Regional Production Networks and Implications on Trade and Investment Policies, and Regional Cooperation: The Case of the Philippines

Paulynne Castillo

I. INTRODUCTION

Regional/Global production networks (GPNs) are new only in sense that participation by local enterprises and state supporting facilities have latched on in partnership with leading multinational corporations (MNCs). Thus, a conventional GPN combines a large, multi-divisional multinational corporation (a.k.a., flagship), its subsidiaries, affiliates and joint ventures, its suppliers and subcontractors, its distribution channels and value-added resellers, as well as its R&D alliances and a variety of cooperative agreements, such as standards consortia (Ernst, 1997 and Sloan, 2000). The firm (a.k.a., flagship) breaks down the value chain into a variety of discrete functions and locates them wherever they can be carried out most effectively, where they improve the firm's access to resources and capabilities, and where they are needed to facilitate the penetration of important growth markets.

The main purpose is to gain quick access to lower-cost foreign capabilities that are complementary to the flagship´s own competencies. Outsourcing allows firms to focus on core business and improve efficiency. Outsourcing companies usually outsource a number of functions and the efficiency gains depend on the ability for the suppliers to deliver the required quality at the right time.

GPNs are market-driven based on concentration of trade, proximity, scale economies and efficiency. Its international dimension particularly that of vertical specialization, takes advantage of differences in comparative advantage between countries at a finer level of specialization than trade motivated by comparative advantage at an industry level.

In a number of industries the vertical stages of production differ largely in their factor intensity. Some stages are labor-intensive, others are capital-intensive while yet others use skilled labor intensively. In the electrical machinery and electronics sectors, for example, product development is highly skills-intensive and could be located in a country rich in skilled and professional workers. GPNs, therefore, influence factor market relationships as in technology transfer, workforce quality, skills, work attitudes, institutional relations, industrial relations, civic capacity, civil society, even ecosystems over and above government-to-government interactions.

Meanwhile, the success of networks depends on how network boundaries and composition are defined, what are the critical ingredients or factors for their development and success, how to balance autonomy and interdependence, how to manage public-private interface and how to evaluate network performance. These factors can be artificially induced by states as part of industrial policy. In high-technology industries, for example, (i.e., electronics and high disk drives) state agencies have redesigned the domestic architecture of supply infrastructure in critical technologies to enable domestic firms and MNCs to compete effectively (Mathews, et al, eds 2000, Gray and Dunning, 2000 and McKendrick, et al, 2000). The defining feature of GPNs is local participation. Domestic firms ratchet up and leverage themselves more competitively and securely to partner MNCs.

Given their scope and complexity, GPNs are expected to increasingly influence the nature and span of regionalism from the institutional and policy perspectives. The multilateral system will ultimately matter most for GPNs and MNCs. Thus, there is a need to balance

GPNs/regionalization and regionalism on one had, and square off new regionalism with multilateralism on the other.

II. FRAMEWORK

Value chain analysis provides a framework for understanding the concrete actors in these Philippine industries. "A production network approach adds to the picture by encouraging us to focus on the connections between firms and subsidiaries, not only the vertical linkages that comprise the value chain, but also the horizontal ones between firms and various other actors" (Sturgeon, 2000).

A final product, before it reaches the end consumers, goes through a sequence of productive activities in the process of their transformation from raw materials to the final product. These series of productive activities is called a value chain. A value chain is formally defined as "the linked set of value-creating activities all the way from basic raw material sources for component suppliers through the ultimate end-use product delivered into customers' hands" (Shank, 1989). There are three kinds of value chains. The simple value chain (Appendix D), the extended value chain (Figure 2) and the production network, which is a combination of two or more value chains (Figure 3).

In this era of rapid globalization to stay in the market producers have to withstand tough competition. Efficiency in production, meaning an increase in value at constant price or a decrease in price with the value of the product remaining constant, and an understanding of the dynamic factors within the value chain are of utmost importance.

In lieu of this, Value Chain Analysis, which in literature is viewed as a core analytical tool of strategic management accounting (Porter, 1985), can be used to study the value chain and have a better position in the market as a result. The basic idea of the value chain analysis is to break up the chain of activities that runs from basic raw materials to end-use customers into strategically relevant segments in order to understand the behavior of cost and the sources of differentiation" (Shank and Govindarajan, 1992)

A. Methodology

To meet the abovementioned objectives, the study will make use of descriptive and statistical analyses and will heavily rely on secondary data, with particular focus on the patterns of production, subcontracting arrangements, trade and investment. The study will compare and contrast the development of Philippine industries - the semiconductor, automotive and garments industries, in particular – with the leading sectors in Asia and the United States.

B. The Role of Regional Trading Agreements

1. Trade Liberalization and GPNs

The rate of growth in the value of international trade has been strong and since the mid-1980s has consistently exceeded that of world output. This has been accompanied by a growing participation of developing countries in world trade over the past three decades– between 1970 and 2000, the share of developing countries in global merchandise trade rose from about one-fourth to almost one-third – and by a rapid transformation in the composition of their exports from primary commodities to manufactures, particularly since the early 1980s: manufactures

now account for 70 per cent of developing country exports, after stagnating at around 20 per cent in the 1970s and early 1980s.

Feenstra (1998) suggests four possible factors to explain the growth of world trade: trade liberalization, falling transportation costs, income convergence among the main trading economies, and increased vertical international production sharing Several empirical studies have tried to disentangle the relative importance of these factors. Concentrating on the growth in trade relative to income among a group of 16 developed countries, and hence not considering the impact of vertical international production sharing, Baier and Bergstrand (2001: 21), for example, conclude that 'trade liberalization appears to have contributed about 75% of the (approximately) 2% annual growth of world merchandise trade as a share of income in the post-war period compared with transport-cost declines, which have contributed only 25% of the growth in trade relative to income'.

Moreover, international production sharing appears to be more a product of bilaterally or multilaterally negotiated preferential agreements. While it is difficult to determine the impact of tariffs on production sharing, there is evidence to suggest that, in addition to geographic proximity and significant differences in wage rates, vertical production sharing has been stimulated by discriminatory country-specific concessions for specific products under various preferential trading agreements, rather than by tariff declines that are the result of multilateral trade negotiations and apply equally to all countries.

The Philippines, since the beginning of 1980s, has been implementing trade and investment policies that have been made gradually liberal and open. The reforms were aimed at fostering greater openness as well as promoting an outward-oriented industrialization strategy; carried out in various stages involving unilateral, regional and multilateral liberalization.

An example of the unilateral trade liberalization program carried out starting 1981 is the progressive reduction in tariffs known as the Tariff Reform Program (TRP). The TRP, carried out in three stages, reduced the overall level of protection and the dispersion of tariff protection within and across sectors and industries. TRP I, implemented from 1981-1985, eliminated tariff rate from a peak of 100% to a maximum of 50%. From 1991 to 1995, under TRP II, the maximum tariff rate of 50% was maintained. TRP III, carried out from 1996 to 2003, imposed a uniform tariff rate of 5% by 2004.

Regional efforts included the Philippines' commitments to the ASEAN Free Trade Area (AFTA), which reduced intra-regional tariff rates to 0-5% from 1993 to 2002. These rates would be brought down to 0% by 2010 for original ASEAN members and 2015 for new members. Membership to the Asia Pacific Economic Cooperation (APEC) led to commitments for free and open trade and investment in the region by 2010 for developed economies and 2020 for developing economies.

Meanwhile, active membership to the World Trade Organization (WTO) paved the way for the country's pursuit of liberalization in world arena. Commitments to the WTO included the binding of tariffs at rate of 10 percentage points above 1995 ceiling rate from 1994 to 2004. Table 1 shows the level of WTO tariff bindings by product group.

Table 1: Scope and Level of Tariff Bindings in the WTO, by Product Group, Philippines

Product Group	Scope of Binding	Level of Binding			
		Up to 10%	11%-20%	Above 20%	Above 40%
Agriculture, excl. fish	100.0	3.1	6.2	90.4	68.2
Textiles and clothing	98.6	0.6	4.7	94.7	2.0
Non-electric machinery	71.8	20.2	66.3	13.5	2.7
Chemicals	71.3	17.4	69.6	13.0	3.1
Electric machinery	58.1	35.1	31.4	33.5	22.6
Minerals	41.9	45.2	20.7	34.1	20.0
Wood, paper, furniture	37.6	21.6	28.0	50.4	8.0
Leather, rubber, footwear, travel goods	36.4	16.2	22.1	61.7	42.6
Transport equipment	32.5	35.8	43.4	20.8	7.5
Metals	31.4	12.7	38.7	48.5	7.3
Fisheries	5.5	30.0	0.0	70.0	40.0
Petroleum, energy	0.0	0.0	0.0	0.0	0.0
Other manufactures	46.0	33.8	30.3	35.9	25.5

Source: Bureau of International Trade Relations–Department of Trade and Industry, 2001

As Medalla (2002:140) puts it, "By ridding market distortions, trade liberalization would espouse greater reliance on the market, foster competition, and provide an even playing field which would encourage the development of industries with real comparative advantage".

Undeniably, the reforms led to increases in total trade (refer to Appendix A) as well as to an improved structure of protection as evidenced by the declining overall average effective protection rates from 38% in 1985 to about 11% 2004 (refer to Table 4).

