn and see the bigger picture as well as the global picture. It is a big headache for us to meet that challenge. But on the other side, we also want to hold onto the local market we already control and continue to earn the high profit we have been earning” (Author's interview 2007)

Therefore, the truly regional and strategic vehicle has become practical concept for other Japanese automakers such as Nissan, Isuzu, and Suzuki. In fact, they have been following Toyota to produce cars in different nations across Asia and trying to meet local government and local market requirement (Toyota 2000, Dowling & Cheang 2000).

Similar tactic to Honda's approach, the global-local strategy, it has produced motorcycles on country-by-country basis (Sakiya 1982, Mito 1990, HMC 2004). As it has been confirmed by Honda's representative from Indonesia as follows:

“This would be far more cost effective, if we could keep continuing a division of labour among our production bases in Asia by letting each plant specialize in a certain type of motorcycle or component, and have these facilities supply each other with products. So that we can move ahead and maintain our lion share in this region. We must keep continuing this tactic based on our experience being the leading maker in motorcycle”
(Author's interview 2007)

In view of that, using business network that have become increasingly complex, evolving from hubs to clusters to webs, Japanese MNEs have become agents both regional economic integration and developmental channel. In this research, this has been referred as the regionalization of Japan's domestic alliance structure.

Subsequently, global strategies are driving Japan to regionalize its economy not cost considerations. This is evident in the fact that high-tech manufacturers use the region in part as a platform for exports to developed markets in the Asia Pacific, the US, and Europe, not merely as a source of 'reverse import' back to the home market (Ichiro 1991).

Moreover, it is like to occur as Japanese MNEs in the automotive use their tremendous advantages to capture more of the 'advanced factors', such as skilled labour and supplier contracts in those host countries (West 2000, Pries & Scheer 2004). Therefore, given those outcomes, Japanese firms could end up with an even tighter grip on their own technology, allowing them to earn monopolistic 'rent' on its use. Even more, they might be able to enrich themselves further by engaging in such practices as transfer pricing⁸. However, the Asian NICs, China, and the ASEAN-4 might not actually feel the pinch of captive development until Japanese high-tech manufactures (such as the automakers) stumble in their pursuit of dynamic technological efficiency (DTE) (Kodama & Kiba 1994). This is because the pace of technology transfer to Asia is largely determined by the pace of Japan's own technological innovation at home (Kodama & Kiba 1994, Chen 1996).

Subsequently, Japanese MNEs also benefit from the proliferation of sub-regional zones in Asia. In most cases, these zones are promoted by local, state, and national governments in hope to achieve complementarities or divisions of labour between geographically proximate but economically disparate areas within their

⁸ See William Rapp, "Japanese Multinationals: An Evolutionary Theory" in Theodor Leuenberger and Martin E. Weinstein (eds), *Europe, Japan, and America in the 1990s: Cooperation and Competition* (Berlin: Springer-Verlag, 1992), pp.248-9.

jurisdiction. These sub-regional zones are quite unlike customs unions or free trade areas; they are 'investment-driven and export-oriented, inward-looking in terms of production networking, but outward looking in terms of exports (Business Times 1992)⁹. They are perfect for Japanese MNEs.

Japanese MNEs in auto industry has been using its Asian production alliance in part as a platform from which to continue supplying high-technology products to Western markets (Hideki 1988, Gwyne 1990, Miyakawa 1991, Chen 1996). While the US and Europe continues to loom large, as markets for Asian exports, high-technology manufacturers in the West are becoming increasingly marginal players in the region's emerging production alliance. It is Asia's supply structure, not its demand structure, which is turning inward (Hatch & Yamamura 1996).

From the political point of view, Japan is devoting more attention to Asia than any time since World War II (Kasahara 2004, Ozawa 2005) by promoting regional economic development and cooperation. Most importantly, the Japanese government is continuing to pump up massive amounts of foreign aid into Asia (e.g. in 35% of aid foreign budget in 1991-1992) and setting up a think tank, the Foundation for Advanced Information and Research (FAIR). On the other side, upset by what they consider to be a 'cold shoulder' from the US and Europe, many Asian leaders are welcoming Japan's embrace. In fact, ASEAN-4, the Asian NICs, China and Japan had set up a new organization, the Western Pacific Economic Cooperation, to represent Asia's interest in multilateral trade talks. Therefore, unless its political and business leaders begin to forge closer and durable ties with their counterparts in Asia, the West may find itself on the outside looking in on the world's most dynamic region. Seeing Japan is quickly embracing Asia, in terms of economy and technology, Japanese have already conquered Asia (Washington Post 1990)

Nevertheless, as this research have focused exclusively on the vertical business ties between Japanese and Indonesian, there is more evidence to investigate the vertical political ties between the Japanese government and host regimes in Asia. These ties are maintained and strengthened through the up and down economic policy among Japanese and Asian countries.

Additionally, it must be noted that the vertical quasi-integration maintained by Japanese MNEs in Asia cannot help but be exclusionary. In this case, American and European MNEs in the automotive industry will face a challenge and hard time to enter the Japanese markets dominated by keiretsu relationships. Breaking into Asian market, therefore, will be difficult as the market share and power of such networks increase¹⁰.

⁹ The example of this zone is Batamindo Industrial Park, the flagship project of the Singapore-Johor-Riau, the cooperation amongst Singapore, Indonesia and Malaysia. The huge park has lured international electronic clusters dominated by Japanese MNEs. The success of Batamindo Industrial Park has inspired another industrial park-industrial estate across Indonesia.

