

**GENDER EARNINGS DIFFERENTIAL IN THE
MALAYSIAN MANUFACTURING SECTOR**

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2018

**GENDER EARNINGS DIFFERENTIAL IN THE
MALAYSIAN MANUFACTURING SECTOR**

by

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**Thesis submitted in fulfilment of the requirements
for the degree of
Doctor of Philosophy**

March 2018

ACKNOWLEDGEMENT

I would like to express my very great special appreciation to Professor Suresh Narayanan, my research supervisor, for his invaluable help, patient guidance, enthusiastic encouragement, useful technical support, immense knowledge and critique of this study. Without his guidance and persistent help, this dissertation would not have been completed.

I also cannot forget the valuable and constructive suggestions offered by my co-supervisor, Dr Jacqueline Liza Fernandez; it is an honour to acknowledge her valuable input.

I am also grateful to my panel of examiners, Professor Prema-chandra Athukorala of the Australian National University, Professor Andrew Tan Khee Guan and Dr Lim Ee Shiang of Universiti Sains Malaysia, for their useful comments and suggestions. I also wish to add special thanks to Dr Loke Yiing Jia whose comments helped me at the proposal stage.

My deepest gratitude and appreciation go to my beloved parents, my brothers, sister, and cousins, for their boundless love, moral support and encouragement throughout my life.

My sincere thanks also go to all my friends, especially Mehrshad Parvin, for helping me gain access to the data and giving me guidance on how to handle them.

Last but not least, I acknowledge my indebtedness to everyone who assisted me, in one way or another, in completing this dissertation. Thank you all very much.

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LIST OF ABBREVIATIONS

AMA	American Medical Association
AOF	Age of Firm
APPR	Apprentice
AU	Motor Vehicles and Parts
BLUE	Best Linear Unbiased Estimators
CH	Chemicals and Chemical Products
CPS	Current Population Survey
DOM	Domestically Owned Firms
DOS	Department of Statistics
ECHPS	European Community Household Panel Survey
EL	Office, Accounts, and Computing Machines
EPU	Economic Planning Unit
EXP	Actual Experience
EXPSQ	Actual Experience Square
FACS	Firm Analysis and Competitiveness Surveys
FDI	Foreign Direct Investment
FO	Food Processing
GA	Garments
HES	Household Expenditure Surveys
HHS	Household Size
HIS	Household Income Survey
HR	Human Resource
ITM	Institute Teknologi MARA
ICA	Investment Climate Assessment
LFS	Labour Force Surveys
LNU	Swedish Level-of-Living Survey
MA	Machinery and Equipment
MCL	Marginal Cost of Labour
MFLS	Malaysian Family Life Surveys
MIX	Mixed Ownership

MNCs	Multinational Corporations
MNEs	Multinational Enterprise
MNM	Management
MPFS	Malaysian Population and Family Survey
MRP	Marginal Revenue Product
MSIC	Malaysia Standard Industrial Classification
MTUC	Malaysian Trade Union Congress
NES	National Employment Survey
NGOs	Non-Governmental Organisations
NLSY	National Longitudinal Survey of Youth
NPW	Non-production Worker
NTU	Non-Trade Union Members
OLS	Ordinary Least Squares
PICS II	Productivity and Investment Climate Survey
PROF	Professional
PSID	Panel Study of Income Dynamics
RU	Rubber and Plastics
SDW	Separated, divorced and widow
SPW	Skilled Production Worker
STATA	Statistical Software
TE	Textiles
TU	Trade Union Members
USPW	Unskilled Production Worker
VIF	Variance Inflation Factor
VMP	Value of Marginal Product
YPS	Young Physician's Survey
WO	Wood and Wood Products

KEBEZAAN PEROLEHAN MENGIKUT JANTINA DALAM SEKTOR PEMBUATAN MALAYSIA

ABSTRAK

Kajian ini menganggarkan saiz perbezaan pendapatan lelaki dan wanita dalam sektor perkilangan Malaysia dan selanjutnya menguraikannya ke bahagian yang dijelaskan oleh perbezaan dalam endowmen dan bahagian yang masih belum dijelaskan. Penguraian selanjutnya dilakukan mengikut tahap pendidikan, etnik, status perkahwinan, kumpulan pekerjaan, subsektor perkilangan, saiz firma, pemilikan firma dan keahlian kesatuan sekerja. Data yang digunakan telah diperolehi daripada Second Productivity and Investment Climate Survey (PICS II), 2006, yang dijalankan dengan kerjasama Bank Dunia, Jabatan Perangkaan Malaysia dan Unit Perancang Ekonomi. Jurang pendapatan bulanan lelaki-wanita di sektor perkilangan adalah 0.2086 dalam mata log, iaitu pendapatan adalah 23.2 peratus lebih tinggi secara relatif untuk lelaki. Ini jauh lebih rendah daripada jurang yang dilaporkan pada tahun 1991 berdasarkan dapatan kajian lepas. Penguraian dua tahap menunjukkan bahawa perbezaan pendapatan disebabkan faktor-faktor yang tidak dapat dijelaskan - yang secara tradisinya dikaitkan dengan diskriminasi, walaupun ini mungkin mencerminkan kesan ciri-ciri lain yang tidak diamati- mengakibatkan pendapatan bulanan purata 28.3 peratus lebih tinggi bagi lelaki. Bahagian yang dijelaskan, disebabkan perbezaan ciri-ciri, manyebelahi wanita dan membantu mengurangkan perbezaan pendapatan. Hasil penguraian tiga tahap adalah sama, walaupun ia merangkumi kesan interaksi yang kecil yang tidak signifikan secara statistik. Hasil kajian menunjukkan 50 peratus atau lebih jurang pendapatan disebabkan oleh faktor yang tidak dapat dijelaskan, baik untuk sektor perkilangan,