Table 4: Philippine Average Protection Rates, 1985-2004

(in percent)

Sectors	1985	1990	1995	2000	2001	2002	2003	2004
Agriculture	9.20	23.63	22.00	14.84	15.68	20.76	20.60	20.08
Mining	6.10	1.67	1.43	0.43	0.36	0.33	0.39	0.42
Manufacturing	55.90	31.02	23.09	17.78	14.31	12.41	11.26	9.94
Overall	38.00	27.86	21.91	16.30	14.10	12.62	11.77	10.76

Source: Philippine Tariff Commission

Philippine foreign trade grew at an average of 9% annually from 1980 to 2003. The highest growth rates, of at most 26%, were posted well after the implementation of the unilateral trade reforms in 1981. Indeed, except for a few isolated years, Philippine foreign trade grew at double-digit rates after 1985. Exports during the same time period exhibited rapid growth (refer to Appendix B), 29% at its highest point in 1995. On the average Philippine exports increased at 9.61% per year from 1980 to 2003. Furthermore, Table 4 shows that while the agricultural sector's EPR rose from 9% in 1985 to 20% in 2004, the mining and manufacturing sectors experienced significant reductions in their EPRs for the same period, from 6% to 0.42% and from 55.9% to 9.9%, respectively.

Finally, studies by Pineda (1997) and Medalla (2002) showed that the Philippine manufacturing sector was to able to increase its competitiveness from 1983 to 1994 as evidenced by falling DRC/SER ratios (refer to Table 5).

Table 5: Philippine Manufacturing Sector Resource Allocation & Efficiency, 1983, 1988, 1994

DRC/SER	Efficiency Classification	Share in Production Value (%)		
		1983	1988	1994
0 < DRC/SER < 1.0	Highly efficient	18.8	39.5	41.6
1.0 < DRC/SER < 1.5	Efficient to mildly inefficient	28.7	22.8	37.9
1.5 < DRC/SER < 2.0	Inefficient	12.3	14.7	7.6
DRC/SER < 2.5	Highly inefficient	39.6	21.8	12.9
Average DRC/SER		**1.7**	**1.5**	**1.2**

Sources: Pineda (1997) and Medalla (2002)

2. Foreign Direct Investments and GPNs

Foreign direct investment supplies a package of production procedures, quality control practices, management, and marketing and human resource techniques that can – under appropriate conditions – place a host country industry along the frontier of best practices in the international industry (Romer 1993, 1994). The contribution of this foreign direct investment package to host country development may – again, under appropriate conditions – be highly dynamic, with a continuous upgrading of the technical procedures, quality control practices, management and marketing and human resource techniques on a real time basis.

Foreign direct investment can make the most extensive and vibrant contribution to host country growth and development when the parent corporation has made the affiliate an integral part of the firm's strategy to maximize its corporate position in world markets. To accomplish this, the parent corporation almost always insists upon wholly-owned status for the affiliate, combined with freedom to use inputs from wherever price, quality, and reliability are most favorable.

The experience of the computer/electronics industry in Southeast Asia has provided the clearest evidence of the process in which affiliates tightly integrated into the regional or global sourcing network of the international investor offer greatest potential to enhance the growth and development of the host country. But similar dynamics resulting from the potent interaction between parent and local subsidiary are present in other sectors as well (Gereffi, 1995).

Over the course of the late-1980s and 1990s, it became apparent that the computer/electronics industry was starting to structure production in Southeast Asia as an integral part of the parents' strategy to advance and defend their competitive position in home country markets and around the world. The interaction between design functions and assembly functions became more intimate: the incorporation of latest technologies, quality control procedures, and management techniques speeded up; the pace of upgrading production processes and production output responded to the cycle of innovation in home country markets (Gereffi, 1995).

Borrus, et al. (1999) and others documented a progression in which foreign multinationals moved their affiliates up the ladder from hand assembly of printed circuit boards, to responsibility for process design and even product design of complex subsystems. McKendrick, et al. (2000) provide a particularly vivid analysis of the increasingly close and brisk interaction between parent and affiliate in the international disk drive industry. The idea of shopping around for cheap inputs became a less and less satisfactory way to characterize the parental supervision within multinational supply chains in computers/electronics.

The impact from foreign direct investment in assembly and processing varies greatly, of course, by industry sector – from low-skill intensive footwear and garment operations in the Philippines and El Salvador, to more sophisticated automobile engine plants in Thailand and Brazil, to cutting-edge disk drive factories in Singapore and Mexico. The creation of integrated international supply chains via foreign direct investment enables host economies to perform activities they already undertake more efficiently. More importantly, it allows host economies to enter entirely new realms of industrial production (Gereffi, 1995).

Indeed, empirical estimates of the benefits from trade and investment liberalization that permit the establishment of international supplier chains between developed and developing countries reach 10 to 20 times conventional measurements of the results for trade liberalization alone (Romer 1994). When there are economies of scale in crossborder production networks, the results are larger still, with the great majority of the benefits showing up in enhanced efficiency and greater exports from the developing country economy (Lopez-de-Silanes, et al. 1994; Markusen, et al. 1995).

Regional trading agreements, therefore, if the goal is to promote linkages to the global production network, should focus on commitments that would lower trade barriers between countries and reduce the restrictions on foreign direct investments for the industries the economic block would like to promote.

3. Semiconductors and Electronics Industry

The use of electronics in industry dates back to the 1920's, particularly during the early days of radio broadcasting in the United States. The "new" technological innovation led to annual sales of close to $50 billion on consumer electronics in the United States alone. Almost eight decades later, this technology based on the controlled flow of electrons or other carriers of electric charge, became the foundation for the invention electronic products consumers enjoy today such as televisions, cellular phones, radios, radars, and other products (Columbia Encyclopedia, 2004).

Thus, defining the electronics industry is tricky. Afuah (1997) has shown that products are insufficient to define an industry when specialized suppliers exist; when there is complex market segmentation and abrupt change in demand patterns; when there is intense and unpredictable technical change; and when financial institutions accelerate the pace of industrial restructuring and increase uncertainty. Not only do all these conditions prevail in the electronics industry but key sectors are also in turmoil, with the between sectors boundaries changing incessantly. Given these limitations, the definition that this paper will adopt will include hardware (i.e. electronics equipment and components) software, information services, and a variety of newly emerging markets that result from the convergence of digital information, audio and video, and communication technologies (i.e., internet services).

Production of semiconductors, and microprocessors, which constitute key components of most products in the electronics sectors (and other industries as well), is capital-intensive. Assemblage of the final products, however, is labor-intensive and could be located in a labor-rich country. The continually expanding market for its products offered various opportunities for multinational corporations to locate in the developing world. Subsequent geographical shifts in production of electronic products can be traced to the decade of the '50s. Electronics companies from the United States, then the world leader in electronics production, first explored prospects in Japan. These companies eventually reached the shores of Hong Kong, the Republic of Korea, Taiwan, Singapore, Brazil, India, Mexico, and more recently, China and

some South East Asian countries like Indonesia, Malaysia, Thailand, and of course, the Philippines (Salazar, 1998).

Moreover, the nature of electronics production evolved to the specialization we observe today. Capital-rich countries like the United States and Japan manufacture the key components and develop the technology required for its expanded application while labor-rich countries concentrate on assembling the final products.

Globalization in the electronics industry combines a massive, yet highly concentrated, international dispersion of the value chain with an important organizational innovation, the spread of global production networks (GPN). These networks are a response to the increasingly demanding coordination requirements of geographic dispersion, and integrate the dispersed supply and customer bases of a global network flagship company (e.g., Compaq, IBM or NEC).

The production process of electronic products consists of four main activities: wafer design, wafer fabrication, assembly, and product testing. Wafer design and wafer fabrication are capital-intensive processes which are usually performed by industrialized countries like the United States. These processes are classified in the upper segment of the production network.

On the other hand, assembly and product testing are labor-intensive processes and are usually conducted by labor-intensive countries. These processes are classified in the lower segment of the production network, which are produced by like China and the Philippines. The reason is that labor is very cheap in these countries compared to industrialized countries (Salazar, 1998). Figure 4 shows the different processes in the electronics industry's value chain.

A critical capability for the creation of GPNs in the semiconductor industry is the intellectual property and knowledge associated with setting, maintaining and continuously upgrading a de facto market standard. This requires perpetual improvements in product features, functionality, performance, cost and quality. It is such "complementary assets" (Teece, 1986) that the multinational corporation increasingly outsources. This has given rise to a proliferation of specialized suppliers, segmenting the industry into separate, yet closely interacting horizontal layers (Grove, 1996).

For the semiconductor industry, the availability of standard components, which allows for a change in computer design away from centralized (IBM mainframe) to decentralized architectures (PC, and PC-related networks) served as a vehicle for the creation of GPNs. Standard components made it possible for new options to emerge for outsourcing, transforming what was once a vertically integrated industry into horizontally disintegrated, yet closely interacting market segments (i.e., integrated circuits, board assembly, disk drives, operating systems, applications software, and networking equipment). Over time, each of these individual market segments became rapidly globalized.

A case in point, there is a huge gap between the US share of world exports (18%) and its market share based on company ownership (32%), which suggests that a very high share of US production of semiconductors is taking place overseas. The same is true for Asia, where the gap between ownership-based and export market shares is higher at 38% by country of origin, versus 19% by ownership. Asia, seemingly, has attracted the bulk of investments not only from the US but also from Japan and Europe.

Geographic dispersion however is heavily concentrated on a few specialized local clusters. The hard disk drive (HDD) industry provides an example both for the breath-taking

speed of geographic dispersion, as well as for its spatial concentration (Ernst, 1997, Sloan) Until the early 1980s, almost all HDD production was concentrated in the U.S., with limited additional production facilities in Japan and Europe.

Today, only 1 percent of the final assembly of HDDs has remained in the US, while Southeast Asia dominates with almost 70% of world production, based on units shipped. Slightly less than half of the world's disk drives come from Singapore, with most of the rest of the region's production being concentrated in Malaysia, Thailand, and the Philippines.