¹⁰ See Roberts Z. Lawrence, "Japan's Different Trade Regime: An Analysis with Particular Reference to Keiretsu," *Journal of Economic Perspective*, Vol. 7, No. 3 (Summer 1993), pp.3-19.

8. Conclusion

The automotive industry (i.e. car) is developed to an increasingly high degree, on a global and transnational basis, not only in marketing terms but also in corporate structures and strategies, finance, product design, development, and manufacture. While the growth of vehicle industries in newly industrializing countries is an important current development, in the major industrialized the motor industry is mature.

These two broad features of the industry mean that technical development and competitive forces along with market growth generate the main dynamics of change in its structure. And both these dynamic forces express themselves transnational rather than within the confines of national boundaries.

At present, the industry faces the risk of volatile changes in the highly competitive car markets in the world. Despite the dominance of American, European, and Japanese car companies, Asian car companies are now exerting an influence on the world industrial system, even though some of them have been part of the Japanese car as parents company.

The Japanese approach to organizational knowledge creation can be applied outside Japan and that the key adjustment needed is a prolonged phase of socialization and externalization. This adjustment is needed because it takes time for people from different cultures to share tacit knowledge. It also takes more time to build trust between people from different cultures. The examples of Toyota and Honda in Indonesian plants have confirmed this postulate.

In focus, the example of Toyota, the leading car manufacturer, has expanded its managerial and manufacturing in Indonesia as regarded as lucrative market and promising productional location for Asia-Pacific rim .The globalization of Toyota in the automotive industry has caused restructuring, developing it into a truly world wide. This initiative has been taken place since 1970s in Java region Indonesia. Since then the operation of Toyota Indonesia has been doing progressively growing along with managerial and technological path dependency.

It is the fundamental system that Toyota views its world and does business. This operational excellence is based in part on tools and quality improvement methods made famous by Toyota in the manufacturing world, such as just in time (JIT) along with *kanban*, *kaizen*, one-piece-flow, *jidoka*, and *heijunka*. These techniques helped generate the lean manufacturing revolution in manufacturing industry, specifically in the automotive.

Nevertheless, implementing the Toyota's basic principle and characteristic outside of the Japan is another challenge for Toyota as the transplants have been relocated globally. Therefore, understanding path dependence of managerial and manufacturing technology from Parents Company in Japan to the selected host country is deliberately significant to understand the trajectory in Toyota Production System supported by suppliers and partners. Although displaying a number of unique or at least differentiating factors from other industries, there are still very important lessons to be learnt which have a wider application.

Subsequently, in response to the growth of car industry in ASEAN region and Asian market, Toyota Indonesia increasingly makes efforts to improve their production system and management system. Furthermore, Toyota Indonesia has become a significant base for Toyota Asia-Pacific of the core of the global industrial system of the automotive, not only in manufacturing and sales but also in technology and management. Furthermore, the establishment of vehicle and engine plants in Indonesia by Toyota has led to a net increase in demand for locally supplied components. It is also part of Japanese production systems (i.e. TPS) which using the concept of lean production by JIT and kanban system, to avoid waste in manufacturing activities. In addition, these plants are likely to be organized on quite stringent just-in-time principles, thus reinforcing the need for new components supply sites close to vehicle assembly plants.

In addition, the perspective of forging the automotive industrial production networks and macro regional integration is equally valid for all Asian economies (ASEAN in particular), but not for all industries; like it has been suggested that this analysis applies best to manufacturing industries, especially high-tech industries such as automotive industry. These industries, however, can function as an engine, transforming a low wage, labour intensive, and developing economy into a higher-wage, technology-intensive, and developed economy.

Nevertheless, the analysis is not an outlook analysis that cannot and does not attempt to predict what might happen in the relatively distant future. In fact, this analysis is an attempt to reflect on what has happened in the beginning and what has been going on in the automotive industry in Indonesia (including ASEAN and Asia). In view of that, this analysis is trying to fill in the gap between the theory and the practice of the Asian automotive industry, which has been dominated by the Japanese MNEs particularly for Indonesian automotive in regional context.

It is widely recognized that in Japanese automotive firms, they should not just be conceived as legally bounded entities and owners of property assets, but also as institutions with permeable and highly blurred boundaries or so called 'networks within networks', the Japanese keiretsu. As in the Japanese vertical quasi-integration process, the Japanese opened up their boundaries and tapped into their own keiretsu first then continued with the surrounding networks, and created certain realms of firm-territory interaction; this process known as firm in region and region in firm.

From the perspective of regional competition, there is possibility for Japanese automotive MNEs to lose its competitive edge in ASEAN-4. As the American and European rival might force Japanese MNEs to modify or abandon a preferred course of action in Asia: a sudden, unexpected increase in production costs will cause a Japanese MNEs to choose a low-cost but unrelated supplier. These are all possible scenarios in response to forging the automotive industrial production networks and macro regional integration, an attempt from Asian government to intervene to restrict the behaviour of Japanese MNEs, extricating themselves from Japan's embrace. In fact, to anticipate this, Japanese government is moving aggressively to secure the nation's innovative capacity in Asian region. Moreover, Japan is consolidating its system of cooperation that promotes dynamic technological efficiency.

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