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Indonesian Electronics Industry: Building International Competitiveness through Trade Policy Reform, IT-Based Inter-Firm Linkages and New Institutions

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This report discusses the main issues and options facing Indonesian's electronics industry in building its industrial competitiveness. The introduction provides an overview of the major issues. Section 2 outlines a survey of some of the key structural characteristics of the electronics industry is provided. Section 3 looks at some of the strengths of the electronics industry in Indonesia. Section 4 provides an overview of the immediate challenges for industrial survival. Sections 5 and 6 look in detail at the structural and organizational challenges facing the industry covering consumer and other electronics segments. Section 7, summarizes the findings and Section 8 outlines policy measures dealing with the industry-wide issues and the medium to long run measures directed at improving industry-specific and firm-level competitiveness that are essential if Indonesia is to become a successful player in the global electronics industry.

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**INDONESIAN ELECTRONICS INDUSTRY:  
BUILDING INTERNATIONAL COMPETITIVENESS  
THROUGH TRADE POLICY REFORM,  
IT-BASED INTER-FIRM LINKAGES AND NEW  
INSTITUTIONS**

by  
*Idris F. Sulaiman\**

**January 2001**

\*The views expressed in this report are those of the author and not necessarily those of USAID, the U.S. Government or the Government of Indonesia. For comments, please e-mail direct to: [idriss@indo.net.id](mailto:idriss@indo.net.id)

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## NOTES:

Currency: Unless otherwise stated, all \$ values are in the United States dollars.

## GLOSSARY OF ABBREVIATIONS

AFTA	ASEAN Free Trade Area
APEC	Asia Pacific Economic Co-operation
ASEAN	Association of South East Asian Nations
ASEAN-4	Four members of Association of South East Asian Nations (Indonesia, Malaysia, the Philippines and Thailand)
AV	audio and video equipment
BAPEKSTA	<i>Badan Pelayanan Kemudahan Ekspor dan Pengolahan Data</i> (Agency for Export Facility Services and Financial Data Processing, Indonesia)
BPM-PBUMN	<i>Badan Penanaman Modal dan Pembinaan Badan Usaha Milik Negara</i> (the Board of Investment and State-owned Enterprises, previously known as <i>BKPM</i> )
BKPM	<i>Badan Koordinasi Penanaman Modal</i> (Investment Co-ordination Board at the national level, Indonesia)
BPS	<i>Badan Pusat Statistik</i> (Central Bureau of Statistics, Indonesia)
CBU	completely built up
CD/CDP	<i>compact disc player</i>
CEPT	Common Effective Preferential Tariff
CKD	completely knocked down
CRT	cathode ray tubes
CTVs	colour television sets
DKI	<i>Daerah Khusus Ibukota</i> (Special Capital Territory of Jakarta)
DRAM	dynamic random access memory
DVD	digital video disk
EDI	electronic data interchange
EPR	effective protection rate
EPROM	Erasable programmable read-only memory
EPTE	<i>Enterpor Produksi Tujuan Ekspor</i> (industrial estates)
EPZ	export processing zones
ESB	Export Support Board ( <i>Dewan Penunjang Ekspor</i> )
EU	European Union
FDI	foreign direct investment (a term used in preference to its equivalent direct foreign investment)
FMV	fair market value
FOB	free on board
GATT	General Agreement on Tariffs and Trade
GSP	General System of Preferences
GOI	Government (of the Republic) of Indonesia
IC	integrated circuit

IETC	Indonesia Export Training Center ( <i>Pendidikan dan Pelatihan Ekspor Indonesia</i> )
ILMEA	<i>Industri Logam, Metal, Elektronika dan Aneka (Dir. Jen., Directorate General of Metals, Electronics and Miscellaneous Industries, MOIT)</i>
IMF	International Monetary Fund
IPO	international procurement office
ISIC	Indonesian Standard Industry Classification
IT	information technology
ITA	Information Technology Agreement
<i>Jabotabek</i>	'Greater Jakarta' or <i>DKI</i> JAKarta and the adjacent areas around it delineated by the cities of BOgor, TAngerang and BEKasi.
JETRO	Japan External Trade Organisation
JIT	just in time
LCD	liquid crystal displays
LGE	Lucky-GoldStar Electronics
<i>Mastel</i>	<i>Masyarakat Telematika</i> (Telecommunications and Informatics Society)
MFN	most-favoured nation status
MOIT	Ministry of Industry and Trade, Indonesia ( <i>Departemen Industri dan Perdagangan, Deperindag</i> )
MNE	multinational enterprise (a term synonymous with multinational corporation or multinational firm)
NAFED	National Association for Export Development
NIE	newly industrialising economy
OA	office automation equipment (copiers, facsimiles, word processors, office computers, electronic cash registers, typewriters, and calculators)
OBN	own brand name (strategy)
OEM	original equipment manufacturing (strategy)
OLI	Ownership–Location–Internalisation paradigm
PCM	product cycle model
PECC	Pacific Economic Co-operation Council
<i>PKB/PDKB</i>	<i>Penyelenggara Kawasan Berikat</i> (bonded management companies)/ <i>Pengusaha di Kawasan Berikat</i> (licensees located in a bonded zone)
<i>PMA</i>	<i>Penanaman Modal Asing</i> (foreign capital investment scheme as classified by the <i>BKPM</i> )
<i>PMDN</i>	<i>Penanaman Modal Dalam Negeri</i> (domestic capital investment scheme as classified by the <i>BKPM</i> )
<i>PT</i>	<i>Perseroan Terbatas</i> (placed in front of Indonesian company names, equivalent of company limited or the acronym: Co. Ltd.)
QC	quality control
R&D	Research and development
RHQ	regional headquarters
SMEs	small and medium-size enterprises
TQC	total quality control
TVs	television sets
VCR/VTRs	video cassette recorder or video tape recorder sets
WTO	World Trade Organisation

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# **BUILDING INDUSTRIAL COMPETITIVENESS IN THE INDONESIAN ELECTRONICS INDUSTRY**

## **EXECUTIVE SUMMARY**

During the 1990s, electronics became one of the key export products in Indonesia. For the period between January and June 2000, electronics exports went up by 147% compared to the corresponding period in 1999 electronics was the second largest non-oil exports (16% of total) after textiles. However, most exports came from MNE affiliates; the domestic-oriented segment has lagged behind the export-oriented segment and many firms did not survive the Crisis starting in late 1997. There are serious challenges facing the domestic firms such as international competitive threats from 'parallel' imports; the lack of local sourcing and product development. Strategic alliances with existing multinational firms to build critical components are rare; and networks of entrepreneurial firms, sophisticated supporting firms and technical infrastructure institutions needed to create dynamic clusters of flourishing concentration of competitive and innovative companies don't exist. How can they be created?

This report begins with an overview of the structure of the industry, its strengths and the main immediate and future challenges for enhancing its international competitiveness. The report endeavours to make a qualitative assessment of the key issues based on survey interviews and original tabulation of official data as well as based on secondary data sources. Some policy recommendations for short-term manufacturing renewal are outlined together with measures which can build longer term international competitiveness in the opening years of the new millennium.

The report discusses the main issues and options facing Indonesian's electronics industry in building its industrial competitiveness. The introduction provides an overview of the major issues. Section 2 outlines a survey of some of the key structural characteristics of the electronics industry is provided. Section 3 looks at some of the strengths of the electronics industry in Indonesia. Section 4 provides an overview of the immediate challenges for industrial survival. Sections 5 and 6 look in detail at the structural and organisational challenges facing the industry covering consumer and other electronics segments. Section 7, summarises the findings and Section 8 outlines policy measures dealing with the industry-wide issues and the medium to long run measures directed at improving industry-specific and firm-level competitiveness that are essential if Indonesia is to become a successful player in the global electronics industry.

### *Overview of the Situation and Structure.*

More than three years after of the Crisis, the Indonesian electronics industry is yet to fully recover. Some structural changes underway prior to the Crisis appear to have been reinforced during the recent period. In the aftermath, despite the uncertainties of current political developments in Indonesia, some positive developments and new opportunities in the industry have appeared on the horizon. Whilst a declining trend in exports and manufacturing performance appeared to set in before the Crisis in relation to production and exports, since 1999 most surviving electronic firms – particularly those with foreign

majority ownership – appear to be on their way to recovery. The cleavage between the domestic-oriented segment and export-oriented segment, however, has grown wider. Most domestic-oriented electronics segments suffered a fall in production and exports. A significant proportion of domestically-owned firms did not survive the Crisis and those remaining are faced with capital shortages, rapid technological change, and rising international competition, in particular the rising tide of illegal ‘parallel’ imports.

Many firms that survived in supplying the domestic market did so by lowering their dependence on imported components – a silver lining in the Crisis. But despite the drastic devaluation of the rupiah, both foreign-owned and domestically-owned firms which are export oriented fared relatively better, particularly those that diversified their exports to non-Asian destinations. During the last three years, many firms – both domestic and foreign – have come under increasing pressure to maintain their market share against the flood of ‘parallel’ imports, particularly from China. The potentially large domestic market contracted rapidly and languished in most of 1998 but by 1999 some expansion in domestic consumption of electronic goods began to take place. In recent years, a transformation of the structure of production and exports has taken place with components and parts playing a greater role. Although most have come from foreign firms, the domestic component has also strengthened.

#### *Strengths of the industry*

Strengths can be found in its domestic market size, its proximity to Asia and in the presence in Indonesia of many world-class multinational enterprises (MNEs) which are engaged in end-product assembling and critical component manufacturing activities from East Asia and the United States which came during the boom years. Their continued presence testifies to the ‘lock-in’ advantages of the domestic market, such as sunk investments, and a trained workforce, given the experience of net disinvestment in the last two years after the Crisis.

#### *Immediate challenges for survival and perennial weaknesses of the industry*

The report argues that broad structural changes after the Crisis were accompanied by greater foreign domination of the consumer and component industries but not in the home electrical appliances sector. The immediate challenges facing the industry lie in ‘leveling the playing field’ against parallel imports, that is in establishing an effective tariff system that would ensure greater competition; and in bringing about renewed growth amongst the ‘own brand’ assembling firms and domestic component firms. Longer term perennial structural weaknesses (such as underdeveloped domestic components and parts manufacturers; and uncertainties in the trade, political and legal regime) and other organisational weaknesses are identified.

#### *Mid-to-longer term challenges faced by the industry*

The mid-to-longer term challenges faced by the industry can be classified under two headings: firstly, due to structural weaknesses, namely underdeveloped domestic components and parts manufacturers regional concentration without local sourcing, high but declining import dependence and low local sourcing for less ‘bulkier products’, ‘shallow’ industrial depth, low-value adding and limited range of products and increased

uncertainties due to changes in trade, political and legal regime; and secondly, due to organisational weaknesses, namely, electronics trade based on low value-added exports, weak capability for technological absorption and development, weak supporting technical institutions and support infrastructure, weak human resource development, fragmented responsibility for industrial and investment promotion, lack of strategic marketing for promotion of exports and a narrow focus of industrial association.

*Policy recommendations for manufacturing renewal in the short term*

Policy recommendations are outlined based on measures that clearly set out the short-term manufacturing renewal agenda in addition to measures that would deal with the longer term challenges of microeconomic reform.

There needs to be a combination of short-term measures to reduce effective protection, particularly the luxury goods tax, implemented at the same time as measures aimed at reducing the flow of illegal parallel imports through bold reform program of the Indonesia Customs office. The latter is deemed more time-consuming and fraught with difficulties particularly due to weak government administrative capabilities. Nevertheless, together with the gradual harmonising of tariffs on completely built goods and components, these measure will provide greater incentives to assemble certain products and components.

*Policy recommendations for manufacturing competitiveness in the longer term*

In terms of medium and longer term microeconomic reforms, the paper suggests measures to deal with the problems of small- and medium-sized supporting firms, not just in the core electronics industry but also in related supporting industries. Rather than aiming to directly promote a selected or ‘targeted’ specific sub-sector or even products (which is deemed risky and fraught with difficulties particularly due to weak government administrative capabilities), the focus should be on generic or functional targeting of activities in terms of functional support to bolster the international competitiveness of domestically-owned components firms and to encourage greater foreign investment in ‘critical components’ and supporting activities. Wherever possible, instead of direct subsidies, preference should be given to programs or forms of public-private partnership where the government would only provide initial seed capital and infrastructure but ‘brokerage’ assistance or services would be delivered on a user-pay basis (for example Indonesia Export Training Centre).

*Specific recommendations on industry-wide issues:*

1. FDI Policy:

A coordinated program to attract foreign MNEs to locate production of critical components for consumer and business/electronics to Indonesia needs to be developed with a focus on existing and new MNEs:

- Develop direct contact with large investors or MNEs to build a fabric of familiarity between the MOIT/BKPM and the global investment community through a proactive strategy of investor relations (such as investor relations effort

- by Mexico and other emerging market's authorities) which could help MOIT/BKPM influence market sentiment and obtain market feedback in response to policy changes;
- MNEs should be encouraged to relocate particular specific components (either as 100% FDI or as part of a consortium with local firms, e.g. Tosummit TV-tube plant) along with many of their first-, second- and other layer supporting companies in their home countries; public-private dialogue with the industry association should also be part of the selection process of specific projects;
  - Domestic component manufacturers need capital participation to solve their financial difficulties as well as technical assistance, and technological tie-ups with MNEs. 'Match making' measures to bring the supplier and buyer together and to lift their competitive position as 'indirect' exporters to the existing multinational assembly firms in Indonesia;
  - Establish a world-class and pro-active (fed by data from the industry association with new Internet technical assistance program) and new "investor relations office" division in the for the Investment Co-ordination Board (BKPM) is proposed to bring greater international exposure and more transparency in the role of FDI approval for BKPM and BKPMD through data collection and legal enforcement powers; a cross-agency coordination team (BKPM, MOIT, MTC, BPPT) should be formed and better data collection on realised FDI should be carried out;
  - Strategic alliance focus: In meeting the price, quality and delivery demands of foreign and local assemblers who are already in Indonesia, supplier SMEs can receive significant benefits from 'match making' including technological broadening and deepening. By up-grading of their capabilities, SME suppliers can become increasingly internationally competitive with export-oriented foreign assemblers; then an immediate by-product would be greater international marketing capability to obtain sourcing contracts or 'original equipment manufacturing' (OEM) opportunities and eventually own-design manufacturing (ODM) and own-brand sales overseas (OBS).

## 2. Strategic Inter-firm Networking Program and Policies to Support Domestic Components small and medium sized enterprises (SMEs):

- (1) Beginning with the adoption of a program to increase the number of supplier SMEs that are 'wired' (e.g. as part of a wider preparation for the arrival AFTA to get at least 80% component SMEs effectively connected to the Internet by 2002, made possible as costs of 'connectivity' is falling). Many short-term direct cost benefits can be reaped (such as the lowering of transaction cost and improved marketing capabilities, accountability and data collection). Implemented through the existing industry associations or sub-contracted to specialist agency, this program aims to establish and operate the Internet-based procurement operations (initially without payment system and eventually to a full e-market place) as well as an information clearing house to improve inter-firm cooperation and educational programs;
- (2) The above Internet program must comprise facilitating the provision of hardware and software as well as be accompanied with the provision of training courses for SME

managers and employees at available training institute (such as IETC, Mas-Gobel Institute). These courses covers topics which enhance their firm's competitiveness (such as managerial, finance, productivity, marketing, quality control, design and export/imports procedure courses).

- (3) To increase the capacity of SMEs to improve their links with the assemblers in Indonesia as well as international purchasing offices (IPO) of multinationals in Singapore and other centres in the region, an international-level exhibition in Jakarta such as Globaltronics (Singapore) or Hong Kong Electronics could be jointly supported by the industry associations and the government;
- (4) Strategic-based approach of strengthening the industrial organisation which is combined with the cultivation of classical entrepreneurs (changes existing order by introducing innovations), intrapreneurs (catalyst/motivator of employees to reach company goals) and interpreneurs (catalysts beyond the firm to the sub-sector and promoter to release processes of organisational learning – horizontally as well as vertically); as part of a program in this strategic-based approach and a way to showcase internationally competitive local firms, a series of public awareness campaigns related to electronics products promotion could be considered. For example, 'business plan competition/award' to spur innovation (see below) together with public profile campaign such as 'local product/component design award', 'buy local/national first', and 'local product/component customer service award'. However, the term 'local/national' must conceptually be distinguished from indigeneity, as local/national product brands can be either manufactured by indigenous firms or by foreign-owned firms.
- (5) Industry associations must play the important role in promoting international competitiveness and innovative initiatives. Internet-delivered and other extension services can increased the participation of members within the components sector in particular basic metals, plastic and other non-electronics industry; Industry association can inform particular training services available and work with specialist training or marketing agencies with multilateral agencies support. Additional measures to improve links between industry associations in Indonesia (under an 'umbrella' organization such as MASTEL in the IT&T sector) or links with other regional industry associations are also explored in the report. The aim is to maximize inter-linkages between SMEs and to spur innovation. Participation from the majority of core electronics firms as well as those in non-electronics components industries such as metals, electro-mechanics, plastic molding and others in areas such as distribution;
- (6) Regional-specific policies must be developed in cooperation between MOIT and regional economic development authorities to improve international competitiveness and innovative capacities (product, design, process and incremental innovation). The basis of cooperation between the two agencies must be that the principles and benefits of free trade between nations also applies to free trade within nations such that internal free trade barriers must be eliminated and local discrimination against other citizen must be eliminated. The aim of such cooperation program is that while most electronics operations are still in low value-added segments, to increase the amount engineering and product redesigning or 'reverse engineering' work carried out locally, and undertaken by MNEs. In addition, dynamic cluster model is proposed

to deal with challenges to make the transition from price-led to product-led competition and from external-integrated to region-integrated clusters; program to be considered include: the formulation of integrative policies to advance entrepreneurial firms, capabilities for networking, technological management, and to develop advanced and mid-level skills; to work with regional educational institution to focus on increasing the output and quality of specific technical graduates which are in line with the demands of industry;

3. Measures dealing with technology infrastructure (supporting institutions):

Technical education and industry technical infrastructure (in the area of standards, product certification and testing and industry statistics) directly related to the maintenance and improvement of the basic technical infrastructure and needs to be prioritized. In addition, institutional support for firms to adopt ISO standards can assist SMEs. A regular independent evaluation of the activities of the existing institutions such as the Indonesia Export Training Center (IETC), National Association for Export Development (NAFED) and Export Support Board (*Dewan Penunjang Ekspor*) should be conducted to improve the quality of institutional support for domestic components and end-product manufacturers.

4. Specific recommendations on the firm-level to foster innovation and improve capabilities:

(1) Measures directed at enhancing SMEs to improve their innovative, managerial and technical capabilities through training services provided by specialized institution (for example IETC and Mas-Gobel) as well as sub-contracted 'productivity and quality centres' which offers effective and competent services for SMEs. These can blend various 'westernised' production management practices and strategies with those of Japanese, Korean and other East Asian practices specifically tailored for the Indonesian conditions. For example, techniques that can be applied are continuous improvement, minimum waste of energy and effluent, materials and time, management-workers relations, zero defect and other programs which can enhance efficiency and competitiveness of firms; in addition or complementary to such program would be expansion of the existing programmes of on-the-job transfer of production know-how by technical experts from the United States, Japan, and elsewhere (provided through USAID, JICA, GTZ as well as international NGOs of retired professionals (such as International Executive Service Corp) who are willing to assist in their relative areas of expertise;

(2) To help build successful and innovative enterprises and in cooperation with regional governments and with private sector entities – industry association, service providers, universities, research institutes and companies, business plan competition can be organized. This could serve as a catalyst to foster entrepreneurialism within the broader community of SME supporting industries and to help individual start-ups to get off the ground or existing SMEs to start new business ventures. With possible funding from MNE affiliates which is match by the government, a blue print for a

business plan competition to help start-ups get off the ground and existing companies can be conducted. Similarly, large companies can also set up their own competitions to create business, either internally or in related research/manufacturer communities;

- (3) One of the principal ways around access to technology problems is for domestic firms to enter strategic alliances with foreign component SMEs. To do this, domestic component firms have to become stronger technologically, which means that the government and the private sector need to invest in their own technological capability in order to bargain more effectively for access to newer technology.

These are some of the key strategies to move away from simple assembly processes. The working agenda towards technological capability development in an innovation-driven industry such as electronics must be based on continuing public-private dialogue and partnership.

The postwar trend toward offshore manufacturing in electronics is based on MNEs locating to countries where local companies have earned a reputation as being able to meet product quality and cost requirements, as well as, technical specifications of the global market. But sourcing decisions are not influenced by these factors alone. Increasingly, it has become important that global suppliers be able to provide services related to design, testing, component qualification and prototyping capabilities, as well as to provide access to markets.

## 1 INTRODUCTION

Robust industrial competitiveness and technological capability can provide Indonesia with the basis for the successful post-Crisis recovery in Indonesia. Electronics goods provide a substantial portion of exports earnings but the existing weakness in industrial depth in terms of the lack of local sourcing of components and quality supplier has hampered multinational and domestic firms from moving their manufacturing activities to higher value adding operations.

Electronics is one of the advanced technologies which are central to economic development. It can well be argued to be the most important. The electronics industry – or at least the information technology aspects – are central to the process of industrial transformation (Ernst and O'Connor 1992: 13). Countries in Asia Pacific region and elsewhere with strong electronics industries will have an advantage in the development of all kinds of manufacturing and many kinds of services. In Japan, Korea<sup>1</sup> and Taiwan, the electronics industry now produces and exports more than any other manufacturing industry (EIAJ 1998: 2, Hobday 1998: 62). Conversely, countries with weak electronics industries will be handicapped by the need to import process technology in order to keep abreast of technical standards both in manufacturing and services. The strength of the electronics base of any country is in turn dependent on several factors: the

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<sup>1</sup> Korea throughout the paper refers to the Republic of (South) Korea.

competitiveness of its core companies, the quality of its electronics and related supporting industries, and its technical labour force.

Indonesia's electronics stands at a defining point. Economic crisis and large currency depreciation such as that experienced by Indonesia usually produce an initial slowdown in the economy. In the aftermath of such a depreciation, this is usually followed by an increase in export competitiveness and the export sector normally spearheads the rest of the economy in bringing about recovery.

Now, more than three years after the outset of the Crisis, the Indonesian electronics industry<sup>2</sup> has seen only a moderate growth in production and exports since 1999 but not fully recovered to pre-Crisis levels. A lingering sense of uncertainty about the economy due to political and security factors still predominates the investment environment. Foreign and domestic firms have decided to wait and see.

Despite the harsh market conditions after the East Asian crisis since 1997, the electronics sector in Indonesia in 2000 is showing some positive developments. Like in Vietnam, the Philippines and Thailand, it is once again one of the fastest growing export sectors. Electronics sales in the first semester of 2000 were up by an average of 90% compared to the previous period (*Bisnis Indonesia*, 22 July 2000). According to the officially published figures, in June 2000 Indonesian exports reached its highest level in 10 years at \$5.291 billion – for the first time going over the \$5 billion mark in a single month. In the first semester 2000, the non-oil exports sector reached \$22.8 billion which is an overall growth of 27% to compared to the same period in the previous year.

The electronics and electrical machinery became one of the top 10 contributors of this exports growth with audio and video electronics accounting of 13% of total exports or nearly \$ 3.0 billion.<sup>3</sup> In a related development, telecommunications equipment exports obtained the number two ranking (at a little over \$1 billion) amongst the top-10 export goods to the US during the same period.<sup>4</sup>

The structure of production and exports have also significantly changed with components and parts, particularly integrated circuits and printed circuit boards produced by foreign transplants, playing a much bigger role. Notwithstanding the above positive developments, there are underlying problems within the electronics industry – some of

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<sup>2</sup> The terms of reference of this project lists the relevant product groups as focus including radio-cassette players, televisions, VCRs, DVDs (ISIC-38321) and parts (ISIC-38324), computers, calculators, office equipment and parts (ISIC-38253). However, it did NOT include household electrical equipment (ISIC-38330) and air conditioning, refrigeration and the like (ISIC-38294). It can be argued that both are of great relevance to both foreign- and domestically-owned assembly firms and their local suppliers as they are often jointly produced within the same firms and are included in the definition of the electronics industry.

<sup>3</sup> In semester I of 2000, oil and gas exports rose by 72.16% or by \$6.468 billion and the balance of trade showed a surplus of \$15.586 billion; imports reached \$13.682 billion or a rise of 18.62%. Most of the growth in exports, occurred in the second quarter with electronics and electrical machinery as one of the major commodities. The other important commodities in order of importance are clothing, processed and pulped wood and toys (*Bisnis Indonesia*, 2/8/00:2).

<sup>4</sup> Christianto Wibisono suggests that the telecommunications electronics exports performance is beyond expectations. It would be interesting to speculate that most of this exports came from large US or other foreign firms since most Indonesian small and medium enterprises (SMEs) are 'passive' in their marketing in the US and only tend to rely on purchasing agents from the US (*Bisnis Indonesia*, 6/8/00: 2).

them stemming from the long-standing weaknesses of the domestic firm particularly related to weak technological capabilities of SME component suppliers. Due to the impact of the Crisis, the depreciation of the rupiah and a host of difficulties, these mainly domestic-oriented firms are under increasing threat of total annihilation. Not only have Indonesian brand names products been on the decline in their market share due to unrelenting expansion in parallel imports which grew from a previous steady flow to become a torrent after the Crisis in many segments.

Such imports have been the bane of both domestic and foreign firms in Indonesia. Amidst domestic credit indebtedness and other difficulties, both domestic and foreign firms compete with cheaper smuggled goods, but it has hit particularly domestic firms in consumer electronics, with estimates of the survival rate of the domestic firms as low as 30-40%, raising the spectre of de-industrialisation. While there is improvement in exports and investments in recent times, there are a lot of urgent and medium-term challenges to be faced. This study focuses on these challenges, the resolution of which will determine the competitiveness of both domestic and foreign firms in the Indonesian electronics industry.

In marked contrast to the efforts of neighbouring ASEAN-4 countries, the Indonesian government policy in the area of electronics is less than clear. Government policies which affect the industry are dispersed among numerous department and agencies, many of which pursue priorities which are irrelevant or even detrimental to Indonesia's electronics industry competitiveness. Trade policy of widely differing duties of completely built up and has resulted in increased parallel imports and ad hoc policy on changes in trade and wage policy has resulted in added uncertainty. The disappearance of significant number of domestically-owned firms, many of them producing components, could not be contained in the aftermath of the Crisis. During this time, the increasing inability of many domestic firms to match the technological capabilities of their foreign owned competitors presents a serious challenge confronting the industry. The events in the past three years suggest that a reappraisal is in order.

This study outlines the structural characteristics of the Indonesian electronics industry and provides some policy measures which can be taken to improve international competitiveness. The outcome of the microelectronics race will determine a nation's position in the world in the new century.

## **2 STRUCTURE OF THE INDONESIAN ELECTRONICS INDUSTRY**

### **2.1 Regional comparative broad output mix (consumer, components and industrial electronics)**

Prior to the crisis, the structure of the Indonesian Electronics Industry was that of a late catch-up in the Asia Pacific region which was dominated by the consumer electronics segment while the parts and component segment was relatively small. For example, in 1994 the consumer segment in Indonesia represented more than 57% of the total production while components and parts made up only 22% (Table 2). By 1999, this

situation had changed dramatically with the two segments making up 42% and 41% respectively.

A comparison with the electronics industries among East Asian economies suggests that Indonesia's total electronics output is slightly larger than that of the smallest producer of electronics, the Philippines. Indonesia's component segment is the smallest while its consumer electronics segment is the largest in the region in 1993 (Figure 1). In contrast, in Korea components and parts electronics makes up the largest proportion of production. Alternatively, a high proportion of industrial electronics in the total such as seen in Taiwan, is often perceived as an indicator that high value adding manufacturing activity is taking place within the electronics industry (Sulaiman 1999: 58).

## **2.2 Regional comparative specific key output mix**

In terms of 11 key product categories, Indonesia is far behind Malaysia and could be compared to India in its share of advanced high-value adding products in their export composition among the ASEAN-4 countries and India. Indonesia produces mainly products such as VCRs, Hi-Fi Stereos, standard (non-flat TFT) computer monitors and TVs - all can be considered to be 'mature' in their product cycle (Figure 2). Products which require more sophisticated technology such as facsimile machines, personal computers (PC), printers and other PC peripherals such as CD-ROM/HDD/FDD are produced mainly in Singapore and Malaysia. However, like countries that exports substantial electronics products, the Indonesian electronics exports is also dominated by a few mature products but their proportions in the total exports tends to be lower than Singapore, Malaysia and Thailand. Nevertheless, in the mature product categories, Indonesia can be favourably compared to India.

## **2.3 Production, Exports, Imports and Balance of Trade in Indonesian electronics**

Recent trends in production, exports, imports and balance of trade are as follows (Table 2, 3 and 4):

- (i) Nominal production of all electronics goods was weakened by the crisis in 1997 but showed a large expansion (46%) in 1998 and a slight contraction (-2%) in 1999 while changes in the composition of production amongst the three segments appear to have occurred with a large decline in the share of consumer electronics, a smaller decline in business electronics and a significant increase in the production of electronics components (Table 2);
- (ii) Annual nominal exports data (from BPS) suggest that there is a similar trend in the change of export composition between the three segments occurring, but with an even greater share of components in exports. Exports of consumer electronics (CE) goods declined dramatically by 28% in 1997 and again by 23% in 1998 but recovered slightly in 1999 to \$1,906 billion (Table 3). In contrast, exports of components and parts (CP) electronics increased continuously throughout the 1994-99 period by 23% in 1995, 27% in 1996, 10% in 1997, and continued by

0.4% in 1998 and again dramatically increased in 1999 by 29% (Table 3). The decline of CE exports in real terms could be explained by other factors than problems related to trade finance since many exporting companies are joint ventures with multinational firms. There are indications that there might be rapid changes in global sourcing patterns towards Mexico and Eastern Europe (by some Japanese, Korean and US multinationals) could spell difficulties for Indonesian electronics in the near future.

However, when real monthly exports data for consumer electronics are calculated,<sup>5</sup> a different picture emerges (Magiera 2000). Like other industries such as toys, electronics exports appear to have experienced a slowdown even before the crisis in 1997 and monthly exports are at the level of 1995 in early 2000 (Figure 1).<sup>6</sup> This trend is in line with those experienced in other countries (Sulaiman 1999: 55) suggest that the use nominal data needs to be carefully interpreted. Important changes in the measurement of electronics exports occurred due to the changes in Indonesia's export declaration procedures in 1997:

- (a) under the procedures which were used between August 1997 and April 1999, exporters could use a simplified export declaration form (PEBT) for shipments of under Rp 300 million. Magiera (2000: v) outlined how the form has created difficulties in interpreting Indonesian export statistics, particularly export statistics during most of the economic crisis. The main result is that official PEB export statistics in many commodities in 1998 and 1999 show sharp falls and these are sometimes attributed to the economic crisis even though but could actually be linked the use of the new PEBT forms. It was expected that exports in 2000 will show sudden increases since exported products that were formerly recorded under PEBT will now be recorded under their proper HS numbers;
- (b) in the first semester of 2000, the exports statistics for many key exports including electronics did in fact show large increases;
- (c) Magiera 'relocated' more than 40,000 company records on PEBT shipments during the last four months of 1997. They were matched with company records from previous years. The annual real export data estimation results of the relocation process suggests that for the consumer electronics (SITC76) the PEBT allocated exports for 1997 (compared to 1996) declined by 9.8%, instead of by 14.9% (as reported by the non-PEBT allocated data). For 1998, the decrease in the PEBT allocated Exports was 18.8%, instead of 22.4%. The results of the relocation process suggests that for 1999 (compared to 1998) there was a slight decline of 0.6%, instead of a 7.9% rise (as reported by non-PEBT allocated data). Thus, there is under-reporting of PEB exports statistics as a result of the use of the PEBT forms during the period between April 1997 and April 1999; but more importantly, the deflated exports data suggest that up to the end of 1999, the

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<sup>5</sup> The real monthly export data is calculated by deflating using an export price index with Jan 1997=1 and including the PEBT exports together with the official PEB exports.

<sup>6</sup> The PEBT form requires that exporters specify the general nature of the item being exported, but not a detailed export classification code (HS number). As a result, the PEBT reporting codes contain far less information than standard 9-digit HS codes and it is difficult to determine the precise nature of the items being exported. The PEBT form has also resulted in difficulties in interpreting Indonesian export statistics since official exports (based on PEB or *Pemberitahuan Ekspor Barang* forms) are still reported under standard HS and SITC codes.

performance of consumer electronics exports measured in real terms has not been as spectacular as the nominal data would suggest (See Figure 3). Notwithstanding the measurement problem, however, recent signs of recovery are appearing and the total exports in electronics has come close to the levels in the pre-crisis years. The distribution or structure of electronics exports is very different in 1999 to that in 1996 with component electronics playing a much greater role and, conversely is the case with consumer electronics;

- (iii) Nominal imports of CE goods have declined dramatically by 48% in 1998 and again by 97% in 1999 (Table 4 while those of CP electronics declined earlier in 1996 by 9% which continued in 1997 by 12%, in 1998 by 154% and in 1999 by 75%. While some of the above fall in imports could be caused by increased local sourcing, but most CP imports are used for processing by assembling CE as well as other CP firms. Since there is a lead time between the date parts are imported and the date finished goods are exported, decline imports could serve as an indicator of future exports. This has not happened.

For January - June 2000, Indonesia's total electronics exports increased by 147% compared to the previous period. It became the second largest non-oil exports (16% of total) after textiles and is expected to reach \$6 billion in 2000 (up 78% from 1999, \$3.645 billion). In 1997, electronics export was the third largest after wood and textiles.

- (1) While nominal total imports and each of the three main segments are even lower in 1999 than in 1998, this indicates that either signs of export recovery are not clearly apparent or, more likely, *that local sourcing could be rising*. Nevertheless, there is little doubt that the CP segment has done reasonable well in exports – however measured – throughout the last 3-4 years. The trend is even more pronounced in the estimated imports of 'real' components, which has declined since around August 1997 (Figure 3).
- (2) Greater role of Batam exports: The increase in the exports of CP electronics since 1996 went hand in hand with the increasing importance of Batam Island ports (Batu Ampar and Sekupang) from exporting 45% and 59% of the total exports in 1996 and 1999 respectively while Jakarta (Tg. Priok and Soekarno-Hatta International Airports) declined during the corresponding period from making up 52% to 31% of the total imports (Table 5). The exporting firms in Batam Is. are mainly subsidiaries of foreign multinationals.

In mid-2000, the MOIT announced that the expected nominal exports in electronics for the calendar year 2000 would be around \$3.9 billion, which is a rise of 12% from \$3.2 billion in 1999 of which 59% comes from mainly foreign MNE affiliates in Batam.<sup>7</sup> More recent estimates suggest that the total electronics exports will increase by 134% in 2000 compared to the previous year. This suggest that electronics exports growth far

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<sup>7</sup> The definition of the electronics industry to calculate the exports data used for this announcement evidently differs for that used in Table 3 which recorded that the total value exports for 1999 as \$3.896 billion.

surpasses some other non-oil exports such as textile products which is expected to increase 25% in the same time period (*Bisnis Indonesia* 14/10/2000). While such nominal exports figures are larger than the expected increase in non-oil exports of 26%, some caution must be exercised since, as shown above, the actual deflated or real exports trends could be lower the figures for exports.

#### **2.4 Declining numbers of firms and workers in the electronics industry**

According to the Central Bureau of Statistics (BPS), the numbers of firms and workers employed in all three segments of electronics appears to have increased during the years from 1990 to 1997, reflecting the situation prior to the crisis. Using a different definition of the industry, data from the Ministry of Industry and Trade (MOIT) shows that the different segments experienced different rates of employment decline in 1998 but in 1999, in contrast to the others, the Industrial/Business electronics segment experienced a significant increase in employment (Table 7). The data on firm numbers (and by implication on employment, Table 6) is compared to the more recent data provided by the industry association, the Indonesia Electronics Electrical Industry Association (IEEIA or *Gabungan Elektronika Indonesia*). While it may not be the complete listing, there is a total of 46 end-product and 139 component manufacturers listed by the association which makes a total of 185 firms in 2000. In the absence of any official or other reliable data, the difference of 73 (=258-185) firms between 1997 and 2000 suggest that as much as 28% of total firms did not survive the Crisis. Interviews with official of the IEEIA and other leading firms suggest that perhaps at much as 30-40% of the total firms – mostly domestic firms – did not survive the Crisis although many assembling firms return to their former status of being electronic goods distributors.

#### **2.5 Net domestic value-added and indirect taxes**

The domestic value adding activity in electronics has increased in recent years. There is a great variation amongst the different products, as defined by their ISIC codes, in their value adding (defined by market price and by factor production cost) and in their contribution to indirect taxes.