Multinational corporations dominate the Philippine electronics industry. The key players, the companies with the largest market share, are mostly of American and Japanese origins (refer to Appendix C). The three largest electronic manufacturers – Intel Corp., Amkor Technology Inc., and Texas Instruments Inc. – and other chip companies have invested more than $5 billion in the country since 1996 (Frank, 1999).

Intel Corp., one of the leading electronics manufacturers in the country, a $500 million plant in the late 90's to assemble Pentium III chip and other leading products. Amkor's expansion of one of its assembly-test plants employed an estimated 10,000 Filipinos. Texas Instruments spent $45 million on expansion in 1997 for its digital processing signal chips. Other leading companies situated in the Philippines are Fujitsu Computer Products and Gateway Electronics Corporation with investments reaching $1 billion in 1996 (Frank, 1999).

Initially, for foreign investors are attracted to the Philippines due to its supply of well-educated laborers. (Frank, 1999) An English speaking country, Filipino workers are able to communicate effectively with their foreign employers. Moreover, these laborers are willing to accept wages that are at least 30% lower than wages in Malaysia and other neighboring countries. Compared to Indonesia, China, Thailand, Malaysia and Singapore, the Philippines has the third lowest standard monthly salaries the electronics sector's director for manufacturing at $2368; third lowest salary for plant/factory manager at $1623; second lowest for engineer at $547; and the second lowest for production supervisor at $449 (refer to Table 7).

Table 7: Monthly Salaries of Employees of Electronic Sector
(in USD)

Country	Director Manufacturing	Plant/Factory Manager	Engineer	Production Supervisor
Indonesia	2180	915	533	315
China	1866	1399	746	589
Philippines	2368	1623	547	449
Thailand	2772	1931	927	618
Malaysia	4364	2033	1171	728
Singapore	6740	4639	2290	1847
USA	11592	8025	5460	3917

Source: SEIPI, 2002

Despite the seemingly the proliferation of MNCs in the country, country's electronics sector suffers from low technological and local content, which hampers its potential. Much of the activity in MNC affiliates is still at the simple assembly and testing level (despite the fact that some MNCs use local engineers for advanced activities). This may not constrain exports for the time being, but the capabilities developed for low-level assembly may not automatically grow into those needed for more advanced products and processes.

Indeed, in the semiconductor chain found (Figure 4), the Philippines is located in the last two columns, the lower end of the chain, testing and assembly. Most local MNCs import the wafer and lead frames. These are then assembled, tested, and exported either to the mother companies or to end-users like television manufacturers or cellular phone producers (Salazar, 1998). Only a handful local or indigenous companies performs upper segment activities (i.e., software and design system and research and development on printed circuit boards and smart cards).

What accounts for the local industry's inability to advance to the upper segment of the electronic global production network? According to Delfin Sabido IX, director of the Advanced Science and Technology Institute (ASTI), one reason is the quality of the country's engineering graduates (Ramos, 2003); alluding to a weak academe- industry linkage. Armenia Ballesteros, director of Electronics and Information Technology Department of the Board of Investments, adds quantity of engineering graduates as a second reason. Moreover, Ballesteros claims that the Philippines has limited market access and source of prototyping materials, inadequate incentives to develop new products, and high cost of raw materials (Burgonio, 2003). Added to the high cost of power, poor infrastructures, and shaky security (Macaraig, 2003), potential investors in upper segment processing, therefore, choose alternative host countries.

To illustrate, SEIPI claims that electricity makes up a large percentage of the electronic industry's cost. Intel, for example, allots 41% of their budget to electricity; Texas, 25%; and Team Pacific, 13%. Cost of electricity per kilowatt hour in the Philippines is YS$0.10. Thailand, Malaysia, China, and Indonesia are $0.08, $0.06, $0.04, and $0.02 respectively. The cost of power in the Philippines is therefore the highest among these five countries. SEIPI further reports that electronics companies in Malaysia are mostly capital-intensive, upper segment, but their budget for electricity is only 10% of the total costs (SEIPI, 2002).

As for infrastructure, the Philippines have poor roads, highways, buildings, and other infrastructures. The sporadic terrorism, hi-jacking, and other serious criminal activity drive away investors partially explaining the poor transfer of technology to the local industry (Macaraig, 2003).

Moreover, unpredictable minimum wage increases discourages potential foreign investors. According to SEIPI, there has been a 93% increase in minimum wage from 1995 to 2002. This is much too high compared with Thailand that only had a 22% increase in minimum wage for over 9 years. As of 2002, the labor cost per hour in the Philippines is $1.70. China's labor cost per hour is only $0.04, and Indonesia's is only $0.01 (SEIPI, 2002). In terms of labor cost, it is reasonable for investors to flock to China and Indonesia.

Finally, Malaysia, China and Thailand offer lower tax rates and more incentives than the Philippines. The Philippines has the highest tax rates at 32% compared to China's and Thailand's 30% and Malaysia's 28%. Furthermore, China offers a 100% tax refund for export oriented enterprises while Malaysia give a 60-100% tax allowance for capital expenditure as well as a 60% allowance for reinvestment. The Philippines has no such provisions (refer to Table 7).

Thus, despite the country's markets all over the world, in terms of competitiveness, the Philippines is ranked 40th compared to Singapore at 5th, Malaysia at 26th, China at 31st, Thailand at 34th, and Indonesia at 37th.

Among the perceived weaknesses of the local electronic sector, is its weak linkage with multinational corporations. Philippine electronics manufacturers are kept at the assembling stage, which requires little, if any, infusion of new technology. Yet, with the rapid change in semiconductor technologies are subject to rapid change, without a flexible and advanced base the Philippines, the local industry may not be able to prevail over its lower cost competitors. There is also the possibility that new technologies will not be sensitive to labor costs, but seek locations that offer advanced production, design and supply capabilities despite higher wages.

Low local value added in the Philippines is another reflection of its weak technological capabilities. Average local content is only 20% in semiconductors. It is higher, 25%, in simple items like printed circuit boards and lower, 10-15%, in complex products like microprocessors (made by companies like Intel), below the average levels reached in Malaysia (around 45%) and Taiwan (75%).

It is widely acknowledged that local supplier capabilities (especially among SMEs) are weak; they need to be strengthened if local content is to keep rising. There are practically no local producers with the capability to take on original equipment manufacture (OEM), which was one of the main arrangements used by firms in Korea and Taiwan to access new technologies and export advanced electronics products.

The most important immediate issue facing the Philippines in the competitiveness area is clearly the sustainability of the electronics export boom. However, there are other important, longer-term, strategic issues related to export competitiveness: the overwhelming dependence on one activity is risky, labor-intensive exports show disturbing signs of declining competitiveness, and institutional support for the upgrading of enterprise capabilities remains in adequate. It is not possible to give an unequivocal answer to the issue of electronics export sustainability.

The critical factor is the international sourcing pattern of leading US and Japanese multinationals, and these are based on economic as well as other factors (including corporate strategies). It is not immediately obvious why there has been a regional shift in sourcing of semiconductors towards the Philippines from traditional centers like Malaysia.

Nonetheless, electronics remains to be the Philippines' major export commodity since the decade of the 90s. In 2003, electronics products accounted for more than 40% of the country's total sales abroad. As contained in Appendix E, except for declines in 2001 and 2003, foreign sales grew on the average of roughly 24% per annum. Bulk of these products, about 78.5%, is accounted for by components/devices, also known as, semiconductors (refer to Appendix F). The balance includes foreign sales of electronic data processing, office equipment, consumer electronics, telecommunications, communication/radar, control and instrumentation, medical/industrial instrumentation, and automotive electronics.

Although the latter sub-industries make up least part of the total electronics exports, they appear to be among the fastest growing sectors. For example, the office equipment, which accounts for a mere 0.34% of total electronic exports has largest growth rate, 2547.80%. Likewise, medical/industrial instrumentation, which has the least percentage share to total exports, less than 1%, has a growth rate of 54.34% - greater than the components/devices' growth rate of 22.83% (refer to Appendix G).

The Philippines' biggest market for electronics is the United States. It absorbs 26% of the country's foreign sales. Europe is a close at 22%; followed by other Asian countries at 21%.

The ASEAN countries make up 17% of the market, Japan at 11%, and other countries at 3%. (SEIPI, 2002)

Sustaining the growth of the sector, however, requires an integrated effort in addressing the problems identified above. The most important of which is strengthening the local industry's linkage with the electronics industry's global production network. Moving up the chain would lead to the transfer of newer technologies to the local manufacturers, increased competitiveness and the production of higher valued added products.

4. Automotive Industry

The manufacture of automobiles in the Philippines used to be a typical import substitution industry. In the early 70s, the government began to implement policies geared towards rationalizing production and furthering technological development in the hopes of taking advantage of the opportunities offered by an increasingly competitive environment in the world market.

Among the first vehicle manufacturing programs to be employed are the Progressive Car Manufacturing Program (PCMP), the Progressive Truck Manufacturing Program (PTMP) and the Progressive Motorcycle Manufacturing Program (PMMP). Designed to protect the more than 20 car companies that made up the industry in the 1970s, they succeeded in producing more than 30 vehicle brands and 100 models.

Moreover, the programs led to the creation of three important policies. First, the closure of the domestic auto market to CBU imports. Second, they resulted to the reduction of the total number of car assemblers from more than 20 to five (5). Third, mandatory local content was required for locally assembled vehicles. Soon after the implementation of these coordinative programs, the Philippine automotive market grew strongly.

Since production of automobiles requires a large number of components, the industry has also developed extensive and sophisticated division of labor and production networks. These programs attracted foreign car and components manufacturers to locate in the archipelago.

