

Aldaba, Rafaelita M.; Aldaba, Fernando T.

**Working Paper**

## Assessing the Spillover Effects of FDI to the Philippines

PIDS Discussion Paper Series, No. 2010-27

**Provided in Cooperation with:**

Philippine Institute for Development Studies (PIDS), Philippines

*Suggested Citation:* Aldaba, Rafaelita M.; Aldaba, Fernando T. (2010) : Assessing the Spillover Effects of FDI to the Philippines, PIDS Discussion Paper Series, No. 2010-27, Philippine Institute for Development Studies (PIDS), Makati City

This Version is available at:

<https://hdl.handle.net/10419/126832>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



**Philippine Institute for Development Studies**  
*Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas*

## Assessing the Spillover Effects of FDI to the Philippines

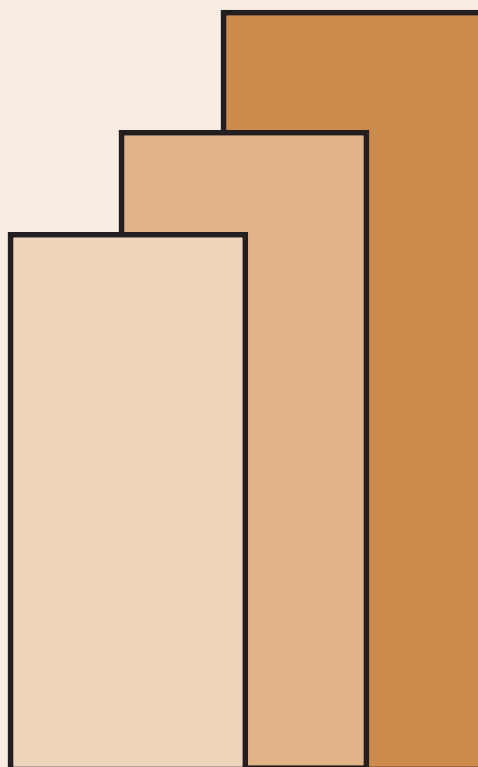
*Rafaelita M. Aldaba and Fernando T. Aldaba*

**DISCUSSION PAPER SERIES NO. 2010-27**

The *PIDS Discussion Paper Series* constitutes studies that are preliminary and subject to further revisions. They are being circulated in a limited number of copies only for purposes of soliciting comments and suggestions for further refinements. The studies under the *Series* are unedited and unreviewed.

The views and opinions expressed are those of the author(s) and do not necessarily reflect those of the Institute.

Not for quotation without permission from the author(s) and the Institute.



**November 2010**

For comments, suggestions or further inquiries please contact:

**The Research Information Staff**, Philippine Institute for Development Studies

5th Floor, NEDA sa Makati Building, 106 Amorsolo Street, Legaspi Village, Makati City, Philippines

Tel Nos: (63-2) 8942584 and 8935705; Fax No: (63-2) 8939589; E-mail: [publications@pids.gov.ph](mailto:publications@pids.gov.ph)

Or visit our website at <http://www.pids.gov.ph>

## **ABSTRACT**

The experience of the Philippines shows that FDI spillover effects are not automatically generated. Opening up the economy to FDI has contributed to the country's exports of high-technology products and overall economic growth. However, the spillover effects of FDI to domestic firms have remained limited due to the domestic firms' weak competitiveness and inability to absorb the technology or knowledge being transferred. The government needs to adopt a more comprehensive approach that would combine industrial policy to improve and develop domestic parts and supplier firms with measures to create an environment conducive to the creation and expansion of FDI-related spillovers as well as increase participation in higher segments of industry value chain.

Keywords: Philippine foreign direct investment; FDI spillover effects; horizontal, forward, and backward linkages, regional production networks

## **Executive Summary**

### **FDI Policy Shift in the 1990s**

In the last two decades, the Philippines has considerably liberalized its FDI policies. Through the legislation of Republic Act 7042 or the Foreign Investment Act (FIA) in June 1991, the country allowed foreign equity participation up to 100% in all areas not specified in the Foreign Investment Negative List. At the same time, the Philippines pursued changes in its investment incentive schemes in order to encourage FDI inflows.

Various investment incentive measures were granted through the different investment regimes administered by the Board of Investments (BOI), Philippine Economic Zone Authority (PEZA), Subic Bay Metropolitan Authority (SBMA), Clark Development Corporation (CDC), and other bodies mandated by various laws to establish, maintain, and manage special economic or free port zones. BOI-registered enterprises are allowed income tax holiday up to eight years, tax and duty free importation of spare parts, and tax credit on raw materials. PEZA grants the most generous incentives including income tax holiday, basic income tax rate of 5% of gross income, and tax and duty free importation of capital equipment, spare parts, and raw material inputs. Except for the income tax holiday, Clark and Subic enterprises enjoy the same incentives available to PEZA enterprises.

### **FDI Performance and Structure**

The 1980s witnessed fluctuating FDI inflows; but with the liberalization efforts in the early 1990s, steady increases in FDI inflows were registered from 1991 to 1994. Although substantial declines were observed in 2001 and 2003, some recovery was felt as FDI increased from 2004 till 2007. In terms of FDI sectoral distribution, a structural shift seems to be taking place as inflows to the manufacturing sector slowed down while inflows to the services sector particularly finance and telecommunications continued to rise.

Within manufacturing, FDI inflows have been dominated by the food and beverage sector with a share of 12.7 percent in the 2000-2007 period. The share of chemicals and chemical products fell to 4.2 percent in the 2000s from 12.2 percent in the 1980s. Coke, refined petroleum, and other fuel products also dropped to only 3.3 percent in the 2000s from nine percent in the 1990s. Similarly; FDI inflows in machinery, apparatus and supplies fell to two percent from a share of nine percent in the 1990s. There is also a decline in the share of transport equipment from 3.7 percent in the 1980s to 2.6 percent in the 2000s. Only paper and paper products witnessed an increase from 0.31 percent in the nineties to 1.25 percent in the 2000s.

In terms of FDI sources, the US was the country's largest source of FDI inflows up to the 1980s. However, its share dropped from 56 percent in the 1980s to only 13 percent in the 1990s and 2000s. US dominance has been substantially diluted by the increasing presence of Japan, Netherlands, UK, and Singapore. Japan's share increased from 13 percent in the 1980s to 24 percent in the 1990s, although this fell to 18 percent in the 2000s.

While the investment policy reforms and opening up of more sectors to foreign investors in the past decade resulted in improvements in FDI inflows to the country, on the overall, FDI inflows to the Philippines have been limited and the country's FDI performance has lagged behind its neighbors in East and Southeast Asia. Compared with FDI inflows to the ASEAN 6 countries, the Philippines received the lowest level of FDI inflows particularly in the 1990s and the 2000s. In terms of cumulative FDI inflows, for instance, Vietnam's total soared to US\$40 billion while the Philippines barely increased at US\$18.96 billion in 2007.

## **FDI and Regional Production Networks**

Participation in regional/global production networks provide domestic firms not only access to export markets but to newer technologies as well. These can generate substantial positive spillovers and externalities. The current regional economic integration process is important in facilitating the establishment and development of regional production networks.

The Philippines is host to affiliates of foreign automakers and electronics companies and has participated in their production networks. However, given the country's narrow participation in the production networks of MNCs in these industries, opportunities for spillovers into the local economy become limited. While the Philippines' largest exports are high technology products such as electronics and auto parts, these are mainly concentrated in labor-intensive, highly import-dependent, and low value added segments like semi-conductors and wiring harnesses. Hence, the backward linkages to the domestic economy created by these high tech exports have remained limited.

## **Assessment of FDI Spillover Effects**

The empirical analysis shows that based on the full sample, productivity spillovers take place horizontally from multinational corporations to domestic firms within the same industry at the five-digit level. There is no evidence that productivity or employment spillovers take place between foreign and domestic firms either through backward linkages (where domestic firms supply intermediate inputs to foreign firms) or through forward linkages (where foreign firms supply intermediate inputs to domestic firms). Though these results may be attributed partly to the data aggregation and other limitations of the dataset, these are consistent with the present condition of the manufacturing industry characterized by the weakness of forward and backward linkages between firms. Given these limited linkages between domestic firms and MNCs, it would be difficult for productivity spillovers from foreign affiliates to take place through forward or backward linkages channels.

## **Policy Recommendations**

The experience of the Philippines shows that FDI spillover effects are not automatically generated. Opening-up the economy to FDI has contributed to the country's exports of high-technology products and overall economic growth. However, the spillover effects of FDI to domestic firms has remained limited due to the domestic firms' weak competitiveness and inability to absorb the technology or knowledge being transferred. This implies that for spillovers to take place, the absorptive capacity of domestic firms must be strengthened.

To deepen the firm linkages within the economy, the development of domestic parts and suppliers would be crucial. With the increasing regional economic integration in East and Southeast Asia, potential opportunities could arise from the growth of regional production networks where domestic parts and supplier firms could act as subcontractors of outsourced parts and components. To improve the competitiveness of domestic parts and suppliers and strengthen their linkages with foreign affiliates, the government needs to adopt a more comprehensive approach that would combine industrial policy to improve and develop domestic parts and supplier firms with measures to create an environment conducive to the creation and expansion of FDI-related spillovers as well as increase participation in higher segments of industry value chain. The following policies are suggested:

**Human Resource Development and Training.** The government must implement substantial reforms in all stages of education and training system to raise the learning capabilities of firms and upgrade labor skills.

**Industrial and Technology Upgrading.** For the Philippines to move up the technology scale, design and development skills and technological capabilities must be improved. Industrial upgrading would

necessitate a strong base of domestic knowledge. This would require the development of specialized skills and technological capabilities, particularly in electronics and auto parts.

**SME Finance Support Programs.** In the country, the lack of access to financing has severely constrained the growth of SMEs. Private banks were able to overcome these challenges by providing assistance in preparing accounting records, business advise, and simplifying loan documentation and tailor fitting loans to match the borrower's cash flow.

**Linkages Improvement and Promotion of Subcontracting and Outsourcing Activities.** It is important to develop a program to provide information exchange to local firms to make strategic linkages with MNCs. Supplier development and linkage programs can be developed to improve linkages between domestic firms, especially SMEs, with foreign affiliates of MNCs.

**Improvement of Infrastructure and Logistics and Overall Investment Climate.** Good infrastructure and logistics that lower production cost and facilitate the easy supply chain management from the procurement of inputs to the export of outputs are important for the operations of production networks. The government must continue to pursue policies to lower power and communication costs, provide sufficient port systems, reduce travel time, and offer travel and shipment options. To improve the country's investment climate, it is important that the government immediately focus not only on inadequate infrastructure but also on the country's low institutional quality, corruption and inefficient bureaucracy that continue to constrain doing business in the country.

**Capacity Building and Adequate Funding for the Department of Trade and Industry and Board of Investments' Competitiveness and Linkages Program.** Strengthen the capacity of the staff and provide adequate resources for the effective implementation of the programs to be designed to improve industry competitiveness and linkages between domestic firms and MNCs.

# **Assessing the Spillover Effects of FDI to the Philippines**

## **Rafaelita M. Aldaba and Fernando T. Aldaba<sup>1</sup>**

### **1. Introduction**

Economic theory suggests that foreign direct investment (FDI) can generate positive spillovers to domestic firms in the host country. Since multinational corporations (MNCs) are an important source of international capital and technology, their entry can facilitate the transfer of technical and business know-how resulting in productivity gains and competitiveness among local firms. These spillover effects develop through best practice demonstration and diffusion, or through the creation of linkages with foreign and domestic firms becoming either suppliers or customers, or through the movement of experienced workers from foreign to local firms. The entry of MNCs may also increase competition and force domestic firms to imitate and innovate.

Domestic firms also benefit from spillovers and externalities associated with FDI through exports and/or international integration (Costa and de Queiroz 2002). MNCs have established global or regional production bases where domestic firms, particularly small and medium enterprises, can participate by serving as potential suppliers of outsourced parts or services. Participation in these networks can also provide domestic firms access to export markets. Global/regional production networks have increasingly grown in sectors such as automotive, machineries, electronics, and garments.

There are two broad classifications of technological spillovers from FDI to domestic firms: horizontal (within or intra industry) and vertical (inter industry) spillover effects. Horizontal spillover refers to the effect the presence of MNCs has on domestic firms in the same sector. Vertical spillovers from FDI occur as a result of the interaction between domestic and foreign firms that are not in the same industry. This may take place through backward or forward trade linkages between foreign and domestic firms. Backward linkages are created when MNCs source raw materials and intermediate products from domestic firms. Forward linkages are created through contacts between domestic and foreign firms.

The existing FDI literature shows an increasing number of studies examining the technology spillovers from FDI to domestic firms. However, the evidence that foreign presence generates positive productivity externalities remains limited since the empirical literature indicates mixed results. Many show significant positive spillover effects from FDI while some find no or statistically insignificant result from technology spillover. The diverse results may be attributed to differences in countries' ability to benefit from foreign investment reflecting varying levels of absorptive capacity and market structure.

To attract FDI inflows and generate the positive spillover effects from the presence of foreign firms, the Philippines liberalized its FDI policy and offered various foreign investment incentive measures. To date, however, there are only few studies that examine the productivity spillovers to domestic firms. Most studies focus on the impact of FDI on economic growth and on the determinants of FDI to the Philippines. There are hardly any empirical studies that explicitly apply quantitative analysis in evaluating whether FDI generates technology spillover from foreign to domestic firms. Due to the paucity of FDI firm-level panel data, it is difficult to measure or disentangle the contribution and different effects of FDI.

---

<sup>1</sup> The authors are Senior Research Fellow at the Philippine Institute for Development Studies and Professor of Economics at the Ateneo de Manila University, respectively. The research assistance of Mr. Donald Yasay is gratefully acknowledged. The authors would also like to thank the East Asian Development Network for the research grant provided to conduct the study and the participants of the conference on "FDI in East Asia: Issues, Strategies, and Prospects" held in Seoul, Korea on September 25, 2009 for their valuable comments and suggestions.

The paper will focus primarily on the Philippine manufacturing industry. Its main objective is to assess the spillover effects of FDI on domestic industry particularly on labor productivity and employment<sup>2</sup> and examine whether the presence of foreign firms generate positive spillover effects to domestic firms. After the introduction, section two of the paper will review the government's FDI strategies, policies and programs in terms of their effectiveness in improving the country's FDI performance particularly in comparison with its ASEAN neighbors. Section three will look at FDI flows, distribution and sources along with a comparative assessment of the country's performance vis-à-vis its ASEAN neighbors. It will also assess the potential effects of the country's free trade agreements (FTAs) on FDI using case studies on global/regional production network industries such as electronics and automotive. Section four will examine the effects of FDI using the 1988 and 1998 Census and Survey of Manufacturing Establishments on productivity and employment. Section five will summarize the paper's findings and implications and formulate policy recommendations to foster FDI contribution and positive spillovers to the domestic economy.

## **2. Brief Literature Survey and Overview of FDI Policies and Programs**

### **2.1 Review of Selected FDI Literature in the Philippines**

Most studies on FDI in the Philippine FDI during the early 1980s were critical of its impact on the economy. Looking at the period from 1945 to the 1970s, Lindsay and Valencia (1981) concluded that "the argument that foreign investment has made substantial contributions to the economic development of the Philippines is a weak one; significant costs and minor benefits are more the order of things". FDI's employment contribution was minimal simply because their presence in the economy was still not substantial. In terms of other economic contribution, the authors indicated that management training had been positive while capital inputs were negligible.

As the Philippines lagged behind its ASEAN neighbors in attracting FDI, studies during the late 1980s to the 1990s focused on the determinants of FDI, the impact of the level of industry protection on FDI along with the impact of FDI on exports. In earlier papers that examined FDI determinants, Lamberte (1993) found that a liberal legal framework is not enough to attract FDI in the country. It must be complemented by sound macroeconomic policies particularly in managing economic growth, foreign exchange and wages which were found statistically significant in the regression analysis done in the study. Based on a time series model, Subido (1974) showed that the rate of return was the most statistically significant variable that explained FDI to the Philippines.

Aldaba (1995) identified the factors that explain why the Philippines failed to capture its share of FDI flows in the region. Her empirical analysis showed positive relationship between FDI and the level of protection, stock of public investment, real gross domestic product and real effective exchange rate. Regarding the impact of FDI on exports, her results showed a highly significant negative relationship between exports and FDI flows from the US, Japan, and Europe. This indicated the anti-export orientation of FDI flows to the Philippines since these were mostly intended for the domestic market to substitute for imports. The high level of protection in the manufacturing industry encouraged protection-hopping and domestic-oriented FDI. FDI flows to the country were largely concentrated in highly protected industries such as chemicals, processed food, transport equipment, machinery and appliances, textiles and garments, basic metal products and petroleum and coal. This is confirmed by the significant positive relationship between effective protection rate and FDI.

Miranda (1994) reviewed the employment effects of multinational enterprises over the period 1983 to 1988. He found that direct employment in foreign affiliates in all sectors was only less than 1% of total employment in both 1983 and 1988. The author indicated that there was an actual decline

---

<sup>2</sup> An assessment of the impact on exports would have been useful, however, this could not be included in the report due to data constraints exports.



in direct employment because of the economic and political crisis in those periods. Mendoza and Inamura (1995) presented an analytical framework to measure the effects of US and Japanese FDI on the Philippine economy particularly the technological structure, amount of domestic production and imports, level of employment, wages and prices from 1982 to 1991. However, due to lack of data, the study was unable to come up with accurate estimates on the impact of FDI.

In a comprehensive FDI paper, Austria (2006b) assessed not only the impact of the country's FDI policies on FDI flows, trends and patterns; but most importantly, she also examined the channels through which FDI affects economic development. By examining the characteristics of FDI in the country supplemented by economic indicators such as exports, imports, and employment in the country; she concluded that though FDI made significant contribution to the country's development, its impact on technology transfer, productivity, domestic linkages, and employment are limited. The apparent lack of local suppliers and poor logistics and infrastructure have been the major impediments to FDI. The lack of local suppliers limited the channel by which technology can create spillover effects in the rest of the economy. Moreover, poor logistics and infrastructure limit FDI flows to industries with weak linkages with the rest of the economy. No backward linkages are created because FDI in the country is characterized mainly by export manufactures that are labor-intensive and highly import-dependent. Employment contribution also remained small as the percentage of direct employment in export zones to total employment registered less than one percent share throughout the 1990s.

In an earlier paper that looked at the determinants of total factor productivity (TFP) in the Philippines, Austria (2002) found mixed results on the role of FDI. A positive, but statistically insignificant relationship between FDI and TFP growth was found. On the other hand, with total FDI and manufacturing FDI as determinants yielded a significant positive effect of total FDI to TFP and a significant negative effect of manufacturing FDI on TFP growth. The author explained that to the extent that MNCs are oriented toward global rather than local profits, there may be less room for adaptation of technology to the local environment.

