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THE TERMS AND WORKING CONDITIONS OF WOMEN WORKERS IN
THE MANUFACTURING SECTOR WITH SPECIFIC REFERENCE TO
THE ELECTRONICS INDUSTRY IN MALAYSIA

by

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INTRODUCTION

This paper intends to provide an understanding on the employment conditions of women workers in the manufacturing sector in general and the electronics industry in particular, so that readers can derive some inferences on the quality of life of these workers. It draws from three categories of data: firstly primary field data from wide-ranging studies conducted by the writer in 1977-1979 on 1294 women workers in export-oriented industries⁽¹⁾, and from specific case-studies on electronics workers in 1983-1986, secondly, research findings of similar studies like the HAWA study on factory women workers in Selangor in 1980, and thirdly secondary data obtained from the various government and non-government agencies in the period 1976-1986. The paper is divided into three sections.

Section One provides a brief introduction on the labour force participation of women in the manufacturing sector, the nature of the electronics industry and the occupational and health hazards associated with this industry.

On the basis of research findings from the relevant sources, Section Two proceeds to discuss in depth the employment conditions in the electronics industry and focuses on the following aspects: wages and payment system, facilities and fringe benefits, work hours, shift work and overtime work, work standard and production quota system, job security, training and occupational mobility.

Section Three lists the major conclusions on the quality of life of women workers in the electronics industry on the basis of inferences drawn from the preceeding discussion in the earlier sections.

The distribution of sample respondents by type of industry is as follows:

electronics workers:	769
textiles and wearing apparel:	329
others:	196

SECTION ONE

(1) Women's Labour Force Participation in the Manufacturing Sector

Since 1970 there has been a steady increase in women's entry into the labour force of the manufacturing industries. (Please see Table 1). When compared with the other sectors, this increase is indeed significant and outstanding; the percentage of women working in the manufacturing sector increased from 7.3% in 1970 to 20.7% in 1980. This remarkable trend is largely a result of the introduction of export-oriented industrialization in Malaysia and the establishment of several labour-intensive, export-oriented industries like electronics, textiles and garments and food-processing industries.

Traditionally, as shown by studies in the West, these are industries where the majority of workers comprised women and this pattern is now prevalent in Malaysia. As indicated by the figures in Table 2, the majority of Malaysian women are also concentrated in these industries. When compared to men workers, women comprised 88.4% of workers employed in the clothing, 84.9% in the electronics, 62.9% in the textiles and 60.4% in the food preparation industries in Malaysia.

The establishment of export-oriented industries in Malaysia is reflective of the general trend in the World economy when giant multinational industrial companies essentially from the developed countries are setting up subsidiaries in off-shore locations in the developing countries. One of the reasons for locating these runaway factories in Malaysia is the availability of cheap and docile female workers for labour-intensive jobs in the international production process. The other major reason is the attractive deal given by the Malaysian government in the form of locational incentives (for example, free-trade zone facilities) and loose labour laws. Non-stringent labour laws together with negligible enforcement facilitate the easy exploitation of workers and enables the continuance of harsh work conditions and an unhealthy work environment for workers.

With export-oriented industrialization, the electronics industry has become and remains the largest employer in the manufacturing sector with a total of 3,200 workers in 1970, 50,000 workers in 1977 and over 160,000 workers in 1981. Over 75% of the electronics industry workforce are women (Jamilah Ariffin 1984: 234).

The electronics industry in Malaysia comprises four types of establishment - products, components, industrial and communication equipment and others. Of these, components establishments employ the largest number of workers and the largest proportion of female production operators. More than 90% of the production - assembly line workers are women in the age group 16-25 years most of them Malays from the rural areas with inadequate knowledge and preparation for industrial work. In

TABLE 1

EMPLOYED MALES AND FEMALES IN THE MANUFACTURING
SECTOR OF PENINSULAR MALAYSIA 1957-1980

Year	Total	Male	Female
1957	135,382 (100%)	112,837 (83.3%)	22,545 (16.7%)
1970	251,939 (100%)	178,881 (71.02%)	73,058 (28.98%)
1974	498,113 (100%)	313,385 (62.9%)	184,728 (37.1%)
1975	533,496 (100%)	324,070 (60.75%)	209,426 (39.26%)
1980	596,270 (100%)	357,350 (60%)	238,920 (40%)

Source: Jamilah Ariffin "Women Workers in the Manufacturing Industries" CAP publication 1983 p. 50 and the Population Census 1980.

TABLE 2

WOMEN'S PARTICIPATION IN THE MANUFACTURING
INDUSTRIES - 1979

Type of Industry	No. of Women	% of total employed
Electronics	52,886	<u>84.9</u>
Textiles	22,627	<u>62.9</u>
Clothing	15,198	<u>83.44</u>
Rubber Products	8,598	50.5
Plywood	5,606	41.6
Printing and Publishing	4,872	34.8
Plastic Products	4,540	50.3
Biscuits and Confectionary	3,470	59.8
Tobacco	2,111	53.2
Tin Cans and Metal Boxes	2,057	57.2
Pineapple Canning and Miscellaneous food preparations	2,031	<u>60.4</u>
Chemical Products	1,864	55.6
Brass, Copper, Pewter and Aluminium Products	1,202	

Source: Quarterly survey of Employment in Manufacturing Industries, Peninsular Malaysia, 1979, Department of Statistics.

terms of ownership, most of the electronics factories are foreign owned. The largest number of workers are employed by American companies, followed by Japanese companies and European-owned firms.

