

Chapter 20

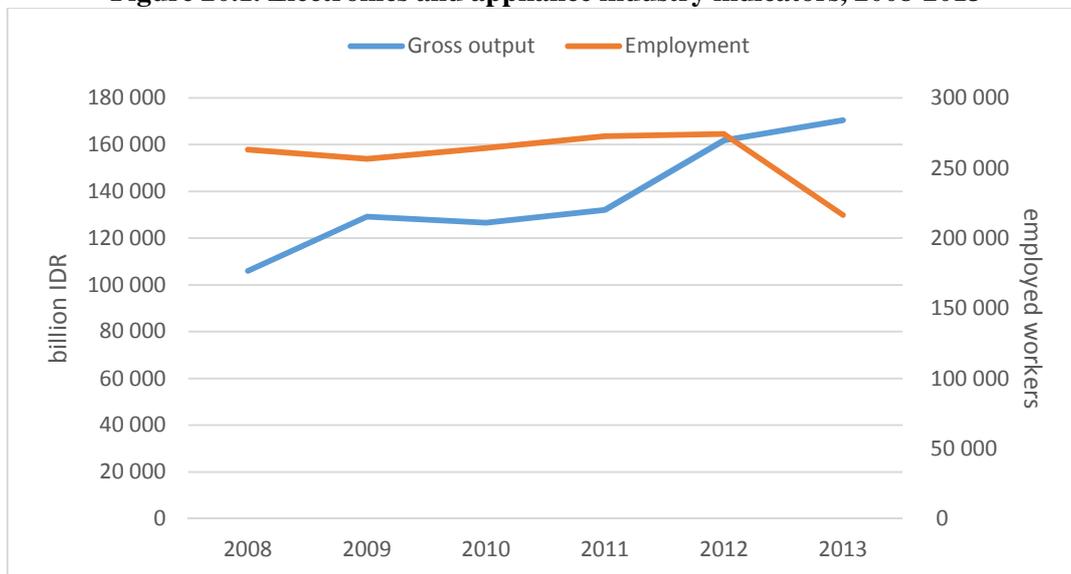
Manufacturing of Consumer Electronic Appliances in Indonesia

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20.1. The Consumer Electronics Industry in Indonesia

The electronics and electrical appliance industry in Indonesia had a gross output of IDR 170.4 trillion (USD 12.8 billion) in 2013, an increase of 5.3 percent over the IDR 161.8 trillion (USD 12.2 billion) recorded in 2012. In 2008-2013, the industry has seen steady growth, growing at an annual average rate of 10 percent during the period (Figure 20.1). On the other hand, employment in the industry had a sharp fall in 2013, employing 216,550 workers during the year compared to 274,194 workers employed in 2012.

Figure 20.1. Electronics and appliance industry indicators, 2008-2013



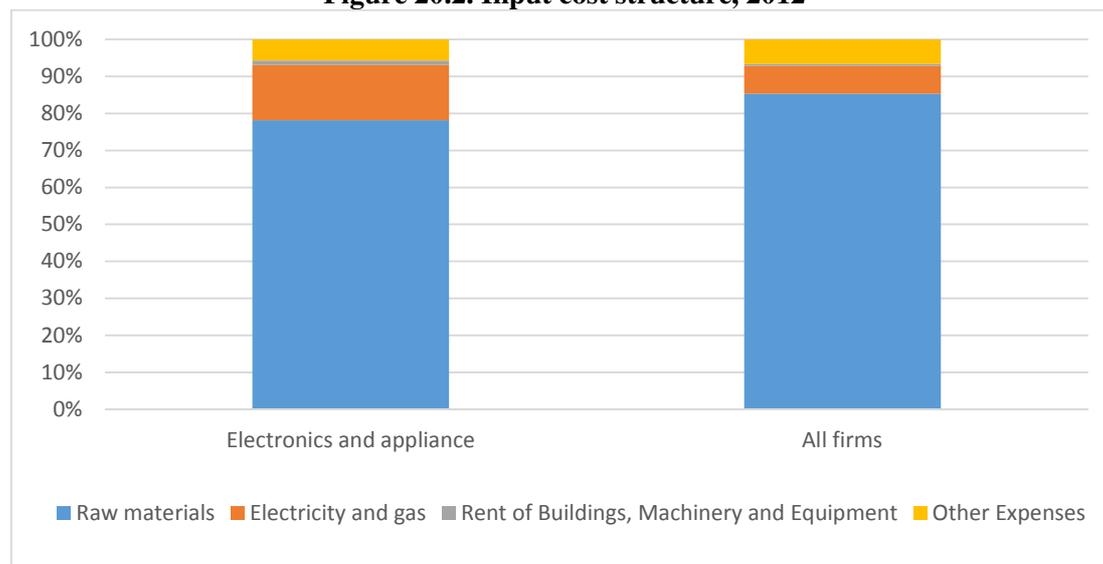
Note: Figures represent gross output and employment of medium and large manufacturing enterprises in the subsectors of “Computer, Electronic, and Optical Products” and “Electrical Equipment”.

