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THE ELECTRONICS INDUSTRY IN THE ASEAN COUNTRIES :

INDONESIA*

Prepared by

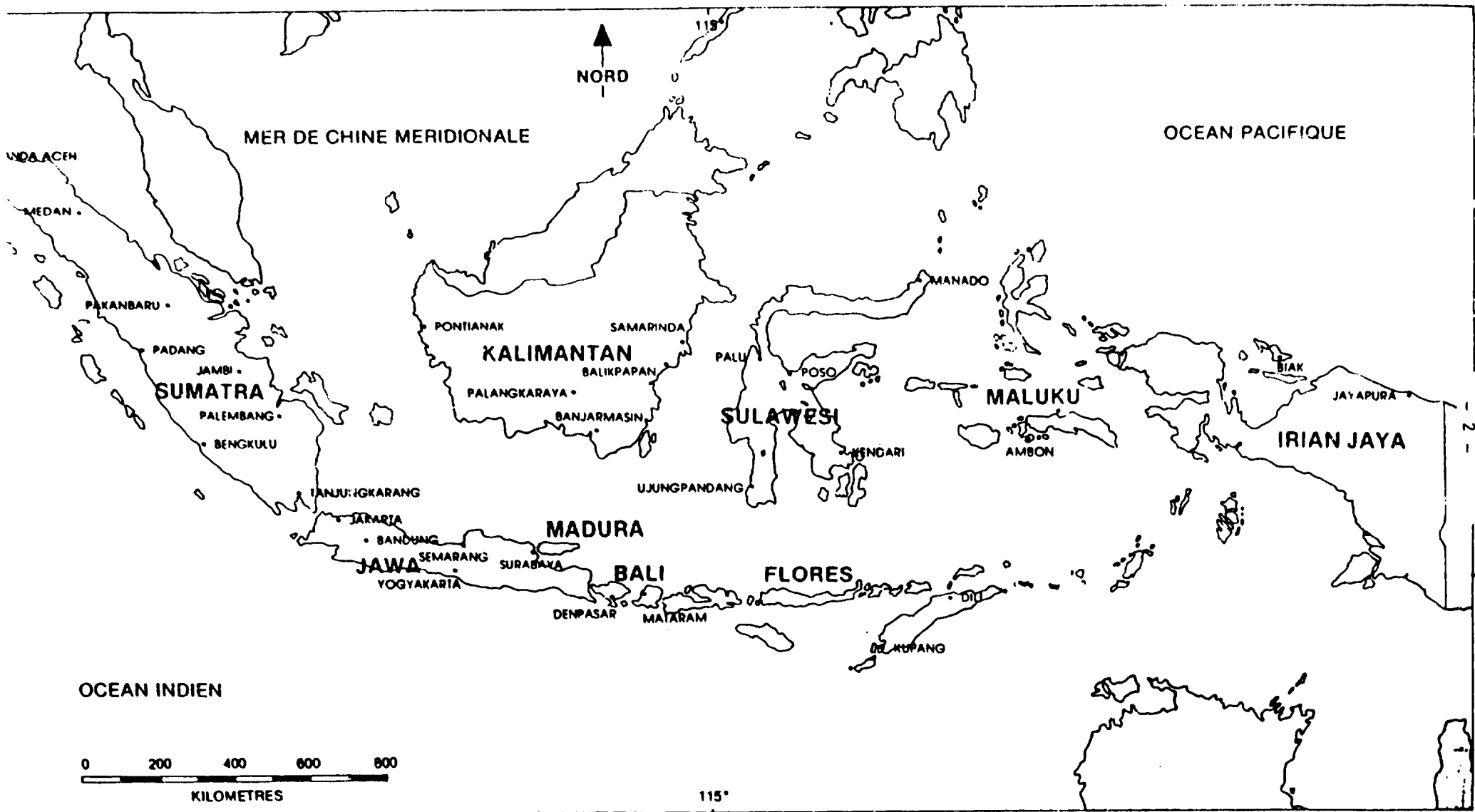
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1. INTRODUCTION

The Indonesian Republic, with its 165 million inhabitants, is the fifth largest country in the world in terms of population.

1.1. Economic development

The Indonesian economy, which made rapid advances between 1965 and 1981, was severely affected by the reverses in the price of oil products. It has developed at a slower rate since 1982. (Table 1)

Two sectors dominate the economy: agriculture and mining (in particular oil and gas). Industrial growth was rapid from 1965 onwards, and the manufacturing sector is in fourth position behind services, agriculture (25% of the GDP) and mining (14%).