The early 1980s, however, were a difficult time for the Philippine automobile market, with international economic crises and a domestic economic slowdown affecting the industry. Vehicle sales decreased significantly as regulations became more demanding of automotive companies, especially as it related to foreign exchange requirements. By the mid-1980s, the competitive landscape had changed drastically as many of the assemblers had withdrawn from the country, and only Mitsubishi and Nissan remained.

In 1987, new Motor Vehicle Development Programs (MVDP), particularly Car Development Program (CDP), the Commercial Vehicle Development Program (CVDP) and the Motorcycle Development Program (MDP), were created in recognition of the sector's potential to spur economic growth. They were instituted in the hopes of revitalizing the sector.

Meanwhile, within the framework of ASEAN, a number of initiatives to advance regional cooperation in the automobile industry have been attempted, but their results have been rather disappointing. For example, Brand-to-Brand Complementation (BBC) was introduced in 1988, and allowed auto assemblers to obtain privileges of a 50 percent tariff reduction for imports of components.

Gradual liberalization continued in last decade of the 20th century both in the local and regional fronts. The Philippine government created the People's Car category immediately followed by the creation of the luxury car category two years later. In 1994, additional access was granted through the ASEAN Industrial Joint Venture (AIJV) Scheme. All closed categories, in 1996, such as the People's Car category, which includes vehicles with less that 1,200cc, were opened up to new participants, subject to certain investment requirements for components manufacturing under the MVDP. The importation of all types of vehicles was, and continues to be, liberalized, with the intention of dropping all local content requirements in an expeditious manner. The important vehicle categories in the Philippines include the following: 1) Passenger Vehicles, which include the People's Car, Sub-compact and Compact Cars, and Luxury cars; and 2) Commercial Vehicles, which include the Asian Utility Vehicle, Light Commercial Vehicles, and Trucks and Buses.

Although automobiles and automotive components are also subject to AFTA, tariff reduction in this sector has made little progress. In response to Malaysia's request to delay reducing automobile tariffs for two years from 2003 to 2005, ASEAN members set a protocol in November 2000 establishing the procedure for member countries to temporarily delay the tariff reduction schedule. It is not clear if Thailand, Indonesia and the Philippines will reduce their tariffs on automobiles and components to 5 percent by the year 2003, as originally planned. Reflecting this tariff situation, most of the car assemblers and components manufacturers currently utilize the ASEAN Industry Cooperative Organization (AICO) scheme, which succeeded BBC in 1996.

As a result of the BBC scheme, which was succeeded by the AICO, car manufacturers developed a system of regional complementation of key components. Under the arrangement, the Indonesian subsidiary specializes in production of gasoline engines, the Thai subsidiary in diesel engines, the Philippine subsidiary in transmissions, and the Malaysian subsidiary in steering gears and electrical parts. Each subsidiary purchases components from suppliers in the respective country, makes a CKD (completely knocked down) consisting of components manufactured in its own factory and purchased from suppliers, and the package is then exported to subsidiaries in other ASEAN countries for final assembly. This form of complementation is widely adopted by car assemblers utilizing the AICO scheme.

The reason why this form of complementation had to be adopted was because authorities of respective ASEAN member economies grant AICO privileges to companies fulfilling certain criteria. One of the criteria is the sharing of resources among member economies, which implied each of the company's ASEAN subsidiaries involved in the AICO arrangement should be engaged in value-adding activities. Because of this condition, simple trading of completely-built-up-cars (CBUs) was not allowed as an AICO arrangement. Automotive assemblers, including Company C, proposed the scheme of consolidated purchasing of components from suppliers in the respective countries and regional complementation of CKD packages, in order to meet this requirement.

Each subsidiary specializes in production of semi-finished components, which are exported to other regional subsidiaries to assemble finished components. For instance, its Thai subsidiary specializes in production of several components including starters and alternators, the Indonesian subsidiary in compressors, the Philippine subsidiary in meters, and Malaysian subsidiary in condensers. The division of labor seems to have evolved gradually while the company was expanding its operations in ASEAN, rather than as an overall restructuring of the regional operations.

The current Philippine excise tax rate for automotive vehicles is based on engine displacement, as opposed to vehicle value. This system imposes a competitive disadvantage on imported vehicles with larger engine displacement, including many U.S. exports. Current tax rates for motor vehicles with gasoline engines are: 15 percent for engines up to 1600 cubic centimeters (cc), 35 percent for those with engines between 1601-2000cc; 50 percent for those between 2001-2700cc; and 100 percent for those with engines 2701cc and above. For motor vehicles with diesel engines, excise tax rates are 15 percent for engines of up to 1800cc; 35 percent for those with engines between 1801-2300cc; 50 percent for those with engines between 2301-3000cc; and 100 percent for those with engines 3001cc and above.

At present, the Philippine motor vehicle industry is comprised of two sectors: the motor vehicle assembly and the motor vehicle parts and components manufacturing. The motor vehicle assembly sector is grouped based on the type of motor vehicles, such as passenger cars, commercial vehicles (utility vehicles, pick-ups, vans, trucks, buses, special purpose vehicles) and motorcycles. Appendix E lists the number of participants per sub-sector as well as each category's total capacity per year. At this time, the industry is operating at an estimated 40% of its capacity.

In terms of ownership, the industry is dominated by Japanese automobile manufacturers (refer to Appendix F). Toyota Motor Philippines, Honda Car Philippines, Inc. and Isuzu Motor lead the local industry in investments and employment. Other principal motor vehicle manufacturers are Ford Motor Co. Phils., Columbian Autocar Corp., Pilipinas Hino Inc. and Norkis Trading Company.

Domestic sales in the past seven years, 1995 to 2001, have been fluctuating at best. Rising real income and a general optimism about the future performance of the Philippine economy led to the most number of passenger cars, 21.1% increase, and commercial vehicles, up by 10.2%, sold in 1996 (refer to Appendix G). The Asian financial crisis, which resulted in the depreciation of the Philippine peso in 1997 and a slowdown in the economy in the succeeding years, resulted in steep declines in domestic automotive sales, particularly in the passenger cars sub-sector. Consequently, vehicle sales growth went down by double-digits. For passenger cars, the drop continued until 2001, with only 21,728 units sold. The commercial vehicles sub-sector, on the other hand, appears to be recovering. Sales in 2001 have already surpassed the pre-crisis level.

The parts and components manufacturing sector comprises of 256 companies producing various parts and components made of metals, plastic, rubber, and composite materials for both the OEM and replacement markets. The principal components manufacturers are Yazaki-Torres Manufacturing Corp. (wiring harness), United Technologies Automotive Phils. (wiring harness), Temic Automotive (Phils.) Inc. (anti-brake lock system), Honda Engine Manufacturing Phils., Inc. (engines), Asian Transmission Corp. (automotive transmissions), Toyota Autoparts Phils. (automotive transmission), Fujitsu Ten corp. of the Phils. (car stereos) and Aichi Forging Co., Inc. (forged parts). By end of 1999, the parts industry contributed investments of approximately PHP27 billion, employment of 45,000 and export of over US$1.1 billion (refer to Appendix H), which has increased more than ten-fold from 1988 level.

Looking toward the future, it is not surprising that the country is increasingly focusing on the production of exportable components and strengthening ties with multi-national suppliers in order to secure global sourcing contracts. The government plans to further develop its parts

industry by attracting new foreign investment in strategic parts, allowing suppliers to access raw materials at favorable tariff rates and rationalizing tariff structures.

5. Garments and Textile Industry

A migratory industry, market access, the operations of multinational producers, and the allocation of quotas under the MFA are significant influences on the pattern of garment exports. In Asia, the export thrust has come mainly from local (and regional) firms, while in Latin America foreign (particularly the United States) affiliates have been predominant. The MFA has long dictated the location of garment exports, and has sheltered many quota holders from the full force of competition. Its abolition by 2005 will lead to a massive 'shake-out' in all exporting countries.

The OECD market has been moving to higher quality products, where the cost of labor per se counts for less. Wages will remain the overwhelming consideration for the slowly diminishing segment of the lowest quality products. In others, technology, specialization, design, marketing and flexibility will be the dominant competitive factors.

Table 15 shows that in 2001 the world largest garments exporters is a mixture of labor abundant, subcontractor economies (i.e., China, Mexico, India, Bangladesh and Indonesia) and advanced economies whose contribution to the production of garments leaned more on technology, design and marketing (i.e., Italy, Hong Kong and Germany).

Table 15: World's Largest Garments Exporters, 2001

Rank	Country	Value of Exports to the World Market (in USD million)
1	China	36,108
2	Italy	13,596
3	Hong Kong	9,222
4	Mexico	8,571
5	Germany	7,416
6	Turkey	7,336
7	France	6,697
8	India	6,682
9	Bangladesh	5,153
10	Indonesia	4,589

In order to cope with the strong competition from both domestic and foreign producers of garments, leading apparel manufacturers in the United States and Europe are adopting "strategies that will alter the content and scope of their global sourcing networks" (Gereffi, 2001). The approach includes "shrinking their supply chains and using fewer but more capable manufacturers". Moreover, they are "discontinuing certain support functions (such as pattern grading, marker making, and sample making), and reassigning them to contractors and adopting more stringent vendor certification systems to improve performance." Finally, "they are shifting the geography of their sourcing configuration from Asia to the western hemisphere" (Gereffi, 2001).

Thus, "the decision of many larger manufacturers in developed countries is no longer whether to engage in foreign production, but how to organize and manage it" (Gereffi, 2001). Similar to other GPNS, flagships supply, or designate a supplier within the network, intermediate

inputs (cut fabric, thread, buttons, and other trim) to extensive networks of offshore suppliers, "typically located in neighboring countries with reciprocal trade agreements that allow goods assembled offshore to be re-imported with a tariff charged only on the value added by foreign labor" (Gereffi, 2001).