secara keseluruhannya, dan juga dalam hampir semua sub-sampel. Pengecualian adalah dalam golongan pemegang ijazah (dalam subsampel yang berkaitan dengan pendidikan) dan kumpulan SDW (Berpisah, Bercerai dan Janda) (dalam subsampel yang berkaitan dengan status perkahwinan). Lelaki berpendapatan lebih tinggi daripada wanita bukan sahaja dalam sektor perkilangan secara keseluruhan, tetapi juga apabila data dianalisis dalam subsample berdasarkan sifat-sifat modal insan (tahap pendidikan yang berbeza), ciri-ciri peribadi (etnik, status perkahwinan), kategori pekerjaan, subsektor perkilangan saiz firma dan pemilikan firma, dan keahlian kesatuan sekerja. Hanya dalam subsektor Jentera dan Peralatan (MA), pendapatan keseluruhan wanita melebihi pendapatan lelaki. Di antara inisiatif yang dicadangkan untuk meningkatkan pendapatan wanita adalah membantu mereka mendapatkan pendidikan yang lebih baik dan menyediakan akses kemudahan penjagaan anak yang lebih baik kepada wanita yang berkahwin untuk memastikan penyertaan mereka dalam tenaga kerja yang tidak terputus. Untuk menangani kemungkinan diskriminasi, dasar sedia ada yang menentang diskriminasi perlu diperkukuhkan dan dikuatkuasakan dengan lebih meluas dan berkesan. Lebih penting lagi, persepsi negatif majikan mengenai pengambilan pekerja wanita juga perlu ditangani.

GENDER EARNINGS DIFFERENTIAL IN THE MALAYSIA MANUFACTURING SECTOR

ABSTRACT

This study estimated the size of the male-female earnings differential in the Malaysian manufacturing sector and further decomposed it into the part that is explained by differences in endowments and the part that remains unexplained. Further decomposition was done by education levels, ethnicity, marital status, occupation groups, manufacturing subsectors, firm size, firm ownership and trade union membership. The data used was drawn from the Second Productivity and Investment Climate Survey (PICS II), 2006, conducted collaboratively by the World Bank, the Malaysian Department of Statistics, and the Economic Planning Unit. The male-female mean monthly earnings gap in the manufacturing sector was 0.2086 in log points, which translates to 23.2 percent higher earnings for men. This is substantially lower than the gap reported in 1991 by an earlier study. The twofold decomposition indicated that the earnings difference due to unexplained factors—traditionally attributed to discrimination, though it might be capturing the effects of other unobservable traits—resulted in 28.3 percent higher mean monthly earnings for men. The explained portion, due to differences endowments, favoured women and helped narrow the earnings difference. The result of the threefold decomposition was similar, although it captured a negligible interaction effect that was not statistically significant. The findings showed 50 percent or more of the earnings gap was due to unexplained factors, both in the case of the manufacturing sector, as a whole, as well as in almost all the subsamples. The exceptions were in the case of degree holders (in the subsample related to education) and Separated, Divorced and

Widowed group (in the subsample related to marital status). Men earned more than women not only in manufacturing sector as a whole, but also when the data were analysed by subsamples based on human capital attributes (different levels of education), personal characteristics (ethnicity, marital status), occupation categories, manufacturing subsectors, firm characteristics (size of firm and firm ownership), and trade union membership. Only in the Machinery and Equipment subsector did overall earnings of females exceed that of males. Among the initiatives suggested to increase the earnings of women are helping them acquire better education and providing married women access to better child-care facilities to ensure their uninterrupted participation in the workforce. To address possible discrimination, existing policies against discrimination should be strengthened and be enforced more widely and effectively. More importantly, negative employer perceptions regarding the employment of women should also be addressed.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Women have recorded considerable gains in the Malaysian labour market. Their rate of participation, though still below that of males, has maintained a rising trend whereas that of males appears to have levelled off. Their increasing participation in the labour force has also seen women making impressive inroads into occupations in the secondary and tertiary sectors of the economy (Malaysia, 2015c). However, despite these advances, the wage differentials in favour of men appear to be persisting, at least when mean and median figures are compared (UNRISD, 2005).

1.2 Labour Force Participation Rate

The labour force participation rate is defined as the ratio of labour force (those employed and/or actively seeking work) to the working age population (15-64 years), expressed as a percentage.¹ The labour force participation rate of males was more than double that of females between 1957 and 1980 in Malaysia (Table 1.1). The male participation rate showed an increasing trend from 1970 to 1986, before remaining constant in 1990 and recording lower rates thereafter. It has settled at a lower rate (around 80-81 percent) since 2012.

Table 1.1 Male and Female Labour Force Participation Rates in Malaysia, 1970-2016.