Source: BPS and APEC PSU staff estimates.

According to data from BPS, up to 78.2 percent of input costs in the electronics and appliance industry are from raw materials (i.e., parts, components, or cost of input goods). This reflects the general cost structure of manufacturing firms where 85.3 percent of input costs are from raw materials. As may be expected, the electronics and appliance industry is more energy intensive than manufacturing firms in general. While manufacturing firms generally spend 7.4 percent of total input costs on electricity and gas, the electronics and appliance industry allocates 14.8 percent of input costs to energy (Figure 20.2).

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Figure 20.2. Input cost structure, 2012



Note: Figures for “electronics and appliance” represent cost inputs of medium and large manufacturing enterprises in the subsectors of “Office, accounting, and computing machinery”, “Electrical machinery and apparatus n.e.c.”, “Radio, television and communication equipment and apparatus”, and “Medical, precision and optical instruments, watches and clocks”.

Source: BPS and APEC PSU staff estimates.

The electronics industry can be categorised into three segments: consumer electronics, industrial electronics, and components electronics. In Indonesia, the consumer electronics segment is the most developed owing to a large domestic market of 62 million households, while the industrial electronics segment (e.g., office equipment, telecommunications, data servers) has been developing due to the expanding telecommunications sector. The components electronics segment (e.g., microchips, motherboards, transistors), on the other hand, is relatively weak, with the electronics sector highly dependent on imported components to assemble.

The electronics industry in Indonesia started in the 1950s with the establishment of the PT Transistor Radio Thayeb Mfg. Co. as the first producer of “Tjawang” transistor radios in the economy². In the 1970s, the government encouraged joint ventures between domestic firms and foreign electronics companies in a bid to spur technology transfer. In the 1970s, the electronics sector shifted from assembling imported components to producing components in Indonesia. In the mid-1980s, the introduction of several deregulation measures shifted policy in the electronics industry from import substitution to export-orientation, encouraging the establishment of more electronics firms as well as IT companies. However, the 1997 Asian financial crisis and the resulting decline in household purchasing power led to the closure of many electronics firms in Indonesia. Although electronics exports recovered quickly after the crisis due to favourable terms of trade (i.e., depreciation of the Indonesian rupiah), the electronics parts and components industry found itself unable to compete with cheap imports from China. Likewise, local electronics producers found it more profitable to import products from China and market them domestically with their own brands. Moreover, a previous luxury tax on electronics did not lead to the development of locally produced electronics; rather, it encouraged smuggling and the finding of loopholes to gain access to foreign brands.

Although Indonesia had the good idea to encourage the development of the electronics parts and components industry in order to tap into the international electronics global value chains, the

² This discussion on the development of Indonesia’s electronics industry is taken from Negara, S. D. (2010) “Chapter 5: Fragmentation of Electronics and Textile Industries from Indonesia to CLMV Countries”. In Banomyong, R. and M. Ishida. “A Study on Upgrading Industrial Structure of CLMV Countries”. ERIA Research Report 2009, No. 7-3.