This kind of international subcontracting system exists in every region of the world. It is called the 807/9802 program or "production sharing" in the United States (USITC, 1997), where the sourcing networks of U.S. manufacturers are predominantly located in Mexico, Central America, and the Caribbean; in Europe, this is known as outward processing trade (OPT), and the principal suppliers are located in North Africa and Eastern Europe; and in Asia, manufacturers from relatively high-wage economies like Hong Kong have outward processing arrangements (OPA) with China and other low-wage nations (Birnbaum, 1993).

In the Philippines, the garments industry started in the late 1950s as a group of cottage-level enterprises that replaced the traditional home sewing, dressmaking, and tailoring establishments. Through government support in the form of incentives and liberal credit facilities, the garments industry has become one of the Philippines' most competitive industries, contributing an annual average of PHP12.5 billion to the country's gross national output from 1998-2002, accounting for about 5.28% of the manufacturing sector's value added and steadily growing at an average rate of about 2.55% per year during the same period (refer to Table 16). The latest Philippine Census of Establishments reports a total of 2,025 garment firms with an average total employment of ten (10) or more workers as belonging to the sector in 1998, accounting for 12.92% of the total number of establishments of the same category in the Philippine manufacturing sector. Employment in the industry was placed at 156,989, or 13.61% of total manufacturing employment, in 1998 with total compensation of PHP10.61 billion during the same period.

Table 16: Philippine Garments Industry Value Added, 1998-2002
(in 1985 prices)

Year	Garments Industry Value Added (in PHP million)	Growth (in %)	Percentage Share in Total Manufacturing Value Added
1998	12,699	2.78	5.74
1999	10,801	(14.95)	4.81
2000	12,327[a]	14.13	5.20
2001	12,801[a]	3.85	5.24
2002	13,688[a]	6.93	5.42
Average	**12,463.2**	**2.55**	**5.28**

Note: [a] Data are as of May 2003
Source: 2003 Philippine Statistical Yearbook, NSCB

Table 17: Change in the Number of Philippine Garment Firms and its Employment Level, 1997-1998

Year	Number of Firms		Number of Paid Employees[a]	
	Garments	Manufacturing	Garments	Manufacturing
1997	2,003	14,734	154,006	1,097,175
1998	2,025	15,674	156,989	1,153,526
Percentage Change	**1.10**	**6.38**	**1.94**	**5.14**

Note: [a] Averages for the year
Source: 2003 Philippine Statistical Yearbook, NSCB

Table 18: Philippine Garments Industry Revenue and Costs, 1997-1998
(in PHP million, current prices)

Year	Revenue	Total Cost
1997	50,205	33,030
1998	55,472	32,815
Percentage Change	**10.49**	**(0.65)**

Source: 2003 Philippine Statistical Yearbook, NSCB

Relative to the manufacturing sector, however, the industry grew at a slower pace in terms of the number of establishments, 1.1% compared to the manufacturing sector's 6.4%, and employment, 1.9% versus 5.1% (refer to Table 17). Revenue, nonetheless, rose by 10.5% during the period accompanied by a slight reduction in cost, 0.65% (refer to Table 18)

Meanwhile, in general, exporters in the sector are members of the to the Garments and Textiles Export Board (GTEB). During the period 2001-2003 these accounted for about 40% of the total establishments in the industry. At least a third of these establishments are medium-sized firms with a capitalization of at least PHP6 million (refer to Table 19).

Table 19: GTEB Registered Firms

Firm Size	2001	2002	2003
<PHP1 million capital	265	292	334
>PHP1 million>PHP6 million capital	268	283	297
>PHP6 million capital	243	252	258
Total	**776**	**827**	**889**

Source: Garments and Textile Exports Board

Moreover, garments exports, valued at an average of US$ 2.4 billion, accounted for about 7.5% of the Philippine's total exports from 1997 to 2002 (refer to Table 20). The country's primary market is the United States accounting for about 81% of total foreign sales in 2001. A distant second is the European Union at 12%. Canada completes the top three markets at 3% (refer to Table 21).

Table 20: Philippine Garments Exports, 1997-2002
(in USD million)

Year	Value of Garments Exports	Growth (in %)	Percentage Share to Total Philippine Exports
1997	2,349	(3.05)	9.31
1998	2,356	0.30	7.99
1999	2,267	(3.78)	6.47
2000	2,563	13.06	6.73
2001	2,403	(6.24)	7.47
2002	2,391	(0.50)	6.79
Average	**2,388**	**(0.04)**	**7.46**

Source: Philippine Department of Trade and Industry

Table 21: Philippine Garments Industry Major Markets in 2001

Market	Value of Exports (in USD million)	Share to Total Garments Exports (in %)
United States	1,951	81.19

European Union	287	11.94
Canada	67	2.79
Total	**2,305**	**95.92**

Source: Habaradas, "The Challenge of Adjustment in the Textile and Garments Industry: The Role of Internal and External Linkages", 2004

In 2001, the Philippine garments top six export items accounted for an estimated 15% of total garments foreign sales (refer to Table 22). Two particular product lines in the aforementioned list reflect the Philippine's revealed comparative advantage, namely, women's/girls' blouses and skirts of cotton, knitted, ranked 4th top exports with an RCA of 5.08 and babies' garments and clothing accessories of cotton, knitted ranked 6th with an RCA of 6.25 (refer to Table 23).

Table 22: Largest Philippine Garments Industry Export Items in 2001

(in USD thousand)

Product Description	Export Value
Women's/girls' dresses of synthetic fibers, not knitted	62,231
Men's/boys' trousers and shorts of synthetic fibers, not knitted	59,144
Women's/girls' blouses and skirts of cotton, knitted	59,096
Women's/girls' blouses and skirts of cotton, not knitted	59,067
Women's/girls' trousers and shorts of synthetic fibers, not knitted	57,695
Babies' garments and clothing accessories of cotton, knitted	56,608
TOTAL	**353,841**

Source: Philippine Department of Trade and Industry

Table 23: Most Competitive Philippine Garments Exports, 2001

Product Description	RCA Values
Babies' garments and clothing accessories, not knitted	17.73
Men's/boys' shirts, knitted	11.02
Women's/girls' slips and petticoats, night dresses and pajamas, panties, bathrobes, etc., not knitted	6.51
Babies' garments and clothing accessories of cotton, knitted	6.25
Gloves, mittens and mitts, knitted	5.62
Women's/girls' blouses and skirts, knitted	5.08
Men's/boys' shirts, not knitted	4.22
Women's/girls' suits, ensembles, jackets, dresses, skirts, trousers and shorts, not knitted	4.10
Brassieres and parts, girdles, panty girdles and parts, corselettes, corsets, braces, etc.	3.81

Source: Habaradas, "The Challenge of Adjustment in the Textile and Garments Industry: The Role of Internal and External Linkages", 2004

Despite apparent success of the Philippine garments industry, the sector is highly dependent upon subcontracting arrangements. In most cases, large firms, mostly multinational corporations, farm out the assembly of garments to small assemblers. This is in direct contrast with the garments districts of North Italy wherein firms are fully integrated, a characteristic of advanced producers (as in the 'industrial districts' of North Italy). Local Filipino garment manufacturers tend to remain in low-skill, low value activities. These firms find the greatest difficulty in finding the financial, human and technological resources to improve their technology.

This aforementioned problem is particularly true if the subcontractor's link with the large firms is not strengthened and switching cost is marginal. Reinforcing the local industry's competitive edge at all levels, therefore, involves improving training facilities for operatives;

creating and improving training facilities for garment design, pattern making, draping and other advanced skills; benchmarking technical efficiency; assisting firms with productivity-raising measures and in-house training; improving the competitive position of the upstream textile industry; and encouraging the formation of specialized 'clusters' where firms share facilities, information, technology and skills.

Given the current state of the local industry and emerging trend in the global market, the future of Philippine clothing sector depends on continuous quality upgrading, which, in turn, is subject to the use of new technologies, better access to the best fabrics and other inputs (a strong domestic textile, dyes and accessories industry), advanced technical, management, design and marketing skills, and timely delivery and flexibility. As mentioned, these are now the factors that give apparel manufacturers a competitive edge in the world market. High degrees of vertical integration, needed in the past to ensure reliable quality and delivery, is less of an advantage, as higher quality products tend to require smaller firms and greater inter-firm specialization and subcontracting.

Although the local garment sector has reasonable human capital, especially in fine embroidery (important for infant wear and certain dresses where the Philippines has a leading position in US markets), it is weak in several specialized technical skills (pattern making, draping and design). Worker productivity is variable, but there have been few attempts to raise productivity by benchmarking. Small producers are the furthest behind world 'best practice', but several large producers have also not introduced appropriate process and quality management techniques. As far as equipment is concerned, investments and FDI in the industry have fallen behind those in other industries.

Some large exporters have invested in CAD/CAM equipment, containerization of shipments and advanced process systems, and so improved their quality and turnaround times. However, the bulk of the industry remains uncompetitive by best practice standards. Design capabilities in the Philippines clothing industry, albeit growing, remain weak. Existing design schools are inadequate and firms often hire expensive foreign designers. Design weaknesses hold back quality upgrading, since producers are unable to offer buyers their own collections and find it more difficult to 'shop around' for different, more rewarding, markets.