Years	1957	1970	1980	1982	1986	1990	2000	2010	2012	2013	2014	2016
Male	88.7	79.3	84.8	85.3	85.8	85.3	83.0	79.3	80.5	80.7	80.4	80.2
Female	30.8	37.2	42.2	44.5	46.4	47.8	47.2	46.8	49.5	52.4	53.6	54.3

Source: Malaysia (1993); Malaysia (2003); Malaysia (2012); Malaysia (2015a); Malaysia (2017a).

Note: Indicates years for which data are available.

¹ <https://www.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=a2prMDQ3cXVRanJPbFU3cldseVJLQT09>

On the other hand, the female participation has shown a broadly increasing trend, rising from about 31 percent in 1957 to reach about 54 percent by 2016. Proportionately more women are now participating in the labour force, though their participation rate remains considerably below the male rate.

1.3 Occupational Distribution

The rising participation rate of women has been accompanied by changes in the occupational distribution as well; women have moved from agriculture and gained access to jobs in the secondary and tertiary sectors of the economy (Table 1.2).

Table 1.2 Percentage Distribution of Male and Female Workers by Occupation, 1970-2014.

Years	Male					Female				
	1970	1980	1991	2000	2014	1970	1980	1991	2000	2014
Professional, technical and related workers	4.6	6.4	6.4	9.0	18.3	5.3	8.5	9.4	13.6	23.4
Administrative and managerial	1.0	1.4	2.8	4.9	6.2	0.1	0.3	0.6	2.3	2.9
Clerical and related workers	5.4	6.8	7.0	6.9	3.8	4.1	11.1	14.1	17.7	17.7
Sales and services workers	17.9	19.3	21.3	20.3	19.2	13.3	16.2	25.5	29.8	29.0
Agriculture, forestry & others	47.6	35.9	29.4	20.7	8.5	66.8	46.3	28.1	13.9	5.2
Production workers	23.5	30.1	33.1	38.2	44.0	10.4	17.6	22.3	22.7	21.8
Total (%)	100	100	100	100	100	100	100	100	100	100

Source: Malaysia (2003); Malaysia (2015a).

Note: Indicates years for which data are available.

Between 1970 and 2014, the distribution of women workers in agricultural occupations saw a drastic decline; in 1970, nearly 67 percent of all employed women were engaged in agriculture or related occupations but this fell to just 5 percent in 2014. Similarly, the share of

all working women engaged in professional and technical occupations, clerical and related jobs, and sales services recorded a substantial increase over this period. The shares of women concentrated in these occupations exceeded the shares of their male counterparts in 2014, suggesting substantial gains across the occupational hierarchy.

1.4 Overall Mean and Median Wages

Mean and median monthly wage data by gender are available for selected years between 2010 and 2016 (Table 1.3). The mean and median monthly wages for males were RM1810 and RM1280 respectively, in 2010. The comparable figures for females were lower, RM1702 and RM1250, respectively. Thus, the mean wage of women was about 94 percent of the men’s wage and the median wage of women was about 98 percent. The difference in mean wages between males and females remained largely unchanged in subsequent periods, but widened with respect to the median wage; in 2014 female median wage was about 94 percent of the wage of their male counterparts. This however narrowed to become about 98 percent by 2016.

Table 1.3 Mean and Median Monthly Salaries and Wages by Gender, 2010-2016.

Years	2010	2011	2012	2013	2014	2016	2010	2011	2012	2013	2014	2016
	Male (RM)						Female (RM)					
Mean (RM)	1810	1845	1947	2086	2280	2500	1702	1752	1861	1992	2148	2398
Median (RM)	1280	1355	1450	1500	1600	1721	1250	1300	1500	1500	1500	1685

Source: Malaysia (2013); Malaysia (2015b); Malaysia (2017b).

Note: Indicates years for which data are available.

1.5 Mean Wages by Occupation Groups

The mean monthly wages of men and women by occupation groups, between 2008 and 2014, show that the wages of men exceeded that of women in all groups, and in all the three time-periods being examined (Table 1.4).

However, there were improvements in the relative earnings of women in three occupation groups. The male-female wage ratio decreased significantly (from 1.70 to 1.23) in the senior officials and managers group but only marginally (from 1.29 to 1.27) among professionals. Lower down the occupational hierarchy, the ratio declined slightly (from 1.38 to 1.26) among plant and machine operators and assemblers.

Table 1.4 Average Monthly Basic Wage by Gender and Occupation, 2008-2014.

Years	2008	2012	2014	2008	2012	2014	2008	2012	2014
	Male (RM)			Female (RM)			Male-female wage ratio		
Senior officials and managers	4296	5644	6883	2522	4159	5591	1.70	1.36	1.23
Professionals	3670	4358	5001	2848	3384	3950	1.29	1.29	1.27
Technicians and associate professionals	2007	2474	3024	1957	2354	2814	1.03	1.05	1.07
Clerical workers	1407	1853	2161	1325	1663	1857	1.06	1.11	1.16
Services workers	924	1506	1800	802	1003	1211	1.15	1.50	1.49
Skilled agriculture and fishery workers	730	1110	1422	513	713	812	1.42	1.56	1.75
Craft and related trade workers	1081	1327	1608	727	752	939	1.49	1.76	1.71
Plant and machine operators and assemblers	860	1311	1612	623	896	1283	1.38	1.46	1.26
Elementary occupations	693	1015	1215	561	756	846	1.24	1.34	1.44
Overall	1473	1906	2280	1239	1838	2148	1.19	1.04	1.06

Source: Malaysia (2013); Malaysia (2015b).