Three generic product classifications stand out as the three largest are the sub-assembly and components electronics (ISIC38324); radio, television and other entertainment devices (ISIC38321); and communications equipment (ISIC38322) in terms of their contribution to output, value added and indirect taxes. However, they also have high input costs reflecting a relatively high import content (Table 8).

In terms of government revenue, radio, television and other entertainment devices (ISIC38321) which makes up a significant part of consumer electronics, is the largest of the three in terms of its contribution in indirect taxes. The other important segment of consumer electronics, namely household electrical appliances (ISIC38330), contributes much less than ISIC38321 but still is quite significant compared to that of sub-assembly and component electronics (ISIC38324). It should be noted also that ISIC38321 is dominated by foreign MNE affiliates, while ISIC38330 is dominated by domestically-

owned assemblers, which tend to have a relatively higher local content (63-90%) than their foreign competitors (Table 9).

## **2.6 Local sourcing, export performance and other firm characteristics**

Electronics has been the third largest export most of the 1990s and the second largest in the first half of 2000. It has increased at an above average rate amongst non-oil exports. CP exports play an increasing role. Most of these can be attributed to the foreign parts manufacturers who established their plants in Indonesia to supply foreign assemblers in the country as well as for the global market. Most of such component makers also are 'indirect exporters' as over 50% of their products go to overseas market and more than 80-90% of such components were being produced in the Bonded Zones (Kawasan Berikat-KB) and Entrepot-for-exports designated areas (*Entrepot Produksi Tujuan Ekspor, EPTE*) in *Jabotabek* (32%) and *Batam* (59% in value terms, Table 5).

There is considerable variation in the plant establishment characteristics among foreign, domestic and public firms.<sup>8</sup> Similarly, a significant variation appears in the characteristics of plant establishment across the above three key electronics sub-sectors.

Using data obtained from surveys conducted by the Central Bureau of Statistics (BPS) consisting of 9 characteristics of establishments or plants for the three ownership groups made for 1990, 1993, 1996 and 1998, the impact of the changes in regulatory regime (with more 'deregulated' investment and other laws) and impact of the recent economic Crisis in Indonesia can be observed. The data show changes in the characteristics of establishments in the electronics subsectors, namely consumer electronics (ISIC-38321: radio, TV and other consumer electronics), component electronics (ISIC-38324: sub-assembly parts and consumer electronics) and household electrical appliances (ISIC-38330, see Table 9).

The above changes had a variable impact on foreign and domestic firms and across the three segments of electronics. The change between the years 1996 and 1998 is highlighted by the column showing the difference in percentage changes.

### **2.6.1 Domestic firms disproportionately bear the brunt of the Crisis**

In terms of the number of establishments, while the numbers of foreign firms in Consumer Electronics (CE) increased over 1990-1996, the number of domestic firms fell in 1993, perhaps due to the severity of foreign competition for the domestic market. It climbed back in 1996. After the Crisis, the number of foreign firms dropped by 21% while that of domestic firms dropped by 66%. In Component and Parts Electronics (CPE) segment, foreign firms numbers rose by 57%, while the number of domestic firms

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<sup>8</sup> Public firms may either be state enterprises (BUMNs) which have switched from other lines of production into electronics or firms which are formerly private firms but now under the management of the Indonesian Banking Restructuring Agency (IBRA). In the available data, this distinction is not made. As a result, they are not discussed in detail in this project.

declined by 15%. Finally, in Household and Electrical Appliances (HEA) segment, the number of foreign firms dropped by 17% while 66% of the domestic firms stopped production. In short, the trend revealed here is that domestic firms were disproportionately affected by the Crisis compared to foreign firms. Foreign firms appear to run larger establishments, have higher value added per worker, and have better plant efficiency despite higher labour cost per worker than their domestic counterparts. In the HEA subsector that is more domestic-oriented, there are only few foreign plants (6 compared to 20 domestic firms in 1996).

Turning to percentages of exports in total output and of inputs imported, after the deregulation of foreign investment in the early 1990s, most foreign firms were engaged in export-oriented activities while domestic firms were focused on supplying the Indonesian domestic markets.

### **2.6.2 Consumer electronics: domestic firms became more export oriented than foreign firms but domestic firms increased their import content while foreign firms did the opposite in 1998**

In the CE segment, the percentage of output exported by foreign firms leapt from 20% in 1993 to 71 per in 1996 but fell back to 53% in 1998 suggesting a fall of 25% after the Crisis. There was an inconsistent trend for domestic firms. After a spectacular increase from 1990, the export share in their output fell from 54% in 1993 to 20% in 1996, but jumped to 97% in 1998 (an increase of 385%). In terms of imported inputs, foreign firms in the CE segment appear to have consistently lowered their proportions from 1993 to import only 60% of their inputs in 1998, while the domestic firms also lowered their imports contents until 1996 but after the onset of the Crisis increased the share of input imported to a very high level of 99% in 1998.

### **2.6.3 Component and parts electronics: both domestic and foreign firms drastically lowered their exports while domestic firms lowered their import content, at the same time, foreign firms maintained their high import content in 1998**

In CPE, a different trend also exists between foreign and domestic firms. With the foreign firms, after an increase in the proportion of exported production from 1990 to 1993, there was a decline from 1993 to 1996 and a further drastic fall in 1998 to a mere 6% of total production. Their local sourcing increased during this period and the onset of the Crisis did not change their share of inputs imported, which was at a high level of 92%. Domestic firms in CPE, exported a high proportion of their production in 1993 but lowered their exports in 1996 which then diminished to a mere 2% in 1998. Their local sourcing diminished between 1993 and 1996 but was reversed by 1998 as they lowered their imports.

#### **2.6.4 Home appliances electronics: domestic firms have been totally oriented towards the domestic-market while foreign firms increased their exports; at the same time, domestic firms lowered their import content and the opposite was the case for foreign firms in 1998**

In HEA, there are very few foreign establishments with 5-6 firms and the low percentage of exports among foreign firms in the household appliance subsector prior to the Crisis (27% in 1993 and 20% in 1996) suggests that their main motive in relocating to Indonesia was to focus on the domestic market. This, however, changed in 1998 with 74% of their production exported. Their imports sourcing also show a decreasing trend from 1993 and 1996 but increased to 61% in 1998. In the case of domestic firms in the HEA segment, their production has been focused on the domestic market and their percentage of imported inputs lowered significantly in 1998 to 50% of the total suggesting a greater reliance on the domestic parts.

While the data in Table 9 revealed only trends until 1998, a year after the Crisis, domestic firms in all the three segments appear to be more severely affected than their foreign counterparts. There appear to be increasing numbers of foreign parts suppliers, with their number of domestic firms more than doubling in 1998 compared to 1996. The number of domestic household electronics appliance firms appeared to be least affected in the aftermath of the Crisis in 1998.

#### **2.6.5 More ‘bulkier’ electronics products tend to have higher local sourcing**

The domestic parts firms appear to have survived better than those in the consumer electronics segment. Most encouraging trends are the increase of many foreign parts firms (many of which were encouraged by their home-country suppliers to relocate to Indonesia) and the growing local content by component and parts as well as household electrical appliances segment. This warrants a closer examination of local sourcing particularly in ‘bulkier’ mature products (see Table 10), such as air-conditioners, colour TVs, refrigerators, electric fans and irons.

Comparison of Table 9 and 10 reveals much higher local sourcing in CPE and HEA by domestic firms than by foreign firms but the opposite trend was experienced by CE firms.

Since 1996, fewer domestically-owned CPE firms appear to have Value-added/Output ratios that are higher than foreign-owned competitors. This reflects the fact that most of foreign parts makers are partly owned or closely associated with East Asian MNE-affiliates in Indonesia. Foreign CPE firms ‘followed’ MNE principal assemblers (such as Matsushita, Sanyo, Mitsubishi) in relocating to Indonesia since there are no local part makers of higher value critical electronics components (such as transformer, DC motor, crystal oscillator, and others) which can meet global standards of quality, price and reliable delivery. Unless such criteria are met, export-oriented MNE subsidiaries are reluctant to use local materials or parts.

The global electronics industry increased its pace of rapid structural transformation in the 1990s in response to changes in the regional and worldwide consumption patterns. In the early 1990s prior to the onset of the Crisis, a massive relocation of Japanese and NIE firms occurred into Indonesia. The difference of this relocation compared to the one that occurred during the preceding three decades was that more higher value critical components were relocated by assembler firms and a large number of Japanese and Korean MNEs attempted to raise their local procurement rate and sourcing outside their business groups in their new locations (Sulaiman 2000).

After 1997 the relocation of critical component plants have mostly ceased. There are some exceptions, however, such as the relocation of foreign manufacturers to Indonesia to supply well-known firms Epson (printer manufacturers) and KDS (quartz). In June 2000, around 16 firms had realised their investment plans out of the 20 firms which planned to relocate prior to the onset of the Crisis. Also, during the first half of 2000, a number of large MNE affiliates are expanding their investments to expand their production capacity, notwithstanding a protracted labour dispute (see PT Sony Electronics Indonesia discussed below) and the uncertain political climate and the weak local currency.

## **2.7 Impact of the East Asian Crisis**

The results of the survey as outlined in Table 9 above reveal trends of electronics establishments in the three main broad segments until 1998. It shows that in the aftermath of the Crisis, domestic firms in all the three segments were more severely affected than their foreign counterparts.

The uneven impact of the Crisis was also shown in a study by the World Bank where domestic-oriented domestic firms were worse off than export-oriented FDI firms. 'Less than 15% of domestic-oriented firms were better off in terms of increased output levels in 1998 while over 40% of their export-oriented counterparts were better off or no worse off, compared to a year earlier' (Widianto 1999: 14).

A recent study of CSIS based on data up to 1998 confirm the data obtained in this study (Table 9) that the Crisis had a variable impact on the different segments of electronics industry in Indonesia. The CSIS found that the consumer electronics industry was hit first and hardest during the Crisis and the BPS used suggest value of production decreased by 60% from the previous year (Table 11). Likewise, business/industrial electronics also immediately experienced the impact of the crisis with its real value of output declining by 60% compared to the year before. The least affected segment was the electronics component with a decline of only 29% in 1997, and a quick recovery growth of 16 during 1997-98 (Feridhanusetyawan et al. 2000: 43-44).

The CSIS study (based on average performance indicator 1990-96) also confirmed that the consumer electronics segment is characterised by a dualistic structure where foreign firms are efficient and have extensive trade networks, while domestic firms are inefficient and have poorly developed trade networks. The study found that the situation is

somewhat better with the electronics component sub-sector in that there were less discrepancies in the performance between foreign and domestic firms.

In contrast to the CSIS findings above, our findings for the period between 1990 –1998 (Table 9 above) found that particularly in 1998 in both consumer electronics and component electronics there are somewhat large discrepancies in the performance between foreign and domestic firms. In 1998 compared to 1996, within the component electronics segment, the number of foreign establishments increased but the domestic firms declined. In terms of export/output very low ratio were obtained in 1998 for both foreign and domestic firms. These represent a decline of 90% and 94% for the respective group of component firms compared to the 1996 figures. The comparable figures for the consumer electronics is that domestic firms increased their exports by 385% while foreign firms actually reduced their exports 25% for domestic component firms (Section 6.3).

Turning to efficiency indicators, in the component segment the foreign firms are more efficient than domestic firms in 1998 (Table 9) since the average number of workers per foreign establishment was 196 compared to 362 for domestic firms. These respectively represent a fall of 11% in the former case and increase of 39% in the latter compared to 1996. Similarly, the valued-added per worker ratio was 24% (which was a fall of 14%) for foreign firms and 49% (which was a fall of 8%) for domestic firms. The difference in the overall performance between foreign and domestic firms appeared to have widen in the aftermath of the Crisis.

Having considered some key structural features of the main electronics segment and compared some performance indicators of the foreign and domestic firms, it can be deduced that a structural change has occurred in the electronics industry, namely: that the component and parts segment has assumed a greater importance out of the three major sub-sectors in the 1990s. While since the Indonesian economy has not yet fully recovered, and thus it may be too early to determine, it appears that rather than a temporary or cyclical event, this structural change could be a lasting phenomenon.

### **3 STRENGTHS**

The global electronics industry increased its pace of structural transformation in the 1990s in response to changes in the regional and worldwide consumption patterns. The pace of this global transformation poses a threat in that many of the trends diminish the relative importance of Indonesia's principal factor endowment – low- cost labour. Since the mid-1970s, 'the proportion of direct labour costs in total manufacturing costs has been declining relative to overhead of material expenses, due to the rapid pace of automation that began in high-end components manufacturing but is slowly spreading to final equipment assembly as well' (SRII 1992: 1-13).

This section reviews some of the strengths of the Indonesian electronics industry in the light of the recent trend a structural change in the composition of output and exports towards a greater importance of electronics components.

### **3.1 Large domestic market**

Indonesia's market is potentially the fourth largest market after the United States, China and Russia. With a population of over 200 million and an estimated 10-20% of this population in the medium to higher incomes bracket, many foreign firms considered it as an important market. Since 1970, many MNEs have established joint-ventures and subsidiaries in Indonesia. While domestic sales increases did not meet their initial expectations, local regulations changed in the 1980s to allow for greater export activity. Since 1993, several measures such as the EPTE system and the lowering of duties for components and material resulted in further increases in large-scale foreign investment in export-oriented production bases, mainly by Japanese and Korean firms. Many of these transplants are located in accessible and well-organised industrial parks such as MM2100, EJIP and Karawang in the *Jabotabek* area.

### **3.2 Low cost labour**

Low labour cost endowment can still offer great scope, especially combined with the attraction of other factors such as the large market and the other advantages below (4.3-4.4). Indonesia should be able to meet the needs of global manufacturers for both low cost labour and access to markets.

Competition in attracting foreign investment to host countries is determined by total costs and profitability. Large affiliates of MNEs and domestic firms often claim that the social security and other additional payments to workers add to the labour cost burden faced by firms, but in the case of most electronics production, labour cost makes up only between 5-10% of the total manufacturing cost faced by major firms (SRII 1992: 1-4). Hence, countries trying to attract foreign investment in the electronics industry in the 2000's may no longer be able to depend on low labour cost alone as a competitive advantage.

Nevertheless, other 'key' factors in the perceived profitability by most electronics firms are the cost and ease of imports and exports flows. They influence the nature of Indonesia's comparative advantage which is in 'assembly operations and low end production' which mostly translate to labour-intensive and import-intensive production processes. However, to make the best use of these advantages, improvements in human resource development and technical infrastructure must be made (Sulaiman 2000: 93).

### **3.3 Presence of foreign assemblers in the domestic market**

The presence in Indonesia of export-oriented foreign subsidiaries which assemble end-products and affiliated components and parts supporting firms can be turned into an advantage for the domestic components makers.

Most component firms are smaller specialist firms that do not have the international network of multinationals. As East Asian MNE started assembling consumer electronics on a large scale in Indonesia in the early to mid 1990s, many of their regular small- to medium components suppliers have followed to locate their plants near to each other in

industrial parks within and around *Jabotabek* and Batam. Such a creation of production bases works to Indonesia's advantage as 'one critical success factor of Japanese consumer electronics firms has been in the close proximity of their suppliers – information flows freely, service is superb and change can be rapid' (SRII 1992: 10-9).

MNE affiliates from East Asian, the United States and Europe cluster around industrial parks with adequate physical infrastructure in the *Jabotabek* area along the lines of the earlier models in Batam Island, near Singapore. There are many international brands of consumer electronics that are currently assembled in Indonesia. Assembly firms particularly from East Asia and local supporting industries are familiar with total quality control (TQC), just-in-time (JIT), continuing improvement processes (CIP), lean management, reengineering and ISO standards (IEEAI, 1997). This is a potential source of comparative advantage because the intensity of domestic competition is one of the determinant of an internationally competitive industry.

Indonesia's weakness in the component supplier infrastructure is largely due to weak domestic firms which suffer from a lack of design capabilities, R&D, technical know-how and skilled manpower. Such factors prevent the domestic firms from developing a components production base on its own (SRII 1992: 10-8). MNE assemblers in Indonesia cannot source most of their components locally and are importing those items at very low tariff levels. This ensures that both foreign and domestic producers remain cost competitive but it is not a desirable long-term situation as it will not promote forward or backward links with other segments of the domestic electronics industry.

A comprehensive study estimated that less than twenty firms are involved in (electronics) component manufacturing in 1992 (SRII 1992: 3-38). While special effort to identify core electronics and related parts firms is yet to be carried out, in 2000 at least 110 firms are identified in core electronics segment and 328 are registered as both electronics and its related suppliers with the industrial association, IEEIA (see Tables 11-14). In terms of exports performance, components constituted only 39% of total exports in 1989, as opposed to 67% in 1985 while exports of consumer electronics contributed 58% to total exports in 1989 and 33% in 1985. By 1989, the assessment for the overall electronics industry was that '(it) is not yet export-oriented' (SRII 1992: 3-7). The situation has now changed considerably. By 2000, the electronics industry has become one of the key export earners.

### **3.4 Proximity to Singapore and the large ASEAN market**

One of the major changes that has taken place in the fast changing structure of Asian production networks for the global electronics industry is the emergence and growth of Singapore as a key hub in South East Asia, namely as a centre of international purchasing offices (IPOs) for many multinationals from East Asia and the United States. The share of Singapore in global electronics production from 1.3% in 1985 to 4.4% in 1994, ranking fourth largest in the world after the United States, Japan and Korea (Wong 1998: 1).

Production of components on the nearby Batam Island, is known among IPO managers in Singapore, and electronics production in Batam in 1999 was over US\$1.375 billion constituting 59% of Indonesia's total electronics export (Table 5). However, in a recent survey about electronics components from other parts of Indonesia, Singaporean IPO managers claim that 'they did not have any information of the Indonesian parts industry or even could not think of its existence at all' while Malaysian and Thai parts manufacturers frequently visit them (JICA 2000: 10-13).

Non-Japan East Asia has become an important player in the world's production of electronics hardware. Firms from advanced countries in general, and the US and Japan in particular have increasingly extended their supplier bases and production networks to the four Asian NIEs, ASEAN and China. Together these accounted for 16% of global electronics production, equal to about 45% of Japanese electronics output (Elsevier 1996).

Here lies a great potential for parts and component exporters based in Indonesia. Both foreign and local components should take advantage of Singapore, being the nearest overseas market, and of the ASEAN region. The 'flip side' of the AFTA coin is that it enhances Indonesia's 'locational advantages'. Indonesia also has special Generalised System of Preferences (GSP) facility in exporting electronics to the US market which provides an additional attraction for foreign assembly and components plants. While there are difficulties in penetrating the European Union market (now with increasing trade barriers in the form of environmental and product standards), some exports have been successful into the Middle Eastern countries (JICA 2000: 10-25).

#### **4 IMMEDIATE CHALLENGES FOR INDUSTRIAL SURVIVAL**

The lack of a broad component supplier base or supporting industries within Indonesian electronics have long been a subject of policy discussion (SRI 1992: 10-8) similar to the fact that illegal parallel imports have hurt the local market. Field interviews of managers of domestic and foreign electronic firms, however, suggest that this is one of the key issue which is threatening the survival of not only domestic firms but, in recent years since the Crisis, it has also increasingly affected foreign affiliates' sales to the domestic market. Another issue, which is the underlying cause of such illegal imports, is the wide discrepancy in tariff rates between final products and components.

The existence of illegal imports has seriously weakened the competitiveness of locally assembled products. As the Crisis disproportionately affected the domestic firms, the problem of increasing illegal imports is the major challenge facing Indonesian electronics brand names. This section will review illegal imports and some other key issues which pose as challenges for industrial survival particularly for domestically owned firms.

##### **4.1 Parallel imports, 'smuggling' and under-invoicing**

No single factor can be ascribed as a cause of the fall in competitiveness of the Indonesian electronics industry. Yet in fieldwork interviews, many industry participants

have made a case for the overwhelming contribution of the rise in 'parallel' importing or smuggling through under-invoicing in imports. The problem has been estimated to already significantly affect the domestic market of electronics in 1991-92:

'...perennial problem faced by the industry was from informal trade...this is an issue that emerges almost annually (to date) and estimates range from 20-50% of the domestic market is met by "creative" imports' (Thee and Pangestu 1993:33)

Although some argue that Indonesia's geography provides a natural setting for smuggling activity, the principal cause of the persistent smuggling has not been illegal boat crossings from overseas but the tax incentive system against local manufacturers. After the onset of the Crisis in 1997, the perennial problem has apparently become worse. The goods suspected to have been imported using under-invoicing are estimated to make up about 70-90% of the total domestic electronics sales, depending on specific products.

While some dumping may be taking place, the increase of illegal imports particularly from China since 1998 has not been due to the smuggling in small boats into Indonesian territory but through main ports by means of 'under-invoicing'. This practice, according to Mr Amiruddin Saud, Chairman of GINSI (*Gabungan Importir Nasional Seluruh Indonesia*, All Indonesian National Importers Association), is based on the false declaration of the invoicing price of imported goods. By declaring that an imported product from, for example, Hong Kong that actually costs HK\$5 as HK\$1.20, 'rouge' importers would choose to use the 'green passage' (*jalur hijau pemeriksaan*) which does not require checking where 90% of imports are currently processed, while only 10% of total goods are going through the 'red passage' which require customs inspection. When there is a post audit of the records, it is often found that most of the suspected illegal importers are not supplying correct addresses. According to Mr Saud, such practices, rather than dumping, result in the prices of Chinese goods to be much lower (by 21 to 63%, an average of 41% for 6 most popular electronics goods, see Table 16) than their domestic competitors. (*Warta Ekonomi*, August 2000: 11-13). Field interviewees suggest that if smugglers actually paid the appropriate tariff and taxes then this difference should only amount to 5-10%.

The situation has deteriorated since the East Asian economic crisis where greater lenience in port monitoring by the Customs officers resulted in an increase of incorrect reporting of completely build up (CBU) products as components or semi-assembled parts. (various interviews of company managers, June-Aug. 2000). The estimated loss of tax revenue to the government is predicted to be around Rp 1.96 trillion (Table 12) . Only 20% of the total sales of Rp 14 trillion are made by domestic firms in Indonesia (Adhi Sukmono, *Republika* 8/2/2000). Another source estimated that under-invoicing practices in the importation of 12 electronics items have caused tax losses to the State of around \$80 million (Rachmat Gobel, *Suara Karya* 28/1/00).

There are various allegation of the existence of corrupt practices amongst the Custom officers and others. It has been alleged by Lee Kang Hyun, Secretary of the IEEIA, that a small group of about 10 importers (who have the backing of some 'rogue' high-ranking military figures) have been heavily bribing officials of the Customs department. Several prominent business figures who are also executives of industry associations, including Mr

Lee (who has been reported to have received death threats over this issue), have lodged official complaints with the Government. He stated that 90% of Chinese imports that are in the domestic market are suspected to be illegally imported (*Warta Ekonomi* 7/8/2000:13).

Field interviews (Mr. Adhi Sukmono and others) suggest that one of the reasons behind the large difference between illegal imports (particularly those from China) and locally manufactured products are the high rates of taxes paid by the local manufacturers. Taxes totalling up to 52.5% are levied on imported electronics products - these comprise of: Tariff (*Bea Masuk* - 20%), Value Added Tax (*Pajak Penambahan Nilai* - *PPN* - 10%), Luxury Goods tax (*Pajak Penjualan Barang Mewah* - *PPnBM* - 20%), Income Tax (*Pajak Penghasilan* - *Pph pasal 22* - 2.5%). Most locally assembled products have high import contents such that their final price would reflect the 20% tariff.

Note that tariffs on imported components for locally produced products are around 5% or less (see Section 6.1.4).<sup>9</sup> There is a high level of illegal parallel importation in electronics goods since traders and assemblers evade duties, taxes or both. Enforcement is difficult and it is further complicated by the difficulty of distinguishing between various level of subassembly and component imports. There is also a problem with domestic tax enforcement where often domestic assemblers can sell products with or without or paying VAT and luxury tax. It is also hard to determine whether distributors of smuggled goods pay these taxes (Table 15 assumes that they do).

In late 1999, Chinese VCD retailed in Indonesia for Rp 375,000 per unit (FOB price Rp 225,000, landed cost Rp 275,000 with 20% importer mark-up, dealer price Rp 343,750) but in China it costs 700 yuan or Rp 575,000. The average price of Chinese VCD in August 2000 is around Rp. 688,000. The price in August 2000 might be higher, the (unweighted) average price difference in VCDs between those with Chinese brands and Other brands is high at 63% (See Table 16).

In an attempt to counter illegal importation of VCD and cassette software, a government team was formed from the Directorate General, Association of Recorders, and the Police, and the regulation introduced that all these products must carry a sticker that states that sales tax (*PPN*) has been paid. However, a subsequent raid in Chinatown in 13 May 1999 resulted in a riot, albeit not as large-scale or widespread as one that occurred in 1998. As a result, enforcement of such regulation may be questionable.

The bill for bureaucratic neglect of the illegal electronics goods has finally come due as such importing has seriously hurt the domestic market of most electronics products in Indonesia. These include both products made by domestically-owned as well as foreign

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Should that be more explicit? Otherwise It's strange to have a tariff on local products. 2. If smuggled goods be sold without paying VAT and Luxury tax, then in addition to the smuggling, there must be a problem with domestic tax enforcement. But doesn't that mean domestic products could also be sold without paying VAT and luxury tax? - Actually in Table 15 it says that distributors of smuggled goods ARE taxed. 3. should there be a mention of the cost of bribes.]]

owned firms which have plants in the country. The most serious price competition from illegal imports has been in the local VCD assembling industry which has been virtually wiped out, but such imports are threatening all other segments of electronics (Box 1).

BOX 1:

**Parallel importing and biased tax system arrested the development of fledging local industry despite growing local market for VCD-players**

Prior to 1993, the VCD players market did not exist. Assembly of VCD players in Indonesia started in 1995 by some manufacturers of consumer electronics, particularly those with access to a supply of components from their principals. Due to the high dependency on imported components, this assembling industry did not developed further. Despite of the devaluation of the rupiah against the US dollar, the prices of VCD-players did not increase but in fact fell to a very low level – opening up new markets by making them more affordable to lower and middle classes in Indonesia. Most of the imported VCD-players which are very competitive in price are illegally imported and have escaped various taxes. As a result, their sales have hurt the sale of high-quality VCD-players with famous brand names, and many of the local VCD-player assemblers have gone bankrupt.

The domestic demand for VCD-players is estimated to grow by 20% per year but calls by local VCD-player producers to the government to lower various local taxes for the import of VCD components have fallen on deaf ears. The importation of various well-known and unknown brands of completely built-up players continues to grow unabated, and the fledging local assembling industry has drastically reduced its output (Table 13) and most domestic firms have been forced to stop production (Table 14). Interestingly, no import of VCD-players is shown in the data from the Central Bureau of Statistics (BPS); it is suspected that almost all of such products are recorded under the item ‘Other VCR Equipment’ or ‘Electronics Components.’ (Data Consult/Indonesia Commercial News No. 274, 24/8/2000).

Attempts by MOIT to introduce a recent regulation (SK No. 608/MPP/Kep/10/1999 dated 14/10/1999 to be implemented on 14/1/2000) on the requirement for products to have a manual and warranty card (as well as an authorised label) have met with little success. No significant increase in funding has been set aside for ‘sweeping teams’ called ‘Law Enforcement Teams’ (comprising Justice, Police, Tax and Customs Ministry as well as MOIT officials). Worse still, it has been reported that these ‘sweeping teams’ have in fact been alleged to have been asking for protection money from shop owners (*Warta Ekonomi*, August 2000). Under such circumstances, it is difficult to imagine that government agencies such as MOIT or others can enforce similar regulations in the future.

Another government agency, the Directorate General of Customs (*Ditjen Bea dan Cukai*) recently announced that it has taken ‘anticipated steps’ to prevent smuggling since April 1999 and ‘saved’ Rp 21.6 billion in state revenues (*Business News* 1/5/2000). Many field interviewees remarked that there have been many previous measures that have been announced but they are largely ineffective.

The growth in cheap imports of electronic and electrical goods from low-wage competing countries (particularly China) as outlined above can be attributed to problems associated with the Customs department:

- (iv) Field interviews suggest that corrupt practices within this department were prevalent even prior to the recent flood of imports and the practice of under-invoicing, partly as result of corrupt practices of Customs officials and partly as a

result of interference in the running of the Customs department by military officers during the Suharto era. Imported goods were inspected according to their Harmonised System (HS) classification. If importers have nothing to declare, they are assigned to the 'green lane' (*jalur hijau*), which is subject to minimal inspection. If importers declare that their imported goods require inspection or if the Customs officials determine that particular imported goods must be inspected then the goods go through the 'red lane' (*jalur merah*). However, during the Suharto era, there was an unofficial 'yellow lane' (*jalur kuning*) for particular imports belonging to the Suharto family, very high-level officials or well-connected people.

- (v) Prior to the introduction of partial computerisation of all import and export activities through the Indonesian ports which began in 1990 (with the funds collected from land and building taxes – *Pajak Bumi dan Bangunan*), all containers had to be emptied and their contents placed in warehouses at the ports. Improved container technology and the use of computers to speed up the processing of goods since 1995 means that most imported containers are not directly checked and only a small proportion are inspected.
- (11. The partial computerisation of Customs procedures suffered from many limitations, principally from the lack of well-trained computer technicians, operators and software programmers. While there were various training programs conducted to improve the situation, many of those trained left their positions due to the much higher salaries which they could obtain from the private sector.
- (12. The partial computerisation of the activities of the Customs department from its inception was handled by *BAPEKSTA* who did not smoothly respond to calls to repair breakdowns or other hardware problems and are very slow to send technicians. Although the Customs department has now outsourced much of the computer maintenance to the private sector, *BAPEKSTA* still control a significant part of the operations.
- (13. Various training programs for Customs officials overseas (in Australia, Singapore, Malaysia, China, Taipei, Japan, the United States, the United Kingdom and Canada) were conducted in the 1990s, and since 1996 the requirement of entry into admission in to the Customs department has been improved. The minimum requirement of entry is now an undergraduate degree. However, the key positions are still being held by senior officers from the Suharto era and the work culture has not changed very much, as the younger officers fear for their positions if they speak out.
- (14. Since the onset of the East Asian financial crisis, the official salaries of Customs officials have not kept up with increases in the cost of living; so it is hardly surprising that there is an increase in the practice of corruption.

Indonesian regulations covering the importation of every commodity under the HS classification under the Custom Law have been in existence for some years and are perceived to be adequate from a legal standpoint. The problem lies, as often is the case, in the implementation.

Although some argue that Indonesia's geography of open waters and countless island provides a natural setting for smuggling activity, the principal cause of the persistent smuggling has been the economic incentive provided by a tilted level playing field against domestic manufacturers. The problems of illegal imports suggest that there is case for lowering various taxes so that domestic and foreign end-product assemblers in Indonesia can compete on a level playing field with imports, particularly those from China. In addition, a complete harmonisation of tariff rates between final products and components could remove any economic incentives for importers and assemblers to engage illegal importation. Further discussion of policy remedies for these complex problems is provided below. Table 15 contains an assessment of the conditions facing smugglers/parallel import distributors and local manufacturers of electronics.

#### **4.2 Indonesia's comparatively disadvantageous export incentive schemes**

Compared with other ASEAN-4 countries, Indonesia's export incentive schemes appear to be less generous. As part of its compliance with the WTO Agreement, Indonesia does not have a corporate tax incentive directly applied to export as it can be considered as export subsidy. (See Table 17 for a comparison of export incentive schemes in the ASEAN-4 countries).

The following are additional requirements for exporters which makes Indonesia appear less generous than its ASEAN counterparts:

(i) the amount of the security to be posted for the duty exemption scheme, at 100% of duties payable, is much higher than the regional norm at around 50-75%; this increases interest costs and ties up working capital;

(ii) The duty drawback scheme is inflexible since it does not allow a 'substitution drawback', that is local materials or component cannot be subcontracted to indirect 'exporters'(these are firms that supply export-oriented firms but themselves are companies with often *PMDN* status) because these firms do not enjoy facilities afforded to exporters. The change to restrict drawbacks procedures in early 2000 has increased this inflexibility. Unlike other ASEAN countries, Indonesia does not make any provisions for indirect exporters to access imported materials on duty and tax-free basis through extension of the regular duty exemption scheme. However, Indonesia allows for the application of public and private common bonded warehouses rebate mechanisms.

(iii) the requirement to forecast import requirements and export plans over a 12 month period for the duty exemption scheme is likewise restrictive by regional standards. In other ASEAN-4 countries, a 'one-stop' approval and clearance system is used which combines prior licensing with the import procedure;

(iv) the rule for advance payment of income tax equivalent to 2.5% of the import value is uncompetitive and a redundant control feature;

### **4.3 AFTA ‘readiness’ and effective ‘liberalisation’ with parallel imports**

The onset of AFTA liberalisation is scheduled for 1 January 2002. The schedules for Indonesian tariff reductions for the years 1995 and 1996 follow those of the tariff reductions under AFTA–CEPT but there is a higher end target of 0–10 per cent compared with 0–5 per cent under AFTA (Table 27). Under the AFTA–CEPT program, by 2003 the most-favoured nation (MFN) tariffs could be slightly higher than CEPT tariffs, with a margin of preference ranging from 2.5–5 per cent.

AFTA aims to promote scale and other firm-specific internalisation efficiencies of the ASEAN region as an export production location. In committing to the implementation of CEPT mechanisms, Indonesia enhanced its locational advantage as export base for foreign firms. Most large foreign-owned firms are attracted to relocate to the ASEAN-4 countries with an aim to export to the rest of the world, and capturing the local market was ‘not their immediate objective’. The destination of their exports was primarily the US market (for most MNEs, it is their largest market), followed by the other ASEAN countries, and Japan and the European Union came last (Das 1998: 80).

Aside from the national and AFTA schedules, there is continued pressure on cross-border tariffs from global agreements, in particular the Information Technology Agreement (ITA). In 1996, Indonesia also was a signatory to this International Technology Agreement (ITA). This agreement requires the elimination of customs duties and other charges on information technology products through equal reductions, beginning on 1 July 1997 and concluding on 1 January 2000. The tariff cuts will affect computers, telecommunication products, semi-conductor manufacturing equipment, software and scientific instruments.

While the full implementation of ITA tariff schedules has been delayed as a result of the Crisis, what has been implemented under ITA (SK No. 178 implemented 1/6/2000) has been claimed to have caused many domestically-owned industries to go bankrupt or change their line of business to retailing electronics.

Fieldwork interviews of electronics companies suggest that AFTA-‘readiness’ on the part of foreign large firms appears to be better than for domestic end-product assemblers and SMEs in electronics. Given that most domestic firms have been mainly preoccupied with the impact of the Crisis, it is not surprising if many domestic firms in Indonesia may not as well placed as electronics industries in the other ASEAN countries.

Prior to the onset of the Crisis in late 1997, Indonesia was perceived to be ‘on track’ in lowering its tariffs in line with its commitments to the AFTA and ITA. A Ministerial Decree issued in 1997 (*KMK No. 659/97*), most components and parts products manufactured by indirect exporters were subject to a 0% import tariff rate on components. The recent increases in tariff on sub-assembly and components (Ministerial

Decree KMK No. 98/2000) which sets the tariff duty for most components at 5% can be seen as a set back. It has become a major source of concern on the part of Japanese/Korean investors as well as domestic producers in Indonesia.

Trade regime profoundly affects Indonesia's domestic competition as well as its attractiveness as a place to invest for foreign investors. There is a danger that if the current situation is allowed to continue whereby there is a wide discrepancy between final products and components that the problem of illegal parallel imports will grow unabated. In relation to the realisation of the AFTA targets, the Indonesian government must come to grips with narrowing the differences between the two groups of products. In addition, there is clearly a need to harmonise Indonesia tariffs levels as well as export incentive schemes with those that are applied in other ASEAN countries.

Since the 1990s, there is a growing orientation of most large multinational firms to build production networks in the region. While the strategies of Japanese, Korean and other MNE operations may place different emphasis on the Indonesia domestic market. There is a danger that, if Indonesia does not offer a competitive tariff structure, most of MNEs would not consider the country for new investments or, worse still, they would be likely to reduce their existing manufacturing presence in Indonesia to become mere marketing outposts of their products.

#### **4.4 Increased labour militancy and increased number of unions**

In the last three years since the Crisis, increased labour militancy has become a major concern to both domestic and foreign companies. There have been two prominent protracted cases which affected electronics firms. The first involves workers at the Maspion group of companies (one of which is an established electronics firm since 1971) in Surabaya regarding workers' demands for increased wages, transport and meal allowances.