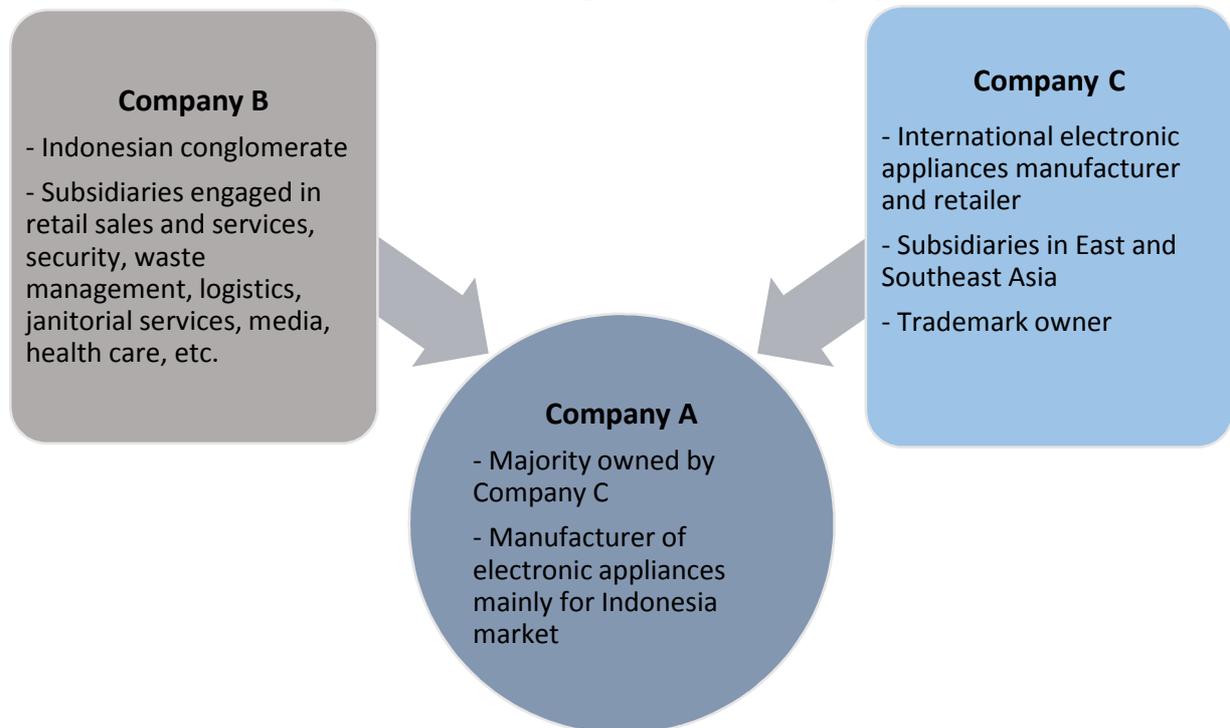
unfortunate timing of the Asian financial crisis and the unintended consequences of protectionist measures hindered its development. As a result, Indonesia has not been able to integrate its electronics industry into global production networks in the same way Malaysia and Thailand have.

20.2. Company Background

The company interviewed for this case study is a leading manufacturer of consumer electronic appliances in Indonesia. This company has had a presence in Indonesia for more than three decades producing refrigerators, air conditioners, washing machines, fans, and entertainment systems. It employs more than a thousand employees and had a sales turnover of more than a trillion rupiah in 2014. For this analysis, we focus on the value chain for air conditioners as this appliance contributes the most in terms of sales revenue.

The manufacturing company that we interviewed (**Company A**) is a joint venture between an Indonesian conglomerate (**Company B**) and an international consumer electronics appliance firm (**Company C**). Company C owns the electronics brand manufactured by Company A (Figure 20.3).

Figure 20.3. Ownership Structure of Company A

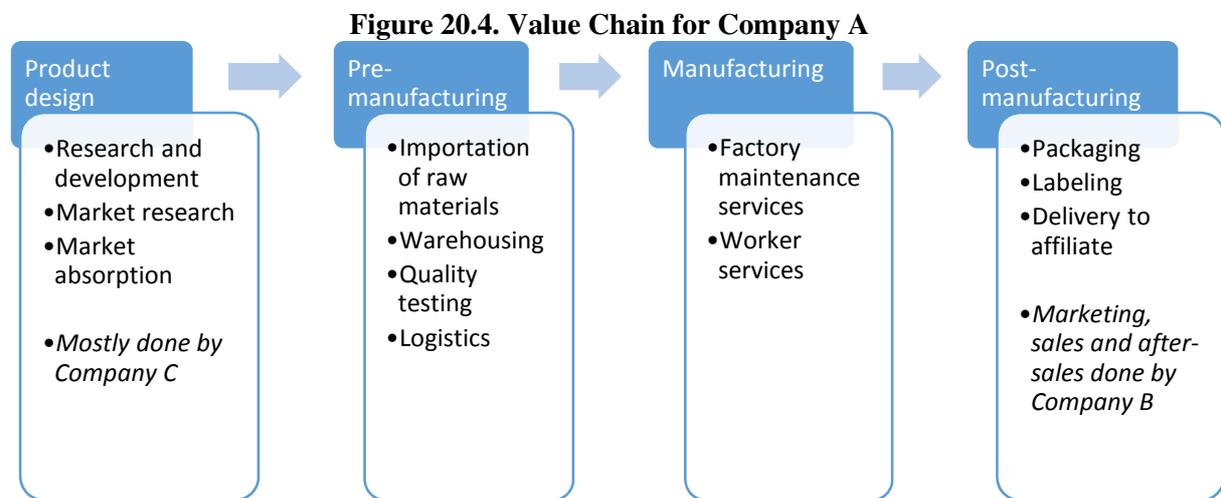


20.3. Description of the Value Chain

Company A is in a unique setting due to its age and affiliation with both a large local conglomerate and a major international electronics firm. Hence, most pre- and post-manufacturing processes are handled by affiliate companies, and the company focuses almost solely on the manufacturing aspect of the value chain.

