Chapter 2

Literature Review

2.1   Introduction

In chapter 1, we outlined the differences in terms of education, labour force participation, occupation and earnings between men and women. From the discussion, it is evident that Malaysian women have made important strides in various fields of national development including improved access to education, and greater participation in the economy and labour market. In spite of these, males, on the whole, continue to command higher earnings than females.

In this chapter, we search for plausible causes for the wage differences between men and women. This chapter is organised as follows: section 2.2 describes the relative earnings position of women and men around the world, section 2.3 presents a survey of Malaysian studies, section 2.4 discusses the objectives and scope of study. Section 2.5 describes the research methodology, and finally section 2.6 highlights the limitations of the study.

2.2   Male-female Earnings Differentials

2.2.1   Male-female Earnings Differentials: International Perspective

Over the last two decades, a large amount of effort has been directed towards changing the position of women in labour markets worldwide. Equal pay for equal work policy was designed to eliminate situations where men and women doing similar work received different wages by a process of raising women's wage to parity. However, despite all these efforts, earnings differentials between women and men continue to exist.

Table 2.1 presents unadjusted average male-female earnings ratios from a number of countries. It can be seen that earnings differentials between women and men are still substantial in most of the countries cited. Starting with the Latin American and Caribbean countries, female-male earnings ratios in the late 1980s ranged from a low of 0.55 in Jamaica to a high of 0.97 in Paraguay. Most fall within the range of 0.6 to 0.8. In the other developing countries, the average female-male earnings ratio exhibits a similar pattern, ranging from 0.6 in Cyprus to 0.8 in Kenya. Table 2.1 shows that in all the countries of the region for which data are available for two points in time, there is a clearly rising trend in the ratios, with the exception of Chile, Costa Rica, and Sri Lanka. On the other hand, earnings differentials in the industrialised countries are not dissimilar to those in other parts of the world. As is evident from Table 2.1, in the United States, for instance, female white full-time workers' earnings were only 59 to 65 percent of their male counterparts.

Table 2.1   Female-male Earnings Ratios: International Comparisons

Country	Year	Pay period	Ratio	Country	Year	Pay period	Ratio
Latin America and Caribbean				Sri Lanka [4,14]	1980	Daily	0.89
Argentina [1]	1985	Weekly	0.65		1982		0.81
Bolivia	1989	Weekly	0.60		1985		0.77
Brazil	1980	Monthly	0.61		1988		0.76
Chile [2]	1979	Monthly	0.51	Swaziland	1980	Monthly	0.44
	1987		0.47		1983		0.64
Colombia [3]	1978	Weekly	0.55		1987		0.65
	1988		0.85	Tanzania [4,5]	1978	Monthly	0.89
Costa Rica [4,5]	1980	Monthly	0.70		1981		0.92
	1989		0.69	*More developed countries*			
Ecuador [6]	1966	Monthly	0.48	Belgium [4]	1985	Hourly	0.62
	1987		0.64		1988		0.64
El Salvador [7]	1970	Hourly	0.82	France [4]	1970	Hourly	0.87
	1980		0.81		1981		0.80
	1987		0.90		1987		0.82
Haiti [8]	1987	Hourly	0.87	Germany (F.R.) [4,15]	1970	Hourly	0.69
Jamaica	1989	Weekly	0.55		1982		0.73
Paraguay [4,5]	1983	Monthly	0.81		1989		0.73
	1989		0.97	Hong Kong [4,14]	1982	Daily	0.76
Peru [9]	1986	Weekly	0.73		1986		0.77
Uruguay [10]	1979	Weekly	0.52		1989		0.73
Venezuela	1987	Weekly	0.70	Japan [4,5]	1971	Monthly	0.52
	1989		0.78		1982		0.53
					1989		0.50
Other developing countries				Korea (R. of) [4]	1980	Monthly	0.44
Cyprus [4,9,11]	1975	Weekly	0.47		1983		0.47
	1982		0.58		1989		0.53
	1989		0.60	Netherlands [4]	1980	Daily	0.78
Egypt [4]	1971	Weekly	0.61		1988		0.77
	1977	Hourly	0.63	Switzerland [4]	1980	Daily	0.68
Kenya [4,12]	1980	Monthly	0.80		1988		0.67
	1984		0.83	United Kingdom [4,14]	1970	Daily	0.70
	1988		0.80		1982		0.69
Malaysia	1976	Weekly	0.65		1984		0.70
Singapore [13]	1986	Monthly	0.59	United States [15]	1980	Daily	0.59
	1989		0.61		1987		0.65