The growing deficit in current payments (Table 2) and the extent of debt servicing payments (40% of all exports) led the government to launch, from 1986 onwards, a series of reforms designed to reduce the budget deficit, to liberalise the economy and to promote non-oil exports.

1.2. The manufacturing industry

Indonesia is an under-industrialised country. The third largest country of the Third World in terms of population it is many years behind India or China, countries in which the per capita GDP is nevertheless lower.

1.2.1. Industrial policy

The various industrialisation plans have given priority to the industries supporting agriculture, to those which utilise raw materials and highly labour-intensive industries. At the end of the seventies emphasis was placed on building up the intermediate goods, iron and steel and petrochemicals industries. The crisis has held back some of these investments (aromatics and steam-cracking complexes).

One constant feature of industrial policy, contrasting with what is found in the remaining ASEAN countries, is the little importance given to promoting the exporting industries.

1.2.2. The role of the State and the private national and international sectors

The State participates in a limited number of sectors, but its role within them is important; there are 217 State Enterprises (Badan Usaha Milik Negara, or BUMN), 27 of which have signed joint-venture agreements with private companies.

Table 1
BREAKDOWN OF THE GDP AND ITS GROWTH

	1980	1985
Agriculture	30.60	23.60
Mining and manufacturing	24.60	29.70
Transport and building	11.20	11.80
Commerce and services	33.60	34.90
TOTAL	100.00	100.00
in US\$ billions	72	87

Growth of the GDP	1970-1980	1980-1985
	8.00%	5.74%

Table 2
BALANCE OF PAYMENTS (extracts)

	1980	1984	1985	1986	1987
Balance of current payments	2864	-1856	-1923	-4004	-3400
Exports, fob	21795	20754	18527	14396	16500
Imports, fob	12264	15047	12705	11938	12500

Source : IMF

Table 3
PROJECTS APPROVED BY THE BKPM,
by sectors, between 1967 and September 1987

	US\$m	%
Agriculture	451	2.7
Forestry	312	1.9
Fishing	118	0.7
Mining	1725	10.4
Agro-food industries	608	3.7
Textiles	1201	7.3
Timber	326	2.0
Paper	531	3.2
Chemicals	2678	16.2
Non-metallic minerals	761	4.6
Iron and steel	3410	20.6
Metal products	2747	16.6
Others	28	0.2
Building	411	2.5
Hotels	456	2.8
Estates	488	2.9
Transport	184	1.1
Services	109	0.7
TOTAL	16544	100.0

They exercise a monopoly on sugar refining (since nationalisation) and on oil through Pertamina, the largest Indonesian company; PT Pusri produces fertilizers and distributes them down to village level. Since it came to the rescue of Indocement the State dominates this industry, metallurgy (tin and aluminium) and the iron and steel industry through Krakatau. There are also IPTN Nusantara and PT Pabrik Kapal (PAI) in shipbuilding.

The importance of the State enterprises has increased since 1981 when measured by their assets or the contribution of their turnover to the GDP (in current Rupiahs).

Foreign capital investments must be approved within the framework of the Foreign Capital Investment Law of 1967; the BKPM is responsible for evaluating the proposals. Between 1967 and 1987 it approved investments to a total sum of US\$ 16.5 billion, mostly in the form of joint-ventures. (Table 3)

Foreign companies, either subsidiaries or joint-ventures, accounted for a quarter of the manufacturing value added in 1983.

Foreign companies dominate the following industries : soaps and detergents, cosmetics, brewing, glassmaking, dairy products, batteries and car sub-assemblies. A fifth of the investments approved by the BKPM are directed towards metallurgy, including Asahan in aluminium. The engineering industries (in particular car manufacture) and the chemicals industries have each mobilised 16% of the foreign capital investments. Other important sectors are mining (10.7%) and textiles (7%).

1.2.3. Structure of the industry

The structure of Indonesian industry is characterised by a high degree of heterogeneity.

According to the Biro Pusat Statistics 5.75 million persons were involved in manufacturing activities in 1985, but according to the industrial statistics those companies with more than 20 employees employ a total of 1.2m wage-earners. The gap between these two evaluations indicates the magnitude of the manpower employed in the "informal sector", such as the converting of agricultural food products and smaller textiles and repair activities (car repairs, but also electrical and electronic products).