Note: Indicates years for which data are available.

In contrast, the relative earnings of women fell steeply over time among skilled agriculture and fishery workers (with the male-female wage ratio increasing from 1.42 to 1.75 between 2008 and 2014) and craft and related workers. Women also lost out in service, clerical and elementary occupations.

In sum, the data suggest that the increase in participation and the occupational gains made by women have not seen parallel gains in mean wages, and have actually resulted in a decline in

their median wage. By occupation, women registered wage gains in jobs higher up in the occupation hierarchy but lost in most occupations lower down, with the exception of operators and assemblers. Paradoxically, this was also a period that saw women gaining greater access to education, jobs and wider legal protection. Interestingly, broadly similar developments have been noted almost universally (OECD, 2016).

1.6 Previous Malaysian Studies

Past Malaysian studies relied on diverse data sets making it difficult to compare their results. The data sources include the Household Income Surveys (HIS), Labour Force Surveys (LFS), Malaysian Family Life Surveys (MFLS), Malaysian Population and Family Survey (MPFS), and the National Employment Survey (NES). There are also self-conducted surveys covering particular sectors of the economy. Despite the variety of data sources, all studies on gender differential in earnings in Malaysia have uncovered the presence of a considerable, unexplained difference in favour of men.²

The starting point in the study of gender wage differential is probably the work by Chua (1984) who used data from the Household Income Survey (HIS) of 1973 and the Labour Force Survey of 1974. He found that differences in human capital traits explained between 26 to 63 percent of the male-female wage differentials. Unexplained factors accounted for the remaining 36 to 74 percent of the wage differentials. Several subsequent studies relied on later versions of the HIS. Milanovic (2006) drew on data from three HIS (1984, 1989 and 1997). He found that the differences in the average earnings, after taking into account other factors (level of education, experience, ethnic differences, location, etc.) was 41 percent in 1984 but the difference narrowed to between 36-37 percent by 1997. On the other hand, he estimated that the gender discrimination gap widened from 18 percent in 1984 to 22 percent

² Several other Malaysian studies published in what has been classified as ‘predatory journals’ have not been reviewed here.

in 1997, noting that it nevertheless was much lower than the 30 percent reported for the US (Bureau of Labor Statistics, 2009).

Fernandez (2009) examined the data from the HIS of 1995 that Milanovic (2006) had omitted. She focused primarily on male-female earnings differential within occupation groups. She found that gender earnings gaps differed by occupation groups. It was widest (in favour of men) in male dominated occupations and narrower in female dominated occupations. She also opined that intra-occupational gender earnings gaps were important in contributing to the overall gender earnings gap, even in the tight labour market that prevailed in 1995. While some part of the earnings gap was due to gender differences in wage-related factors (such as education, experience and hours of work), which largely favoured men, a substantial portion of the gender earnings gap within occupations was attributed to the residual component. She found the overall gender gap to be about 35.2 percent in 1995.

Another set of data that was analysed by researchers is the Malaysian Family Life Surveys (MFLS). This, too, was said to be nationally representative. Latifah (1998) used the 1988 survey data and found the gender earnings gap to be 41 percent. She further noted that more than 50 percent of the earnings differential was due to factors that cannot be explained by differences in human capital endowments and the explained variables accounted for less than 10 percent of earnings differential. Schafgans (2000), who argued that semi-parametric estimations were better, estimated the wage equation intercept using the same data and found that the gender (offered) wage gap to be larger, between 63 and 68 percent, and discrimination to be between 72 and 78 percent.

Goy and Johnes (2015) also used semiparametric estimation methods but drew on data from the Malaysian Population and Family Survey (MPFS) conducted by the National Population and Family Development Board in 1994 and 2004 to examine the movement of the gender

earnings gap in between the two periods. They found a gender wage gap of 53 percent in 1994 which had fallen to 45 for the restricted sample³ and to 42 percent for an unrestricted sample by 2004. They also observed that the gender wage gap was wider at the bottom of the wage distribution and narrowed as one moved up. Furthermore, the observed differences in the productive characteristics of the workers did not reflect of the wage gap between males and females.

Yet another source of data is the National Employment Survey (NES) of 2009 conducted by Ministry of Human Resources Malaysia and the Labour Department of Malaysia. The information collected is protected under the Official Secrets Act and special permission is needed to gain access to this data base. This large employer-employee linked survey with data on monthly earnings was used by Sanjivee (2015). The advantage of the data set was that it had some firm level characteristics that earlier data sets could not provide. Adding these characteristics appeared to reduce the unexplained part of wage differences attributed to discrimination. From the mean wage gap decomposition of the full sample within an occupation, the male-female earnings difference was 0.02 log point in favour of men. The Blinder-Oaxaca decomposition suggested that negative 150 percent (0.03 log point out of a 0.02 log point of earnings difference) of the disparity was attributable to the differences in returns to the gender differences in characteristics (explained portion). The discrimination effect accounted for 250 percent (0.05 log point out of a 0.02 log point of earnings difference) of the disparity across the male-female wage distribution. Disparity due to discrimination persists but appears much reduced.⁴

³ The restricted sample referred to only married women and their spouses, while the unrestricted sample consisted of the full sample of individuals.