[1] Buenos Aires only. [2] Ages 14-65 in manufacturing only. [3] Data from 12 largest cities. [4] All-non-agricultural activities. [5] Employees. [6] Data from Quito, Cuenca and Guayaquil only. [7] Manufacturing in San Salvador only. [8] Port-au-Prince establishments only. [9] All working population. [10] Manufacturing industry only. [11] 1975 data are for manufacturing only. [12] Includes payments in kind. [13] Includes agricultural establishments with more than 25 employees. [14] Excludes ISIC major divisions 2, 5, 6, and 8. [15] Excludes coal and mining and ISIC major divisions 6, 8 and 9. [16] Full-time workers in manufacturing.

Sources: Terrell (1992: 389, Table 1).

Several factors may account for the variations in these average ratios. These include variations in the number of hours worked, the status of employment viz full-time or part time, the sector of employment (agriculture or non-agriculture), and whether it is public or private sector. In order to make meaningful comparisons, all these factors need to be held constant. Relative differences in human capital, particularly education or experience between men and women account for some of the wage gap, and changes in their levels over time can help explain the narrowing or widening of the gap. For instance, Gindling (1990) found that the decline in the female-male earnings ratio during 1981-82 in Costa Rica was primarily the result of the entrance of the less educated women into the labour market. Similarly, in the USA, Polachek (1990) found that the rise in the earnings ratio between female and male between 1970s and 1980s was due primarily to the slowdown in the number of new female entrants into the labour market in the 1980s, which resulted in a rise in the average level of experience of the women in employment. Finally, a significant portion of these differentials are usually attributed to discrimination, some of which may be overt wage discrimination in the labour market and some of which are considered pre- or non-market discrimination (Terrel, 1992: 390).

2.2.1.1 Empirical Evidence on the Relative Role of Discrimination and Endowments in Sex-related Earning Differentials

In the analysis of earnings differentials, econometric literature tends to group the determinants of gender earnings differentials into 2 broad categories, namely, differences in the 'endowments' between men and women, and overt labour market discrimination. Differences in endowments refer to male-female differences in the amount of human capital possessed (e.g. education, training and experience). Overt market discrimination, on the other hand, is usually defined as 'different payment rules for men and women with the same productivity characteristics' (Terrell, 1992: 391). Besides, job characteristics variables (e.g. private versus public employer, size or location of firm) are also sometimes included in the earnings functions. However, for comparisons, we focus our attention on the relative roles of overt discrimination on the one hand, and differences in endowments, on the other, in explaining gender earnings differentials. Empirical studies have adopted the first generation approach[1] popularised by either Oaxaca (1973) or Blinder (1973) to determine the relative importance of these two sources in explaining female-male earnings differentials. The main findings are presented in Table 2.2.

As indicated in Table 2.2, in all but one country study - that of Tanzania in 1977 - more than 50% of the female-male earnings differentials is attributed to differences in the wage structures of men and women. Such differences are often referred to as overt

---

[1] This approach does not take selectivity bias into account.

labour market discrimination. From Table 2.2, it is also evident that the differences in these coefficients account for a larger proportion of the earnings differentials in Latin America (more than three-quarters) than in the more industrialised countries (from a little more than one-half to about two thirds)[2].