Moreover, the heavy dependence of manufacturers on imported raw materials is a major industry concern. Increasing the sector's value added and boosting its competitive edge requires the development of a "strong forward and backward linkage between garments and textiles industries" (Austria, 1996). Evidenced by the South Korean and Chinese experiences, an internationally competitive fabric producing sector is the backbone of successful garment exporting economies (World Bank. 1987). As local textiles are relatively more expensive, the Philippine apparel industry sources more than 90% of its raw material needs abroad.

In addition, delivery times by Philippine exporters are variable: good firms can deliver products to the EC in 30-40 days, but most need 60 days for repeat orders. While this is better than the regional average (for South Asia, China, Indonesia or Thailand) of 90 days, it does not match East Europe or Turkey's 21-40 days, or West Europe's 14-28 days. In terms of quality as shown by average unit price, Philippine garments fetch lower prices than those from Hong Kong, Korea, Malaysia, India, China, Thailand, Indonesia, Mexico or Turkey. The industry suffers from weaknesses in the upstream local textile industry, which has poor dyeing and finishing capabilities. This forces garment producers to rely heavily upon imports, often adding to their lead times.

Finally, according to the U.S. International Trade Centre, critical to the continuous growth and development of the garments industry in any country are the following: business climate, infrastructure conditions, proximity and preferential access to major world markets, access to a reliable supply of raw materials, availability of low-cost skilled workers and skilled management, and level of supplier service and reliability. Business climate includes macroeconomic factors (i.e., investment, bureaucracy, etc.). Infrastructure, on the other hand, is not limited to the availability of road networks but, most importantly, the speed with which information are transmitted and received (telecommunications). The quality of the labor force is likewise an important consideration (i.e., factors relating to trainability). Last but not least, investors need to be assured that there will be a reliable supply of raw materials, which pertains to the level of development of support industries (i.e., the textile and chemical sectors to name two).

6. Global Production Networks and Local Development Policy

The extent to which local industrial clusters can take advantage of globalization to engage in a process of learning and upgrading largely depends on the ability of local institutions to successfully integrate GPN operations into the local economic activities. The experience of Third Italy and Silicon Valley, for example, show that regional industries that succeed in the global economy have built a culture of learning and innovation supported by local institutions such as governments, community-based, employers' and workers' associations.

Thus, as local enterprises struggle to adapt their mode of operation to build a sustainable competitive advantage, local institutions, likewise, need to find new and flexible ways to mediate between GPN needs while supporting industrial competitiveness. Local institutions can develop policies to simultaneously (1) support the acquisition of new knowledge and competencies in the industrial community, and (2) ensure that the gains from learning are distributed on a fair basis among local actors (Morgan, 1996).

The idea of policy networks can be applied in a variety of ways to support skills building and upgrading at the local level. First, while their focus remains primarily local, innovative development policies should be articulated within a global perspective. A vision of how global production networks are structured, and how particular sets of firms are integrated within them, will provide a useful set of benchmarks for local policy formulation. Local institutions can help firms, SMEs in particular, to successfully integrate into global networks by identifying opportunities and threats in the global environment, and facilitating the establishment of innovative development policies should be articulated with a global vision.

III. CONCLUSION

There seems to be no question that the type FDI that will benefit developing countries the most are those that link local industries with the global production network. Empirical evidence shows that these types of investments promote the incorporation of latest technologies, quality control procedures in satellite firms. management techniques speeded up. Likewise, research findings indicate that the pace of upgrading production processes speeded up and production output responded to the cycle of innovation in the home country (country of origin) markets of subsidiaries integrated into the regional or global production network.

Trade and investment liberalization and deregulation policies, whether undertaken unilaterally, in the regional and/or multilateral levels facilitate the creation of GPNs. Liberalization and deregulation policies in pursuit of international competitiveness, however,

necessitated the review of industry norms and structure to more fully take advantage of the opportunities offered by globalization (i.e., the relatively unfettered flow of information and production resources). Global competition meant efficiency and productivity just as governance meant transparency and accountability.

Meanwhile, FDI are more and more being undertaken to form strategic alliances, partnerships and networks. FDI is no longer just grounded on material resources but now anchored in the supply of intellectual capital as inputs, the ability to spawn innovations, creations, and inventions (Suarez-Villa, 2000). Thus, highlighting the importance of the globalization of technology, which allows the global exploitation of technology as in patents or intellectual property rights (IPR); global technological cooperation in resource pooling, complementarities or strategic alliances; and global generation of technology within a single MNC in laboratories is situated abroad. In this respect, East Asia may consider the newfound IT competitive advantage of South Asia, especially India, as part of the Asian network of strategic alliances which have much to do with GPNs.

These regulations paved the way for the evolution of GPNs as in garments, automobiles, electronics and hard disk drives. GPNs involve inter- and intra-firm relationships of MNCs in collaboration with local enterprises creating a virtuous circle. The relative dynamism and openness of East Asia attracted leading MNCs to relocate part of their production to their shores facilitating their entry to the so-called global production networks (GPNs).

In the Philippines, the challenge is to sustain the integration of local firms within global production networks through the implementation of networking strategies between local institutions, supporting agencies, and enterprises. The role of these innovative policy networks is particularly important at the local level, in specialized industrial clusters where globalization pays more, or hits harder, and where innovative policy institutions are striving to find new, flexible ways of interacting between themselves and with businesses.

Finally, although entering global production networks can be an effective vehicle for local job creation, as illustrated by the substantial increase of employment generated in Export Processing Zones during the last decades (ILO, 1996), it is only through industrial upgrading that the quality of jobs can be improved. In general, however, activities performed in EPZs are typically restricted to the low-skilled, low-value assembly stages of global production chains. Cost-based competition is achieved by 'sweating' labor.

Case studies of Singapore, Malaysia, the Philippines and India, Kuruvilla (1996), to achieve sustainable competitive advantage and improve living standards, it is necessary to compete on quality rather than costs, and develop the skills, involvement and motivation of the workforce that in countries that moved from a low-cost export-oriented strategy to a higher value-added export-oriented strategy. The focus of industrial relations and human resource policies should, therefore, shift from cost containment to skills development and workforce flexibility.

Evidence shows that higher skilled and motivated workers bring more value to production activities, which make firms more profitable and allow them to pay higher wages. This perspective then highlights the importance of industrial relations and human resource policies implemented by local producers and the need for widespread improvement of employment conditions as a necessary foundation for local development. Research findings indicate that competitive forces alone are not likely to produce such social outcome, so that firm-based upgrading strategies need to be complemented by a consistent set of supportive policies.

References

Afuah, A.N. (1997), "Responding to Structural Industrial Changes: A Technological Evolution Perspective", Industrial and Corporate Change, Vol. 6, #1, 183-202.

Appelbaum, R.P. and J. Kessler (1997), ˜Transformations in industrial organization, production and retailing: a challenge to commodity chain analysis", Occasional Paper, 12, Institute for Social, Economic and Behavioral Research, University of California at Santa Barbara.

Amin, A., D. Bradley, J. Howells, J. Tomaney and C. Gentle (1994), ˜Regional incentives and the quality of mobile investment in the less favoured regions of the EC", Progress in Planning 41(1): 1-112

Arndt, Sven. (2002) "Global Production Networks and Regional Integration." The Lowe Institute of Political Economy, Claremont McKenna College Working Paper Series No. wp 2003-12

Austria, Myrna (1996). Catching Up with Asia's Tigers, Volume II. Philippine Institute for Development Studies, p. 73.

_____, (2000). Competitiveness of the Philippine IT Industry: What Lies Ahead. Philippine Journal of Development 27 (2): 105-148.

_____, (2002a). Productivity Growth in the Philippines After the Industrial Reforms in Josef Yap. (editor), Chapter 6, The Philippines Beyond 2000: An Economic Assessment.. Philippine Institute for Development Studies, Makati City.

_____, (2002b). East Asian Regional Cooperation: Approaches and Processes. Paper presented at the International Conference on East Asian Cooperation: Progress and Future Agenda. 22-23 August 2002, Beijing, China.

_____, and John Lawrence V. Avila (2001). Looking Beyond AFTA: Prospects and Challenges for Inter-regional Trade. Philippine Journal of Development.28 (2): 143-166.

Baier, Scott and Henry Bergstrand (2001), "The Growth of World Trade: Tariffs, Transport Costs, and Income Similarity," Journal of International Economics, 53 (1), 1-27.

Birnbaum, D. (1993), Importing Garments through Hong Kong: Third Horizon.

Blonigen, Bruce and Robert Feenstra. "Protectionist Threats and Foreign Direct Investment." National Bureau of Economic Research Working Paper No. wp 5475, Cambridge, Massachussetts.

Borensztein, Eduardo, Jose De Gregorio and Jong-Wha Lee. "How does Foreign Direct Investment Affect Economic Growth?" National Bureau of Economic Research, Working Paper No. wp 5057, Cambridge Massachusetts

Borrus, M. (1995). "Left for Dead: Asian Production Networks and the Revival of US Electronics". University of California at Berkeley: Berkeley Roundtable on the International Economy Working Paper.

Burgonio, M (2003), "RP Electronics Firms Post 17% Growth in Q1", IT Matters, Business World.

Clancy, M. (1998), ˜Commodity chains, services and development: theory and preliminary evidence from the tourism industry", Review of International Political Economy, 5 (1): 122-48.

De Dios, Loreli, 1998. "Impediments to Trade in the Philippines," in Impediments to Trade in APEC: The Case of China, Indonesia and Philippines. APEC Study Center Institute of Developing Economies, Tokyo, Japan.

Dicken. P., P.F. Kelly, K. Olds and H. W-C. Yeung (2001), ˜Chains and networks, territories and scales: towards a relational framework for analysing the global economy", Global Networks, 1(2): 89-112.