⁴ Log point can be converted to percentage points using the following procedure: explained difference divided by total earnings differential multiplied by 100. See Pacheco and Cochrane, 2015.

If indeed the data from the HIS and MFLS are nationally representative, the findings should be comparable, at least with respect to the overall gap in gender wages. Based on the studies surveyed above, the gap was 41 percent in 1984 (Milanovic, 2006), remained unchanged in 1988 (Latifah, 1998), but widened to 53 percent in 1994 (Goy and Johnes, 2015), and narrowed considerably to 35.2 percent in the tight labour market of 1995 (Fernandez, 2009). It remained between 36 to 37 percent in 1997 (Milanovic, 2006), only to widen to 42 percent by 2004 (Goy and Johnes, 2015). In effect, although the earnings of males and females increased between 1984 and 2004, the gender earnings gap remained virtually unchanged, despite some fluctuations in the intervening period.

Studies that focus on particular sectors or institutions may sometimes be more reliable; a few studies fall within this category. Lee and Nagaraj (1995) conducted a survey of 1,413 workers in the manufacturing sector in Klang Valley in 1991. They found evidence suggesting that women with the same human capital endowments as men received lower returns and were concentrated in subordinate positions. However, about 54 percent of the difference in monthly earnings between men and women were attributed to differences in productive endowments. The rest of the gap was presumably due to discrimination. Another 1991 survey by Rahmah and Zulridah (2005) looked at gender wage differentials in Klang Valley and Penang, but concentrated on six major subsectors of the manufacturing sector (electrical and electronics, textile, wood-based products, transport equipment, food, and chemicals). The survey had covered 2,046 workers in these six subsectors. Their results suggested that demographic and human capital variables determined up to 74.3 percent of the male-female wage differentials—a figure larger than that reported for the Klang Valley sample by Lee and Nagaraj (1995) during the same period. Rahmah and Zulridah (2005) also found that the unexplained portion accounted for about 25.7 percent of gender earnings differential.

In 1999, Rahmah and Ragayah (2003) did a study that focussed on gender wage differentials among 2065 skilled, semi-skilled and unskilled employees in the six selected manufacturing subsectors (electrical and electronics, textile, wood-based, transport equipment, food and chemical industry) in the Klang Valley and Penang. The decomposition of earnings differential between skilled and semi-skilled employees showed that the gender variable explained only 26.7 percent of the overall differential. Human capital variables (number of years of schooling, training and experience) were important in affecting earnings differential and accounted for 41.2 percent of total differential. However, location appears to be less important, accounting for just 1.1 percent of the difference in earnings. The unexplained portion accounted for 31 percent of the earnings differential.

The decomposition of the earnings differential between skilled and unskilled employees showed that gender variable accounted for just 3.5 percent of the total differentials. Human capital variables contributed 19.1 percent, while location accounted for 11 percent. There were significant earnings differential between skilled and unskilled employees, with the unexplained portion making up 66.3 percent of the differentials. The gender and location of the workplace variables only explained 5.1 percent and 1.2 percent of the earnings differential between semi-skilled and unskilled employees, respectively. The human capital variables accounted for 54.9 percent of the total earnings differential, but 38.8 percent of the differentials remained unexplained (Rahmah and Ragayah, 2003).

Chapman and Harding (1985) utilized data from a 1979 Tracer survey restricted to graduates from a single educational institution (Institut Teknologi MARA). The sample consisted of 733 graduates of ITM over the period, 1966 to 1977. They found a gap of 29 percent in the earnings between men and women. Of this, 34 percent of the gender earnings disparity was attributed to the lower productivity or human capital attributes of women relative to men. The remaining portion was due to the concentration of women in low-paying occupations.

Several problems arise with these Malaysian studies. First, studies based on HIS and MFLS may be using nationally representative data but rely on surveys that were not designed to measure the earnings of individuals. Rather, the earnings of working individuals were extracted from household level data. This, in turn, poses two limitations. One, many characteristics of the place of work are not available. For example, a managerial worker employed in the public and private sectors may earn very differently even if other human capital attributes are held constant. The same can be said of those employed within the private sector. An identical job with identical qualifications may be rewarded very differently in firms with different characteristics (for example, firm size, firm ownership, age of firm, export orientation etc.). Ignoring such differences overstates the unexplained portion that is often attributed to discrimination. Two, a selection bias arises when subsamples are extracted from a main sample that had collected data for a different objective. A further limitation of these studies is the measure of 'experience'. Household surveys do not provide information on actual work experience; thus, age or age minus years of education minus age when the individual starts schooling is often used as a proxy. These proxies tend to overstate the experience of newer entrants or of those who have moved in and out of the workforce (like women who drop out during the years they care for children and re-join afterwards). One can also question the reliability of studies that use such data to estimate earnings differential across many industrial subsectors or occupation groups across differently constituted sectors because the heterogeneity of the samples is not controlled for.

The large and unexplained portion of male-female wage differentials has been traditionally attributed to discrimination. However, one has to be cautious when drawing such a conclusion. As Fernandez (2009) was careful to point out, several other factors may be captured in the unexplained portion. For example, survey data of any kind misses out on key personal characteristics such ability, motivation and differences in the quality of education.

These data also miss out information regarding firm characteristics that may affect the wages being paid. Furthermore, a smaller coefficient on work experience for women may well be capturing their conscious decision to invest less in on-the-job training than men. Finally, large residuals will also rise if there is considerable job heterogeneity within each occupational group.