Other FDI studies have focused on the importance of creating an enabling environment and good investment climate to attract FDI with key factors such as macroeconomic fundamentals, infrastructure, governance and institutions (World Bank-ADB 2005, Booze Allen Hamilton 2007). CPBO (2003) identifies the factors discouraging FDI which include the high cost of doing business (electricity, wages, corruption, etc.) and high risks related policy inconsistency, political instabilities and peace and order.

FDI studies have also examined the impact of investment incentives on FDI flows. With increasing globalization, governments have competed in offering various investment incentives to influence the investors' location decisions. In earlier studies, statistical analyses conducted by Lamberte (1993) and Aldaba (1995) showed that changes in the investment incentives regime are ineffective in attracting FDI. Reside (2006) asserts that many of these incentives are 'redundant' since "market and resource seeking" FDI will come anyway without them. In examining the impact of various FDI incentives, Aldaba (2006) concluded that in the absence of fundamental factors such as economic conditions and political climate, tax incentives alone are not enough to generate a substantial effect on investment decisions of investors nor can they make up for the country's fundamental weaknesses. She noted that the country's complex investment incentive system combined with poor investment climate explain why the Philippines has performed badly in attracting FDI inflows relative to its neighbors.

## **2.2 Philippine Foreign Direct Investment Policy**

Prior to the 1990s, Philippine foreign direct investment policy was characterized by a highly restrictive and complicated regulatory and investment incentive system. There were two government incentive-giving bodies that regulated foreign investments, the Board of Investments (BOI) and the

Export Processing Zone Authority (EPZA, which later became Philippine Export Zone Authority or PEZA). The two government agencies implemented three different legislations governing foreign direct investments. BOI implemented the 1967 Investment Incentives Act and the 1968 Foreign Business Regulations Act while the EPZA was mandated to implement the 1972 Export Processing Zone Act.

**Table 1: Chronology of FDI-Related Legislations**

Year	Legislation	Description
1967	Investment Incentives Act	<ul style="list-style-type: none"> <li>restricted foreign ownership in non-pioneer industries up to forty (40) percent equity</li> <li>ownership requirement rule was relaxed if the enterprise engaged in a pioneer activity or if it exported at least 70% of its production.</li> </ul>
1968	Foreign Business Regulations Act	<ul style="list-style-type: none"> <li>required foreign investments that were not registered under the Investment Incentives Act and whose equity participation exceeded 30% equity to obtain prior authority from the BOI</li> </ul>
1972	Export Processing Zone Act [PD 66]	<ul style="list-style-type: none"> <li>permitted foreign ownership up to 100% subject to the approval of EPZA</li> </ul>
1979	Executive Order 567	<ul style="list-style-type: none"> <li>allowed the EPZA to designate a specific plant site of an industrial firm or a group of industrial firms as a special export processing zone which are entitled to the same incentives granted to the 4 government-owned regular zones</li> </ul>
1987	Omnibus Investment Code	<ul style="list-style-type: none"> <li>simplified and consolidated previous investment laws</li> </ul>
1991	Foreign Investment Act [RA 7042]	<ul style="list-style-type: none"> <li>liberalized existing regulations &amp; allowed foreign equity participation up to 100% in all areas not specified in the Foreign Investment Negative List (FINL)</li> </ul>
1992	Bases Conversion and Development Act (RA 7227)	<ul style="list-style-type: none"> <li>created the Bases Conversion and Development Authority (BCDA) and the Subic Bay Metropolitan Authority (SBMA) to adopt, prepare and implement a comprehensive development program for the conversion of the Clark and Subic military reservations into special economic zones</li> </ul>
1993	Executive Order 8	<ul style="list-style-type: none"> <li>established the Clark Development Corporation (CDC), as the implementing arm of the BCDA for the Clark Special Economic Zone [the Supreme Court revoked these incentives in July 2005, stating that RA 7227 did not grant privileges to locators operating in Clark]</li> </ul>
1994	Foreign Bank Liberalization	<ul style="list-style-type: none"> <li>allowed the establishment of ten new foreign banks</li> </ul>
1995	Special Economic Zone Act [RA 7916]	<ul style="list-style-type: none"> <li>created the Philippine Economic Zone Authority (PEZA) to manage and operate government-owned zones and administer incentives to special economic zones</li> </ul>
1996	Republic Act 8179	<ul style="list-style-type: none"> <li>further liberalized foreign investments &amp; allowed greater foreign participation in areas that were previously restricted</li> </ul>
2000	Retail Trade Liberalization Act [RA 8762]	<ul style="list-style-type: none"> <li>allowed foreign investors to enter the retail business and own them 100% as long as they put up a minimum of US\$7.5 million equity</li> </ul>
2000	General Banking Law [RA 8791]	<ul style="list-style-type: none"> <li>allowed foreign banks to own up to 100% of one locally-incorporated commercial or thrift bank during a 7-year window</li> </ul>

The 1967 Investment Incentives Act restricted foreign ownership in non-pioneer industries up to forty (40) percent equity. The ownership requirement rule was relaxed if the enterprise is engaged in a pioneer activity<sup>3</sup> or if it exported at least seventy (70) percent of its production. Under the

<sup>3</sup> Pioneer projects are those which (i) engage in the manufacture, processing or production; and not merely in the assembly or packaging of goods, products, commodities or raw materials that have not been or are not being produced in the Philippines on a commercial scale; (ii) use a design, formula, scheme, method, process or system of production or

Foreign Business Regulations Act of 1968, foreign investments that were not registered under the Investment Incentives Act and whose equity participation exceeded thirty (30) percent equity required these enterprises to obtain prior authority from the BOI.

Subject to the approval of PEZA, the Export Processing Zone Act of 1972 permitted foreign ownership up to 100 percent, however, only the industries that were being promoted were allowed to be set up. In 1979, Executive Order No. 567 allowed the EPZA to designate a specific plant site of an industrial firm or a group of industrial firms as a special export processing zone which are entitled to the same incentives granted to the four government-owned regular zones located in Bataan, Baguio, Cavite, and Mactan. The limited success of these zones in the 1980s prompted the government to institute changes in its EPZ policies.

Towards the 1990s, the attitude and policy direction of the Philippines toward foreign direct investment changed considerably. Given the decline in commercial bank loans and foreign aid in the 1980s, the government realized the need to rely more on foreign direct investments to achieve sustainable economic growth. At the same time, the government recognized the need to expand exports and the potential economic contribution of FDI through the transfer of knowledge and experience. The nineties witnessed a policy shift as the Philippines adopted more open and flexible policies toward FDI. This was almost carried out simultaneously with the country's market-oriented reforms consisting of trade liberalization, privatization, and economic deregulation in the 1980s up to 1990s. The country accelerated the FDI liberalization process through the legislation of Republic Act 7042 or the Foreign Investment Act (FIA) in June 1991.

The FIA considerably liberalized the existing regulations by allowing foreign equity participation up to 100% in all areas not specified in the Foreign Investment Negative List (FINL) which originally consisted of three component lists: A, B, and C.

List A: consists of areas reserved for Filipino nationals by virtue of the Constitution or specific legislations like mass media, cooperatives or small-scale mining.

List B: consists of areas reserved for Filipino nationals by virtue of defense, risk to health moral, and protection of small and medium scale industries.

List C: consists of areas in which there already exists an adequate number of establishments to serve the needs of the economy and further foreign investments are no longer necessary.

Prior to this, 100% eligibility for foreign investment was subject to the approval of the Board of Investments. The FIA was expected to provide transparency by disclosing in advance, through the FINL, the areas where foreign investment is allowed or restricted. It also reduced the bureaucratic discretion arising from the need to obtain prior government approval whenever foreign participation exceeded 40%.

Over time, the negative list has been reduced significantly. In March 1996, RA 7042 was amended through the passing of RA 8179 which further liberalized foreign investments allowing greater foreign participation in areas that were previously restricted. This abolished List C which limited foreign ownership in "adequately served" sectors. Currently, the FIA has two components Lists A and B covering sectors where foreign investment is restricted below 100%, those falling under the Constitution or those with restrictions mandated under various laws.

---

transformation of any element, substance or raw materials into another raw material or finished goods which is new and untried in the Philippines; (iii) engage in the pursuit of agricultural, forestry, and mining activities considered as essential to the attainment of the national goal; and (iv) produce unconventional fuels or manufacture equipment which utilizes non conventional sources of energy. Non-pioneer projects include those that are engaged in common activities in the Philippines and do not make use of new technology.

The mid-1990s witnessed the liberalization of the banking and retail trade sectors. The 1994 Foreign Bank Liberalization allowed the establishment of ten new foreign banks in the Philippines. With the legislation of the General Banking Law (RA 8791) in 2000, a seven-year window has been provided during which foreign banks may own up to 100 percent of one locally-incorporated commercial or thrift bank (with no obligation to divest later).

To develop international financial center operations in the Philippines and facilitate the flow of international capital into the country, foreign banks have been allowed to establish offshore banking units (OBUs). OBUs are subject to virtually no exchange control on their offshore operations and are not subject to tax on income they source from outside the Philippines. Only income from foreign currency transactions with local banks, including branches of foreign banks that are authorised by the *Bangko Sentral ng Pilipinas* to transact business with OBUs and Philippine residents is subject to a final tax of 10%. Non-residents are exempt from income tax on income they derive from transactions with OBUs.

Incentives have also been offered to multinationals that establish regional headquarters (RHQ) or a regional operating headquarters (ROHQ) in the Philippines.<sup>4</sup> Both RHQs and ROHQs are entitled to the following incentives: exemption from all taxes, fees, or charges imposed by a local government unit except real property tax on land improvements and equipment; tax and duty free importation of training materials and equipment; and direct importation of new motor vehicles, subject to the payment of the corresponding taxes and duties.

In March 2000, the passing of the Retail Trade Liberalization Act (Republic Act 8762) allowed foreign investors to enter the retail business and own them 100% as long as they put up a minimum of US\$7.5 million equity. Singapore and Hong Kong have no minimum capital requirement while Thailand sets it at US\$250,000. A lower minimum capitalization threshold (\$250,000) is allowed to foreigners seeking full ownership of firms engaged in high-end or luxury products. R.A. 8762 also allowed foreign companies to engage in rice and corn trade.

While substantial progress has been made in liberalizing the country's FDI policy, certain significant barriers to FDI entry still remain. The sectors with foreign ownership restriction include mass media, land ownership where foreign ownership is limited to 40%, natural resources, firms that supply to government-owned corporations or agencies (40%), public utilities (40%), and Build-Operate-Transfer (BOT) projects (40%). Details are discussed in Appendix A.

## **2.3 Tax Incentives and Other Fiscal Measures to Attract FDI**

In the last two decades, the Philippines pursued changes in its investment incentive schemes in order to encourage FDI inflows (see Table 1). In 1987, a new Omnibus Investments Code was legislated to simplify and consolidate previous investment laws and added two new measures: income tax holiday for enterprises engaged in preferred areas of investment and labor expense allowance for tax deduction purposes. Under the new Omnibus Investments Code, foreign and domestic investors may avail of fiscal and non-fiscal incentives provided they invest in preferred areas of investment identified annually in the Investment Priorities Plan (IPP). If the areas of investment are not listed in the IPP, they may still be entitled to incentives, provided:

---

<sup>4</sup> An RHQ is a branch office that principally serves as a supervision, communications and coordination centre for the subsidiaries, branches or affiliates of a multinational company operating in the Asia-Pacific Region and other foreign markets. It is allowed to operate only as a cost centre, and may not participate in any manner in the management of any subsidiary or other branch office the multinational has in the Philippines, or to solicit or market any goods or services. An ROHQ is a branch office that is allowed to derive income in the Philippines by performing qualifying services to its affiliates, subsidiaries or branches in the Asia-Pacific Region (including the Philippines) and other foreign markets. The services it is able to render, however, are limited to general administration and planning, business planning and coordination, sourcing and procurement of raw materials and components, corporate finance advisory services, marketing control and sales promotion, training and personnel management, logistics services, research and development services and product development, technical support and maintenance, data processing and communication, and business development.

- at least 50% of production is for exports, for Filipino-owned enterprises; and
- at least 70% of production is for export, for majority foreign-owned enterprises (more than 40% of foreign equity).

In the 1990s, several other laws containing investment incentive packages were legislated; the most important of which are RA 7227 known as the Bases Conversion and Development Act of 1992 and RA 7916 or the Special Economic Zone Act of 1995. RA 7227, or the Bases Conversion and Development Act of 1992, was enacted into law in March 1992 with the objective of accelerating the development of the former United States military bases into special economic zones. The Act created two administrative bodies, the Bases Conversion and Development Authority (BCDA) and the Subic Bay Metropolitan Authority (SBMA), tasked with adopting, preparing and implementing a comprehensive development program for the conversion of the Clark and Subic military reservations into special economic zones. The BCDA is mandated to oversee and implement the conversion and development of Clark and other military stations; while the SBMA is mandated to oversee the implementation of the development programs of the Subic Bay Naval Station and surrounding communities. In 1993, Executive Order No. 80 was issued establishing the Clark Development Corporation (CDC), as the implementing arm of the BCDA for the Clark Special Economic Zone. In July 2005, the Supreme Court revoked the incentives stating that RA 7227 did not grant privileges to locators operating in Clark.

In 1995, RA 7916 was legislated to shift the focus away from government EPZs towards private industrial zones. Focus has also shifted from the traditional EPZ in which firms must be 100 % export-oriented and engaged in recognized manufacturing activities towards industrial parks which allow all industries regardless of market orientation and a separate, fenced-in EPZ for wholly export-oriented firms. Republic Act 7916 also replaced the EPZA and created the Philippine Economic Zone Authority (PEZA) to manage and operate government-owned zones and administer incentives to special economic zones (ecozones). RA 7916 allowed greater private sector participation in zone development and management through the provision of incentives for private zone developers and operators. Zone developers are allowed to supply utilities to tenants by treating them as indirect exporters. Activities permitted within the economic zones have also been expanded.

In the absence of an integrated and comprehensive FDI incentive scheme, the introduction of various investment incentive legislations resulted in a fragmented and complex system of investment promotion programs. The current system is characterized by different investment regimes administered by different government bodies consisting of Board of Investments, Philippine Economic Zone Authority, Subic Bay Metropolitan Authority, Clark Development Corporation, and other bodies mandated by various laws to establish, maintain, and manage special economic or free port zones.

Table 2 presents a comparison of the major incentives provided by the different investment incentive-giving bodies (see Appendix B for detailed list of incentives). BOI-registered enterprises are allowed income tax holiday up to eight years, tax and duty free importation of spare parts, and tax credit on raw materials. Under EO 226, the incentives of importing capital equipment duty and tax free and tax credit on purchase of domestic capital equipment expired in 1997. After the lapse of the income tax holiday, the regular corporate tax rate of 32% will apply to BOI enterprises. PEZA grants the most generous incentives including income tax holiday, basic income tax rate of 5% of gross income, and tax and duty free importation of capital equipment, spare parts, and raw material inputs. Except for the income tax holiday, Clark<sup>5</sup> and Subic enterprises enjoy the same incentives available to PEZA enterprises.

---

<sup>5</sup> The October 2004 and July 2005 rulings of the Supreme Court nullified the fiscal incentives given by four special economic zones including the Clark Special Economic Zone (CSEZ). In March 2006, Presidential Proclamation 1035 was signed declaring the CSEZ as a PEZA Special Economic Zone. Still, with the Supreme Court decision all locators would be

**Table 2: FDI Incentives by Type of Investment Regime**

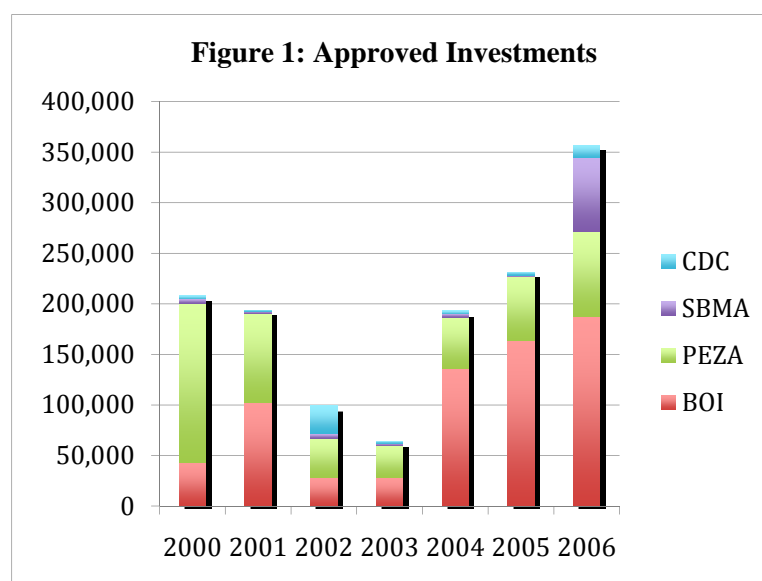
	Investment Regime	BOI OIC	PEZA	SBMA & CSEZ
Incentives	Income	4-8 years ITH	4-8 years ITH	No ITH
	Others	After ITH, payment of the regular corporate tax rate of 35% of taxable income	After ITH, exemption from national & local taxes, in lieu of this special rate of 5% tax on gross income	5% tax on gross income in lieu of all local & national taxes
	Importation of raw materials & supplies	Tax credit	Tax & duty exemption	Tax & duty exemption
	Purchase of breeding stocks & genetic materials	Tax exemption within 10 years from registration	Tax & duty exemption	Tax & duty exemption
	Imported capital equipment, spare parts, materials & supplies	Tax & duty exemption on spare parts (duty & tax free importation of capital equipment expired in 1997) <sup>6</sup>	Tax & duty exemption	Tax & duty exemption

**Table 3: Approved Investments by Government Promotion Agency (in million pesos)**

Agency	2000	2001	2002	2003	2004	2005	2006
BOI	43,612	102,037	28,352	28,341	135,723	163,879	187,616
PEZA	156,698	88,320	38,741	31,346	50,561	62,761	83,761
SBMA	4,664	1,837	4,542	2,359	3,728	1,484	72,933
CDC	2,913	1,569	27,548	1,749	2,935	3,110	12,693
<b>Total</b>	<b>207,886</b>	<b>193,762</b>	<b>99,184</b>	<b>63,795</b>	<b>192,947</b>	<b>231,235</b>	<b>357,003</b>

Note: Approved investments refer to both domestic and foreign.

Sources: Board of Investment, PEZA, and SBMA.



subject to back taxes and duties. The House of Representatives passed two bills seeking to regain the fiscal incentives and provide tax amnesty. Currently, the bills are in the Senate for deliberation.

<sup>6</sup> Executive Order 313 (2004) restored these incentives.