Dunning, J. (1993), Multinational Enterprises and the Global Economy. Wokingham, Addison-Wesley.

Dyer, J. and W. Chu (2000), ˜The determinants of trust in supplier-automaker relationships in the U.S., Japan, and Korea", Journal of International Business Studies31(2): 259-85.
Ernst, D. (2000b), ˜Global production networks and the changing geography of innovation systems: implications for developing countries", East-West Centre Working Papers No.9, Honolulu, Hawaii.
Ernst, D. and L. Kim (2001), ˜Global production networks, knowledge diffusion, and local capability formation: a conceptual framework", Paper presented at the Nelson & Winter Conference, Aalborg, June 12-15.
Ernst, Dieter. "The Internet's Effects on Global Production Networks: Challenges and Opportunities for Managing in Developing Asia." East-West Center Working Papers, Economics Series, no. 33
Ernst, Dieter and Luthje. "Global Production Networks, Innovation, and Work: Why chip and System Design in the IT Industry are Moving to Asia." East-West Working Center, Honolulu, Hawaii.
"Foreign Direct Investment, Trade, and Global Production Networks in Asia and Europe." GPN Working Paper 2. *Making the Connections: Global Production Networks in Europe and East Asia.*
Feenstra, R. (1998), "Integration of Trade and Disintegration of Production in the Global Economy", Journal of Economic Perspective 12, No 4 (Fall).
Gereffi, G. (1995), ˜Global production systems and third world development" in B. Stallings (ed.), Global Change, Regional Response. New York, Cambridge University Press: 100-42.
Gereffi, G. (1999a), ˜International trade and industrial upgrading in the apparel commodity chain", Journal of International Economics, 48(1): 37-70.
Gereffi, G. (1999b), ˜A commodity chains framework for analysing global industries", mimeo, Department of Sociology, Duke University.
Gereffi, G. (2001), "Global Sourcing in the U.S. Apparel Industry", JTATM, Volume 1, Issue 1, Fall 2001.
Grove, A.S. (1986), Only the Paranoid Survive, How to Exploit the Crisis that Challenge Every Company and Career, Harper Collins Business, New York and London.
Habaradas, Raymund (2004). "The Challenge of Adjustment in the Textile and Garments Industry: The Role of Internal and External Linkages", IDRC.
Henderson, J. (1989). The Globalisation of High Technology Production. London, Routledge.
Ikenberry, G, John, (2000), "The Political Economy of Asian Regionalism", East Asian Economic Perspectives, March, Vol 11, pp 35-61.
Intal, Ponciano, 1997. Sustaining the Philippine Economic Resurgence. Paper presented
at a symposium in honor of Dr. Gerardo Sicat and Dr. Jose Encarnacion, Jr. Philippine Institute for Development Studies, September 23-25, 1997, Makati City.
Lopez-de-Silanes F., J. R. Markusen, and T. F. Rutherford. 1994. Complementarity and Increasing Returns in Intermediate Inputs. Journal of Development Economics. 45:101-19.
Mathews, J. A. (1997). "Silicon Valley of the East: Creating a semiconductor industry in Taiwan", California Management Review, 39 (4), pp. 1-29.
Mathews, J. A. and Cho, D. S. (2000). Tiger Technology: The Creation of a Semiconductor Industry in East Asia. Cambridge: Cambridge University Press.
McKendrick, David, G., Doner, Richard, F. and Haggard, Stephan (2000) From Silicon Valley to Singapore: Location and Competitive Advantage in the High Disk Drive Industry, Stanford: Stanford University Press.
Medalla, Erlinda, 2002. "Trade and Industrial Policy Beyond 2000: An Assessment of the Philippine Economy" in Josef Yap, (ed.), Chapter 3, The Philippines Beyond 2000: An Economic Assessment. Philippine Institute for Development Studies, Makati City.

_____, et. al., 1995. Catching Up with Asia's Tigers. Vol. I. Philippine Institute for Development Studies, Makati.
_____, 1996. Catching Up with Asia's Tigers. Vol. II. Philippine Institute for Development Studies, Makati.
Morgan, Kevin (1996), "Learning by Interacting: Inter-firm Networks and Enterprise Support" in Network of Enterprises and Local Development, (Paris: Organization for Economic Cooperation and Development): 53-66.
Organization for Economic Cooperation and Development, (1998), Migration and Regional Economic Integration in Asia. Paris: OECD.
Panagariya, Arvind, Quibria, MG and Rao, Narhari, eds, (1997), The Global Trading System and Developing Asia. New York: Oxford University Press for Asian Development Bank.
Panagariya, Arvind, (1999), Regionalism in Trade Policy: Essays on Preferential Trading. Singapore, London: World Scientific.
Patalinghug, Epictetus, 1983. Market Concentration in Philippine Food, Home Appliance and Textile Industries. Philippine Review of Economic and Business.20(2):215-233.
Pineda, Virginia S., 1997. Effects of the Uniform Five Percent Tariff on Manufacturing. PTTAF-PSC, Tariff Commission and Philippine Institute for Development Studies, Project No. 95-04. Makati City.
Porter, Michael, E, (1990), The Competitive Advantage of Nations. New York: Free Press.
Quibria, MG, (1997), "Labor Market Integration in Asia", in Panagariya, Arvind, Quibria, MG and Rao, Narhari, eds, The Global Trading System and Developing Asia. New York: Oxford University Press for Asian Development Bank. pp 171-202.
Ramstetter, Eric, (1998), "Measuring the Size of Foreign Multinationals in the Asia-Pacific ", in Thompson, Grahame, ed, Economic Dynamism in the Asia-Pacific: The Growth of Integration and Competitiveness. London and New York: Routledge, pp 185-212.
Romer, Paul (1993), "Two Strategies for Economic Development: Using Ideas and Producing Ideas", in World Bank, Proceedings of the World Bank Annual Conference on Development Economics 1992 (Washington, World Bank).
Sampson, Gary, P, (2000), Trade, Environment, and the WTO: The Post-Seattle Agenda. Washington DC: Overseas Development Council.
Shank, J. (1989), "Strategic Cost Management: New Wine or Just New Bottles", Journal of Management Accounting Research (Fall).
Sturgeon, Timothy J. (2000), "How Do We Define Value Chains and Production Networks? Background paper prepared for the Bellagio Value Chains Workshop, 25 September – 1 October 2000. Rockefeller Conference Centre, Bellagio, Italy.
Suarez-Villa, Luis, (2000), Invention and the Rise of Technocapitalism. Lanham: Rowman & Littlefield.
Teece, David (1986), "Profiting from Technological Innovation", Research Policy, 15, 6, 285-306.
Timmer, Marcel, (2000), The Dynamics of Asian Manufacturing: A Comparative Perspective in the Late Twentieth Century. Cheltenham: Edward Elgar.
Tulloch, Peter, (2000), "Asian Trade Policy Choices in a Rapidly Globalizing World Economy", paper presented at Asian Development Bank 13th Asian Development Outlook, Manila, 27-28 November.
World Bank, (1987). The Philippine Issues and Policies in the Industrial Sector, Volume I, Washington D.C.
_____, (2000). "Trade Blocs". New York: Oxford University Press for World Bank.

Appendix A: Philippine Foreign Trade, 1980-2003

(in USD million)

Year	**Total Trade**	**Growth Rate** (in %)
1980	13,518	25.83
1981	13,666	1.09
1982	12,688	(7.16)
1983	12,492	(1.54)
1984	11,460	(8.26)
1985	9,740	(15.01)
1986	9,885	1.49
1987	12,457	26.02
1988	15,234	22.29
1989	18,240	19.73
1990	20,392	11.80
1991	20,891	2.45
1992	24,343	16.52
1993	28,972	19.02
1994	34,815	20.17
1995	43,985	26.34
1996	52,969	20.43
1997	61,162	15.47
1998	59,157	(3.28)
1999	65,779	11.19
2000	72,569	10.32
2001	65,207	(10.14)
2002	70,635	8.32
2003	73,198	3.63

Source: National Statistics Office

Appendix B: Philippine Exports, 1980-2003

(in USD million)

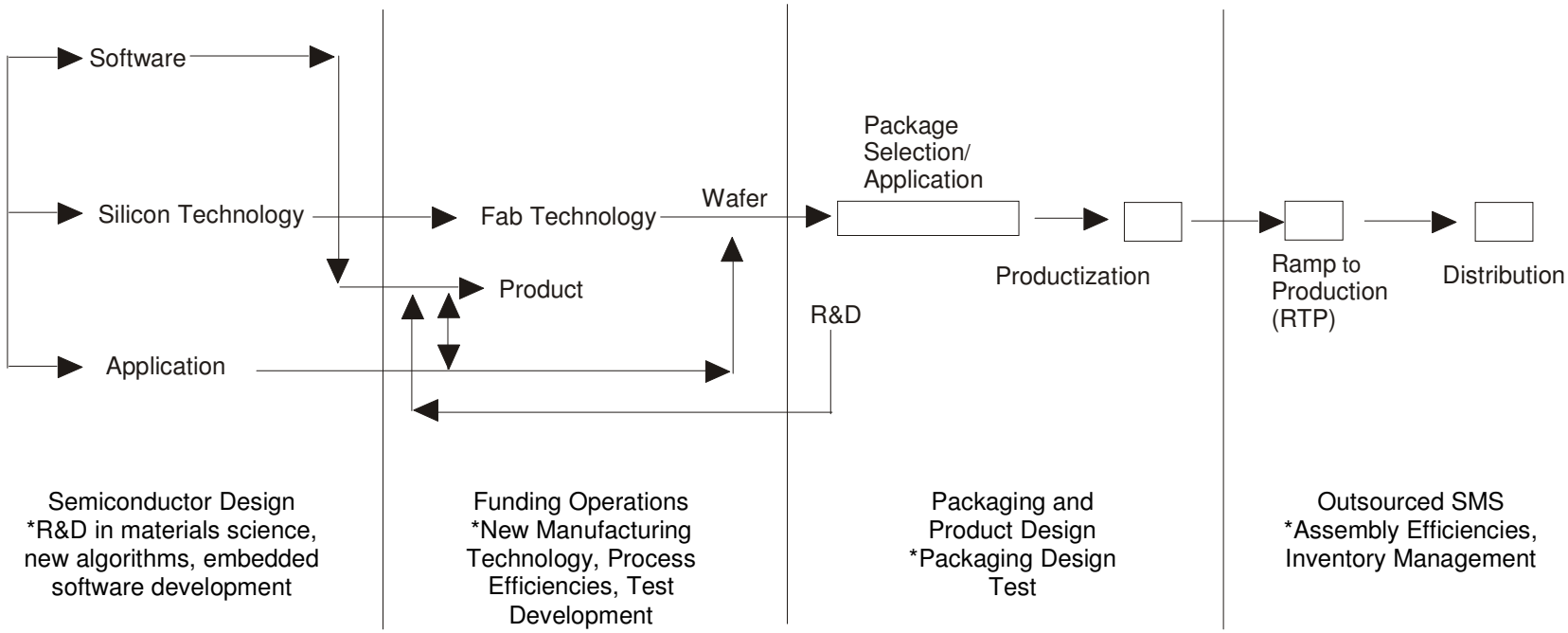
Year	Total Exports	Share to Total Trade (in %)	Growth Rate (in %)
1980	5,788	42.82	25.80
1981	5,720	41.86	(1.17)
1982	5,020	39.56	(12.24)
1983	5,005	40.07	(0.30)
1984	5,391	47.04	7.71
1985	4,629	47.53	(14.13)
1986	4,842	48.98	4.60
1987	5,720	45.92	18.13
1988	7,074	46.44	23.67
1989	7,821	42.88	10.56
1990	8,186	40.14	4.67
1991	8,840	42.31	7.99
1992	9,824	40.36	11.13
1993	11,375	39.26	15.79
1994	13,483	38.73	18.53
1995	17,447	39.67	29.40
1996	20,542	38.78	17.74
1997	25,228	41.25	22.81
1998	29,497	49.86	16.92
1999	35,037	53.26	18.78
2000	38,078	52.47	8.68
2001	32,150	49.30	(15.57)
2002	35,208	49.84	9.51
2003	35,750	48.84	1.54

Source: National Statistics Office

Appendix C: Top Manufacturers of Semiconductor Devices and Other Electronic Components in the Philippines

IT (Philippines), Inc.	Nanox Philippines, Inc.
Philips Semiconductors Philippines, Inc.	Daeduck Philippines, Inc.
Rohm Electronics Philippines, Inc.	Fujihiro Philippines, Inc.
Texas Instruments (Philippines), Inc.	Tottori Sanyo Electric (Phils.) Corp.
Intel Technology Philippines, Inc.	Automated Technology (Phil.), Inc.
Ionics EMS, Inc.	Rohm Mechatech Philippines, Inc.
Amkor Technology Philippines (P1/P2), Inc.	Analog Devices (Philippines) Inc.
Amkor Technology Philippines (P3/P4), Inc.	Shindengen Philippines Corp.
Sanyo Semiconductor Manufacturing Phils. Corp.	Ibiden Philippines, Inc.
Intel Philippines Mfg., Inc.	Allegro MicroSystems Philippines, Inc.
NEC Components Philippines, Inc.	PerkinElmer Optoelectronics Philippines, Inc.
Dae Ryung Ind., Inc. Philippines	Cirtek Electronics Corp.
Vishay (Philippines), Inc.	Orient Semiconductor Electronics Phils., Inc.
Nidec Copal Philippines Corp.	SB Flex Philippines, Inc.
Psi Technologies, Inc.	Odawara Custom Manufacturing Service Co., Ltd.
First Sumiden Circuits, Inc.	Team Pacific Corp.
Fairchild Semiconductor Hong Kong (Holdings) Ltd.	Juntec Corp.
SANYO Capacitor (Philippines) Corp.	Heraeus Electronic Materials Philippines, Inc.
SCG Philippines Inc.	Ase Holding Electronics (Phils.), Inc.
Electronics Assemblies, Inc.	Enomoto Philippine Manufacturing, Inc.
Fuji Electric Philippines, Inc.	Itec Corp.
KEC-Astron Philippines, Corp.	Read-Rite Philippines, Inc.
Dyna Image Corp. Philippines	CAM Mechatronic (Phils.), Inc.
Asian Micro Manufacturing Phils., Inc.	Ju-Young Electronics (Philippines), Inc.

Appendix D: Value Chain of Semiconductors



Source: SEIPI, 2002

Appendix E: Electronic Exports to all Countries, 1991-2003

(in USD)

Year	Total Exports	Total Electronic Exports
1991	8,839,513,852	2,043,399,647
1992	9,824,314,301	2,466,770,809
1993	11,374,805,286	3,197,624,144
1994	13,482,895,542	4,476,729,038
1995	17,447,186,135	6,746,291,285
1996	20,542,546,399	8,826,410,135
1997	25,277,702,630	12,698,964,403
1998	29,496,352,868	17,602,484,403
1999	35,036,892,660	24,786,859,402
2000	38,078,249,794	26,754,467,654
2001	32,150,202,692	21,614,688,672
2002	35,208,158,692	24,321,896,429
2003	36,231,205,444	24,168,307,211

Source: National Statistics Office, Economic Indicators and Indices Division

Appendix F: Percentage Share of Electronics Sub-industries to Total Philippine Electronics Exports, 1991-2003

(in percent)

Year	Components or Devices (Semi-conductors)	Electronic Data Processing	Office Equipment	Consumer Electronics	Telecom-munications	Communi-cation Radar	Control and Instrumen-tation	Medical or Industrial Instrumen-tation	Auto-motive Electronics
1991	87.86	5.22	0.01	4.90	0.18	1.52	0.03	0.01	0.26
1992	82.09	7.87	-	6.51	0.16	1.53	0.02	0.01	1.82
1993	81.14	6.74	0.00	8.15	0.12	1.83	0.03	0.00	1.98
1994	82.61	5.20	0.00	7.09	0.11	1.87	0.05	0.00	3.06
1995	83.33	6.53	0.00	5.01	1.09	1.61	0.02	0.00	2.41
1996	81.45	9.79	0.23	4.42	1.02	0.99	0.04	0.00	2.05
1997	77.73	16.33	0.54	2.71	0.49	0.50	0.02	0.00	1.67
1998	79.45	15.26	0.52	2.26	0.50	0.52	0.05	0.00	1.42
1999	79.97	16.60	0.36	1.22	0.27	0.45	0.05	0.00	1.09
2000	75.73	18.44	0.30	1.78	0.68	1.72	0.06	0.00	1.28
2001	68.93	23.46	0.84	2.17	1.01	1.81	0.09	0.00	1.69
2002	69.45	24.23	0.51	2.03	0.84	1.56	0.06	0.01	1.31
2003	70.41	23.42	0.76	2.22	0.40	1.41	0.02	0.02	1.35
Average	**78.47**	**13.78**	**0.34**	**3.88**	**0.53**	**1.33**	**0.04**	**0.00**	**1.65**

Source: National Statistics Office

Appendix G: Growth Rates & Average Growth Rates of Sub-industries of Philippine Electronics Exports, 1991-2003

(in percent)

Year	Components or Devices (Semi-conductors)	Electronic Data Processing	Office Equipment	Consumer Electronics	Telecom-munications	Commu-nication Radar	Control and Instrumen-tation	Medical or Industrial Instrumen-tation	Auto-motive Electronics
1991	-	-	-	-	-	-	-	-	-
1992	12.79	82.02	-	60.34	8.73	21.34	-20.13	-51.77	737.28
1993	28.14	11.06	-	62.19	-1.67	54.60	116.23	-78.19	41.58
1994	42.54	8.08	-98.23	21.77	31.13	43.69	105.72	-37.99	115.82
1995	52.01	89.23	13,337.25	6.43	1,337.94	29.71	-32.26	83.59	18.53
1996	27.89	95.93	11,840.39	15.63	23.45	-19.55	138.96	115.31	11.31
1997	37.31	140.13	236.12	-11.97	-31.46	-26.88	-42.92	228.02	17.67
1998	41.67	29.50	33.85	15.93	0.43	44.13	360.90	18.13	17.73
1999	41.74	53.20	-4.35	-24.25	-24.81	20.19	36.40	165.95	7.50
2000	2.22	19.90	-9.13	57.51	174.31	315.60	16.18	39.64	27.70
2001	-26.47	2.77	125.84	-1.29	19.29	-15.08	29.91	-5.37	6.56
2002	13.38	16.21	-30.71	5.28	-5.83	-2.97	-29.11	70.09	-13.18
2003	0.74	-3.94	47.00	8.49	-53.21	-10.30	-63.62	104.71	2.54
Average	**22.83**	**45.34**	**2,547.80**	**18.00**	**126.74**	**37.87**	**51.36**	**54.34**	**82.59**

Source: National Statistics Office

Appendix H: Philippine Automotive Industry Structure

Sub-sector	**No. of Participants**	**Total Capacity** (in units/year)
Passenger Car Assembly	14	221,450
Commercial Vehicle Assembly	21	145,950
Motorcycle Assembly	21	462,100

Source: Department of Trade and Industry