1.7 Focus on the Manufacturing Sector

The present study is an attempt to overcome some, if not all, of the above weaknesses. It examines the manufacturing sector by utilising individual level data collected from establishments.⁵ The focus on manufacturing is justified on the grounds that it is not only one of the two dominant sectors in the economy, in terms of contribution to the GDP (the other being services), it has also been the main avenue for the employment of women over the past few decades.

Table 1.5 shows the gross domestic product, by kind of economic activity, between 1970 and 2015. As a result of strong growth, the contribution of both manufacturing and services to GDP continued to rise from 1970 until 2000. The contribution of manufacturing increased from 14.6 percent in 1970 to 31.9 percent by 2000; the same period saw the share of services rising steadily from 42.6 percent to 53.9 percent. And while the relative share of manufacturing began to decline after 2000, the services sector has maintained its relative dominance. Even so, manufacturing's contribution to GDP remains second only to that of services.

⁵ The data and their source are discussed in Chapter 3.

Table 1.5 The Percentage Contribution of Economic Sectors to the GDP, 1970-2015.

Years	1970	1980	1985	1990	2000	2005	2010	2015
Agriculture	28.8	23.9	20.9	18.6	8.9	8.3	7.6	6.9
Mining and Quarrying	6.9	4.5	10.5	9.8	7.3	6.7	9.8	7.5
Manufacturing	14.6	18.6	19.7	26.7	31.9	31.6	25.2	24.8
Construction	3.7	4.6	4.8	3.6	3.3	2.7	3.2	4.2
Services	42.6	45.4	43.5	42.6	53.9	58.2	53.2	55.4
Import duties less imputed bank service charges	3.4	3.0	0.6	-1.4	3.6	-7.4	1.0	1.2
Total (%)	100	100	100	100	100	100	100	100

Source: Malaysia (2010); Malaysia (2011); Malaysia (2016).

Note: Indicates years for which data are available.

The manufacturing sector has played a key role in Malaysian exports. Table 1.6 shows the share of different commodities in the export of manufactured goods between 1970 and 2014. Chemicals and petroleum products, food, beverages, tobacco and wood products accounted for 65 percent of all manufactured exports in 1970. However, since 1980, electronics, electrical machinery and appliances have dominated; in 1980 these commodities comprised 48 percent of manufactured exports and by 2000 they accounted for 71 percent. Since then, although the share has declined, this subsector continues to remain the most important.

The structural transformation of the economy from agriculture to manufacturing and services coincided with greater access to education by women and marriages taking place at a later age. These developments facilitated the absorption of women into urban job opportunities provided by these both manufacturing and services. The manufacturing sector, in particular, saw rapid growth with the injection of foreign direct investment (FDI) responding to attractive government incentives.

Table 1.6 Malaysia: Composition of Manufactured Exports (%), 1970-2014.

Years	1970	1980	1985	1990	2000	2010	2014
Food, beverages and tobacco	18	8	6	4	2	4	4
Textiles, clothing and footwear	5	13	10	9	3	2	2
Wood products	15	7	3	3	4	3	3
Rubber products	3	1	1	3	1	4	3
Chemicals and petroleum product	32	6	13	7	8	17	22
Non-metallic mineral products	3	1	1	2	1	1	2
Iron, steel and metal manufacture	4	4	3	3	3	6	7
Electrical and electronic machinery and appliances	2	48	52	57	71	52	50
Other machinery and transport equipment	11	4	5	4	1	2	2
Other manufactures	7	8	7	8	6	9	5
Total manufactured export (RM million)	615	6319	12471	46833	323998	487974	587178

Source: Malaysia (1981a); Malaysia (1991a); Malaysia (2000a); Malaysia (2010); Malaysia (2016).

Note: Indicates years for which data are available.

The influx of multinational corporations (MNCs) in the 1970s, focusing on labour intensive assembly-type operations requiring repetitive but delicate work opened the doors for female employment opportunities, especially in export manufacturing.

Table 1.7 shows the change of employed persons by gender in sectors between 1957 and 2014. Agriculture is no longer the major employer of women. The share of women workers employed in this sector shrank drastically from 76.7 percent in 1957 to just 8.5 percent in 2014. The same period saw women made substantial inroads into the manufacturing sector, with the fastest gains recorded between 1957 and 1991; the proportion of women engaged in manufacturing rose from a mere 4.3 percent to 24.3 percent, well ahead of their shares in wholesale/retail, hotel and restaurants sector and community and personal services sector. By 1991 their share in manufacturing had fallen somewhat to 16.5 percent, reflecting possibly the move of manufacturing away from assembly-type operations. In 2014, the shares of women in the wholesale/retail, hotel and restaurants sector, and community and personal services sector exceeded their share in manufacturing.

Table 1.7 Share (%) of Males and Females in the Workforce Employed by Sector, 1957-2014.