Table 3 and Figure 1 present the distribution of approved investment by agency. In 2006, BOI accounted for 53 percent of the total while PEZA and SBMA cornered 23 and 20 percent, respectively. On the average, the BOI registered an share of 49 percent while PEZA accounted for 41 percent of the total from 2000 to 2006. SBMA and CDC had shares of six and five percent, respectively.

Given weak institutions in the country, the highly fragmented and complex investment incentive system can easily become a source of corruption. During the late 1990s, the country's tax credit system was weakened by cases of tax credit fraud due to the proliferation of tampered, fake, and used tax credit certificates which were sold and re-used resulting in large costs to the government amounting to billions of pesos in revenue losses. Hence, there is a need to carefully weigh these incentive measures.

### 3. Analysis of FDI Trends, Structure and Relationship with Regional Integration

#### 3.1 Trends and Patterns, Distribution and Sources

Table 4 presents the inward and outward FDI flows in the Philippines covering the years 1980 to 2007. The 1980s witnessed fluctuating FDI inflows; FDI flows rose until 1983, dropped in 1984 and 1985, and increased again in 1986 reaching a peak of US\$999 million in 1988. The late 1980s were characterized by a renewed fall in FDI inflows, but from 1991 to 1994, steady increases in FDI inflows were registered. Although, substantial declines were observed in 2001 and 2003, some recovery was felt as FDI increased from 2004 till 2007.

**Table 4: Inward and Outward FDI Flows (in million US\$)**

YEAR	Inward FDI		Outward FDI	
	Flow	Stock	Flow	Stock
1980	114	914	86	87
1981	243	1157	47	134
1982	193	1350	61	195
1983	247	1597	27	222
1984	137	1734	15	237
1985	105	1839	58	295
1986	157	1996	11	306
1987	415	2411	53	359
1988	999	3410	16	375
1989	568	3978	9	384
1990	550	4528	22	406
1991	556	5084	27	433
1992	776	5860	101	534
1993	1238	7098	374	908
1994	1591	8689	302	1210
1995	1459	10148	98	1308
1996	1520	11668	182	1490
1997	1249	12917	136	1626
1998	1752	14669	160	1786
1999	1247	15916	133	1919
2000	2240	18156	125	2044
2001	195	10385	-140	892
2002	1542	11565	65	957
2003	491	11411	303	1260
2004	688	12745	579	1839
2005	1854	14562	189	2028
2006	2921	16024	103	2131

	2007	2928	18952	3442	5573
average percent change					
1980-1989		40.5		39.8	
1990-1999		11.5		68.6	
2000-2007		109.8		402.7	

Source: UNCTAD FDI Indicators (World Investment Report 2008).

Table 5 presents a sectoral breakdown of FDI for the three periods 1980-1989, 1990-1999, and 2000-2007. A structural shift seems to be taking place as inflows to the manufacturing sector slow down while inflows to the services sector particularly finance and telecommunications continue to rise. As the table shows, the share of manufacturing FDI, which dominated total FDI inflows during the 1980s and the 1990s, fell from 46 percent to 31 percent in the current period, 2000-2007. The share of the financial sector increased significantly from eight percent in the 1980s to 17.5 percent in the nineties, and currently, its share stands almost at par with manufacturing at 30 percent. Transport, storage and communication sector also witnessed an increase in its share to 18 percent in the current period from 17 percent in the 1990s and one percent in the 1980s. Mining and quarrying share dropped to seven percent from 34 percent in the 1980s. Real estate, renting, and business services accounted for a share of seven percent during the 1990s and the 2000s.

**Table 5: FDI Inflows<sup>7</sup> by Industry (in million US\$)**

Industry Group	Cumulative FDI Inflows			Percentage Share		
	1980-89	1990-99	2000-07	1980-89	1990-99	2000-07
<b>TOTAL</b>	<b>2,020.66</b>	<b>8,339.62</b>	<b>8,342.20</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Agriculture, Hunting and Forestry</b>	<b>36.74</b>	<b>10.01</b>	<b>12.63</b>	<b>1.82</b>	<b>0.12</b>	<b>0.15</b>
Agricultural and Animal Husbandry	35.72	6.68	0.31	1.77	0.08	0.00
Services Activities Except Veterinary						
Activities						
Farming of Animals	0.00	0.30	0.03	0.00	0.00	0.00
Fishery	0.00	2.81	0.00	0.00	0.03	0.00
Growing Crops	0.00	0.00	11.17	0.00	0.00	0.13
Hunting, Trapping and Game	0.00	0.00	9.02	0.00	0.00	0.11
Propagation Including Related						
Service Activities						
Others	0.00	0.09	0.23	0.00	0.00	0.00
<b>Manufacturing</b>	<b>923.07</b>	<b>3,809.49</b>	<b>2,577.18</b>	<b>45.68</b>	<b>45.68</b>	<b>30.89</b>
Food Products and Beverages	214.49	1,004.03	1,055.78	10.61	12.04	12.66
Textiles	39.41	76.57	0.81	1.95	0.92	0.01
Wearing Apparel	0.00	0.00	0.90	0.00	0.00	0.01
Coke, Refined Petroleum and Other	53.62	760.38	270.82	2.65	9.12	3.25
Fuel Products						
Chemicals and Chemical Products	246.54	329.23	347.29	12.20	3.95	4.16
Paper and Paper Products	0.00	25.54	103.96	0.00	0.31	1.25
Publishing, Printing and	0.00	0.00	0.17	0.00	0.00	0.00
Reproduction of Recorded Media						
Rubber and Plastic Products	0.00	54.14	28.05	0.00	0.65	0.34
Basic Metals	105.70	198.34	92.38	5.23	2.38	1.11
Machinery, Apparatus, Supplies	0.00	769.30	175.92	0.00	9.22	2.11
Radio, Television and	0.00	0.00	2.19	0.00	0.00	0.03
Communication Equipment						
Electrical Machinery and Apparatus,	0.00	0.00	4.85	0.00	0.00	0.06
NEC						

<sup>7</sup> Data based on registration are recorded at the time these are registered with the BSP; which could be later than the actual foreign exchange remittance. Registration of investments is not mandatory and is required only where capital repatriation and remittance of profits/earnings on the investments are intended to be serviced with foreign exchange from the banking system.



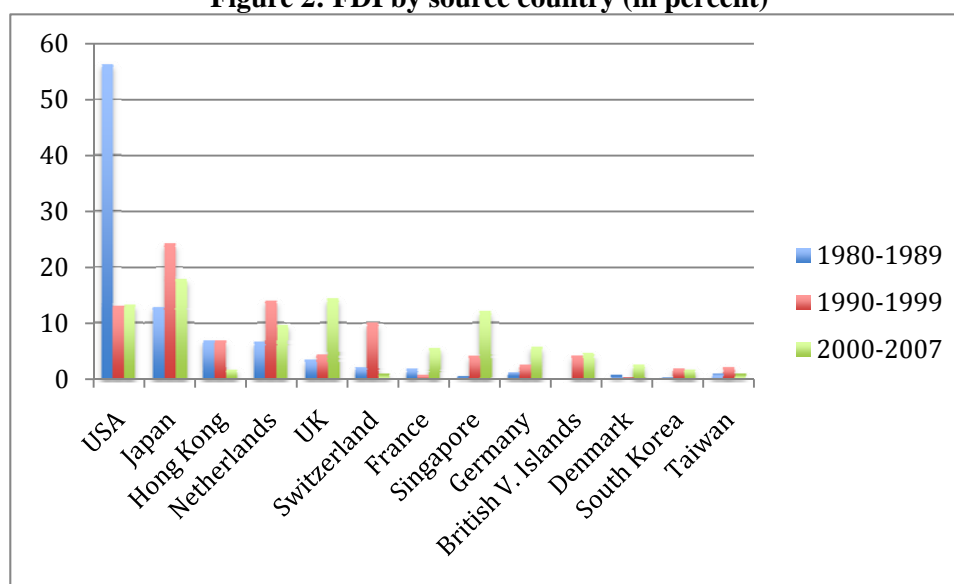
Machinery and Equipment, N.E.C.	0.00	0.00	8.58	0.00	0.00	0.10
Fabricated Metal Products, Except	0.00	0.00	2.40	0.00	0.00	0.03
Machinery and Equipment						
Metal Prods, exc. Mach.	6.45	37.07	0.00	0.32	0.44	0.00
Other Non-Metallic Mineral Products	0.00	175.33	152.47	0.00	2.10	1.83
Office Accounting and Computing	0.00	0.00	0.05	0.00	0.00	0.00
Machinery						
Medical, Precision and Optical	0.00	0.00	23.48	0.00	0.00	0.28
Instruments, Watches and Clocks						
Motor Vehicles, Trailers and Semi-	0.00	0.00	34.91	0.00	0.00	0.42
Trailers						
Other Transport Equipment	75.60	228.43	217.03	3.74	2.74	2.60
Recycling	0.00	0.00	0.10	0.00	0.00	0.00
Others	0.00	77.91	28.07	0.00	0.93	0.34
Manufacturing, N.E.C.	0.00	0.00	0.90	0.00	0.00	0.01
<b>Construction</b>	12.86	307.17	270.99	<b>0.64</b>	<b>3.68</b>	<b>3.25</b>
<b>Education</b>	0.00	0.00	0.22	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Electricity, Gas and Water</b>	0.00	0.00	80.97	<b>0.00</b>	<b>0.00</b>	<b>0.97</b>
Collection, Purification and	0.00	0.00	17.15	<b>0.00</b>	<b>0.00</b>	<b>0.21</b>
Distribution of Water						
Electricity, Gas Steam and Hot Water	0.00	0.00	63.82	<b>0.00</b>	<b>0.00</b>	<b>0.77</b>
Supply						
<b>Financial Intermediation</b>	152.54	1,455.50	2,513.08	<b>7.55</b>	<b>17.45</b>	<b>30.12</b>
Banking Institutions	81.86	679.86	1,178.42	<b>4.05</b>	<b>8.15</b>	<b>14.13</b>
Other Fin. Institutions	70.68	775.65	887.80	<b>3.50</b>	<b>9.30</b>	<b>10.64</b>
Activities Auxiliary to Financial	0.00	0.00	20.03	<b>0.00</b>	<b>0.00</b>	<b>0.24</b>
Intermediation						
Insurance and Pension Funding,	0.00	0.00	30.29	<b>0.00</b>	<b>0.00</b>	<b>0.36</b>
Except Compulsory Social Security						
Non-Bank Financial Intermediation	0.00	0.00	396.53	<b>0.00</b>	<b>0.00</b>	<b>4.75</b>
<b>Health and Social Work</b>	0.00	0.00	0.33	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Hotels and Restaurants</b>	0.00	0.00	10.12	<b>0.00</b>	<b>0.00</b>	<b>0.12</b>
<b>Mining and Quarrying</b>	680.89	351.78	559.41	<b>33.70</b>	<b>4.22</b>	<b>6.71</b>
<b>Wholesale and Retail Trade; Repair of Motor Vehicles, Motorcycles and Personal and Household Goods</b>	64.82	367.89	243.73	<b>3.21</b>	<b>4.41</b>	<b>2.92</b>
<b>Real Estate, Renting and Business Services</b>	126.80	587.85	595.05	<b>6.28</b>	<b>7.05</b>	<b>7.13</b>
Computer and Related Activities	0.00	0.00	62.46	<b>0.00</b>	<b>0.00</b>	<b>0.75</b>
Miscellaneous Business Activities	0.00	0.00	376.86	<b>0.00</b>	<b>0.00</b>	<b>4.52</b>
Real Estate Activities	0.00	0.00	42.49	<b>0.00</b>	<b>0.00</b>	<b>0.51</b>
Research and Development	0.00	0.00	0.42	<b>0.00</b>	<b>0.00</b>	<b>0.01</b>
<b>Other Community, Social and Personal Service Activities</b>	0.00	0.00	3.44	<b>0.00</b>	<b>0.00</b>	<b>0.04</b>
<b>Transport, Storage and Communications</b>	22.94	1,379.52	1,463.90	<b>1.14</b>	<b>16.54</b>	<b>17.55</b>
Posts and Communications	13.82	658.74	1,761.94	0.68	7.90	21.12
Supporting and Auxiliary Transport	0.00	15.45	3.38	0.00	0.19	0.04
Activities; Activities of Travel						
Agencies						
Land Transport	1.39	0.81	1.53	0.07	0.01	0.02
Electricity	0.00	637.47	82.39	0.00	7.64	0.99
Air Transport	0.00	34.72	0.20	0.00	0.42	0.00
Water Transport	0.00	6.31	5.27	0.00	0.08	0.06
Others	0.00	10.49	58.75	0.00	0.13	0.70
<b>Public Administration and Defense, Compulsory Social Security</b>	0.00	0.00	0.23	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Others	0.00	70.45	10.95	0.00	0.84	0.13
--------	------	-------	-------	------	------	------

Source: Bangko Sentral ng Pilipinas (BSP).

Within manufacturing, FDI inflows have been dominated by the food and beverage sector with a share of 12.7 percent in the 2000-2007 period. The share of chemicals and chemical products fell to 4.2 percent in the 2000s from 12.2 percent in the 1980s. Coke, refined petroleum, and other fuel products also dropped to only 3.3 percent in the 2000s from nine percent in the 1990s. Similarly; FDI inflows in machinery, apparatus and supplies fell to two percent from a share of nine percent in the 1990s. There is also a decline in the share of transport equipment from 3.7 percent in the 1980s to 2.6 percent in the 2000s. Only paper and paper products witnessed an increase from 0.31 percent in the nineties to 1.25 percent in the 2000s.

**Figure 2: FDI by source country (in percent)**



Source: Bangko Sentral ng Pilipinas (BSP).

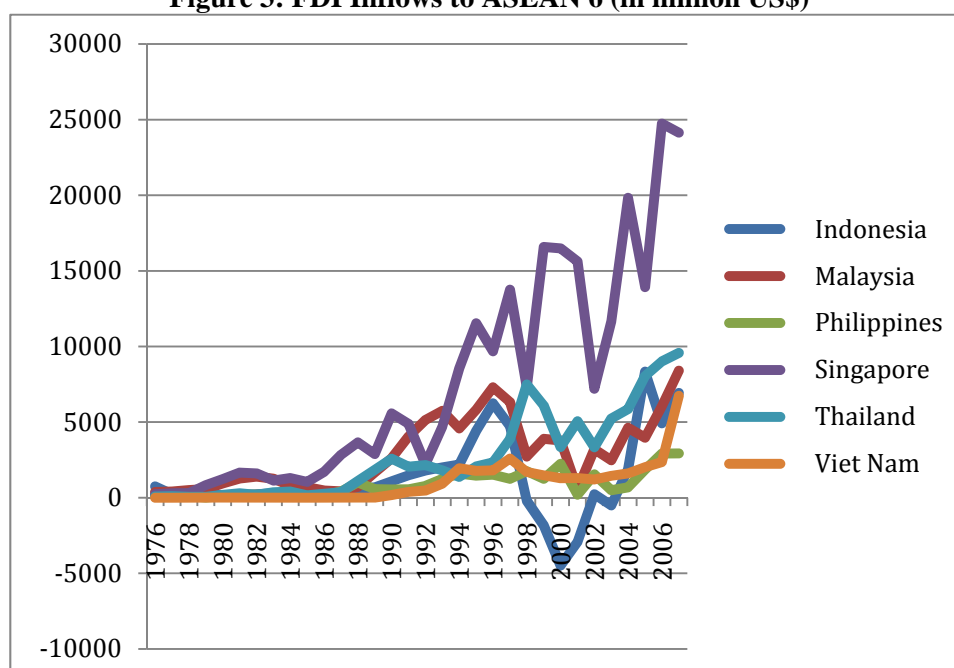
The last two and a half decades have witnessed changes not only in the sectoral concentration of FDI but also in its sources. Up to the 1980s, the US was the country's largest source of FDI inflows. However, its share dropped from 56 percent in the 1980s to only 13 percent in the 1990s and 2000s. US dominance has been substantially diluted by the increasing presence of Japan, Netherlands, UK, and Singapore. Japan's share increased from 13 percent in the 1980s to 24 percent in the 1990s, although this fell to 18 percent in the 2000s. Singapore increased its share significantly from less than one percent during the 1980s to four percent in the 1990s to 12 percent in the recent period. The share of the Netherlands rose from seven percent to 14 percent, but declined to 10 percent in the 2000s. The UK share went up to 14 percent from four percent in the previous two decades.

### 3.2 FDI in ASEAN 6 Countries: A Comparative Analysis

Figure 3 compares FDI inflows to the Philippines with flows to Singapore, Thailand, Malaysia, Indonesia, and Vietnam from the mid-1970s up to the year 2007. The figure shows that huge differences are evident in FDI inflows to the ASEAN 6 countries with the Philippines receiving the lowest level of FDI inflows particularly in the 1990s and the 2000s. Table 6 and Figure 4 present FDI stock in these countries. Both show that in 1990, cumulative FDI inflows to the Philippines amounted to US\$ 4.5 billion while Vietnam registered a total of US\$ 1.65 billion. In 2000, Vietnam surpassed the Philippines total of US\$18.2 billion as its total FDI reached US\$20.6 billion. In 2007, Vietnam soared to US\$40 billion while the Philippine total barely increased at US\$18.96 billion.

FDI studies show that the most important determinants on the ability of countries to attract FDI relate to the investment climate (particularly the FDI regime and the effectiveness of FDI promotion), the economic competitiveness of the country, and its growth prospects (FIAS, WB, and IFC, 2005). Lall (1997) summarizes the three major determinants and factors affecting FDI into three major components: economic conditions, host country policies, and strategies of multinational enterprises (MNE) that are associated with the extent and pattern of FDI in developing countries (see Box 1).

**Figure 3: FDI Inflows to ASEAN 6 (in million US\$)**



Source: UNCTAD FDI Indicators (World Investment Report 2008)

**Table 6: FDI Inward Stock in ASEAN 6 Countries (million US\$)**

Country Name	2007	2000	1990
Indonesia	58955.00	25060.45	8732.45
Malaysia	76747.62	52747.49	10318.00
Philippines	18952.00	18156.19	4528.19
Singapore	249667.27	112632.80	30468.04
Thailand	85749.35	29915.00	8242.25
Viet Nam	40235.32	20595.61	1649.59
China	327087.00	193348.00	20690.62
Hong Kong	1184471.00	455469.00	201652.87

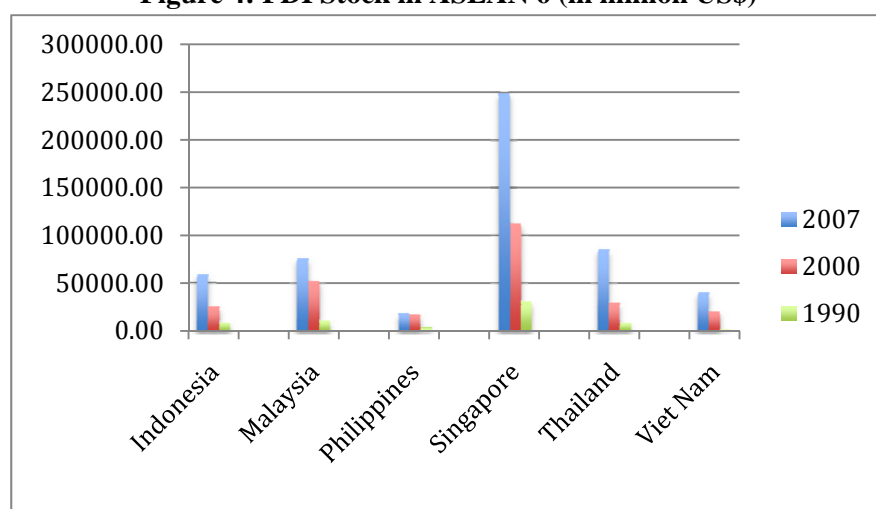
Source: UNCTAD FDI Indicators (World Investment Report 2008).

The Philippines has considerably liberalized its FDI policies in the last two decades. At the same time, it has granted various investment incentive measures. While the investment policy reforms and opening up of more sectors to foreign investors in the past decade resulted in improvements in FDI inflows to the country, on the overall, FDI inflows to the Philippines have been limited; hence the country's performance has lagged behind its neighbors in East and Southeast Asia.

Table 7 presents three sets of competitiveness indicators: growth competitiveness, macro environment, and public institutions indices along with the rankings of the Philippines and other Southeast Asian countries out of a total of 102 countries for the years 2004 and 2009. The macro environment index is based on macroeconomic stability, country credit risk, and wastage in government expenditures while the public institutions index is based on measures of the enforcement of contracts and law and degree of competition. The results show that the Philippines together with

Indonesia performed substantially poorly than Malaysia and Thailand. While Philippine ranking for macroeconomic stability index improved, its ranking worsened for the growth competitiveness and institution indices.

**Figure 4: FDI Stock in ASEAN 6 (in million US\$)**



Source: UNCTAD FDI Indicators (World Investment Report 2008).

**Box 1: Host Country Determinants of FDI**

Economic conditions	• Markets	Size, income levels; urbanization; stability & growth prospects; access to regional markets; distribution & demand patterns
	• Resources	Natural resources; location
	• Competitiveness	Labor availability, cost, skills, trainability; managerial technical skills; access to inputs; physical infrastructure; supplier base; technology support
Host country policies	• Macro Policies	Management of crucial macro variables; ease of remittance; access to foreign exchange
	• Private Sector	Promotion of private ownership; clear & stable policies; easy entry/exit policies; efficient financial markets; other support
	• Trade & Industry	Trade strategy; regional integration & access to markets; ownership controls; competition policies; support for SMEs
	• FDI Policies	Ease of entry; ownership; incentives; access to inputs; transparent & stable policies
MNE strategies	• Risk Perception	Perception of country risk based on political factors, macro management, labor markets, policy stability
	• Location, sourcing, integration transfer	Company strategies on location, sourcing of products/inputs, integration of affiliates, strategic alliances, training, technology

Source: Lall, S. (1997), "Attracting Foreign Investment: New Trends, Sources, and Policies", Economic Paper 31, Commonwealth Secretariat.

**Table 7: Competitiveness Indicators Rankings for Selected Southeast Asian Countries**

Country	Growth Competitiveness	Macro Environment	Public Institution Index
---------	------------------------	-------------------	--------------------------

	Index		Index			
	2004	2009	2004	2009	2004	2009
Malaysia	29	21	27	38	34	30
Thailand	32	34	26	41	37	57
Philippines	66	71	60	53	85	105
Indonesia	72	55	64	72	76	68

Source: World Economic Forum, Global Competitiveness Report, 2003-2004 and 2008-2009.

A study by the Asian Development Bank (2005) indicated that the poor quality of key infrastructure services, a fragile and underdeveloped financial system, and a perception that contracting and regulatory uncertainty adds to the costs of doing business which also makes investors hesitant. The surveyed firms identified corruption and macroeconomic instability as the two biggest impediments to a good investment climate in the Philippines. Electricity supply, security and regulatory uncertainty also figured prominently.

The World Bank's doing business indicators showed the same concerns on costs, complexity, and uncertainty in contract enforcement. The World Bank viewed the Philippines as providing a less certain environment compared with Indonesia, Thailand, China, and Malaysia. Table 8 shows a comparison of the business costs indicators for the Philippines and its East Asian neighbors. The table reveals that in general the Philippines, along with Indonesia, performed significantly below the other East Asian countries in terms of corruption-related indicators. It had the worst indicators for procedure to enforce a contract, number of start-up procedures, and time to enforce a contract. Between 2004 and 2009, some improvements are observed for time to start a business and employment index.

**Table 8: Cost of Doing Business Indicators**

Source: World Bank, World Development Indicators, 2004 and Doing Business 2009.

Country	Number of start-up procedures		Time to start a business (days)		Cost to register business (% of GNI pc)		Procedures to enforce a contract		Time to enforce a contract (days)		Employment laws index: range 0 (less rigid) to 100 (very rigid)	
	2004	2009	2004	2009	2004	2009	2004	2009	2004	2009	2004	2009
Philippines	11	15	59	52	24	29.8	28	37	164	842	60	35
PRChina	11	14	46	40	14	8.4	20	34	180	406	47	27
Malaysia	8	9	31	13	27	14.7	22	30	270	600	25	10
Hong Kong	5	5	11	11	2	2	17	24	180	211	27	0
Indonesia	11	11	168	76	15	77.9	-	39	225	570	57	40
S Korea	12	10	33	17	18	16.9	23	35	75	230	51	45
Singapore	7	4	8	4	1	0.7	23	21	50	150	20	0
Thailand	9	8	42	33	7	4.9	19	35	210	479	61	18
Vietnam	11	11	63	50	30	16.8	28	34	120	295	56	24

Tables 9 and 10 present infrastructure indicators measured by utility and real estate costs. Electricity and land acquisition costs in the Philippines are the highest in the region. The country is also among the highest in terms of internet and telecommunications costs as well as in facilities lease.

In terms of industry competitiveness, there are quite a number of issues that the country needs to address particularly on productivity improvements, skills development, and technology upgrading. There is no doubt that market-oriented reforms such as trade liberalization, deregulation, and privatization are necessary in order to improve the allocation of resources. However, it is important to emphasize that simultaneous with this, efforts are needed to address fundamental factors such as the modernization of our infrastructure, raising the level of education and labor skills, upgrading existing technologies, increasing productivity along with improvements in the overall business climate.

Improving the fundamentals for economic growth will not only attract FDI inflows but will also increase the chances for spill over benefits to accrue to the private sector. To realize this, it is important that local firms have the ability and motivation to invest in absorbing foreign technologies and skills.

**Table 9: Utility Costs**

Country	Electricity (US\$/KwH)	Water (US\$/cubic meter)	Sewer (US\$/cubic meter)	Telecom (US\$/minute to the US)	Internet (US\$/mo. T1 line equiv)
PRChina	0.08	0.21	0.18	0.25	5452
Indonesia	0.07	0.59	0.80	1.00	4863
Malaysia	0.07	0.51	0.66	0.24	4388
Philippines	0.10	0.21	0.19	0.30	5452
Thailand	0.06	0.31	0.17	0.56	4283
Vietnam	0.07	0.25	-	1.30	7497

Source: MIGA and World Bank, Benchmarking FDI Competitiveness in Asia, 2004.

**Table 10: Real Estate Costs**

Country	Land acquisition costs (US\$/square meter)	Building Construction Costs (US\$/square meter)	Facilities Lease (US\$/square meter gross/mo.)	Office Lease (US\$/square meter gross/mo)
PRChina	35	97	-	25
Indonesia	66	221	7	11
Malaysia	60	282	-	12
Philippines	61	1022	5	7
Thailand	52	329	2	5
Vietnam	-	-	3	12

Source: MIGA and World Bank, Benchmarking FDI Competitiveness in Asia, 2004.

The case of Ireland, which has for a long time been considered a preferred location for FDI, has shown that its success in attracting FDI and benefiting from such was largely due to the country's having the right fundamentals (Barry and O'Malley, 1999). Blomström and Kokko (2003) emphasized that these together with an investment incentive program should form part of an integrated approach for attracting FDI. To attract export-oriented FDI, Ireland as well as Singapore pursued more integrated approaches by placing their FDI policies in the context of their national development strategies and focusing on productivity improvements, skills development, and technology upgrading.

### **3.3 Promoting Intraregional Investment and Regional Production Networks (RPNs) through Economic Integration**

#### **ASEAN Economic Community (AEC) and Regional Production Networks**

Studies on European economic integration generally provide empirical support for the proposition that integration is a positive determinant of FDI. The implementation of the Single Market Programme led to significant increases in investment in both manufacturing and services sectors. Internal European Union trade seems to be complementary to intra-regional FDI as economic liberalization facilitates the relocation of economic activities and the formation of production and distribution networks. All these suggest that the integration process is a significant influence in the rise of investments in Europe, along with its changed pattern and flow over the years. Apart from the experiences of the EU, NAFTA also shows the importance of regional integration in attracting FDI (Aldaba and Yap 2008).

In recent years, the uncertainty in the successful conclusion of the World Trade Organization (WTO)'s multilateral trade negotiations has led to a new wave of regionalism through the surge in free trade agreements (FTAs). In the Asia Pacific region, for instance, there were only 54 FTAs in 2000. As of December 2008, a total of 250 FTAs are already in force with several others currently under negotiation. Currently, the Philippines has a total of 12 FTAs, five are concluded (Japan-Philippines, Korea-ASEAN, China-ASEAN, AFTA, and Japan-ASEAN), two are under negotiation (ASEAN-India, ASEAN-Australia and New Zealand), and five are proposed (see Table 11).

**Table 11: Philippine Free Trade Agreements**

Concluded	Under Negotiation	Proposed
Japan-Philippines Economic Partnership Agreement (2006)	ASEAN-India Regional Trade and Investment Agreement (2004)	People's Republic of China-Japan-Korea Free Trade Agreement (2003)
Korea-ASEAN Free Trade Agreement (2006)	ASEAN-Australia and New Zealand Free Trade Agreement (2005)	East Asian (ASEAN+3) Free Trade Agreement (2004)
PRC-ASEAN Free Trade Agreement (2005)		East Asian (ASEAN+6) Free Trade Agreement (2007)
ASEAN Free Trade Agreement (1993)		ASEAN-EU Free Trade Agreement (2003) [negotiations launched in May 2007]
Japan-ASEAN Comprehensive Economic Partnership Agreement (2005)		United States-Philippines Free Trade Agreement (1989)

Source: Asia Regional Integration Center, [www.aric.adb.org](http://www.aric.adb.org)

The creation of the ASEAN Economic Community (AEC) is expected to promote free investment flows and freer capital flows. One of the major objectives of the AEC is to deepen economic integration among the ASEAN Member Countries through the establishment of a region-wide production base that will attract more foreign direct investment. It is important to note that FDI has encouraged the growth of regional production networks and production sharing in ASEAN and East Asia. The regional production networks, which are at the heart of intraregional trade and investment flows, are the key drivers of economic growth in ASEAN together with its integration with the East Asian region.

Table 12 shows the intra-ASEAN FDI by host country for the period 2002 to 2006. Intraregional investment inflows dropped by 28 percent in 2003, but increased by two percent in 2004, by 35 percent in 2005, and by 66 percent in 2006. FDI flows from ASEAN to the Philippines increased by 100 percent between 2002 and 2003, but declined in 2004 and 2005, with net outflows registered in 2006. The largest recipient of intraregional flows was Thailand with a share of 35 percent. Next came Singapore (22.3 percent) and Indonesia (22.2 percent). Malaysia followed with a share of about 12 percent and Vietnam and Cambodia with shares of five and two percent, respectively. The Philippines accounted for a share of only 1.3 percent.

Table 13 shows intra-ASEAN cumulative investment by source country and by industry sector for the period 1996 to 2006. The largest single country source is Singapore which accounted for 64 percent of the total cumulative flows during the period under review. Malaysia is far second with a share of 21 percent, and third is Indonesia with a share of about 11 percent. The Philippines accounted for around 1.9 percent of the total, Thailand had a share of almost one percent while the rest of the ASEAN member countries registered shares of less than one percent. The table also reveals

that most of these went to manufacturing with a share of 36 percent. Real estate was next with its share of almost 19 percent. Trade and commerce followed and financial intermediation with shares of 12.9 and 12.7 percent, respectively while services registered a share of 12.5 percent. Mining and quarrying had a share of about 11 percent.

**Table 12: Intra-ASEAN FDI Flows: 2002-2006 (in million US\$)**

Host Country	2002	2003	2004	2005	2006	Total	% Share
Brunei Darussalam	21.23	36.79	19.66	19.43	9.71	106.82	0.55
Cambodia	8.52	19.88	31.92	129.18	155.54	345.04	1.78
Indonesia	1,296.62	383.46	204.25	883.32	1,524.53	4,292.18	22.15
Lao PDR	2.92	2.98	7.75	6.68	10.56	30.9	0.16
Malaysia	0.02	251.12	980.17	572.91	467.82	2,272.05	11.73
Myanmar	25.11	24.28	9.31	38.35	27.79	124.84	0.64
Philippines	87.44	175.37	71.11	12.69	-95.56	251.06	1.30
Singapore	762.3	699.2	548	1,175.60	1,137.70	4,322.80	22.31
Thailand	1,408.29	1,060.42	688.71	762.22	2,822.12	6,741.76	34.79
Viet Nam	200.43	100.4	242.87	164.72	181.89	890.31	4.59
<b>TOTAL ASEAN</b>	<b>3,812.89</b>	<b>2,753.90</b>	<b>2,803.75</b>	<b>3,765.11</b>	<b>6,242.09</b>	<b>19,377.75</b>	<b>100.00</b>

Source: ASEAN Secretariat

**Table 13: Intra-ASEAN FDI Flows, by source country and industry (1999-2006, in million US\$)**

	Bru	Cam	Indo	Lao	Mal	Myan	Phils	Sin	Thai	Viet	Total	%
Agriculture, fishery & forestry	-	1	-3	-	201	3	22	192	89	0	503	2.2
Mining & quarrying	0	-	22	-	198	0	18	2,178	3	1	2,421	10.8
Manufacturing	16	1	37	8	401	2	148	7,343	156	7	8,119	36.1
Construction	3	-	-20	0	112	0	3	137	41	0	277	1.2
Trade/commerce	85	6	115	0	-176	27	10	2,807	31	10	2,914	12.9
Financial intermediation	-7	0	431	1	1,048	-1	124	1,782	-514	0	2,864	12.7
Real estate	4	4	1,776	1	1,995	45	81	337	-2	18	4,257	18.9
Services	10	0	81	0	845	11	3	1,463	397	8	2,818	12.5
Others	5	7	92	0	91	1	13	-1,890	21	4	-1,657	-7.4
<b>Total</b>	<b>116</b>	<b>18</b>	<b>2,530</b>	<b>11</b>	<b>4,714</b>	<b>87</b>	<b>421</b>	<b>14,349</b>	<b>220</b>	<b>48</b>	<b>22,515</b>	<b>100</b>
<b>% share</b>	<b>0.52</b>	<b>0.08</b>	<b>11.24</b>	<b>0.05</b>	<b>20.94</b>	<b>0.39</b>	<b>1.87</b>	<b>63.73</b>	<b>0.98</b>	<b>0.21</b>	<b>100</b>	

Source: ASEAN Secretariat

As earlier indicated, the FDI flows to ASEAN are closely associated with the intra-industry trade taking place in ASEAN and East Asia and the establishment of vertically integrated production networks. Kawai (2004) wrote that the FDI-trade nexus is a natural consequence of MNCs' efforts to form regional supply chains and production networks. This phenomenon is characterized by the exports of parts, components, capital equipment and other industrial inputs to be assembled into finished goods in China for export to the outside world. Kawai further notes that the production networks have promoted the specialization of production in East Asia by fragmenting the multinationals' production processes into different sub-processes located in different economies based on comparative advantage.

Participation in regional/global production networks provide domestic firms not only access to export markets but to newer technologies as well. To increase their overall competitiveness in



international markets, lead multinational firms provide their local affiliates and local suppliers with more rapid technological upgrading and greater attention to quality control, cost control, and human resource development. All these can generate substantial positive spillovers and externalities.

The current regional economic integration process is important in facilitating the establishment and development of regional production networks. This is illustrated by the case of the automotive industry where trade liberalization through the ASEAN Free Trade Area (AFTA) has made integration of production in the region attractive. Automotive manufacturing is a highly global and a high-tech industry. Being capital intensive, it requires economies of scale in order to make its operations profitable. To maintain firm competitiveness, foreign automakers have fragmented their production process by separating the capital intensive segments from the labor-intensive ones with the latter being transferred to developing countries that are characterized by large domestic markets.

For instance, under Toyota's Innovative Multi-Purpose Vehicle (IMV) Project, Toyota upgraded and expanded plants in Thailand (Toyota Motor Thailand or TMT), Indonesia (PT Toyota Motor Manufacturing Indonesia or TMMIN), Argentina and South Africa and turned them into assembly and export bases for a line of innovative IMVs (Figure 5). The Project also aims to increase imported components sourced from Toyota plants and suppliers in Asian and Latin America countries outside Japan. Toyota Thailand is regarded as the key base and is expected to export 140,000 units of pick-up trucks and SUVs. In 2005, Toyota's first R&D center (Toyota Technical Center Asia Pacific Thailand) in an emerging market was opened in Thailand.

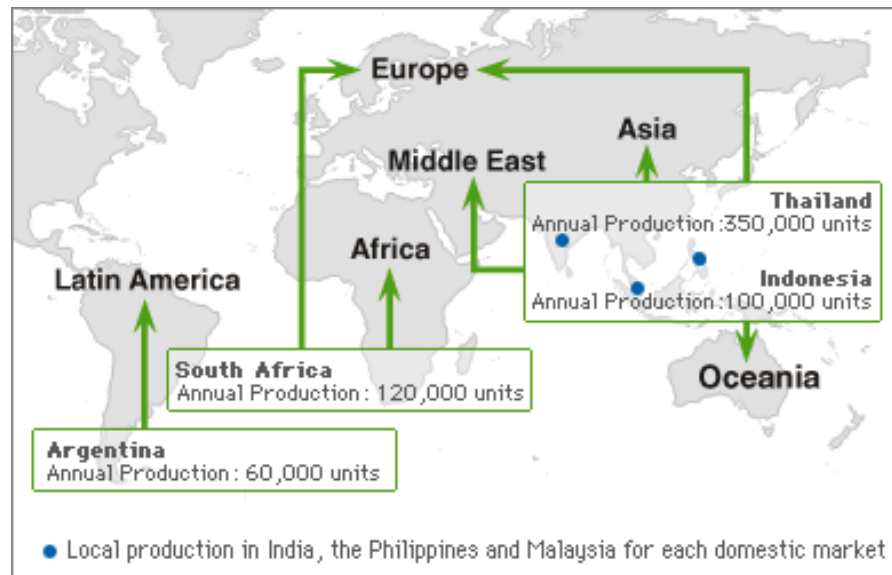
Thailand emerged as the regional hub not only of Toyota but the world's other large automakers such as Mitsubishi, Honda, Auto Alliance (Ford and Mazda), GM, and Isuzu. As the export platform of these companies, Thailand's production increased markedly from 589,126 units in 1996 to 1,176,840 in 2006. A total of 539,206 units were exported while 682,693 units represented domestic sales in 2006.