Figure 20.4 shows the value chain for Company A. In the product design stage, Company A receives instructions on technology and design from Company C. Company B, on the other hand, provides inputs on quantities needed for a particular product. Company A studies these specifications and proceeds to

the pre-manufacturing stage, where it procures needed raw materials and, if needed, new equipment are installed and production capacity is expanded. It then manufactures products to Company C's specifications and in the quantities required by Company B. In the post-manufacturing stage, Company A packages and delivers the products to Company B, which takes over all post-manufacturing activities.



Source: Interview with Company A.

In the product design stage, most of the activities are carried out by Company C, which owns the brand and most of the technology. Although Company A provides inputs to Company C and its affiliates elsewhere in Asia, final decisions on product design and technology are taken from Company C. On the other hand, most of the activities in the post-manufacturing stage—including marketing, sales, after-sales services, and consumer feedback—are handled by affiliates under Company B. Most services required by the firm are also procured from Company B.

20.4. Services along the Value Chain

The ownership structure of Company A—i.e., a joint venture between two large firms with their own complex value chains—has made its own manufacturing value chain relatively simple. Likewise, its age and long presence in Indonesia is reflected in its procurement of services along its value chain. Whereas newer firms may be more likely to outsource most of their services, in the case of Company A most services are either in-house or with affiliate companies rather than outsourced to third parties.

Appendix A provides a listing of the services procured by Company A in the course of its value chain, as well as the sources of these services. As can be seen in Table 20.1, there are 87 various services required by Company A in its value chain, mainly in its manufacturing phase; office and general services account for the most number of services as these support the entire value chain. A majority of services are supplied in-house, followed by services provided by affiliate companies. Services outsourced to third parties are a minority in Company A's value chain.

Table 20.1. Service Supply along the Value Chain

Phase	Number of Services	In-house	Company B or C	3 rd party
Establishment	6	5	0	2
Pre-manufacturing	13	10	4	3
Manufacturing	27	15	11	9
Post-manufacturing	10	4	7	2
Office and General Services	31	19	11	11
Entire Value Chain	87	53	33	27

Note: The sum of in-house, affiliate, and 3rd party services may not add up to the total number of services as some services may be provided by more than one modality. E.g., waste management services can be done in-house (employed janitors), by affiliate companies (janitorial services sister company), and third parties (specialised waste management) depending on the disposal requirements.

Source: Interview with Company A.

Establishment and Product Design

Given Company A’s decades-long presence in Indonesia, it does not need to procure services related with setting up a business. However, it still requires annual renewal of business-related licenses and permits according to applicable laws. Likewise, it needs to regularly apply for and renew work visas for some expatriate staff from Company C. For these regulation-related services, Company A has in-house administrative staff to handle paperwork and file them with appropriate government agencies. Company A also has in-house legal and financial departments to handle legal and bank-related issues associated with running the firm.

At the product design stage, most services related to product research and development are handled by Company C. Hence, research into new technologies, industrial design, and packaging are implemented by Company C, with Company A providing inputs and feedback by in-house engineers. Patent acquisition, if required, is done in-house by Company A. Most market research is done by Company C, although Company A also procures the services of a third-party market research firm for monthly market data.

At this stage, there is minimal outsourcing of services to third parties. Due to its decades-long presence in Indonesia, Company A has already built up internal support systems for government relations that can handle licenses, permits, and visas. On the other hand, the proprietary nature of product development requires that technological and design research are conducted with affiliates or in-house. Only market research, which requires regular surveys and focused group discussions, can be outsourced to third parties.

Pre-manufacturing Stage

All of Company A’s raw inputs—such as sheet metal, plastic powder, or chemicals—are imported from various economies such as China; Japan; Korea; Malaysia; Singapore; and Thailand. Most paperwork related to the importation of raw materials—e.g., procurement transaction and customs coordination—is done in-house, although Company A sometimes hires a third-party translator to communicate with suppliers based in other economies. Freight insurance, if needed, is procured from third parties.

Logistics services for bringing in raw materials are procured from various sources. Sea, air, and rail transportation to import materiel are procured from third party suppliers, but land transportation from

the port to Company A's warehouses are procured only from Company B. Storage services for raw materials is done in-house by Company A, which has built its own storage warehouses including facilities for storing chemicals and gases (e.g., refrigerants).

If new equipment needs to be installed for the production of new products, Company A will do the installation in-house for small equipment. However, for major equipment, Company A may require the specialised services of Company C or an external supplier depending on the technical requirements of the equipment.

At the pre-manufacturing stage, the main services that are outsourced to third parties relate to overseas transport—whether sea or air transportation of raw materials. Land transportation, on the other hand, is sourced from affiliates under Company B. The other main aspect of this stage—warehousing—is done in-house by Company A, which over decades has built sufficient infrastructure to meet its storage needs.

Manufacturing Stage

Of the 27 various services procured by Company A during the manufacturing stage, 15 are provided in-house, 11 are procured from one of the affiliates under Company B, and nine are procured from external suppliers (see Appendix A Table A.3 for a detailed list of these services).

Most services related to the day-to-day operations of the factory and other manufacturing facilities—including production administration, warehousing, water treatment, and equipment maintenance—are provided in-house as these are integral to Company A's operations. Other services for the maintenance of the grounds, such as gardening, security, and waste disposal are provided by sister companies under Company B, while Company C sometimes provides engineering services for specific projects. If specialised expertise is needed for some services, such as equipment cleaning or hazardous waste collection, the services of external suppliers are procured. Likewise, engineering services (e.g., machining) are either provided by in-house engineers or obtained from external suppliers depending on required expertise.

On the other hand, most services related to workers' welfare are provided by sister companies under Company B. These services include catering, dormitory facilities, medical services, and retail outlets. Company A provides human resource services in-house, as well as recreational (e.g., karaoke) and religious facilities (i.e., mosque). Retirement and health services for workers are provided in-house by Company A, while mandated social benefits are obtained from Badan Penyelenggara Jaminan Sosial (BPJS).

In the manufacturing stage, which is the most crucial stage in Company A's operations, the most essential services relate to engineering, maintenance, and workers' welfare services. Most of these services are provided in-house or through affiliates due to intra-firm trust—whenever possible, Company A prefers to work with Company B or C to meet service requirements. Services from third parties are procured only when expertise is not available in-house or with affiliates, or if mandated by law (e.g., BPJS). Moreover, as Company A does not produce its own water supply or electricity, these services are procured from external suppliers: the power distributor for electricity and the water utility company for water.

Post-Manufacturing Stage

After the products are manufactured, Company A makes them ready for packaging and delivery. Decisions on packaging design is done by Company C as it owns the brand, although Company A also

provides inputs on packaging design. Packaging services, on the other hand, are all done in-house by Company A.

Company A produces units on an available-to-promise basis (ATP), which means it produces a specific number of units by a due date for immediate delivery. While it has an in-house facility for final products, it is only for one-day storage for outbound delivery the next day. Delivery services are provided by a transportation firm under Company B.

Orders for Company A's products come from a sister firm under Company B, which handles all sales and after-sales services. Hence, all retail services, advertising, warranties, and after-sales services are handled by Company B and are external to Company A's operations. After Company A produces the appliances, it is immediately shipped out to Company B which sells the item. The only involvement of Company A in sales or after-sales services is the provision of spare parts to Company B.

Company A is peculiar in that it practically has no post-manufacturing activities. Product design and branding are handled by Company C, while marketing, sales, and after-sales are done by Company C. As such, most post-manufacturing activities such as advertising, customer relations, repairs, and retail are not utilised by Company A.

Office and General Services

As Company A has had a presence in Indonesia for several decades, it has already built up a considerable set of in-house service structures, which were a necessity before outsourcing became common practice around the world. As such, most office and general services in Company A are provided in-house, including those that are commonly outsourced to third parties by other firms such as financial services (e.g., treasury services), IT support, health care and pensions, and human resource services (e.g., personnel search and headhunting).

However, its affiliation with Company B has also led to some office services to be outsourced, such as security, telecommunications, public relations. On the other hand, Company C continues to provide most research and development services, product design and packaging, and upper management services (e.g., strategic direction). General services outsourced to third parties include utilities, courier services, external auditing, and specialised IT, repair, or waste management services.

As with the manufacturing stage, Company A prefers to provide office and general services in-house or from affiliates due to trust issues. Being a decades-old company, Company A has had time to develop in-house service structures—such as health care support, treasury services, pensions—that other younger firms may struggle to develop and are outsourced by necessity. Likewise, Company A's age may be leading to path dependence on doing business as it always has: after having developed in-house service structures, it may be more costly to outsource certain services regardless of possible efficiency gains.

20.5. Policies Affecting the Value Chain

Due to its long presence in Indonesia, Company A has adjusted well to many regulatory requirements and policies affecting its value chain. It reports no problems of getting imports through customs inspections and clearance. Policies on foreign equity restrictions are also not a problem as the electronics manufacturing industry allows full foreign ownership, while policies on foreign workers do not affect Company A as the only foreign workers in the firm are a few members of higher management. Likewise, regulations on quality standards are not an issue as Company A is in the forefront of setting standards and is one of the few firms in Indonesia that can provide product testing services.

A policy area that Company A has had difficulty with is the tariff structure in Indonesia, particularly for importing its raw materials. Company A reports that tariffs for completely built air conditioners and refrigerators are lower than those for inputs such as sheet metal, which can be a disincentive to develop local manufacturing capacity. Based on data from the WTO³, average ad valorem duties for air conditioners and refrigerators are 10 percent, while duties for treated or coated flat-rolled iron or non-iron steel are 12.5 percent. According to Company A, the cause of this issue is that HS codes for steel sheets are not differentiated. Although treated or coated steel sheets for automotive and electronic appliances are different products with different standards of treatment or coating, they share the same HS code. Hence, while the government may wish to protect local manufacturers of automotive steel sheets, these protections end up hurting local manufacturers of electronic appliances as well.

Corporate tax rates in Indonesia are another policy aspect that affects Company A's value chain, albeit indirectly. As Company C has a manufacturing presence in various economies in Southeast Asia including Indonesia, higher corporate tax rates in Indonesia can affect investment and manufacturing decisions of its parent firm as taxes ultimately affect the bottom line. Indonesia's corporate tax rate stands at 25 percent; in comparison, the corporate tax rate in Viet Nam is 22 percent and set to go down further to 20 percent in 2016. According to Company A, this distorts the market and makes it difficult to compete with manufactured goods from China or other Southeast Asian economies, making it cheaper to manufacture goods abroad and import them into Indonesia.

Property rights protection and labour laws on compensation are other policy areas that Company A thinks can be improved. Company A reports that trademark infringement has been an ongoing problem with some local competitor firms adopting logos, industrial design, and packaging that can be confused with those of Company A. Moreover, patent applications tend to be very lengthy in Indonesia, with the whole process from application to patent certificate taking about one and a half years⁴. On the other hand, rigid labour laws on compensation reward seniority over performance. Company A suggests that there should be more flexibility on compensation issues in order to promote productivity.

Although not directly identified by Company A as a policy constraint, more can be done at the policy level to upgrade the skills of workers and develop the capabilities of local suppliers. According to Company A, they often find it difficult to hire skilled workers for their manufacturing processes. This is surprising given Indonesia's large pool of young workers, with demographic dividends expected to continue for several decades. However, the constraint is not in finding people willing to work but finding workers with matching skills. Policy can do much to address this skills gap by providing workers with more access to training opportunities, including vocational education and lifelong learning. In order to ensure that these training will impart skills needed by manufacturers such as Company A, efforts to upgrade workers' skills will need to be coordinated with the needs of industries. This could be done with labour market monitoring of skills demand and supply, as well as regular consultation with industry groups. This feedback mechanism—involving both statistical monitoring of the labour market and consultation with stakeholders—should be part of a larger policy to promote manufacturing.

This policy, in turn can be directed towards upgrading the capacity of local manufacturers to provide inputs higher up the value chain. According to Company A, local firms can only provide basic manufacturing services, and there are no local suppliers that are capable of providing them with higher value-added manufactured inputs such as casings or mouldings. At present, they need to ship plastic powder to China or Malaysia where they will be transformed into, say, air-conditioning casings, before importing them back to be assembled in Indonesia. The government can thus explore ways to develop

³ WTO Data on MFN Tariff for Indonesia, last updated on 29 April 2015.

⁴ According to the World Intellectual Property Organization, the time it takes to obtain a patent can range from a few months up to 18 months, depending on the rigorousness of the examination process.

http://www.wipo.int/sme/en/faq/pat_faqs_q4.html

local manufacturing capacity so that firms can produce outputs higher up the value chain. Moreover, development of manufacturing can be synchronised with the skills development of Indonesian workers.

In the past decades, several services that were once provided in-house in Company A have been outsourced to affiliate of third-party firms. These services include cleaning, transportation, security, and waste disposal. The decision to outsource these services, however, had more to do with cost efficiency and trust rather than due to policy influences. Of course, some regulations direct Company A to outsource some services, such as external auditing or specialised waste disposal, but these are more the exception rather than the rule.

Appendix A

Services Used in the Value Chain and Service Supplier

Table A.1. Establishment phase

<i>Stage/ Category</i>	<i>Service</i>	<i>Central Product Classification (CPC) Ver.2 Code</i>	<i>Please mark (X) if the service is used in your supply/value chain</i>	<i>Supplied in-house</i>	<i>Supplied by another company in the group</i>	<i>Outsourced to third-parties</i>
1. Government services (licensing etc.)	Company registration and licensing services	91138 - Public administrative services related to general economic, commercial and labour affairs	X	X		X
	Information and statistical services	Class of 9113 - Public administrative services related to the more efficient operation of business	X			X: monthly market data
	Visa and immigration services for foreign investors/ employees	91290 - Public administrative services related to other public order and safety affairs	X	X: Admin staff		X: airport transfers

2. Other services (professional etc.)	Banking and finance services	71121 - Deposit services to corporate and institutional depositors 71135 - Non-mortgage loan services for business purposes	X	X		X: bank
	Legal services	82130 - Legal documentation and certification services	X	X		