The jobs created by MNC electronics investment in the semi-conductor industry in Malaysia (as well as in other off-shore locations) involve labour-intensive assembly of electronics components, and final testing process. In this process, the silicon wafer, about two to four inches in diameter are sliced into about 500 separate chips. Each individual chip is bonded with wire leads. In the early phase of the production technological process, this involves labour-intensive procedures where each assembler, peering through a microscope or highly-powered magnifying lens, attaches a variety of minuscule wires - each the size of a strand of human hair, on to a chip using fine soldering equipment. In the more advanced phase of the production technology (which is presently being adopted in some factories in Malaysia) this process can be handled by sophisticated bonding machines. Each chip may be bonded with as many as 50 wires. The rest of the assembly process involves dipping the bonded chips into a protective coating of metal or ceramic and then baked in ovens of 600°F to 100°F to seal them. Once the manufacturing process is completed, the final stage involves testing each chip. Assembly workers must dip the chips into tanks of various liquids or chemicals and then test them with complicated and expensive equipments.

Generally, women workers in this industry are therefore engaged in routine, fragmented repetitive work which is essentially boring but requires alertness, nimbleness and speed.

The semi-conductor industry has been characterised by intensive price and technology competition from early in its history. The fierce competition has led to rapid technical innovations and sharp decline in the prices of electronic products. The situation is reflected in the short life of electronic components and products. Rapid advance in semi-conductor technology over the past twenty years has been very evident. The industry which emerged in the early 1950's has passed through four distinct periods of growth and product development, firstly, in the early 1950's semi-conductor devices such as the transistor have been developed. Secondly, in the early 1960's various silicon integrated circuit (IC) often referred to as the 'chip' have emerged in the market. Integrated circuits are able to combine up to 100,000 transistors, resistors and other circuitry on a single chip of silicon which is about half the size of a fingernail. Thirdly, in the late 1960's large scale integrated circuits (LSI) have been developed. These circuits combine hundreds of silicon integrated circuit (CI) using metal oxide semi-conductors (MOS). Fourthly, in the mid-1970's the single chip micro-processors (MPU) which form the central processing unit of computers have emerged. Today, an integrated circuit is, therefore, a tiny silicon chip that can perform as many functions faster and cheaper than the original

digital computer and every few years, most of the major manufacturers are capable of quadrupling the number of functions the last generation of chips can perform.

Due to the rapid periods of change and product development, the semi-conductor devices of different generations appear to have the introduction and growth period of about ten years before reaching their maturity. The comparable period for individual products would be even shorter, i.e. about five years. The shorter product life of electronic components and products is, therefore, a major aspect of the electronics industry. In this situation, research and development (R and D) activities is of vital importance to electronics companies since technologies and equipment are rapidly outmoded and replaced.

Other than the rapid rate of technological changes and development, the industry is also characterised by the rapidly growing demand for electronic products. For example, during the period 1963-1973, the growth rate for the US electronics market was 202%. The semi-conductor market expanded 331%, and within this sector the integrated circuit market has a growth rate of 5,406% (Scibberas, 1977). Similar rates of growth were recorded in the 1973-1978 period.

The rapid expansion in the electronic products' market is linked with the emergence and growth of several electronics firms. This is particularly evident in the semi-conductor industry where small but highly competitive firms have emerged. Competition among these firms is intense. If a new technology is not exploited quickly by one firm, another is bound to utilise it first. Firms that are slow to innovate or make mistakes in the direction of their research and development quickly find themselves shut out of the market by the more advanced (and often cheaper) products of their competitors. Rampant price competition on a national and international level (for example, between American and Japanese electronics firms) is speeding the drop in prices. For instance, active price and technology competition in the late 1970's has caused a drastic fall in the price of a single electronic function to about one hundred thousandth of its price in 1950 (Siegel, 1980).

In addition to the trend of price declines, the market for semi-conductors is also characterised by rapidly fluctuating demand. This volatility is most rapid since the 1974 recession. This situation affects producers' policy by recruiting and retrenching workers at short notice.

Although the electronics industry was considered to be one of the cleanest and safest industry, a United States study found it to be the third most dangerous industry in terms of workers exposure to harmful chemicals during the production process. The health and safety hazards prevalent in the industry and their implications for women workers can be discussed in relation to the types of chemicals utilised, radiation, eye-ailments and reproduction problems.

Chemicals

Organic solvents are used widely such as Trichloroethylene (TCE) phenols, and methanol. Many of these solvents are extremely toxic to the liver and kidney and are believed to cause cancer. Table 3 shows a list of chemicals commonly used in the semi-conductor industry in Malaysia and their potential ill-health effects.

Other chemical hazards in the electronics industry are linked to the soldering, plating and encapsulation process such as acids, (concentrated nitric and sulphuric acids) metal fumes (mainly tin and lead) and epoxies. Lead encountered in the plating and dipping section also exposes workers to lead poisoning which have dire effects on the reproductive system.