Years	Male					Female				
	1957	1970	1980	1991	2014	1957	1970	1980	1991	2014
Agriculture and Forestry	52.6	45.4	37.5	28.9	14.6	76.7	58.9	49.3	28.2	8.5
Mining and Quarrying	3.1	2.6	1.4	0.7	0.8	1.8	0.8	0.3	0.2	0.3
Manufacturing	7.0	9.5	11.8	15.2	16.9	4.3	8.5	16.3	24.3	16.5
Electricity, Gas and Water	0.7	1.0	0.2	0.9	1.4	0.1	0.1	0.1	0.1	0.4
Construction	3.9	3.0	6.4	8.7	13.4	1.0	0.5	1.0	0.7	2.0
Wholesale and retail trade, hotel and restaurants	12.7	11.0	13.1	16.9	23.2	4.0	5.3	11.2	19.7	28.0
Transport, Storage and Communications	4.5	5.0	5.0	5.9	7.7	0.3	0.5	0.7	1.5	3.2
Finance, Insurance, Real Estate and Business Services	0.4	1.0	1.9	4.0	4.3	0.1	0.5	1.6	3.9	7.3
Community, Social and Personal Services	14	17.7	22.7	18.8	17.7	11.2	16.4	19.5	21.4	33.8
Total (%)	100	100	100	100	100	100	100	100	100	100

Source: Malaysia (2003); Malaysia (2015a).

Note: Indicates years for which data are available.

It is also worth noting that since 1980, the distribution of employed women in manufacturing had either exceeded or equalled the distribution of employed men in the sector. For example, in 1980, 11.8 percent of all employed men were found in manufacturing while 16.3 percent of all working women were in the same sector. The share of women increased even further by 1991 (24.3 percent as compared to 15.2 percent of all men) before the shares equalized in 2014.

Table 1.8 shows the changes in gender distribution within the manufacturing workforce between 1970 and 2016. In the first period, women accounted for about 28 percent of all workers engaged in the sector. The share rose rapidly to peak at 46.4 percent of the total workforce by 1990. Since then, their share has declined somewhat, reflecting the structural

change in manufacturing that moved away from assembly-type operations; in 2016, women comprised 38.9 percent of all workers in manufacturing.

Table 1.8 Gender Distribution of the Manufacturing Workforce (%), 1970-2016.

Years	1970	1980	1985	1990	1995	2000	2005	2008	2010	2012	2014	2016
Male	71.9	59.9	56.9	53.6	56.6	58.9	60.4	60.8	61.6	64.0	62.2	61.1
Female	28.1	40.1	43.1	46.4	43.4	41.1	39.6	39.2	38.4	36.0	37.8	38.9
Total (%)	100	100	100	100	100	100	100	100	100	100	100	100

Source: Malaysia (1971); Malaysia (1981b); Malaysia (1991b); Malaysia (2000b); Malaysia (2012); Malaysia (2015a); Malaysia (2017a).

Note: Indicates years for which data are available

Table 1.9 showed the monthly wages of men and women in the manufacturing sector between 1983 and 2016. It is clear that the average wage of men was consistently higher than that of women. Prior to 1991, the average female wage was less than half of the average male wage. Nonetheless, male-female difference in mean wages has been decreasing; the female wage as a percentage of the male wage stood at 75.7 percent in 2016.

Table 1.9 Monthly Average Wage by Gender, in the Manufacturing Sector, 1983-2016.

Years	1983	1985	1987	1989	1991	1993	1995	1997	2012	2013	2014	2016
Male (RM)	707	825	838	864	952	1082	1242	1449	1815	1959	2255	2321
Female (RM)	336	407	401	420	495	612	719	912	1304	1464	1660	1758

Source: United Nations Research Institute for Social Development (UNRISD) (2005); Malaysia (2013); Malaysia (2015b); Malaysia (2017b).

Note: Indicates years for which data are available; data refer to earnings per month (*ringgit*).

The brief discussion above establishes the importance of the manufacturing sector in studying the gains in earnings made by women. It was and still is an important channel of access to urban jobs for women as evidenced by the fact that it remains a major sector of employment for women. The share of women in the manufacturing workforce is also large and the average wage between men and women appears to have narrowed over time. The manufacturing

sector is significant also because it is located within the formal sector that recognizes and rewards educational qualifications. It therefore will serve as a benchmark; if discrimination against women persists here, the situation will probably be worse in other less formal sectors.

There are also other gains from focussing on just one important sector. It minimises the heterogeneity of job descriptions within occupations across different industries (or economic sectors). In addition, the data on individuals within the manufacturing sector allows for the control of other factors likely to influence earnings such firm size, firm location, sector of activity of the firm, actual work experience of individuals, skill level and occupations. However, as with all other studies, personal abilities of individuals will remain unmeasured. This is referred to as the *ability bias* (Borjas, 1996).

1.8 Problem Statement

In spite of the commitment reflected in the adoption of the principle of equal pay for work of equal value since 1969, and anti-discrimination policies (such as Employment Act of 1955, Equal Pay Act of 1970, and Sex Discrimination Act of 1975), and their rising participation in paid employment, female earnings remain below that of men in Malaysia. While past studies have affirmed the existence of this earnings gap, the unexplained difference attributed to discrimination is in dispute, and possibly overstated. The availability of data on individual workers in the manufacturing sector drawn from the records of firms that employ them provide a unique opportunity to further understand the size and nature of this unexplained difference traditionally attributed to discrimination. This is because many attributes likely to explain male-female earnings differences are unavailable from household level data are available from the firm level data.

1.9 Research Questions

This study therefore proposes to revisit the gender earnings differential debate in manufacturing with three main research questions.