### **Philippine Participation in RPNs: Case Studies of the Automotive and Electronics Industries**

In the case of the Philippines, affiliates of Japanese automakers Toyota, Mitsubishi, Honda, and Isuzu as well as American firm Ford have established their presence in the domestic market. Only Ford has made the country its export platform for passenger cars. In the case of Toyota, it has assigned the Philippines as its manual transmission export hub. Auto parts such as wiring harnesses and transmissions are among the country's major exports. Auto parts exports are made by large MNCs like Toyota Auto Parts, Fujitsu Ten, Yazaki, IWS (Sumitomo Electric), PAC (Denso), AFC (Aichi Steel), JECO, TRP (Tokai Rika), HKR, and Technol Eight. However, backward linkages are limited because these exports are labor-intensive and highly import-dependent. The link of MNCs to the domestic economy is limited and thus, the value added of these exports is low.

The Philippine automotive industry developed under a heavy government protection and regulation. However, after almost three decades of import substitution (from the seventies to the nineties) which was centered on local content policy, a large part of the parts and components industry still remains underdeveloped. With limited backward linkages created, the link between the automotive assembly sector and local parts and components has remained weak. As such, the local content program only had a limited impact on the growth and development of the parts and components industry. Very little parts and components are locally sourced with the domestic parts sector accounting for only 10 to 15 percent of the total number of parts and components needed by local assemblers. In contrast, the Thai auto industry sources close to 85-90 percent of their parts domestically.

**Figure 5: Global Production Network of Toyota Motor Corporation**



Source: Toyota Motor Corporation

Production networks are also found in the machinery, electrical goods and electronic parts and components. In the Philippines, electronics comprise the bulk of total exports with an average share of 65 percent in the 2000s. Like the auto parts industry, the sector is confronted with the same problem of limited backward linkages. There are 865 electronics companies in the country, 72 percent are MNCs. These are located in special economic zones. A critical mass has been created with the presence of big American companies Intel and Texas Instruments; European firms Intel and Philips; Japanese firms Sony, Toshiba, Hitachi, Fujitsu; Korean firms Samsung and Goldstar and Taiwanese firm Acer. With 50 percent of the world production of 2.5" HDD and 10 percent of 3.5" HDD manufactured in the Philippines, employment in the sector increased from 69,000 in 1990 to 346,000 in 2003 or a 13.2% annual growth rate.

The industry's exports are mainly concentrated in semiconductor assembly, packaging and testing (APT). From the viewpoint of participation in the electronics industry value added chain, the Philippines operates in a very narrow range. Agarwalla (2005) estimated the country's participation to be less than 15%. Apart from APT, the industry participates peripherally in printed circuit board assembly and enclosures (plastics, sheet, metal, etc). This narrow participation leaves the country vulnerable to eroding participation in the global electronics industry and stagnation even in the semiconductor APT. It also limits the opportunities for spillovers into the local economy. Unless the country participates in other segments of the value chain, it would be difficult for it to significantly increase its profitable participation in the global electronics industry.

Studies have shown that the country's participation in the global production network has hardly progressed beyond the lowest level of the production chain (Austria 2006a). Agarwalla indicated that major parts of the electronics supply chain do not reside in the Philippines and unless a technology is developed in the country that makes it commercially viable to bring these elements of production to the Philippines, they will continue to remain outside the country or locate in China, the most competitive country in the region.

Given the limited role of Philippine electronics in the labor-intensive assembly and testing segment of the production process, our electronics exports have been import dependent with minimal domestic value added. Austria (2006a) noted that backward linkages in the electronics industry remain weak because local suppliers are few and immature. Santiago (2005) attributed this to the following problems: unavailability of raw materials, difficulty of finding local suppliers, unreliability of local suppliers, high cost of local raw materials, failure to meet required quality standards. Faced with these constraints, MNCs are forced to import their intermediate inputs. This is illustrated by the case of Wistron Infocom (formerly ACER International), manufacturer of motherboards and computer

notebooks for export. Located at the Subic Bay Industrial Park, the excellent infrastructure attracted its suppliers in Taiwan to follow and locate also in Subic. The foreign suppliers tried to establish linkage through outsourcing with local suppliers. However, minimal linkages were created due to the poor quality of output and high costs of outsourcing locally (Austria 2006b). Agarwalla pointed out that in many instances, the multinational companies that could increase their local purchases were restricted by headquarters because the parent company had a global buying program requiring them to import from certified global suppliers even those items that are locally available. To address this, local suppliers are positioning themselves to become global suppliers of these MNCs. However, the process of being approved as global supplier is slow and costly.

The auto parts and electronics industries seem to rely on a pattern of production, investment, and trade which depends largely on low-skilled, labor-intensive segment of the international production network of MNCs. There are risks associated in depending too much on this existing pattern. Foreign investments in these activities are highly mobile and with the presence of competing locations offering relatively cheaper labor, the Philippines becomes less and less attractive. For instance, the number of Japanese auto parts companies operating in the Philippines declined from 43 in 2001 to only 34 in 2005 while those located in our neighboring East Asian countries went up (Yamamoto 2006). In 2001, Thailand was the preferred supply base of Japanese companies, although this has changed in 2005 as the number of Japanese auto parts in China increased from 134 to 294 between 2001 and 2005; in Thailand this went up from 151 to 185 during the same years. In Indonesia, this rose from 75 to 84 and in Malaysia, from 38 to 43 companies.

Amid the weak competitiveness of domestic manufacturers particularly among the suppliers of parts and other inputs, multinational affiliates together with the government are pursuing programs to develop the creation of backward linkages between their companies and domestic suppliers. In the automotive industry, an attempt to enhance the productivity of local auto parts suppliers is being made through a public-private program called ECOP-Big Enterprise Small Enterprise (EBESE). Toyota Motors Philippines is the most active participating company. EBESE is a partnership among the Employers Confederation of the Philippines (ECOP), Department of Science & Technology (DOST), and Department of Trade & Industry (DTI).

EBESE aims to develop a network of partnership where big enterprises can mobilize their resources to help SMEs to learn and undertake productivity improvement strategies. This is carried out in two levels: the basic level teaches know-how in basic tools such as 5S or good housekeeping, process flow, plant layout and human values related to productivity improvement. The next level teaches Just-in-Time (JIT) concept of eliminating and preventing anything that does not add value to the product in compliance to QCD requirements of customers. So far, the Program has created significant impact in terms of productivity improvements and revenue increases among its participants.

In the electronics industry, trade fairs and industry associations provide opportunities for networking and linkage development (Aldaba 2008c). Reverse trade fairs are held where the different components of a product are displayed to encourage domestic companies to engage in the manufacture of these parts and components. The industry association known as Semi-conductor and Electronic Industry of the Philippines, Inc. (SEIPI) maintains a database on suppliers to its member firms. SEIPI has also set up a “Center for Excellence” – the Advanced Research and Competency Development Institute offering advanced training for electronics employees.

Given the potential growth of production networks as regional integration efforts intensify, the Philippines must re-orient its policies to focus on developing the parts and suppliers sector, particularly the small and medium enterprises (SMEs). Constrained by limited resources, SMEs are often disadvantaged and operate with significant information gaps. SMEs are usually driven by customer specifications, designer preferences, and the knowledge of their procurement groups. It is crucial to develop a program and strengthen current programs to provide information exchange to local firms to make strategic linkages with MNCs.

Policies designed to develop capacities to manufacture components at world-levels of quality, cost and reliability and to keep up with constantly changing technical specifications must be formulated and implemented. Improving the competitiveness of local parts and suppliers is critical for the country to benefit from the increase in FDI flows (particularly in production networks) as regional integration deepens. This is also necessary to ensure that existing MNCs will remain and expand operations as well as to attract new global players to locate in the country. The more competitive the country's suppliers are, the greater the potential for creating and sustaining deeper linkages with MNCs and for engaging in higher value added activities. MNCs, in general, prefer where possible to source their inputs locally. Linking with production networks offer possibilities of technology transfer and quality control along with the creation of backward linkages leading to a deepening of the country's industrial structure.

#### 4. Impact of FDI Spillovers on the Productivity the Philippine Manufacturing Industry

Apart from finance, FDI often transfers knowledge in the form of production expertise and managerial skills. As Findlay (1978) postulates, FDI increases the rate of technological progress in host country through a "contagion" effect from the more advanced technology and management practices used by foreign firms (as cited in Lim E-G 2001). These knowledge effects are known as FDI externalities or spillovers, defined as an increase in the productivity and efficiency of domestic firms as a consequence of the presence of foreign firms in the domestic economy.

##### **Box 2: Transmission Channels of FDI Spillovers**

###### **Skills via labor mobility**

Workers gain new skills through explicit and implicit training provided by foreign firms. They take these skills with them when they later accept employment in domestic firms or start their own firms.

###### **Exports and infrastructure improvements**

Since MNCs engage in international trade, they lay the groundwork for domestic firms to benefit from distribution networks, logistic services and infrastructure improvements. Domestic firms can also learn about the regulatory frameworks with which exporters must comply.

###### **Imitation**

This takes the form of reverse engineering, where a domestic firm creates a similar product based on the design of a good or service that a foreign affiliate produces. Note that imitation is only successful if the domestic firm has the technical capacity and ability to source the necessary inputs to produce a similar product.

###### **Competition**

The entry of foreign firms increases competition in the domestic market forcing domestic firms to become more productive.

###### **Vertical linkages**

Through backward and forward linkages, spillovers are transmitted in the domestic economy. As foreign firms set up vertical production networks, domestic firms are able to participate in their production chains. Since these suppliers must meet certain quality standards, they benefit from the experience and knowledge of the foreign firm.

Source: Leshner and Miroudot (2008).

A spillover occurs when domestic firms are able to improve their productivity by copying some technology used by MNCs in the domestic market. Spillovers take place when a multinational affiliate demonstrates help prospective suppliers set up production facilities and provides technical assistance to improve products. While horizontal and vertical linkages are the main focus of this paper, there are other channels through which spillovers become possible. Leshner and Miroudot

(2008) summarizes five different channels through which spillovers are transmitted: skills via labor mobility, exports and infrastructure improvements, imitation, competition, and vertical linkages (see Box 2).

A particularly significant channel for spillovers is through the linkages between MNCs and their local suppliers and customers: horizontal, forward, and backward linkages. Horizontal linkages occur between MNCs and domestic producers within the same sector. A horizontal spillover can occur when local firms copy some technology used by multinational affiliates in the domestic market.

Backward linkages represent connections between domestic firms and their multinational customers where domestic firms supply intermediate inputs to foreign firms. A backward spillover occurs when the MNC provides training and help in the management and organization of domestic firm suppliers as well as technical assistance and information to help domestic firms become reliable suppliers of high quality products that are delivered on time. Another backward spillover occurs when multinational affiliates assist local suppliers in finding additional customers including their sister affiliates in other countries. Such suppliers may then start exporting to the sister affiliates and to other independent external purchasers (Lall 1980 as cited in Lim E-G 2001).

Forward linkages are connections between a domestic firm and its multinational suppliers where domestic firms purchase intermediate inputs from foreign firms. A forward spillover occurs when a multinational affiliate provides training and other technical support to their customers.

Following Javorcik (2004), horizontal linkages are calculated as the average percentage of foreign ownership in the sector weighted by each firm's contribution to sector output.

$$Horizontal_{jt} = \sum_i Foreign\ Ownership_i * \frac{Output_{it}}{\sum_i Output_{it}} \quad \text{for all firms } i \text{ in industry } j \quad (1)$$

Horizontal linkages are calculated using the 1988 and 1998 Annual and Census of Manufacturing Establishments from the National Statistics Office. Since the datasets do not provide information on foreign equity shares, a dummy variable for foreign ownership is used instead; it takes a value one when foreign equity is greater than or equal to ten percent and zero otherwise.

Backward linkages measure the potential backward spillover effects on a producer industry from foreign presence in the downstream sector and are calculated as the proportion of an industry's output of intermediate goods (consumed in the country) supplied to foreign-owned firms.

$$Backward_{jt} = \sum_k \delta_{jk} * Horizontal_{kt} \quad \text{if } k \neq j \quad (2)$$

where the backward coefficient,  $\delta_{jk}$  represents the proportion of sector j's output that is supplied to sector k (with foreign presence).

Forward linkages are proxies for the potential forward spillover effects from foreign presence in a producer industry's suppliers. They are calculated as the proportion of a sector's intermediate consumption supplied by foreign firms.

$$Forward_{jt} = \sum_m \varphi_{jm} * Horizontal_{mt} \quad \text{if } m \neq j \quad (3)$$

where the forward coefficient,  $\varphi_{jm}$  represents the proportion of inputs purchased by sector j from sector m (with foreign presence).

The forward and backward linkages are calculated using data from the 1994 and 1998 Input-Output Tables from the National Statistical Coordination Board. Appendix C and D present the horizontal, backward, and forward linkages for 1988 and 1998 covering 126 manufacturing sectors. On the average, horizontal linkages are higher than backward and forward linkages. The strongest horizontal linkages (with values between 0.9 and 1) are in the following manufacturing sectors: other dairy products; hardboard and particle board; stationers, artists and office supplies; petroleum refineries; flat glass; professional and scientific measuring and controlling equipment; watches and clocks; soaps and detergents; and fiber batting, padding, and upholstery fillings. Horizontal linkages are also high in sectors such as milk processing; butter and cheese manufacturing; flavoring extracts; carpets and rugs; rubber tire and tube; metal and wood working machinery; parts and supplies for radio, TV and communication; photographic and optical instruments; and rebuilding and major alteration of motor vehicles. Foreign presence is significant in these sectors.

Backward linkages are strongest in textile spinning; weaving, texturizing and finishing; milk processing; basic industrial chemicals. The strongest forward linkages are in asphalt, lubricants and miscellaneous products; products of petroleum and coal; butter and cheese manufacturing; ice cream and sherbets; carpets and rugs; rubber and tire manufacturing; and pesticides and insecticides.

To examine the effects of FDI spillovers on productivity, the following basic model by Lee and Kang (2009) is adopted:

$$\log P_{ijt} = \alpha_0 + \alpha_1 \ln X_{ijt} + \alpha_2 \ln Own_{ijt} + \alpha_3 \ln Spill_{ikt} + \omega_{ijt} \quad (4)$$

where

$P_{ijt}$ : productivity variable

$X$ : vector of variables determining productivity (firm specific and industry specific)

$Own$ : foreign ownership

$Spill$ : various spillover effects

$i$ : firm subscript

$j$ : sector subscript

$t$ : time subscript

$\omega$ : error term

Two productivity variables, value added per worker ( $VApw$ ) and employment ( $Emp$ ) are employed. Three control variables are used; capital per worker ( $Capw$ ), four-firm concentration ratio ( $CR4$ ), and total revenue ( $TR$ ). Three proxies for FDI spillovers are used: horizontal linkages ( $HL$ ), backward linkages ( $BL$ ), and forward linkages ( $FL$ ). Based on these specifications, the following equations are estimated:

$$\begin{aligned} \log VApw_{ijt} = & \beta_0 + \beta_1 \log Capw_{ijt} + \beta_2 \log TR_{ijt} + \beta_3 \log CR4_{jt} + \beta_4 ForOwn_{ijt} + \beta_5 HL_{it} \\ & + \beta_6 BL_{it} + \beta_7 FL_{it} + \omega_{ijt} \end{aligned} \quad (5)$$

$$\begin{aligned} \log Emp_{ijt} = & \delta_0 + \delta_1 \log Capw_{ijt} + \delta_2 \log TR_{ijt} + \delta_3 \log CR4_{jt} + \delta_4 ForOwn_{ijt} + \delta_5 HL_{it} \\ & + \delta_6 BL_{it} + \delta_7 FL_{it} + \gamma_{ijt} \end{aligned} \quad (6)$$

where

$VApw$ : value added per worker in constant 1985 prices

$Emp$ : total employment

$Capw$ : capital per worker based on value of fixed assets at the end of the year in constant 1985 prices

*TR*: total revenue

*CR4*: four-firm concentration ratio

*ForOwn*: foreign ownership is a dummy variable, it is equal to 1 if the firm is foreign-owned and 0 otherwise

*HL*: horizontal linkages

*BL*: backward linkages

*FL*: forward linkages

$\omega$ ,  $\gamma$ : error terms

The main data sources are the 1988 and 1998 Annual Census and Survey of Establishments. Both the industry and firm level datasets are supplemented by the 1994 and 2000 Input-Output Tables. The summary statistics for the main variables are presented in Table 14A and 14B.

Two datasets are used: the five-digit industry level and the firm level. Since the firms in the datasets are non-identifiable, a sectoral panel dataset was created by aggregating the firm level information into industry sub-sectors at the five digit product level. Based on this, the model is estimated using panel regression. The model is also tested using firm level pooled OLS regression. Note that while panel regression takes into account both the space and time dimension of the data, in pooled OLS regression, these are disregarded as observations for each firm are just stacked one on top of the other. In examining the spillover effects of FDI, panel regression is the more appropriate technique since it allows a richer way of analyzing the data which is not possible if only pooled OLS regression is applied. Fixed effects and random effects models are the most common estimation techniques used in panel data. Given the significant differences among the sub-sector industries, fixed effects model seems to be useful since it takes into account these individual characteristics.

**Table 14A: Summary Statistics Sectoral Panel Data**

	Variable definition	All Firms			Domestic Firms Only		
		No. of Obs	Mean	Standard Deviation	No. of Obs	Mean	Standard Deviation
<i>VApw</i>	Value added per worker in constant 1985 prices	537	234483	1146030	508	153107.2	391865.3
<i>Capw</i>	Capital per worker based on value of fixed assets at the end of the year in constant 1985 prices	537	169101.7	512920.7	508	108387.1	239946.1
<i>TR</i>	Total revenue in constant 1985 prices (in million pesos)	537	1800	7800	509	928	2370
<i>EMPT</i>	Employment	537	3713	8129	508	2777	5520
<i>CR4</i>	Four-firm concentration ratio	537	85.914	20.842	509	85.140	21.137
<i>HL</i>	Horizontal linkages	537	0.283	0.341	509	0.244	0.305
<i>FL</i>	Forward linkages	537	0.120	0.080	509	0.121	0.081
<i>BL</i>	Backward linkages	537	0.143	0.233	509	0.144	0.235

**Table 14B: Summary Statistics Cross section Firm Level Data**

	Variable definition	All Firms	Domestic Firms Only
--	---------------------	-----------	---------------------

		No. of Obs	Mean	Standard Deviation	No. of Obs	Mean	Standard Deviation
<i>VApw</i>	Value added per worker in constant 1985 prices	14643	93087.6	887531	13254	66884.26	481963.9
<i>Capw</i>	Capital per worker based on value of fixed assets at the end of the year in constant 1985 prices	14643	69845.78	454556.2	13254	52190.07	325854
<i>TR</i>	Total revenue in constant 1985 prices (in million pesos)	14643	59.1	843	13254	30.2	305
<i>EMPT</i>	Employment	14643	112	383	13254	83	287
<i>CR4</i>	Four-firm concentration ratio	14643	51.758	28.979	13254	50.294	28.705
<i>HL</i>	Horizontal linkages	14643	0.187	0.235	13254	0.162	0.212
<i>FL</i>	Forward linkages	14643	0.123	0.066	13254	0.121	0.065
<i>BL</i>	Backward linkages	14643	0.091	0.184	13254	0.085	0.176

**Table 15: Effects of Foreign Ownership: Labor Productivity**  
Sectoral panel regressions

	All Firms		Domestic Firms Only	
	Fixed-effects	Random-Effects	Fixed-Effects	Random-Effects
<i>HL</i>	0.3083742** (0.1415054)	0.2402486** (0.1077457)	0.0826681 (0.1976758)	0.121275 (0.1027155)
<i>FL</i>	0.9493116 (1.566008)	-0.0233629 (0.4556655)	0.4623844 (2.00034)	-0.2485388 (0.437941)
<i>BL</i>	0.3269026 (0.4586485)	0.1807574 (0.166766)	0.1367038 (0.4797592)	0.1004774 (0.1613272)
<i>LogTR</i>	0.3152111*** (0.0468282)	0.2518881*** (0.0211652)	0.3524922*** (0.056047)	0.2609255*** (0.0219973)
<i>LogCapw</i>	0.1039765** (0.0503457)	0.2482688*** (0.0330456)	0.0873431 (0.0621347)	0.2325695*** (0.0374709)
<i>LogCR</i>	0.2792002** (0.1234914)	0.7015982*** (0.1216061)	0.3224195** (0.1477557)	0.7949121*** (0.1325458)
<i>constant</i>	2.695791*** (0.8746811)	0.639571 (0.7235071)	2.108684** (1.006735)	0.2918602 (0.7824632)
<i>Observations</i>	527	527	495	495
<i>R<sup>2</sup></i>				
<i>within</i>	0.5343	0.4842	0.4651	0.3976
<i>between</i>	0.5537	0.6835	0.4925	0.6497
<i>overall</i>	0.5526	0.6391	0.4759	0.5761

Note: Robust standard errors in parentheses. The dependent variable is logVApw. \*\*\*, \*\*, and \* denote significance at one percent, five percent, and ten percent; respectively.

$$\log VApw_{jt} = \beta_0 + \beta_1 \log Capw_{jt} + \beta_2 \log TR_{jt} + \beta_3 \log CR4_{jt} + \beta_4 HL_{jt} + \beta_5 BL_{jt} + \beta_6 FL_{jt} + \omega_{jt}$$

To examine the effect of horizontal and vertical spillovers on labor productivity, equation (5) is estimated using fixed and random effects models. The estimation is performed on the full sample and on the sample of domestic firms only. Table 15 presents the results on the spillover effects of FDI on labor productivity. Based on the full sample, the results indicate that the coefficients on horizontal linkages are positive and statistically different from zero. As new technologies are introduced in the country, domestic firms can observe foreign firms and imitate them or pursue ways to acquire these



techniques and apply them leading to productivity increases. The movement of highly skilled workers and managers from foreign firms to domestic firms can also have a positive effect on the productivity of domestic firms. Note, however, that based on the sample of domestic firms only, the coefficients on horizontal linkages are still positive but no longer significant.

Both the backward and forward spillover effects are insignificant in all model specifications. These findings are consistent with the present weak forward and backward linkages in the manufacturing industry especially between small and medium domestic enterprises and large domestic enterprises and multinational corporations. For instance, the number of subcontractors and subcontracted work as percentage of total value of output have been declining with latter registering a dramatic fall to 0.7 percent in 2003 from 3.7 percent in 1994 (Aldaba 2008c). The case studies on the auto parts and electronics sectors discussed in the preceding section also illustrate the small number of suppliers and their lack of competitiveness. This implies that the creation of backward linkages within the manufacturing industry has remained limited (Aldaba 2008a). As such, local content and manufacturing value added have remained low since manufacturing activities have become more dependent on imported inputs.

On the average, manufacturing posted average growth rates of 0.88% during the period 1980-1989; 2.33% for the period 1990-1999; and 4.41% during 2000-2007. Its share to total output has remained stagnant in the past decades as its contribution dropped from 26% during 1980-1989; to 25% in 1990-1999; and to 24% in 2000-2007. In terms of employment contribution, manufacturing failed to create enough employment to absorb new entrants to the labor force as its share dropped from 10% in 1980-1989 and 1990-1999 to 9.5% in 2000-2007. The country's top exports consisting of electronics and automotive parts are characterized by weak linkages and low value added (see Austria 2004 for electronics; Aldaba 2008b and 2008c for auto parts). Given these limited linkages, the presence of multinational corporations fails to generate spillover effects to domestic firms. These results also support the descriptive analysis and conclusion of Austria (2004) that the impact of FDI on domestic linkages fell short of expectations.

For the control variables, the coefficients on total revenue are positive and highly significant in all four model specifications. The coefficients on capital per worker are also positive and statistically significant (except in the fixed effects model covering the sample of domestic firms only). The coefficients on the four-firm concentration ratio are positive and highly significant.

**Table 16: Effects of Foreign Ownership: Employment**  
**Sectoral panel regressions**

	All Firms		Domestic Firms Only	
	Fixed Effects	Random-Effects	Fixed Effects	Random-Effects
<i>HL</i>	-0.1981525 (0.1395986)	-0.1062433 (0.0988361)	-0.0937952 (0.1545942)	0.0130594 (0.1021357)
<i>FL</i>	-0.5369768 (1.620065)	0.5182153 (0.501948)	-0.4652387 (1.722362)	0.4208229 (0.5485467)
<i>BL</i>	0.1775491 (0.4876088)	-0.2725728 (0.1629659)	-0.0248966 (0.4717358)	-0.2106308 (0.1753376)
<i>LogTR</i>	0.6494278*** (0.0394644)	0.7049544*** (0.0189169)	0.6424855*** (0.0481624)	0.7049127*** (0.0194577)
<i>LogCapw</i>	-0.1570239*** (0.044871)	-0.2716435*** (0.0327833)	-0.1882933*** (0.0474423)	-0.2775626*** (0.0342038)
<i>LogCR</i>	-0.2334949*** (0.0994917)	-0.6894791*** (0.0988519)	-0.2503883*** (0.0935688)	-0.7192423*** (0.0984979)
<i>constant</i>	-2.695565*** (0.772727)	-0.5957698 (0.5934622)	-2.187446*** (0.8818069)	-0.460425 (0.6147702)
<i>Observations</i>	527	527	496	496
<i>R<sup>2</sup></i>				
<i>within</i>	0.7601	0.7317	0.7378	0.7129
<i>between</i>	0.8275	0.8779	0.8506	0.8818
<i>overall</i>	0.8101	0.8508	0.8260	0.8510

Note: Robust standard errors in parentheses. The dependent variable is logEMPT. \*\*\*, \*\*, and \* denote significance at one percent, five percent, and ten percent; respectively.

$$\log Emp_{jt} = \delta_0 + \delta_1 \log Capw_{jt} + \delta_2 \log TR_{jt} + \delta_3 \log CR4_{jt} + \delta_4 HL_{jt} + \delta_5 BL_{jt} + \delta_6 FL_{jt} + \omega_{jt}$$

Table 16 presents the results on the spillover effects of FDI on employment. As the table shows, all the coefficients on spillover linkages are insignificant for all model specifications. All the control variables have the expected signs (positive coefficient on total revenue, negative on capital per worker, and negative on four-firm concentration ratio) and are highly significant for both fixed and random effects models.

Next, equation (5) is estimated using pooled ordinary least squares (OLS) method. The model also includes industry and time dummies. The results shown in Table 17 show that the coefficients on FDI backward linkages are positive and statistically significant in all four models that are estimated. Mixed results are found for measures of horizontal linkages. Based on the full sample, the coefficients on horizontal linkages are negative but not statistically significant. However, based on the sample of domestic firms only, the coefficients are negative and statistically significant. The coefficients on forward linkages are positive and highly significant only in the models without time dummies. In all specifications with both firm and time dummies, the coefficients on forward linkage lose their statistical significance and become negative.

For the control variables, the coefficients on both total revenue and capital per worker are both positive and highly significant. The coefficients on the four-firm concentration ratio are insignificant. The foreign ownership dummy is also not significant.

**Table 17: Effects of Foreign Ownership: Labor Productivity**  
**Pooled OLS firm level regressions**

	All Firms		Domestic Firms Only	
	(1)	(2)	(3)	(4)
<i>ForOwn</i>	0.0106882 (0.0263495)	0.01117 (0.0263286)	-	-
<i>HL</i>	-0.078048 (0.0508648)	-0.07071 (0.0508398)	-0.1078327** (0.0552993)	-0.1023266* (0.0551891)
<i>BL</i>	0.511622** (0.2388227)	0.9160794*** (0.2094763)	0.4359682* (0.2485497)	0.7566564*** (0.2193789)
<i>FL</i>	-0.4469025 (1.003947)	1.555185** (0.7826533)	0.6041357 (1.037175)	2.177755*** (0.8397127)
<i>LogTR</i>	0.3710663*** (0.00439)	0.3725027*** (0.0043595)	0.3742924*** (0.0045738)	0.3754418*** (0.0045226)
<i>LogCapw</i>	0.0600451*** (0.0035355)	0.0603816*** (0.0035508)	0.0534079*** (0.0035284)	0.0536238*** (0.0035378)
<i>LogCR4</i>	-0.0155045 (0.0180725)	0.0003134 (0.0173603)	-0.0157455 (0.0183455)	-0.0023125 (0.0173244)
<i>Industry Dummies</i>	Yes	Yes	Yes	Yes
<i>Time Dummy</i>	Yes	No	Yes	No
<i>Observations</i>	12744	12744	11387	11387
<i>R</i> <sup>2</sup>	0.6667	0.6663	0.6429	0.6427

Note: Robust standard errors in parentheses. The dependent variable is logVApw. \*\*\*, \*\*, and \* denote significance at one percent, five percent, and ten percent; respectively.

$$\log VApw_{ijt} = \beta_0 + \beta_1 \log Capw_{ijt} + \beta_2 \log TR_{ijt} + \beta_3 \log CR4_{ijt} + \beta_4 ForOwn_{ijt} + \beta_5 HL_{ijt} + \beta_6 BL_{ijt} + \beta_7 FL_{ijt} + \omega_{ijt}$$

Table 18 presents the results for equation (6) which estimates the spillover effects of FDI on employment. The coefficients on backward linkages are negative and highly significant in all models with both time and industry dummies. This implies that foreign presence in the downstream sector has a negative effect on employment in local supplier firms (operating in the upstream sector). The coefficients on forward linkages are positive and significant only in the models without time dummies. Once time dummies are included, the coefficients on forward linkages turn insignificant (and negative).

The coefficients on foreign ownership dummy are positive and highly significant suggesting that on average, firms with foreign equity have higher employment than domestically-owned ones. For the control variables, the coefficients on total revenue and capital per worker are positive and negative, respectively and highly significant. The coefficients on the four firm concentration ratio are negative and statistically significant.

**Table 18: Effects of Foreign Ownership: Employment**  
**Pooled OLS firm level regressions**

	All firms		Domestic Firms Only	
	(1)	(2)	(1)	(2)
<i>ForOwn</i>	0.0909884*** (0.0243694)	0.091991*** (0.0244628)	-	-
<i>HL</i>	0.1250381*** (0.0453007)	0.1387308*** (0.0452911)	0.1486018*** (0.050655)	0.1602315*** (0.050693)
<i>BL</i>	-0.628912*** (0.2303082)	0.105146 (0.2021541)	-0.5740245** (0.2464419)	0.0770068 (0.2162829)
<i>FL</i>	-0.3266798 (0.8521837)	3.284945** (0.6899226)	-0.4939247 (0.8845451)	2.671957*** (0.7303035)
<i>LogTR</i>	0.5427118*** (0.0038995)	0.5453178*** (0.0038596)	0.5361681*** (0.0041)	0.5385066*** (0.0040604)
<i>LogCapw</i>	-0.0676299*** (0.003531)	-0.067048*** (0.0035003)	-0.0597837*** (0.0034434)	-0.0593787*** (0.0034192)
<i>LogCR4</i>	-0.0281965* (0.016801)	0.0004541 (0.016126)	-0.0383402** (0.0171311)	-0.0110941 (0.0162704)
<i>Industry Dummy</i>	Yes	Yes	Yes	Yes
<i>Time Dummy</i>	Yes	No	Yes	No
<i>Observations</i>	12814	12814	11453	11453
<i>R<sup>2</sup></i>	0.8038	0.8031	0.7841	0.7835

Note: Robust standard errors in parentheses. The dependent variable is logEMPT. \*\*\*, \*\*, and \* denote significance at one percent, five percent, and ten percent; respectively.

$$\log Emp_{ijt} = \delta_0 + \delta_1 \log Capw_{ijt} + \delta_2 \log TR_{ijt} + \delta_3 \log CR4_{ijt} + \delta_4 ForOwn_{ijt} + \delta_5 HL_{ijt} + \delta_6 BL_{ijt} + \delta_7 FL_{ijt} + \gamma_{ijt}$$

Due to the use of different econometric techniques, on the whole, the results of the different estimations yielded mixed results. But as earlier indicated, panel regression seems to be the more appropriate technique. In the panel sectoral regression with log labor productivity as dependent variable, the coefficients on horizontal linkages for the full sample are positive and statistically significant for both fixed and random effects models. However, these are positive but insignificant when based on the sample of domestic firms only. In the pooled regression, the results show the opposite. The coefficients on horizontal linkages are negative and statistically significant based on the sample of domestic firms only but insignificant based on the full sample.

In the panel regression, the coefficients on backward linkages are insignificant in all model specifications, but in the pooled regression, these are positive and statistically significant. For forward linkages, the results are somewhat similar for both panel and pooled OLS regressions. Except for the results without time dummies in the pooled regression, the coefficients on forward linkages are not significant.

With log employment as dependent variable, the same mixed results are found. In the panel regression, the coefficients on horizontal linkages are insignificant but are positive and significant in the pooled OLS regression. While the coefficients on backward linkages are insignificant in the panel regression, these are negative and statistically significant in the pooled regression. For forward spillovers, the same results are obtained except for the models without time dummies in the pooled OLS.

## 5. Conclusions and Policy Recommendations

The main focus of the paper is to address the question on whether FDI generates spillovers that benefit domestic firms in the host economy. The empirical analysis shows that based on the full sample, productivity spillovers take place horizontally from multinational corporations to domestic firms within the same industry at the five-digit level. However, the positive relationship loses its significance when the estimation is based on the sample of domestic firms only. There is no evidence that productivity or employment spillovers take place between foreign and domestic firms either through backward linkages (where domestic firms supply intermediate inputs to foreign firms) or through forward linkages (where foreign firms supply intermediate inputs to domestic firms). The results are consistent with the present condition of the manufacturing industry characterized by the weakness of forward and backward linkages between firms within the industry. Given the limited linkages between domestic firms and MNCs, it would be difficult for productivity spillovers from foreign affiliates to take place through forward or backward linkages channels.

These tend to imply that for spillovers to take place, the existing linkages between firms need to be deepened and at the same time, the absorptive capacity of domestic firms must be strengthened. To achieve this, the development of domestic parts and suppliers would be crucial. The absence of an efficient industry supply base has constrained the type of FDI flows that the country has attracted, mostly manufactured exports that require relatively less skills, labor-intensive, and import dependent. These types of FDI are highly mobile and with the presence of competing locations offering relatively cheap labor, the country becomes less attractive. With the country's narrow participation in the production networks of MNCs in these industries, opportunities for spillovers into the local economy become limited.

While the Philippines' largest exports are high technology products such as electronics and auto parts, these are mainly concentrated in labor-intensive, highly import-dependent, and low value added segments like semi-conductors, wiring harnesses, and transmissions. Hence, the backward linkages to the domestic economy that have been created by foreign affiliates manufacturing these high tech exports have remained limited. To significantly increase spillovers and profitability, it is important for industry participation to move up towards higher segments of the value chain.

With increasing regional economic integration in East and Southeast Asia, potential opportunities could arise from the growth of regional production networks where domestic parts and supplier firms could act as subcontractors of outsourced parts and components. Links with regional production networks offer possibilities of technology transfer and provide a promising route for domestic firms to access export markets. The need to strengthen domestic parts and suppliers and deepen their linkage with foreign affiliates are necessary conditions for the country to benefit from the expected FDI flows arising from the establishment of regional production networks.

To improve the competitiveness of domestic parts and suppliers and strengthen their linkages with foreign affiliates, the government needs to adopt a more comprehensive approach. This would combine industrial adjustment policy to improve and develop domestic parts and supplier firms and create an environment conducive to the creation and expansion of FDI-related spillovers as well as increase participation in higher segments of industry value chain. At the same time, it is important to review and simplify the various investment incentive schemes.

The following policies are suggested:

### **Human Resource Development and Training**

The government must implement substantial reforms in all stages of education and training system to raise the learning capabilities of firms and upgrade labor skills. The quality and completion rates need to be improved and the length of schooling must be brought at par with international norms. Technical schools must reorient their curricula to serve employer needs and requirements and address

specific skills needed by industries. Government support must be provided in the training and development of workers.

### **Industrial and Technology Upgrading**

Given the presence of lower cost competitors in the Region and who have stronger technological capabilities and well-developed supply chains, the Philippines needs to move up the technology scale. This implies engaging in design and development skills and technological capabilities. Industrial upgrading would necessitate a strong base of domestic knowledge. This would require the development of specialized skills and technological capabilities, particularly in electronics and auto parts. One possible way is to design and grant incentives to encourage universities and researchers to interact closely with industries. Through public private partnerships, research centers could be established to serve as venues for world-class professional training; advanced research, development and engineering and new venture incubation.

The country can learn from the experience of South Korea, Taiwan, and Singapore which set up central institutions to monitor and diffuse new technologies and provided technological services to small and medium enterprises (SMEs) in particular. These include material testing, inspection, certification of quality, instrument calibration, establishment of repositories of technical information, patent registration, research and design, and technical training. Cost sharing was adopted in providing these services.

### **SME Finance Support Programs**

In the country, the lack of access to financing has severely constrained the growth of SMEs. Private banks are reluctant to lend to SMEs because of their general aversion to dealing with a large number of small accounts. Many SMEs cannot access available funds due to their limited track record, limited acceptable collateral, and inadequate financial statements and business plans. Some private banks were able to overcome these challenges by providing assistance in preparing accounting records, business advise, and simplifying loan documentation and tailor fitting loans to match the borrower's cash flow.

### **Linkages Improvement and Promotion of Subcontracting and Outsourcing Activities**

The efforts of the electronics industry association in bringing together suppliers and buyers are commendable. It is important to develop a program to provide information exchange to local firms to make strategic linkages with MNCs. Supplier development and linkage programs can be developed to improve linkages between domestic firms, especially SMEs, with foreign affiliates of MNCs. The government can facilitate the matching of firms as well as provide subcontracting and outsourcing advice to domestic firms.

### **Improvement of Infrastructure and Logistics and Overall Investment Climate**

Good infrastructure and logistics that lower production cost and facilitate the easy supply chain management from the procurement of inputs to the export of outputs are important for the operations of production networks. The government must continue to pursue policies to lower power and communication costs, provide sufficient port systems, reduce travel time, and offer travel and shipment options. To improve the country's investment climate, it is important that the government immediately focus not only on inadequate infrastructure but also on the country's low institutional quality, corruption and inefficient bureaucracy that continue to constrain doing business in the country.

### **Capacity Building and Adequate Funding for the Department of Trade and Industry and Board of Investments' Competitiveness and Linkages Program**

Strengthen the capacity of the staff and provide adequate resources for the effective implementation of the programs to be designed to improve industry competitiveness and linkages between domestic firms and MNCs.

## References

- Aldaba, R. 1995. "Foreign Direct Investment in the Philippines: A Reassessment". In Medalla et al. *Catching Up With Asia's Tigers*. Philippine Institute for Development Studies. Makati City, Philippines.
- \_\_\_\_\_. 2006. "FDI Investment Incentive System and FDI Flows: The Philippine Experience". PIDS Research Paper Series 2007-03 and as PIDS Discussion Paper 2006-20.
- \_\_\_\_\_. 2008a. "Assessing Competition in Philippine Markets". PIDS Discussion Paper 2008-23. Philippine Institute for Development Studies. Makati City, Philippines.
- \_\_\_\_\_. 2008b. "Globalization and the Need for Strategic Government-Industry Cooperation in the Philippine Automotive Industry". PIDS Discussion Paper 2008-21. Makati City, Philippines.
- \_\_\_\_\_. 2008c. "SMEs in the Philippine Manufacturing Industry and Globalization: Meeting the Development Challenges". Chapter 8 in ERIA Research Project Report 2007 No. 5. Edited by Lim, H. *Asian SMEs and Globalization*.
- Aldaba, R. and J. Yap. 2009. "Investment and Capital Flows: Implications of the ASEAN Economic Community Blueprint". Philippine Institute for Development Studies Discussion Paper Series 2009-01.
- Agarwalla, G. 2005. "Philippines Electronics Equipment Production and Manufacturing". World Bank. Paper presented at the "2005 WB-PIDS Workshop on Policies to Strengthen Productivity in the Philippines" and at the "2004 ASEM Trust Fund: Philippines Closing the Productivity Gap World Bank-FIAS-PIDS Workshop".
- Asian Development Bank. 2004. "Improving the Investment Climate in the Philippines". A Report by the Development Indicators and Policy Research Division of ADB.
- Austria, M. 2002. "Productivity Growth in the Philippines after the Industrial Reforms". Edited by Yap, J. *The Philippines beyond 2000: An Economic Assessment*. Makati City: PIDS.
- \_\_\_\_\_. 2006a. "Enhancement and Deepening of the Competitiveness of the Philippine Electronics Industry Under a Bilateral Setting". PIDS Discussion Paper Series 2006-09. Philippine Institute for Development Studies. Makati City, Philippines.
- \_\_\_\_\_. 2006b. "Foreign Direct Investment and Economic Development: The Case of the Philippines". Edited by Urata, S., C. Siow Yue, and F. Kimura. *Multinationals and Economic Growth in East Asia*. London, Routledge.
- Blomström, M. and A. Kokko. 2003. "The Economics of Foreign Direct Investment Incentives". Working Paper 168.
- Booze, Allen and Hamilton. 2007. "Southeast Asia Commercial Law and Institutional Reform and Trade Diagnostic: the Philippines". USAID.
- Congressional and Planning Budget Office. 2003. "Reviving Investments in the Country". Policy Review. House of Representatives.

- Foreign Investment Advisory Service, World Bank and International Finance Corporation. 2005. "Fostering Linkages Between Multinational and Domestic Firms in the Philippines". Paper presented at the Policies to Strengthen Productivity in the Philippines Conference. June 27, 2005.
- Findlay, R. 1978. "Relative Backwardness, Direct Foreign Investment, and the Transfer of Technology: A Simple Dynamic Model". *Quarterly Journal of Economics*. Vol. 42.
- Javorcik, B.S. June 2004. "Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers through Backward Linkages". *The American Economic Review*. Vol. 94. No. 3.
- Kawai, M. 2004. "Trade and Investment Integration for Development in East Asia: A Case for the Trade-FDI Nexus". Institute of Social Science, University of Tokyo.
- Lall, S. 1980. "Vertical Interfirm Linkages in LDCs: An Empirical Study". *Oxford Bulletin of Economics and Statistics*. Vol. 42.
- \_\_\_\_\_. 1997. "Attracting Foreign Investment: New Trends, Sources, and Policies". Economic Paper 31. Commonwealth Secretariat.
- Lamberte, M. 1993. "Attracting Foreign Investments in the Philippines". Development Research News. Vol. XI. No. 1. January-February. Philippine Institute for Development Studies. Makati City, Philippines.
- Lee, H. and S. Kang. March 2009. "The Linkage Impact of Foreign Direct Investment on Labor Productivity in Korea". Paper prepared for the EADN Project.
- Leshner, M. and S. Miroudot. October 2008. "FDI Spillovers and Their Interrelationships with Trade" OECD Trade Policy Working Paper No. 80.
- Lim, E-G. November 2001. "Determinants of and the Relation Between Foreign Direct Investment and Growth: A Summary of the Recent Literature". IMF Working Paper 01/175.
- Lindsay, C. and E. Valencia. 1981. "Foreign Direct Investment in the Philippines: A Review of Literature". PIDS Working Paper 81-11. Philippine Institute for Development Studies. Makati City, Philippines.
- Mendoza, A. and H. Inamura. 1996. "Effects of FDI on the Philippine Economy". Inter-disciplinary Information Services. Vol. 2. No. 1. Tohoku University.
- Miranda, C. 1994. "Employment Effects of Multinational Enterprises". International Labor Organization.
- Reside, R. 2006. "Fiscal Incentives and Investments in the Philippines". Economic Policy Reform & Advocacy.
- Santiago, E. 2005. "About the Philippine Electronics Industry: A Snapshot". PowerPoint Presentation.
- Yamamoto, H. 2006. "Benchmark Survey Project Competitiveness of ASEAN vs. China vs. India on Auto Parts Industry". PowerPoint Presentation.

## **Appendix A**

### **Remaining Barriers to FDI**

#### *Foreign Investment Negative List*

##### *List A*

Due to constitutional constraints, List A restricts foreign investment in the practice of licensed professions as well as in the following industries: mass media, small-scale mining, private security agencies, and the manufacture of firecrackers and pyrotechnic devices. Foreign ownership ceilings are imposed on enterprises engaged in, among others, financing, advertising, domestic air transport, public utilities, pawnshop operations, education, employee recruitment, public works construction and repair (except Build-Operate-Transfer and foreign-funded or assisted projects), and commercial deep sea fishing.

The exploration and development of natural resources must be undertaken under production sharing or similar arrangements with the government. For small-scale projects, a company should be at least 60 percent Filipino-owned to qualify. High-cost and high-risk activities such as oil exploration and large-scale mining are open to 100 percent foreign ownership. In 1998, private domestic construction was deleted from List A, lifting the 40 percent foreign ownership ceiling previously imposed on such entities.

Rural banking remains completely closed to foreigners. In securities underwriting, the limit on foreign ownership was raised from 40 percent to 60 percent in 1997. The limit for financing companies was also raised to 60 percent in 1998. The insurance industry was opened up to majority foreign ownership in 1994 with minimum capital requirements increasing along with the degree of foreign ownership.

In retail trade, foreign equity remains banned in retail companies capitalized at less than \$2.5 million.

##### *List B*

Under List B, foreign ownership in enterprises is generally restricted to 40 percent due to national security, defense, public health, and safety reasons. List B also protects domestic small- and medium-sized firms by restricting foreign ownership to no more than 40 percent in non-export firms capitalized at no less than US\$200,000.

#### *Land Ownership*

Land ownership is constitutionally restricted to Filipino citizens or to corporations with at least 60 percent Filipino ownership. The Philippine Constitution bans foreigners from owning land in the Philippines. Foreign companies investing in the Philippines may lease land for 50 years, renewable once for another 25 years, or a maximum 75 years.

#### *BOT*

The legal framework for build-operate-transfer (BOT) projects and similar private sector-led infrastructure arrangements is covered under RA 6957 (as amended by RA 7718). The BOT law limits foreign ownership to 40% in BOT projects. Note that many infrastructure projects like public utilities, franchises in railways/urban rail mass transit systems, electricity distribution, water distribution and telephone systems are in general natural monopolies.



## *Omnibus Investments Code*

The Omnibus Investments Code mandates the incentives and guarantees to investments in the Philippines. Certain provisions of the incentives law impose more stringent conditions on foreign-owned enterprises seeking to qualify for BOI-administered incentives. In general, foreign-owned firms producing for the domestic market must engage in a "pioneer" activity to qualify for incentives. "Non-pioneer" activities are generally opened up to foreign equity beyond 40 percent only if, after three years, domestic capital proves inadequate to meet the desired industry capacity.

For firms seeking BOI incentives linked to export performance, export requirements are higher for foreign-owned companies (at least 70 percent of production should be for export) than for domestic companies (50 percent of production for export).

Foreign-owned companies must divest to a maximum 40 percent foreign ownership within thirty years or such longer period as the BOI may allow. Foreign firms that export 100 percent of production are exempt from this divestment requirement.

### **Appendix B** **FDI Incentives Under Different Regimes**

#### **1) Board of Investments Registered Enterprises: 1987 Omnibus Investments Code**

In general, BOI registered enterprises are entitled to the following incentives:

#### **Tax Exemptions**

- a) Income Tax Holiday (ITH)
  - Six years for new projects granted pioneer status;
  - Six years for projects locating in Less Developed Areas (LDA), regardless of status (pioneer or non-pioneer) and regardless of type (new or expansion);
  - Four years for new projects granted non-pioneer status; and
  - Three years for expansion and modernization projects. (In general, ITH is limited only to incremental sales in revenue/volume.)
  - An additional year may be granted in each of the following cases:
    - i. The indigenous raw materials used in the manufacture of the registered product is at least fifty percent (50%) of the total cost of raw materials for the preceding years prior to the extension unless the BOI prescribes a higher percentage; or
    - ii. The ratio of total imported and domestic capital equipment to the number of workers for the project does not exceed US\$10,000 to one (1) worker; or
    - iii. The net foreign exchange savings or earnings amount to at least US\$500,000 annually during the first three (3) years of operation.

In no case, however, shall a registered firm avail of ITH for a period exceeding eight years.
- b) Exemption from taxes and duties on imported spare parts; the duty & tax free importation of capital equipment which expired in 1997 was restored in May 2004 with the issuance of Executive Order 313.
- c) Exemption from wharfage dues and export tax, duty, impost and fees for a period of ten years from the date of registration.

- d) Tax exemption on breeding stocks and genetic materials within ten years from the date of registration or commercial operation.

#### Tax Credits

- a) Tax credit on the purchase of domestic breeding stocks and genetic materials within ten (10) years from the date of registration or commercial operation.
- b) Tax credit on raw materials and supplies

#### Additional Deductions from Taxable Income

- a) For the first five (5) years from date of registration, additional deduction for labor expense equivalent to fifty percent (50%) of the wages of additional skilled and unskilled workers in the direct labor force. This incentive shall be granted only if the enterprise meets a prescribed capital to labor ratio and shall not be availed of simultaneously with ITH. This additional deduction shall be doubled if the activity is located in a LDA.
- b) Additional deduction for necessary and major infrastructure works. This privilege, however, is not granted to mining and forestry-related projects as they would naturally be located in certain areas to be near their source of raw materials.

#### Non-fiscal Incentives

- a) A registered enterprise may be allowed to employ foreign nationals in supervisory, technical or advisory positions for five years from date of registration. The position of president, general manager and treasurer of foreign-owned registered enterprises or their equivalent shall, however, not be subject to the foregoing limitations.
- b) Simplification of customs procedures for the importation of equipment, spare parts, raw materials and supplies and exports of processed products.
- c) Importation of consigned equipment for a period of 10 years from date of registration, subject to posting of a re-export bond.
- d) The privilege to operate a bonded manufacturing/trading warehouse subject to Customs rules and regulations.

### **2) Philippine Economic Zone Authority Registered Enterprises: Special Economic Zone Act of 1995**

#### Incentives to Ecozone export and free trade enterprises

- a) Corporate income tax exemption for four years to a maximum of eight year
- b) Exemption from duties and taxes on imported capital equipment, spare parts, materials and supplies
- c) After the lapse of income tax holiday, exemption from national and local taxes, in lieu thereof, special five percent tax rate on gross income<sup>1</sup>.
- d) Tax credit (equivalent to 25 % of duties) for import substitution of raw materials used in producing nontraditional exports

---

<sup>1</sup> Gross income refers to gross sales or gross revenues derived from business activity within the zone, net of sales discounts, sales returns and allowances and minus costs of sales or direct costs. The allowable deductions are direct salaries, wages or labor expenses, production supervision salaries, raw materials used in the manufacture of products, goods in process, finished goods, supplies and fuels used in production, depreciation of machinery and equipment, rent and utility charges, and financing charges.

- e) Exemption from wharfage dues, export tax, impost or fee
- f) Additional deduction for training expenses
- g) Tax credit on domestic capital equipment (equivalent to 100% of taxes and duties)
- h) Tax and duty free importation of breeding stocks and genetic materials
- i) Tax credit on domestic breeding stock and genetic materials (equivalent to 100% of taxes and duties)
- j) Additional deduction for labor expense
- k) Unrestricted use of consigned equipment
- l) Employment of foreign nationals
- m) Permanent residence status for foreign investors and immediate members of the family
- n) Simplified import-export procedures

**Incentives to ecozone domestic market enterprises**

- a) Exemption from national and local taxes and in lieu thereof, payment of a special rate of five percent on gross income.
- b) Additional deduction for training expenses
- c) Incentives under the Build Operate and Transfer Law (BOT under RA 6957 as amended by RA 7718)

**Incentives to ecozone developers/operators**

- a) Exemption from national and local taxes and in lieu thereof, payment of a special rate of five percent on gross income
- b) Additional deduction for training expenses
- c) Incentives under the Build Operate and Transfer Law (BOT under RA 6957 as amended by RA 7718).

**3) Subic Bay Metropolitan Authority and Clark Development Corporation registered enterprises: 1992 Bases Conversion and Development Act**

**Incentives**

- a) A final tax of 5% on gross income earned shall be paid in lieu of all local and national taxes. (Gross income refers to gross sales derived from any business activity less cost of sales, cost of production or direct cost of services.)
- b) Tax and duty free importation of capital equipment, raw materials, supplies, spare parts and all other articles including finished goods.
- c) Permanent residency status for investors, their spouses, dependent children under 21 years of age, provided they have continuing investments of not less than US\$250,000
- d) Employment of foreign nationals.