Radiation

This is a hazard presently faced by quality control operators and may also pose a serious danger to many bonding machine operators in electronics factories that are steadily replacing manually operated tasks with automated technology. Excessive radiation dosages can lead to leukaemia and mutation changes in the foetus due to chromosomal damage.

Eye-strain, headaches and Eye Diseases

In the semi-conductor electronics factories where intense use of the workers' eyesight is utilised as in manual bonding or visual checking of the assembled chips, complaints of eye-strain, headaches and failing eye-sight are usually reported by workers.

The problem of eye-strain is usually aggravated by poorly maintained microscope lenses or because the magnification allowed by management is not sufficient so that workers have to strain their eyes to examine for defects in the printed circuit. The closed environment in the factories and common usage of work instruments among workers allows for the spreading of infectious eye disease like conjunctivitis.

X-rays used in the electronics industry for identifying flaws in printed circuits and X-rays generated by cathode ray terminals (CRTS or VDTS) can also be very harmful if the exposure is in large and consistent amounts. preliminary evidence suggests that high level exposure could cause cancer.

TABLE 3

SOME CHEMICAL HAZARDS IN SEMI-CONDUCTOR INDUCTOR INDUSTRIES

(i) De greasing and cleaning

- Trichloroethylene (TCE) - causes skin dermatitis and irritation of eyes, nose and throat.
 - suspected carcinogen.
 - can cause a sudden heart irregularity or stoppage resulting in death if exposed to high vapor concentration.
- phenols - suspected carcinogen
 - highly irritating to the skin eyes and upper respiratory tract.
- methanol, freon - skin dermatitis

(ii) Tin Plating/Dipping

- Lead (vapor) - lead poisoning
- Arsenic (vapor) - dermatitis and cancer
- Tin - benign pneumoconiosis (stannosis)
- Acids (concentrated nitric and sulphuric acids) - burns, ulcers of the skin, mucous membranes and eye tissues, irritation of the respiratory tract.

(iii) Molding (Encapsulation of the finished I.C.)

- Epoxy (dust) - irritation of respiratory tract (long term effects are undetermined)
 - has irritating and sensitizing properties.

Source: Lee S.H. "Occupational and Health Hazards with Reference to Female Workers" 1984 p. 25.

Reproduction Hazards

This is an aspect which should be considered seriously since the majority of the workers are women in the reproductive age. Pregnant women workers who are in contact with organic solvents or chemicals are likely to experience reproductive difficulties and frequency of spontaneous abortions. Exposure to xylene causes longer and heavier menstrual period, antimony may cause miscarriage late in pregnancy, premature births, and arsenic may cause breast cancer and urigenital cancer. Exposure to cadium and lead has been associated with defects in the formation of the fetus.

SECTION TWOEMPLOYMENT CONDITIONS IN EXPORT-ORIENTED MANUFACTURING INDUSTRIES
WITH SPECIFIC REFERENCE TO THE ELECTRONICS INDUSTRIES2(1) Wages and Payment System

Several recent studies (Snow 1978 and Frobels et. al. 1980) have shown that Asian women workers are frequently exploited as cheap labour by export-oriented multinational companies. This point is reiterated by Osman-Rani and K.S. Jomo (see Osman-Rani and K.S. Jomo 1980). The issue of cheap labour can be investigated in terms of two criteria. Firstly, by comparing the wages paid to Asian women workers and those paid to their female counterparts in the multinational companies' own countries, and secondly by comparing the different wages paid by these industrial companies to male and female workers doing the same job.

Unequal wages for Asian and Non-Asian Female Workers

Several research findings have revealed the broad differences in the wage rates and amenities given to female electronics workers in industries as compared to Third World countries. (Grossman, Muster, Linda Lim and Snow). The situation is succinctly described by one report in the Far Eastern Economic Review:

"Wages for unskilled and semi-skilled labour in Asian Free Trade Zones are between a tenth and an eighth of those in the West, and total working time per year because of overtime hours are up to 50 per cent higher than in Western factories. Social overhead costs in the form of social security payments, fringe benefits, travel, uniform, and other allowances are only 20 - 30 per cent of the total payment compared with 80 per cent in the West"

(Far Eastern Economic Review 18 May 1978: 79).

In addition to these wage differentials, other studies like Frobels' and Muster's (1980) have shown that the productivity of Asian workers is higher than workers in the West. The differentials therefore are larger than they might at first appear.

Given these conditions of higher productivity, as well as willingness to work for lower wages and benefits, it is not surprising that electronics multinational companies prefer to employ Asian workers in off-shore locations. Profits too, tend to be maximised in these off-shore locations (Lim 1978). The conclusion is clear. Asian female workers in general and Malaysian female workers in particular are exploited as sources of cheap, but productive labour by electronic multinational

companies.

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Unequal Position Between Male and Female Workers in the Industrial Sector

Women industrial workers in Peninsular Malaysia are disproportionately found in the lowest wage categories. A comparison of male and female earnings in the manufacturing sector in Peninsular Malaysia is shown in Table 4.

It can be calculated from the given figures that almost half (42%) of all female workers earn less than \$100 per month while only .14 percent of male workers are in this salary category. The vast majority (90%) of female workers employed in manufacturing industries earn less than \$200 per month compared with only 57 percent of male workers. Only 10 percent of female workers in the manufacturing sector earn between \$200 - \$599 per month while 38 percent of males do so.

The obvious inequalities between male and female wages in the manufacturing sector is further demonstrated by comparing the average monthly earnings of inskilled male and female workers. Details are provided in Table 5.

In Peninsular Malaysia, unskilled female labourers' average earnings are 43 percent of the equivalent male earnings. A comparison of average monthly earnings according to male and female categories of unskilled labourers in the major labour market areas of Peninsular Malaysia reveals that on average, females earn only 69 percent of the total earnings of their male counterparts.

The discriminating treatment given to female workers becomes more glaring when we consider that male workers are usually paid more than women workers for doing the same job. The figures in Table 6 and 7 shows the unequal wage rates for male and female production workers in the manufacturing industries and in the electronics industry.

Complementing this pattern of low earnings among female workers in the industrial sector, the research findings of my survey in 1977 show that the majority of our sample received very low monthly income. More than 9 out of 10 of the sample received an average monthly income in the range of \$70 to \$200. By urban income standards, these figures fall within the lowest category and are well below the mean urban household income of \$435 (see Malaysia, Mid-Term Review of the Second Malaysia Plan (1971-1975), 1973, p.3).

Generally the electronics companies, especially those by giant multinational corporations (like Motorola, Robert Bosch, R.C.A.) pay higher wages than smaller electronics companies and non-electronics companies. On the whole, the research findings indicated that electronics workers are paid higher wages than

TABLE 4

EMPLOYMENT BY SALARY/WAGE GROUP IN ALL COVERED INDUSTRIES, PENINSULAR MALAYSIA, 1974*

Salary/Wage Group (full-time workers)	Male	%	Female	%	Total	%
> \$2,000 per month	(790)	98	(13)	2	(803)	100
\$1,200 - 1,999 per month	(1,429)	96	(60)	4	(1,489)	100
\$1,000 - 1,199 per month	(1,064)	93	(81)	7	(1,145)	100
\$ 800 - \$ 999 per month	(1,443)	94	(95)	6	(1,538)	100
\$ 600 - \$ 799 per month	(3,509)	91	(349)	9	(3,858)	100
\$ 400 - \$ 599 per month	(11,044)	91	(1,052)	9	(12,096)	100
\$ 200 - \$ 399 per month	(51,712)	85	(9,252)	15	(60,964)	100
\$ 100 - \$ 199 per month	(70,159)	59	(49,029)	41	(119,188)	100
< \$100 per month	(23,063)	35	(43,025)	65	(66,088)	100
Total	(164,213)		(102,956)		(267,169)	

*Figures based on Survey of Manufacturing Industries, Peninsular Malaysia, 1974.

TABLE 5

CROSS-INDUSTRIES - LABOURERS* - BY LABOUR MARKET AREA, EARNINGS AND RATES OF
PAY SAMPLE OF 330 ESTABLISHMENTS**

Sex	Kuala Lumpur/Petaling Jaya Labour Market Area				Penang/Butterworth Labour Market Area				Johore Bahru Labour Market Area				Ipoh Labour Market Area				Other Labour Market Areas in Peninsular Malaysia				Peninsular Malaysia			
	AE	ARPM	ADR	AHR	AE	ARPM	ADR	AHR	AE	ARPM	ADR	AHR	AE	ARPM	ADR	AHR	AE	ARPM	ADR	AHR	AE	ARPM	ADR	AHR
Male	218	183	5.86	0.91	149	156	4.18	0.28	268	158	8.79	0.76	173	182	5.21	-	179	217	3.47	0.61	294	192	4.07	0.64
Female	163	149	4.60	0.80	129	120	3.70	0.30	135	176	3.63	0.90	120	114	4.56	-	113	142	3.47	0.54	125	146	3.70	0.57

* Including factory production workers.

** Occupational Wage Survey - Peninsular Malaysia, 1977.

AE = Average Earnings
ARPM = Average Rate Per Month
ADR = Average Daily Rate
AHR = Average Hourly Rate

TABLE 6: Wage Differentials According To Sex 1980

Industry Occupation	Motor vehicle & parts industry		Chemical product industry		Plywood & particle board		Tobacco product industry		Rubber product industry
	M \$	F \$	M \$	F \$	M \$	F \$	M \$	F \$	M \$
Manager	3120	-	2772	-	1882	-	3142	-	3004
Supervisor/ foreman	821	-	928	578	516	292	1557	-	652
Clerk	555	412	611	218	386	300	732	529	311
General worker	261	179	339	252	193	160	327	227	343
Production operator	-	-	419	372	-	-	-	-	-

Source: Occupational Wage Survey 1980
Ministry of Labour

Note: M = male
F = female

Cited in Goh Pek Chen (1986)

TABLE 7

AVERAGE EARNING PER MONTH (\$) BY SEX AND OCCUPATION IN
THE ELECTROINCS INDUSTRY MAY 1977, 1980 & 1983

Occupation	1977		1980		1983	
	M	F	M	F	M	F
Supervisor & foreman, general	639	411	779	484	1,801	1,473
Production operator	185	163	228	222	n.a.	n.a.
Material handler	168	219	272	281	629	561
Quality control inspector	281	200	299	270	634	421

Source: Occupational Wage Survey 1984, Ministry of Labour.