Table 2.2   Survey of Empirical Findings on Sources of Earnings Differentials by Sex

Country	Year	Female - Male earnings ratios	% of earnings differentials explained by	
			Human Capital endowments	Returns to endowments (pay structure)
Industrialised				
Canada	1970	0.60	36.7	63.3
	1980	0.64	35.3	64.7
Taiwan	1982	0.64	40.1	59.9
United States				
Manufacturing	1970	0.59	45.0	55.0
Manufacturing	1981	0.59	31.3	68.7
Services	1981	0.75	39.5	60.5
Latin America and Caribbean				
Argentina	1985	0.65	22.0	78.0
Chile	1987	0.47	-14.9	114.9
Colombia	1988	0.85	12.3	87.7
Haiti	1987	0.87	4.1	95.9
Venezuela	1989	0.78	14.0	86.0
Other developing				
Cyprus	1979	0.55	37.5	62.5
Malaysia	1979	0.71	14.4	85.6
Tanzania	1977	0.76	102.9	-2.9

Source: Terrel (1992: 393, Table 2).

---

[2] The divergent cases in Table 2.2 are Tanzania and Chile. The Tanzanian results are explained by the fact that the women in the sample have much lower average human capital endowments than men, which accounts for the entire female-male wage gap. Hence the authors of the Tanzania study (Knight and Sabot, 1982) conclude that discrimination is not a problem in the manufacturing sector in that country. The Chilean labour market represents the other extreme in that working women there have higher average endowments than men (hence replacing women's endowments with men's endowments would increase the wage gap) and all of the wage differential is the result of lower returns on women endowments.

2.2.2 The Importance of Occupational Structure in Earnings Functions

Studies incorporating occupational structure into the estimated earnings functions can explain much of the female-male earnings differentials. Oaxaca (1973) found the earnings gap between men and women in US would have been reduced by 22.5 per cent by equalising the occupational distribution of men and women with the same education and years of experience. In Tanzania, Knight and Sabot's (1982) study showed that the differences in the distribution of men and women across occupational categories in 1975 explained 22 per cent of the wage gap. In Cyprus, House (1983) found that the different occupational structure between sexes and the difference in returns for men and women within the same occupation accounted for 16 per cent of the earnings gap. In fact among the ten sets of variables (education, potential experience, firm experience, firm size, industry, occupation, region, union status, public sector and English-speaking university) the set of occupational variables was the second most important factor, after potential experience, in explaining the wage gap. On the other hand, Chapman and Harding (1986) found that the wage gap between Malaysian females and males in 1979 would have been reduced by 61.6 per cent if women had had the same occupational structure as men. In Latin America, Gindling (1991) and Tenjo (1991) also found that the distribution of women across occupations is important in explaining the wage gap. Using 1979 data on all working women in Bogota, Columbia, Tenjo's (1991) study found the earnings gap between men and women to be 28 per cent. However, when domestic servants were excluded from the sample it was found that the gross female and male differentials drops to 10 per cent. Tenjo's study showed that excluding domestic servants

from the sample narrowed the differential in endowments and the gender wage gap. However, the empirical estimates showed that women in other occupations received lower returns to their human capital endowments. Gindlings' (1991) Costa Rica study yielded results consistent with Tenjo's (1991). The exclusion of domestic servants reduced the female-male wage gap.

As discussed above, the importance of differences in occupational structure cannot be denied. The inclusion of occupational structure in earnings functions estimates increases the explanatory power of the estimates. Occupational structure serves to emphasise the fact that women are frequently crowded or over-represented in a smaller number of lower-level occupations than men.

2.3 Survey of Malaysian Studies

Chua (1984), relying on the Malaysian Household Income Survey 1973 and the 1973 Malaysian Labour Force Survey data sets, studied wage differentials by sex. In this study, a sample size of 4,670 observations, which yielded 3,190 observations for males and 1,480 observations for females was utilised. Chua adopted Oaxaca's (1973) methodology, regressing the log of monthly wage on schooling, age and other personal characteristics. In the full scale regressions, he incorporated several groups of explanatory variables. The first group of the independent variables was educational levels. Chua classified educational attainment into seven levels, i.e., no certificate (NONE), OTHER, Lower Certificate of Education (LCE), School Certificate (SC), Higher School Certificate (HSC), College-

trained, either with HSC or SC (COLLEGE) and Bachelor Degree and above (BA). The variable for OTHER refers to 2,214 observations for educational achievements which Chua regarded as not applicable[3] (see Chua, 1984: vii). All such variables as OTHER, LCE, SC, HSC, COLLEGE, AND BA are dummies, and those reporting no certificate are used as the base.

Demographic characteristics included the individual's age, and age-squared (age^2). Age is a proxy for experience because the information on experience could not be derived from the data set. The quadratic term was entered to reflect the parabolic shape of the earnings functions.

In terms of marital status, he made a distinction between three categories: singles who had never married (SINGLE), married but with the spouse absent due to separation divorce or death (MSNP), and married with spouse present (MARRIED) serving as the control group.

Working hours were also reported in the data set as hours-worked per week. For estimation purposes, the hours-worked per week was then multiplied by 365 and then divided by (12X7) to derive monthly working hours compatible with the monthly earnings. To indicate the residential location for observation, he also included a dummy, URBAN which is defined as settlements with populations of 10,000 and above into the earnings

---

[3] Chua provided no clear definition but this would clearly be qualifications other than those specified, e.g. this may include religious education.

functions. Apart from this, to take account of the individual's financial responsibilities, HEAD, a dummy which refers to head of household was also included.

The final group of dummy variables incorporated in the regression are job categories. In this study, an individual's specific job was coded at the one-digit level according to the Malaysian Occupational Classification. In the analysis, AGRICULTURE was chosen as the reference group for occupation.

To estimate the returns to schooling, he compared the coefficients across six levels of certification. In the full scale regression, it is found that there is premium for education, and this premium increases with the level of education for both males and females. The coefficients were generally found to be higher for females than for males. However, it needs to be mentioned that men tend to have higher premium at lower educational levels. For men, completed LCE, completed SC, and completed HSC yield earnings premiums of 45 per cent, 37 per cent and 21 per cent respectively over the previous completed stages. The corresponding figures for women are 43 per cent, 19 per cent and 37 per cent respectively. A woman college graduate earned 18 per cent more than those with HSC while the corresponding figure for a man was 32 per cent. As for those with a BA, it is found that a female with a BA earned 57 per cent over those college-trained female graduates, while the corresponding figure for a man was 9 per cent. This seems to suggest that women tend to enjoy higher premium at higher levels.

Each additional year of age raised the monthly wages of men by 11 per cent. In contrast, the rate of return to age was only 6 per cent for women. However, it must be mentioned that the rate of decline is higher for men than for women.

In the analysis of discrimination, before standardising for male-female differences in occupational attainment, the average value of the discrimination coefficient is 0.29. However, after including occupational dummies, the average value of the discrimination coefficient derived from the full-scale equation is 0.27, which is not much different from what is derived from the personal characteristics regressions. This implies that sex differences in the distribution by occupation do not narrow much of the wage differential. Chua (1984: 60), is of the opinion that job discrimination is not very important compared with the differences in personal characteristics. Chua concluded by suggesting that women should be given more opportunities for higher education.

Chua's (1984) study suffers from two principal limitations. First, actual work experience is not incorporated. Individual's actual age was used as a proxy for experience. This tends to overestimate the work experience of ever-married women because such women spend more years out of the labour force after completing schooling than do married-men. In addition, using age as a proxy for experience also tends to overestimate the experience of those with more education. This is due to the fact that, *ceteris paribus*, those with higher education will tend to enter labour market later than those with lower education. Second, job characteristics were widely classified at the one digit level according to the Malaysian Occupational Classification. This implies that the same job is

not actually being compared. Equally important is the fact that the occupation classification used tends to classify jobs by sectors rather than by skill levels. This may explain the fact that despite controlling for occupational attainment, the discrimination coefficient did not change much.

Turning to Chapman and Harding (1984)[4], we have a study that relies on a very restricted sample. In particular, they used a data set from a survey conducted in 1979 on ex-students of only one tertiary institution, i.e. the Mara Institute of Technology (ITM). The data set covered 356 males and 249 females. Chapman and Harding followed the human capital framework and estimated separate equations for males and females. The natural log of hourly earnings was regressed on individual characteristics such as years of schooling[5], work experience, ability/motivation proxy (Fail)[6], marital status, and occupational dummies. Occupational attainments were categorised according to specific occupation (for detail definitions, see Chapman and Harding: 374-75).The results demonstrate that an additional year of schooling increases women's wages by 8 per cent compared to 5 per cent for men. On the other hand, the returns to experience do not differ between the sexes. These findings are at variance with Chua's findings. The discrepancy could be explained by the fact that in this study, the sample covered only individuals with no more than twelve years of experience. This is because in the early years of the life cycle,

[4] Chapman, B.J. and Harding, J.S. (1984), "Sex Differences in Earnings: An Analysis of Malaysian Wage Data", *Journal of Development Studies*, Vol. 21. No. 3: 363 - 376.

[5] This is the addition of three components: primary and secondary schooling, ITM schooling and post-ITM schooling, excluding short courses provided by employers and part-time courses undertaken through part-time study (e.g. professional courses like accountancy).

[6] A dichotomous variable equal to unity if the individual had indicated he or she had left ITM after failing a course, otherwise zero.

differences between men and women will tend to be smaller. In the early years, majority of women may still have relatively strong labour force attachment. For instance, in Malaysia, female labour force participation rate declines sharply among those in the forties and above.

Failing a course has a significant negative effect on the wages of both men and women. The regression results show that failing a course was associated with a 23 per cent and 13 per cent reduction in wages respectively. The coefficients of marital status are positive for both men and women. The effect is, however, larger for men than for women.

A major part of the earnings differentials between men and women is attributable to the employment of women in low-paying occupations. The results show that if women had their current levels of endowments, but were distributed across occupations in the same proportions as men, they would only earn 10.7 per cent less than men.

Overall, the results reported demonstrate that women earned considerably less than men for reasons other than differences in (observable) skills. Even if women were to be in the same occupational categories as men, with their current levels of productivity endowments, they would earn 24.6 per cent less than men. It cannot, however, be denied that a large part is still attributable to women's inferior occupational attainment.

One advantage in this study over Chua's study is that, the sample was drawn from the same educational institution, hence there is no problem relating to institutional differences in quality that has to be taken into consideration. Furthermore, a complete job

history of the individual is available allowing for a better measure of experience than the usual approximation (Age - Schooling - 6). Nevertheless, it must be noted that unemployment was not taken into account in the study.

However, this study suffers because of the short experience of the respondents whereby they had no more than twelve years of work experience. As a result, there is little variation in experience. More importantly, as noted earlier, women with short work experience tend to have very strong labour force participation rate which therefore conceals the real situation for women as a whole. Another limitation arises from the absence of direct information on hourly wage rates. Monthly wages were adjusted to hourly rates based on two broad assumptions. First, the public sector employees were assumed to work for 38 hours per week over a 4.3 weeks month. Second, private sector employees were assumed to work a 45 hour week. Since hours worked per month is likely to vary between jobs, it is possible that particular coefficients are biased. Third, the variable FAIL was used as a proxy for motivation. The interpretation of this variable leaves more questions unanswered. For instance, the variable could also be a measure of ability. In addition, this study is not a national random sample and is therefore only specific to ITM.

A third study by Lee and Nagaraj (1995)[7] was confined to employees in the manufacturing sector in the Klang Valley. This study[8] covered a sample size of 1,413

---

[7] Lee, K.H. and Nagaraj (1995), 'Male-Female Earnings Differentials in Malaysia', *Journal of Development Studies*, vol. 31, No: 3: 467-480.

[8] This is actually an improved study over the study by Lee and Sivananthiran which was conducted in 1992.

respondents. Of this total, 602 were men and 811 were women. In the analysis of gender differences in earnings, a weighted sample was used. They adopted the standard Mincerian earnings function, where the mean monthly earnings of males and female were regressed upon the usual human capital variables such as education, experience, and training. Apart from this, some additional variables such as socioeconomic background, establishment characteristics and work characteristics were also included. As for the educational variable, six dummy variables were assigned to various level of educational attainments. In addition, they also included occupational attainments in the regression. In this study, occupational attainment is classified at the 1-digit Malaysian Occupational Classification with some modification to allow for a distinction between skilled, semiskilled and unskilled categories.

From the regression analysis, the finding shows that there is a premium for education in the manufacturing sector, and this premium increases with the level of education. However, it must be noted that the coefficients of all educational levels, with the exception of tertiary or diploma level, are larger for women than for men. This finding is similar to Chua's finding. For women, the lower return to a tertiary certificate or diploma can be explained by the fact that for most women these would cover training programmes such as clerical, bookkeeping, and secretarial courses. On the other hand, for the men, most of them are more likely to be in the technical or professional fields. As far as experience is concerned, it is found that there is a premium for each additional year of experience for men and women. However, the rate of return to an additional year of experience for men is only two percentage points higher than that for women. In terms of establishment training,

the premium for women who have had more than one incidence of training is found to be much lower than that found for men.

In the analysis of sex earnings differentials, they employed the Oaxaca methodology (1973). On the decomposition of earnings differentials, they found that the differences in earnings structure plays a very important role in explaining the earnings differential in favour of men. The earnings structure alone accounted for 46 percent of the explained differential, leaving 54 per cent of the explained differential to differences in endowments.

In conclusion, they are of the opinion that the provision of more education and formal training will not necessarily reduce earnings differences between males and females. They, therefore, suggested that further investigation into the reasons why females tend to be crowded in low-paying occupations, and why there is a negative discrimination against them for similar human capital endowments.

This study is obviously an improvement over Chua's study. First, this study looked in terms of skills levels. This would reduce possible sources of bias resulting from the greater heterogeneity of a more diverse sample. However, it must be mentioned that this study may not be better than Chapman and Harding's because specific occupations were included in the latter study. Second, this study has a better measure of experience, whereby individuals' actual years of work experience was obtained, after deducting for periods of unemployment. Apart from using more explanatory variables, earnings from sales commissions and overtime were also included. Including all kinds of earnings for each

individual may reduce the earnings gap. Therefore, earnings comparisons can be made more objectively.

However, as in other studies, there are also several limitations in this study. The main limitation arised from the fact that the data reported over relied on the listing compiled by the Ministry of Human Resources, which favoured the larger establishments. This has resulted a far less comprehensive coverage of small - scale establishments.

A second limitation arised from the inability to control for all factors which may give rise to productivity differences. The main variables that are absent in the estimation include ethnicity, number of children and absenteeism. As the list of proxies for productivity differences is not exhaustive, the results can only be viewed as providing a broad indication of the bases of pay differences. Besides, this study also suffers from the fact that job categories were so broadly classified, and therefore, the same job is not actually being compared.

Another less serious limitation is that the study depended on observed wages because wage offers could not be observed. As no correction for selectivity bias had been made, the reliance on observed wages could underestimate the extent of wage discrimination. However, this may not be a serious limitation. As argued by Psacharopoulos and Tzannatos (1992: 177), 'Under these circumstances, one needs to know about what is paid in the labour market to those who work. Even if working females are a self-selected group with better than average characteristics than the whole

group of females, these are the ones whose productive characteristics are evaluated in the labour market.... In this respect, the appropriate decomposition of the pay gap should apply to the coefficients of the female wage equation uncorrected for selectivity and to the average value of characteristics held by working females only'.

The literature explaining female-male wage differentials in Malaysia reviewed here indicate that there is a premium for education and this premium increases with the level of education. However, it must be noted that the coefficients were generally found to be higher for females than for males at the higher levels. As for returns to experience, the findings by Chua (1984), and Lee and Nagaraj (1995) indicate that the coefficient for men is larger than that for women. In contrast, Chapman and Harding's (1984) finding reported otherwise.

As discussed earlier, the inclusion of occupational structures in earnings functions estimates tends to narrow the female-male wage gap. However, these studies still suffer because comparisons were made between a more heterogeneous group of workers.

2.4   Objectives and Scope of the Study

In Malaysia, the government has long acknowledged the significant contribution by women to overall national development. As such, it has actively and consistently promoted the participation of women in development through facilitating their access to social, economic and political opportunities. Specific strategies were formulated to

effectively incorporate women in the process of development. Concerted efforts were also made to reduce existing constraints and facilitate the assimilation of women into the mainstream of social and economic activities[9].

In the last three decades as a result of rapid expansion of educational facilities, economic development and industries, women in Malaysia have made great strides forward. Malaysian women appear to have made significant in-roads into the manufacturing, wholesale, retail, hotel and restaurant sectors of the economy. They have also made in-roads into production, clerical, sales and related occupations. However, in spite of this, women are still concentrated mainly in low-paying jobs, and often earn less than their male counterparts in the same occupational category (Lee and Sivananthiran, 1992: 6).

In view of the fact that sex differences in earnings persist, this issue remains a fertile field for researchers. So far, better measures of the explanatory variables have not significantly reduced the unexplained portion of the earnings gap. This study is designed to further examine earnings differentials between men and women. In particular, this study seeks to include factors which may have an impact on earnings but which have, thus far, not been found in Malaysian - case studies. These measures include the frequency, duration, and intermittence of work experience for both men and women.

---

[9] Malaysia, (1991) *Sixth Malaysia Plan, 1991 - 1995*, Kuala Lumpur, National Printing Department.

Perhaps more importantly, no study includes direct measures of absenteeism, and self-imposed restrictions on job-choice. To the extent that these factors differ between the sexes, and have important effects on earnings (see Corcoran and Duncan, 1977). The 'unexplained' portion of the earnings gaps estimated in the past studies might be overstated. Furthermore, as discussed earlier, in all the studies reviewed occupational categories were too broadly classified. The same job is not actually compared.

Hence, in this study, we will investigate and assess the role of family commitment in explaining the earnings differentials between male and female production workers. Marital status of workers is held constant by restricting the study to married male and female production workers only. By studying a less heterogeneous group of workers, the bias resulting from the greater heterogeneity of a more diverse sample is reduced. Throughout the study, we will examine the relationship between income, educational attainment, work history, on-the-job training, labour force attachment and gender within the human capital framework.

In this study, several hypotheses are put forward for testing. These hypotheses are:

i. Women earn less than men because they will acquire less work experience when they withdraw from the labour force to have and raise children.

ii. Men earn more than women because they receive higher returns to human capital, namely, education and experience.

iii. Men are paid more than women because they received more on-the-job training, and higher returns to training.

iv. Women earn less than men because they have higher job turnover (or unstable employment pattern).

v. Women earn less than men because they have a higher degree of absenteeism due to illness of other family members , especially children.

vi. Women earn less than men because they have self- or family- imposed restrictions on job locations and work hours that are compatible with their household responsibilities.

2.5   Research Methodology

2.5.1   The Sampling Design

This study is based on data collected through a sample survey conducted on married production workers in Alor Gajah. Due to time and financial constraints, a rather small sample size of 200 production workers was selected, 100 men and 100 women.

In view of the fact that a listing of establishments operating in Alor Gajah was not available, and the breakdown of employment by sex was absent, probability sampling is therefore, not feasible. Hence, we adopted quota sampling methodology. The advantage of adopting this sampling technique is that it is less costly and less time consuming in preparing sample and field work. However, the principal disadvantage is that the errors

introduced by selection procedure are unknown and unmeasurable (Davis and Cosenza, 1988: 231). The findings here cannot, therefore, be generalised without caution

Basic socio-economic information was collected for each of the respondent. For this purpose, a 63 item questionnaire was developed (see Appendix 1). The questionnaire obtained data on worker's earnings, sex, years and level of schooling completed, spouse's occupation and earnings, age at first job, number of years with previous and present employers, and training. In terms of training, we focused on on-the-job training. In this study, on-the-job training is defined as an instance of training from a superior, usually the supervisor or foreman. In the survey, information concerning incidence, duration, place and type of training were gathered. In addition, a worker was also required to provide information on indicators of labour force attachment, namely, absenteeism due to own illness and illness of other family members; self-imposed restrictions on work hours and location, and plans to quit work.

The purposive sample was drawn from employees in 13 manufacturing firms. The following procedure was employed to generate the sample. First, we identified firms that were willing to cooperate in the survey of workers. Arrangements were made to interview workers between shifts or during breaks or mealtimes. All respondents were guaranteed confidentiality.

The differences in workers' response rate appeared to depend mostly on the firm's support and the nature of the production process rather than on individual

differences between workers. The highest response rates were in firms that gave employees time off from work to attend interview. Several of the firms, however, employed a large number of Bangladeshi workers, and even though the firms were very supportive, these workers were not suitable for interview because of communication problem. Besides, we also wanted to survey a more homogeneous group, and therefore focused on married Malaysian production workers.

2.5.2 Model

For the purpose of this paper, we adopt the standard Mincerian human capital earnings function to estimate the wage functions. The specific earnings function in this model takes the form:

$$\ln W_{ij} = X_{ij} B_j + U_{ij}$$

where i   = individual

    j   = gender groups: males and females

    X_{ij} = a vector of individual characteristics

    β_j = a vector of coefficients

    U_{ij} = stochatic error, normally distributed with mean zero

        and variance σ^2, and

    $\ln W_{ij}$ = log earnings for individual i in group j

For the analysis of earnings differentials between sexes, we adopt Oaxaca's (1973) methodology. The observed earnings differentials between men and women are decomposed into three components, i.e., the differential due to differences in endowments, the differential due to differences in the wage structure (or coefficients) and an unexplained component[10]. Following Oaxaca (1973), the male-female monthly earnings differentials is given by:

$$(1) \qquad D = \frac{W_m/W_f - (W_m/W_f)^*}{(W_m/W_f)^*}$$

where (W_m/W_f) is the observed male-female monthly earnings ratio, and $(W_m/W_f)^*$ is the monthly earnings ratio in the absence of discrimination.

The average earnings for males ($\overline{\ln Wm}$) and females ($\overline{\ln Wf}$) can be written as:

$$(2) \qquad \overline{\ln W_m} = \Sigma b_m \overline{X}_m$$

and (3) $\qquad \overline{\ln W_f} = \Sigma b_f \overline{X}_f$

where b_m and b_f are the regression coefficients of the variables explaining earnings for male and female, respectively, and $\overline{X}_m$ and $\overline{X}_f$ are the corresponding mean values of the explanatory variables for males and females in the estimating equation. The gross

---

[10] The unexplained component is often attributed to pure discrimination. However, care should be taken in interpreting it as it can be affected by omitted factors which have a bearing on earnings.

differences in average earnings is:

$$(4) \qquad \overline{\ln W_m} - \overline{\ln W_f} = \Sigma b_m \overline{X}_m - \Sigma b_f \overline{X}_f$$

Assuming that the observed male wage structure would apply to both sexes (no discrimination), then the difference between the actual monthly earnings of male and the hypothetical monthly earnings of females will reflect differences in productivity endowments between the sexes:

$$(5) \qquad \overline{\ln W_m} - \overline{\ln W_f}^{\cdot} = \Sigma b_m \overline{X}_m - \Sigma b_m \overline{X}_f = \Sigma b_m (\overline{X}_m - \overline{X}_f)$$

Subtracting (5) from (4) leaves, as a residual, that part of gross difference that cannot be explained by differences in productivity endowments:

$$(6) \qquad \overline{\ln W_f^{\cdot}} - \overline{\ln W_f} = \Sigma (b_m - b_f) \overline{X}_f$$

Since it is derived as a residual, equation (6) is taken as a measure of sex discrimination in earnings[11].

2.6 Limitations

The main problem in terms of data arises from our reliance on a small sample confined to a sub-urban district. The results of this study are tentative and cannot be generalised without care.

---

[11] In view of the index number problem, we also make estimates on the assumption that the female monthly earnings structure applies. We, therefore, obtain a range of possible values of the extent of discrimination.

A second limitation stems from the exclusion of other variables that affect the decision to invest in human capital. For instance, several factors such as ability or intelligence, and quality of schooling, which have an impact on the level of education and income have been excluded. In view of the fact that most of these factors tend to be positively correlated with income and educational levels, their exclusion leads to an upward bias in the estimate of the rates of return, particularly to schooling.

Bias can also arised from the unobservable variables, in particular, wages offered cannot be observed. As a correction for selectivity bias can not be made, this would tend to underestimate the extend of wage discrimination. However, this may not be a serious limitation as we are only interested to study the wage differential arising in the labour market from demand factors.