## Appendix C

### Horizontal, Backward, and Forward Linkages: 1998

IO	Description	Horizontal	Backward	Forward
043	Slaughtering and meat packing	0.0000	0.0212	0.0049
044	Meat and meat products processing	0.0163	0.0120	0.0246
045	Milk processing	0.8535	0.7002	0.0622
046	Butter and cheese manufacturing	0.8875	0.0969	0.4940
047	Ice cream, sherbets and other flavored ices	0.0000	0.0000	0.3438
048	Other dairy products	1.0000	0.0016	0.2382
049	Canning and preserving of fruits and vegetables	0.3168	0.0421	0.0257
050	Fish canning	0.0000	0.0381	0.0532
051	Fish drying, smoking and manufacturing of other	0.2500	0.0000	0.0473
052	Production of crude coconut oil, copra cake and meal	0.2327	0.1155	0.0397
053	Other crude vegetable oil, fish and other marine oils	0.2123	0.2246	0.0679
054	Manufacture of refined coconut oil and vegetable oil	0.0670	0.1563	0.1554
055	Rice and corn milling	0.0061	0.0323	0.0060
056	Flour, cassava and other grains milling	0.1496	0.1356	0.0395
057	Manufacture of bakery products except noodles	0.1795	0.0001	0.1208
058	Noodles manufacturing	0.2186	0.0000	0.1200
059	Sugar milling and refining	0.0981	0.1720	0.0532
060	Manufacture of cocoa, chocolate and sugar	0.2445	0.0434	0.1510
061	Manufacture of desiccated coconut	0.2765	0.0039	0.0356
062	Manufacture of ice, except dry ice	0.0000	0.0000	0.1355
063	Coffee roasting and processing	0.4759	0.0025	0.0382
064	Manufacture of animal feeds	0.0937	0.0001	0.0329
065	Manufacture of starch and starch products	0.0481	0.0295	0.0926
066	Manufacture of flavoring extracts, mayonnaise and	0.7679	0.0303	0.0748
067	Miscellaneous food products	0.0498	0.0692	0.1445
068	Alcoholic liquors and wine	0.1644	0.0000	0.0980
069	Malt liquors and malt	0.0000	0.0005	0.0312
070	Softdrinks and carbonated water	0.0000	0.0000	0.1042
071	Bottling of Mineral Water		0.0000	0.0365
072	Cigarette manufacturing	0.0196	0.0000	0.0493
073	Cigar, chewing and smoking tobacco	0.2274	0.0000	0.0858
074	Tobacco leaf flue-curing and redrying	0.1133	0.0585	0.1069
075	Textile, spinning, weaving, texturizing and finishing	0.4593	1.1624	0.2114
076	Fabric knitting mills	0.6066	0.5062	0.2190
077	Hosiery, underwear and outerwear (knitted)	0.7576	0.0618	0.2816
078	Manufacture of made-up textile goods except wearing	0.2186	0.0619	0.1910
079	Manufacture of carpets and rugs	0.8718	0.0000	0.3049
080	Cordage, rope, twine and net manufacturing	0.1112	0.0405	0.1075
081	Manufacture of articles made of native materials		0.0010	0.2139
082	Manufacture of artificial leather and impregnated and		0.0703	0.0503
083	Manufacture of fiber batting, padding, upholstery	0.9066	0.0368	0.0854
084	Custom tailoring and dressmaking shops	0.0603	0.0112	0.0611
085	Manufacture of ready-made clothing	0.4288	0.0094	0.1957
086	Embroidery establishments	0.3099	0.0018	0.2169
087	Manufacture of other wearing apparel except footwear	0.5457	0.0001	0.1900
088	Manufacture of leather footwear and footwear parts	0.6037	0.0057	0.2094
089	Sawmills and planing of wood	0.0000	0.4462	0.0975
090	Manufacture of veneer and plywood	0.0836	0.0646	0.1919
091	Manufacture of hardboard and particle board	1.0000	0.0019	0.0784
092	Wood drying and preserving plants	0.0000	0.0001	0.0265
093	Millwork plants	0.0990	0.0040	0.0506
094	Manufacture of wooden and cane containers and small	0.2421	0.0633	0.0613
095	Manufacture of wood carvings	0.0955	0.0231	0.0048
096	Manufacture of misc wood, cork and cane products	0.0000	0.0185	0.0570
097	Manufacture and repair of wooden furniture including	0.0679	0.0033	0.0735
098	Manufacture and repair of rattan furniture including	0.0211	0.0008	0.0605
099	Manufacture and repair of other furnitures and	0.0407	0.0006	0.1315

100	Manufacture of pulp, paper and paperboard	0.3742	0.1827	0.0869
101	Manufacture of paper and paperboard containers	0.1744	0.2339	0.2232
102	Manufacture of articles of paper and paperboard	0.0835	0.1362	0.2369
103	Newspapers and periodicals	0.0000	0.0067	0.1952
104	Printing and publishing of books and pamphlets	0.0000	0.0272	0.2315
105	Commercial and job printing and other allied industries	0.1030	0.0270	0.1218
106	Tanneries and leather finishing	0.1347	0.2699	0.1965
107	Manufacture of products of leather and leather	0.3054	0.0544	0.1258
108	Rubber tire and tube manufacturing	0.8641	0.0258	0.2978
109	Manufacture of rubber footwear		0.0007	0.1857
110	Manufacture of other rubber products, n.e.c.	0.3572	0.1392	0.1372
111	Manufacture of basic industrial chemicals	0.3970	0.9285	0.1568
112	Manufacture of fertilizers	0.7989	0.0090	0.2340
113	Manufacture of synthetic resins, plastic materials and	0.4121	0.6564	0.2003
114	Manufacture of pesticides, insecticides, etc.	0.2322	0.0037	0.3005
115	Manufacture of paints, varnishes and lacquers	0.5613	0.1602	0.1515
116	Manufacture of drugs and medicines	0.3967	0.0328	0.1143
117	Manufacture of soap and detergents	0.9245	0.0413	0.1368
118	Manufacture of perfumes, cosmetics and other toilet	0.5607	0.0189	0.2040
119	Manufacture of miscellaneous chemical products	0.6745	0.6048	0.1610
120	Manufacture of plastic furniture, plastic footwear and	0.2927	0.4904	0.1588
121	Petroleum refineries including LPG	0.9978	1.0804	0.0210
122	Manufacture of asphalt, lubricants and miscellaneous	0.0000	0.2137	0.6940
123	Manufacture of pottery, china and earthenwares	0.4549	0.0003	0.1138
124	Manufacture of flat glass	0.9728	0.1110	0.1614
125	Manufacture of glass container	0.0386	0.1380	0.2280
126	Manufacture of other glass and glass products	0.5819	0.1663	0.2402
127	Cement manufacture	0.2940	0.0528	0.1553
128	Manufacture of structural clay products	0.6044	0.0084	0.1252
129	Manufacture of structural concrete products	0.0790	0.0001	0.1920
130	Manufacture of other non-metallic mineral products,	0.0502	0.0503	0.0733
131	Blast furnace and steel making furnace, steel works	0.4399	0.5431	0.0485
132	Iron and steel foundries	0.1696	0.5472	0.1760
133	Non-ferrous smelting and refining plants, rolling,	0.8649	0.2025	0.0297
134	Non-ferrous foundries	0.1778	0.4086	0.2864
135	Cutlery, handtools, general hardware	0.3395	0.1134	0.1440
136	Structural metal products	0.1891	0.0473	0.0686
137	Manufacture of metal containers	0.0669	0.1862	0.2535
138	Metal stamping, coating, engraving mills		0.0378	0.2288
139	Manufacture of wire nails	0.0000	0.0270	0.1728
140	Manufacture of other fabricated wire and cable	0.3204	0.1520	0.1068
141	Manufacture of non-electric lighting and heating	0.0000	0.0002	0.0536
142	Manufacture of fabricated metal products except	0.0000	0.3009	0.0885
143	Manufacture of agricultural machinery and equipment	0.0000	0.0000	0.2740
144	Manufacture of metal and wood-working machinery	0.8144	0.0064	0.2300
145	Manufacture of engines and turbines, except for	0.4716	0.1083	0.0783
146	Manufacture, assembly and repair of office, computing	0.5959	0.0000	0.0455
147	Manufacture of pumps, compressors, blowers and	0.0000	0.0809	0.1073
148	Machine shops and manufacture of non-electrical	0.5277	0.0736	0.1144
149	Manufacture of electrical, industrial machinery and	0.7599	0.2185	0.0585
150	Manufacture of radio and TV receiving sets, sound	0.6812	0.0225	0.1559
151	Manufacture of communication and detection		0.0003	0.0934
152	Manufacture of parts and supplies for radio, TV and	0.8127	0.1061	0.0101
153	Manufacture of appliances and housewares	0.2910	0.0587	0.1718
154	Manufacture of semi- conductor devices		0.3440	0.1021
155	Manufacture of primary cells and batteries and electric	0.1193	0.0187	0.1006
156	Insulated wires and cables	0.0365	0.2033	0.1137
157	Manufacture of current-carrying wiring devices,		0.0987	0.0456
158	Manufacture of electrical lamps, fluorescent tubes and	0.1990	0.0933	0.1178
159	Shipyards and boatyards	0.7103	0.0015	0.0772
160	Manufacture and assembly of motor vehicles	0.6382	0.0108	0.2477

161	Rebuilding and major alteration of motor vehicles	0.8780	0.0313	0.1263
162	Manufacture of motor vehicles parts and accessories	0.3416	0.2160	0.0845
163	Manufacture, assembly of motorcycles and bicycles	0.2254	0.0000	0.1066
164	Manufacture, assembly, rebuilding and major	0.7966	0.0000	0.0206
165	Manufacture of professional, scientific measuring and	0.9476	0.0260	0.0991
166	Manufacture of photographic and optical instruments	0.8944	0.0000	0.0759
167	Manufacture of watches and clocks	0.9414	0.0004	0.0921
168	Manufacture and repair of furniture and fixtures, made	0.0920	0.0009	0.2313
169	Manufacture of jewelry and related articles	0.3165	0.0000	0.0102
170	Manufacture of musical instruments	0.0000	0.0000	0.2024
171	Manufacture of sporting and athletic goods	0.7006	0.0000	0.1373
172	Manufacture of surgical, dental, medical and		0.0033	0.1610
173	Manufacture of ophthalmic goods		0.0281	0.1511
174	Manufacture of toys and dolls except rubber and	0.3927	0.0001	0.1548
175	Manufacture of stationers', artists' and office supplies	1.0000	0.0256	0.1149
176	Miscellaneous manufacturing	0.3397	0.1709	0.0999
	Mean	0.3493	0.1117	0.1344
	SD	0.3193	0.2040	0.0962

## Appendix D

### Horizontal, Backward, and Forward Linkages: 1988

IO	Description	Horizontal	Backward	Forward
043	Slaughtering and meat packing	0.0000	0.0592	0.0037
044	Meat and meat products processing	0.0882	0.0088	0.0208
045	Milk processing	0.8535	0.6964	0.0420
046	Butter and cheese manufacturing	0.8875	0.0920	0.4891
047	Ice cream, sherbets and other flavored ices	0.0000	0.0000	0.3178
048	Other dairy products	1.0000	0.0009	0.2313
049	Canning and preserving of fruits and vegetables	0.0255	0.0455	0.0183
050	Fish canning	0.0000	0.0419	0.0366
051	Fish drying, smoking and manufacturing of other seafood	0.1086	0.0000	0.0340
052	Production of crude coconut oil, copra cake and meal	0.1716	0.0699	0.0342
053	Other crude vegetable oil, fish and other marine oils and	0.2784	0.1714	0.0679
054	Manufacture of refined coconut oil and vegetable oil	0.0277	0.1545	0.1394
055	Rice and corn milling	0.0033	0.0167	0.0050
056	Flour, cassava and other grains milling	0.1029	0.0483	0.0352
057	Manufacture of bakery products except noodles	0.0444	0.0000	0.1103
058	Noodles manufacturing	0.0764	0.0000	0.0954
059	Sugar milling and refining	0.0981	0.1498	0.0450
060	Manufacture of cocoa, chocolate and sugar confectionery	0.1732	0.0401	0.1503
061	Manufacture of desiccated coconut	0.2765	0.0023	0.0301
062	Manufacture of ice, except dry ice	0.0000	0.0000	0.1305
063	Coffee roasting and processing	0.4759	0.0025	0.0313
064	Manufacture of animal feeds	0.0493	0.0000	0.0349
065	Manufacture of starch and starch products	0.0567	0.0283	0.0809
066	Manufacture of flavoring extracts, mayonnaise and food	0.8960	0.0220	0.0646
067	Miscellaneous food products	0.0282	0.0606	0.1516
068	Alcoholic liquors and wine	0.1412	0.0000	0.0978
069	Malt liquors and malt	0.0000	0.0005	0.0289
070	Softdrinks and carbonated water	0.0000	0.0000	0.1015
071	Bottling of Mineral Water		0.0000	0.0298
072	Cigarette manufacturing	0.0196	0.0000	0.0340
073	Cigar, chewing and smoking tobacco	0.2045	0.0000	0.0705
074	Tobacco leaf flue-curing and redrying	0.1126	0.0522	0.1152
075	Textile, spinning, weaving, texturizing and finishing	0.4033	0.8364	0.2068
076	Fabric knitting mills	0.4719	0.3686	0.1969
077	Hosiery, underwear and outerwear (knitted)	0.7009	0.0483	0.2307

078	Manufacture of made-up textile goods except wearing	0.1672	0.0425	0.1430
079	Manufacture of carpets and rugs	0.7263	0.0000	0.2670
080	Cordage, rope, twine and net manufacturing	0.0557	0.0296	0.0947
081	Manufacture of articles made of native materials		0.0006	0.1971
082	Manufacture of artificial leather and impregnated & coated fabrics		0.0526	0.0428
083	Manufacture of fiber batting, padding, upholstery fillings	0.5334	0.0237	0.0815
084	Custom tailoring and dressmaking shops	0.0069	0.0082	0.0555
085	Manufacture of ready-made clothing	0.1689	0.0068	0.1656
086	Embroidery establishments	0.2449	0.0010	0.1874
087	Manufacture of other wearing apparel except footwear	0.2403	0.0001	0.1569
088	Manufacture of leather footwear and footwear parts	0.2170	0.0147	0.1663
089	Sawmills and planing of wood	0.0000	0.3055	0.0973
090	Manufacture of veneer and plywood	0.2149	0.0429	0.1373
091	Manufacture of hardboard and particle board	1.0000	0.0008	0.0776
092	Wood drying and preserving plants	0.0000	0.0001	0.0283
093	Millwork plants	0.0152	0.0037	0.0435
094	Manufacture of wooden and cane containers and small	0.0287	0.0468	0.0647
095	Manufacture of wood carvings	0.0000	0.0163	0.0042
096	Manufacture of misc wood, cork and cane products	0.0000	0.0125	0.0393
097	Manufacture and repair of wooden furniture including	0.0480	0.0024	0.0407
098	Manufacture and repair of rattan furniture including	0.0159	0.0005	0.0559
099	Manufacture and repair of other furnitures and fixtures,	0.0091	0.0002	0.1047
100	Manufacture of pulp, paper and paperboard	0.3301	0.1403	0.0888
101	Manufacture of paper and paperboard containers	0.1103	0.1856	0.1956
102	Manufacture of articles of paper and paperboard	0.0378	0.1128	0.2139
103	Newspapers and periodicals	0.0000	0.0061	0.1938
104	Printing and publishing of books and pamphlets	0.0000	0.0251	0.2115
105	Commercial and job printing and other allied industries	0.0293	0.0213	0.1247
106	Tanneries and leather finishing	0.1207	0.1352	0.2183
107	Manufacture of products of leather and leather substitutes	0.1102	0.0421	0.1028
108	Rubber tire and tube manufacturing	0.7977	0.0202	0.2916
109	Manufacture of rubber footwear		0.0007	0.1692
110	Manufacture of other rubber products, n.e.c.	0.1550	0.1039	0.1258
111	Manufacture of basic industrial chemicals	0.4710	0.7302	0.1582
112	Manufacture of fertilizers	0.5902	0.0005	0.2357
113	Manufacture of synthetic resins, plastic materials and	0.4064	0.5273	0.1985
114	Manufacture of pesticides, insecticides, etc.	0.0132	0.0038	0.2977
115	Manufacture of paints, varnishes and lacquers	0.6777	0.1179	0.1613
116	Manufacture of drugs and medicines	0.3354	0.0247	0.1222
117	Manufacture of soap and detergents	0.5444	0.0379	0.1360
118	Manufacture of perfumes, cosmetics and other toilet	0.3254	0.0144	0.2117
119	Manufacture of miscellaneous chemical products	0.7087	0.4666	0.1657
120	Manufacture of plastic furniture, plastic footwear and	0.0838	0.3756	0.1559
121	Petroleum refineries including LPG	0.9978	0.8793	0.0181
122	Manufacture of asphalt, lubricants and miscellaneous	0.0000	0.1963	0.6942
123	Manufacture of pottery, china and earthenwares	0.2350	0.0003	0.0939
124	Manufacture of flat glass	0.8918	0.1252	0.1438
125	Manufacture of glass container	0.0359	0.1320	0.1817
126	Manufacture of other glass and glass products	0.6633	0.1280	0.2258
127	Cement manufacture	0.2940	0.0309	0.1478
128	Manufacture of structural clay products	0.2649	0.0064	0.1349
129	Manufacture of structural concrete products	0.0718	0.0001	0.1701
130	Manufacture of other non-metallic mineral products,	0.0450	0.0348	0.0684
131	Blast furnace and steel making furnace, steel works and	0.2381	0.3729	0.0401
132	Iron and steel foundries	0.1118	0.3085	0.1159
133	Non-ferrous smelting and refining plants, rolling, drawing	0.8242	0.1436	0.0254
134	Non-ferrous foundries	0.0982	0.3273	0.2713
135	Cutlery, handtools, general hardware	0.3742	0.0978	0.0865
136	Structural metal products	0.0593	0.0420	0.0529
137	Manufacture of metal containers	0.0081	0.1367	0.1856
138	Metal stamping, coating, engraving mills		0.0263	0.1592

139	Manufacture of wire nails	0.0000	0.0153	0.0986
140	Manufacture of other fabricated wire and cable products	0.0699	0.1432	0.0749
141	Manufacture of non-electric lighting and heating fixtures	0.0000	0.0002	0.0343
142	Manufacture of fabricated metal products except	0.0000	0.2239	0.0601
143	Manufacture of agricultural machinery and equipment	0.0000	0.0000	0.1393
144	Manufacture of metal and wood-working machinery	0.6761	0.0046	0.1765
145	Manufacture of engines and turbines, except for transport	0.1747	0.0860	0.0518
146	Manufacture, assembly and repair of office, computing	0.5956	0.0000	0.0341
147	Manufacture of pumps, compressors, blowers and	0.0000	0.0309	0.0622
148	Machine shops and manufacture of non-electrical	0.2856	0.0566	0.0812
149	Manufacture of electrical, industrial machinery and	0.5435	0.1546	0.0509
150	Manufacture of radio and TV receiving sets, sound	0.6451	0.0185	0.1380
151	Manufacture of communication and detection equipment		0.0003	0.0860
152	Manufacture of parts and supplies for radio, TV and	0.7522	0.0968	0.0078
153	Manufacture of appliances and housewares	0.1158	0.0568	0.1203
154	Manufacture of semi- conductor devices		0.3074	0.0836
155	Manufacture of primary cells and batteries and electric	0.1168	0.0149	0.0916
156	Insulated wires and cables	0.0405	0.1538	0.0828
157	Manufacture of current-carrying wiring devices, conduits & fittings		0.0637	0.0356
158	Manufacture of electrical lamps, fluorescent tubes and	0.1125	0.0652	0.1079
159	Shipyards and boatyards	0.5447	0.0015	0.0610
160	Manufacture and assembly of motor vehicles	0.6225	0.0068	0.1746
161	Rebuilding and major alteration of motor vehicles	0.4987	0.0305	0.0931
162	Manufacture of motor vehicles parts and accessories	0.2855	0.1756	0.0601
163	Manufacture, assembly of motorcycles and bicycles	0.0879	0.0000	0.0690
164	Manufacture, assembly, rebuilding and major alteration	0.7638	0.0000	0.0168
165	Manufacture of professional, scientific measuring and	0.9460	0.0204	0.0630
166	Manufacture of photographic and optical instruments	0.7481	0.0000	0.0722
167	Manufacture of watches and clocks	0.7662	0.0004	0.0813
168	Manufacture and repair of furniture and fixtures, made	0.0276	0.0005	0.1589
169	Manufacture of jewelry and related articles	0.1449	0.0000	0.0098
170	Manufacture of musical instruments	0.0000	0.0000	0.1705
171	Manufacture of sporting and athletic goods	0.5893	0.0000	0.1035
172	Manufacture of surgical, dental, medical & orthopedic supplies		0.0028	0.1338
173	Manufacture of opthalmic goods		0.0162	0.1372
174	Manufacture of toys and dolls except rubber and plastic	0.2123	0.0001	0.1185
175	Manufacture of stationers', artists' and office supplies	1.0000	0.0156	0.0884
176	Miscellaneous manufacturing	0.1965	0.1219	0.0843
	Mean	0.2749	0.0865	0.1170
	SD	0.3019	0.1591	0.0920