The other relates to PT Sony Electronics Indonesia (SEI), and more seriously threatens the confidence of many foreign companies, particularly Japanese. . The two-month dispute started on 26 April 2000 and involved a new 'standing operation' production procedure from a sitting operation. The new cell-design production system had been used by other Sony companies in the region for years but not by many other Japanese companies in Indonesia.<sup>10</sup>

The company tried to settle the dispute internally but to no avail. It alleges that the Metal Workers Association (*Persatuan Pekerja Metal Indonesia, PPMI*) used illegal practices of squatting in the locker rooms and other intimidation tactics against non-striking workers, while the security authorities did little to intervene. The prolonged strike caused the company major losses as it had to close 10 of its 20 production lines but the company insist that it wants to maintain its production plant to meet the large domestic market. The

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<sup>10</sup> There is an apparent reluctance on the part of Sony's manager to follow the sitting production practice used in other Japanese MNE-affiliates, which provide seats for workers and longer/larger conveyer assembly belts (A. Sukmono/IEEIA, interview, 27/6/00).

plant also has the lowest productivity amongst Sony plants in Southeast Asia.<sup>11</sup> The PPMI charges that the company acted arrogantly and implemented the work system changes without proper consultations with the workers or their representatives.

A government sponsored body, the Central Committee for Labour Disputes Settlement (*P4P*) has been formed under the supervision of the Ministry of Manpower (MOM) to deal with such an industrial dispute. Indeed, the committee was involved in the informal negotiations between the workers and PT Sony Electronics Indonesia. On the side of the workers, there was also a representative from the International Metal Federation based in Switzerland. While the dispute was concluded by a ruling issued by MOM in 29 June, 2000, allowing the management of Sony to dismiss 928 workers, it showed to many potential and existing foreign investors that the government was slow and failed to effectively maintain security. Sony's case was perceived as a test case for the new government's capacity to resolve industrial dispute. Sony received a lot of negative coverage in the Indonesian press while Indonesia's image in the Japanese press and amongst many existing and potential Japanese investors was also tarnished. Many foreign companies present in Indonesia fear that if the dispute was allowed to deteriorate further, or worse, if as a result Sony had to close down its production facilities in Indonesia, similar industrial action by the union could affect smaller companies in the industry.

## **5 STRUCTURAL CHALLENGES**

There are a number of structural challenges faced by the electronics industry in Indonesia. First, foreign components firms have been performing well in terms of exports but the development of the domestic industry has been adversely affected by the Crisis (Tables 9 and 23). From the data in section 3, it is clear that a downturn of production began in 1997 and of exports in 1996 – both of which have been forcing structural change in the distribution of sub-sectoral output towards a greater importance of the components sub-sector.

During the period between 1997 and 2000, this structural change in the sub-sectoral composition output continued. The component segment not only survived the Crisis better, but also continued to show a positive growth (table 3).

### **5.1 Underdeveloped domestic components and parts manufacturers**

While there are few critical electronics and electric components produced by domestic firms, the export competitiveness of Indonesian component industries as a whole has no doubt improved in recent years. As we saw above, a large part of the improvement in the output and exports performance of the component sub-sector came from the affiliates of foreign MNEs, and the numbers of domestic components firms as well as the scope of

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<sup>11</sup> PT Sony Electronics Indonesia is one of the large Japanese end-product assemblers that invested in an export-oriented large-scale production facilities in Indonesia in the early 1990s' wave of FDI. Its currently manufactures video compact disc (VCD) players and television sets and prior to the strike had an average daily production of some 4,000 units. Sony is often seen as an innovative company and one of the leaders in setting the trends of electronics production, investment and management style by other Japanese electronics firms. Recently, Sony started to transform its management structure to meet the demands of e-commerce.

their activities has increased. This section provides an overview of the most dynamic sub-sector of electronics, namely the components and parts industry.

In contrast to the automobile, motor cycle and machinery industries, there are fewer indigenous supporting firms in electronics in Indonesia. It is estimated that the core electronics supporting industry directly employs 3-4,000 people. Most of the component suppliers to the large assemblers (such as Sony, Sanyo and others) that arrived in the 1990s are foreign SMEs. There are fewer domestic firms which are spin-offs of or suppliers to the more established MNE such as National Gobel and Sanyo which have been present in Indonesia since the early 1970s.

While there is some information on the electronics SMEs which support end-product assemblers, a full survey and documentation of the non-electronics (those namely in metal, plastics and other industries) supporting firms is not yet available. However, there are some unofficial data on these firms which might provide a sketch of their characteristics.

According to the 1996-97 Directory of IEEIA, there are some 27 of 41 (65%) companies with domestic-majority ownership.<sup>12</sup> Some these companies are in the electronics components industry, while others are located in *related industries* such as plastic injection/moulding making, metal parts, and packaging.

More recent data available from IEEIA for 2000 suggests that, in terms of plant numbers, there are still more domestic firms (73%) than foreign firms (27%) in the total of electronics and non-electronics components firms (Table 20). The largest number of domestic firms are in metal, plastic and chemical parts sub-sectors while the largest number of foreign firms are in electric, raw material and plastic parts sub-sectors. This suggest that there is some tendency towards specialisation in component manufacture.

While data on their output, exports and cost of production which could shed light on their relative economic importance are not yet available, the recent data on 328 electronics and non-electronics components firms suggest that, in the component sub-sector, there is a significant number of foreign firms in Indonesia, with Japanese firms forming the majority followed by Korean firms.

While the above data may be incomplete (with a possible under-representation of Batam), further research can be conducted on the basis of this data to determine in more detail the characteristics of electronics and non-electronics components firms, and the mapping of their inter-linkages and clusters.

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<sup>12</sup> Some the companies listed in the 1996-97 Directory of IEEIA are by definition in electronics components industry such as printed circuit board (PCB, 1 firm), integrated circuit (IC, 2 firms), loudspeaker/speaker system and box (4 firms), telescopic antenna, (2 firms), professional electronics (1 firm), electronic cable (1 firm), quartz crystal (2 firms), transformers (2 firms), compressor (1 firm), cathode ray tube (CRT, 2 firms), ornament/name-plate/control-panel/component-tag/promotion&cift-items (1 firm), wide-range components (7 firms), audio-video mechanism (1 firm). However, others are located in *related industries* such as plastic injection/moulding making (5 firms), metal parts (4 firms), packaging (3 firms).

### 5.1.1 Regional concentration without extensive local sourcing of components

Turning to an overview of the geographical location of the manufacturing plants of the above 328 firms, their largest concentration appears to be located in the 'Other (parts of) West Java area (14%), followed by North Jakarta (13%), West Jakarta (12%) and Bekasi (12%) (see Table 21). In total, plants located in the Greater Jakarta (*Jabotabek*) form the largest concentration (83%) of the total of core electronics and related parts firms. A similar conclusion can be reached concerning the location of head offices of parts firms, since 88% of their head offices are located in the Greater Jakarta area (Table 22).

The underlying question on the efficacy of regional concentration or geographical clustering for the electronics industry is difficult to answer for an industry with so many products and intermediate assembly processes, not to mention the numerous sub-sectors of very different labour- and technology-intensities. However, some indications can be found. With respect to local sourcing in electronics, it has been suggested that the economies of local content sourcing<sup>13</sup> vary significantly with:

- (d) the type of electronics products; for example, semiconductor assembly and testing is likely to have much lower local content economies than PC assembly;
- (e) the nature of the intermediate inputs concerned; for example, direct parts vs. tool and die making services;
- (f) technology complexity, or to what extent the competitive context changes over time; for example, as a component becomes increasingly complex and expensive (e.g. disk media) and assembly yield becomes an important differentiating factor, close geographic proximity with the manufacturers (hard disk drive assemblers) becomes more important to improve responsiveness and to fix yield problems;
- (g) maturing products have an opposite trend: as a component technology between the supply base and the usage point may decrease (Wong 1998: 7).

Most of the products manufactured in Indonesia tend to be mature products and most of the assembling processes tends to be of low to medium technology level. This suggests that geographical concentration of supporting SMEs near end-products assemblers may be less relevant to the efficiency of assemblers. However, if we include considerations relating to the 'inbound logistics related to the procurement of materials, parts and components' as well as 'outbound logistics' (Ernst and O'Connor 1992: 32) including the ease to export, assembler firms – particularly affiliates of Japanese and Korean MNEs – in general appear to have a preference locally source as much of their raw material, parts and components as possible, provided that these meet their quality and delivery requirements.

Unlike consumer electronics assemblers which tend to be large MNE foreign firms, many component manufacturers are smaller specialist firms. Some may have ties with MNE groups or 'keiretsu', but many do not have the international organisation of MNEs. Japanese firms, in particular, have networks of many SME subcontractors that often set

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<sup>13</sup> The question of economies of local sourcing relates to whether there are 'inherent advantages in locating the supply base in close geographic proximity to the usage point, or do economies of scale favour concentration of the supply base at one or a few locations globally, even if these are quite distant from the usage points' (Wong 1998:6).

up plants near to each other. One critical success factor of Japanese and Korean consumer electronics firms has been the close proximity of their suppliers which bring advantages of free information flows and better service which can be critical in the face of rapid change (Reichter 1999: 25). Hence, while there is geographical concentration in the Indonesia electronics industry in several key regions but they are evidently without extensive component production base given the relatively low local sourcing as indicated by the available data (Table 9 and 10).

### **5.1.2 High but declining import dependence and greater local sourcing for less 'bulkier products'**

In most cases of component sourcing of products which are relatively small in size and have low transport cost (such as small passive components or relatively cheap active components), the need to have suppliers geographically close may not be strong. The relatively low transport cost of bringing such components from overseas (for example from Malaysia and Singapore) in large quantities from large scale producers may result in reducing the relevance of cluster development of part makers for nearby assemblers. Nevertheless, the fact that there is a significant number of core electronics and related components and parts firms already present in the Greater Jakarta region as seen above suggest that there is greater local sourcing in recent years.

Due to transportation costs consideration, manufacturing of bulkier electronics products tend to rely on greater local sourcing. Most of the domestic and foreign components firms in Indonesia are involved in supplying bulkier products (Table 10) such as plastic moulding, metal and machining parts as well as supplementary materials such as Styrofoam and exterior carton boxes for packaging (JICA 2000: 10-10-10-25). Together with automotive and machinery, these electronic sub-sectors serve the domestic market well and are indirect exporters as many of these electronics supply export-oriented assemblers.

Maturing smaller products have an opposite trend: value added in Indonesia by Japanese MNEs is often lower than the value of critical components, rendering them 'pure' assembly operations in many of these electronics segments, particularly those with high value but small-sized and less 'bulky' products. However, there are also suggestions that labour-intensive processes often are chosen because capital goods to automate production processes is very costly (e.g. the cost for an integrated-chip insertion machine starts at \$300,000) and it is cheaper to use manual assembling methods over the short- to medium-term (5 years).

Most foreign assemblers and parts manufacturers in Indonesia possess efficient networks of suppliers in the East Asian region. They prefer to use parts made by firms in the same MNE group as the main assembler firms and sourced through their International Purchasing Office (IPO) based in Singapore or Malaysia. For example, in the production of videocassette recorders only 24% is procured in Indonesia and around 10% is procured

from firms outside the same group of firms; in bulkier electronics goods such as colour TV sets, particularly larger models such as the 20 inch CTV, over 75% of parts are procured locally since cathode ray tubes are produced in the country.

Turning to the core electronics components and parts manufacturing firms, recent data from MOIT for the period 1995-1998 (Tables 23 and 24) for 110 firms suggest the following trends:

(i) Since 1996 there has been a growth in the components production, workforce and value added. The data for production and exports is consistent with the increasing trend in production and exports in components and parts between 1995 and 1997, but their magnitudes are less than other published data (Table 2 and 3 above). Similarly, the rising trend in employment is also consistent with other published data. However, the numbers are far greater than those for the same period as shown in Table 7.

(ii) Turning to exports, the MOIT data (Table 23) show a decline in exports from \$539.5 million 1996 to \$469.4 million in 1998 which is inconsistent with the BPS data (Table 3). The latter shows an increase in exports from \$960 million in 1995 to \$1.464 billion in 1998 and \$ 2.076 billion in 1999.<sup>14</sup> The two respective data sets, however, show a similar trend of declining imports of electronics components, with a particularly sharp drop in 1998. An estimation of 'real' electronics component imports shows a persistent decline since early 1997 (see Figure 3).

(ii) The MOIT data (Table 23) shows that import dependence of component firms persistently declined from 93% in 1995 to 83.9% in 1997 but stayed almost constant at 84.6% in 1998'. This trend is comparable with the processed data obtained from BPS (with a larger sample in Table 9) but only for the years 1996 and 1998. The BPS data suggests that for domestic firms in the component segment (ISIC 38324), the imported input content more than doubled from 36% in 1990 to 76% in 1993 but fell from drastically from 83% in 1996 to 65% in 1998. For foreign firms, however, the imported input content fell from 95% in 1990 to 88% in 1993 but remained the same at 92% in 1996 and in 1998.

(iii) In the MOIT data (Table 24), there is a significant change in the ownership of component manufacturing firms after the Crisis. Foreign (*PMA* facility) firms increased in numbers from 56 firm in 1995 to 101 firm in 1997 but fell drastically to 16 in 1998. Domestic (*PMDN* facility) firms followed a similar trend in their numbers which increased from 21 in 1995 to 31 in 1997 but fell to a single firm in 1998. Nevertheless, this drastic reduction is accompanied by a growth in the other type of domestic firms, namely in the non-facility firms, from 33 in 1995 to 40 in 1997; however in 1998, there was a less drastic reduction in their numbers to 15 firms. Foreign *PMA* firms in 1998 still make up 50% of the total number of component firms, but the non-facility clearly is playing a greater role (47% of total).

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<sup>14</sup> The difference in exports trend in the two data sets could be due to the different classification use, namely the difference between the ISIC and HS trade data classification.

(iv) as in the IEEIA data, the MOIT data suggest that a large proportion of firms are located in West Java (namely in Bekasi and Tangerang and adjacent area) and in Riau (namely on the Batam island); but in both areas there has been drastic reductions between 1997 and 1998.<sup>15</sup>

Indonesian manufacturing generally suffers from a perennial problem of shallow industrial depth and high import dependence. While there is a great need for more current and reliable firm-level data, the above overview of the parts and components segment suggests that import content has been declining in recent years but that there is a drastic reduction in the numbers of both foreign and domestic component firms. There is some indication that there were greater numbers of less sophisticated and bulkier electronics components prior to the Crisis. However, the most recent evidence on the reduction in firm numbers suggests that special efforts must be made to identify and induce foreign assemblers and their component SMEs to co-relocate to Indonesia.

### **5.1.3 ‘Shallow’ industrial depth, low-value adding and limited range of products**

A more recent detailed study by a Japanese agency (JICA 2000: 10-15–10-25) which focuses on Japanese electronics firms suggests that the electronics components industry still suffers from shallow industrial depth, low-value adding and a limited range of products. Based mainly on extensive field survey of Japanese firms, the study details the trend in the key sub-sectors of electronics components:

(i) in electronics parts:

While the situation varies with particular products, local procurement of the critical high-value added parts are mainly from fellow foreign suppliers – either abroad or in Indonesia. For example, in the case of VCRs – until recently the largest exported electronic item – by a Japanese firm, 44% of critical parts are procured from Singapore and Malaysia. The remaining 24% of critical parts (tuners and video heads) are made ‘in house’ in Indonesia and 28% of other components (power transformer, plastic cabinet and mechanical components) are procured in Indonesia from subsidiaries belonging to the same group. The parts that are sourced locally from domestic firms are printed circuit boards, packing styrene foam, corrugated cardboard boxes, the wire harness and power cords; these, however, amount to less than 4% of the total material cost.<sup>16</sup>

In the case of colour TV production by Japanese firms, local sourcing depends to a high degree on the particular size. Critical parts such as tuner, flyback transformer and deflection yoke are produced by local firms belonging to the same group as the main

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<sup>15</sup> While the IEEIA list above covering core electric and related parts has a larger sample (328 firms, Table 20-22) than the MOIT list (32 firms in 1998, see Table 24), it has no coverage of firms in Batam and other locations in Indonesia. The IEEIA data does not provide the details of firm status (no listing of PMDN, PMA or Non-Facility status of firms); the BPS data (Table 9) however has a sample of 181 firms in the year 2000.

<sup>16</sup> The report argues that VCRs are the most important product for Indonesia in term of its total electronics exports which might continue for the foreseeable future, and that VCRs have a typical distribution share of electronic, electrical and other components such that the above trend could may well continue into the foreseeable future for all of electronics (JICA 2000: 10-17). CTV is the second largest export product after VCR.

Japanese assemblers; plastic cabinets and plastic parts are produced by other Japanese firms in Indonesia. These parts make up about 75% of local content (the most expensive part, namely CRT/TV-tubes, is produced locally) while 23% of electric and electronics parts are imported through the Singapore IPO and sourced from the region. While no electronics and electric parts are sourced from local firms, metal mechanical parts, styrene foam, carton boxes and packing materials are sourced locally but these amount only to 2% of the total cost (JICA 2000: 10-16 – 10-18).

(ii) in electrical parts:

To obtain the procurement trend of electrical components by Japanese firms, the JICA study used a Japanese refrigerator plant as an example. The electric parts (thermostat, fan timer and fan motor) and mechanical parts (drier, evaporator, door gasket) are mainly supplied from six domestic and foreign firms in Indonesia but these firms in turn import the critical parts for their components from Japan, China, Korea and Thailand (no detailed sourcing percentages are provided). Since both electric and mechanical parts are bulky, most assemblers try to co-locate their suppliers in Indonesia. Domestic assembly of refrigerators appear to have a relatively high local sourcing of 79% (see Table 10).

(iii) in related plastic moulding parts:

There is extensive local sourcing of moulded cabinets and parts, however the technologies and skills for making moulding dies and the modification and repairing of moulding injection machines is very limited in Indonesia. While there is great scope for local sourcing of many more moulded parts, such as plastic resins (the material for moulding injection) which are made in Indonesia as a natural by-product of oil. Indonesian plastic resin are slightly cheaper (2-3%) than imports but products from domestic firms are often rejected since they are perceived to lack uniformity and quality as well as to be unsuitable for high volume exports by Japanese assemblers. The case of the uncompetitive Indonesian plastic resin clearly illustrates up-stream inefficiency combined with poor production technology of domestic producers.

(iv) supplementary and packing materials:

Most MNEs and local assemblers rely on local procurement for packing materials but there is a concern related to the high moisture content in styrofoam, the poor print ink durability on the exterior carton boxes, and the lack of use of recycled materials.

Given there are a large number of export-oriented foreign assembly firms which maintained their presence after the Crisis, there are several suggestions made by the JICA study (JICA 200: 10-32 – 10-34) to overcome the problem of shallow industrial depth. These are to encourage MNEs to increase their local critical component production, to increase local participation in components joint-ventures and to improve the match-making of local and foreign SMEs engaged in component productions, together with government measures to improve export-competitiveness of the supporting industries.

While recent increases in components production and exports have been encouraging, most of this increase has come from a small number of foreign component firms producing high value-added critical parts such as VCD tuners and heads, TV tubes or

CRTs, transformers, DC motors, crystal oscillators or rechargeable batteries. Other components which have attained export competitiveness in Indonesia are parts for audio tapes and speakers. While these appear to enjoy greater local sourcing in recent years after the Crisis, there is a need to improve in technological capability of local components and parts.

#### **5.1.4 Increased uncertainty due to changes in the trade, political and legal regime**

The international competitiveness of the Indonesian electronics industry depends a great deal on foreign investments. A recent McKinsey report on this industry suggest that the output of this industry in anyone year is highly correlated with the previous inflow of FDI. The flow of FDI, in turn, heavily depends on the investment climate and degree of confidence by foreign and domestic investors.<sup>17</sup> This section reviews some of the more important factors that affect the investment climate, particularly those that specifically affect the industry.

The Indonesian government has previously acknowledged the important role of electronics components and parts and since the early 1990s, it has provided lower tariffs and better facilities to import electronics components. Since 1993, the government has put in place the *KB/EPTEs* program (or their more recent derivatives) which has assisted the local assemblers with cheaper and easier access components.<sup>18</sup>

Based on a Ministerial Decree issued in 1997 (*KMK No. 659/97*), most components and parts products manufactured by indirect exporters were subject to a 0% import tariff rate on components with exception to those in the official tariff list (*BTBMI*).<sup>19</sup> For revenue raising purposes, however, a new Ministerial Decree (*KMK No. 98/2000*) in March 2000 stated that tariff duty for most components are now set at 5%, and those with tariff rates below 5% would be subject to the rates listed in the *BTBMI*. These recent developments have dismayed many domestic and foreign firms. The electronics industry association, the IEEIA, maintained that it was not consulted about the new ministerial ruling. They maintained that higher tariffs on electronics components adversely affect both component makers and assemblers resulting in a loss of competitiveness with respect to other countries in the region.

Small differences or lower prices of Indonesian-made components (even if they are made by other foreign parts makers in Indonesia) can be attractive to local MNE assemblers. However, if there are unpredictable increases in component prices, compounded by greater political uncertainties in Indonesia, many MNEs would prefer to import components from Malaysia or elsewhere in the AFTA region. This is also the case for domestic firms that assemble TVs or refrigerators for the domestic market and have to

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<sup>17</sup> A. Soebroto (President of PT. Panggung Electric Corp.), 'Improving the competitiveness of the Indonesian Electronics Industry', unpublished paper, 5 August 1999 (in Indonesian).

<sup>18</sup> Some of the recent initiatives are known as *PKB* – bonded management companies – or *PDKB* – licencees located in a bonded zone – where companies can then claim a duty payment rebate from *BAPEKSTA* for the raw materials and parts that they have purchased.

<sup>19</sup> The official tariff is stipulated according to the Indonesian Tariff Book (*Buku Tarif Bea Masuk Indonesia, BTBMI*).

import critical components such as CRT/TV tubes and compressors from overseas even though these critical components are made in Indonesia.<sup>20</sup>

There is no doubt that foreign assembly firms which have established their production bases in Indonesia are attempting to reduce their cost and would like to increase their local sourcing, but since there are only few local manufacturers, they are forced to depend on imported parts from abroad. Some of the demand for components by foreign affiliates should be met by local component makers if they are able to produce at a competitive price, and to meet the technological and delivery standards. The catch-up 'game' becomes a lot easier if local component manufacturers can do it in partnership with foreign affiliates. However, in order to do that there needs to be a predictable and competitive tariff structure and an open regulatory environment.

The above ministerial decree issued this year is compounding fears on the part of investors that some ASEAN members are backsliding on their commitment on trade liberalisation made in 1992. In that year, Indonesia along with other members agreed to work towards the Common Effective Preferential Tariff (CEPT) scheme. In 1998, ASEAN members agreed to eliminate all import duties by 2010 for the original six ASEAN Free Trade Area (AFTA) participants, and by 2015 for the four newer members (Vietnam, Cambodia, Laos and Myanmar). In November 2000, a meeting of ASEAN leaders signed an agreement allowing members to backtrack on their earlier trade liberalisation commitments. By allowing Malaysia a two-year reprieve before it has to cut car import tariffs, the opportunity is now there for other members to take advantage of the exemption clause to delay opening up sensitive industrial sectors (*Jakarta Post*, 23 November 2000). As a result, the commitment to start AFTA for ASEAN founding members in 2002 may be diluted. The backsliding could increase uncertainty at a time when Indonesia, like many other ASEAN members, is badly in need of foreign investors to assist the recovery from the 1997 economic crisis.

In Indonesia's case there are additional uncertainties faced by foreign investors. Throughout 1998 and 1999, political uncertainties lead many investors to take a 'wait and see' approach to investment. The current government is seen as facing many difficulties as the political system is at a transitional stage between an authoritarian government and a more democratic one. Compared to the period prior to the onset of the 1997 Crisis, after the disturbances of May 1998 there have been more labour disputes, and more (sometimes serious) breakdowns of security, law and order (including the Sony case as outline above). There is also a perception of political turmoil with frequent riots and violent demonstrations. The impending decentralisation of which formally starts in 2001 compound the general feeling uncertainties with respect to the relationship between central government and local administration, particularly in relation to the investment approval agency (BKPM and its regional counterparts BKPMD).<sup>21</sup>

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<sup>20</sup> Almost all domestically-owned consumer electronics assembly factories import sub-assembled kits from China, the exception are the affiliates from Japan and Korea (interview, July 2000).

<sup>21</sup> Implicit in the new Government Regulation No. 25/2000 concerning decentralisation is the empowerment of the regions to approve or reject investment proposals. However, the authority to provide licenses to strategic and high-tech industries remain a central prerogative (Soesastro and Thee 2000).

The above factors are sources of great concern to many foreign investors and firms already in Indonesia and are reflected by the persistent low value of the rupiah. The new government installed since October 1999 has made several attempts to attract new FDI into the country, or to repatriate domestic capital which fled the country after the riots of May 1998. Measures included streamlining the investment licensing process, the offer of tax holiday, , the offer of tax holidays, and a further simplification of the investment licensing process and of the Negative List for Investment.

Notwithstanding the perceived difficulties outlined above, the value of foreign investment approvals during the period between January and October 2000 surged by about 30% compared to the same period in the previous year, indicating greater foreign confidence.<sup>22</sup> Most of the recent investments in electronics, however, tend to be expansion investments by existing firms rather than new investments.<sup>23</sup>

The development of an internationally competitive Indonesian electronics industry requires substantial inflows of capital, resources and technology. Foreign firms are not only a valuable source of technology and capital but can also provide important channels for accessing foreign markets. In order to attract long-term FDI, the Indonesian government needs to consider the 'valid complaints of foreign and domestic investors about various cumbersome administrative and time-consuming procedures and the attendant facilitation costs associated with these procedures, the high costs of infrastructure and acquiring land' and give top priority to 'eradicate corruption' which has hurt both FDI and domestic investment (Soesastro and Thee 2000: 22).

## 6 ORGANIZATIONAL CHALLENGES

This section seeks to identify organisational factors which inhibit Indonesia from becoming more internationally competitive in the global electronics industry.

### 6.1 Electronics trade based on low value-added products

In the last three decades of the twentieth century, the global electronics production has grown more rapidly than any other category of industrial production and it has been characterised by rapidly changing technologies that have dramatically reduced product life cycles (Ernst 1998). As Porter (1990) has illustrated, competitive advantage is a dynamic phenomenon and it evolves in response to factors both internal and external to a particular country.<sup>24</sup> A country whose firms are competitive in a particular segment may

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<sup>22</sup> The total approved foreign investment reached a peak of \$33.8 billion in 1997, fell to \$13.6 billion in 1998 and dropped again to \$10.8 billion in 1999. The value of FDI approvals during the January-October period reached a total of US\$14.6 billion according to BKPM.

<sup>23</sup> At least three major electronics firms are planning to expand their existing operations in 2001: PT Sony Electronics Indonesia, PT Matsushita Kotobuki Electronics Peripherals Indonesia, and computer-printer manufacturer PT Epson Indonesia Industry (*Jakarta Post*, 1 November 2000).

<sup>24</sup> Porter identified five broad sets of factors in a company's domestic environment which enable it to catch-up: (1) markets for production factors, in particular advanced factors like skilled and educated labour and venture capital; (2) the nature of demand for electronics goods and services; (3) firm strategies and industry structure; (4) the state of development of supplier networks and related industries; and (5) the policy, institutional and regulatory framework for developing an electronics industry.

lose that advantage if other countries' firms are successful in 'catching up'. A latecomer firm's ability to catch up will depend in turn on whether it can come up with new products and new process technologies.

Under such conditions, no single company, or even any single country is capable of being entirely self-sufficient in electronics. For high technology products, it has been identified that 'strategic alliances among firms increased competitiveness in electronics as a means to acquire needed technologies and to share R&D and manufacturing costs as well as to expand access to markets with other major players in electronics' (World Bank 1990: i). There is some suggestions that if exports are based on a narrow range of products and few markets, this is disadvantageous for an industry (*PAPIPTEK-LIPI, 1996*). However, in the global electronics market there has been a pronounced tendency for product specialisation based on a few high value added products. For example, while producing a wide range of products, Korean firms have relied on TVs, VCDs and microwaves as well as DRAM memory chips at least in the early phase of their development for the main sources of cash flow; likewise, Taiwanese firms in microcomputers, laptops and peripherals; Singapore became the largest exporter of hard disk drives for computers in the world; and Malaysia became one of the largest exporters of semiconductors. A country may be competitively strong in one or more areas but may well have weaknesses in others. As Ernst and O'Connor (1992: 229) stated: 'Even Japan, which is often held up as the paragon of competitiveness in advanced electronics, has weaknesses in penetrating world markets for personal computers and in software developments.'

During the last two decades, Indonesia has experienced an influx of offshore relocation investments in electronics by East Asian and other MNEs. They established basic capabilities of manufacturing plants of less sophisticated and labour intensive electronics products. The evidence on Indonesia's export and import concentration in 1997 suggests that while Singapore is a major destination for some electronics exports, there are several other countries that are important export markets, such as Japan, the United States, Korea, Malaysia and others. Similar situation with import source countries is similar (See Table 25). The sourcing of components and the organisation of the exports markets for electronics products can be suspected to be influenced highly by the business strategies of the dominant MNEs, and by international links of Indonesian conglomerates active in the Indonesian electronics industry.<sup>25</sup> Nevertheless, the key observation to make is that while Indonesia's electronics trade is not overly concentrated in one or two markets, the types of products that it produces tend to be low value-added (mainly sub-assembly products) , while most of the imported electronics products are high value-added critical active components which are not produced in the country (CRTs being the exception). One of the main product groups that is currently assembled or manufactured in neighbouring ASEAN countries but only is small quantities in Indonesia is integrated circuits (or semiconductors). IC's comprise the single, most critical component in electronics and they dictate product obsolescence.<sup>26</sup>

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<sup>25</sup> There are high levels of concentration of MNEs in export-oriented production in Indonesia. It is estimated that 9 'groups of firms' (these are a collection of Japanese or Korean firms belonging to the same parent or *keiretsu*) accounted for more than 70% of the total output for exports in 1997 (Sulaiman 1999).

<sup>26</sup> Operations of MNEs in developing countries are limited to assembly (packaging) and testing activities involving moderately capital and labour intensive (SRII 1992: 5-7).

## 6.2 Weak capability for technological absorption and development

While the affiliates of MNEs in Indonesia have established solid reputations for being able to meet the technical specifications, product quality and cost requirements of the international market, the sourcing decisions by their IPOs and headquarters today are not influenced by these factors alone. These global supplier firms increasingly find themselves under pressure to establish production bases which are able provide services related to design, testing, component qualification and prototyping capabilities as well as access to markets.

Successful Asian NIEs firms (from Korea, Taiwan, Hong Kong and Singapore) and second-tier NIEs (from Malaysian and others) have achieved world class capabilities and manage to build a higher value added production base in their home countries that can further move them up the 'ladder' of value added. Indonesian domestic firms in turn have opportunities in low-end products and processes (that would no longer be economical in NIEs) by moving up the ladder of value added themselves. This requires that they are competitive with respect to delivery requirements, product quality, price and performance. The Indonesian electronics industry, given the weak technological capabilities of its domestic firms, is yet to establish the basic building blocks for the industry before moving up the ladder of value added in electronics. While some have excelled, many domestic SMEs have yet to prove themselves to be reliable suppliers of basic components and production equipment, to meet rigorous quality standards, and to successfully assimilate imported technology (Section 6.1).

Several studies on firm-level technological capabilities in the Indonesian electronics industry concluded that:

(1) There is a lack of connection between building up indigenous technological capability and export growth:

After the regulatory and incentive regime changed as a result of deregulatory measures since 1991, exports of electronics increased rapidly. In 1992, an estimated two thirds of exports are accounted for by exports from majority foreign owned firms located both on Batam and Java (Thee and Pangestu 1993: 91). This proportion could well have increased until 1997. In many cases, the foreign partner is in control at the pre-investment and project execution stage; as a result, there is very little connection as yet between building up of indigenous technological capability and export growth. The situation in the years after the 1997 crisis would not have altered this situation much. One exception is that whenever the domestic partners in joint ventures are in financial difficulties, foreign partners tend to take over a greater equity, if not buying out the entire joint venture, suggesting an even greater control by the foreign partner in most cases.

(2) Large domestic companies and majority owned joint ventures, almost all in the consumer segment, have modern production facilities:

These firms have developed more technological capabilities than majority owned export oriented joint ventures, typically by attempting to develop their own marketing, minor

and major changes, and design capabilities. The domestic firms have active R&D departments and have developed product and circuit design capability. The best example is PT Hartono Istana Electronics, producing colour TV and audio products under the Polytron brand. The study referred to above noted that, for such a large domestic firm, the 'timing of entry' (the time when they entered the consumer electronics business, that is when they were able to start to compete with most of the principal MNEs) and the 'individual company history' and 'strategic alliances with foreign partners' played important roles for such companies. These factors enable them to survive the competition and to develop superior technological capabilities (Thee and Pangestu 1993: 92-3).

Many other Indonesian domestic companies who do not have foreign strategic alliance, however, suffer from a weakness in finding OEM contracts in that they are unable to export in sufficient volumes (especially with regard to market access) and unable to keep up with technology (Thee and Pangestu 1993: 91-2). Nevertheless, more recently some domestic companies were able to explore new export markets in Europe and the Middle East on OEM basis (until the Crisis in 1997). Others are able to directly supply to chain stores and large supermarket chains in the United States. OEM business is one of the best ways to acquire advance technology, management know how of high volume production and quality control (JICA 2000: 10-28).

(3) Large affiliates of MNEs in general do no or very little R&D:

Almost all affiliates which entered assembly and manufacture in Indonesia do not conduct their own R&D, such as major product change or design capacity development.<sup>27</sup> MNEs such as Sony, Aiwa, LGE, Samsung usually have their R&D facilities in their home countries and rely on their overseas partner for most of their technical needs. Their marketing is also conducted either by their IPO in Singapore or by headquarters. In Indonesia, most of their manufacturing processes are done either 'under one roof' or within one 'business group', from assembly of PCBs, plastic injection, to packaging and labelling. Fieldwork interviews suggest that automotive and other basic metal industry have layers in their supplier subcontracting networks while in the electronics industry, subcontracting is not common.

(4) Smaller domestic companies assembling have not moved much beyond the CKD assembly stages:

Domestic companies that assemble consumer goods, personal computers, telephone sets and sub-assembling products tend to mainly be engaged in batch production, with no discernible organised process. The danger of such operations is that as technology changes more rapidly, they will be less able to respond effectively. Most such firms are largely dependent on imported components (SRII 1992: 5-1).

An overall assessment on technological capabilities of domestically owned firms based on past (SRII 1992) and recent reports (JICA 2000: 10-13) as well as field interviews suggest that, with the exception of some large firms, the production technology in most Indonesian domestic firms are on average satisfactory, but their product technologies are

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<sup>27</sup> One exception is Matsushita affiliate the National Gobel group which, at least prior to the 1997 crisis, did some minor product change R&D.

weak across the board. Amongst all electronics segments, large consumer electronics firms appear to have the best and most modern plants in Indonesia. Their production technologies covering line layout, assembly skills (including soldering methods), inventory control and process quality control can be rated from good to very good. The product technology of such firms have been rated as fair on average as there is some limited capability to modify or improve product designs. Plants which are export-oriented tend to have total quality assurance and functional testing.

The business/industrial electronics segment is based on a limited variety of products, mainly telecommunications equipment and PC assembly. The latter, dominated by small-medium domestic companies, is growing as the local PC market is healthy and estimated to be growing by over 40% in the year 2000 (*Bisnis Indonesia*, 10 October 2000). With the exception of Epson's printer assembly plant, there is very little manufacture of electronic equipment, industrial control or medical electronics equipment. The largest producer of telecommunication equipment is PT INTI, a state-owned corporation which survives by serving a niche market of non-discriminating buyers. Thus it is generally perceived that PT INTI does not have comparable quality, reliability and safety standards to those firms which manufacture for the export market.

In the case of the components electronics segment, apart from plants of MNE affiliates that make critical components production, there are some domestic firms which have adequate technological capabilities in basic electromechanical sub-assembly parts such as speakers and antennas (section 6.1). An important active components assembly activity is in integrated circuit (IC) or semiconductor assembly and testing. Notably Malaysia and more recently the Philippines have been successful in attracting FDI in this field. Indonesia was able to attract three MNEs who made their commitment to locate their IC assembly process here just before the 1997 Crisis. As a result of the Crisis, only one is continuing with the investment and there are few indications that the investment in the other two plants will be realised as yet.

There is little doubt that foreign firms possess better production efficiency than their domestic counterparts in all electronics segments. The figures on worker productivity (Table 9) in the consumer, components and household appliances segments based on the value added per worker data in the years 1990, 1993, 1996 and 1998 appear to confirm this trend. Foreign firms appear to have higher productivity than their domestic counterparts. Furthermore, amongst foreign firms, those in the consumer electronics segment appear to have a higher productivity, and appear to have increased productivity after the Crisis.

An assessment by a team of engineers of the question of technology transfer in Indonesia concluded that 'the effects of a lack of systematic technology effort in the Indonesian electronics industry has been costly. There is much redundant technology transfer from overseas such that most technology that tends to be transferred in joint-ventures are on the need-to-know basis, no more. There is excessive reliance by the domestic firms on imported components and sub-assemblies because the design skills – especially the components selection and integration skills, are not transferred' (SRII 1992: 5-4). Recent

field interviews of domestic firms (and their industry association representatives) appear to confirm such an assessment.

### **6.3 Weak supporting technical institutions and support infrastructure**

Mechanisms and institutions to facilitate the development of local technological capability have been identified as absolutely essential in the development of successful electronics industries in Taiwan and Korea (World Bank 1990, 1993). Institutions include those which specifically provide services related to design, testing, component qualification and prototyping capabilities as well as service to improve access to markets.

In Indonesia, there are no government or private R&D institutes that provides technical services to the electronics industry, particularly to assist the SMEs. There are some institutions that are engaged in limited R&D activities in electronics with the potential to support the activities of electronics firms – both large and SMEs – but these are yet to be fully realised.

#### **6.3.1 Inter University Research Centre on Microelectronics, the Institute of Technology Bandung (ITB)**

In 1986, the Centre was set up under a World Bank loan to undertake education, training and R&D activities in electronics. As the first centre of excellence on microelectronics in Indonesia, its function has been mainly in serving a number of other universities (running courses, seminars and some projects of industrial interest) with 5 laboratories (devices and processes, IC design, system and applications, manufacturing and microelectronics components).

The centre appears to have a more extensive program in the area of Information Technology (IT) and its applications in Indonesia are part of its core activity with various research program in computer network applications, commercial software, security, domain registration and emergency response system.

The centre is involved in a smaller number of commercial links relating to electronics hardware projects than in IT-related projects.<sup>28</sup> On the other hand, there are more projects relating to IT applications, namely e-commerce, internet security, networking devices, internet service provision.

There are issues relating to the activities of the Centre that could indicate some weaknesses:

(a) a relatively low number of publications in international referred journals;

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<sup>28</sup> For example, some of the commercial projects are currently 5 projects dealing with hardware product development running in 2000: with the National Signalling Council (LSN) on secure telephones, with PT Mecoindo on KWH-Meter error calculator device, with PT Telkom on an automated coin detection unit, and two projects with PT. PLN (state electricity enterprise) relating to electronics application devices.

(b) a modest output of well trained engineers capable of commercial product design and development who have taken further work in the electronics sector;

(c) few projects that co-ordinate activities in the non academically challenging area of 'reverse engineering' which has served other Asian countries (such as Japan, Korea, Taiwan and Singapore) well.

Nevertheless, the research that is conducted by the Centre is becoming more industry driven and it claims to have more than 11 commercial partners, including PT Omedata (semiconductor assembler), PT Indosat (satellite operator), PT Telkom (telecommunication carrier) and affiliates of some international companies such as IBM, Lotus, Schlumberger and Microsoft Indonesia.

### **6.3.2 State Enterprises (PT LEN Industri and PT INTI)**

Established in 1965 as National Electronic and Electrical Institute, PT LEN became an institute under the Academy of Sciences (LIPI). The organisation has evolved through several stages; it extended into a small-scale production of professional electronics (1980), producer of TV and earth stations (1983) and was restructured in 1986.<sup>29</sup> In 1990s, it became the state-owned PT LEN Industri under the strategic industry body BPIS until 1997 when it was restructured to become self-financing in 5 years. Previously LEN had capabilities in in-house component development and production of commercial and military products for niche markets of non-discriminating buyers,<sup>30</sup> but it now aims to become the centre of excellence in professional electronics and the component industry.

While plans to set up manufacturing capabilities in integrated circuits (limited wafer fabrication) to support the electronics industry are yet to come to fruition due to cost considerations, LEN has evolved from the previous model of technology acquisition in other state enterprises in Indonesia (based on an outdated model of state intervention characterised by direct control of R&D and production activity with state subsidies) to one which is more oriented to commercialisation to end-user state-firms as well as training programs.<sup>31</sup>

PT INTI (Industri Telekomunikasi Indonesia), is the leading state-enterprise in telecommunication equipment manufacturing in Indonesia. Since 1984 PT INTI has

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<sup>29</sup> In 1986, LEN was restructured to become TELEKOMA (R&D centre for telecommunications, strategic/military electronics, components and materials), TELIMEK (R&D centre for Mechatronics and Power Engineering), INKOM (R&D centre for informatics and computer sciences) and Pusat LEN (engineering and production unit).

<sup>30</sup> LEN used to carry out in-house component development and production of thin and thick film circuits, and hybrids for applications in telecommunications, automobile, medical, office electronics and home appliances. Facilities include mask making, thick film equipment, silicon processing equipment and others. LEN also produced radar, satellite communication equipment and other equipment for the military (SRI 1992: 5-10).

<sup>31</sup> LEN has been working with other companies and institutions such as BPPT, TVRI / RRI, PT. KAI, Department of Transportation, PT. TELKOM, PT. INKA, PT. PAL, PT. PINDAD, and Department of Defence to carry out various joint-development and manufacturing programs. Furthermore, LEN offers on the job training such as radio communication, basic electronics, ISO 9000 series, telecommunication system and TV transmitter to outside institutions.

pioneered the production of modest quality digital telephone exchanges and currently manufactures a range of other equipment, including customer premises equipment, transmission & mobile communication equipment.<sup>32</sup> In addition, the company also manufactures personal 'handyphone' system, in-house flexible access network system, PCB, mechanical and plastic parts as well as manufacturing, engineering and calibration services. To maintain an international standard of production, it has technical co-operation agreements with foreign manufacturers such as Siemens AG, BTM, TRT/Phillips, JRC and NEC, Ericsson, Alcatel and TTIC. PT INTI has also been concentrating on improving its activities as well as product designs, service systems, after-sales service, repair service, installation, and training and consultation. PT INTI also claims to support small-scale firms through its product calibration service. However, the extent of use of such service by electronics SMEs is expected to be minimal due to cost considerations and since such service is largely directed at telecommunication equipment testing.

While both LEN and PT INTI have become more commercially active in recent years, neither institution appears to provide sufficient technological support to a large number of SMEs in the electronics components segment. One reason for this is that they engage predominantly in the telecommunication equipment production and depend on government procurement.

### **6.3.3 Limited technical standards development**

There is a perception amongst most affiliates of MNEs and domestic firms in Indonesia that the technical standards system in Indonesia is lacking in competent and independent organisations that can provide quality and safety tests of locally produced electronics products. Furthermore, there is no effective enforcement mechanism in place for poor product standards or a lack of adequate manuals in the national language. As a way to curb the recent influx of parallel imports, the government issued a ministerial decree, stating that locally sold electronics products must be sold with an Indonesian product manual. In the aftermath, only very few products sold in the market meet this requirement and there is little in the way of official enforcement of such a decree.

The standard system of a country can support industry by: (i) formulating standards and codes for product and processes; (ii) implementation of calibration schemes for measuring equipment and instruments used in production; (iii) implementation of laboratory accreditation schemes to regulate laboratories testing and certification products.

There is fragmentation in the responsibility of standard formulation and implementation in Indonesia since such responsibilities are in the domain of individual ministries. In the area of electronics, the MOIT or specifically its organ, the Centre for Industrial Standardization (PUSTAN) is in charge of this responsibility and works in collaboration

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<sup>32</sup> PT INTI provides a calibration laboratory which can offer services to meet commercial needs for standard calibration techniques.

with the Directorate General of Metals, Machinery and Electronics (ILMEA). The National Standardisation Council (*Dewan Standarisasi Nasional*) oversees quality management formulation from international ISO standards into the local context, that is SNI standards (*Standar Nasional Indonesia*).<sup>33</sup>

A comprehensive nationwide calibration scheme or laboratory accreditation scheme for product testing and certification in Indonesia is co-ordinated by the Association of Calibration and Testing Laboratories (*ALKaPI, Asosiasi Laboratorium Kalibrasi dan Pengujian Indonesia*),

There are limited schemes for the engineering sector but these are yet to include the electronics industry. Such a move is essential not only to assure the quality of electronics products but also to keep potentially dangerous sub-standard products from entering the market or to ensure that electronics products are accepted into restrictive markets. Since 1992, exports to the European Union must show evidence of compliance with the ISO quality standards, and recently the eco-label requirement has been enforced in the EU. Thus a more comprehensive testing and certification of products and components is necessary to develop the local components requirement. Brand name products manufacturers in Indonesia or overseas only accept components which have been properly certified by a recognised organisation. Furthermore, enforcement of the product testing and certification process must clearly be carried out.

#### **6.4 Weak human resource development**

The Indonesian electronics industry today is still at its infancy where most of the current production is in the form of assembly operation with low value adding. The principal resource requirement, therefore, are skilled manpower rather than a large number of engineers.

Due to the overall low level of skilled manpower in Indonesia (albeit the educational level of the labour force is improving) and the even lower percentages joining industry (including the electronics sector),<sup>34</sup> companies have often found it difficult in obtaining skilled workers. A recent report suggested that ‘the current general secondary education, senior secondary technical vocational education, the post-secondary vocational technical education and the higher education systems (in Indonesia) do not meet the needs of the industry’ (JICA 2000).

Another report (JICA 1997: 3-132) which assesses the need for human resources of supporting industries in Indonesia further points to the following weaknesses:

(i) the geographical structure of the country inhibits labour mobility;

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<sup>33</sup> For example the ISO 9001 is a system of quality management, process control and verification requirement while the ISO 14001-14021 (eco-label) is an added system of quality environmental management and organisational control adopted in October 1996.

<sup>34</sup> The education level of the labour force in Indonesia is relatively low compared with other major Asian countries but it has been improving at a rapid pace. The share of workers with incomplete primary schooling among the total labour force dropped from 67% in 1980 to 46% in 1990 (JICA 1997: 3-121)

- (ii) there is no coordination among the ministries and related institutions for technical vocational training so that there is no standard models of industrial training which is tailored to the demands of industry; this further reduces labour mobility;
- (iii) education and training in high-level skills and in new technologies are not sufficiently provided and
- (iv) the responsibility for technical vocational training is mainly in the hands of the government; there is some technical training by the private sector in the electronics industry such as the Mas-Gobel Institute Foundation which was established in 1984 by Matsushita subsidiary PT National Gobel to provide extensive and systematic training for complex manufacturing processes and in the maintenance and repair of complex automated production equipment. However, most of those who are trained in this institute are workers which belong to large companies rather those from the supporting SMEs.

The electronics industry association (IEEIA) takes the view that the government could take a more active role in expanding the number of polytechnics (STM) with some specialisation in electronics to meet the growing needs of the industry. It is actively participating in the National Vocational Training Council (*Majelis Pendidikan Kejuruan Nasional*) in the chair position of the Electronics Working Group to develop the syllabus of technical education. There is also a Forum for Human Resource Managers (*Forum Untuk Urusan Personalia dan Umum*) which meets every three months, and which was reactivated in 1998 by IEEIA.

## **6.5 Fragmented responsibility for industrial and investment promotion**

In Indonesia, various aspects of industrial promotion and policy is shared among numerous agencies (JICA 2000). For example, there are sectoral agencies such as the Ministry of Industry and Trade in charge of industry and trade policy while the Ministry of Co-operatives and Small-scale Enterprises is responsible for small-scale industry. Tariff changes and VAT issues are dealt with by the Ministry of Finance. The National Development Planning Board is in charge of planning and resource allocation as well as approving and monitoring all industrial projects funded by bilateral, multilateral and national agencies. Finally, the Board for Investment (BPM, previously Ministry)<sup>35</sup> is responsible for the formulation of investment policies and the approval of foreign direct investment, and the Board of State-owned Enterprises is in charge for managing all state enterprises.

All ASEAN members and the emerging market economies in the world are competing for foreign direct investment (FDI). The fact that Indonesia has experienced a negative FDI flow (that is net divestments of FDI) to the amount of US\$360 million in 1998 and growing to US\$ 3.3 billion in 1999 (Soesastro and Thee 2000) suggest that there is a need to take a fresh and coordinated approach to attract FDI. Since FDI is vital to the process of recovery and particularly in the electronics industry. The responsibility of a new investment promotion under the BPM could be further enhanced by the establishment of a world-class investors program which implements and coordinates a proactive strategy of investor relations. Such promotion can build progressively stronger relations with the

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<sup>35</sup> In September 2000, the previous Ministerial status of the body was change to the Board for Investment.

global community of investors and lenders as well as specific industry associations overseas.

## **6.6 Lack of strategic marketing for promotion of exports**

The National Agency for Export Development (NAFED) is the government agency in Indonesia that is responsible for non-oil/gas export promotion, and dissemination of information. It is located within the MOIT and is expected to be the main body that promotes exports in the world markets and could assist particularly SMEs.

In the aftermath of the Crisis in 1997, NAFED was forced to close 13 Indonesian Trade Promotion Centres (ITPCs) overseas due to its financial difficulties and the organisation was restructured to become more market-oriented. It currently runs one secretariat and five centres.

In 1990, with the assistance of the Japanese government and under the MOIT, Indonesian Export Training Centres (IETCs) were established to provide education, training. It provides training in export-import management and various aspects of business practices to operate in the global market, and in English, Japanese and Chinese languages. Direct consultation (on quality control) and market opportunity information are also offered together with a Resource centre with Internet access for all trainees, attendees, participants and alumnus. Since its inception, the IETCs trained more than 12,000 people on modestly priced 'user-pays' courses. Recently, it is exploring the possibilities of opening up 4 other additional centres in several key province capitals in the second phase beginning in February 2001. Unfortunately, however, the focus of IETC activities covers only the furniture, rubber, textile and garment sectors but not the electronics or basic metal industrial sectors. However, given its success in these sectors, an extension of IETC activities to include participants from these sectors but also other related sectors such as the plastics, engineering and other industries could be considered.

## **6.7 Narrow focus of industrial association**

The interactions between the Indonesia Electronics and Electrical Industry Association (IEEIA) and government officials have covered a wide range of issues from human resources (see above) to matters relating to technology, investment promotion, taxation, regulation and other matters. During the period between 1992 and 1997, the association has been active with bi-monthly meetings as well as annual working meetings (RAKERNAS) involving the two members from the industry and government agencies including the MOIT where important issues are formally discussed.

While the association spends a large part of its lobbying efforts on the simplification of the bureaucratic procedures including tariff harmonisation, verification and the Follow-up Payment Request (*Tagihan Susulan*),<sup>36</sup> Luxury Goods Tax (*PPnBM*) and the reduction of tariffs on components and the EPTE (industrial estate) facilities, the association has

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<sup>36</sup> *Tagihan Susulan* (Follow-up Request for Payment) is put forward by the Customs Department after they verify the correct payment of tariffs and duties after the imported commodity has been delivered.

endeavoured to improve the industry structure through its comprehensive recommendations to the Directorate General of the Basic Metal and Electronics Industry from time to time. Some of its proposals in 1993 to improve the industry's international competitiveness that related to the EPTE facilities and the lowering of components tariffs were eventually accepted in 1995. The association supported the proposal from a consultant's report (SRII 1992) to promote foreign investment in CRT-TV tube plants.<sup>37</sup> One of the proposals that was accepted but could not be implemented due to the onset of the Crisis was the development of an Electronics Components Industrial Park (*Lingkungan Industri Komponen Elektronika, LIKE*) in Purwakarta, near Bekasi (west of Jakarta) where many electronics firms are located.

Various forms of public-private collaboration has taken place in the following areas:

- (i) investment promotion strategy where the association has worked together with MOIT and BKPM (including sending members) in the promotional trips to a number of countries including Japan, Korea and Taiwan to attract components and parts manufacturers to invest in Indonesia.
- (ii) environmental program to phase out the use of ozone depleting substances (ODS) in refrigerators and air-conditioners so that members follow the time table set by the government with the assistance of Montreal Protocol Fund;
- (iii) skills development program as outlined above;
- (iv) information exchange with electronics industry associations in East Asia;
- (v) participation in overseas activities with JETRO from Japan (Asian Industrial Exchange Program, Expert Group Meetings on Electro-Industries) and IAS-DEG from Germany (participation in the Munich Exhibition);
- (vi) publishing a bi-annual list of its members which is distributed domestically and overseas as well as publishing a bilingual (Indonesian/English) bulletin on recent developments (every two months until mid-1997) and short circular (after December 1998);
- (vii) to alleviate the impact of the Crisis, in June 1998, the IEEIA put forward the concerns of its member directly to the MOIT relating to the difficulties in obtaining working capital, letter of credit for importing components and raw materials, as well as problems relating to container shortage, GSP and labour issues. The association organised a forum to meet (bi-monthly) with the distributors of electronics products<sup>38</sup> (*Forum Komunikasi Marketing Gabungan Elektronika*) to exchange production/market data and ideas as a response to the May 1998 riots.

The Secretariat of the associations was improved during the 1993-97 period with the inclusion of a skilled journalist in the permanent staff (provided with an official car) and with the introduction of some computing capability. While the association now has an Internet site with some basic information, neither the short circular nor the bulletin has been made available on this site; and much useful information that could assist members as well as potential buyers/sellers or investor is yet to be provided on the site (such as a

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<sup>37</sup> Now Indonesia has two CRT plants: one owned by an Indonesia consortium joint-venture with Japan (PT Tossummit EDI) and another owned by LG Electronics (PT LG EDI).

<sup>38</sup> During the disturbances in May 1998, many electronics distributors (who are mainly of Chinese Indonesian backgrounds) suffered extensive loss of stock and property damage as a result of the burning of their shops and supermarket facilities.

complete listing of members with product, contact details as well as list of component suppliers, details of latest regulations and regional developments).

The coverage of membership of the electronics industry association is still very limited to mainly large firms (both foreign and domestic), and most electronics components and parts manufacturers (110 electronics supporting firms are registered with the MOIT in 2000) are not covered by the association. Parts and component suppliers from other non-electronics segments as well as from the packaging sector are not linked in to the association in any systematic way (329 electronics and non-electronics supporting firms are listed by the IEEIA in 2000). These form the bulk of the total (328-110= 218 firms are known to IEEAI, see Table 20-22). There is an understanding on the part of the secretariat that many of these SMEs are interested in maintaining a relationship with the IEEIA to market their products to its members. Nevertheless, the participation rates particularly from the Non-Facility (non-PMA, non-PMDN which is growing in numbers) is low and as a result the budget for activities often is inadequate. Given that the membership fees are relatively high, many SMEs may not be able to afford it.

While the perception of the effectiveness of the IEEIA in its work has been generally well regarded by the members interviewed, the executives of the association tend to come from large end-product companies rather than from SMEs from the supporting industries for electronics. In many cases, officers of the association are corporate executives who cannot give much time to organisational activities.

While the association has several committees in specialised areas (professional electronics, audio-video, household appliances, components supply, international/export market development and general), it does not appear to be engaged in any specific activity which focuses on productivity enhancement or mastery of product and process technology. This appears to be a major shortcoming but it is an area which is understandably difficult to tackle given the lack of funds and appropriate technical and teaching staff at the association.

Given that many domestic electronics firms are still facing difficulties in the aftermath of the 1997 Crisis and that the membership itself is dropping (section 3.1) rendered the association with less financial resources to recruit new members. There is an urgent need for an upgrading of the association's Internet capabilities<sup>39</sup>, data collection and information dissemination capabilities of the association, especially in the face of regional and global liberalisation. In other words, the focus of the activities of the industry association must be widened to include SMEs in the supporting industry. To do this, the association must show greater benefits for each individual company in participating as member. As a result, it is to become more of an effective forum to conduct public-private dialogue as well as to expand activities, which in turn increase the merits of participation.

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<sup>39</sup> The IEEIA has a home page on the Internet: [www.eeia-id.com](http://www.eeia-id.com) but information that is provided in it might not be of limited use for members in the area of marketing to end-product assemblers, or any information on productivity enhancement or mastery of product and process technology.

## 7 SUMMARY OF FINDINGS

Indonesian electronics has become an industry with a proven record of being an export performer since the late 1980s, and has shown enormous potential. While the last two to three years have been turbulent, the component electronics segment continued to be an export performer; however, those who enjoyed this growth have mainly been foreign MNE affiliates. While most foreign firms and domestic export oriented firms survived the East Asian crisis in 1997, many domestic firms and smaller SME suppliers have not.

A survey of the structural features of the industry during the last three years since the Crisis of 1997 suggests that most firms in the industry are yet to fully recover. The cleavage between the domestic-oriented segment and export-oriented segment, however, has grown wider. Most domestic-oriented electronics segments have suffered a fall in production and exports. A significant proportion of domestically-owned firms did not survive the Crisis and those remaining are faced with capital shortages, rapid technological change, and rising international competition, in particular the rising tide of illegal 'parallel' imports. Many firms that survived in supplying the domestic market did so by lowering their dependence on imported components – a silver lining in the Crisis. But despite the drastic devaluation of the rupiah, both foreign-owned and domestically-owned firms which are export oriented fared relatively better, particularly those that diversified their exports to non-Asian destinations. During the last three years, many firms – both domestic and foreign – have come under increasing pressure to maintain their market share against the flood of parallel imports, particularly from China. The potentially large domestic market contracted rapidly and languished in most of 1998, but by 1999 some expansion in domestic consumption of electronic goods began to take place. In recent years, a transformation of the structure of production and exports has taken place with components and parts playing a greater role. Although most exports have come from foreign firms, the domestic component has also strengthened.

Strengths of the industry can be found in its domestic market size, its proximity to Asia and in the presence in Indonesia of many world-class multinational enterprises (MNEs) which are engaged in end-product assembling and critical component manufacturing activities. These investments were made by East Asian and the U.S. firms during the boom years. Their continued presence testifies to the 'lock-in' advantages of the domestic market, such as sunk investments, and a trained workforce, given the experience of net disinvestment in the last two years after the Crisis throughout the manufacturing sector in Indonesia.

Turning to the immediate challenges for survival and the perennial weaknesses of the industry, it is found that broad structural changes after the Crisis were accompanied by greater foreign domination of the consumer and component industries, but not in the home electrical appliances sector. The immediate challenges facing the industry lie in 'leveling the playing field' against parallel imports, that is in establishing an effective tariff system that would ensure greater competition; and in bringing about renewed growth amongst the 'own brand' assembling firms and domestic component firms.

Longer-term perennial structural weaknesses (such as underdeveloped domestic components and parts manufacturers; and uncertainties in the trade, political and legal regime) and organisational weaknesses are identified.

Both short and longer-term measures to improve the electronics industry in Indonesia must aim to enhance competitiveness, which is critical in electronics because of the inherent dynamism of the industry. In the electronics industry, there is a strong need to strive for international competitiveness from the very start.

The mid-to-longer term challenges faced by the industry can be classified under structural and organizational weaknesses (see Box 2). There is a strong indication that the economic crisis since 1997 has further intensify both structural and organizational weaknesses, adversely affecting particularly domestic firms in the industry.

In the last two years, the electronics industry in Indonesia has grown again, partly due to a growth of exports and partly due to domestic demand for consumer electronics. This growth has been enjoyed by sub-sectors of electronics, especially the components subsector which is dominated by foreign MNE affiliates. A major challenge for Indonesia's electronics industry is to transform the advantages or strengths it has enjoyed - a rapidly growing internal market in consumer electronics, potential indirect exports market of components to meet the needs of MNE affiliates already present in Indonesia, its proximity to Asia and its adequate basic infrastructure - to become more competitive internationally throughout the electronics industry.

There are opportunities for Indonesia to become an important player especially in the low-end of many parts of the global electronics industry. This because the global

**Box 2: Mid-to-longer term structural and organisational weaknesses of the Indonesian electronics industry**

Structural weaknesses	Organisational weaknesses
Underdeveloped domestic components and parts manufacturers	Electronics trade based on low value-added exports
Regional concentration without local sourcing	Weak capability for technological absorption and development
High but declining import dependence and low local sourcing for less ‘bulkier products’	Weak supporting technical institutions and support infrastructure
‘Shallow’ industrial depth, low-value adding and limited range of products	Weak human resource development
Increased uncertainties due to changes in trade, political and legal regime	Fragmented responsibility for industrial and investment promotion
	Lack of strategic marketing for promotion of exports
	Narrow focus of industrial association

electronics trade is continuing to grow rapidly; because there is a trend toward global sourcing (and in particular through IPO-centre hub and production-network spokes structures); and because of the movement of the NIEs (Singapore, Korea and Taiwan), and near-NIEs (Malaysia and Thailand) up the ladder of value added in electronics. A well-considered integrated strategy, which is a product of a more open public/private consultation within the Indonesian electronics industry, can follow essentially a similar path as those implemented in Malaysia and Singapore, while combining it with specific Indonesian characteristics. The following is intended to provide GOI, PEG-USAID and other interested parties with an overview of the main policies and options facing Indonesia’s electronics industry.

**8 POLICIES TOWARD MANUFACTURING RENEWAL AND COMPETITIVENESS**

Indonesia requires a well thought out and consensus-based integrated national strategy which takes account of Indonesia’s unique characteristics. The strategy needs to be based on Indonesia's key strengths and weaknesses as well as the conditions of the global and regional electronics industry, which has grown more rapidly than any other category of industrial production.

In order to emulate the success of many East Asian NIEs, Indonesia - like other developing countries that are seeking to develop an internationally competitive electronics industry - must able to reach levels of economic growth similar to industrialisation of the early 1990s. Translating this message to a broad agenda for transformation is the task at hand and this report recommends that focus of private-public dialogue is pitched at three levels as part of a short term agenda for manufacturing renewal and a long term aim towards enhancing the dynamic international competitiveness of the industry:

(1) Industry-wide (that is applying to all manufacturing industries) policies which would be directed at reducing the fiscal burden and the cost of doing business in Indonesia in the short term; for example, the main focus of manufacturing renewal in the electronics industry would be to remove barriers or impediments to competition in the short term, and to bring about a more 'levelled playing field' in the tariff regime;

(2) At the industry-specific level policies which focus on the diffusion of productivity-enhancing technologies by functional targeting of activities such as investment, improvement of research and development and other basic building blocks of the available technical infrastructure. While there are suggestions from certain quarters that 'selection' or targeting' of certain sub-sector or even products is an essential part of the long term agenda or vision so that they can be 'promoted' by means of a range of instruments, the difficulties in doing so are pointed out in this section and innovative functional means of support are instead recommended;

(3) At the firm level measures to increase the financial, technological management and entrepreneurial capabilities of domestic large and SMEs firms are outlined which the government and private sector can consider are elaborated below.

### **8.1 Policies for manufacturing renewal: industry-wide measures directly relevant to the electronics sector**

The experiences of Taiwan, South Korea and Singapore show that success in electronics requires a framework that encourages competition, especially at home and in export markets. In Indonesia, there is a need to address the most essential missing element of the broader industrial policy: the impediments to strong domestic competition. While these are industry-wide issues relevant throughout the industrial sector, they are 'particularly critical in electronics because of the inherent dynamism of the industry and the need to strive for international competitiveness from the very start' (World Bank 1990: vi).

Most of the industry-wide measures can be implemented in a relatively short time frame (over a 18-24 months period) once the ministerial or cabinet decision has been made. They can be termed 'industry-wide' policies because of their widespread relevance to, and impact on, the entire framework of manufacturing industry development in Indonesia. These policies aim to bring about short-term manufacturing renewal to 'level the playing field' and to reduce the fiscal and administrative burden faced by both domestic and foreign firms.

Industry-wide measures deal with immediate challenges, some related to the industry-wide issues, such as: (a) the twin problem of high 'parallel' imports and high tariffs and taxes to lower the fiscal burden; (b) administrative issues relating to relatively unfavourable indirect-export incentives; (c) foreign and domestic investment administration; (d) anti-dumping investigations; and (e) increased industrial unrest and labour disputation.

### 8.1.1 Dealing with the twin problem of high ‘parallel’ imports and high effective protection rate

High ‘parallel’ imports and high tariff and taxes are two sides of the same coin. The immediate task is to accurately quantify the fiscal loss of reducing or eliminating the wide discrepancy in tariff rates between final products and components. Tariffs on consumer electronics items (*bea masuk* - 20%), value added tax (*pajak penambahan nilai* - PPN - 10%), luxury goods tax (*pajak penjualan barang mewah* – PPNBM – 20%), and income tax (*pajak penghasilan* – PPH 22 – 2.5%) add up to a total of 52.5% (Tables 12 and 15). By contrast, the tariffs rates on components are around 0-5%.

The current tariff and duty structure has two effects on the industry:

- (i) it enables assembly of products with uncompetitive production structures to continue in Indonesia that are out of line with ASEAN or globally competitive levels;
- (ii) the large-scale parallel imports of electronics goods occurs because traders or distributors evade duties, tariffs or both as well as practising under-invoicing in the importation of products.

As enforcement by the Customs department has not been entirely successful for some decades, it is unlikely that they will be effective in the near future notwithstanding the importance of their current efforts and the need to step up surveillance. Enforcement is further complicated by the difficulty of distinguishing between various levels of subassembly and component imports. A lower and more uniform tariff and duties schedule for CBU consumer electronics and telecommunications equipment will effectively close the loopholes and bring the prices of these goods closer to international levels, thereby removing the incentives to commit the illegal activity of under-invoicing.

Immediate action to be taken by the government would be to narrow the discrepancy in tariff rates between components and final products by:

(1) bringing current tariff levels (BM) for electronics products, currently ranging from 0 to 50%, to a more uniform schedule that ranges from initially 0-20% and finally to 0-5% (a level in line with AFTA targets). This would affect mainly affect assembly operations of sub-assembly components in sub-sector which may be inefficient by regional standards and therefore may not be in Indonesia’s interest to protect even in the short term as the practice provides incentives to continue under-invoicing and other forms of parallel imports; in the longer term, such sub-sectors represent misallocation of resources;

(2) remove luxury good taxes (PPNBM) on goods which are produced locally and imported where they are no longer appropriately classified as such; for example smaller sized TVs, iron, refrigerators and many other items that should no longer be considered luxury good items.<sup>40</sup> Measures (1) and (2) together would considerably reduce the

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<sup>40</sup> Note that cellular or mobile telephones are not subject luxury good tax in Indonesia.

average tariff and duties, but large reductions in both are needed to make Indonesian produced (or assembled) goods more competitive. Consider, for example, that the electronics products from China are, on average, 41% cheaper than the available brands imported from other sources and domestically produced in Indonesia (Table 16);

(3) harmonising tariffs and duties at levels similar to those applied in other ASEAN countries;

(4) impose a new rule that the importation of components and parts for sub-assembly can no longer be done by general importers (*importir umum*) but rather by companies which are engaged in assembly and manufacturing of electronics with permits from MOIT or official sole importers or affiliates of multinational principals; the latter two parties must also state their corporate tax identification numbers (*NPWP, SPK, WP Besar*);

(5) distributors of electronics goods must also have proper tax identification (*Faktur Pajak*) of the products that they sell directly to consumers;

***Measures 1,2 and 5 are essentially for tariff harmonisation; but that 3 and 4 are to combat illegal parallel import directly.***

Given sufficient political will, there is a case to reduce if not eliminate the luxury goods tax. The estimated loss of revenue due to smuggling or parallel import is in the order of Rp. 1.96 trillion (Table 12). If there is an immediate reduction of the luxury-good (PPnBM) taxes on many of the domestically-produced products, the loss of PPnBM can make locally assembled products more competitive.<sup>41</sup> As most parallel importers do not pay taxes, the lower taxes on the domestically-oriented firms as well as indirect suppliers to export-oriented firms will put them in a better position. It has been estimated that at present, the local market is dominated by parallel imports (up to 80% of the total market in some segments). An analysis of the contribution of indirect taxes from different ISIC product group suggests that radio, television and other entertainment equipment contribute proportionally more to the payment of indirect taxes than other product groups.

If illegal, untaxed imports are so high, then perhaps tariff revenue will not fall much when tariff rates are lowered because in return the proportion of legal exports rises.

### **8.1.2 Reform of Customs department, reduction of under-invoicing and implementation of product standards rules**

Enforcement of rules and ministerial decrees in Indonesia is a complex and difficult task, particularly in the aftermath of the Crisis of 1997. What follows is an overview of some

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<sup>41</sup> Former Finance Minister Radius Prawiro issued a Ministerial Decree to lower *PPnBM* but his successor Mar'ie Muhammad re-imposed it due to political consideration that the government might be seen to be too favourable to some minority groups (Sukmono 1999).

additional policies which might be considered to minimise the problem of illegal parallel imports through administrative reform, once there is political consent to do so.

As additional action to those proposed in section 9.1.1, the government can consider the following measures to reduce parallel imports or the importation of sub-assembled components:

(1) impose a requirement that before electronics imports are shipped from overseas, physical features and price of goods be inspected to obtain an SGS certificate (SGS must be held fully accountable for this service). In addition, there is a need to increase the surveillance of CBU importers, with increased monitoring of CBU importers by open and transparent registration of the individual directors and companies, such that it will be easier to trace those who did not pay the appropriate taxes;

(2) on arrival in Indonesia, the imported products will be inspected again by the Indonesian Customs (double-checking) and importers will be liable for any differences in physical appearance, quantity and quality of goods to those that were previously stated;

(3) the above requirement should be applied to the imported goods that are individually priced above \$500 rather than \$5000;<sup>42</sup>

(4) further automation of the documentation of price in the invoice (*fraktur*) of importing so that if the price of an imported commodity from, for example, Hong Kong is recorded as HK\$5 (not HK\$1.20 as would be the case if under-invoicing occurs) then this can be audited (by an independent agency) against the actual price in the country of origin; all importers should be required to lodge their forms electronically and the system would be totally cashless; should there be any evidence of under-invoicing then Customs department would be in position to impose hefty fines;

(5) full automation and complete implementation of the Electronics Data Interchange and the abolishment of the cash payment system for exporters and importers, so that there is a greater likelihood for auditors to detect under-invoicing and trace the key players;

(6) increased surveillance of Customs and full implementation of standard tariff on Completely Built-Up (CBU) imports; in order to deal with the problem of illegal parallel imports, increased surveillance of Customs and full implementation of standard tariff on Completely Built-Up (CBU) imports can be considered, such that the cost of importing such products will increase;

(7) Increased surveillance of CBU imported brand name products, implementation of National Standards and of a rule regarding of Indonesian language manual and warranty cards for all imported products. Another way to increase surveillance of CBU imports, is

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<sup>42</sup> The above points are based on the suggestions that were raised by an executive of an electronics firm at the Working Meeting (*Rapat Kerja*) of Mastel, an NGO working in the field of telecommunication, informatics and electronics in a letter to the then Coordinating Economics Minister, Mr. Kwik Gian Gie (who was himself at one time a manager of an electronics company).

to register all their brand names, and by the implementation of the product standards set by the Indonesian National Standards (SNI), particularly involving imports from China;

(8) independent electronic monitoring of Custom staff, continued training of younger officers or speedy early retirement scheme or replacement of the ‘Suharto era’ officials at Customs;

(i) there is a great need to replace the senior officials who might have been involved in corrupt practices of the past and the promotion of those who have cleaner records;

(ii) random weekly or monthly spot checks of the so-call ‘green lane’ (*jalur hijau – bebas pemeriksaan*) of Customs and the ‘red lane’ (*jalur merah – yang wajib periksa*) particularly of containers which are categorised as components of electronics and electrical or other goods; and complete abolition of the special treatment lane or ‘yellow lane’;

(iii) the appointment of a foreign (such Singapore Port Authority) or independent domestic agency to carry out regular review of Customs department procedures as well as the operation of the computer and reporting system; and

(iv) The placement of monthly reports of the Customs department (*Bea dan Cukai*) and all transaction and procedures so that they can be accessed on-line from various parts of Indonesia;

(v) Appointment of an industry ombudsman with powers to make cases for prosecution;

### **8.1.3 Legal reform and the reduction corrupt business practices**

Legal rules and regulations in Indonesia tend to reinforce discretionary models within the government and the legal profession rather than rule based models of decision making and when there is a lack of clear economic rationale for certain rules governing competition, then the ineffective legal framework tends to discourage both domestic and foreign investors. For example, the anti-monopoly regulation (UU No.5/1999) which states that if a company controls more than 50% share of any market then it can be deemed to have unfair competitive advantage over rivals and placed under watch by the Commission for Commercial Competition Supervision (*Komisi Pengawas Persaingan Usaha, KPPU*).<sup>43</sup>

Corrupt practices occur not just in the government agencies but they allegedly occur also in business practices particularly by procurement officers which have become a source of excessive additional cost not just in the electronics but also in the basic metals and automotive industries. Since the inception of the new Wahid government in October 1999, there is a greater freedom of press and some progress have been made in the legal reform with the establishment of a number of new legal institutions such as the KPPU, National Ombudsman and Law 31 of 1999 says there is to be an anti-corruption commission by August 2001. But there is a strong perception among both domestic and foreign investors that there is a lack of equal and consistent legal treatment and that legal

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<sup>43</sup> A key critical component manufacturer of TV tubes (CRT), PT Asahimas Flat Glass was placed under notice by the Commission for allegedly controlling 65% of the market for flat glass panels (*Bisnis Indonesia*, 20/12/00). It is the only glass producer of its kind in the country.

reform, particularly relating to the judicial and justice system, has barely begun in Indonesia. Apart from political uncertainty, weaknesses in the legal system and process is seen as stalling the return foreign and domestic investments.<sup>44</sup>

#### **8.1.3.1 Measures: Intensification of legal reform to deal with corrupt business practices**

(1) Combined reform of the Anti-Monopoly Law (UU No 5/ 1999) and the patent rights law (UU No. 13/1997) concerning the prohibition monopoly to better accommodate internationally-acceptable legal laws on agreements concerning the intellectual property rights (IPO) such that end-products and critical components assemblers would not be subjected to the restriction of maintaining over 50% of total market share, at least in the first five years of operations.

(2) The appointment of a new section with the National Ombudsman Office which exclusively deals with industry issues with adequate powers and resources to make cases for prosecution;

(3) Referral of some of the worst cases of corruption to the new Anti-Corruption Commission and other similar organisations;

(4) Review of some of the legal clauses which effectively deter foreign and domestic investments in the Anti-Monopoly Regulation, Company Law and other areas of law.

#### **8.1.4 Harmonizing trade regime and incentives between Indonesia and other ASEAN countries**

Government development strategies in some other ASEAN countries have previously offered a greater variety of incentives (especially to indirect exporters) to encourage the development of the electronics industry in their respective countries. Influenced by the deregulation schedules required under AFTA and WTO, many of these countries are now abandoning such incentives.

For example, by 2003 Malaysia will have to abandon its trade-balancing incentives such that export incentives – the export credit refinancing scheme, subsidised insurance schemes for export (including use of warehouse) and double deduction exemption for exports will be removed. The Malaysian government will avoid reintroducing tariffs exceeding 5% (UNIDO 2000: 30).

As part of Malaysia's compliance with the WTO agreement, privileged treatment of local and indigenous firms over foreign owned firms in the provision of sales tenders. However, incentives for indirect support and use of government instruments can be

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<sup>44</sup> The Association of Indonesian Attorney (*Asosiasi Advokat Indonesia*) alleged that many judgements made by the Indonesian Commercial Courts and the Supreme Court appear to be tainted by corruption as no single successful prosecution on commercial cases such as insider trading, monopolistic practices and others has been made in cases of (*Bisnis Indonesia*, 23/12/00).

applied in areas such as training and R&D on a non-discriminatory basis and incentives and controls on environmental pollution are allowed, since such provisions generally do not discriminate against foreign firms over local firms.

While AFTA is WTO-consistent, it also allows for countries to slow down or temporarily suspend deregulation initiatives when faced with an economic crisis. Recently, ASEAN leaders signed an agreement giving flexibility to some countries that are having difficulties in meeting tariff-cutting measures which are part of fulfilling the AFTA targets by 2002 (Bisnis Indonesia 23/11/00). However, the WTO is more important and therefore it is critical that Indonesia aim to establish a trade regime that is taking cognisance of this broader trade body, particularly in the light of the imminent entry of China into the WTO. China is in direct competition to ASEAN countries in attracting FDI in the export-oriented electronics investment. And since there is no clear indication that previous incentives have been successful in attracting MNEs for manufacturing operations in Indonesia, and that most other ASEAN governments are reducing their incentive schemes, the Indonesian government must take a very cautious approach and in this area. Incentives must address the fundamental factors of industrial competitiveness in order to be effective. They require co-ordination between the different support instruments and policies. Financial incentives alone cannot generate industrial competitiveness.

Notwithstanding these issues, rather than incentives, a tax relief for firms which are indirect exporters to supporting domestic and foreign firms would be WTO-consistent since it does not offer privileged treatment of local and indigenous firms. While this is an incentive of sorts, too – incentive to become an indirect exporter can be both applied to local affiliates of MNEs and local SMEs.

As outlined in Section 5.3 above, unlike other ASEAN countries, Indonesia does not make any provisions for indirect exporters to access imported materials on duty and tax free basis through extension of the regular duty exemption scheme. However, Indonesia allows the application of public and private common bonded warehouses rebate mechanisms.

the electronics industry is largely an assembly based industry that is unique in that most products have a greater number of components than most non-electronics products, particularly compared to simpler manufacturing products such as textile or garments, or even automotive.

If Indonesia aims to attract FDI in the components segment, the government will have to recognise this fact and need to consider the above exemptions for indirect exporter firms which otherwise have to pay VAT and duties all the way up the production chain. Since these firms have products which are sold to export-oriented end-product assemblers, lower costs will generate greater demand for local components and parts.

There appears to be a greater resistance to special provisions for indirect exporters at the Ministry of Finance (Tim Tariff), the ministry which is responsible for VAT collection

than from any other government department. This issue has been raised in numerous public-private consultations, such the annual national working meeting RAKERNAS which involves MOIT, MOF, Customs, IEEIA, MASTEL and other interested parties.

One remaining important trade policy issue which is particularly relevant in attracting components and parts MNEs is in the restriction regarding the importation of second-hand machinery and capital equipment (*SK Menperindag No. 278/MPP/Kep/-7/2000*). While recent reports suggest that there are moves afoot to make the conditions for the importation of such equipment even more restrictive and is particularly directed at the transport sector (*Bisnis Indonesia* 18/12/00). If such restrictions are continued or even made more strict for the importation of electronics capital equipment then this may work against attracting overseas SMEs which manufacture components and parts and which are planning to co-relocate to Indonesia following their principal MNEs.

#### **8.1.4.1 Measures: Harmonising Indonesia's trade regime with other ASEAN countries**

(1) implementation of some VAT exemptions for indirect export-oriented firms on a limited time (1-2 year) basis which manufacture parts and components for the electronics end-product manufacturers; alternatively as a second best measure, rebates of VAT for indirect exporters can be put in place but most firms experience bureaucratic inertia or slowness in claiming drawback facilities;

(2) Zero-rating of VAT on sales to EPZ (or EPTE/KB);

(3) provision of income tax credit on local materials used in exports and income tax deduction on export value added;

(4) non-discriminatory treatment of companies which are operating in EPTE/KB with those which are oriented towards the domestic market in that tariff and other duties (BM, PPh22, PPN, PPnBM) should be levied only at the point of sale to the domestic market;

#### **8.1.5 Anti-dumping measures**

Much has been said by business leaders about the need to apply anti-dumping (AD) measures, but the reality is that it is difficult and time consuming to try to put a case to the WTO. Much of the Indonesian business community may be misinformed about WTO rules concerning AD and the rights of companies for protection under the law.

Under the WTO Agreement on Anti-Dumping, an AD investigation (which must be carried out by a government body, the Anti-Dumping Authority) must be thorough and anti-dumping actions can only be taken if there is a causal link between dumping and injury. Otherwise there is no point to the AD action. Evidence must be shown to prove that link before provisional or definitive AD duties can be imposed. The mere fact that the 'domestic industry has recently suffered losses and dumped imports have simultaneously increased is not, in and of itself, sufficient evidence of causality'. The above government body, 'must examine all other factors which could be causing the domestic industry to

decline, including increased volumes or lower prices of non-dumped imports, contractions in demand or changes in the pattern of consumption, the inability of the domestic industry to supply proper qualities of the product on a reliable basis, competition between foreign and domestic producers, changes in the domestic cost structure due to investments in new plant capacity, developments in technology, the export performance and productivity of the domestic industry, and exports of products incorporating the allegedly dumped product' (Magiera 2000:3).

#### **8.1.5.1 Measure: Adoption of measures based on a new independent anti-dumping commission<sup>45</sup>**

- (1) The establishment of a new and independent Commission (The Trade Injury and Remedy Commission) to administer AD, countervailing duty, and safeguard procedures;
- (2) A new regulation to clarify the objectives of AD investigations which state that AD duties can only be imposed when they are in Indonesia's national interest, as current AD investigations have not included an analysis of the impact of AD measures on the national economy;
- (3) Clarify linkages to other Indonesian laws (particularly the Anti-Monopoly Law which states that a market share of 50% or more may result in monopolistic practices and/or unfair business competition) so that the laws are applied consistently;
- (4) Tightened rules on injury since current regulations are weak;
- (5) New regulations on Public Notice and Public Hearings are required since the existing Anti-Dumping Authority does not provide public explanations for its decisions, which means that it is impossible for the public or other government agencies to evaluate these decisions.

#### **8.1.6 Reduction of labor disputes and tackling industrial organization issues**

Protracted labour disputes are harmful to Indonesia's ability to attract foreign investment particularly in the electronics industry. The 'word of mouth' travels very quickly from the existing foreign firms to potential investors. Industrial disputes also hurt the workers involved, particularly if they have to endure long periods without income and even face dismissal. The recent increase in labour disputes and industrial action by many newly formed unions must be seen in the historical context. During Suharto's 32 years in power, labour issues were carefully controlled and there was only one official labour union which in turn was under direct government control.

The Central Committee for Labour Disputes Settlement (P4P) which has been formed under the supervision of the Ministry of Manpower (MOM) appears to have successfully dealt with the protracted industrial dispute at PT Sony Electronics Indonesia. However, if some important lessons from the Sony and other disputes are to be drawn then there is a greater chance towards industrial harmony.

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<sup>45</sup> Some of the recommended revisions to Indonesia's Anti-Dumping Regulations are recommended in a recent paper on the issue (Magiera 2000).

#### **8.1.6.1 Measures: Reduction of uncertainty of labour costs and alternative resolutions of labour disputes**

- (1) in order to maintain industrial harmony, the government, company industrial negotiators, and workers' union organisers must be given training and further education; the number of unions streamlined; workers and their unions are to be convinced that any third party arbitrator such as the P4P must be seen and act as an impartial, independent and professional dispute resolution service;
- (2) in order to maintain industrial harmony, the human resource manager and union organisers can be given training and further education to resolve labour disputes;
- (3) implement other industrial relations reforms such as: the number of unions streamlined; union membership must be made optional for workers; and compulsory secret-ballot voting of union executive and of strike action;
- (4) orderly representation by unions on P4P and industry forums so that they can have the confidence that any third party arbitrator such as the government in P4P must be seen and act as impartial, independent and professional in industrial dispute resolution; outcomes must be legally binding;

In this regard, as a short-term measure a case can be made for further training (with additional international assistance) in the area of dispute resolution for the staff of P4P. While a new Manpower Minister has only been recently appointed,<sup>46</sup> in the medium- to longer term, the government needs to strengthen the legal basis of this arbitration body so as: (a) to provide a prompt response; (b) to hear and assist in the resolution of labour disputes; (c) to make decisions legally binding on all parties; and (d) to enforce the agreed terms of settlement by contract. Further moves toward a specialised Industrial Arbitration Court could also be considered.

#### **8.1.7 Expansion of domestic and international marketing**

Through the IEEIA, other industry associations<sup>47</sup> and trading house Internet facilities, additional support could be considered to improve domestic marketing of electronics products and components.

##### **8.1.7.1 Measures: improvements to the domestic marketing with a focus on 'indirect' exporters and existing MNEs in Indonesia**

- (1) Expansion of 'Indirect' export market for components by offering incentives to the affiliates of MNEs in Indonesia; in return they can offer OEM, ODM and other contracts to those which can meet price, quality and delivery standards;
- (2) Support for domestic sales promotion to SMEs:

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<sup>46</sup> While the previous Minister of Manpower, Mr. Bomer Pasaribu was only in office in less than one year, the new Minister, Ir Al Hilal Hamdi, who is also the Minister for Transmigration was only appointed in August 2000 has made his key policies known yet.

<sup>47</sup> Some of the activities relating to the industry association, IEEIA will be discussed further below.

- (a) Support for finding orders from new customers (preparation of brochures, cost estimates, standard models of contracts, information on buyers needs);
- (b) Database of parts and component markets (monthly updates on Internet);
- (c) Product-diversification of supporting industry enhanced by information, technical and financial support (see 9.3.2).

A greater promotion of 'indirect' exports in Indonesia entails promoting greater competitiveness of products of SMEs to affiliates and joint-venture assemblers based in Indonesia that are export-oriented. Since many MNEs source a large amount of their component requirements from Singapore where they locate their IPO centres, it makes sense to aggressively promote local suppliers to the IPOs so that they can enjoy greater sales overseas without investing in overseas distribution networks. Once greater political stability returns to Indonesia, more medium-sized Japanese and Korean firms will expand their production which will bring greater opportunity to the 'indirect' export market. Indonesian SMEs must be given encouragement through their industry associations (perhaps as part of official delegations) to frequently visit Singapore and other IPO centres in the ASEAN region.<sup>48</sup>

The use of the Internet can provide many improvements on market information exchange between assemblers and suppliers, basis for further development towards e-procurement (electronics procurement system with automated ordering and payment system), as a tool for technology upgrading and for data collection by government and research institutions.

"The internet is like a weapon sitting on a table ready to be picked up by either you or your competitors" Michael Dell, Founder of Dell Computers, Upsite e-magazine, June 1997. While Indonesia has long way to go before it can establish a sophisticated electronic government infrastructure such as found in some Asian countries such as Singapore and it may take time before many electronics firms, large assemblers and SME supplier firms take full advantage of the Web given problems with the financial system and a host of difficulties associated with connecting to and effective use of the Internet. While even in Singapore, the uptake of the 'electronics market place' of the Internet technology is not as widespread as the 'New Economy' practices is not yet prevalent. However, for Indonesia, like its ASEAN neighbours, it can be argued that component and parts procurement can be improved by the Internet if creative ways to adopt this new technology are explored and strong support from the government and industry association. In Thailand, for example, partial adoption of the Internet e-commerce (without payment system) is having some success.

In relation to international marketing of Indonesian electronics products and components, there are suggestions that Indonesian firms should embark on a medium and long-term export market re-orientation. When there is a slowdown in the domestic market, there is often a strong incentive to explore new export markets (for example in Egypt which has imported many Indonesian products) but the US market is the toughest, EU is becoming

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<sup>48</sup> These suggestions have been put forward by a Japanese agency (JICA 2000: 10-13).

more competitive, Middle Eastern and Africa offers great potential. Issues with export promotion activities related to government agencies such as NAFED is discussed below.

Singapore which is the nearest and largest market for components in Asia, has one of the most advanced electronic governments. While the local business community might be slower on the uptake of Internet, the IPO offices of multinational based there could be much quicker in taking full advantage of the Internet. In a paper entitled 'Globalization of US-Japan Production Network and the Growth of Singapore's Electronics Industry', an region expert on the electronics industry suggests that "the 'local' supply base for electronics manufacturing firms in Singapore should more properly be interpreted as encompassing regional networks that span all of South East Asia" and you mentioned Indonesia particularly for more mature products' (Wong 1998: 7).

#### ***8.1.7.2 Measures: improvements to export competitiveness and overseas direct marketing***

- (1) Support for sales promotion by SMEs to the IPO offices of multinational enterprises based in Singapore and elsewhere in the region;
- (2) Promotion of barter trade with Middle Eastern countries who supply oil to Indonesia;
- (3) Promotion of bilateral agreements with a number of African countries which are distribution centres in this continent for duty exception or special discounted price for Indonesian products or with barter agreements (for example Egypt);
- (4) Enforcement of GSP facilities from advanced countries such as the United States, European Union, Japan and Australia using the rationale that Indonesia is one of the most indebted developing countries in the world.<sup>49</sup>
- (5) Direct marketing through exhibitions by the industry association (9.2.5) and export promotion agencies such as NAFED offices overseas (9.2.3).

The policy recommendations outline above are generally for the short-term (with 1-2 year implementation). They attempt to address some of main issues which will have to be overcome if Indonesia is to move beyond the current critical impasse, and, cover policies for manufacturing renewal at industry-wide level which are directly relevant to the electronics sector. The experience of other successful countries in the region show that success in electronics requires a framework that encourages competition, especially at home and in export market. Indonesia must overcome the impediments to strong domestic competition. Trade and manpower policies must be encourage the building of the existing investments many by both domestic and foreign investment as well as spur on the growth of the electronics supporting industry.

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<sup>49</sup> The last three recommendations were drawn from IEEIA, 'Strategies and Policies to Develop the Electronics Industry', memo, Jakarta, June 1999. They suggest that these policies could be put in place in the short term measures (1-2 years implementation).

## **8.2 Policies towards manufacturing competitiveness I: Industry-specific measures to strengthen inter-firm networks and improve technological infrastructure**

This section outlines industry-specific policy recommendations to strengthen inter-firm networks particularly amongst domestically-owned firms and their links with affiliates of foreign MNEs. In addition, industry-specific policies to improve technological infrastructure and institutional support are proposed, which are critical in dealing with both structural and organisational challenges facing the industry.

As part of the measures which enhance inter-firm networking capabilities, particularly in building links with MNE affiliates, the first area of policy development which must be considered is FDI policy and associated technology development issues. These are considered under the heading of industry-wide policies because of the unique features in electronics, namely, close linkages between the level of incoming FDI, technology development and economic growth in the industry. Secondly, policies to enhance inter-firm networking which could benefit domestic components SMEs are considered, and thirdly, measures dealing with technology infrastructure (supporting institutions).

### **8.2.1 Implementing a Proactive Strategy for Investor Relations**

As part of an effort to identify steps that could help to avoid economic and financial crisis in the future, a number of emerging market authorities have been urged to take up a strategy to develop direct contact with large investors or MNEs (IIF 1999). Since Indonesia's future growth depends on private capital flows, the main aim for such a policy is to build a fabric of familiarity between the MOIT/BKPM and the global investment community through a proactive strategy of investor relations (such as investor relations effort by Mexico and other emerging market's authorities) which could help MOIT/BKPM influence market sentiment and obtain market feedback in response to policy changes.

While such proactive strategies which have been organised around regular briefings for financial analysts and institutional investors to keep a country's financial investors informed, a similar proactive strategy to attract longer term investors such as MNEs which arguably are just as important for Indonesia's medium to long term economic growth should also be considered. Information on critical elements which can contributing to the severity of a economic and financial crisis (such as irregular reporting of foreign exchange reserves, sectoral export/import performance, differences in other economic and financial statistics published by key government agencies and the opacity of government economic and investment policy intentions) could be provided through regular contact with investors and analysts to keep them apprised with the most recent indicators.

#### ***8.2.1.1 Measure: Establish a new Industrial Investors Relations Office (IIRO) to attract new and expand existing FDI***

The MOIT in collaboration with BKPM can establish a new Industrial Investor Relation Office (IIRO) either within the existing BKPM or outsourced to a specialised private

agency<sup>50</sup> which will have the primary function:

- (1) to establish active and regular contact with investors, analysts, and ratings agencies;
- (2) to create a list of interested investors and analysts for mass distribution through email and fax of Quarterly Reports, news releases, special announcements, downloadable historical data;
- (3) to design and maintained an investor-focused Internet Web page;
- (4) to conduct regular English-language quarterly publication of key economic indicators, summary of recent developments and economic briefings via teleconferences.

Several important challenges must be met by the newly created body. First, by closely working with other government bodies, it must be able to collect, harmonise, maintain and translate the necessary reliable economic and financial data to investors; current situation where key information was available but maintained in varying formats and by separate agencies will be replaced by one agency which can ‘speak with one voice’. A second challenge is to replace the current approach of government reporting – providing statistics with little or no narrative – needs to be enhanced by incorporating a ‘story’ designed for sophisticated MNE investors with the presentation standards of world-class publications. A third challenge is to go beyond the current practice of one-way communication by government agencies to one where a dynamic two-way dialogue can be established between the investor community and the MOIT/BKPM which will deepen the authorities understanding of the characteristics of the various sources of investment and feedback from investors, particularly in assisting them to anticipate and reduce vulnerability to negative sentiment in market perceptions of Indonesia’s investment climate.

### **8.2.2 Simultaneous FDI and technology policy development**

A recent report suggest that future policy should identify a number of priority industries and export products which the government and the private sector can jointly promote. This approach is taken by a recent JICA report which selected a number of electronics products as having a high potential for direct exports (parts for data processing, IC and speaker) and indirect exports (parts for TV and radio, cathode ray tubes, capacitors, printed circuit board, plastic injection moulding and metal press parts) on the basis of some performance indicators (JICA-SRIC 2000: 10-8).<sup>51</sup> In addition, the report also reported a number of areas selected for priority development on the basis of field interviews of mostly Japanese managers of MNEs (Box 3).

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<sup>50</sup> In 1995, the Ministry of Public Finance in Mexico established the Investor Relations Office (IRO) which is headed by an executive director with three economics graduate and three support staff (<http://www.shcp.gob.mx/english/iro>.)

<sup>51</sup> The basis for selection of these products is made on the performance of a number of variables (high export growth 1994-98, high average export value 1994-98, high labour productivity and low import dependency in 1997; the difficulties in using such data as a basis for future prediction of success is that there are rapid changes in the locational strategies of MNE production and product technological change that tend to make any analysis based the past 5 year data for future potential products questionable.

**Box 3: Selected areas with high potential in export competitiveness in the Indonesian electronics industry on the basis of field interviews of mainly Japanese managers of MNEs.**

- *Electronic devices:* IC, diodes parts, capacitors, ceramic and other 'high value-adding' electronic devices such as cathode ray tubes require very high technology; must have economies of scale and high quality; local assembly and component firms must form joint-ventures or become a member of a consortium of local and foreign companies (in a similar way to which one of the two projects which established CRT plants); effective FDI policy is required to attract MNEs and their critical component makers and their suppliers (Epson is one large MNEs which recently invested in additional capacity and encouraged 16 of its suppliers to co-locate to Indonesia).
- *Electrical components:* TV parts (tuners, remote controls, etc.) and data processing parts (HDD, FDD, PCBA, etc.) - require latest digital circuit design and precise mechanical components; many MNEs on Batam produce them. Domestic firms do possess technological capabilities to produce some parts as subcontractors but they have no or little designing capabilities - measures to bolster electronics design capabilities are needed.
- *Electric parts:* speakers, antennas, connectors, and printed circuit boards are already manufactured by local firms but technology, production capacity and quality of products must be improved to meet global standards - improvement in management and production methods, met partly through training and partly through learning to supply products to existing MNE affiliates (Singaporean and Malaysian Model); transformer, DC motor, crystal oscillator for mobile phones are now 'star' exports by these affiliates, esp. from Batam.
- *Mechanical components:* plastic/moulding, metal and mechanical parts are 'bulky parts' and have high local demand due to transportation costs but local firms have quality and delivery problems; in all cases above, the assignment of Japanese and other foreign engineers and further training in human resources must be increased.
- *Supplementary packing and other materials:* Styrofoam, exterior carton box, etc. rely on local procurement but there are moisture, print-ink durability and other quality problems - quality control and further human resources training is required (JICA 2000: 10-20 – 10-40).

However, there are difficulties in taking a more targeted approach given that a much greater direct role to government (even more than have the four Asian NIEs along the quasi-continental economies of Brazil, India and China, the BIC economies) may not be feasible in Indonesia. In contrasting the strategies followed by the BIC economies, on the one hand, and with those followed by the four Asian NIEs, the latter have been much more successful in accomplishing their objective of high export performance and in becoming internationally competitive (World Bank 1993: 260). In a rapidly growing industry such as electronics, judging the importance of some of the new technology areas is extremely difficult given the speed of technical change. Making targeted choices is thus risky because of the uncertainty inherent in new areas.

There is little doubt that Indonesia like other developing countries is more concerned with follower strategies. The main issues at stake if the government were to follow this line of strategy are:

- (1) That follower strategies are easier provided that the underlying technologies do not change radically; in electronics, however, new technologies are introduced at a very

rapid rate and it is very difficult to select the right niches and sequence to build cumulatively from the easier to more complicated;

- (2) that the degree of government involvement in directing or targeting a sector is dependent on the administrative capability of the government and the quality of its civil service;
- (3) that targeting has both direct and indirect costs; the direct costs are the special incentives that may be given to the targeted industry at the expense of non-targeted industries; and the indirect costs are the additional costs or lower quality products the users have to bear as the targeted industry learns to produce; such indirect costs are often larger than the direct costs, especially if the targeted sector fails to become competitive.
- (4) In their targeting, the BIC economies have focused 'too broadly and have hurried to developed the whole electronics industry based on import substitution while the Asian NIEs instead have focused more narrowly and have progressed sequentially – from production of components and assembly for foreign consumer electronics to production of components and simple consumer electronics by their own national firms, and then to production of sophisticated electronics products and components – as their experience grew'. In Hong Kong and Singapore, the electronics industry have developed in 'a much less planned way than in Korea and Taiwan more narrowly focused, that development has followed a sequence determined more by foreign firms making use of the comparative advantage of producing there than by government' (World Bank 1993: 260).

With respect to the issue of access of technology that novel and new approaches are needed. Section 6 above shows that leading electronics firms, with few exceptions, in Indonesia, have made no investment in in-house technology, relying totally on technology supplied by overseas partners or licensor and that production technologies are satisfactory but weak across the board.

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How have the various strategies of Asian NIEs overcome such problems?

Firstly, Korea promoted technology by direct government sponsorship and financing of research and training, and by promoting liberal tax incentives to encourage R&D spending by the private sector.

Secondly, in a similar effort, Taiwan government established training institutes for the electronics industry, and in 1980 established the Hshinchu Park to accommodate private sector investment and research (World Bank 1993).

Thirdly, Singapore promoted technology by incentives such as double deduction on R&D spending and accelerated depreciation for R&D equipment. The government also set up complementary programs such as (a) Skill Development Fund to finance formal and on-the-job training programs; (b) the Local Industry Upgrading Program (LIUP) to improve management and technical operations capabilities, (c) the automation training programs for operators, (d) the initiatives in advanced technologies (InTech) to subsidise training of engineers in new, advanced technologies; (e) the Research Incentives Schemes for Companies (RISC) to train R&D engineers and scientists; (f) Manpower and Capability Development Division within the Economic Development Board (EDB) to focus on identifying potential skills and technical know-how gaps and devising training programs to address these gaps; (g) pro-active infrastructure development policy, particularly broadband information network; (h) industrial land policy; (i) strategic industrial cluster promotion of magnetic hard drive industry by attracting supporting industries such as disk media sputtering, clean room technical services, optical data storage devices; and lastly but most importantly, (i) liberal policy towards foreign talents such that MNEs are allowed to bring in foreign managers and technical professionals. In Singapore, the foreign technical manpower supply has been very important in electronics and IT industry and a recent survey of IT manpower in Singapore found 24% of the IT professionals were non-Singaporean (Wong 1998: 15).

Finally, Malaysia promoted technology and built up unique capabilities particularly in assembling and packaging chips over three decades by incentives such as:

- (1) double deduction for export promotion and credit insurance premium;
- (2) export credit financing; industrial building allowance;
- (3) incentives for industrial adjustment; for small-scale companies; for computers and IT assets; for storage, treatment and disposal of toxic waste;
- (4) exemption from import duty and sales tax on direct raw materials/component; on machinery and equipment;
- (5) drawback of excise duty on parts, ingredients or packaging materials; of sales tax on materials used in manufacturing and of import duties;
- (6) promotion of training, the use of environment-friendly technologies, and technological (product and process) deepening in firms.

Malaysia also promoted a regional development or 'cluster' strategy relying on sophisticated regional agencies such as the Penang Development Corp., which was established by the state government in 1969 and has developed programs in

industrialisation, urbanisation, tourism promotion and human developed programs (UNIDO 2000).

As discussed earlier, most ASEAN countries are shifting promotional emphasis to SMEs and indirect incentives such as training, R&D and environmental support rather than direct targeting of incentives to comply with the WTO agreement. It is far from clear whether Indonesia's government agencies possess similar administrative capability to those of the Singapore's EDB or Malaysia's Ministry of International Trade and Industry.

Returning to the technological access question, the evidence from other developing countries which have pursued policies to develop the electronics industry suggest the following difficulties:

- (1) privatisation of standards in the electronics industry is closing up so that barrier to enter some electronics components is increasing;
- (2) accessing the latest technology through licensing is getting harder;
- (3) due to greater emphasis on intellectual property rights (IPR) with patent infringements are pursued more actively and forced to settle infringement claims; and
- (4) 'reverse engineering' of technology especially in the electronics industry; (World Bank 1993: 263).

Rather than to pursue targeting of particular components for foreign investment or local development, the Indonesian government would be better advised to take a cautious strategic approach that has been important in the more successful NIEs (Korea, Taiwan and Singapore and China). From the measures these countries have taken the following lessons can be learned:

- (1) Focus on the development of the basic building blocks for the industry before moving up the ladder of value in electronics. This means that the policy focus was in facilitating the development of a reliable supply of basic components and production equipment, rigorous quality standards, and the ability to successfully assimilate imported technology;
- (2) Aiming towards competitiveness in advanced electronics may not be relevant for building the basic blocks of establishing a reliable supply of basic 'mature' products and components with improved quality and delivery standards. As components become increasingly complex and expensive (e.g. disk media), assembly yield becomes an important differentiating factor, close geographic proximity with the manufacturers (hard disk drive assemblers) is important to improve responsiveness and to fix yield problems; this is also true for some manufacturer-specific products (e.g. plastic moulds and PCBs) but not for most passive and other components;
- (3) Focus on moving from price-led to product-led competition: as firms in first- and second-tier NIEs such as Malaysia are continuing their transition up the technology ladder, they are faced with competition from higher-performance rival firms (from

Japan, the United States and Europe) with superior production capabilities and from lower-wage country firms (relocations to China and Thailand after the Crisis and, to a lesser extent, to Indonesia and the Philippines); Malaysia's cluster development aims to develop greater linkages and complementation of firms within the three regions which cover issues beyond improvements in manufacturing processes. Nevertheless, Indonesia can put in place technological infrastructure in anticipation of the rapid move toward product-led competition; in addition, NIEs rely on a large, high quality skilled labour force and large numbers of scientist and engineers; Indonesia lacks behind countries in the region with the lowest percentage of scientists and engineers amongst ASEAN-4 countries.<sup>52</sup>

- (4) Encourage firms to enter strategic alliances with MNEs from developed countries. In order for domestic firms to do this, they have to become stronger technologically; this could mean that policy-driven mechanisms must be put in place to enhance these firms' technological capabilities so that they are in a better position to bargain more effectively for access to newer technology.

These are some of the key elements of a successful policy to complement a technology-driven FDI policy in Taiwan and Singapore (World Bank 1991, 1993 and Wong 1998).

There is room to successfully leverage FDI by putting in place a more coordinated program to attract foreign direct investment by MNEs and to encourage them to co-locate their production of critical and other components for consumer and business/electronics end-product manufacturing in Indonesia. There is a need to focus on meeting the requirements of existing MNEs so that they encourage firms within their business group to co-relocate in Indonesia.

#### **8.2.2.1 Measures: Co-ordinated campaign to attract new and expand existing FDI**

The following policy measures are recommended:

- (1) Encourage MNEs to relocate production of specific components<sup>53</sup> (either as 100% FDI or as part of a consortium with local firms, e.g. Tosummit TV-tube plant) along with many of their first-, second- and other layer supporting companies in their home countries. Financing through a consortium rather than a single entity (such as the Asia Permai-Tommy Suharto bid in 1996) for critical components plants such as IC assembly and testing could be more successful. A public-private dialogue with the industry association should also be part of the selection process of specific projects; it is essential that public-private consultation is part of the selection process of principal MNE partners to enter the selected critical component production.

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<sup>52</sup> In Indonesia, a large proportion of engineering graduates do not continue their career in engineering related areas. For example, in 1985, there were 14.4 engineers per 10,000 population but 37% of engineering graduates are in administrative work and 60% end up in non-engineering occupations in 1985 (UNESCO study, 1989). [This seems to imply that 97% do not become engineers – in turn that means that if all engineering grads did become engineers, there would be around 480 engineers per 10000 population. Can that be right?]

<sup>53</sup> The list of specific components to be recommended could be determined by a consensus of various national MNE groups as well as domestic firms through private-public dialogue or survey of companies.

- (2) Regular visits of main foreign companies overseas which produce the selected critical components by key members of the government to encourage these companies to bring higher value added processes to Indonesia, increase their local content, and to take on local technical trainees in their home country affiliates, which would be supported by introducing tax deductions for training expenses.
- (3) 'Match making' measures to bring the supplier and buyer together and to lift their competitive position as 'indirect' exporters to the existing multinational assembly firms in Indonesia. Domestic component manufacturers need capital participation to solve their financial difficulties and technical assistance, as well as technological tie-ups with MNEs.;
- (4) Clearer division of the role for FDI promotion, service provider and data collection for the Investment Co-ordination Board (BKPM) and FDI service policy its regional counterparts (BKPMD); [??] A cross-agency coordination team (BKPM, MOIT, MTC, BPPT) should be formed and better data collection on realised FDI should be carried out;
- (5) Strong focus of FDI policy on forming strategic alliances such that other policies should be directed to find out what affiliates of MNEs and large domestic firms require so that SMEs in the supporting industry can meet the price, quality and delivery demands of foreign and local assemblers who are already in Indonesia; a quarterly Internet survey of MNE affiliates and large domestic firms can be conducted by the MOIT in co-operation with the IEEIA and, if required, a specialist consultant firm – which would solicit the most current strategic requirements of affiliates of MNEs and large domestic firms. The survey can initially be conducted manually but after a year trial, Internet-based questionnaire will be the main form of interaction to lower costs.

The central focus of the FDI program could be the 'match making' activities between MNEs and SME suppliers, enhanced by better data provided by the industry associations. The aim is to lift the competitive position of domestic SMEs as 'indirect' exporters to the existing multinational assembly firms in Indonesia. Technological broadening and deepening by these SMEs will occur as they can become increasingly internationally competitive by supplying export-oriented foreign assemblers. An immediate goal is for many SMEs to obtain sourcing contracts in the form of 'original equipment manufacturing' (OEM), then own-design manufacturing (ODM) and eventually own-brand sales overseas (OBS).<sup>54</sup>

### **8.2.3 Inter-firm Networking to Support Domestic Components SMEs**

Inter-firm networking capabilities play a critical role in fostering growth and innovation. This is one of the conclusions of the study on the Malaysian electronics industry. This

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<sup>54</sup> By initially using an OEM arrangement with MNEs based in Singapore, local suppliers could aim to excel in niche areas through principal MNEs. For example, SoundBlaster is one celebrated case of a firm in Singapore whose hardware became a standard component used in IBM-compatible computers.

study also suggest that successful firms use inter-firm networks to compress new product-development time and foster innovation, and that networking capabilities foster decentralization and diffusion of design within a region, and become a source of innovation, sectoral transition, and value-adding growth (UNIDO 2000: 8).

One of the main reasons behind the failure of SME clusters to be effective (or dynamic) in Indonesia is that they lack market information. This in turn reduces the attractiveness of a cluster as a production base. Successful clusters have an effective mechanism to ensure a constant flow of technology and market information (Urata 2000: 101). MOIT introduced numerous program to form clusters ('centra'), for example, the PIKM in 1974, revised into the BIPIK, KOPINKRA in 1989 and '*Pengembangan Klaster Industri*' in 2000.

One of the key policy recommendations in this study is to look at ways to build technology and market information sources for SME suppliers and product assemblers. This involves supporting institutions such as the industry associations, MOIT, the universities as well as contracted outsourcing service companies in order to increase the rate of Internet uptake in the electronics and related supporting industries.

Policy recommendations to enhance inter-firm networks in Indonesia which particularly enhance the networking capabilities of supplier SMEs would be based on the integrated Internet-based inter-firm networking (III) policy which could be administered jointly by the MOIT and the new IT agency.<sup>55</sup>

#### ***8.2.3.1 Measures: the development of integrated internet-based inter-firm (III) networks***

- (1) Getting SMEs 'wired' or 'connected' as part of an comprehensive IT-based approach to enhance the competitiveness of SME suppliers, with a focus on the increased use of the Internet.

Inter-firm networking capabilities will rapidly increase with the adoption of a policy-driven program to increase the number of supplier SMEs that are directly or indirectly 'wired' or connected to the Internet. Since the cost of 'connectivity', data processing and transmission is rapidly declining,<sup>56</sup> there are many benefits that will accrue from such policies, such as the facilitation of new buyer-supplier networks, faster technology diffusion, improved market and regulatory information as well as greater flexibility and availability of training courses. Accountability and data collection can also be improved.

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<sup>55</sup> Coordinating Minister for the Economy, Rizal Ramli announced that a special agency is to be established in 2001 to speed up the development of IT as 'the government is eager to take advantage of the \$15 billion loan promised by the Japanese government for the development of IT industries in Asia' (Jakarta Post, 20/12/00).

<sup>56</sup> An electronic memory circuit that cost \$10 in the 1950s came down to a hundred-thousandth of a cent by 2000; by year 2010 we could have computers that store information as single electrons and such machines would pack the power of thousands of PCs onto a chip the size of a postage stamp (Boisot 1998:260). [*I would say the price of a PC and monthly access to ISP is more relevant here.*]

A key imperative for the above policy recommendation is the fact that the costs of 'connectivity' is falling (Box 4) are the following policy elements of an integrated Internet-based 'Inter-firm Networking' policy. The main aim here is to lubricate the internal/external dynamics that spawn entrepreneurial firms, foster innovation, speed-up communications and decision-making and improve accountability as well as deliver more profit.

Notwithstanding some well known difficulties (Box 5), a new program can be considered to facilitate direct Internet connections for SMEs with an initial feasible target, to connect all core-electronics suppliers (numbering less than 50 firms based on the number in Table 24) in the first phase by the end of 2001); in the second phase by the end of 2002, internet connections should be extended to core-electronics suppliers (numbering less than 400 firms based on the number in Tables 21-22); in the third phase, to establish SME tele-e-commerce centres (*Wartel/Warnet-UKM*) that can facilitate the use of Internet for those which are not connected under the previous programs and facilitate training on a selected number of electronics-related industry 'clusters' of the 19 strategic industries, in cooperation with existing semi-government training marketing organisations such as Indonesia Export Training Centres.<sup>57</sup> Intensive training of SMEs can be contracted to specialist companies with multilateral agency support, based on recent on-going World Bank/MOIT study of computerization of SMEs in traditional wood, leather, textile and other sectors.

Financial, logistics and technical aspects of the above programs will need to be elaborated but the principal elements would be based on private-public co-operation in terms of its financing with significant support by multilateral agencies. The World Bank and JETRO recently announced that they are both interested in expanding the role of commercial Internet cafes (The Warnet Plus Project) to connect isolated regions. Such a program could be more focused in the provision of effective assistance to SMEs, particularly in export competitive component industries such electronics, automotive, basic metals and machinery engineering, textile products, foods, wooden products in particular areas of high concentration of supplier SMEs (for example for electronics, see Table 21-22).

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<sup>57</sup> A recent policy paper recommended a choice of 19 strategic industries as potential core industries in the national development of 'clusters' (*Ringkasan Eksekutif Rencana Induk Pengembangan Industri* – Executive Summary of the Core Industrial Development, Ministry of Industry and Trade, September 2000).

**Box 4: Falling Cost of Internet Connectivity and Growing Potential of the Internet**

- (1) The current monopoly of PT Telkom on the telephone line access is due to end in 2003 with more telecommunications carriers entering the market;
- (2) Alternative to the telephone access is increasing in the forms of satellite microwave link, leased line and virtual private networks (VPN);
- (3) Faster broadband (high-speed access) to the Internet is now offered by 7 companies; such that services such as videoconferencing, distant learning, telephony/voice over internet protocol, application specific provider service (for software and other applications) and others are available;
- (4) There are business-to-customers (B2C) possibilities for end-product makers (20 million Indonesians online by 2004 from 1.0-1.5 million in 2000 - OW Purbo, JT,6/11/00); Huge potential for e-marketplaces (B2B market): in Asia is \$30.5b in 2000 but in 2005 will grow to \$650b - a factor of 21.3 times (G Sachs in Ebiz BW, 23/10/00); minimising middlemen in the supply chain (Asia: typically 3-4; twice more than in EU).
- (5) Foreign end-product assembly companies already built networks to their suppliers; domestic ones may need to follow suit (one MAN microwave connection LAN costs Rp. 20 million);
- (6) Law (UU Telekom No36/99) opens door for new FDI in telecommunications and IT; According to a recent statement by official (Dirjen PosTel), access to all citizens by 2005 (if 1 million SST/year can be built for \$5 billion, one SST is around \$1000.);

- (2) Formulate and implement a pilot program to strengthen the capabilities of electronics and non-electronics SME suppliers, implemented by MOIT but outsourced to specialist private company, would aim to establish and operate the Internet-based procurement operations (initially without a payment system and eventually moving to a full e-market place) as well as an information clearing house to improve inter-firm cooperation and educational programs to complement the above tele-e-commerce centres;

**Box 5: Some main common problems for SMEs in utilizing the Internet**

- (1) Getting SMEs to obtain appropriate computers and training of staff to use the Internet such that policy-driven subsidies in financing and training should be considered;
- (2) Cost of 'connectivity' to Internet: Coming down fast with cheaper computers, ISP costs for SMEs; cheaper cable TV connection costs, emerging high-speed wireless and satellite technology, high-speed metropolitan area network (MAN) through microwave for medium and larger firms; Uneven telecommunication infrastructure;
- (3) Screening of buyers and sellers due to a lack of comprehensive credit services;
- (4) Difficulties in translating business relationships and networks to the Web due to difficulties in changing mind-set that cuts through government and corporate bureaucracy; lack of legal infrastructure specially tailored to IT needed.

- (3) Strengthening the Internet capabilities of the industrial organisation, the IEEIA and others which support core and non-core electronics industry: the IEEIA and other industry associations must play an important role in promoting innovative initiatives which increase the participation of members within the above Internet-based and other programs; recent reports suggest that multilateral agencies such the World Bank and JETRO are earmarking funds for Internet-based projects for SMEs in 2001.

- (4) Establishment of an inter-industry association forum such as *MASTEL*<sup>58</sup> which can facilitate public-private dialogue between industry associations (such as IEEIA; Electronics Marketers Club;<sup>59</sup> Computer Traders Association, APKI; Telecommunications Café Suppliers Association, APPWI; Telecommunications Electronics Association, AIETI; and others such as SME suppliers association and association representing non-electronics manufacturers from industries such as plastic molding, metals and others), government agencies, large MNEs and SMEs – both domestic and foreign so as to determine the working agenda for the electronics and related industry and institution. One of the key items that could be part of the working agenda of such a forum would be the selection of priority areas with high potential in export competitiveness in the Indonesian electronics industry on the basis of up-to-date views from major principals from different foreign nationality groups as well as domestic firms. As an alternative, if establishing this new forum proves too difficult, then joining *MASTEL* and establishing a special caucus on hardware related issues might a temporary possibility. Other items which can be regularly discussed in this forum are up-to-date issues that concern affiliates of MNEs and large domestic firms (Section 9.1.1).
- (5) Measures to establish links with existing electronic commerce trade sites or companies to enable clusters to become more dynamic (such as the ones that have been established by local or overseas companies).

There is a clustering of firms around the *Jabotabek* area and there is much scope for greater inter-firm linkages development through the industrial organization. In addition, there is much scope to gradually work from a partial- towards a full-electronic exchange system. There are a number of e-procurement projects running in Indonesia already. For example, since 1999 Grup Sinar Mas (in cooperation with bidnets.com) is operating an e-procurement system for business to business (B2B) transactions similar to the US company Schlumberger's MarketSite. A number of other business groups such as Lippo Group (lippostar.com) and PT Cisadane Raya Chemicals are beginning to invest in similar e-commerce technology (Swa 21, 19 Oct., 2000).

The application of such systems and expansion of the existing Internet facilities would open up various possibilities and in its full implementation promises a more efficient

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<sup>58</sup> *MASTEL (Masyarakat Telematika, Telecommunications and Informatics Society)* was established in December 1993 as the organisation for encompassing all those interested in the telecommunications and informatics (information technology and multimedia) sector, in order to face the ever-changing strategic environment, and to formulate ideas and conduct activities in promoting and developing the Indonesian. *MASTEL* is a non-profit organisation that also function to serve as a bridge between government and industry players as well as those who observe telecommunications sector. *MASTEL* is supported by 15 associations and has 48 corporate members, 179 individual members including those that come from non-profit organisations ([www.mastel.or.id](http://www.mastel.or.id)).

<sup>59</sup> In the ensuing months after the Crisis and as a result of the growing store distribution of electronics goods through large retail stores such as Macro and Carrefour in Jakarta, a forum of electronics vendors was established called the Electronics Marketing Club in 1998. This Club interacts regularly with the IEEIA to exchange information on market trends and other policy issues such as the introduction of Indonesian language manuals for more sophisticated electronics goods, and warranty cards. Such interaction with a forum of suppliers within the electronics sector broadly defined as well as with those in the other related sectors would be a step in the right direction to improve matching of assemblers and suppliers and disseminate information.

market, ensuring the lowest price and speedy delivery. The argument that e-commerce will lead to higher profits will eventually win over SMEs to buy or sell direct because lower prices mean smaller profits for non-assembling suppliers namely those who are merely engage in distribution of products.

Despite numerous government assistance programs directed at SMEs over the years, one of the reasons behind the failure of SME clusters to be effective in Indonesia is that they are caught in a vicious circle due to a lack of market information which in turn reduces the attractiveness of their clusters as a production base. One of the policy recommendations by a recent comprehensive study on 'SME Promotion in Indonesia' is to create dynamic clusters, which could be achieved by adopting measures such as the creation of market contact points and access to technical services for product improvement (Urata 2000: iv, 119).

The basis of this recommendation is that successful clusters have an effective mechanism to ensure a constant flow of technology and market information. However, physical contact points in many locations could prove to be costly.

Therefore one measure that can be considered is to look at ways in which the electronics and related industries can utilise the existing industry associations, IEEIA<sup>60</sup> or a separately formed organisation for the electronics supporting and their related supporting industries in Indonesia to build a more effective Internet-based facility or e-marketplace, on a semi-online basis only which does not involve payment. The initial main purpose for such a facility would be for matching buyers and suppliers of electronic components. Given that supply chains in Asia can often involve three or four middlemen – twice as many as in Europe – such a facility would readily reduce transaction costs.<sup>61</sup>

If many preconditions for the expansion of e-commerce in the future are met, this facility could be turned into a full online electronic data interchange (EDI) or business-to-business (B2B) facility, or be linked to a number of other B2B exchange websites, some with specialised direct sourcing applications specifically written for the electronics industry in the region.<sup>62</sup> Given that even in the next five years the Asian region (albeit

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<sup>60</sup> While the Indonesia Electronic and Electrical Appliances Industries Association already has a website ([www.eeia-id.com](http://www.eeia-id.com)), it does not yet function as such a facility.

<sup>61</sup> E-commerce sites that are based on semi-online systems which do not offer an on-line payment system have expanded at a more rapid pace in other Asian countries such as Thailand than the full online systems which do offer this service. The report also noted that in December 1999, the penetration rate of e-commerce in computer and electronics business in Thailand is 17% and 5% respectively (E-commerce Resource Centre, Thailand quoted by *Bisnis Indonesia*, 20/10/2000). Mitsubishi Heavy Industries Ltd., in Japan is one of company that set up its six overseas procurement divisions on the Internet but this is used only to find new suppliers. No online purchase can be made because the firm still requires written receipts and half of their suppliers do not have any Internet capabilities (*Business Week*, 25/10/2000: 59).

<sup>62</sup> One successful example of an online exchange for computer chips is Asia-Tech based in the Silicon Valley, United States, which connects 100 suppliers in Asia and buyers in the West. The logistics support for the exchange is provided by Sanyo Electric Trading Co. There are numerous examples for other exchanges appearing, for example for the apparel industry ([fasturn.com](http://fasturn.com)), for Asian chemical companies ([chemcross.com](http://chemcross.com)), for general business based in one country (Singapore's Commerce Exchange). A recent article argues that Asia is behind the rest of the world in Internet online transaction. In 2000, it is estimated that online transaction by Asian companies will reach \$30.5 billion, about one-fourth and one-eighth as much as business in Europe and the United States. By 2005 Asia's e-commerce is expected

slower than the rest of the world) is projected to have a phenomenal (21-fold) increase in electronics exchange or electronic transactions and that what drives the new information is the economies of networks, even a promotion to use the Internet for limited (or semi-online) uses could be very effective in the near future and prove to have a useful educational value for buyers and sellers of electronics components.<sup>63</sup>

There is an example of an existing general ‘match-making’ on-line system which has operated well since 1996, called Global Technology Network (GTN), which is a computer-based system for matching Indonesian enterprises with: (1) other companies within Indonesia; (2) companies in ASEAN countries; (3) US-based companies; (4) companies in GTN represented countries.

The program utilises on-line and off-line resources available through its world wide network of representative offices to develop bilateral trade opportunities. The purpose is to assist Indonesian companies in accessing business related information so that they may develop long-term trade relationships. GTN is a program of the US Agency for International Development (USAID), Office of Business Development.

While GTN has an extensive database in several sectors such as communications and information technology, health manufacturing and technology and others, it has no specific listing for electronics hardware companies. Any Indonesian company searching for trading partners, joint ventures, licensing agreements or technical assistance through business alliances can benefit from the program, and companies are encouraged to register with the GTN/Indonesia with some small incentives.<sup>64</sup> With programs such as GTN for the US market and others which aim for different key markets, there is a greater chance for Indonesian electronics SMEs to get ‘online’ and find buyers. The challenge might be to get to that stage where they can present their products in a way that is acceptable on the Internet, as well as to go beyond marketing issues to own design and manufacturing capabilities, to meet orders at the right price, quality and consistency of delivery.

In addition to developing the domestic capability of producing electronics and IT related hardware, it is just as important if not more to apply IT across a broad spectrum of Indonesia’s economic activities. If successful, the above III program can be applied to other section of the manufacturing and services industry. Besides enhancing the

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to reach \$650 billion but its size in Europe will be twice as large and in the United States more than three times bigger (BusinessWeek, E.Biz 23/10/00).

<sup>63</sup> Two well know-economists summarised the information (Internet-based or otherwise) economy as follows: ‘The central difference between the old and new economies: the old industrial economy was driven by economies of scale; the new information economy is driven by the economies of networks’ (Shapiro and Varian 1999: 173).

<sup>64</sup> GTN/Indonesia registers detailed information about a local company and/or technology request, and send the information by Internet to a central distribution and dissemination centre in Washington DC. This request will then be matched in the GTN’s databases with appropriate firms throughout the world. Within a few days the Indonesia company will receive Letters of Interest from local, regional or American firms. After both parties have identified a mutual interest in pursuing a business relationship, either organization may apply for a GTN travel grant of maximum US\$ 5,000. The services are free of charge through a joint USAID and International Executive Service Corporation program. This organisation focuses on providing companies in developing countries with volunteer executives, managers and technicians who are available to provide consulting and advisory services to local organisations.

productivity of the Indonesian economy, such a move will create a multiplier effect to generate the domestic demand for electronics and IT products as well as services.

### **8.2.3.2 Measures: Enhancing the technology infrastructure**

(1) Regular independent evaluation of the activities of key existing marketing institutions such as the Indonesia Export Training Center (IETC), National Association for Export Development (NAFED) and Export Support Board (*Dewan Penunjang Ekspor*) should be conducted to improve the quality of institutional support for domestic components and end-product manufacturers; the government should consider expanding NAFED's export promotion activities with exhibition activities and by holding component procurement fairs ('reverse' exhibitions); and by reopening abroad some of the Indonesia Trade Promotion Centres (ITPC) that were closed in 1998. NAFED's role should also be expanded in providing a comprehensive and up-to-date market information system and effective marketing strategies for the development of trade; following some overseas examples, NAFED could encourage local and indigenous firms to hire foreign staff or contract out market research in key foreign markets.<sup>65</sup>

(2) Provision of subsidies for technical services to the electronics industry, particularly those activities which assist SMEs, by such institutions such as UI (Jakarta), ITB (Bandung), and ITS (Surabaya). Polytechnics and universities would be the best places to hold short-term programs for technical experts and managers of SMEs. The syllabus and delivery of training programs could be further complimented by overseas university MBA programs so that the educational content will not be merely limited to technical matters but also include sophisticated business management education that is relevant to their specific sub-sectors. A new private-publicly funded support initiative will overcome some of the reasons why previous government support programs have had very little uptake by electronics components SMEs.<sup>66</sup>

(3) As the electronics sector has been selected as one of the industries with high export and growth potential under the current MOIT 'cluster-based' approach, in order to deal with challenges to make the transition from price-led to product-led competition, the above Internet-based policies should be formulated as part of an comprehensive approach to advance technical, management and entrepreneurial skills of SME firms; in particular in relation to their capabilities for market networking, technological management, and to develop advanced and mid-level skills through further training and measures aimed at increasing entrepreneurship and global marketing capabilities amongst SMEs.

### **8.2.3.3 Strengthening human resource development**

(1) Increasing the output and quality of technical graduates (engineering, computer science, mathematics and natural science); every effort must be made by the government to encourage large MNEs to collaborate with the existing training

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<sup>65</sup> For example, in Malaysia, local and indigenous firms are offered financial incentives when overseas research involves using personnel abroad by the Malaysia External Trade Development Corporation (MATRADE), see [www.matrade.gov.my/matcorp.html](http://www.matrade.gov.my/matcorp.html), viewed on 12 November 2000.

<sup>66</sup> There are very few electric and electronics parts manufacturers who make use of joint facilities such as the Technology Upgrading (*Usaha Peningkatan Teknologi, UPT*) program (JICA 2000: 4-128).

institutions and universities; both large firms and supporting SMEs require design engineers, CAD/CAM system and other technical experts; a long term strategy would require the opening of centres of excellence or technical universities, including those based on appropriate elements of foreign systems such as *Fachhochschulen* (Germany), polytechnics (the United Kingdom), *kooka/koogyoo daigaku* (Japan).

- (2) Provision of tax incentives for the dispatch of overseas technical experts in the design, production control and other areas in domestic large assemblers could be further enhanced by the provision of tax deductions or other appropriate incentives; in-house training of workers and managers at institutions such as the International Export Training Centre in Jakarta and other 5 major cities (which are yet to cater specifically for training of personnel from the electronics and electrical sector)
- (3) Promotion and participation in international cooperation programs with similar overseas bodies by the Centre for Industrial Standardisation (PUSTAN) and the National Standardisation Council (DSN) which oversees ISO standards, as these standards have and will continue to change business practices in private companies and state-owned enterprises in Indonesia. Similar programs should be considered for a laboratory accreditation scheme for product testing and certification in Indonesia, coordinated by the Association of Calibration and Testing Laboratories (ALKAPI), so that foreign firms would no longer need to send their products overseas for certification;
- (4) Greater coordination among the ministries and related institutions to work towards an upgraded national standard of technical vocational and university training which is tailored to the demands of industry:
  - (a) convene regular meetings of the industry associations organization (such as MASTEL) with representatives from government, industry and academic institutions to determine manpower and training requirements for the electronics sector, taking into account inputs from existing and potential multinational investors;
  - (b) facilitate the process where industry associations and foreign chambers of commerce in Indonesia – which are already represented on the advisory boards of polytechnics – can provide input by developing the curriculum, designing internship stints and by providing instructors with industry experience;
  - (c) develop selected skills vital to the development of the electronics industry, such as craft skills in tool and die making; electronics and electro-mechanical devices; as well as computer programming and system analysis;
  - (d) over the long term, provide university graduates with design and development skills and encourage foreign manufacturers to relocate such functions to Indonesia.
- (5) Reduce the government's responsibility for technical vocational training by the provision of public subsidies to private technical colleges and training institutes

- such as the Mas-Gobel Institute Foundation, particularly to provide more programs for technicians from the supporting SMEs; evaluate the feasibility of implementing a program such as the Skills Development Fund in Singapore – where employers contribute 2-4% of the payroll for low-wage workers into a fund for approved courses – to assist employers in upgrading their generally unskilled workforce;
- (6) Provision of greater funding and profile to the National Vocational Training Council (*Majelis Pendidikan Kejuruan Nasional*) and bodies such as the Forum for Human Resource Managers by subsidising their participation in business plan and other technical competitions (see Section 9.3); these bodies should be encouraged to develop standards and qualifications for technical skills which are recognised nation-wide;
  - (7) Regional-specific policies to further innovative capacities (product, design, process and incremental innovation). The aim of such programs is to strengthen provincial economic development agencies so that they can formulate their local industrial competitiveness and FDI policy. One successful example in the region is the model of provided by the Penang Development Board (Malaysia).

While most operations in domestic end-product firms as well as supplier SMEs are still in the low value-added segments, the above policies to strengthen technical infrastructure would be directed at enhancing their technological capability as well as at increasing the amount of engineering and product redesigning work undertaken locally by affiliates of MNEs. Improving industrial standards management, product certification and testing and industry statistics can lead to greater scope for multinationals to procure from and work with domestic suppliers.

#### **8.2.4 Physical infrastructure (which directly supports the components electronics industry)**

Both overseas and Indonesian experience has shown that industrial parks have been successful in attracting foreign investment. Such is also the case with technology and specialised industrial parks in attracting a blend of essential supporting SMEs which provide products and services to principal MNEs and local large assembly firms.

The development of an industrial estate which is specifically oriented towards components have been muted since 1994 by IEEIA and MOIT. The idea is that SME affiliates of MNEs from different countries would be encouraged to co-relocate in Purwarkarta, which is geographically close to where most of their MNE principals have their plants, namely around Bekasi. It was to be called the Electronics Components Industrial Estate (*Lingkungan Industri Komponen Elektronika, LIKE*) but the plan was not realised due to the lack of funds in the aftermath of the 1997 Crisis. While there is little scope in restarting the project given the current lack-lustre situation with new or

greenfield foreign investment, in one or two years' time, when the economy is showing signs of improvement, the LIKE could be reconsidered with strong private-public coordination and the participation of provincial authorities.

#### **8.2.4.1 Establishment of component and other industry parks (LIKE)**

Industry parks should be established with strong involvement of the private sector process, while and tackling the following oft-cited issues which are associated with industrial or technology parks:

- (1) that bureaucrats may determine targeted sub-segments and/or regulatory mechanisms without serious consultation with the private sector;
- (2) that management and coordination of the LIKE project be tendered to a company with a proven record in the private sector;
- (3) that technology transfer initiatives be made part of the aims of the project, starting with human capital transfers from foreign supplier SMEs to indigenous firms;
- (4) that the project include some tax incentives towards indigenous SMEs in purchasing or leasing affordable factories at the site.

There are additional physical infrastructure related issues that the government should consider, namely the the safety of trade-related traffic from industrial estate areas and land/sea transportation regulatory improvements such as greater regulation of vessel schedules, rationalisation of shipping rates and rail and road transportation cost reviews (JICA 2000).

#### **8.2.5 Strengthening the industrial association**

The most important industry association within the electronics and electrical industry is the Indonesian Electronics and Electrical Industry Association. It is dominated by large electronics and electrical end-product manufacturers. A recently established Electronics Marketing Club is loosely associated with the IEEIA, but other electronics suppliers including plastics, metal parts, packaging, and other firms do not appear to be closely linked to the IEEIA. By enhancing the IT capabilities of the IEEIA and their members, markets, regulatory and technology information using an enhanced Internet Website and other IT capabilities (database of market and trends), which could be wholly or partly outsourced to specialised firms. In doing so, they can engage in domestic and international promotion of their members and industry strengths, productivity enhancement and mastery of product and process technology, and links with ASEAN and East Asian Industry Associations can be strengthened. While the IEEIA is perceived to be weaker than automotive and machinery industry associations, given the recent better export performance of the electronics industry, there should be some scope for improvements in the profile of the IEEIA.

If there is an improved Internet homepage with relevant content for members and for clients on company characteristics and products (and links to company email addresses

and homepages), there will be a greater attraction for new members. The coverage of membership in the electronics industry association is still very limited even among electronics components manufacturer (110 firms were registered with the MOIT in 2000). While suppliers from other non-electronics segments are not linked organisationally, they formed the bulk of the total (328 firms are known to IEEAI (Section 7.)).

The main objectives of strengthening and reinforcing the industry association are to strengthen the communications network between members, with related government agencies and with overseas industry associations.

#### ***8.2.5.1 Measures: Strengthening organizational structure of the industry associations***

(1) strengthening the IEEIA organisational structure by consolidating its organizational structure it will attract a greater membership coverage of not only PMA and PMDN firms but also non-facility firms within the core electronics industry. In order to do so, IEEIA would require better administration office and higher participation of the existing MNE members. Measures would include:

(a) expanding the administration office from the present one or two key full-time administrative officers by an additional one or two officers who are dispatched from member corporations to serve for limited periods of one or two years without remuneration from the association; direct financial assistance might be in order as the MOIT data collection can be outsourced to the industry association.

(b) expansion of fee based activities including the publication of compiled and analysed market data and the information of related industries, organisation of seminars and training sessions; such that the financial strength of the association would increase;

(c) government promotion for participation in the association such as tax deduction incentives for additional members' contribution towards computer or other equipment used by the IEEIA. Since there are greater benefits for participation in the association due to its improved IT and advisory capabilities, an expanded role of the sub-committees, particularly the sub-committee that deal with the different components sub-sectors, would increase member numbers;

(2) implement a 'cluster' strategy through industry-specific forums such as those proposed above (similar to MASTEL) would further bring greater involvement of components manufacturers through a separate organisation of non-electronics parts makers, or a combined organisation for both the latter and the existing IEEIA members;

(3) encourage MNEs to provide systematic support for the SMEs, particularly parts and components manufacturers, by affiliates of MNEs which are end-product assemblers; this can take the form of co-operative groupings comprised of specific components SMEs (such as in plastic moulding, basic metals, electrical parts and others) co-ordinated by the IEEIA and focused on development issues relating to upstream to downstream industries;

the MOIT would play a role in reinforcing the linkage between the assemblers and components firms.<sup>67</sup>

(4) diversification and expansion of activities of the association: various activities which by themselves will bring benefit to the membership and therefore potentially can increase membership, including compilation of a comprehensive list of member companies - this list can also be made available to outside observers on a fee-paying basis; establishing a data collection system and provision of information to members on a monthly or periodic basis on printed as well as computer electronic formats;

(5) Upgrading of analytical capability of the IEEIA to enable it to contribute effective arguments and ideas related to industrial development – temporary placement of technical experts from large firms or multilateral agencies, by dispatch of overseas technical experts (design, production control and other) from specialised retired technical experts organisation such as the US International Executive Service Corporation program to work on either subsidised or partial-volunteer basis.

(6) Promotion of greater involvement of the IEEAI and other the component manufacturers with the Indonesian and foreign commerce chambers at the regional level in order to open up trading contacts with various chambers of commerce in ASEAN, key East Asian countries as well as the European Union and the United States to understand the needs of the potential customers, particularly those engaged in assembling activities in electronics;

(7) Encouragement of a pro-active role in the installation and upgrading capacity of internet connectivity (as outlined above), funded by multilateral agencies through the MOIT and implemented by outsourcing IT specialist firms, the IEEIA can. The IEEIA could build up its IT-based information service (see section 9.2.2 above and take the lead in the provision of market information and technology trends, as well as distant learning and training programs through sub-contracted *Wartel/Warnet* which can deliver high speed Internet access to selected sites of learning, or at existing training institutes such as the Mas-Gobel Institute;

(8) Cooperation by the IEEIA with general e-commerce firms (particularly with those located in Singapore or in ASEAN countries such as Singapore's Commerce Exchange) as well as specialised electronics companies (such as Samsung's e-commerce business) and commercial trading houses (such as Sanyo Electric Trading Co.) in the promotion of member products;<sup>68</sup>

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<sup>67</sup> According to a recent survey result: 'In general, support from the assemblers to the parts and components manufacturers consists largely of technical troubleshooting for problems arising in quality control or manufacturing. There is no systematic support. Neither is there any support for non-technical matters, such as business management and finance. Only a very few companies receive routine assistance, and the majority of companies only receive assistance when a quality related or other technical problem arises' (JICA 2000: 4-128).

<sup>68</sup> There is some evidence that in Asia, e-commerce businesses that tend to succeed are not industry specific, but rather are generalists. These are either existing outsourcing leaders that have adapted well to the New Economy, or one of the few new names still emerging despite the recent e-commerce downturn (*Far Eastern Economic Review*, 30/11/00).

(10) Organisation of study tours of ‘model’ companies (for benchmarking purposes, see the concept of the selected ‘model’ companies from business plan competition in section 9.3.2 below); and the invitation of experts from multilateral sources or individual donor country agencies to provide individual guidance to SMEs.

### **8.3 Towards manufacturing competitiveness II: firm-level measures to improve technological, financial, marketing and managerial-entrepreneurship capabilities**

#### **8.3.1 Enhancement of firm-level financial capabilities**

One of the principal ways around problems for domestic component firms to enter strategic alliances with foreign component SMEs, is for them to become stronger financially in order to finance day to day operating costs. As a consequence of three to four years of economic stagnation, there are hardly any firms that are planning new investments and as the cost of raw materials, imported and local parts soars against declining rupiah sales, many firms are finding it hard to survive. To make matters worse, it is harder for the SMEs to obtain credit, particularly with high interest rates. On the whole, it is difficult for domestic firms to make a sound investment and business plan without institutional financing schemes that specially meet their needs.

##### ***8.3.1.1 Measures: enhancement of firm-level financial capabilities***

- (1) Provision of a complete institutional financing for component SMEs which could include a system for export credit guarantees and a debt facility, and credit for modernisation of factories and equipment.
- (2) General improvement of financial management of SMEs including shortening account receivables, reduction of stock, adequate investment for productivity and quality improvements, and for new products; better processing of accounting and taxation which can be facilitated by improved computer and internet skills.

#### **8.3.2 Enhancement of firm-level technological capabilities**

A second principal way around access to technology problems so that domestic firms can enter strategic alliances with foreign component SMEs is to improve their technological capabilities. For domestic component firms to become stronger technologically, the government and the private sector need to invest in their own technological capability in order to bargain more effectively for access to newer technology through strategic alliances with MNEs.

Any attempts for government to facilitate technology transfer require effective governance. If the government intends to enhance the innovative and technical capabilities of SMEs through the provision of an extension and technology transfer service, the development of technology governance is a critical means to assist firms in

catching up with the moving technology frontier. The principal ingredient is the improvement of government-business coordination, which arguably might be difficult to achieve through formal channels (such as RAKERNAS) but better through informal settings offered by bodies such as MASTEL.

To bring about dynamic participation by partners and strong co-ordination towards better supplier networks, R&D co-operation, the streaming of demand-driven training, as well as technology development and market building requires sophisticated administrative capability of the government and a high quality civil service. If these requirements are not met, and particularly if there is no government agency that can impose stringent screening mechanisms and impose penalties or remove recipients of preferential technical assistance or loans, it would be more appropriate to find alternative mechanisms, through industry associations or third party organizations with international or national expertise that can be subcontracted to perform the task.

For example, in Malaysia the Technology Transfer Unit (TTU) was established by the Ministry of International Trade and Industry and Ministry of Industrial Development Agency (MITI/MIDA) in 1975. Its initial function was to document technology transfer agreements and *ex ante* screening of technology transfer from foreign to domestic firms. From the late 1980s, it started to use instruments that filter firms strategically to complement technology development and clusterization in the electronics industry, and it began to screen, monitor and appraise *ex post* technology transfer agreements. However, there are some governance difficulties:

- (4) firms that *do not comply* with the conditions set by agreements *are not* removed from incentive schemes;
- (5) many *local obstacles external* to the firms that weaken the competitiveness of SMEs were not tackled;
- (6) Ex post appraisal, which is an essential governance mechanism, *did not* receive the support from the private sector through national co-ordination council;
- (7) The TTU *did not* sufficiently assist local licensees to draw better bargains from foreign licensors and in some cases it did not seek the right foreign licensor nor select viable local licensees for matching.

As a result, despite the genuine initiative to cheapen and deepen transfer of relevant technologies to Malaysian firms, the TTU has not been considered to have functioned efficiently or effectively, as the agency is perceived to suffer from relative lack of transparency, accountability and in some cases from the incidence of collusion (UNIDO 2000, 148 and correspondence with an electronics specialist researcher, University of Malaya, 7/11/00). In addition, in Malaysia incentives to promote linkages, international procurement, and location of IT firms in the Multimedia Super Corridor (MSC) and in less industrialized areas of East Peninsular Malaysia and East Malaysia have not generated expansion of the value added chain due to 'coordination failures between a number of support institutions which were created to provide incentives for stimulating high technology operations, technology transfer agreements, industrial parks and other areas' (UNIDO 2000/2, 149). Penang is an exception in this regard.

Hence, Indonesia needs to carefully consider similar measures directed at enhancing the innovative and technical capabilities of SMEs, particularly since the MOIT or other agencies such as the Agency of the Application and Assessment of Technology (BPPT) may not yet have attained sufficient administrative capability and high quality personnel to formulate and effectively implement such programs. If an extension service or other support mechanisms were to be established in Indonesia then the public-private initiatives must attain a high level of private sector support.

#### **8.3.2.1 Measures: foster firm-level technology and innovation capabilities**

(a) An extension service led by MNE assemblers and supported by MOIT/BPPT/LIPI can be established under a legally binding cooperative agreement between interested component SMEs whereby stringent screening mechanisms are put in place to select viable local licensees for matching with MNE assemblers; incentive schemes are put in place (for example, in the form of tax deductions) for the assemblers' systematic support for the selected SMEs, particularly in non-technical matters such as business management and finance; and the selected companies receive routine technical assistance through the extension service, offered by individual MNE assemblers which have a specific license agreement with the particular SME in techniques of production management suited to the principal.

(b) firms that do not comply with the conditions set by agreements after a specified period of time should be promptly removed from incentive schemes;

(c) any *local obstacles external* to the firms that weaken the competitiveness of SMEs should be tackled by the quarterly meeting of the new inter-industry association forum (e.g. MASTEL see 9.2.2) and the annual RAKERNAS meeting;

(d) Ex post independent quarterly appraisals conducted by subcontracted private research bodies, including independent auditors, is to be an essential part of the governance mechanism; this should receive the support from the private sector through the national co-ordination council.

The attainment of efficient and effective assistance program to draw better bargains from foreign licensors for local licensees is a process that, in some cases, might take some years to achieve. However, the process must be started and the government and the IEEIA will need to take the initiative to build effective linkages between the assemblers and components SMEs.

#### **8.3.3 Enhancement of firm-level entrepreneurial capabilities**

One way to enhance the entrepreneurial capabilities of SMEs is for private-public sponsored business plan competitions. Notwithstanding the difficulties in planning in the post Crisis environment (outlined in 9.3.1 above), once political and economic stability returns to Indonesia, on the basis of the experience in the United States and Europe, business plan competition can be used to effectively create networks of entrepreneurs,

venture capitalists, and service firms that are needed to create flourishing clusters of high-tech businesses.

In East Asian industrialised countries, the cultivation of the individual classical entrepreneur (who changes the existing order by introducing innovations) together with those that nurture the intrapreneur (who is a catalyst/motivator of employees to reach company goals) and the interpreneur (a catalyst beyond the firm to the sub-sector and promoter to release processes of organisational learning, horizontally as well as vertically) have been found to assist the creation of concentrations of high-tech businesses (Richter 2000).

The use of business plan competitions can initiate the process leading towards networks of MNEs, local entrepreneurs, venture capitalists, and service firms that are specifically suitable to for Indonesian conditions, and to stimulate the development of higher tech electronics supplier firms. Such competitions would have to be co-sponsored by some large MNEs, national or regional governments, business and industry association, universities and research institutes. These are to coax into the open not only the Muhammad Gobels and Uripto Widjajas<sup>69</sup> of the future but also the latent network of talented entrepreneurial academics, PhD/graduate students, advisers and financiers on whom they depend. Business plan competitions could become the catalysts.

The idea of using business plan competitions was originally developed by students at the Massachusetts Institute of Technology and was taken up by the international consultant McKinsey which has sponsored competitions in developed as well as in developing countries (for example in South Africa and India) to stimulate the growth of start-up hi-tech companies (Dodt et al. 1999). Notwithstanding many practical problems in adapting the idea in the Indonesian context, a competition within the broader SME community might aim to:

- (i) reward the best 'indirect' exporter's tie-up with MNEs,
- (ii) assist individual start-ups getting off the ground, or
- (iii) for existing domestic companies, to uncover and develop the innovative potential of their own employees, that is to put to use their own in-house talent.

#### ***8.3.3.1 Measures: to foster firm-level business plan competitions***

The blue print for the Indonesian business plan competition could be formulated by a joint team consisting of established entrepreneurs from the electronics industry, IEEIA, BPPT, the MOIT, MOC, supporting multilateral agencies such World Bank, ADB, and others as well as research institutions. While in Indonesia there are some awards already provided by large MNEs (such the IBM e-Business Media Award which is given annually to a business entity which has excelled in e-business and internet achievements), the idea to use some aspects of the McKinsey competition might be a first of its kind in Indonesia and it must have a few essential ingredients for it to succeed (following the McKinsey idea):

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<sup>69</sup> The two individuals who started their electronics businesses in the 1960s are well-known pioneers in the Indonesian electronics industry.

(1) there must be enough participants to attract venture capitalists, MNEs and other sponsoring companies. Such numbers can only be attained if the competition is 'well promoted and its threshold for admission kept low, so that even those who have never written a business plan can take part';

(2) given that the competition would be open to people with minimal business knowledge and experience, it must be 'structured as learning programs'. For example, the McKinsey competitions have three phases, each lasting two months: (i) requires a first-cut description of the business idea (the product or service and the value it offers to customers), the market and the competition; (ii) an outline of the marketing and sales plan, the business system and organisations they propose to create, and the financial opportunities and risks posed by the ventures; (iii) a description of the management team that will run the operation as well as a financial plan. These are then integrated into a final, comprehensive document (Dodt et al. 1999:67).

(3) participants of the competition must be given adequate financial incentives at each of the phases above which can help select from large numbers of early participants (the selection of firms at each stage is conducted by a team of independent evaluators consisting of established entrepreneurs, MNEs, government and research institution officials) and also help motivate participants to keep on going;

(4) the business plan competition must not be a one-off event but is part of a long term commitment from institutional sponsors (for example, corporate business development departments of assembler MNEs and large domestic companies, government agencies, universities and interested foundations such as the Mas-Gobel Institutes) to finance the costs of the program's infrastructure, prize money, and public-relations activities. So, the collaboration between the private, multilateral agency and public sectors is critical;

(5) the competition must have their own staff of organisers, including an independent project manager and a qualified and competent support team capable of balancing the interests of all the parties.

While some of these requirements might be too difficult to attain at present in Indonesia, starting such a process might well be worth considering since it promises to bring out unrecognised talent and innovative business ideas which can be discovered, cultivated and subjected to some systematic scrutiny, in turn bringing benefits both to its sponsors and to the larger community (Dodt et al. 1999: 66-69).

There are alternative 'model business' firms which were selected by a team of experts who would prescribe some 'laundry list' suggestions for their improvements (JICA 2000: 10-26 – 10-40). The model firms are then to be emulated by other SMEs (and provided with tax incentives for further 'match-making with MNEs in technology licensing or other forms of strategic alliance. *This seems a very different model businesses to the business plan competition process of selection* as without a process which is neither transparent nor accountable and without a structured learning program for SMEs as the

business plan competition model. Another argument for the competition model is that high profile Indonesian universities must now find their own funding from the private sector, competitions may be educational for some innovative academics who are beginning to think seriously about becoming entrepreneurs. Also, the ‘discounted fee-based’ use of public or university buildings could be considered for the independent competition organization along with the relevant industrial associations.

### **8.3.3.2 Summary of firm level measures**

The above section outlines a number of policy measures which can be considered by policy makers to enhance capability and competitiveness of firms (particularly domestically-owned domestic firms but also their foreign owned counter parts) deal with overcoming structural challenges and dealing with organisational challenges related to issues within firms and inter-firm networking capabilities.

The focus is on the post 1990s trend of offshore manufacturing in electronics MNEs locating to Indonesia with companies which have earned their reputation as being able to meet product quality and cost requirements as well as meet technical specifications of the global market. But sourcing decisions are not influenced by these factors alone. Increasingly, it has become important that global suppliers be able to provide services related to design, testing, component qualification and prototyping capabilities and access to markets.

The key principle is facilitating access to the supporting commercial, technical and physical infrastructure for the supporting SMEs both local foreign and domestically-owned companies to enhance their financial, technological, managerial and entrepreneurial capabilities.

## **9 SUMMARY OF RECOMMENDATIONS ON KEY ISSUES IN THE INDONESIAN ELECTRONICS INDUSTRY**

One of main challenges in the development of the Indonesian electronics industry is to overcome the lack of industrial depth, and import dependence. While in the 1990s, the industry made substantial progress in obtaining foreign investments in higher technology products and components, but there was less development of indigenous manufacturing and marketing capability of domestic firms and their ability to move up the value chain, own brand names occurred only to a limited extent. Domestic end-product and component firms relied mainly on assembly labour with limited development of indigenous suppliers, and complementary technical and supporting institutions.

No single company or even any single country is capable of being entirely self-sufficient in electronics. Since Indonesia may not be capable of moving up the ladder of value by relying on its own resources, to establish basic capabilities as a manufacturer of less sophisticated, labour-intensive products, and in order to deepen its economic structure and build the missing middle in the industrial output mix, Indonesia must aim to establish strategic alliances with multinational enterprises – both with those that are already

present in the country and with those that require a production base for export-oriented activity. Here lie the possibilities for diffusing technology through greater local sourcing. Indonesian indigenous firms must establish a solid reputation for being able to meet the technical specifications, product quality and cost requirements of the international market.

Sourcing decisions by MNEs, however, are not influenced by these factors alone. MNEs increasingly depend on the ability to provide related services to design, testing, component qualification and prototyping capabilities and free access to domestic and international markets. With respect to market access, Indonesia offers very attractive export opportunities in low-end products but if Indonesia want to move up the ladder of value adding then it must also deliver on the other requirements.

In order to move up the ladder of value added, and to bring about industrial deepening and structural change, Indonesian indigenous firms and policy makers must pursue and forge a long-term vision and innovative strategy suitable to the Indonesian structural characteristics. The notion of 'economic structure' is multi-faceted. It has to be defined as to the detail of disaggregation and the relevant structural characteristics. Most frequently, structural change is analysed at the fairly aggregate level of an 'industry.' This is an abstraction that rarely fits factual decision-making or ownership structures.

Industries are, at best, given factual substance when represented by different industrial ministries, industrial organisation or lobby groups. But, of course, not all decision makers are organised at the industry level. In fact, much of what happens in the process of structural change and economic growth occurs at a much greater level of disaggregation, at the level of enterprises, division within enterprises, plants, products, workplaces and regionally dispersed market places. In reality, structural flexibility or rigidity – factor mobility guided by profit-loss incentives – is made at the micro-micro-economic level. For example, the decision to invest in Indonesia by a second-tier electronics supplier in Japan might be determined by the physical infrastructure such LIKE or the availability of product testing facility. While there are limits as to how much international competitiveness can be effectively influenced by policy-driven measures by a host country, but policy impacts on the technical infrastructure host economy in the medium to longer run can be decisive.

Notwithstanding much existing limitations that has been documented in this paper, much can be gained in an open and transparent private-public dialogue. This is provided that at the outset this dialog does not aim for a 'top-down' public-private agenda which selects what types of products it would like to produce and export, and what types of goods it should continue to import. While not necessary a zero-sum game, an excessive emphasis on a moving target of a few selected sub-sectors or even products can lead to greater likelihood of misallocation of resources.

Rather, a long-term vision for the electronics industry is about broad guidelines of policy. As outlined in this paper, a more constructive approach would be to leave such sub-sectors or product selection decisions to the market players. However, there are several national groups MNEs present in Indonesia (such as those from the United States, Japan,

Korea and others) and firms from a particular country of origin might have different strategies. Therefore, foreign and domestic firms can gain much through institutional building of a number of innovative organic structures such as an independent inter-industry association (*a la* MASTEL), business plan competitions, a quarterly Internet survey of MNE affiliates and large domestic firms and other measures – which place Internet and IT-based solutions at the centre – proposed in this paper. These proposed measure create new institutions which will improve market information and leave decisions on investment and production to the market.

By the very nature of very rapid technological change in the global electronics industry, not much that can be determined through a joint private-public policy process can accurately identify a number of priority sub-industry let alone in advance tell which export electronics products will do well in the following year which the government and the private sector can jointly promote.

Broad guidelines of policy and open-ended trial and error – not conformity to one central, government-planned vision – is the key to enhancing the international competitiveness. While firms certainly do plan, the government should not make concise plans of investment and production matters. Rather than a ‘bureaucratically engineered future’ with its ‘prescription of outcomes in advance circumventing the process of competition, experiment and technological invention’ (Postrel 1998), this paper outlines a number of measures as a first-cut attempt to forge an agenda towards enhancing the international competitiveness of the industry. They are formulated at three interrelated levels: industry-wide, industry-specific and firm-level policies (see table below).

Lack of good governance in both public and corporate sectors can be a key deterrent to greater competitiveness of a country. In particular, the lack of governance can seriously jeopardise a bureaucratically engineered future even if there is an adequate civil service. Through strengthening the structural features and organisational capabilities of the core electronics industry, its supporting and related industries, significant improvements in governance in corporate sector can be achieved. Benefits that flow from such moves would be greater inter-firm linkages, better information flows for matching suppliers and assemblers, market conditions and technology information, and ultimately improved technological infrastructure.

Provided that political stability returns, Indonesia has the ‘right ingredients’, albeit with a number of important exceptions (such as sophisticated agencies in the technological infrastructure area), to attract MNEs to Indonesia. In competition with areas of production such as China, Malaysia, Mexico, Philippines, Thailand and Vietnam, Indonesia must harmonise its trade and regulatory regime, and reduce bureaucratic hurdles such as inefficient Customs, for it to be more competitive. However, the most critical issue for the Indonesian electronics industry if it is to survive the current ‘onslaught’ of smuggled products and the introduction of AFTA in 18 months, is the rationalisation of the tariff and duties (particularly luxury goods duties) structure. The organisational and technological restructuring of the major passive component manufacturers towards higher value added production – based on granting indirect exporters facilities identical to those for direct exporters – is unlikely to occur without increasing domestic and external competition.

While the global electronics industry is constantly undergoing rapid structural transformation which will further alter world wide production and consumption patterns, technological leadership is not a precondition of success in the industry. In computers, for example, the ability to be integrated with other systems rather than state of the art hardware is the basis on which some computer companies thrive. In mature consumer electronics products, a solid understanding of basic technologies and consumer preferences – both for end-products or other component assemblers –is required to develop products which offer enough value to the consumer to generate replacement purchases. The keys to success in this segment are total commitment to product quality, regular and speedy delivery, and control of manufacturing costs. The keys to a successful pro-active policy are the provision of elements that would make up a solid supporting technical and physical infrastructure for manufacturing renewal and competitiveness, and that receives the consensual support of the main participants in the industry.

## SUMMARY OF KEY POLICY MEASURE IN ELECTRONICS

INDUSTRY-WIDE POLICIES	
AIM	MEASURES
Dealing with the twin problem of high 'parallel' imports and high effective protection rate (Section 9.1.1)	Immediate action to narrow the discrepancy in tariff rates between components and final products, rationalisation of imports procedures; removal or reduction of luxury good taxes, stricter rules for the importation of components; tax identification of importers and distributors, harmonising tariffs and duties at levels similar to those applied in other ASEAN countries.
Reform of Customs department ( <i>Bea dan Cukai</i> ), reduction of under-invoicing and implementation of product standards rules (9.1.2)	Reduction of parallel imports or the importation of sub-assembled components through SGS certification, double-checking of imports, fines for the re-entry or re-importation of products, further automation of the documentation of price in the invoice, abolishment of the cash payment system, independent surveillance of the customs department, implementation of national standards and the rules and registration of foreign brands, establishment of a new section in the National Ombudsman Office (NOO).
Legal reform and reduction of corrupt business practices (9.1.3)	Intensification of legal reform to deal with restrictive anti-monopoly law and corrupt business practices, greater role of NOO and the proposed Anti-Corruption Commission;
Harmonising trade regime and incentives between Indonesia and other ASEAN countries (9.1.4)	VAT exemptions for indirect export-oriented firms, income tax credit on local materials, non-discriminatory treatment of companies which are operating in <i>EPTE/KB</i> with those which are oriented towards the domestic market in tariff and other duties
Anti-dumping measures (9.1.5)	Form a new independent anti-dumping commission and implement tightened rules, new regulations to clarify the objectives of AD investigations, clarify linkages to other Indonesia laws, tighten rules on injury, New regulations on Public Notice and Public Hearings
Reduction of labour cost uncertainties, disputes and tackling of industrial organisation issues (9.1.6)	Orderly review of minimum wages and conditions and alternative resolutions of labour dispute training for human resource managers and union organisers, implement other industrial relations reforms, orderly representation by unions on P4P and industry forums
Expansion of domestic and international marketing (9.1.7)	Improvements to the domestic marketing with a focus on 'indirect' exporters and existing MNEs in Indonesia, expansion of 'indirect' export market for

	<p>components, support for domestic sales promotion to SMEs, support for sales promotion by SMEs to the IPO offices of MNEs in Singapore and other ASEAN countries, support for sales promotion by SMEs to the IPO offices of multinational enterprises based in Singapore, promotion of bilateral agreements with a number of African countries, enforcement of GSP facilities from advanced countries, direct marketing through exhibitions by the industry association and by NAFED's overseas offices.</p> <p>Generate greater domestic demand for electronics and IT products and services through development of IT in Indonesia: formation of an advisory or agency body, co-ordination over the long term a joint private/public initiative and by development of computer training programs with national-level accreditation schemes</p>
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<b>INDUSTRY-SPECIFIC POLICIES</b>	
AIM	MEASURES
<p>To strengthen inter-firm networks and improve technological infrastructure:</p> <p>Simultaneous FDI and technology policy development (9.2.1)</p> <p>Inter-firm Networking Program to Support Domestic Components SMEs (9.2.2)</p> <p>Technology infrastructure development (9.2.3)</p>	<p>Co-ordinated campaign to attract new and expand realised FDI, encouragement to MNEs to relocate specific components, regular visits of main foreign companies overseas which produce the selected critical components, 'match making' measures to bring the supplier and buyer together, clearer division of role for FDI promotion, service provider and data collection for government agencies, strong focus of FDI policy on forming strategic alliances</p> <p>Getting SMEs 'wired' or 'connected' as part of a comprehensive approach, a program implemented by MOIT but outsourced to a specialist private company, strengthening the Internet capabilities of SMEs and the industrial organisation, establishment of an inter-industry association forum, measures to establish and to build links with existing electronic commerce trade sites or companies</p> <p>Evaluation of the activities of key existing supporting institutions, subsidies for technical services to the electronics industry, region-specific comprehensive approach to advance technical, management and entrepreneurial skills of SME firms (see also 9.3.3)</p>

Human resource development (9.2.3)	Increasing the output and quality of technical graduates, provision of tax incentives for the dispatch of overseas technical experts, increased role of international cooperation programs by the standardisation bodies, greater coordination among the ministries and related institutions to work towards an upgraded national standard of technical vocational and university training, greater private responsibility for technical vocational training
Physical infrastructure which supports components electronics SMEs (9.2.4)	Establishment of component and other industry parks (LIKE) with strong involvement of the private sector
Strengthening the industrial association (9.2.5)	Strengthening the IEEIA organisational structure, expansion of fee based activities, greater promotion for participation in the association, implement 'cluster' strategy through industry-specific forums (such as MASTEL), encourage MNEs to provide systematic support for the SMEs, diversification and expansion of activities of the association, upgrading of analytical capability, greater involvement of IEEAI and parts makers with the Indonesian and foreign commerce chambers; upgrading capacity of internet and e-commerce connectivity, study tours of 'model' companies

<b>FIRM-LEVEL POLICIES</b>	
AIM	MEASURES
<p>To improve firm-specific capabilities (9.3):</p> <p>Financial capabilities (9.3.1)</p> <p>Technological capabilities (9.3.2)</p> <p>Entrepreneurial capabilities (9.3.3)</p>	<p>Institutional financing for component SMEs and improvement of financial management</p> <p><i>Foster an extension service led by MNE assemblers with strict conditions</i></p> <p>Organize firm-level business plan competition and independent body to run it</p>

## 10 APPENDIX 1: TABLES AND FIGURES

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**Table 1: Investments in the Main Segments of Electronics, 1994-99**

Segment	Status	Year					
		1994	1995	1996	1997	1998	1999
Consumer Electronics	PMA (US\$ Million)	107	107	559	37	16	0
	PMDN (Rp. Billion)	18	0	96	9	1	0
	Non-Fac (Rp. Billion)	33	58	173	53	21	25
Business and Industrial Electronics	PMA (US\$ Million)	10	8	28	14	0	5
	PMDN (Rp. Billion)	80	0	0	0	12	0
	Non-Fac (Rp. Billion)	61	30	30	72	16	99
Components and Parts Electronics	PMA (US\$ Million)	208	470	1,402	332	96	111
	PMDN (Rp. Billion)	129	0	172	313	0	1
	Non-Fac (Rp. Billion)	115	91	209	129	11	3,510

Note: PMA denotes foreign investment status and PMDN the local direct investment status while Non-Fac denotes the Non-Facility investment status which are neither PMA or PMDN;  
Source: Directorate of Industry Electronics, 2000.

**Table 2: Electronics and Electric Appliances Production in Indonesia, 1994-99**

(US\$ billion)	1994	%*	1995	%	1996	%	1997	%	1998	%	1999	%
Consumer Electronics	<b>5.005</b>	57	<b>7.734</b>	56	<b>8.564</b>	54	<b>7.413</b>	43	<b>13.394</b>	42	<b>13.152</b>	42
Business/Industrial products	<b>1.836</b>	21	<b>2.951</b>	21	<b>3.591</b>	23	<b>3.572</b>	21	<b>5.130</b>	16	<b>5.039</b>	16
Components, parts	<b>1.979</b>	22	<b>3.241</b>	23	<b>3.597</b>	23	<b>6.242</b>	36	<b>13.045</b>	41	<b>12.809</b>	41
PEBT**							<b>1.895</b>	11	<b>4.320</b>	14		
Total	<b>8.820</b>	100	<b>13.926</b>	100	<b>15.772</b>	100	<b>17.167</b>	100	<b>31.569</b>	100	<b>31.000</b>	100
% change on												
previous year's total:			<b>37</b>		<b>12</b>		<b>8</b>		<b>46</b>		<b>-2</b>	

Note: \* These figures are percentage share of each segment for a particular year;  
\*\* PEBT data for 1997 and 1998 are included only in the consumer electronics segment; PEBT is export data as obtained from the declaration forms known as 'Notification of Export of Specific Goods' (PEBT or *Pemberitahuan Ekspor Barang Tertentu*)

Source: MOIT based on Central Bureau of Statistics (BPS) data, 2000

**Table 3: Electronics and Electrical Appliances Exports, 1995-99**

(in billion US\$)	1994	%*	1995	%	1996	%	1997	%	1998	%	1999	%
Consumer Electronics	<b>1.340</b>	52	<b>1.658</b>	51	<b>1.704</b> (+3%)	44	<b>1.330</b> (-28%)	27	<b>1.080</b> (-23%)	32	<b>1.096</b> (+1%)	28
Electronic products			<b>0.948</b>	29	<b>0.845</b>	22	<b>0.482</b>	10	<b>0.442</b>	13	-	
Video Recorders			<b>0.415</b>	13	<b>0.622</b>	16	<b>0.637</b>	13	<b>0.374</b>	11	-	
Electrical products			<b>0.295</b>	9	<b>0.236</b>	6	<b>0.211</b>	4	<b>0.265</b>	8	-	
Business/Industrial products	<b>0.515</b>	20	<b>0.635</b> (19%)	20	<b>0.890</b> (29%)	23	<b>0.804</b> (-11%)	16	<b>0.515</b> (-56%)	15	<b>0.631</b> (18%)	16
Components & parts	<b>0.741</b>	29	<b>0.960</b> (23%)	30	<b>1.318</b> (27%)	34	<b>1.458</b> (10%)	30	<b>1.464</b> (0.4%)	44	<b>2.076</b> (29%)	53
PEBT Exports*							<b>0.306</b>	-	<b>0.412</b>	-	<b>0.093</b>	-
Total	<b>2.596</b>		<b>3.254</b>	100	<b>3.911</b>	100	<b>3.898</b>	100	<b>3.363</b>	100	<b>3.896</b>	100

Note: : \* These figures are percentage share of each segment for a particular year; and the percentages in brackets are percentages on the previous year's figure;

PEBT is export data as obtained from the declaration forms known as 'Notification of Export of Specific Goods' (PBET or *Pemberitahuan Ekspor Barang Tertentu*) where exporters are only required to declare general specific classifications of their exports such as 'electronics, textile or plastic' products. The other data which is official export data as declared on Indonesian export declaration forms (PEB or *Pemberitahuan Ekspor Barang*) is based on the Harmonised System (HS) or the Standard International Trade Classification (SITC). The resulting data on total exports for each year are unofficial and are not contained in any government publication.

Source: Directorate for Electronics Industry, MOIT based on data from Central Bureau of Statistics (BPS), 2000.

**Table 4: Electronics and Electrical Imports and Balance of Trade, 1995-1999**

(in US\$ billion)	1994	%	1995	%	1996	%	1997	%	1998	%	1999	%
Consumer Electronics	<b>0.144</b>	4	<b>0.258</b> (44%)	7	<b>0.320</b> (19%)	9	<b>0.363</b> (12%)	10	<b>0.246</b> (-48%)	14	<b>0.125</b> (-97%)	14
Electronic products			<b>0.079</b>	2	<b>0.091</b>	3	<b>0.075</b>	2	<b>0.033</b>	2		2
Electrical products			<b>0.179</b>	5	<b>0.229</b>	6	<b>0.287</b>	8	<b>0.199</b>	12		12
Business/Industrial products	<b>1.447</b>	48	<b>1.671</b> (13%)	45	<b>1.546</b> (-8%)	46	<b>1.804</b> (14%)	50	<b>0.767</b> (-113%)	51	<b>0.444</b> (-90%)	51
Components & parts	<b>1.454</b>	48	<b>1.800</b> (19%)	48	<b>1.651</b> (-9%)	46	<b>1.470</b> (-12%)	40	<b>0.645</b> (-154%)	35	<b>0.331</b> (-75%)	35
Total	<b>3.045</b>	100	<b>3.728</b>	100	<b>3.617</b>	100	<b>3.637</b>	100	<b>1.657</b>	100	<b>0.900</b>	100
Balance of trade	<b>-0.449</b>		<b>-1.132</b>		<b>0.294</b>		<b>0.261</b>		<b>1.706</b>		<b>2.996</b>	

Source: Calculated from data obtained from the Directorate for Electronics Industry, MOIT based on data from Central Bureau of Statistics (BPS), 2000.

**Table 5: Exports and Shares of Main Ports for Exported Electronics Products, 1996 and 1999**

(in \$ billion)	1996				1999				% Region	%
	Consumer	Business	C&Parts	%	Consumer	Business	C&Parts	%		
Tg. Priok/Jakarta	<b>1.076</b>	<b>0.399</b>	<b>0.313</b>	46	<b>0.606</b>	<b>0.172</b>	<b>0.187</b>	28	<b>Total</b>	
S-H Int. Airport/Jakarta	<b>0.02</b>	<b>0.073</b>	<b>0.143</b>	6	<b>0.041</b>	<b>0.062</b>	<b>0.051</b>	4	<b>Jakarta</b>	32
Batu Ampar/Batam Is.	<b>0.523</b>	<b>0.328</b>	<b>0.618</b>	38	<b>0.354</b>	<b>0.226</b>	<b>0.719</b>	36	<b>Total</b>	
Sekupang/Batam Is.	<b>0.005</b>	<b>0.071</b>	<b>0.185</b>	7	<b>0.017</b>	<b>0.147</b>	<b>0.656</b>	23	<b>Batam</b>	59
Others	<b>0.08</b>	<b>0.019</b>	<b>0.059</b>	4	<b>0.077</b>	<b>0.019</b>	<b>0.224</b>	9	<b>Others</b>	9
Total	<b>1.704</b>	<b>0.89</b>	<b>1.318</b>	100	<b>1.095</b>	<b>0.626</b>	<b>1.837</b>	100		100

Source: Calculated from data obtained from Directorate for Electronics Industry, MOIT based on data from Central Bureau of Statistics (BPS), 2000.

**Table 6: Number of firms and workers by segments in Indonesia, 1990-97**  
**Number of firms by segments in Indonesia, 1990-97**

Description	No. of firms							
	1990	1991	1992	1993	1994	1995	1996	1997
Consumer Electronics	48	52	48	44	49	51	56	45
Telecommunication	6	9	11	14	14	15	16	16
Electronics Components	26	36	55	57	90	110	123	172
Electrical Appliances	15	16	17	19	19	19	26	25
Electronics Total	95	113	131	134	172	195	221	258

Description	No. of workers ('000)							
	1990	1991	1992	1993	1994	1995	1996	1997
Consumer Electronics	17	21	23	30	32	35	35	30
Telecommunication	3	5	5	6	7	9	8	7
Electronics Components	6	9	15	19	41	45	54	79
Electrical Appliances	2	3	5	6	6	6	5	5
Electronics Total	29	38	47	61	86	94	102	122

Source: CSIS-IDE (2000: 57) based on BPS data.

**Table 7: Number of workers by segments in Indonesia, 1994-99**

	No. of Workers ('000)							
	1994	1995	1996	1997	1998	% (98-97)	1999	% (99-98)
Consumer Electronics	7.01	6.25	12.61	4.44	3.07	-31	2.88	-6
Industrial/Business Electronics	1.11	2.09	2.89	3.06	0.77	-75	0.89	16
Components and Parts Electronics	6.64	17.17	29.02	21.60	8.72	-60	4.78	-45
Electronics Total	14.75	25.51	44.52	29.10	12.59	-57	8.55	-32

Source: Directorate of Electronics Industry, MOIT, 2000.

**Table 8: Production, Input Costs, Value-added and Production Growth of 19 Segments of Indonesian Electronics by 5-digit ISIC, 1997 (million, Rp.)**

ISIC	Type of Industry	Output	Input Cost	Value Added (Market price)	Indirect Taxes	Value Added (Factor Production Cost)
38311	Electrical generators	32.9	23.4	9.5	1.3	8.2
38312	Electrical motors	114.7	80.9	33.7	4.1	29.7
38313	Alternator and control current devices	307.8	199.8	107.9	1.4	106.6
38314	Electrical panel and switch gear	476.2	271.6	204.6	9	195.6
38316	Other electrical devices	39.3	31.9	7.4	0.7	6.7
38317	Maintenance electrical devices	-	-	-	-	-
38321	Radio, television & other entertainment devices	(2)4,635.8	(2)3,031.2	(2)1,604.6	(1)383.9	(2)1,321.7
38322	Communications equipment	(3)2,640.8	(3)1,863.0	(3)777.8	12	(3)765.8
38323	X-ray equipment and the like	-	-	-	-	-
38324	Sub-assembly and component electronics	(1)7,673.9	(1)2,615.3	(1)2615.3	(2)24.7	(1)2,590.6
38325	Computer software	18.5	6.8	6.8	0.1	6.7
38330	Household electrical appliances	545.5	22.6	226.9	(2)24.8	202
38391	Electrical accumulators (secondary batteries)	865.7	585.2	585.2	4.5	580.7
38392	Dry-cell (primary) batteries	923.3	149.3	149.3	19.4	129.9
38393	Light bulb, centralised and ultra violet lights	502.2	121.0	121.0	6.5	114.5
38394	Gas-tube light bulb	25.0	7.4	7.4	0.4	7
38395	Electrical lamp components	161.1	34.4	34.4	0.1	34.4
38396	Electrical and telephone cables	2,202.5	498.8	498.8	87.9	410.9
38399	Electronics and electrical components	348.0	148.2	148.2	4.5	143.7

Note: ISIC denotes Indonesian Standard Industrial Classification

Source: Business News 6457, 26 Apr 2000 based on data from Indonesian Central Bureau of Statistics (1998)

**Table 9: Firm or Industry Establishment Characteristics By Electronics Segments, 1990, 1993, 1996 And 1998**

**(i) All Firms**

	ISIC-38321: Radio, TV & other CE					ISIC-38324: Sub-assy CPE					ISIC-38330: H El.Appl's				
	1990	1993	1996	1998	%Ch* '96-'98	1990	1993	1996	1998	%Ch '96-'98	1990	1993	1996	1998	%Ch '96-'98
No. of Establishment	48	44	56	36	-36	26	57	123	181	47	15	19	26	28	8
Worker/Est.	364	683	626	852	36	241	342	435	452	4	121	316	210	139	-34
VA/Worker	10	12	34	51	50	9	9	22	54	145	2	15	18	37	106
<b>VA/Output</b>	<b>18</b>	<b>21</b>	<b>25</b>	<b>29</b>	<b>16</b>	<b>32</b>	<b>32</b>	<b>33</b>	<b>27</b>	<b>-18</b>	<b>13</b>	<b>30</b>	<b>21</b>	<b>29</b>	<b>38</b>
Labour Cost/VA	21	24	14	10	-29	21	42	26	21	-19	55	25	20	20	0
Labour Cost/Output	4	5	4	3	-25	7	13	9	6	-33	7	7	4	6	50
Inputs/Outputs	59	66	70	58	-17	30	56	57	63	11	68	62	68	58	-15
<b>% Inputs Imported</b>	<b>81</b>	<b>84</b>	<b>79</b>	<b>66</b>	<b>-16</b>	<b>46</b>	<b>86</b>	<b>90</b>	<b>85</b>	<b>-6</b>	<b>60</b>	<b>77</b>	<b>56</b>	<b>56</b>	<b>0</b>
% Exports	5	38	63	40	-37	27	78	73	6	-92	0	24	15	50	233
Labour Cost/Wkr	2.1	2.9	4.8	5.4	13	2	3.8	5.8	11.3	95	1.2	3.7	3.8	7.4	95

**(ii) Foreign Firms**

	ISIC-38321: Radio, TV & other CE					ISIC-38324: Sub-assy CPE					ISIC-38330: H El.Appl's				
	1990	1993	1996	1998	%Ch* '96-'98	1990	1993	1996	1998	%Ch '96-'98	1990	1993	1996	1998	%Ch '96-'98
No. of Establishment	4	12	14	11	-21	2	25	63	99	57	n	5	6	5	-17
Worker/Est.	944	951	1405	1035	-26	214	450	601	533	-11	n	797	547	278	-49
VA/Worker	25	13	49	46	-6	46	11	21	54	157	n	21	25	65	160
<b>VA/Output</b>	<b>21</b>	<b>20</b>	<b>24</b>	<b>33</b>	<b>38</b>	<b>38</b>	<b>30</b>	<b>28</b>	<b>24</b>	<b>-14</b>	<b>n</b>	<b>31</b>	<b>22</b>	<b>27</b>	<b>23</b>
Labour Cost/VA	19	32	13	16	23	7	37	30	22	-27	n	23	19	18	-5
Labour Cost/Output	4	6	3	5	67	3	11	9	5	-44	n	7	4	5	25
Inputs/Outputs	51	63	72	38	-47	19	61	63	67	6	n	61	65	65	0
<b>% Inputs Imported</b>	<b>65</b>	<b>82</b>	<b>79</b>	<b>60</b>	<b>-24</b>	<b>95</b>	<b>88</b>	<b>92</b>	<b>92</b>	<b>0</b>	<b>n</b>	<b>79</b>	<b>49</b>	<b>61</b>	<b>24</b>
% Exports	5	20	71	53	-25	29	79	83	8	-90	n	27	20	74	270
Labour Cost/Wkr	4.7	4.2	6.3	7.5	19	3.2	4.1	6.3	12.1	92	n	4.7	4.7	11.9	153

Note: \* Denotes percentage change between 1996 and 1998.

Source: UNIDO database calculated from unpublished data from the Central Bureau of Statistics/BPS, Jakarta, various years indicated.

### (iii) Domestic Firms

	ISIC-38321: Radio, TV & other CE					ISIC-38324: Sub-assy CPE					ISIC-38330: H ELAppl's				
	1990	1993	1996	1998		1990	1993	1996	1998		1990	1993	1996	1998	
No. of Establishment	44	31	41	14	-66	23	32	60	51	-15	15	14	20	18	-10
<b>Worker/Est.</b>	<b>311</b>	<b>598</b>	<b>374</b>	<b>196</b>	-48	<b>249</b>	<b>258</b>	<b>261</b>	<b>362</b>	39	<b>121</b>	<b>144</b>	<b>109</b>	<b>97</b>	-11
VA/Worker	6	11	15	101	573	7	7	26	62	138	2	3	9	17	89
<b>VA/Output</b>	<b>15</b>	<b>23</b>	<b>32</b>	<b>20</b>	-38	<b>29</b>	<b>40</b>	<b>53</b>	<b>49</b>	-8	<b>13</b>	<b>22</b>	<b>18</b>	<b>43</b>	139
Labour Cost/VA	24	18	19	6	-68	29	53	18	15	-17	55	51	27	31	15
<b>Inputs/Outputs</b>	<b>4</b>	<b>4</b>	<b>6</b>	<b>72</b>	1100	<b>8</b>	<b>21</b>	<b>10</b>	<b>7</b>	-30	<b>7</b>	<b>11</b>	<b>5</b>	<b>13</b>	160
Labour Cost/Output	65	69	60	1	-98	34	39	34	45	32	68	71	78	49	-37
<b>% Inputs Imported</b>	<b>91</b>	<b>85</b>	<b>77</b>	<b>99</b>	29	<b>36</b>	<b>76</b>	<b>83</b>	<b>65</b>	-22	<b>60</b>	<b>68</b>	<b>76</b>	<b>50</b>	-34
% Exports	5	54	20	97	385	26	76	35	2	-94	0	0	0	0	
<b>Labour Cost/Wkr</b>	<b>1.4</b>	<b>2.1</b>	<b>2.9</b>	<b>5.8</b>	100	<b>1.9</b>	<b>3.5</b>	<b>4.8</b>	<b>9.3</b>	94	<b>1.2</b>	<b>1.8</b>	<b>2.4</b>	<b>5.2</b>	117

### C. Public Firms

	1990					1993					1996					1998			
	1990	1993	1996	1998		1990	1993	1996	1998		1990	1993	1996	1998		1990	1993	1996	1998
No. of Establishment	n	1	1	11	1000	1	n	n	31		n	n	n	5		n	n	n	152
<b>Worker/Est.</b>	<b>n</b>	<b>67</b>	<b>55</b>	<b>1505</b>	<b>2636</b>	<b>108</b>	<b>n</b>	<b>n</b>	<b>341</b>		<b>n</b>	<b>n</b>	<b>n</b>	<b>152</b>		<b>n</b>	<b>n</b>	<b>n</b>	<b>31</b>
VA/Worker	n	6	6	46	667	3	n	n	41		n	n	n	33		n	n	n	3
<b>VA/Output</b>	<b>n</b>	<b>51</b>	<b>52</b>	<b>31</b>	-40	<b>22</b>	<b>n</b>	<b>n</b>	<b>22</b>		<b>n</b>	<b>n</b>	<b>n</b>	<b>28</b>		<b>n</b>	<b>n</b>	<b>n</b>	<b>31</b>
Labour Cost/VA	n	42	65	8	-88	55	n	n	26		n	n	n	12		n	n	n	39
<b>Inputs/Outputs</b>	<b>n</b>	<b>21</b>	<b>34</b>	<b>3</b>	-91	<b>12</b>	<b>n</b>	<b>n</b>	<b>6</b>		<b>n</b>	<b>n</b>	<b>n</b>	<b>3</b>		<b>n</b>	<b>n</b>	<b>n</b>	<b>4.1</b>
Labour Cost/Output	n	31	35	64	83	49	n	n	57		n	n	n	39		n	n	n	0
<b>% Inputs Imported</b>	<b>n</b>	<b>0</b>	<b>0</b>	<b>48</b>		<b>0</b>	<b>n</b>	<b>n</b>	<b>46</b>		<b>n</b>	<b>n</b>	<b>n</b>	<b>31</b>		<b>n</b>	<b>n</b>	<b>n</b>	<b>4.1</b>
% Exports	n	0	0	0		0	n	n	0		n	n	n	0		n	n	n	0
<b>Labour Cost/Wkr</b>	<b>n</b>	<b>2.7</b>	<b>3.9</b>	<b>3.8</b>	-3	<b>1.5</b>	<b>n</b>	<b>n</b>	<b>10.7</b>		<b>n</b>	<b>n</b>	<b>n</b>	<b>4.1</b>		<b>n</b>	<b>n</b>	<b>n</b>	<b>4.1</b>

Note: "n" denotes unavailability of data.

Source: UNIDO database calculated from unpublished data from the Central Bureau of Statistics/BPS, Jakarta, various years indicated.

**Table 10: Percentages of High Local Content in Selected Indonesian Electronics Products, 1999**

Type of Products	Local Part Usage against Cost of Production						
	Parts	%	Parts	%	Parts	%	% of Total
Air-Conditioners (window-type)	Packing & printing materials	3.0	<b>Compressor</b>	44.0	Inner&Door Liner	6.0	79.0
	Plastic parts (ABS, PS, PP)	3.0	Aluminum Tin Foil	5.0	Door Lock Assy	1.0	
	Wire harness	1.0	Steel Sheet & Parts	6.0	PU Inject. Materials	9.0	
			Paint	1.0			
Colour TV (20 inch)	Plastic parts	6.0	<b>CRT</b>	44.0	Power switch	6.0	72.2
	Packing Materials	0.3	Degaussing coil	0.7	Power Cord	0.3	
	Battery	na	Tuner	4.0	Wire & Harness	1.2	
	Speaker	1.4	Flyback transformer	5.0	Metal Parts,	0.7	
	PCB	1.4	Resistor 1/6W & Capacitor	0.6	Screws & Nuts Others	0.6	
Refrigerator (1 door, 140L)	Packing & Printing Materials	3.0	<b>Compressor</b>	30.0	Inner & Door Liner	6.0	79.0
	Plastic Parts (ABS, PS, PP)	8.0	Evaporator	14.0	Door Lock Assy	1.0	
	Wire Harness	1.0	Steel Sheet & Parts	5.0	PU Inject. Mats	9.0	
			Paint	2.0			
Electric Fan	Front & Rear Guard	13.0	Screws and Nuts	1.0	Power Cord	3.0	90.0
	Balder	2.0	<b>Motor</b>	55.0	Label & Printing	2.0	
	Stand & Cover	6.0	Other Parts	1.0	Packing	6.0	
	Neck	1.0					
Electric Iron	<b>Iron Bottom</b>	24.0	Dial & Control	1.0	Power Cord	5.0	97.0
	Cover	17.0	Screws & Nuts	1.0	Label	3.0	
	Handle & Cover	19.0	Presser	6.0	Packing	6.0	
	Element	9.0	Lamp	1.0	Others	5.0	
Radio Cassette	Cabinet	5.0	Transformer	3.0	Ornament	2.0	73.0
	Antenna	1.0	Resistor	3.0	Packing & Print	2.0	
	Speaker	9.0	Capacitor	10.0	PCB	6.0	
	Wire & Cords	3.0	<b>Mechanical Parts</b>	20.0	Others	9.0	

Note: The names of parts that are in boldface are those with the largest proportion in the listed products;  
Source: IEEIA internal report provided by Mr. Adhi Sukmono, June 1999

**Table 11: Crisis Impact on Firm Types, Pattern of Production and Industry Subsector, 1997-1998.**

CATEGORY	PATTERN OF PRODUCTION	INDUSTRY SUBSECTOR
LOSERS	Immediate and sharp decrease	Consumer and business electronics
	Slow decrease throughout	Air-conditioner, refrigerator and the like (A)
	Flat or increase but then decrease	Dry-cell batteries
SURVIVORS	Relatively flat, peak in 98Q3	Home appliances electronics
	Decrease then Increase (sharp – V curve)	Sub-assy electronics component
GAINERS	Flat, increase but then decrease lately	Moulding components

Source: Calculations based on CBS/BPS, Quarterly Production Indices of Selected Large and Medium Manufacturing Industries, data from Q2 1997 to Q2 1999, 1999 (CSIS-IDE/JETRO, 2000).

**Table 12: Estimation of Value Added Tax (PPM) including Luxury Goods Tax (PPnBM) which should be received by Indonesian government if there are no parallel imports**

Estimated Sale of Electronics Rp 14 trillion	PPN 10% Rp 1.4 trillion	PPnBM 10% Rp. 1.05 trillion	Total Rp. 2.45 trillion
Estimated PPN which is not received due to parallel imports	Rp. 0.28 trillion	Rp. 0.21 trillion	Rp. 0.49 trillion
Estimated Loss to the State			Rp 1.96 trillion

Note: PPnBM is estimated at an average rate of 10% since there are electronic products such as cellular or hand-phones which have 0% tax; also it is assumed that gross margin is set at 25% such that PPnBM is calculated by after the sales value has been reduced by 25%.

Source: Sukmono (1999: 3)

**Table 13: Output and Growth of Illegal Imports of VCDs, 1995-2000.**

Year	Output (‘000 unit)	Growth	Illegal Imports (‘000 unit)	Value (US\$‘000)
1995	270		n.a.	n.a.
1996	300	11.1	35.3	4,210
1997	150	-50	150	10,333
1998	50	-66.6	32	1,700
1999	50	0	300*	n.a.
2000			450*	n.a.

Note: \* denotes estimates of the amount of illegal 'parallel imports' based on estimates provided by Mr. A. Sukmono, where the current rate is around 150 containers/month of VCD imported with 'under-invoicing' or declared mainly as components or semi-assembled parts through official ports.

**Table 14: Indonesia's VCD/DVD-Player Production Capacity, 1999**

Producer/ Assembler	VCD			DVD		
	Prod. Capacity	Production		Prod. Capacity	Production	
	('000 unit/yr)	1999	2000	('000 unit/yr)	1999	2000
PT Samsung Electro. Indon.	200	150	170	n.a.	n.a.	n.a.
PT Indomachine	125	4	–	5	4	–
PT Honoris Perdana Industri	100	–	–	5	2	–
PT Hartono Istana Electro.	20	8	–	n.a.	–	–
PT Adap Palembang	20	6	–	n.a.	–	–
Others	175	n.a.	n.a.	n.a.	n.a.	n.a.
Total						

Note: PT Honoris produced 89,600 units in 1995, 74,000 units in 1996, 45,600 units in 1997 and 5,000 in 1998; n.a. denotes not available. Source: Data Consult

**Table 15: A comparison between the conditions faced smugglers/parallel import distributors and local manufacturers of electronics**

'Smugglers' or 'Parallel' Importers <sup>70</sup>	Manufacturers
1. free from any tariffs; the smugglers pass on the goods to distributors who are taxed; but those who smuggle must pay bribes, other fees and value added tax (PPN) and smugglers are very hard to trace by taxation officers;	1. must pay taxes (BM, PPN, BM, PPH, PPN, see Box); it is transparent process and difficult to avoid taxes;
2. shorter turnover cycle of about 2 months (one month lead order and another sales and collection);	2. turnover is relatively longer (about 4 months with 3 months lead time for orders and one month for sales and revenue collection); hence, larger exposure to fluctuations of foreign exchange;
3. only small investment is required; and	3. there are large investments to build factory and administration, sunk cost and sophisticated technology for the manufacturing process;
4. many models can be smuggled (thus greater product model range) in smaller quantities and it's easier to replace a model;	4. fewer models can be manufactured or assembled and production requires large quantities to meet efficient economies of scale;

Source: Field interviews (various firms, June-Aug, 2000)

<sup>70</sup> The term 'smugglers' and 'parallel' importers are used loosely to cover all illegal importation by distributors who, firstly, illegally physically transport their products to evade formal customs inspection, and secondly, those who are engage in *under invoicing* their products through the formal inspection by Customs department. For example, if the actual price from the country of origin is HK\$5, in the invoice (fraktur) it is stated that the price is HK\$1.2.

**Table 16: Comparison of Prices of Electronics Imports from China and Other Brands in the Indonesian Market, 2000**

Type of Product	Chinese Brand	Price(Ths.Rp.)	Other Brands	Price ('000 Rp.)
VCD player	Sanex	750	Panasonic	1,700
	Twin Dog	650	Toshiba	1,800
	Startex	725	Sony	2,000
	Hana	600	Sharp	2,000
	Oska	750		
	Niko	725		
	Linko	725		
	Izunli	575		
Average*	(63% cheaper)	688	Average	1,875
Television sets	Hisense 29 inch	3,400	Panasonic 29 inch	8,200
	Hitachi Fujian 21 inch	1,700	Panasonic 21 inch	3,399
	Changhong 21 inch	1,400	Sony 21 inch	2,400
	Yama 20 inch	1,300	Hitachi 21 inch	2,129
	Izunli 20 inch	1,500	Detron 21 inch	1,500
	Konka 14 inch	975	Phillips 20 inch	2,350
	Moritech 14 inch	900	Polytron 20 inch	1,612
	Simho 14 inch	900	Sharp 20 inch	1,625
			Samsung 20 inch	1,718
			Sanyo 20 inch	1,725
			JVC 20 inch	1,684
			Gold Star 20 inch	1,499
			LG 20 inch	1,882
			Akari 14 inch	1,120
			Digitec 14 inch	1,492
			Sanken 14 inch	1,307
	Average	(32% cheaper)	1,509	Average
Radio & Component	Nidai Compo	400	National Radio Cassette	460
	Diamond Radio Cassette	100	Phillips Radio Cassette	360
	Akaiwa Radio Cassette	100		
Average	(51% cheaper)	200	Average	410
Washing Machine	Sanex (capacity 7 kg)	2,000	Samsung SW T65 CT	1,399
			Sanyo SW650 FT	1,825
			LG WFT 6011 PH	2,778
			National NAW 40 A3	1,265
			Denpo D1 6060	1,010
			Sanken SWS 62	6,690
			Sanken STW 2651	1,290
			Sanken SF W85	4,798
			Average	2,632
	Price	(24% cheaper)		
Split	Uchida 1/2 PK	2,500	LG 1/2 PK	2,850
Air-conditioners	Uchida 3/4 PK	2,600	General 3/4 PK	3,100
	Changhong 1 PK	2,850	Samsung 3/4 PK	3,100
	Changhong 1 1/2 PK	3,500	LG 3/4 PK	2,950
			National 3/4 PK	3,600
			Samsung 1 PK	3,300
			General 1 PK	3,300
			Toshiba 1 PK	3,400
			National 1 1/2 PK	5,600
			Toshiba 2 PK	5,100
	Average	(21% of Other Brands)	2,863	Average
Sewing Machine	Yamata	1,300	Brother	4,500
	Typical	1,800	Pegasus (obras)	4,000
			Sagota	2,150
Average	(56% cheaper)	1,550	Average	3,550

Overall Average Price difference between Chinese and Other Brands:  
 $(63 + 32 + 51 + 24 + 21 + 56)/6 = 41\%$

Note: The averages above are unweighted averages of the difference between the Chinese and the Other Brand group of products;  
Source: Calculated by author from figures in *Warta Ekonomi*, 7 August 2000: 14-15.

**Table 17: Export Incentives among ASEAN 4 countries, 2000**

	Indonesia	Thailand	Malaysia	The Philippines
Fiscal/tax Incentives	BAPEKSTA – drawback system for import duty, sales tax and value added tax	1)Tax drawback from the Customs Dept. for excise duties paid, 2)Rebate from the Fiscal Policy Office based on the estimated tax payments, 3)The Board of Investments offers a special service to facilitate import duty exemptions for re-export production	1)Pioneer status with full tax exemption at statutory income level for a period of time, 2)Investment tax allowance of 100% on qualifying capital expenditure incurred, 3)Double deduction for promotion exports, for promoting Malaysian brand names, approved training, 4)Double reduction on Freight Charge – for rattan and wood based products, 5) Tax exemption on the value of increased exports (10-15%).	1)Tax credit for increase in export revenue (2.5 – 10% credit), 2)Income tax holiday for export producers, export traders and service exporters, 3)Tax credits for taxes and duties on raw material used in the manufacture processing and production of exports, 4)Exemption from wharfage dues and any tax for non-traditional export, 5)Tax and duty exemption for imported spare parts and supplies if 70% of production is exported.
Bonded Zone	PT Kawasan Berikat Nusantara gives facility of export processing zone, bonded warehousing and freight forwarding. There are 8 bonded zones in Indonesia.	1)Bonded warehouse facilities – import duty free for export products, 2)Export processing zones exception from import duties, and other taxes on factory construction materials, machinery, equipment, and inputs needed for the manufacture of exports	Industrial Building Allowance (IBA) – a company is eligible for IBA of 10% of qualifying capital expenditure in respect of building used as warehouses for export and re-export products	Philippines Economic Zone Authority (PEZA) coordinates 4 special economic zones: Bataan, Bagulo City, Mactan and Cavite.

Source: (JICA, 2000: 3-6)

**Table 18: Incentives for Indirect and Smaller Exporters, ASEAN 4, 2000**

	Indonesia	Thailand	Malaysia	The Philippines
Exemption on duties, VAT and other taxes on indirect exports	Yes, through sub-contracting with direct exporters in Bonded Zone and EPTE	No	Yes, through sub-contracting with direct exporter	Yes, through sub-contracting with direct exporter
Rebate of VAT and other taxes on indirect exports	No	Yes	Yes	No
Zero-rating of VAT on sales to EPZ	No	Yes	Yes	Yes
Income tax credit on local materials used in exports	No	No	No	Yes
Income tax deduction on export value added	No	Yes	Yes	No

Source: (JICA, 2000: 3-6)

**Table 19: Comparison of Custom Administration in ASEAN5, 2000**

	Indonesia	Singapore	Malaysia	Thailand	The Philippines
1) Export Clearance	4 ~ 8 hours	0	4 ~ 8 hours	4 ~ 8 hours	2 ~ 3 hours
2) Import Clearance	2 ~ 3 days	10 ~ 15 minutes	0.5 ~ 2 days	2 ~ 7 days	3 ~ 5 days
3) Electronic Data Interchange situation	Import only	All	Im & Export Application No.	Export only	Export only

Source: (JICA, 2000: 3-10)

**Table 20: Types of Electronics Supporting Industries in Indonesia, 2000**

	<b>Local Firms</b>	<b>% Foreign Firms</b>	<b>% Japanese</b>	<b>Korean</b>	<b>Others</b>	<b>Total</b>	<b>% of Total</b>		
Tools	<b>7</b>	3%	<b>1</b>	1%	1	<b>8</b>	2%		
Molding	<b>4</b>	2%	<b>3</b>	3%	2	1	<b>7</b>	2%	
Chemical	<b>32</b>	13%	<b>2</b>	2%	2		<b>34</b>	10%	
General	<b>20</b>	8%	<b>5</b>	6%	2	3	<b>25</b>	8%	
Packing	<b>20</b>	8%	<b>3</b>	3%	2	1	<b>23</b>	7%	
Metal	<b>38</b>	16%	<b>11</b>	13%	6	5	<b>49</b>	15%	
Plastic	<b>37</b>	15%	<b>12</b>	14%	9	3	<b>49</b>	15%	
Sub-contractor	<b>10</b>	4%	<b>2</b>	2%		2	<b>12</b>	4%	
Rubber	<b>7</b>	3%	<b>4</b>	5%	3	1	<b>11</b>	3%	
Raw material	<b>34</b>	14%	<b>18</b>	20%	15	3	<b>52</b>	16%	
Printing	<b>10</b>	4%	<b>2</b>	2%	2		<b>12</b>	4%	
Electric	<b>19</b>	8%	<b>24</b>	27%	22	2	<b>43</b>	13%	
Importer	<b>2</b>	1%	<b>1</b>	1%	1		<b>3</b>	1%	
	<b>240</b>	100%	<b>88</b>	100%	67	21	1	<b>328</b>	100%
% of Total (328) Firms:		73%		27%	20%	6%			

Source: Unpublished data from IEEIAI

**Table 21: Location of parts and component manufacturing plants, 2000**

Location	Total	%	Molding		General*		Metal		Sub-conductor		Raw material		Electric		
			Tools	Chemical	Packing	Plastic	Rubber	Printing	Importer						
Jakarta Special Region (DKI):															
Central	32	10	1	7	2	2	1	1	8	1	6	1	1	1	
East	33	10	1	2	4	4	4	5	3		7		3		
West	38	12	1	3	3	2	1	5	7	1	8	2	4	1	
North	43	13	4	10	7	2	1	2			8	3	5	1	
South	12	4		1	2		1	1			4	1	1	1	
Tangerang	35	11		1	1	7	4	10	1	2	6		3		
Bekasi	39	12		2	3	2	8	8			4	2	10		
Bogor	36	11	1	1	2	4	2	9	5	1	4	2	2	3	
Other West Java	46	14		3		1	11	8	1		8	1	13		
Central Java	6	2					3	2			1				
East Java	3	1						2			1		1		
Batam	5	2			2	1		2							
Other Locations in Indonesia	n.a.														
Total numbers:	328		8	7	34	25	23	48	50	12	11	52	12	44	3
Percentages of Total (n=328):		100	2	2	10	8	7	15	15	4	3	16	4	13	1

Source: Unpublished data from EEIAI

**Table 22: Location of head offices of parts and component companies, 2000**

Location	Total	%	Molding	General*	Metal	Sub-conductor	Raw material	Electric						
			Tools	Chemical	Packing	Plastic	Rubber	Printing	Importer					
Jakarta Special Region (DKI):														
Central	49	15	1	10	3	5	3	5	1	10	2	8	1	
East	41	13	1	4	5	4	5	2	7	1	8	4		
West	60	18	1	2	5	6	4	9	12	1	11	3	5	1
North/Utara	47	14	4	3	11	4	3	3	1		7	2	5	1
South	14	4		1	3		1	2	1	1	2	1	2	
Tangerang	15	5					3	2	4		2	3		1
Bekasi	39	12			1	2	1	10	8	1	2	5	1	8
Bogor	22	7	1			3	2	7	4	1			1	3
Other West Java	34	10		1				6	8	1	4	5	1	8
Central Java	4	1						3	1					
East Java	3	1				1			1					1
Batam	n.a.													
Other Locations in Indonesia	n.a.													
Total numbers:	328		8	7	34	24	23	50	49	12	11	51	11	45
Percentages of Total (n=328):		100	2	2	10	7	7	15	15	4	3	16	3	14

Note: \* Denotes the factory location of the firms

Source: Unpublished data from EEIAI

**Table 23: Summary Indicators of Electronics Sub-assembly and Components Electronics, 2000**

	1995	1996	%	1997	%	1998	%
Production (Rp. Billion)	2396.4	3,096.8	23	6,991.1	56	14,914.3	53
Workforce (Thousand persons)	21,063	50,082	58	79,476	37	80,398	1
Exports (Rp. Billion)	340.6	539.5	37	523.3	-3	469.4	-11
Imports (Rp. Billion)	790.1	821.5	4	521.1	-58	152.6	-241
Value added (Rp. Billion)	842.6	1,189.90	29	2615.3	55	4446.2	41
Investment (Rp. Billion)	515.1	618.1	17	3959.3	84	4,567.4	13
ICOR value	0.43	0.1	-330	0.81	88	0.08	-913
Efficiency level	0.67	0.67	0	0.66	-2	0.73	10
Capacity utilisation rate	70.17	71.06	1	60.45	-18	71.74	16
R&D expenditure (Rp. Thousand)	63,689	199,686	68	443,970	55	n.a	n.a.
Raw material (Rp. Billion)	1,487.10	2,027.60	27	4,282.20	53	10,314.60	58
Local content (%)	6.92	9.55	38	16.1	41	15.37	-5
Imported content (%)	93.08	90.45	-2.8	83.9	-8	84.63	1

Source: Based on data from Central Bureau of Statistics (BPS) and Department of Industry and Trade as cited in 'Memperkuat Industri Sub-Perakitan dan Komponen Elektronika', Kompas 22 August 2000.

**Table 24: Summary of Ownership and Location of Electronics Sub-assembly and Components Electronics, 2000**

	1995	% of Total	1996	% of Total	1997	% of Total	1998	% of Total
Foreign ownership (PMA)	56	51	63	51	101	59	16	50
Local ownership (PMDN)	21	19	20	16	31	18	1	3
Other types of companies	33	30	40	33	40	23	15	47
<b>Geographic location:</b>								
North Sumatra	3	3	3	2	2	1	1	3
Riau	49	45	57	46	74	43	2	6
Jakarta DKI	3	3	6	5	4	2	4	13
West Java	44	40	45	37	72	42	17	53
Central Java	4	4	5	4	14	8	5	16
East Java	7	6	7	6	14	8	5	16
Total firms	110	100	123	100	172	100	32	100

Note: ICOR is the indicator ratio of capital in output value adding

Source: Based on data from Central Bureau of Statistics (BPS) and Department of Industry and Trade as cited in 'Memperkuat Industri Sub-Perakitan dan Komponen Elektronika', Kompas 22 August 2000.

**Table 25: Indonesia's Trade of Major Electronics Items by Country/Economy, 1997**

**(1) Electronics Parts (Passive components)<sup>71</sup>**

<b>Exports Ranking</b>	<b>First</b>	<b>Second</b>	<b>Third</b>	<b>Fourth</b>	<b>Fifth</b>
<b>Fixed resistors (capacity not exceeding 20w)</b>	<b>Singapore</b>	<b>Hong Kong</b>	<b>United States</b>	<b>United Kingdom</b>	<b>Japan</b>
<b>Loudspeakers</b>	<b>Singapore</b>	<b>Germany</b>	<b>France</b>	<b>US</b>	<b>Italy</b>
<b>Printed circuit boards</b>	<b>Singapore</b>	<b>Thailand</b>	<b>Brazil</b>	<b>Italy</b>	<b>Malaysia</b>
<b>Tuners</b>	<b>Singapore</b>	<b>Thailand</b>	<b>France</b>	<b>UK</b>	<b>Germany</b>
<b>Imports Ranking</b>	<b>First</b>	<b>Second</b>	<b>Third</b>	<b>Fourth</b>	<b>Fifth</b>
<b>Resistors (general)</b>	<b>Singapore</b>	<b>Japan</b>	<b>Germany</b>	<b>Malaysia</b>	<b>Taiwan</b>
<b>Loudspeakers</b>	<b>Japan</b>	<b>Korea</b>	<b>Taiwan</b>	<b>China</b>	<b>-</b>
<b>Connecting parts, Switches</b>	<b>Japan</b>	<b>Singapore</b>	<b>Taiwan</b>	<b>Korea</b>	<b>China</b>
<b>Antenna</b>	<b>Sweden</b>	<b>US</b>	<b>Australia</b>	<b>France</b>	<b>Canada</b>

**(2) Electronic Devices**

<b>Exports Ranking</b>	<b>First</b>	<b>Second</b>	<b>Third</b>	<b>Fourth</b>	<b>Fifth</b>
<b>Colour CRT for TVs</b>	<b>Mexico</b>	<b>Korea</b>	<b>Malaysia</b>	<b>Philippines</b>	<b>Thailand</b>
<b>Semiconductor transistors</b>	<b>Singapore</b>	<b>Hong Kong</b>	<b>New Zealand</b>	<b>Korea</b>	<b>Japan</b>
<b>Liquid crystal devices, laser (other than laser diode)</b>	<b>Singapore</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Integrated circuits (other than monolithic ICs)</b>	<b>US</b>	<b>Singapore</b>	<b>Taiwan</b>	<b>Hong Kong</b>	<b>Japan</b>
<b>Imports Ranking</b>	<b>First</b>	<b>Second</b>	<b>Third</b>	<b>Fourth</b>	<b>Fifth</b>
<b>Colour CRT for TVs</b>	<b>Korea</b>	<b>Malaysia</b>	<b>Singapore</b>	<b>China</b>	<b>Taiwan</b>
<b>Photosensitive semiconductor devices</b>	<b>US</b>	<b>Australia</b>	<b>Germany</b>	<b>Korea</b>	<b>Singapore</b>
<b>Parts for LCD</b>	<b>Australia</b>	<b>Germany</b>	<b>US</b>	<b>Japan</b>	<b>Taiwan</b>
<b>ICs (other than monolithic devices)</b>	<b>Japan</b>	<b>Singapore</b>	<b>Malaysia</b>	<b>Taiwan</b>	<b>Thailand</b>

Source: JETRO (1999), 'Electric and Electronics Industries in Selected APEC Economies', Tokyo, March, p.97

<sup>71</sup> Data is based on 9-digit HS trade classification

**(3) Parts for Home Electric Appliances**

<b>Exports Ranking</b>	<b>First</b>	<b>Second</b>	<b>Third</b>	<b>Fourth</b>	<b>Fifth</b>
Electric fan parts	Singapore	US	Malaysia	Japan	Taiwan
Air-conditioner parts	Korea	Thailand	Malaysia	US	Japan
Refrigerator parts (furniture)	Japan	Thailand	Malaysia	France	-
Refrigerator parts (others)	Japan	Philippines	Singapore	Malaysia	-
Washing machine parts (cabinet)	Singapore	-	-	-	-
Washing machine parts (other)	Singapore	-	-	-	-
Electric appliances	Japan	Singapore	Brunei	-	-
Electric heating apparatus	Sri Lanka	-	--	-	-
Electric motors with output not exceeding 37.5 watts	Japan	Singapore	Malaysia	Taiwan	-
Electric motors with output exceeding 37.5 watts	Singapore	France	Hong Kong	India	Japan
<b>Imports Ranking</b>	<b>First</b>	<b>Second</b>	<b>Third</b>	<b>Fourth</b>	<b>Fifth</b>
Electric fan parts	Japan	France	US	China	Spain
Air-conditioner parts	Germany	Japan	Malaysia	Australia	Belgium
Refrigerator parts (furniture)	Taiwan	Australia	Italy	US	France
Refrigerator parts (others)	Thailand	China	Korea	Japan	Greece
Washing machine parts (cabinet)	China	Korea	Philippines	Singapore	Malaysia
Washing machine parts (other)	China	Singapore	Philippines	Korea	Belgium
Electric appliances	Netherlands	Canada	Taiwan	Mexico	Sweden
Electric heating apparatus	China	Taiwan	Germany	Singapore	Japan
Electric motors with output not exceeding 37.5 watts	Japan	Finland	Taiwan	Singapore	Japan
Electric motors with output exceeding 37.5 watts	US	Japan	Korea	China	Australia

Source: JETRO (1999), 'Electric and Electronics Industries in Selected APEC Economies', Tokyo, March, p.97

**Table 26: Industry association (EEIAI) coverage of end-product assemblers and component manufacturers, 2000**

	Total Firms	Association Members	Percentage of Coverage
End-product makers	41	32	78%
Components and parts manufacturers	142	13	9%
Plastic injection	2	0	0

Source: Unpublished data from EEIAI

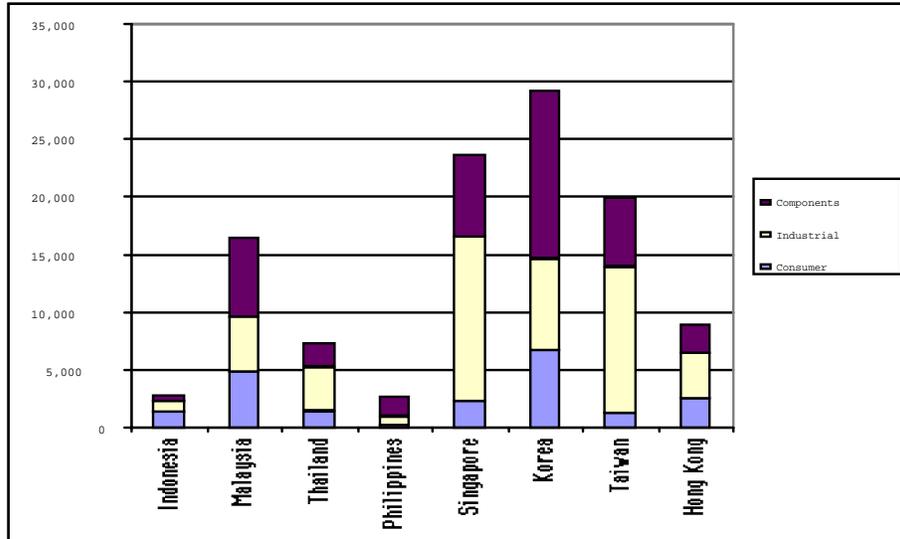
**Table 27: AFTA–CEPT rates of selected electronics products 1995–2003 (per cent)**

Description	1995	1996	1997	2003
Telephone sets	25	10	5	5
Audio frequency electric amplifiers	25	20	20	5
Tape recorders	30	30	20	5
Video recorders and reproducers	30	30	20	5
Radio	30	30	20	5
Car radio	30	30	20	5
Colour TV	30	30	20	5
B&W or monochrome TV	30	30	20	5
Capacitors	5	2.5	2.5	2.5
Resistors	0	0	0	0
Printed circuits	5	5	5	5
Digital integrated circuits	0	0	0	0

Source: ASEAN Secretariat, *CEPT Tariff Schedule*, 1996.

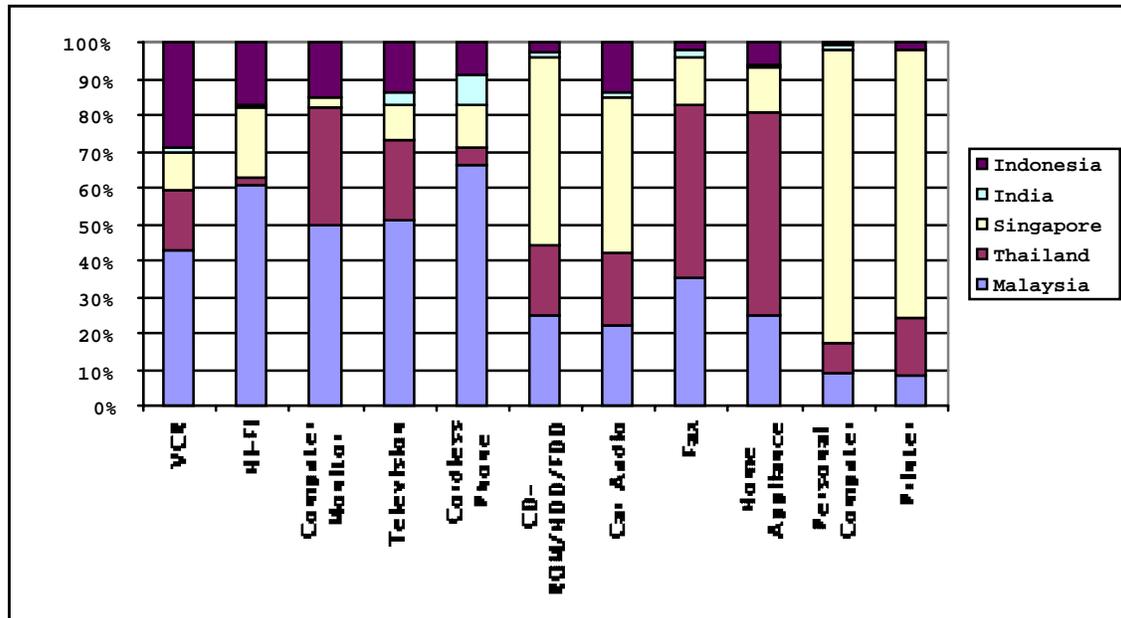
**APPENDIX: FIGURES**

**Figure 1: Electronics production and broad output composition in ASEAN+3 countries, 1993 (\$ million)**



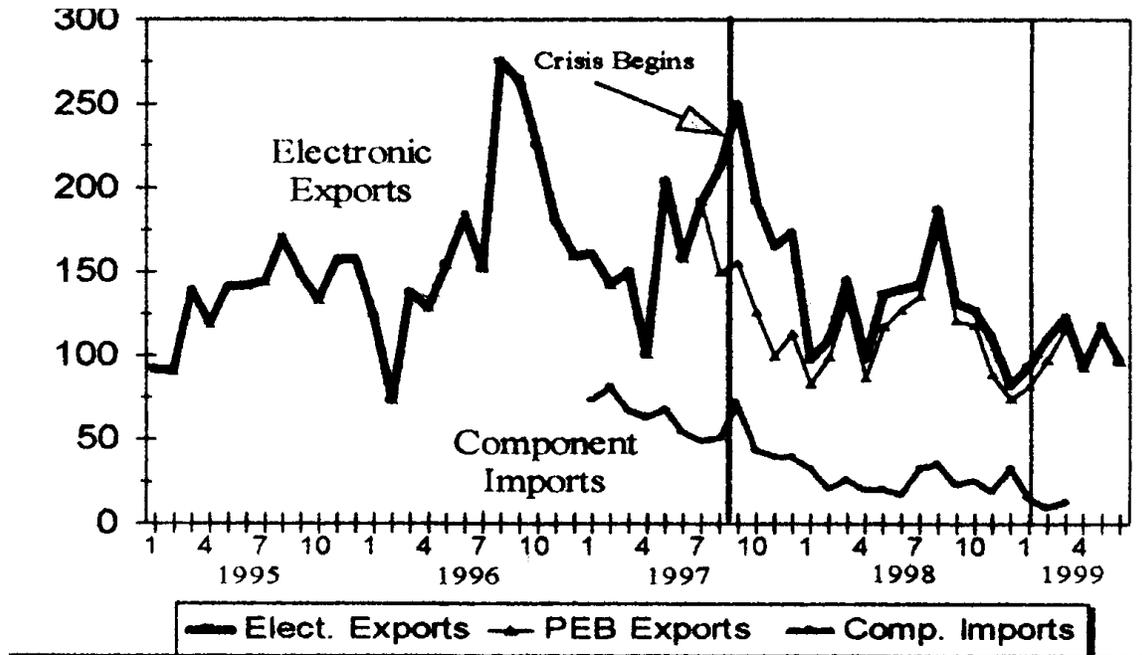
Source: Yearbook of World Electronics Data 1997.

**Figure 2: Electronics production and key export composition in ASEAN4 and India, 1999**



Source: Sanwa Research Institute and Consulting Corporation (2000: 10-4).

**Figure 3: Estimated 'Real' Consumer Exports from Indonesia, 1995-99 (constant million 1997 \$).**



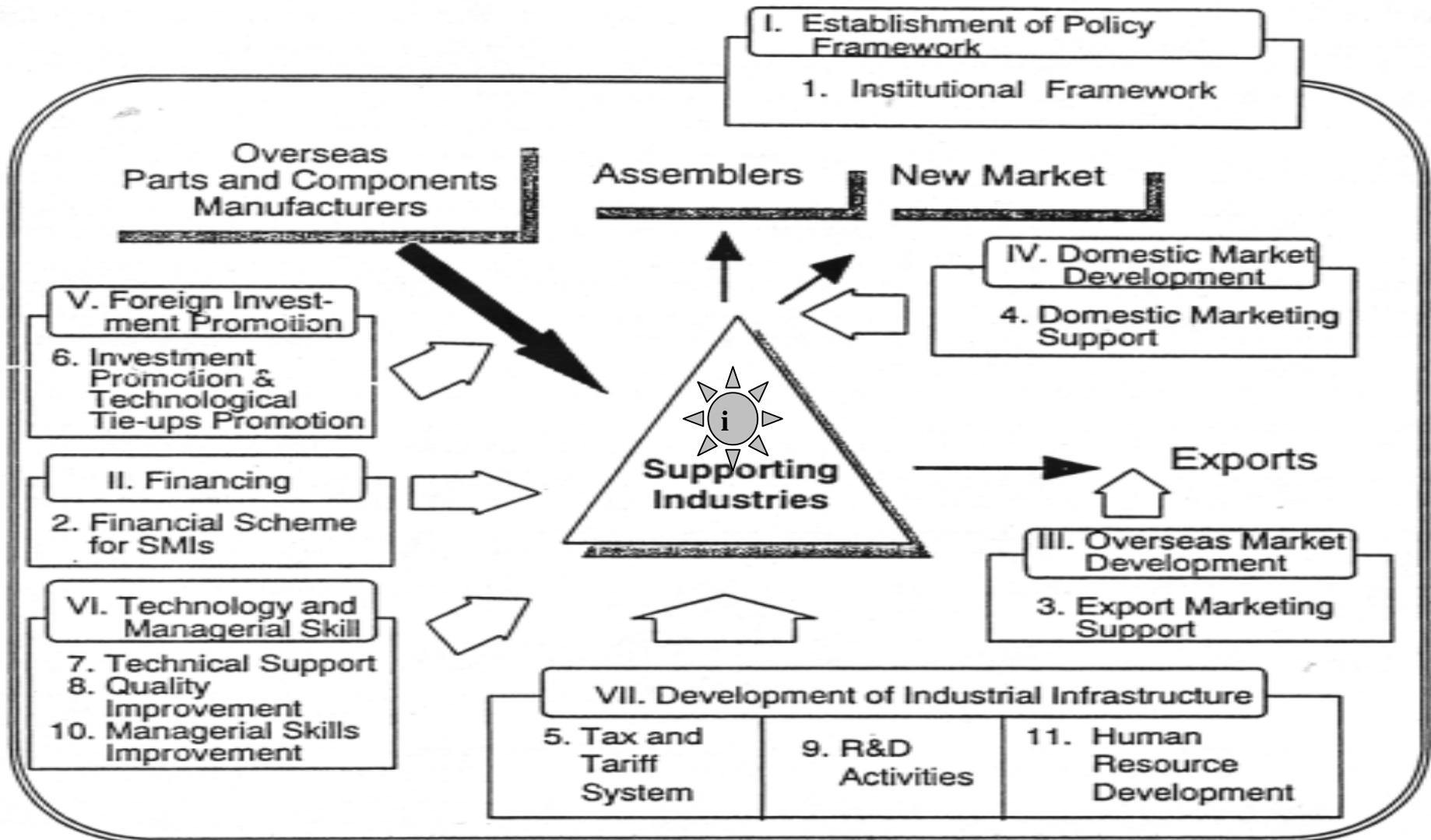
Source: Magiera (2000: Chart 3)

**Figure 4: Proposed phases of business plan competitions in for ‘Indonesia IT in 2001’ project**

	Phase One	Phase Two	Phase Three
Timeline	3 months	3 months	3 months
Primary Target Groups	PhD students Other graduate students Scientists, professors	+ Experienced entrepreneurs	+ Experienced SME component manufacturers  + Experienced MNEs end-user manufacturers
Requirements	Business idea	Business plan draft	Detailed business plan
Prize money	Ten of Rp. 10 – 50 million	Ten of Rp. 20 – 80 million	One prize up to \$ 100-300 million
Supporting Factors	Widespread communication and mobilisation  Contact forums, networking events  Events on entrepreneurship and business start-ups skills  Coaching by experienced entrepreneurs	+ Matching of idea and Entrepreneur  Provision of services to entrepreneurs	+ Facilitation of business and customer contacts  Deal making with venture capitalists, experienced SME component manufacturers and MNEs end-user manufacturers

Source: Adapted from Dodt, et al. (1999: 66), The McKinsey Quarterly, No.3.

**Figure 5: Integrated Approach to Enhance the Competitiveness of Supplier SMEs in the Electronics Components in Indonesia**  
 (Adapted from Source: JICA, June 1999: 6-7; Note: "I" denotes integral Internet connectivity between agencies and supporting industries)



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