Note: M = male

F = female

n.a. = not available for citation

Cited in Goh Pek Chen (1986)

non-electronic workers. My investigation in 1977, revealed that the electronics workers earned higher wages (between \$150 to \$200 per month) than respondents employed in non-electronics companies (between \$70 to \$150 per month).¹ However it should be pointed out that some researchers on the wage-structure of female industrial workers, (Thong 1983) have suggested that electronics companies offer largely illusory wage advantages. In comparing the range of average monthly earnings in the electronics industry with that in rubber milling, rubber latex processing, biscuits manufacturing and other industries which employ unskilled female labour, HAWA research findings conclude that although starting wages are higher in electronics, maximum wages are higher in biscuit manufacturing, tobacco textiles and the plywood and particle board industry. In addition, due to various employment hazards and higher rate of labour turnover and dismissal in the electronics industry, the average work-life of female workers is normally shorter in electronics than in non-electronics factories. The higher wages enjoyed by electronics workers as compared to non-electronics workers are largely short-term advantages.

2. FACILITIES AND FRINGE BENEFITS

In Malaysia, especially in the pre-recession period, competition among firms for female labour is particularly keen. Nevertheless, despite the high demand for female workers, multinational firms collude to maintain a low wage ceiling. They compete among themselves to retain workers by offering a wide range of fringe benefits. This strategy is guided by managements' past experience which showed that fringe benefits form one of the most effective means of attracting and retaining female workers of rural origin. Unlike their experience in Singapore where the more urbanised workers are mainly responsive to monetary rewards, Malay female workers from the kampungs seem to be enticed by the pay packet and fringe benefits. This tendency of Malay female workers fits in well with managements' interests because very often the total cost of providing fringe benefits is less than what would be incurred if wage inducements

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Generally my investigation on female workers' income shows the following trend: In 1979, the incomes of electronics workers in the city-areas rose to an average figure of \$220 while non-electronic workers' income was in the region of \$170 to \$200. In 1983, the average take-home pay of electronics and non-electronics workers in Kuala Lumpur is \$300 and \$250 respectively. The income of female factory workers since 1970 are constantly higher than the income of domestic servants. It is therefore not surprising that with the implementation of export-oriented industries in Malaysia, there is a constant drift of labour from the domestic service sector to the factory employment sector. In 1986, the monthly income of electronics workers is in the region of \$350 - \$380.

were to be the primary form of enticement. On the whole, electronics workers in multinational companies are provided with a wider range of fringe benefits which are not available to workers in non-electronics and local companies.

This situation is confirmed by the findings of my survey in 1977. While almost all the respondents were provided with basic facilities such as canteens, clinics, medical service, work insurance and telephones, electronics workers of large multinational companies have in addition, provided bus transport, rest rooms, library, piped music while working, and sports and games facilities. Performance bonuses, gifts, attractive work uniforms and lavish annual dinners and entertainment are also basic fringe benefits features at these companies. It must however be noted that many of the performance bonuses, gifts and free excursions are in fact earned by the worker through performing work of better quality and higher levels of productivity. A competitive spirit among workers is deliberately encouraged by management. The workers compete against each other on an individual basis or as members of work-teams to achieve higher levels of productivity. As documented by Lim's study of an American multi-national electronics firm in Penang, these competing teams are given fanciful names like "Easy Riders", "Strange Motivation", "New Generation" and "Jaywalkers" (see Lim Pin Loon 1980: 28-29). In addition the workers are encouraged to attempt to surpass the productivity of their counterparts employed in the parent company overseas. According to management, this strategy creates high morale among workers while at the same time instilling them with pride in their work and a sense of identification with the firm. What is not highlighted by management is that these tactics ensure higher productivity from workers and inhibit awareness of their disadvantageous and unstable employment position.

While the services and facilities available to electronics workers can be considered as income-in-kind, these fringe benefits cushion the workers' cost of living only to a limited extent. Among the fringe benefits, only canteen subsidised meals and transport facilities directly absorbed the cost of daily subsistence. And not always do the workers avail themselves of the benefits. The 1977 survey shows that only 54 per cent of the respondents make use of company provided transport. The most needed facility, especially for those who are rural-urban migrants, is accommodation. Unlike the case for Korea or Taiwan where female workers are provided with dormitory-type accommodation, very few industrial companies in Malaysia provide this basic facility. Only 9 per cent of the respondents are staying in company-provided dormitories while my research on factory workers over the period 1978-1983 indicates that the majority of female workers do in fact prefer company-provided hostel accommodation if it is available. As argued in an earlier paper in 1979, one reason for the reluctance of multinational companies to provide accommodation and housing for their workers is because of their "foot-loose" strategy. Relative to cheaper

fringe benefits like subsidised meals and transport facilities, provision of housing is a binding and costly investment. It does not complement multinational companies' policy of leaving their off-shore locations when conditions no longer suit their interest and establishing new contacts in other countries which can offer them cheaper female labour and other benefits.

To summarise, the benefits given by electronics companies to their production workers in the form of higher wages and wide range of fringe benefits are largely illusory. The seemingly better work status of electronics workers as compared to non-electronics workers must also be critically analysed in the context of the different work requirements imposed on electronics workers. We will now view these requirements in the form of work-hours, shift-work system, overtime work, work standards and production Quota System and the related effects and implications on the workers' health and quality of life.

2(3) Working Hours

Relative to non-office (or blue collar) workers in other industries, electronics female production workers do not work excessively long hours. As shown by Table 8 non-office workers surveyed in 14 industries in Peninsular Malaysia work an average of 44 hours per week. The average number of work-hours per week for non-office workers in the electronics industry is also 44 hours per week. It is significant to note that the textiles and wearing apparel industry requires its production workers to work an average of 50 hours per week.

This pattern of longer work hours among non-electronics workers is also exhibited by the findings from my study. An investigation into the work hours of respondents according to type of industry showed that those working longest hours are employed in the non-electronics industry particularly in textiles and wearing apparel. Respondents in the smaller non-electronics companies are also sometimes coerced to work longer hours than laid down by legislation. This is because the larger multinational companies especially those which have strong workers' unions, seem to be more concerned than smaller companies to appear to keep in line with labour laws and regulations and to maintain a good public image.

TABLE 8

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WORK HOURS BY INDUSTRY

Industry	Average Number of Standard Work Hours Per Week
Rubber Remilng	
Office	43
Non-office	47
Rubber Latex Processing (off estates)	
Office	45
Non-office	48
Large Rice Mills	
Office	45
Non-office	46
Biscuit Manufacturing	
Office	46
Non-office	48
Tabacco Products	
Office	39
Non-office	43
Textiles	
Office	46
Non-office	50
Saw-milling	
Office	47
Non-office	48
Plywood and Particle Board	
Office	46
Non-office	47
Printing and Publishing	
Office	42
Non-office	45
Rubber Products	
Office	43
Non-office	47
Chemical Products	
Office	41
Non-office	44
Industrial Machinery and Parts	
Office	43
Non-office	46
Electronics	
Office	44
Non-office	44
Motor Vechiles and Parts	
Office	42
Non-office	44

Source: Statistics Department of Malaysia (1977)
Occupational Wage Survey, Peninsular Malaysia

2(4) Night Shift Work and Rotational Shift System

The relatively shorter working hours of electronics workers, are however offset by the electronics companies requirement of night-shift work for non-office workers. Unlike most non-electronics workers, electronics workers generally have to work on rotating shifts. The 1977 survey indicated that more than 90 per cent of the respondents employed as electronics workers do shift work, while only about half of those employed in other industries are required to do so. This finding is consistent with other studies on the work pattern of industrial workers in Malaysia, for example the HAWA study conducted in 1980 and my recent study on electronics workers in 1986.

My investigation into the shift work hours of electronics firms as well as other researchers' findings, indicate that generally (with the exception of some small electronics companies) most companies operate on the basis of three rotating shifts: The morning shift begins at 7 a.m. and ends at 3 p.m., the afternoon shift is from 3 p.m. to 11 p.m. and the night shift (popularly known among workers as the "graveyard shift") starts at 11 p.m. and finishes at 7 a.m. These shifts are usually rotated on a fortnightly basis. Following the rotational shift schedule, electronics workers have to commence on night-shift work for two weeks after completing a month of non-night shift work. As documented in a conference paper in 1979 (M.A. Jamilah, 1979) my investigations on the work pattern of electronics workers indicate that they are given inadequate rest hours. When compared to other night shift workers in the government services, electronics workers have short rest periods. For instance, hospital staff on night shift are given 96 hours off from their jobs after completing one week's night shift work while most electronics workers are given between 36 and 48 hours off from work after completing two weeks night shifts work.<1> In addition government service workers especially hospital staff are provided with a stipulated amount of food, beverages and other facilities during night shift but industrial workers are not given such "luxuries".<2>

1 Information obtained from a personnel manager of an electronics company in Selangor. An exception must be made for more benevolent companies like Motorola electronics company which gives 56 hours to its night-shift workers. The information on hospital night-shift workers was counter-checked by the writer for its validity.

2 A common complaint made to the writer by several electronics companies' workers and line-supervisors.

The 1977 survey indicates that the majority of the sample-respondents dislike night-shift work. This finding is also supported by my follow-up research on electronics workers over the period 1978-1983. Many female electronics workers complained that night shift disrupts their established sleeping habits. For married women in particular it has a detrimental effects on their sex life. They confided in the writer that many of their husbands do not like them to continue working in the present factory jobs because of the night shift work. In addition some of them confided that they worry about their husbands straying to other women when they are away from home on night-shift work. They also pointed out to the fact that one reason why the Malay community regards them suspiciously is because they go out to work at night. In traditional Malay society, where women are expected to be house-bound and at home after dark, those women who are seen to leave home at night for other activities are often stigmatised. My finding on the unpopularity of night-shift work among electronics female workers is confirmed by past (Lim's 1978) and more recent studies (the HAWA Survey in 1980).

2(4)a Overtime Work

Almost all industrial factories in Malaysia insist upon overtime work from their employees during the periods of heavy market demand for their products. Since there are more regular peak periods for electronics products in the international market, electronics companies tend to impose more frequent overtime work on their workers than other companies. Although according to Malaysian labour laws overtime work is voluntary it is common knowledge that in many industrial factories, overtime is compulsory. Almost all the respondents of the 1977 survey employed in the electronics companies did overtime as compared to 61 per cent of those in other industries. Because of their low basic wages and difficulties in making ends meet in a monetized urban environment, many female workers in general and the sample respondents in particular welcome the opportunity to do overtime and supplement their wages. However, assignment of overtime without sufficient advance notice is resented. Last minute overtime assignments disrupt the workers' social lives and make it difficult for them to participate in scheduled after-work activities. The tendency for electronics firms to demand for overtime work at short notice is a common complaint made to the writer by women factory workers. However, according to management, this practice cannot be amended because they have to comply with sudden orders from their MNC headoffice in keeping with the rapid vacillating market demand for their products.

The pressure of having to do overtime work as well as night-shift work is one reason why electronics workers often complain of chronic tiredness and that they have inadequate rest. This is clearly indicated in the findings of the 1977 survey and confirmed by data from the 1977-1979 longitudinal study, as well as by the HAWA study.

2(5) Work Standards and Production Quota System

The higher pay rates for electronics workers relative to non-electronics workers is also commensurable with the more demanding and competitive work standards in the electronics industry. Unlike non-electronics workers, electronics workers, electronics production operators have to undergo a series of intelligence and aptitude tests in order to be confirmed as regular production workers or allowed to retain their jobs. Strict work standards and quota production systems are imposed on the workers in the semi-conductors and components production factories. The female production operator has to complete a minimum work quota at a given time with a minimum number of mistakes allowed. Her performance and errors are recorded on the work chart. If she fails to complete the quota repeatedly, she will be reprimanded a few times by the line supervisor and in periods where the supply of labour is plentiful, she will be dismissed from the job.

The respondents of the 1977 survey often complained that they were subjected to great pressure to reach production targets. Since most of the electronics firms operate on three shifts, the machines are in constant use 24 hours per day which results in a high degree of wear and frequent breakdowns. In some cases, the line supervisors scold the workers for failing to reach work targets even though mechanical breakdowns prevent them from doing so. Many of the female workers cry or collapse into hysterics when they are under pressure and exhausted by the night shift and overtime work. Mass hysteria among female industrial workers is a common occurrence in many electronics factories in Malaysia. Almost all the 20 electronics factories surveyed in 1977 have faced problems created by mass hysteria among their female workers.

2(6) Job-Security, Job-Training and Occupational Mobility

According to my 1977 survey, 63 per cent of respondents in electronics companies and 59 per cent of the respondents generally indicated their feelings of insecurity about their jobs.

This affirmation could possibly have been influenced by factual knowledge about the nature of employment conditions for women workers. Just two years before the 1977 survey, many factory workers were retrenched due to the recession in the electronics industry. The majority of industrial workers retrenched were women. In this period more than 6,300 electronics women workers lost their jobs.

In a situation where new workers are easily trained and the supply of female labour is plentiful, the bargaining power of experienced workers is low. When these workers are dismissed,

they find difficulty in obtaining other electronics production jobs with pay rates befitting their experience. As has been documented by several researchers (Lim, 1978, Grossman 1979, Frobel 1980), most women workers in export-oriented industries have acquired little marketable skills which can be of some use to them when they are retrenched; their skills are not transferrable. There is also a tacit policy of collusion among electronics companies in Malaysia to maintain low wages and to discourage job-hopping among workers. In addition experienced workers who are retrenched have to start at the bottom of the pay scale when they are re-employed by the same electronics firm or on joining other electronics firms.

Opportunities for promotion are severely limited. Most production-line supervisors and all managers in manufacturing industries are men. From my visits to electronics and textile factories in Malaysia it is very obvious that even in the exceptional cases where production supervisors are women, they are given technically less complex work process as compared to male supervisors.

Most workers are generally concentrated in the least technical positions in the manufacturing industries and the majority remain in these positions through their employment. This situation is confirmed by the findings of my longitudinal study on female workers over the period 1977 to 1979. Of a sub-sample of 120 female electronics workers in the Sungai-Way Free Trade Zone in Selangor, less than 3 per cent have ever been promoted in their jobs. Very few female production operators can even aspire to be promoted to office jobs; the exceptional cases are those who possess very good secondary level educational qualifications and command of the English language. Since the majority of Malay female workers in general and our sample-respondents in particular, are educated in the Malay language stream, they have little chance of promotion to these white collar jobs. In addition because of the rotating shift-work schedule and frequent overtime, female workers, who are keen to improve their educational qualification or learn clerical skills by attending courses after work hours, are unable to do so. Unlike the Korean situation where some firms make special arrangements so that workers can continue their education, such provisions are generally not provided by industrial firms in Malaysia.

It can therefore be concluded that for the majority of female industrial workers in Malaysia, production process work is a dead-end job. For electronics workers in particular it is basically insecure, precarious and possibly of a short-term nature. An awareness of these job characteristics is one reason why many female workers are not committed to their jobs and regard it as temporary employment before obtaining another more secure job or getting married. Findings from the 1977 survey and may research on factory workers over the period 1978-1983 indicate that many of these women prefer to work in white-collar jobs in the government service because of related security

benefits. Many of the factory women workers apply for other jobs while they are still employed in the industrial firms and they constantly think of resigning: as many as 66 per cent of the respondents of the 1977 survey mentioned that they want to resign.

This finding is supported by the recent HAWA study in 1980 which indicated that more than three-quarters of the respondents would like to change jobs if they had a choice. The 1977 survey also showed that the tendency to look for white collar jobs is greater among those respondents who have educational qualifications beyond middle-level secondary education than among those with lesser qualifications. Reports from the management of electronics firms confirm that there is a higher voluntary resignation rate among female workers with higher qualifications.

SECTION THREE: MAJOR CONCLUSIONS AND IMPLICATIONS ON THE QUALITY OF LIFE

On the basis of the preceeding discussion in the first two sections, the following conclusions can be made on the position of womwn workers and relevant implications on the quality of their lives.

Firstly, the production system of the electronics industry and most other manufacturing industries as well, causes several detrimental effects on the physical, and emotional well-being of workers. For example, the rapid and ever increasing pace of production in the electronics factories taxes workers' energy and generate stress-related ailments. As stated earlier, incidents of mass hysteria among electronics women workers have become a characteristic feature in the electronics industry. The monotonous and rigid nature of the production process in most industrial factories creates feelings of boredom and alienation among the workforce. In addition, night shift work, frequent overtime and inadequate rest periods contribute to the malaise of chronic fatigue. The work situation is therefore not conducive to a desired life-style characterised by sufficient leisure time whereby these workers and their families can pursue recreational activities conducive to good mental and physical well-being.

Secondly, and in addition to the rigours associated with all forms of industrial work, electronics production workers especially those constantly exposed to dangerous chemicals and radiation, have higher chances of contracting cancer-related illness than workers in other industries. It is estimated that it will be 10 to 15 years before the possible carcinogenic effects arising from these chemicals begin to show up in the women who work with them now. Similarly, the ill effects of close scope work associated with the bonding process in the electronics sub-conductor industry will be evident after a period of five years. However, since most workers in Malaysia are recent entrants in the electronics industry's workforce, these predicted ill-effects of exposure to chemicals and radiation are not yet obvious. Nonetheless, recent studies in Malaysia have already confirmed that scope work do develop severe eye-ailments among workers.

These studies showed that these workers are usually dismissed from their jobs since they can no longer fulfil production targets. <1> Hazardous work conditions therefore deter production workers from longevity of employment in the electronics industry besides supplying them with fatal diseases in the long run.

¹ Relevant references are Linda Lim (1978) Jamilah Ariffin (1980) Grossman (1979).

Thirdly, the payment system in the manufacturing industries in general and the electronics industry in particular discriminates against women workers. They are in fact discriminated doubly, firstly as Asian workers receiving lesser pay than overseas workers in the home countries of the multinationals, and secondly, as female workers receiving less pay than male workers for the same job performed.

If we were to consider that an urban industrialised setting monetary income comprises a very important determinant of good living standards than we will realise that the low pay received by industrial women workers is not conducive to achieving a good sense of material well-being. As low income earners in an urbanised setting, industrial women workers have to contend with poor, cramped living conditions, frequently non-nutritional diets and low social status.

Fourthly, as workers in the electronics industry which is characterised by highly sophisticated management control systems⁽¹⁾ and high possibility of labour retrenchment, these women are subjected to job insecurity and the dictates of management largely foreign controlled. Studies in Malaysia have shown that most of these workers are rural Malay female migrants who have come to the cities and entered into factory employment with the hope of improving their economic living standards and in some cases to escape from a lifestyle characterised by patriarchal dominance and traditional restrictiveness. Paradoxically, little do they realise that by entering into the service of the electronics industry with its sophisticated, albeit subtle management control systems, they are substituting one form of subordination for another which is equally dominating.

Fifthly, women workers, irrespective of the type of industry they are working for, whether electronics or otherwise, have a similar social and economic status in the labour force hierarchy. They generally occupy an inferior position in the industrial companies and usually regarded by management as a "reserve army of labour". Their employment is considered as a temporary contribution prior to their resignation once they get married. Since it is the policy of most electronics companies to prefer single young women to married ones, those women workers who marry and have children face the possibility of dismissal. Those who manage to keep their jobs may in fact experience a deterioration in their physical and emotional well-being when compared to single women workers who are spared from the additional responsibilities associated with looking after children and the household after the normal working hours. Factory management is largely unsympathetic to the multiple roles of wife, mother and factory worker. Married women with children are

¹ This is elaborated in my earlier paper. See Jamilah (1984)

therefore still required to work night shifts and meet other work demands of the production system. The double responsibilities of motherhood and factory work may soon cause Malaysian women industrial workers to have the same health ailments common among their counterpart in the already highly industrialised nations.⁽¹⁾ Very few industrial companies in Malaysia are prepared to provide facilities to ease the burden of the "double day" of married women workers in the form of child care centres and financial arrangements whereby these workers can procure time-saving household gadgets.

As a concluding note to this paper it is the frank opinion of the writer that more detailed studies on the effects of industrialization on the health and quality of life of Malaysian workers in general and women workers in particular must be done as soon as possible. This is because there is a dearth of knowledge in this area and yet industrialization and women's labour force participation in the manufacturing industries are fast becoming common features of the Malaysian scene. Relatedly, studies on the changing pattern of the Malaysia family as it undergoes transformation from a rural agrarian to an urban industrial base, as well as on the socialization patterns of the newly emerging breed of industrial working class Malaysians are deemed essential.

¹ To date no studies on this aspect have been conducted in Malaysia.

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