Table A.2. Raw-materials, input/pre-production stage

Stage/ Category	Service	Central Product Classification (CPC) Ver.2 Code	Please mark (X) if the service is used in your supply/value chain	Supplied in-house	Supplied by another company in the group	Outsourced to third-parties
1. Procurement of raw materials	Procurement agent for raw material sourcing	85999 - Other support services n.e.c.	X	X		X: translation services for foreign supplier
	Customs-related services for raw materials imported	85999 - Other support services n.e.c.	X	X: customs relations department		
	Quality assurance services (of raw materials)	83441 - Composition and purity testing and analysis services	X	X		
2. Logistics	Freight transportation services (of raw materials) by road, rail, sea or air	Division: 65 - Freight transport services	X		X: Company B for land transport	X: sea, air, and rail transport
	Freight insurance of raw materials	71333 – Freight insurance services	X			X: depends on CIF or FOB
3. Storage	Storage of raw materials – general storage	67290 – Other storage and warehousing services	X	X		
	Storage of raw materials – tank farm	67220 – Bulk liquid or gas storage services	X	X		

4. Product Design	Conception and design of product	83920 Design originals	X	X	X: Company C	
	Industrial design	83912 Industrial design services	X	X	X: Company C	
	Patent acquisition	83960 Trademarks and franchises n/a	X	X		
5. Installation services	Installation services of equipment	873 – Installation services (other than construction)	X	X: for small equipment	X: Company C for major equipment	X: major equipment
6. Others	Training services for staff	92919 – Other education and training services, nec	X	X		

Table A.3. Manufacturing stage

<i>Stage/ Category</i>	<i>Service</i>	<i>Central Product Classification (CPC) Ver.2 Code</i>	<i>Please mark (X) if the service is used in your supply/value chain</i>	<i>Supplied in-house</i>	<i>Supplied by another company in the group</i>	<i>Outsourced to third-parties</i>
1. Production administration	Production Administration - Production management	83115 - Operations management consulting services	X	X		
	Production Administration - Repair and maintenance of factory equipment	87156 - Maintenance and repair services of commercial and industrial machinery	X	X: regular maintenance		X: for overhaul maintenance of equipment
	Production Administration - Quality assurance and compliance with ISO	83441 - Composition and purity testing and analysis services	X	X		
	Warehousing services for intermediate goods	67220 - Bulk liquid or gas storage services 67290 - Other storage and warehousing services	X	X		
2. Services supporting factory daily operations	Cleaning services of factory	85330 - General cleaning services	X	X: minor cleaning	X: mostly Company B	

Engineering Services	83310 - Engineering advisory services Class: 8332 - Engineering services for specific projects	X	X	X: Company C	
Gardening services for factory lawn	85970 - Landscape care and maintenance services	X		X: Company B	
Security guards for factory and warehouses	85250 - Guard services	X	X: Chief security officer	X: Company B	
Sewage water treatment services	94110 - Sewerage and sewage treatment services	X	X		
Specialized cleaning services for machines and equipments	85340 - Specialized cleaning services	X			X
Repair and maintenance services of machines and equipment	87156 - Maintenance and repair services of commercial and industrial machinery	X	X	X	X
Waste collection and recycling services	Class: 9421 - Collection services of hazardous waste 94229 - Collection services of non-	X			X: need special license

		hazardous recyclable materials, other	X		X: Company B	
		94239 - General waste collection services, other	X		X: Company B	
3. Services from government regulation requirements	Government inspections on fire prevention, health hazards, environmental protection and other aspects.	91133 - Public administrative services related to mining and mineral resources, manufacturing and construction 91290 - Public administrative services related to other public order and safety affairs	X	X		X: government
4. Worker- related services	Catering services for workers	63393 - Other contract food services	X		X: Company B	
	Dormitory for factory workers	63220 - Room or unit accommodation services for workers in workers hostels or camps	X		X: Company B	
	Medical services	93121 - General medical services	X		X: Company B	
	Personnel search and referral services - Recruitment of factory workers	85112 - Permanent placement services, other than executive search services	X	X		
	Retail services for workers	Group of 6212 - Non-specialized store retail	X		X: Company B	

		trade services, of food, beverages and tobacco				
	Recreational facilities and services for workers	96520 - Sports and recreational sports facility operation services	X	X		
	Social insurance for factory workers	91320 -Administrative services related to government employee pension schemes; old-age disability or survivors' benefit schemes, other than for government employees 91330 - Administrative services related to unemployment compensation benefit schemes	X	X: retirement and health benefits		X: mandated social benefits (BPJS)
5. Utilities	Utilities (electricity, gas, and water supply)	691 – Electricity and gas distribution (on own account)	X			X
		692 – Water distribution (on own account)	X			X
6. Engineering services	Manufacturing services such as basic machining	886 – Basic metal manufacturing services	X	X		X: depends on required capabilities
		887 – Fabricated metal product, machinery,	X	X		X: depends on required capabilities

Services in Global Value Chains: Manufacturing-Related Services

		and equipment manufacturing services				
7. Others	Product testing to obtain certification	8344 – Technical testing and analysis services	X			

Table A.4. Delivery and sales/post-manufacturing stage

<i>Stage/ Category</i>	<i>Service</i>	<i>Central Product Classification (CPC) Ver.2 Code</i>	<i>Please mark (X) if the service is used in your supply/value chain</i>	<i>Supplied in-house</i>	<i>Supplied by another company in the group</i>	<i>Outsourced to third-parties</i>
1. Packaging and labelling	Design of Packages	83919 - Other specialty design services	X	X	X: Company C	
	Packaging Services	85400 - Packaging services	X	X		
2. Delivery to wholesaler/retailer	Cargo handling services	67110 – Container handling services	X		X: Company B	X
	Customs-related services	85999 - Other support services n.e.c.	X		X: Company B	
	Land transport of goods (from warehouse to domestic port)	65112 - Road transport services of freight by tank trucks or semi-trailers	X		X: Company B	
	Water transport (from domestic port to destination port)	65213 – Coastal and transoceanic water transport services of intermodal containers by container ships	X			X
3. Sales services	Retail trade services - By store	Group of 621 - Non-specialized store retail trade services	X		X: Company B	
		Group of 622 - Specialized store retail trade services				
	Storage and warehousing	67220 - Bulk liquid or gas storage services	X	X: one-day storage;	X: Company B	

Services in Global Value Chains: Manufacturing-Related Services

	services for finished goods	67290 - Other storage and warehousing services		available-to-promise		
4. Others	Warranty, maintenance, repair, and overhaul services	8714 – Maintenance and repair of transport machinery and equipment	X	X: spare parts provision to Company B		

Table A.5. Back-office, utilities and general services

<i>Stage/ Category</i>	<i>Service</i>	<i>Central Product Classification (CPC) Ver.2 Code</i>	<i>Please mark (X) if the service is used in your supply/value chain</i>	<i>Supplied in-house</i>	<i>Supplied by another company in the group</i>	<i>Outsourced to third-parties</i>
1. Finance	Auditing on financial accounts	Group of 822 - Accounting, auditing and bookkeeping services	X	X		X: external auditors
	Financial services	71121 - Deposit services to corporate and institutional depositors	X	X		
		71313 - Group pension services	X	X		
		71701 - Services of holding equity of subsidiary companies	X	X		
	Internal auditing (including audits of financial accounts and corporate governance)	Group of 822 - Accounting, auditing and bookkeeping services	X	X	X: Company C	X: external auditors
		83118 - Head office services				
Insurance services for machinery	71332 - Marine, aviation, and other transport insurance services	X			X	

2. General Management	Corporate communications, marketing and public relationship	83121 - Public relations services	X	X		
	Courier, postal and local delivery services	Group of 681 - Postal and courier services	X			X
	Estate management	72112 - Rental or leasing services involving own or leased non-residential property	X	X		
	Human resources management	83113 - Human resources management consulting services	X	X		
	Human resources management - - Personnel search and referral services for back-office staff	Class of 8511 - Personnel search and referral services	X	X		
	I.T. and information system management, consulting and support, with webpage development	Class of 8313 - Information technology (IT) consulting and support services Class of 8314 - Information technology (IT) design and development services	X	X		X: depends on capacity/ requirements

		Class of 8316 - IT infrastructure and network management services				
	Safety and security services	85230 - Security systems services 85250 - Guard services	X		X: Company B	
	Telecommunication services	Group: 841 - Telephony and other telecommunications services 84210 - Internet backbone services 84221 - Narrowband Internet access services 84222 - Broadband Internet access services	X		X: Company B	
	Uniform - Design and alternation	83919 - Other specialty design services	X	X		X: sewing services
3. Legal	Legal services	82120 - Legal advisory and representation services concerning other fields of law 82130 - Legal documentation and certification services	X	X		
4. Research and Development	Product development/ R&D	81129 - Research and experimental	X	X	X: Company C	

Services in Global Value Chains: Manufacturing-Related Services

		development services in other engineering and technology				
		81400 - Research and development originals				
5. Utilities	Electricity supply	Class of 8631 - Support services to electricity transmission and distribution	X			X
	Gas supply	86320 - Gas distribution services through mains (on a fee or contract basis)	X			X
	Water supply	86330 - Water distribution services through mains (on a fee or contract basis)	X			X
6. Headquarter services	Headquarter services	83118 – Head office services	X	X	X: Company C	
	Management services	83111 – Strategic management consulting services	X	X	X: Company C	