The breakdown by sectors of industry (Table 4) is characteristic of an economy with a low level of industrialisation :

- Work in the agro-food, beverages and tobacco industries accounts for slightly more than a quarter of the value added and 30% of the jobs.

- The second group, the highly labour-intensive industries, includes textiles, clothing, footwear and woodworking. Taken together these account for 23% of the value added but nearly one third of the jobs.

- The intermediate industries have gained in importance in terms of value added during recent years. This is principally the case with the fertilizers, cement, refining, chemicals and the iron and steel industries. These industries represent nearly 20% of the value added.

- The engineering and electrical industries account for 14% of the value added and 10% of the jobs: this concerns principally the assembling of motorcycles and vehicles. The machines industry is very poorly developed.

1.2.4. Trading : a low level of openness

The most recent Input-Output table dates from 1980. It makes it possible to measure the obvious feature of the Indonesian industry, its low level of openness.

In 1980 exports accounted for more than 10% of the outlets in only four sectors, those of timber products, refining, rubber converting and metallurgy (tin). Indonesia is almost self-sufficient in regard to most consumer goods, but imports account for a very important part of the national demand for intermediate products and equipment goods.

As far as exports are concerned these consist essentially of the textiles, clothing, footwear and plywood industries.

Table 4
THE INDONESIAN MANUFACTURING INDUSTRY IN 1985

Code	Heading	Number of companies	Number of jobs	% breakdown : of jobs of V.A.	
311	Food products	1544	217845	13.03	10.47
312	Food manufacture	1298	82325	4.92	2.63
313	Beverages	131	11340	0.68	1.15
314	Tobacco	909	203769	12.19	11.17
321	Textiles	2033	296147	17.71	10.34
322	Clothing	645	68934	4.12	1.59
323	Leather	80	4271	0.26	0.20
324	Footwear	116	8798	0.53	0.46
331	Wood products	920	168600	10.08	9.23
332	Furniture	284	12279	0.73	0.27
341	Paper	135	21486	1.28	1.66
342	Printing	469	34841	2.08	1.38
351	Industrial chemicals	193	36870	2.20	6.44
352	Other chemicals	474	67936	4.06	5.83
355	Rubber	401	94021	5.62	4.94
356	Plastics	558	48893	2.92	2.63
361	Ceramics	45	12320	0.74	0.37
362	Glass	40	10509	0.63	1.48
363	Cement	481	34206	2.05	3.45
364	Clays	584	22896	1.37	0.24
369	Other	99	7745	0.46	2.55
371	Iron and steel	30	15640	0.94	7.07
381	Metal products	548	59066	3.53	4.19
382	Machinery	187	16478	0.99	1.14
383	Electrical equipment	200	43513	2.60	3.70
384	Transport equipment	308	57505	3.44	4.99
385	Precision equipment	40	2124	0.13	0.05
390	Miscellaneous	157	11807	0.71	0.37
	TOTAL	12909	1672164	100.00	100.00

Table 5
PRINCIPAL ECONOMIC PARAMETERS OF THE ELECTRONICS INDUSTRY

	1970	1975	1980	1985	Growth: 1980-85
<u>Manufacturing industries</u>					
Number of establishments	5049		7942	12909	10.20%
Employees	486650		1004729	1672162	10.73%
Sales, billions Rupiahs	300		8298	23027	
Value added, billions Rp	91		2722	7203	
<u>Electrical machinery, 383</u>					
Number of establishments	19	nd	115	nd	
Employees	3400	nd	38759	nd	
Sales, billions Rupiahs	1.10	53	387	nd	
Value added, billions Rp	0.30	18	113	nd	
<u>Electronics, 38320</u>					
Number of establishments		nd	36	51	7.21%
Employees		4815	14527	16526	2.61%
Sales, billions Rupiahs		28	192	318	
Value added, billions Rp		10	39	73.60	
<u>Percentage contribution of electronics</u>					
Number of establishments			0.45	0.40	
Employees			1.45	0.99	
Sales			2.31	1.38	
Value added			1.43	1.02	

Source : Statistik Industri Buro Pusat Statistik

Table 6
PRODUCTION OF THE ELECTRONICS INDUSTRY in US\$m

	1984	as %	1985	as %	1986	as %
Professional electronics	274	39.26	356	49.51	424	50.66
Mass consumer electronics	138	19.77	123	17.11	115	13.74
Components	286	40.97	240	33.38	298	35.60
TOTAL	698	100	719	100	837	100

Source : Yearbook of electronics data, Benn Electronics, 1987

Table 7
MANUFACTURERS' EXPORTS in US\$m

	1980	1981	1982	1983	1984	1985	1986	1987
Textiles	46	36	44	121	200	240	307	105
Clothing	98	95	116	157	296	339	522	167
Electronics	94	74	117	125	214	77	29	3
Total manufactured products	503	672	808	1372	1839	2043	2640	994
Electronics exports as %	18.7	11.0	14.5	9.1	11.6	3.8	1.1	0.3

Table 8
STRUCTURE OF EXPORTS AND IMPORTS OF ELECTRONICS PRODUCTS in US\$m

	1980			1984		
	Exp.	Imp.	Bal.	Exp.	Imp.	Bal.
SITC 75	79	39602	-39523	12	116683	-116671
SITC 761	206	30838	-30632	175	61332	-61157
SITC 762	543	53807	-53264	309	12162	-11853
SITC 763	283	17271	-16988	0	11202	-11202
SITC 764	1392	68897	-67505	3908	159510	-155602
SITC 776	90638	14510	76128	134263	116613	17650
TOTAL	93141	224925	-131784	138667	477502	-338835

Source : UNIDO

2. THE DEVELOPMENT OF THE ELECTRONICS INDUSTRY

2.1. Brief historical survey

The electronics industry began by assembling mass consumer electronic products for the local market. Production did not go beyond the stage of assembling imported sub-assemblies. As from the end of the seventies the growth in the manufacture of telecommunications equipment offered a new dynamic to this industry.

Unlike the other ASEAN countries, and despite the fact that its industrial wages were amongst the lowest in Asia, Indonesia did not attract foreign countries during the waves of relocation in the electronics field. Only two foreign "offshore" companies appear in the records, and both of these closed down in 1986.

2.2 Statistics

Some key figures concerning the Indonesian electronics industry. :

Commencement :	the sixties
Number of employees :	16,500
Number of companies :	51
Production in 1986 :	US\$ 837m
Exports in 1987 :	US\$ 3m
Imports in 1985	US\$ 386m

2.3. Evolution of the economic parameters

2.3.1. Employment and value added

The electronics industry plays a minor role in the Indonesian manufacturing industry.

After having benefitted from a fairly rapid rate of growth between 1975 and 1980, in terms of jobs or of value added, it experienced a slower rate of growth between 1980 and 1985, the date of the latest industrial census. Since then this industry has undoubtedly diminished in importance in terms of employment because of the closure of two large units for the assembly of semiconductors.

According to Table 5, which has been drawn up on the basis of Indonesian sources, in 1985 only 51 companies were listed with a total of 16,500 employees: this represented only 1% of the total manufacturing manpower. In terms of value added the contribution of this sector is even smaller.

Table 9
GEOGRAPHICAL DISTRIBUTION OF EXPORTS in US\$ millions

To :	SITC 75 :		SITC 761:		SITC 762:		SITC 763:		SITC 764:	
	1980	1984	1980	1984	1980	1984	1980	1984	1980	1984
USA					12					
Japan	8					3	14			22
Singapore	59		205	175	3	257			26	3389
Hong Kong		12			63	48			1272	493
Thailand										23
France	10									52
U.K.					457					
F.R. Germany							172			2
WORLD	79	12	206	175	543	309	283	0	1392	3908

Table 10
BREAKDOWN OF TRADING IN COMPONENTS, SITC 776

	Exports to :		Imports from :	
	1980	1984	1980	1984
USA	2	10	1794	62450
Japan	-	17	2076	11740
Singapore	84490	134236	2739	26613
Hong Kong	6095	-	139	655
Malaysia	-	-	-	7784
Philippines	-	-	-	317
Thailand	51	-	-	1469
France	-	-	636	652
U.K.	-	-	147	1754
F.R. Germany	-	-	1983	649
Netherlands	-	-	218	106
WORLD	90638	134263	14510	116613

Source : UNIDO

The available Indonesian statistics do not give any information on the structure of production. Table 6 has been drawn up on the basis of the data in Benn's Yearbook of Electronics. The statistics are not compatible with those given by the administration: Benn's Yearbook evaluates the total sales of the electronics industry as US\$ 800m instead of US\$ 300m (310 billion Rupiahs) in 1985.

Table 6 indicates that professional electronics (data processing, office and telecommunications equipment) is the principal activity of the Indonesian electronics industry. Then follows the components sub-sector and finally the mass consumer electronics sub-sector which represented 20% of the production in 1985.

2.3.2. Trading by the electronics industry

Whilst electronics play only an extremely limited role in Indonesian industry the exports from this sector represent an important proportion of manufactured exports. The orientation towards exporting of this sector contrasts strongly with the orientation towards the domestic market of the rest of industry. (Table 7)

Rather ironically the rapid reduction in the exports from the electronics industry coincided with the change in industrial policy towards giving greater priority to exporting. This policy change was inaugurated by the reforms of May 1986.

Exports were not however sufficient to cover imports so that in 1980 and 1984 the trading balance of the electronics industry was in deficit. (Table 8).

The geographical breakdown of trading (Table 9) and that of trading in semiconductors (Table 10 - SITC Code 776) demonstrates the position of Indonesia in intra-company trading: Indonesia imports components from the United States and Singapore and these, once they have been assembled, are mostly sent to Singapore where they are either tested or integrated into other products.

Amongst the other noteworthy exports of the electronics industry are some items of telecommunications equipment, in particular for ground stations in Malaysia (US\$ 1.8m). A contract for supplies to Jordan was not concluded because of a lack of means of financing it, Indonesia not being able to offer lines of credit.

3. PRODUCTION AND ORGANISATION OF PRODUCTION

3.1. The structure of production

3.1.1. Mass consumer electronics

Video products (colour and black and white television sets) dominate the production of mass consumer electronics. (Table 11)

Assembling of black and white television sets began in 1965 and production increased fairly rapidly up to 1977; then 210,000 sets were assembled. The wider use of colour sets began in 1978 and since that time colour sets have become more important. (Table 11)

Production goes to the domestic market; Indonesia is the largest of the ASEAN countries, but it is also the poorest and the market is therefore fairly limited.

The level of equipment of Indonesian households with consumer goods is fairly low :

- 31 persons out of 1000 possess a television set;
- 205 out of 1000 possess a radio. (Figures from Table 10a)

It must be realised that the level of electrification is still rather low: 17% of Indonesian villages are linked with the mains. The government envisages equipping 7000 new villages and 1.6m housing units. This should considerably increase the outlets for the industry.

3.1.2. Components

Up to 1986 the principal activity in this sub-sector was the assembling of semiconductors. (Table 12)

National Semiconductors made investments in 1974 and has transferred the assembling of MSI circuits (up to 100 gates) to its unit.

Fairchild invested at the same time in Djakarta. It was granted the same rights to extra-territorial advantage as an enterprise located in a free zone. At the beginning of the eighties it was, with a total of 4800 employees, the largest Fairchild overseas establishment.

Apart from these two major offshore enterprises there are numerous small manufacturers of components for mass consumer electronics.

3.1.3. Professional electronics

The telecommunications industry is the most important activity of the Indonesian electronics industry. In terms of value (Table 13) it represents slightly more than 60% of the production.

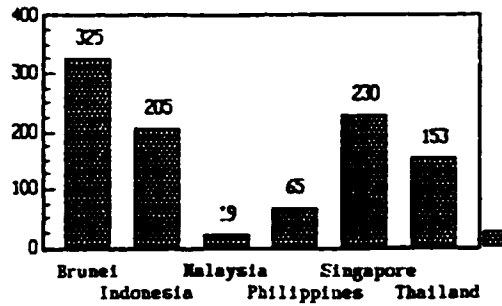
3.1.3.1. Telecommunications

Telecommunications play an extremely important role in Indonesia, which is the largest archipelago in the world. In 1976 Indonesia was the first country in the Third World to utilise a geostationary satellite (Palapa). With only 600,000 lines installed the level of equipment is very low with only 5 telephones for every 100 inhabitants, much lower than in the other ASEAN countries. This backwardness has one advantage; it allows Indonesia to launch out immediately into the digital option.

Table 10a

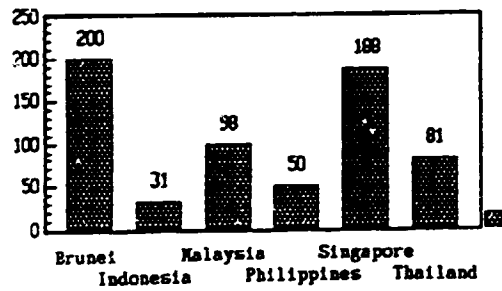
EQUIPMENT IN HOUSEHOLDS

Radios per 1000



EQUIPMENT IN HOUSEHOLDS

Television sets per 1000 persons



TELEPHONE EQUIPMENT

Subscribers per 1000 inhabitants

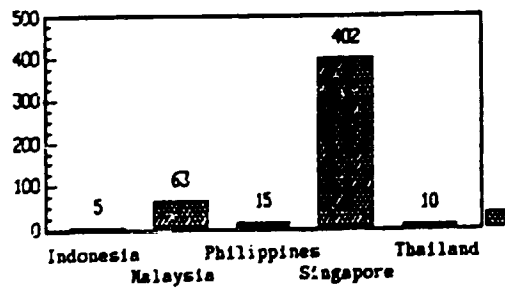


Table 11
MASS CONSUMER ELECTRONIC PRODUCTS

<u>Production by value in US\$m:</u>	1984	1985	1986
	138	123	115
Video	105	89	82
Colour TV	74	66	62
B&W TV	31	23	20
Audio :	24	25	25
Radios	12	11	11
Tape recorders	10	12	13
Record players	2	2	2

Source : Yearbook of electronics data, Benn Electronics, 1987

Principal productions, in thousands units

	1970	1975	1981- 1982	1982- 1983	1983- 1984	1984- 1985	1985- 1986
Television sets	5	166	847	654	623	773	827
Colour	5	166	204	232		337	361
B&W	0	0	643	423		436	466
Radios			1155	1590	1503	1577	1883

Source : Data from Ministry of Industry and PT, 21/4/1986

Table 12
PRODUCTION OF COMPONENTS (Value in US\$m)

	1984	1985	1986
Active	189	133	186
Passive	30	33	41
Audio	67	74	71
TOTAL	286	240	298

Table 13
PRODUCTION OF PROFESSIONAL ELECTRONICS

	1984	1985	1986
Electronic data processing	20	40	50
Office equipment	17	18	19
Control & instrumentation	27	33	35
Medical and industrial	5	7	8
Communications and military	41	45	50
Telecommunications	164	213	262
TOTAL	274	356	424

Source : Benn Electronics

The telecommunications industry was established twenty years ago to meet national needs. Since 1984 a State company assembles digital exchanges under a Siemens licence. The production capacity is 150,000 lines per year. INTI can also manufacture PABX with a capacity of 7500 lines per year, telephone sets (165,000) and multiplex sets (10,800). Amongst other products are 4500 mobile telephones and 20 small earth stations per year. (Table 14)

Amongst other Indonesian products are telephone cables and telex equipment.

3.1.3.2. Informatics

Eight companies are listed which assemble computers. The administration is the principal outlet for data processing equipment; the private demand for personal computers is developing rapidly.

Table 14
TELECOMMUNICATIONS : PRODUCTS MANUFACTURED IN INDONESIA

In 1975 :	In 1984 :
Electromechanical exchanges (EMD)	Digital telephone switching
Telephone sets (H700)	Telephone sets : INTI 111 payphones
HF radios/ssb	HF radios/ssb Small earth stations Automatic mobile telephone system Subscriber radio Multiplex FDM and PCM Radio-sondes and wind-sondes Digital microwaves Packet switching

Source : Asian Electronics Union

Several companies have submitted requests to the BKPM for assembling various data processing components or peripherals, such as keyboards, disk readers, hard disks, terminals and power supplies.

A foreign group has taken over the National Semiconductors unit in order to produce disk readers for export.

3.1.3.3. Software

Software is playing an increasingly important role in telecommunications. As a result of an agreement between the UNDP and the government of Indonesia PT INTI has obtained a contract from the International Telecommunications Union for the design, construction and installation of a Demonstration Packet Satellite Data Network called Packsatnet. The team responsible for writing the software included personnel from PT INTI and two foreign companies. The project was carried out in Bandung and was completed in 1984.

3.2. Organisation of production

3.2.1. Companies

Mass consumer electronics

According to the Association of Electronics Companies 79 establishments were listed in 1986.

The assembling of television sets or radios is sometimes only one of the activities carried out by companies which are highly diversified and which are involved with other electrical consumer products.

The most important company is PT National Gobel, a joint-venture with a Japanese company; other important companies are PT Sanyo, PT Yasonta, PT Pembina Galindra, PT Asia Permai, PT Ratu Irama and PT Panggung Electronics.

By the side of these large companies are numerous small units which often carry out repair work (UNIDO : Small scale electronics industry as subcontractor, IS.549, August 1985). These small subcontracting companies receive their inputs from the large companies, and so may be considered as extensions of the large companies since they often only work for one of them. This organisation of production is integrated into the scheme put forward by the government in 1978, the "Bapat Angkat", which regulates the contractual terms in relationships between subcontractors and their principals.

Components

This sub-sector was dominated by the presence of Fairchild and National Semiconductors, assembling semiconductors; there was also International Harvester manufacturing small coils and polyvaricons.

The two American companies closed down in 1985: this decision was part of their international strategy. It would seem however that the decision of NSC was provoked by the refusal of the Indonesian authorities to permit the automation of certain production lines in the unit, a refusal explained by their desire to avoid unemployment.

The NSC plant has been taken over by a Singapore group which will manufacture disk readers there.

Table 15
THE PRINCIPAL COMPANIES IN MASS CONSUMER ELECTRONICS

Production capacities in thousands of units

	Radios	B and W TVs	Colour TVs
PT National Gobel	520	250	98
PT Sanyo		158	108
PT Yasonta	60	180	180
PT Pembina Galindra	60	30	5
PT Asia Permai	20	15	12

Source : BKPM, PT Data Consult, 21/4/86

Table 16
COMPARISONS OF WAGES IN THE TEXTILES INDUSTRY, SPRING 1987

	France	F.R.G.	Japan	Korea	Indon- esia	Thai- land
Labour costs :						
costs in US\$	9.99	13.01	11.95	1.75	0.20	0.58
Working hours :						
hours/day	7.9	8	8	8	10	8
hours/week	40	40	40	48	51	48
hours/year	1773	1811	2023	2388	2447	2320
normal days/year	224	226	253	286	241	290
Utilisation level of plant :						
days/year	225	246	251	308	285	350
hours/year	5393	5714	5737	7392	6843	8400

Professional electronics

The telecommunications sub-sector is dominated by PT INTI, a State company. Operating around the activities of INTI in Bandung are a number of small companies started by young engineers.

It is, however, local private companies (Cipta Piranti Dinamika) which assemble data processing equipment.

3.2.2. Wages and employment

Wages in Indonesia are the lowest in the ASEAN countries. (Table 16) In the absence of comparative data concerning wages in the electronics sectors in various countries this table sets out the data for the clothing industry, where wage levels for workers are very similar to those operating in electronics.

No information is available regarding skills. An LPEM study by Dr Dorojatun has shown that the most highly skilled personnel were employed in companies operating under licence. Most of the companies assembling television sets provide not only training but also offer the possibility of training courses abroad.

4. THE TRANSFER AND MASTERY OF TECHNOLOGIES

4.1. Levels of integration

Imports of finished electronics products have been prohibited so as to favour and to protect local industry. However despite this prohibition one can see evidence of imports of television sets. In order to accelerate the progress of this industry beyond the assembling stage the government has issued directives concerning the rationalisation of production.

A plan for progressive integration was published in 1978 for the manufacture of television sets and, according to this plan, it would not be until halfway through the nineties that the industry would really reach the manufacturing stage. (Table 17)

As may be seen from Table 18 most of the intermediate products are still imported: in 1985 this represented 85% of all the mass consumer electronics products and 62% for audio products.

The Ministry for Industry has carried out pre-feasability studies on two industrial units intended to reinforce the level of local integration:

- a plant for cathode ray tubes for television sets; the national market has not so far reached a sufficient size (1 million) to justify this investment, which would only be viable by exporting part of its production;
- a unit for printed circuits.

No decision has so far been taken on these two projects.

According to the LPEM study quoted above it seems that no Indonesian company possesses product design capabilities. No company is capable of executing line drawings or building mock-ups.

On the telecommunications industry PT INTI began by working under licence and hopes to reach a 60% level of integration in the nineties. No information is available on the level of integration so far achieved.

In the case of informatics the government has not so far decided on a policy for manufacture and training.

It has however stimulated national production by giving priority to equipment manufactured locally when the various ministerial departments require equipment.

More generally a study (UNIDO/DP/INS/78/078) has identified certain components where production could begin in the near future :

- deflection components, for black and white and colour television sets;
- plastic components;
- electrolytic capacitors operating up to 60 volts.

4.2. Technology

There is no R&D in mass consumer electronics. In telecommunications the R&D budget of PT INTI is equivalent to 1% of the turnover.

According to Indonesian legislation the cost of the technology must not exceed 2% of sales, but it would seem that this requirement is not complied with and, according to local information, royalties can reach 10%.

Table 17
PLAN FOR INTEGRATION IN THE MANUFACTURE OF TELEVISION SETS

Electrical components :

- By 1985 : Loudspeakers
 - Rod antennas
 - Power units
 - Audio I/O transformers.
- By 1990 : Earphones and switches

Passive components :

- By 1985 : Resistors and capacitors
 - Deflection yokes
 - Horizontal drivers
 - Choke coils and fixed coils
 - High frequency coils.
- By 1990 : Thermistors

Active components :

- By 1990 : Diodes and transistors
 - Cathode ray tubes
- By 1995 : Integrated circuits

Design :

- By 1985 : Drawings and models
- By 1990 : Mechanical design
- By 1995 : Electronic design.

Source : LPEM, according to Electronic Association of Indonesia

Table 18
ORIGIN OF THE INTERMEDIATE CONSUMPTIONS
in billions Rupiahs

	Imports	Local	Total	Imports as %
Total	158319	33105	191424	82.71
CKD/TV components	59839	6949	66788	89.60
CKD/cassette components	13753	0	13753	100.00
CKD/audio components	30633	15535	46168	66.35

Source : Industrial Surveys, 1985

5. CONSTRAINTS AND PROSPECTS

5.1. Constraints

An exhaustive UNIDO study, covering all equipment goods industries including the electronics industry, has highlighted the principal constraints on this industry in Indonesia :

- It continues to be dominated by assembly operations using imported components;
- It only employs skilled labour;
- Local integration is always very low and the dependence on imported products is very high.

Another characteristic of the Indonesian industry is linked with the highly protectionist policy of import replacement which the country pursues. Calculations made recently by the World Bank show that in Indonesia the effective level of protection is higher for the capital-intensive industries than for the labour-intensive industries, but it is still the case that the assembling of radios and television sets is amongst the most highly protected activities (Bulletin of Indonesian Economic Studies, August 1986). Whereas Indonesian wage rates in the clothing industry are only a half of those in Korea the production costs are just as high.

5.2. Prospects

For some years now a series of reforms have been implemented which should encourage the exporting industries.

5.2.1. The nominal tariffs have been reduced. The maximum rate has been reduced from 225% to 60% and most of the products are subject to tariffs between 5% and 35%. At the beginning of 1986 nearly 70% of imports fell within the 0-5% category.

In May 1986 the government announced a new series of measures; duty drawback allows indirect exporters to benefit from the return of import duties. This reform, the PAKEM, is administered by the Pusat Pengelolaan Pembebasan dan Pengembalian Bea Masuc (P4BM).

Other reforms have reduced the number of import licences. Half of the 329 headings which were reserved for approved importers now come under the IU heading which permits free importing; this applies to chemicals, paints and dyes, tyres and inners, leather, paper, glass and certain textiles.

5.2.2. The electronics industry has recently been included in the priorities of the government.

Until Repelita IV the growth of this industry was directed towards facilitating the extension of telecommunications.

A commission concerned with the development of electronics was created in 1984 and 1986. Encouragements designed to attract investors were implemented. These measures form part of the series of reforms launched in recent years.

As was pointed out in a study (UNIDO/DP/INS/78/078) the growing sophistication of the electronics industries in Korea and in China (Taipei) offers opportunities to Indonesia. Industrialists should be able to move into those fields in foreign markets which have been abandoned by the enterprises of these two countries, whether these concern black and white television sets or bottom of the range colour sets. The multiplication of OEM agreements should be encouraged. By enlarging the production of television sets the Indonesian industry could succeed in surmounting its handicap of excessive production costs, and could offer products at lower cost on the Indonesian market.