- (i) Are there significant differences in gender earnings in manufacturing by education levels, ethnicity, marital status, occupation group, subsector of manufacturing employment, firm size, firm ownership and trade union membership?
- (ii) What is the size of the unexplained difference usually attributed to discrimination, once human capital and other attributes are accounted for?
- (iii) What policy implications can be drawn from the main factors that results in male female earnings differential?

1.10 Objectives

The study has three main objectives:

1. To decompose male-female earnings to establish the size of earnings differential between the two gender groups in manufacturing by education levels, ethnicity, marital status, occupation groups, subsectors of manufacturing employment, firm size, firm ownership and trade union membership.
2. To decompose male-female earnings differences in manufacturing to the part that can be explained by the differences in human capital attributes and the part that could be due to discrimination, by education levels, ethnicity, marital status, occupation groups, subsectors of manufacturing employment, firm size, firm ownership and trade union membership.
3. To draw policy implications from the main factors that explains male-female differential in earnings.

1.11 Significance of Study

Women play a crucial role in Malaysia's social and economic development. Reducing the gender disparity in earnings is a development priority. The main contribution of the study lies in the fact that it will be able to control for far more differences in individual, firm and occupational characteristics than was previously possible in order to pinpoint more accurately the size of the unexplained portion in earnings differences usually attributed to discrimination. If much of the earnings disparities arise from differences in human capital, the increasing investment in education and training among women will eventually close the gap. Otherwise policy intervention may be required to address discrimination.

1.12 Organisation of Study

The study will be organized into six chapters. Chapter 1, the introduction, provides the rationale for the study which includes the problem statement, research questions, objectives and significant of the study. Chapter 2 reviews theories, the related literature and identifies key variables related to gender differences in earnings found by earlier studies, both in Malaysia and elsewhere. Chapter 3 discusses the conceptual framework, methodology and data used in the study. Chapter 4 reports the gender differential in mean earnings by socio-economic and demographic groups of the data. Chapter 5 presents the results and explains the gender earnings differential in the manufacturing sector as a whole, the subsamples based on occupation categories and the industry subsectors. Chapter 6 shows the findings in the subsamples based on human capital attributes, personal characteristics, firm characteristics and trade union membership. The final chapter draws policy inferences, discusses the limitations of the present study and suggests areas for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The Chapter begins with a brief survey of several theories that can be used to understand gender wage differentials, although they were not explicitly developed for this purpose. The insights they provide are drawn upon to enhance the basic Human Capital framework underlying the conceptual framework used in this study. Subsequently, the empirical literature on the determinants of gender wage differentials is reviewed. The studies rely on diverse data sets making it difficult to compare their results or comment on their findings. With rare exceptions,¹ virtually all studies use the Oaxaca-Blinder decomposition methodology (discussed in Chapter 3), or variations of it, thereby ruling out any useful methodological comparisons as well. The primary objective of the empirical review is to identify the key variables that have been found to explain gender earnings differential in studies across many countries. The key variables are subsequently incorporated into the conceptual framework presented in Chapter 3. To the extent permitted by data availability, they will also be used in the empirical models to be estimated in the current study.

2.2 Theories of Wage Differentials

There are numerous theories attempting to explain wage differentials, though not necessarily gender wage differentials. Some of the more prominent theories are discussed, and wherever possible, their implications for gender differences are examined.

¹ An example is the use of quantile regressions to estimate gender wage differentials. This enables one to analyse the reasons for the wage gap at different points along the wage distribution. See Sakellariou (2004).

2.2.1 Compensating Differentials

In a perfectly competitive model with homogenous labour doing similar work, only one wage rate can prevail; Adam Smith therefore proposed that when wage differentials arise they are compensating in nature; in other words, jobs with unattractive attributes pay higher wage rates than jobs with attractive attributes to compensate for the disutility of the unpleasant nature of the job (Smith, 1976). As Borjas (1996: 189) noted, Smith's insight was that it is not wages that is equated across jobs but that the differences in wages equate the "whole of the advantages and disadvantages" of the job. If jobs with undesirable attributes also pay low wage rates, this is because the supply of labour to these jobs exceeds the demand.

If applied strictly to understand gender earnings differential, this framework would suggest that the higher earnings of men reflect the fact that they are in occupations with attributes not favoured by women (for example, high risk or dangerous jobs) or because men are in occupations that have a higher demand and/or are facing a low supply of workers.

2.2.2 Human Capital Earnings Function

The human capital framework begins with the notion that each worker has a unique set of abilities that is brought into the labour market. To this is added more skills through investments in education and training. This combination of innate abilities and acquired skills constitutes the human capital that adds to the productivity of the individual. If wages are seen essentially as rewards for productivity, then differences in wages between individuals must reflect differences in productivity arising from differences in human capital acquired. The human capital framework would then suggest that differences in male-female earnings are the result of the differences in the human capital acquired by them.

Mincer and Polachek (1974) built an earnings function based on the human capital framework to provide an explanation for the lower earnings of women. They argued that since earnings in the labour market are a function of the human-capital stock accumulated by individuals, any consequent investment will increase the earnings power over an individual's working life. Similarly, negative net investments that erode skills or when skills depreciate, earnings power falls. This relationship between capital accumulation and growth in earnings was captured formally by their 'human-capital earnings function'. Mincer developed these ideas further (Mincer, 1974) in what has become known as the 'Mincerian hypothesis' although it rests on the human capital framework.

In analysing the labour market experience of women, