Industrial Deepening in Malaysia: Policy Lessons for Developing Countries

THAM SIEW YEAN AND LOKE WAI HENG

The Malaysian economy has undergone substantial industrial transformation, shifting from primary commodity production to manufacturing in slightly more than 5 decades since achieving independence. However, efforts to deepen manufacturing development have not succeeded in nurturing a critical mass of domestic entrepreneurs with indigenous innovative capacities as industrialization continues to be dependent on imported technology and capital. Instead, the manufacturing sector is facing premature deindustrialization. In view of these developments, this study aims to assess the extent of industrial deepening in a country through the development of linkages, as well as the key factors that have contributed to this. This has important policy lessons for other developing countries that are following similar export-oriented, foreign direct investment-led strategies for their industrial development. The main findings of this study indicate that while trade and investment policies have contributed to the development of the manufacturing sector, they have also fostered closer integration with the rest of the world rather than within the domestic economy. The electrical and electronics subsector has relatively weaker backward linkages than other subsectors in the economy. Deepening internal integration requires complementary labor, human capital, and technology policies that can facilitate the development of linkages in the manufacturing sector.

JEL classification: F13, F14, O25

I. INTRODUCTION

The Malaysian economy has undergone substantial industrial transformation, shifting from primary commodity to manufacturing production in more than 5 decades since achieving independence in 1957. Sterling growth rates were achieved before the onset of the Asian financial crisis in 1997, leading to Malaysia's inclusion as one of the emerging tigers in the East Asian miracle (World Bank 1993). Real gross domestic product (GDP) grew at an average of 7%–8% per annum, while population growth averaged at 2.5% per annum and GDP per capita grew at 4.5%–5.5% per annum (Zainal 2009). Yet after the Asian financial crisis, Malaysia's economic development appears to have stalled as

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growth rates have faltered, averaging at 4.3% per annum for the period 2001–2009 (Government of Malaysia 2010). While per capita income has grown from $380 to $6,760 from 1970 to 2009, Malaysia appears to have remained in the middle-income category or the middle-income trap as per capita income of other East Asian countries, such as the Republic of Korea, has grown from $260 to $21,530 during the same period.

Numerous studies have shown that manufacturing development foster greater external integration with the world through trade and investment (Gangnes and Assche 2010). However, efforts to deepen manufacturing development have not succeeded in nurturing a critical mass of domestic entrepreneurs with indigenous innovative capacities that can move Malaysia up the value chain of production. Instead, the manufacturing sector is facing negative deindustrialization with falling trade performance as well as a slowing down in labor productivity in key subsectors such as electrical and electronics, textiles, and transport equipment (Rasiah 2008). In view of these developments, the objectives of this study are to assess the extent of industrial deepening in the country through the development of linkages as well as the key factors that have contributed to this development. This has important policy lessons for other developing countries that are also following similar export-oriented, foreign direct investment (FDI)-led strategies for their industrial development.

The paper is organized as follows: Section II summarizes key policy debates on linkage development in the literature before discussing the trade and investment polices used in different phases of industrialization in Section III. Section IV presents an overview of the manufacturing sector and the results of the computed linkages, while Section V discusses the main factors that have contributed to state of domestic linkage development. The last section summarizes the main findings of this paper, as well as policy lessons for other developing countries.

II. POLICY ISSUES

Economic development via industrialization is used as a means to improve the export earnings of a country through greater price stability, as well as to avoid the declining terms of trade commonly associated with the export of primary commodities. The shift of resources from primary commodity production to manufacturing also allows for more rapid productivity growth that is a crucial determinant for improving a country's living standards and its ability to compete globally. Establishing a broad industrial base is therefore seen as an essential step for increasing a country's income.

Trade and FDI are common policy tools used by developing countries to facilitate industrialization. Based on endogenous growth models, FDI can enhance growth by encouraging the incorporation of new inputs and technologies in the production function of the recipient economy (De Mello 1997). In the case of new inputs, output growth can result due to the use of a wider range of intermediate goods in FDI-related production. As for new technologies, spillovers to domestic firms may occur through four different channels: imitation, skills acquisition, competition, and exports (Gorg and Greenaway 2004). These spillovers can increase the productivity of capital and labor in host economies. They are manifested in terms of linkage formation, especially backward linkages, which are deemed to be important as a host country's potential benefit from FDI increases with local procurement since it is a form of technology transfer from multinationals to the domestic firms (Kiyota et al. 2008, Javorcik 2004). Thus, stronger linkages indicate a greater absorption of the technology of multinationals by the domestic economy. It also indicates the extent to which industrialization has deepened from simple to complex manufacturing production that is rooted in innovation and research and development (R&D) capabilities.

However, the extent to which foreign technology can be transferred is not automatic. As empirical studies have shown, it is dependent on certain conditions in the host economy. Macro- and micro-level studies point to various conditions. A macro study by Borensztein et al. (1998), for example, finds that a minimum threshold of human capital is necessary for FDI to have a positive impact. Balasubramanyam et al. (1996) show that trade openness is crucial for obtaining a positive impact from the presence of FDI. Meanwhile, micro or firm-level studies indicate that type ownership (Javorcik 2004), export orientation of the affiliates (Jabbour and Mucchielli 2007), experience of the affiliate as measured by years of operation (Kiyota et al. 2008), as well as technology gap between domestic firms and foreign affiliates (Jabbour and Mucchielli 2007) are some of the key factors that determine the extent of technology spillovers in a host economy.

Therefore, the extent of linkage development is an important question for policy makers since harnessing FDI for technology transfer is a common approach used for industrial development in developing countries (Javorcik 2004, Kiyota et al. 2008).

III. TRADE AND INVESTMENT POLICIES IN VARIOUS PHASES OF INDUSTRIALIZATION IN MALAYSIA

Table 1 summarizes the phases of industrialization in Malaysia. The main trade and investment policies used to foster manufacturing development are tariffs,[1] export incentives, free trade zones, export incentives, and FDI.[2] Import

[1]As noted in WTO (2009), tariffs are the main border measures used affecting imports.

substitution was practiced briefly for about 10 years before shifting out to export-oriented manufacturing due to a limited domestic market and the need to generate employment. Besides fiscal incentives, tariff protection was also used to encourage new investment in manufacturing but it was used moderately compared to other developing countries at that time. The average tariff rate was estimated at 13% in 1965 and very few industries enjoyed tariff protection of more than 30% while nontariff barriers (NTBs) were hardly used (Athukorala 2005).

Table 1. **Summary of Phases of Industrialization and Policies, 1957–2010**

Period	Trade Policies	FDI Policies	Motivations
1957–1967	Import substitution in manufacturing	FDI for import-substituting industries	Supply finished goods that were imported
1968–1980	Export promotion in manufacturing	Free trade zones	Generate employment
1980–1985	Import substitution in manufacturing	Joint venture projects between state-owned enterprises for selected heavy industries such as automotives, motorcycle assembly, steel, cement, fertilizers etc.	Employment, linkages, develop heavy industries, nurturing Bumiputera* enterprises
1986–2005	Export promotion in manufacturing	Relaxation of equity constraints for manufacturing	Employment; technology transfer and moving up the value chain of production through cluster development
2006–2020	Export promotion of manufacturing and selected services as new sources of growth	Relaxation of equity constraints for selected services	Continuation of knowledge-based industrial growth based on cluster development; export of selected services as new sources of growth

* This refers to the Malays and indigenous people. The New Economic Policy that was formulated in 1969 in response to inter-ethnic riots focused on poverty eradication and income redistribution among the ethnic groups, leading to affirmative actions for the Bumiputeras.

Source: Authors' compilation.

[2]WTO (2009) also highlights various other trade instruments such as export taxes that have been used in industrialization. In 2009, 515 tariff lines were imposed export duties out of the 10,389 tariff lines at the 9-digit level. The export taxes are mostly at ad valorem, ranging from 5% to 20%. Products subject to these taxes include timber.

Free trade zones (FTZs) were used in 1972 to draw FDI in to enable the shift to export-oriented manufacturing. Average nominal tariff was 18% in 1970 (Table 2) and subsequently, this was increased steadily to 22% in 1978, but firms in FTZs are allowed to import duty-free intermediate and capital goods. Foreign equity constraints were also relaxed in manufacturing production in these zones, especially for firms exporting 80% or more of their output, and fiscal incentives such as tax holidays were also offered to pioneer status firms. Malaysia's early shift into export-oriented manufacturing created first-mover advantages over other developing countries that were still practicing import substitution at that time. Consequently, these FTZs attracted American firms that were relocating their labor-intensive operations to Southeast Asia in the electrical and electronics (E&E) and textile industries.

Table 2. **Trend in Average Nominal Tariff Rate, 1965–2009**

Year	Tariff Rate
1965	13.0
1970	18.0
1984	26.0
1989	17.0
1990	13.4
1995	10.2
2000	9.2
2006	7.7
2007	7.7
2009	7.4

Sources: Data for 1965–1989 are from Table 1 in Athukorala (2005); 1990–1995 from United Nations Conference on Trade and Development (UNCTAD) website, available: www.unctad.org/en/docs/itcdtab14.en.pdf, accessed 14 September 2010; and 2000–2009 from WTO website, available: tariffanalysis.wto.org/QueryEdit.aspx, accessed 15 September 2010.

However, poor linkage development led to a dualistic industrial structure. Accordingly, heavy industries were launched in 1980 in an attempt to emulate the industrial successes of Japan and the Republic of Korea. In contrast to the earlier private sector-led approach, these industries were borne out of government and foreign multinational partnerships in selected sectors such as iron and steel, transport equipment, cement, petrochemicals, paper and paper products, machinery and equipment, and general engineering and building materials. It was reported that by 1987, there were more than 867 public enterprises, more than a third of which were in manufacturing (Athukorala 2005). Tariff protection was invoked to protect and nurture these infant industries (Table 2), which unlike their East Asian counterparts had no export performance requirements imposed on them. Nontariff barriers in the form of import quotas and licenses were also used at the same time to protect the national car project. Moreover, their development had mixed economic and redistribution goals as these industries are supposed to

develop the linkages needed for industrial deepening and concurrently, they are also meant to develop Bumiputera entrepreneurs in the capital goods industry.

The government incurred large fiscal and external deficits with the launch of the heavy industries, which required the importation of both intermediate and capital goods for outputs that were oriented toward the domestic market. Adverse external circumstances such as the global recession and drop in commodity prices in the early 1980s led to reconsideration of this strategy and forced the government to adopt an alternative strategy that focused on a private sector-led approach. This in turn, translated into an FDI-led approach as FDI equity restrictions were again liberalized subject to the fulfillment of export conditions, while generous incentives were provided and licensing procedures liberalized. Various export incentives were also provided to encourage exports. These trade liberalization measures coincided with favorable external circumstances as the appreciation of East Asian currencies due to the Plaza Accord led to the relocation of Japanese and other East Asian investment to Southeast Asia. Malaysia became a beneficiary of these outflows as the domestic conditions matched the requirements for the subsidiary operations of these multinational companies (MNCs).

A special zone called the multimedia super corridor (MSC) was established in 1996 to facilitate information, communication, and technology (ICT) development in the hope that this will enable Malaysia to leapfrog from a production economy to a knowledge-based economy. Apart from the relaxation of foreign equity constraints, allowing up to 100% foreign equity for companies given the MSC status, tax incentives such as pioneer status, and duty-free importation of multimedia equipment are provided for MSC companies. IT infrastructures at globally competitive telecommunication tariffs and services are also another added incentive used to draw in foreign companies to undertake ICT activities in this zone.

However, the onset of the Asian financial crisis in 1997 derailed the growth of the manufacturing sector due in part to the fall in FDI. Equity constraints were relaxed for the manufacturing sector while exports continued to be promoted through the provision of export incentives such as double deduction for the promotion of exports. After the establishment of the World Trade Organization (WTO) in 1995, there were increasingly trade and FDI liberalization pressures at the multilateral; regional (e.g., ASEAN); and bilateral level. The five different sets of preferential tariffs in Malaysia's current commitments are shown in Table 3. Preferential rates under the ASEAN's Agreement on the Common Effective Preferential Tariff (CEPT) are significantly lower than the other rates. Meanwhile the simple average most favored nation (MFN) rate is the highest under WTO commitments compared to the other arrangements and among product groups. For transport equipment, the tariff obtained under the CEPT is the lowest among the

arrangements shown, followed by the Malaysia Japan Economic Partnership Agreement (MJEPA).

Table 3. **Summary Analysis of Malaysia's Preferential Tariff, 2009**

	MFN	CEPT	ASEAN-PRC	ASEAN-Korea	MJEPA	CEPA
Preferential lines* (percent of all tariff lines)		38.2	32.9	30	34.7	10.6
Duty-free lines (percent of all tariff lines)	60.3	85.3	68.7	81.6	76.7	63.4
Overall average	7.4	0.7	2.9	3.2	3.1	6.7
WTO nonagriculture	7.9	0.7	3.2	3.4	3.2	7.3
Leather, rubber, footwear, and travel goods	13	0.9	4.5	6.4	6.2	9.8
Textiles and clothing	12.2	0.1	4.4	1.2	0.6	11.2
Transport equipment	18.1	1.3	12.6	16.3	10	16.3

*The number of preferential tariff lines includes only lines on which the rate is lower than the corresponding MFN applied rate.

ASEAN = Association of Southeast Asian Nations, CEPA = Malaysia-Pakistan Closer Economic Partnership Agreement, CEPT = common effective preferential tariff, MFN = most favored nation, MJEPA = Malaysia–Japan Economic Partnership Agreement, PRC = People's Republic of China.

Source: WTO (2009).

IV. PERFORMANCE OF THE MANUFACTURING SECTOR

A. Overall Performance

The share of manufacturing in real GDP grew steadily from 11% in 1970 to 15% in 1985. Its share continued to increase to a peak of 31% in 2000, before decreasing progressively to 30% in 2007 (Table 4). In 2009, its share fell to 27% due in part to the global financial crisis of 2008/2009. Its share in total employment of the country increased steadily from a mere 9% in 1970 to a peak of 29% in 2007.

The E&E subsector that first started producing in the FTZs has developed into the biggest subsector before the advent of the Asian financial crisis. Its share in manufacturing value added grew to 26% in 2000 before dropping to 15% in 2008 (see industry 32 in Table 5). Nevertheless, it is still a key sector in Malaysian manufacturing as it is identified as one of the national key economic areas that will drive economic activities in the country in its aspiration to become a high-income economy by 2020 (Government of Malaysia 2010).

Foreign ownership in terms of the share of foreign establishments to total is found to dominate in three subsectors in 2000–2008. These are subsectors 31, 32, and 33. However, Table 6 shows that the share of foreign establishments (F) in the gross value of output, value added, employment, export and import is significantly higher than the domestic establishments (D) in the E&E subsector. Given the dominance of foreign establishments in this subsector, it is important to ascertain the linkage development in this sector relative to other subsectors as the aspired technology transfer is expected to be the greatest in sectors dominated by multinationals.

Table 4. **Manufacturing's Share in GDP and Employment, 1970–2009**

Year	Manufacturing Value-Added as Percent of Total GDP[1]	Manufacturing Employment ('000)	Manufacturing Employment as Percent of Total Employment
1970	11.1	290	8.7
1975	13.9	398	10.1
1980	15.7	802	15.8
1985	15.3	836	15.1
1990	21.6	1,290	19.5
1995	26.5	2,027	25.7
1996	28.5	2,230	26.4
1997	29.2	2,375	27.1
1998	27.3	2,277	27.0
1999	29.2	2,343	26.4
2000	31.2	2,558	27.9
2001	29.5	2,574	26.7
2002	29.4	2,596	27.1
2003	30.1	2,776	27.6
2004	30.9	2,972	28.4
2005	30.7	3,133	28.8
2006	30.9	3,227	28.9
2007	29.9	3,297	28.9
2009	26.6	3,210	27.6

GDP = gross domestic product.

[1]The series are converted to 2000 base year using the following rebasing factors: 0.978 (30.7/31.4) for 1996–2004 , and 0.801 (26.5/33.1) for 1995 and earlier. Values for 2006–2009 are already in 2000 prices. These rebasing factors are obtained from overlapping data in 2005 and 1995, respectively.

Sources: 1970–2000 data are from Tham (2004b); 2001–2005 from *Economic Report 2006/07* (Government of Malaysia 2006); 2005 (in 2000 prices) from *Economic Report 2008/09* (Government of Malaysia 2008); 2006–2009 from Government of Malaysia (2010).

Table 5. **Percentage Share in Manufacturing Value Added, 2000–2008**

Industry Code	Year								
	2000	2001	2002	2003	2004	2005	2006	2007	2008
15	8	9	9	9	8	9	9	9	11
16	1	1	1	1	1	0	0	0	0
17	2	2	2	1	1	1	1	1	1
18	2	2	2	1	1	1	1	1	1
19	0	0	0	0	0	0	0	0	0
20	4	3	3	3	3	3	3	3	2
21	2	2	2	2	2	2	1	1	1
22	2	2	2	2	2	2	2	2	2
23	7	6	8	10	12	14	13	16	19
24	8	8	9	10	12	13	15	12	12
25	7	7	8	8	6	7	7	6	6
26	5	5	5	4	4	4	3	3	3
27	3	2	3	4	4	3	3	5	4
28	3	3	3	3	4	3	3	3	4
29	3	4	3	3	3	3	4	3	3
30	5	5	5	6	7	7	6	9	5
31	4	3	3	3	3	3	3	3	2
32	26	23	19	19	18	17	16	14	15
33	1	2	1	1	1	1	1	1	1
34	3	6	6	5	4	3	4	3	3
35	1	2	2	2	1	1	2	1	1
36	3	3	3	3	3	3	3	3	3

Note: See Appendix (2) for a description of the industries according to the codes used.
Source : Department of Statistics of Malaysia.

Table 6. **Percentage Share of Domestic and Foreign Establishments in Key Industry Variables in the E&E Subsector, 2000–2008**

Year	Number of Establishments		Value of Gross Output		Intermediate Input	
	D	F	D	F	D	F
2000	48	52	23	77	22	78
2001	36	64	19	81	19	81
2002	40	60	20	80	20	80
2003	44	56	19	81	18	82
2004	38	62	21	79	20	80
2005	56	44	34	66	33	67
2006	57	43	22	78	21	79
2007	60	40	17	83	16	84
2008	62	38	23	77	22	78

Year	Value Added		Total Employments		Export Value		Import Value	
	D	F	D	F	D	F	D	F
2000	28	72	30	70	20	80	17	83
2001	20	80	22	78	20	80	20	80
2002	20	80	27	73	16	84	14	86
2003	23	77	28	72	17	83	17	83
2004	25	75	27	73	28	72	21	79
2005	36	64	41	59	34	66	32	68
2006	29	71	30	70	15	85	18	82
2007	23	77	25	75	12	88	8	92
2008	26	74	31	69	17	83	21	79

D = domestic, F = foreign.
Source: Department of Statistics of Malaysia.

B. Industrial Deepening: Linkage Development

Backward linkages of an industry indicate the degree of dependence of a given industry on the economy as a source of input supply, while forward linkages indicate the degree of dependence of the economy on a given industry as a source of input supply.

Linkage development can be ascertained through firm-level studies or input–output (I-O) analysis. Firm-level studies of the electronics subsector indicated few backward linkages in the late 1970s and early 1980s but they started to evolve in the 1990s.[3] The lack of linkage development in 1970–1980 is supported by I-O analysis. Rasiah (1996) concluded that while the manufacturing sector in general had relatively strong backward and forward linkages before the 1970s, weakening linkages were observed subsequently. Rasiah attributed the deterioration in industrial linkage to the implementation of FTZs and licensed manufacturing warehouses that promoted exports with the use of duty-free imports. Kanapathy (2004) updated the linkages calculations to 1991 and noted very little change in the linkage structure of the electronics industry. Firms in Malaysia were found to have higher input dependence with firms outside the country. The dependence of all other sectors on the electronics industry (forward linkage) was also weak, as the industry output went chiefly into exported final demand.

Based on the Rasmussen method (1956), the 1987, 1991, 2000 and 2005 IO tables are used to compute and compare the evolution of linkage development in E&E products relative to other products in both resource- and nonresource-based industries (Table 7).[4] By 2005, it can be observed that backward linkages that are the same or above the industry average (with an index value of 1 and above) are achieved for all the industries (including nonresource-based industries) with the exception of E&E products. Instead, this sector has consistently poorer backward linkage development relative to other sectors in the economy. Generally, resource-based industries have relatively higher backward linkage development than nonresource-based industries.

Forward linkages are quite weak for all subsectors shown, with the exception of petroleum products and the manufacture of metals.[5] This implies that most of the goods produced are exported. These results conform with the conclusions by other studies, namely, backward linkages are more prominent than forward linkages in the manufacturing sector while resource-based sectors are the

[3]See Tham (2004) for a summary of firm-level studies.

[4]See Appendix 1 for a description of the methodology and data used in the computation of linkages.

[5]However, the value obtained for the former has to be interpreted with caution since there is a possible upward bias in linkages values over time in this industry as it uses significantly more "crude oil and natural gas" as inputs—which has experienced higher inflation rate than other inputs. See Appendix 1 on the use of nominal values for the calculation of linkage indexes.

key sectors in linkage formation (Norhayati et al. 2008, Rohana and Zakariah 2007, Hussain 2010).

Table 7. **Backward and Forward Linkages of Resource and Nonresource-Based Industries, 1987–2005**

	1987		1991		2000		2005	
	BW	**FW**	**BW**	**FW**	**BW**	**FW**	**BW**	**FW**
Resource-Based Industries								
Food	1.32	0.94	1.28	0.87	1.24	0.93	1.14	0.86
Beverages and tobacco	1.02	0.70	0.97	0.70	1.01	0.71	1.02	0.70
Wood products*	1.19	0.89	1.22	0.81	1.16	0.76	1.02	0.68
Paper and paper products*	0.95	1.24	0.93	1.21	1.01	1.22	1.00	1.01
Petroleum products	1.16	1.06	1.29	1.62	1.02	2.55	1.10	5.32
Chemical and chemical products	1.03	0.97	0.98	0.91	1.07	0.98	1.06	0.92
Rubber products	1.19	0.86	1.20	0.82	1.15	0.91	1.24	1.04
Nonmetallic mineral products	0.99	0.83	1.04	0.91	1.06	0.92	1.06	0.91
Nonresource-Based Industries								
Textile, clothing, and footwear	0.97	0.85	0.94	0.75	1.02	0.73	1.04	0.70
Manufactures of metal	1.09	1.13	1.08	1.03	0.94	1.05	1.02	1.21
Electrical and electronic products	0.80	0.82	0.94	0.93	0.87	0.86	0.92	0.87
Transport equipment	0.94	0.85	0.93	0.95	1.00	0.90	1.08	0.82

* In 2005 I-O tables, paper and paper products include furniture. Furniture was grouped under wood products in previous years.

BW = backward linkages, FW = forward linkages, I-O = input–output.

Note: The figures show the average linkage index values of an industry with the rest of the economy.

Source: Computed based on method shown in Appendix 1, using the I-O tables from the Department of Statistics of Malaysia (DOS, 1987; 1991; 200; 2005).

Further disaggregation of the E&E subsector is only possible with the 2005 data. Table 8 shows that it is the semiconductor devices, tubes, and circuit boards that have weaker than average industry backward linkage development but conversely, this subsector has relatively stronger forward linkages. One possible reason for the change is the relaxation of export conditions, which was tied to 100% foreign equity ownership in 1998 due to the economic crisis (Tham 2004). Foreign manufacturers in the FTZs are even allowed to sell to the domestic market while all existing firms that had previously received incentives based on their level of exports could apply to the Ministry of Trade and Industry for approval to sell up to 50% of their output to the domestic market. Another possible reason is increasing digitization that has led to an increase in demand for the output of these goods from the other sectors.

The E&E subsector not only has relatively weaker backward linkages than other subsectors shown but also a consistently higher share of imports in direct raw materials used compared to the other subsectors (Table 6).[6] More importantly, the backward linkages developed may not be with Malaysian firms but rather transnational small and medium enterprises that have followed MNCs

[6]Note that the survey of manufacturing industries has only included export and import data in their survey questionnaire from 2000 onward.

to this country to be their suppliers (see Capannelli 1999). In fact, up to now, Malaysia has yet to produce world class indigenous manufacturing companies that can match with the likes of the Republic of Korea's Samsung and LG; India's Tata Steel, Ranbaxy, and Wipro; and the People's Republic of China's (PRC) Huawei and Lenovo (*The Economist* 2008). The large share of imported input with relatively weaker backward linkages shows that this sector is still much more integrated with the global economy rather than with the local.

Table 8. **Linkages in Electrical and Electronics Products, 2005**

	2005	
	Backward	**Forward**
Electrical machinery and apparatus	0.88	0.54
Other electrical machinery	1.02	0.59
Insulated wires and cables	0.87	0.72
Electric lamps and lighting equipment	1.00	0.77
Semiconductor devices, tubes, and circuit boards	0.96	1.82
Television sets, radio receivers and transmitters, and associated goods	0.93	1.74
Medical, surgical, and orthopedic appliances	0.92	0.54
Measuring, checking, and industrial process equipment	0.87	0.78
Optical instruments and photographic equipment	0.83	0.65
Watches and clocks	0.96	0.58

Source: Authors' calculation based on the I-O tables from the Department of Statistics Malaysia (2000 and 2005.

Using the inverse matrix from the 1995 Asian International Input–Output Tables (IDE-JETRO 2001), backward and forward linkages are computed for selected subsectors for the Republic of Korea, Malaysia, and Thailand (Table 9).

Table 9. **Backward and Forward Linkages for Selected Asian Countries, 1995**

Codes	**Description**	**Backward**			**Forward**		
		Malaysia	**Korea, Rep. of**	**Thailand**	**Malaysia**	**Korea, Rep. of**	**Thailand**
008	Food, beverage, and tobacco	1.30	1.21	1.25	1.14	1.27	0.90
010	Timber and wooden products	1.16	1.03	1.00	0.73	0.77	0.96
012	Chemical products	1.08	1.07	1.08	0.96	1.64	0.58
013	Petroleum and petroleum products	0.97	0.71	0.72	0.80	1.03	0.77
014	Rubber products	1.03	1.07	1.16	0.99	0.69	1.43
017	Machinery	0.93	1.06	0.88	0.98	1.14	0.86
018	Transport equipment	0.96	1.22	0.96	0.88	0.92	0.96

Source: Authors' calculation based on 1995 Asian International Input–Output Tables.

For resource-based products such as food, beverages and tobacco, timber, and wooden products, Malaysia's backward linkages are above the country's national industry average, as it is with the Republic of Korea and Thailand. However, forward linkages are above their respective national industry's average for food, beverage, and tobacco only in the Republic of Korea and Malaysia.

But in the case of machinery (017), which includes the E&E subsector, the linkages in Malaysia and Thailand were below their respective own national industry's average, indicating that these two sectors having weak linkages with the rest of its economy in these countries. In contrast, the Republic of Korea's backward and forward linkages of its machinery sector were above the industry average.

The above analysis shows that while Malaysia had first mover advantages in the development of the E&E sector, this did not lead to the development of relatively higher backward linkages in this sector. Instead this sector continues to be import-dependent even though Malaysia has become a leading developing country producer of this category of products (UNIDO 2009). We examine the reasons for the weak backward linkage development in the E&E subsector in the next section.

V. KEY FACTORS CONTRIBUTING TO WEAK BACKWARD LINKAGE DEVELOPMENT IN THE E&E SUBSECTOR

The main contributory factors are: (i) trade and investment policies, (ii) foreign workers, (iii) shortage of human capital of the right quality and quantity, (iv) increasing competition from other countries, and (v) technology.

A. Trade and Investment Policies

The use of tariffs was found to have a positive impact on backward linkage formation in Malaysia in general as higher tariffs as well as other protectionist policies make it more difficult for MNEs to import the necessary inputs (Batra et al. 2003). Conversely, easy access to imported inputs can be expected to have the opposite effect.

Therefore, the use of FTZs to attract FDI and to promote exports has been largely considered to be successful given the large inflows of FDI in the country before the onset of the 1997/1998 Asian financial crisis. However, this strategy has its drawbacks as exports are promoted with the use of dutyfree imports, leading to an easier integration with the world rather than the local economy in other countries as well (Amirahmadi and Wu 1995, Rasiah 1996). In the case of Thailand, which has a similar production structure as Malaysia, Kohpaiboon (2010) also found that duty-drawback programs promoted exports and external integration, at the expense of domestic linkage development.

In Malaysia, although the tariff structure favors the import of raw materials rather than processed goods, the system of exemptions or drawbacks on import duties for intermediate goods for export, and sales tax rebates for the import of raw materials and components used for the manufacture of approved products for

export, have served to encourage the converse to happen.[7] The use of these tariff exemptions, concessions, and drawbacks is quite significant as the revenue foregone for import duties and sales tax amounted to RM1.88 billion in 2007 (WTO 2009). In contrast, the use of export taxes for the export of resource-based products such as timber and rubber tend to increase domestic supply, thereby decreasing their domestic price and encouraging downstream processing and the development of backward linkages (WTO 2009).

This early access to global sourcing for inputs as well as the use of FTZs in other countries has led to an outward rather than inward orientation in the development of the E&E subsector.

B. Foreign Workers

Data provided by the Ministry of Home Affairs indicate that the total number of migrant workers in the country increased from 409,660 in 1999 to 1.9 million in 2009. It has been estimated that between 1990 to 2005, foreign workers contributed more than a third of the increase in total labor supply with over 98% of these being low-skilled contract foreign workers (NEAC 2010, 50). It should be noted that this excludes illegal foreign workers.

Within manufacturing, the share of foreign workers increased from a mere 1.0% in 1980 to 14.1% in 1996 before the Asian financial crisis (Table 10). This increased further to 14.1% in 2000, and steadily to 28% in 2007 before dropping slightly to 27% in 2008. These workers are generally low-skilled production workers due to the lack of domestic workers in these occupational groupings, leading to increasing excess demand (Tham and Liew 2004 and 2010). Tham and Liew (2004 and 2010) found that these workers have a negative impact on labor productivity as they substitute for capital and slow down automation. In the latter study, the capital–labor ratio has fallen from 2000 to 2006 for the panel data used. Data from the Department of Statistics show that the capital–labor ratio for firms with foreign workers fell from 2000 to 2005 while the capital–labor ratio for firms without foreign workers increased.

[7]Tariff protection is generally lower for raw materials than semiprocessed and fully processed goods (WTO 2009, 29). In 2009, the MFN tariff rate for the first stage of processing was 1.1%, compared to 8.7% and 9.1%, respectively, for semiprocessed and fully processed products.

Table 10. **Share of Migrant workers in Malaysian Manufacturing, 1981-2008**

Year	Share of Migrant Workers	Year	Share of Migrant Workers
1981	1.0	2000	14.1
1985	1.6	2001	15.3
1990	2.0	2002	16.2
1995	10.2	2003	18.2
1996	14.1	2004	20.5
1997	13.9	2005	22.1
1998	13.6	2006	23.8
1999	13.2	2007	28.4
		2008	26.9

Sources: 1981–1999 is extracted from Henderson and Phillips 2007; 2000–2008 is extracted from unpublished data from Department of Statistics, Malaysia.

C. Shortage of Human Capital of the Right Quality and Quantity

The shortage of human capital has been reported since full employment was achieved in the early 1990s during the decade-long boom in industrial development. The second Malaysia Productivity and Investment Climate Survey conducted by the Economic Planning Unit and World Bank reported that firms still face difficulties in locating and recruiting the skills needed (World Bank 2009). Similarly, Shahid and Kaoru's (2009) interviews with 27 E&E firms in the electronics cluster in Penang have indicated that their R&D or product/process development efforts are being impeded by shortages of specialized skills.

More importantly, this human resource bottleneck has a qualitative dimension where local university graduates are deemed to have book knowledge, but are ill-equipped to deal with real world problems on the shop floor; and lack basic communication, negotiation, and presentation skills. Appropriate skills and knowledge when available are also insufficient in quantities for MNCs to upgrade their Malaysian operations (Ritchie 2008).

The persistence of skill shortages despite an increasing supply of new college graduates indicates a serious mismatch between demand and supply for skills. This is further evidenced by the emergence of graduate unemployment as the share of tertiary graduates in the unemployed doubled from 7.1% in 1981 to 15.2% in 2000 and increased further to 25.1% in 2006. This reflects in part the state of development in Malaysian universities: none have yet to attain the level of international recognition accorded to the other universities in East Asia such as the University of Tokyo, Seoul National, and National University of Singapore (Pack 2008). Thus while the government's commitment toward human capital efforts in Malaysia compares very favorably with the newly industrialized economies and indeed with even the developed countries, such as Japan and the US, the increase in human capital of the right quality, quantity, and knowledge for technological upgrading to become self-sustaining is still insufficient.

D. Increasing Competition from Other Countries

Increasing competition from the PRC and also other ASEAN member countries has affected the competition for FDI and the industrial upgrading process. Using the net export similarity index,[8] the PRC's net export profile is found to converge with Malaysia's over time, except in 2008, indicating the PRC's growing competition with Malaysia (Table 11). Table 12 also shows that the selected countries in ASEAN have an export profile that is converging with Malaysia's over time, indicating that Malaysia is also facing increasing competition from these countries in its export earnings.

Consequently, Malaysia is unable to compete with other low-cost competitors, without the help of low wage migrant workers.

Table 11. **Net Export Similarity—The People's Republic of China with ASEAN and Other Northeast Asian Economies, 1993–2008**

	1993	1996	1999	2002	2005	2008
Malaysia	20.09	21.72	22.00	31.35	40.07	30.95
Singapore	8.86	10.13	10.80	16.60	23.44	15.85
Indonesia	32.04	31.60	31.48	37.63	31.56	19.03
Philippines	33.63	44.84	25.22	36.91	36.10	26.11
Thailand	48.95	43.62	41.73	41.93	43.55	35.29
Japan	6.40	10.64	11.66	13.15	14.89	n.a.
Korea, Rep. of	31.86	22.21	24.33	25.58	25.10	n.a.

Source: Loke (2009).

Table 12. **Net Export Similarity—Malaysia with other ASEAN Countries, 1993–2008**

	1993	1996	1999	2002	2005	2008
China, People's Rep. of	20.09	21.72	22.00	31.35	40.07	30.95
Singapore	14.73	27.56	26.28	28.07	27.35	41.12
Indonesia	44.76	44.39	38.01	46.31	42.15	45.54
Philippines	26.96	28.92	22.85	29.50	30.93	46.55
Thailand	25.74	31.85	35.96	30.87	33.44	31.29

Source: Loke (2009).

E. Technology

Technology is an important barrier to increased sourcing from indigenous firms. This has been recognized by the government as evidenced in the three Industrial Master Plans that have been developed to promote industrial upgrading. To hasten the process, Malaysia launched the national Action Plan for Industrial Technology Development in 1990, identifying science and technology

[8]The net export similarity index is a modified Finger-Kreinin index where only net export vales of those products with positive values are used. High or increasing index values between two countries can be used to indicate similar or increasingly similar reliance on particular products for export revenue, thereby implying high or increasing competition between the countries' exports. The index can take any value from 0 to 100 with a 0 value implying complete dissimilarity in the export profile of the two countries. A value of 100 implies that the export profiles are identical.

development as a national priority. In line with this Plan, various institutions were established to enhance technology development in the country. These include the establishment of public technical support institutions, such as the Standards and Industrial Research Institute of Malaysia (SIRIM), and National Productivity Corporation (subsequently renamed as the Malaysian Productivity Corporation). SIRIM also conducts research such as contract R&D for the industrial sector. Another public R&D institution is the Malaysian Institute of Microelectronic Systems established in 1992 to support Malaysia's industrial technology development in microelectronics systems. Public universities are also engaged in research, although their links with the manufacturing sector are weak. The Small and Medium Industries Development Corporation (later renamed SMECorp) was established in 1996 as a specialized agency for the promotion and development of SMEs in the country. This seems appropriate given the substantial presence of SMEs in the country and the vital role that they play in the development of linkages between the MNCs and the domestic economy. Various grants were provided to nurture technology development in the country. Other institutions that were also established to facilitate technology development in the country included the Malaysian Technology Development Council, the Multimedia Development Corporation, as well as the MSC.

Despite this, the effectiveness of these intermediary institutions in developing the technology capability of the county has been hindered by the lack of effective monitoring and assessment mechanisms, shortage of appropriate leaders to drive these institutions to deliver, as well as a scarcity of qualified engineers and scientists and lack of R&D support (Rasiah 2010).

VI. CONCLUSION: LESSONS FOR OTHER DEVELOPING COUNTRIES

As in the case of other developing countries, trade and investment policies have been used to promote industrial development in Malaysia. Both export promotion and protection have been used to promote selective subsectors. These policies have been relatively successful in terms of attracting MNCs to produce in the country and increasing the exports of manufactured goods, especially in E&E goods. Over the years, backward linkages have also evolved, but the E&E subsector has less relatively less backward linkages compared with the rest of the economy and it remains import-dependent. Forward linkages, however, have been relatively higher than other sectors.

The difficulties encountered in developing backward linkages in an FDI-dominated sector such as the E&E subsector hold important policy lessons for other developing countries. First, while the use of FTZs and duty drawback programs as a tool for industrialization have facilitated early industrial development, they have also discouraged the development of linkages with the

domestic economy. Since the use of duty drawbacks is to reduce or eliminate implicit export taxes on exports due to tariffs on intermediate inputs used in the production process, a more viable alternative is to reduce tariffs on intermediate inputs. While this will reduce the complexity of border taxation, it will not encourage domestic sourcing unless other policies are in place.

For that purpose, the second lesson from Malaysia's industrialization efforts is the need to have complementary labor policies and human capital that can provide the requisite skills for industrial upgrading. The low labor cost advantage in the early days of surplus labor dissipated quickly with increased demand for labor as manufacturing production expanded. Malaysia's increasing use of low-skilled foreign workers to retain its declining comparative advantage in labor-intensive industries, including the low value-added segment of electronics manufacturing, has retarded industrial restructuring, leading to relatively weak linkage development. The use of foreign workers has delayed the need to upgrade the technology of the firms by investing in the necessary capital equipment.

Third, technology inflows and domestic absorptive capacity are complementary. A highly educated domestic labor force is critical in the identification, modification, and absorption of foreign technology (Pack 2008). Operating entirely new manufacturing processes and producing new products requires well-trained workers and managers. Therefore, producing human capital of the appropriate quality and quantity is essential for the development of both indigenous innovations as well as the mastery of imported and transferred technologies.

Fourth, effective implementation of technology policies that can facilitate technology upgrading is needed to shift manufacturing development to a higher level. Malaysia has not shown any lack of policies or institutional development in this matter. It is however poor implementation that has contributed to the weak technology deepening in the country. Implementation is also dogged by poor human capital and outflow of brains in the country.

APPENDIX 1. METHODOLOGY AND DATA

To estimate the backward and forward linkages of an industry, the Rasmussen method (1956) is adopted in this study. The formulas for the backward and forward linkages are as follows:

Backward linkage index:

$$U_j = \frac{\frac{1}{n}\sum_{i=1}^{n} k_{ij}}{\frac{1}{n^2}\sum_{j-1}^{n}\sum_{i-1}^{n} k_{ij}} \quad \text{(A.1)}$$

Forward linkage index:

$$U_i = \frac{\frac{1}{n}\sum_{j=1}^{n} k_{ij}}{\frac{1}{n^2}\sum_{j=1}^{n}\sum_{i=1}^{n} k_{ij}} \quad \text{(A.2)}$$

where U_j is the backward linkage index, also known as the power of dispersion index; U_i is the forward linkage index, also known as the sensitivity of dispersion index; n is the number of sectors, k_{ij} is the elements of the Leontief inverse matrix.

A sector with an index value greater than 1 indicates that it has a power of dispersion or sensitivity of dispersion greater than the average of all industries in the country.

Data are sourced from the 1987, 1991, 2000, and the 2005 Input–Output Tables of Malaysia's Department of Statistics. The 2005 Input–Output Tables is the latest publication, published in 2010.

Since the values in the Input–Output Tables are reported in nominal terms, it was considered whether there is a need to conduct any deflation in the present study.[9] The elements in the input coefficient matrix, and hence the Leontief inverse matrix, could be affected by price changes to some extent if there is significant disparities among the subsectors' producer price indexes (PPIs). An ideal way is to remove the price effects, in which the input coefficient matrix has to be reconstructed after real values are obtained, or by deflating the nominal values with PPI at the subsector levels. An adjusted Leontief inverse is then recomputed using the adjusted input coefficient matrix. In order to deflate, PPI at all subsector levels must be available in order to obtain real values in every cell in the I-O matrix. Unfortunately the reported PPIs for Malaysia cover only goods. PPI data for services is not available. In addition, the published data for PPIs covers only 10 subsectors while the I-O tables consist of 120 subsectors (for 2005 tables). The absence of a detailed list of PPI for all 120 subsectors hence makes the deflation exercise less fruitful in this case. As a result, we cannot deflate and have to confine our analysis with the reported Leontief inverse, derived from the input coefficient matrix using nominal values.

[9]A review in most of the literature shows no report of any deflation made for the purpose of calculating linkage index values. An exception is found in a study by Miller and Shao (1994) conducted for the US economy.

APPENDIX 2. TABULATION DIVISION AND DESCRIPTION OF MALAYSIAN MANUFACTURING

Division	Description
15	Manufacture of Food Products and Beverages
16	Manufacture of Tobacco Products
17	Manufacture of Textiles
18	Manufacture of Wearing Apparel; Dressing and Dyeing of Fur; Tanning and Dressing of Leather
19	Manufacture of Luggage, Handbags; Saddlery, Harness and Footwear
20	Manufacture of Wood and Products of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials
21	Manufacture of Paper and Paper Products
22	Publishing, Printing and Reproduction of Recorded Media
23	Manufacture of Coke, Refined Petroleum Products and Nuclear Fuel
24	Manufacture of Chemical and Chemical Products
25	Manufacture of Rubber and Plastic Products
26	Manufacture of Other Non-Metallic and Plastic Products
27	Manufacture of Basic Metals
28	Manufacture of Fabricated Metal Products, except Machinery and Equipment
29	Manufacture of Machinery and Equipment n.e.c
30	Manufacture of Office, Accounting and Computing Machinery
31	Manufacture of Electrical Machinery and Apparatus n.e.c
32	Manufacture of Radio, Television and Communication Equipment and Apparatus
33	Manufacture of Medical, Precision and Optical Instruments, Watches and Clocks
34	Manufacture of Motor Vehicles, Trailers and Semi-Trailers
35	Manufacture of Other Transport Equipment
36	Manufacturing n.e.c.

Source: Department of Statistics, Malaysia.

REFERENCES

Amirahmadi, H., and W. Wu. 1995. "Export Processing Zones in Asia." *Asian Survey* 35(8):828–44.

Athukorala, P.-C. 2005. "Trade Policy in Malaysia: Liberalization Process, Structure of Protection, and Reform Agenda." *ASEAN Economic Bulletin* 22(1):19–34.

Balasubramanyam, V. N., M. Salisu, and D. Sapford. 1996. "Foreign Direct Investment in EP and IS Countries." *Economic Journal* 106(433): 92–105.

Batra, G., J. Morisset, and K. Saggi. 2003. Vertical Linkages between Multinationals and Domestic Supplies: Whom do They Benefit and Why? Available: rru.worldbank.org/Documents/PapersLinks/Vertical%20linkages%20May%2009.pdf.

Borensztein, E., J. De Gregorio, , and J. W. Lee. 1998. "How Does Foreign Direct Investment Affect Economic Growth?" *Journal of International Economics* 45(10):115–35.

Capannelli, G. 1999. "Technology Transfer from Japanese Consumer Electronic Firms via Buyer–Supplier Relations." In K. S. Jomo, G. Felker, and R. Rasiah, eds., *Industrial Technology Development in Malaysia: Industry and Firm Studies.* London: Routledge.

De Mello, L. 1997. "Foreign Direct Investment in Developing Countries and Growth: A Selective Survey." *Journal of Development Studies* 34: 1–34.

Department of Statistics. 1987. *Input-Output Tables Malaysia, 1987*. Kuala Lumpur.

———. 1991. *Input-Output Tables Malaysia, 1991*. Kuala Lumpur.

———. 2000. *Input-Output Tables Malaysia, 2000*. Kuala Lumpur.
———. 2005. *Input-Output Tables Malaysia, 2005*. Kuala Lumpur.
———. Undated. Data on the Manufacturing Sector. Kuala Lumpur. Unpublished.
The Economist.2008. "The Tigers that Lost Their Roar." 28 February. Available: www.economist.com/world/asia, downloaded 10 October 2008.
Gangnes, B., and A. V. Assche. 2010. Global Production Networks in Electronics and Intra-Asian Trade. Working Paper No. 10-4, University of Hawaii at Manoa.
Gorg, H., and D. Greenaway. 2004. "Much Ado about Nothing? Do Domestic Firms Really Benefit from Foreign Direct Investment?" *The World Bank Research Observer* 19(2):171–97.
Government of Malaysia. 2006. *Economic Report 2006/07*. Ministry of Finance, Kuala Lumpur.
———. 2008. *Economic Report 2008/09*. Ministry of Finance, Kuala Lumpur.
———. 2010. *Tenth Malaysia Plan: 2011-2015*. Economic Planning Unit, Prime Minister's Department, Putrajaya.
Henderson, J., and R. Phillips. 2007. "Unintended Consequences: Social Policy, State Institutions and the 'Stalling' of the Malaysian Industrialization Project." *Economy and Society* 36(1):78–102.
Hussain, A. B. 2010. "Ranking Sectors Changes of the Malaysian Economy: Input-Output Approach." *International Business Research* 3(1):107–30.
IDE-JETRO. 2001. *Asian Input-Output Tables 1995*. Institute of Developing Economies–Japan External Trade Organization, Tokyo.
Jabbour, L., and J. L. Mucchielli. 2007. "Technology Transfer Through Vertical Linkages: The Case of the Spanish Manufacturing Industry." *Journal of Applied Economics* 10(1):115–36.
Javorcik, B. S. 2004. "Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers through Backward Linkages." *The American Economic Review* 94(3):605–27.
Kanapathy, V. 2004. "Entrepreneurship in Malaysia's Electronics Industry: The Role of SMEs." In D. Hew and W. N. Loi, eds., *Entrepreneurship and SMEs in Southeast Asia*. Institute of Southeast Asian Studies, Singapore.
Kiyota, K., T. Matsuura, S. Urata, and Y. Wei. 2008. "Reconsidering the Backward Vertical Linkages of Foreign Affiliates: Evidence from Japanese Multinationals." *World Development* 36(8):1398–414.
Kohpaiboon, A. 2010. "Trade Policy, Industrialization, and Developmental Challenges: Experiences of Thailand." Paper presented at GEP Workshop on Trade Policies and Industrialization in Southeast Asia: What has Happened and Where Do We Go from Here, hosted by the Leverhulme Centre for Research on Globalization and Economic Policy (GEP), University of Nottingham, Malaysia, 14 October, Kuala Lumpur Teaching Centre, the University of Nottingham Malaysia Campus.
Loke, W. H. 2009. "East Asia and Southeast Asia: Similarity in Trade Structures." Paper presented at the Singapore Review Conference, 6–8 August, Singapore.
Norhayati, Y. B. W., A. L. Mohd Alias, and N. Okamoto. 2008. "Identifying Key Sectors of Malaysian Economy: A Comparison of Unweighted and Weighted Approaches." *Statistics Malaysia* 1(2):11–26. Available: www.statistics.gov.my/portal/images/stories/files/journal/ArticleIIVol12008.pdf?phpMyAdmin=HsSjziTw4modEUBuL5A5eWr139e.

Pack, H. 2008. "Asian Successes vs. Middle Eastern Failures: The Role of Technology Transfer in Economic Development." *Issues Online in Science and Technology*. Available: www.issues.org/24.3/pack.html#, downloaded 10 October 2008.

NEAC. 2010. *The New Economic Model.* National Economic Advisory Council, Kuala Lumpur.

Rasmussen, P. N. 1956. *Studies in Inter-Sectoral Relations*. Amsterdam: North Holland.

Rasiah, R. 1996. "Manufacturing as Engine of Growth and Industrialisation in Malaysia." *Managerial Finance* 22 (5/6):87–117.

———. 2008. "Is Malaysia Facing Premature De-industrialization?" Paper presented at the 2008 National Economic Outlook Conference, organized by the Malaysian Institute of Economic Research, Kuala Lumpur.

———. 2010. "Is Malaysia's Electronics Industry Moving Up the Value Chain." Paper presented at the Workshop on Graduating from the Middle: Malaysian Development Challenges, organized by IKMAS, 27–28 April, Kuala Lumpur.

Rohana, K., and A. R. Zakariah. 2007. "Structural Change, Linkages vs. Leakages in the Malaysian Economy: 1991–2000." Paper presented at the 16th International Conference on Input-Output Techniques, 2–6 July. Available: www.iioa.org/Conference/16th-downable percent20paper.html.

Ritchie, B. 2008. "Economic Upgrading in a State-coordinated, Liberal Market Economy." *Asia Pacific Journal of Management* 26(3):435–57.

Shahid, Y., and N. Kaoru. 2009. Can Malaysia Escape the Middle-Income Trap? A Strategy for Penang. Policy Research Working Paper WPS4971, The World Bank, Washington, DC.

Tham, S. Y. 2004. "Malaysia." In D. B. Brooks and H. Hill, eds., *Managing FDI in a Globalizing Economy: Asian Experiences.* Houndmills: Palgrave Macmillan.

Tham, S. Y., and C. S. Liew. 2004. "Foreign Labor in Malaysian Manufacturing: Enhancing Malaysian Competitiveness?" In A. R. Embong, ed., *Globalization, Culture and Inequalities: In Honour of the Late Ishak Shari.* Bangi: Penerbit UKM.

———. 2010. *The Impact of Foreign Labor on Labor Productivity in Malaysian Manufacturing, 2000–2006*. World Bank, Washington, DC.

World Bank. 1993. *The East Asian Miracle: A World Bank Policy Research Report*. New York: Oxford University Press.

———. 2009. *Malaysia: Productivity and Investment Climate Assessment Update*. Washington, DC.

WTO. 2009. *Trade Policy Review: Report by the Secretariat—Malaysia*. World Trade Organization. Geneva.

UNIDO. 2009. *Industrial Development Report 2009*. United Nations Industrial Development Organization, Vienna.

Yusof, Z. A. 2009. "The Malaysian Economic Model: A Case of Heterodoxy." In A. R. Nungsari and S. A. Suryani, eds., *Readings on Development: Malaysia 2057: Uncommon Voices, Common Aspirations.* Khazanah Nasional, Kuala Lumpur.

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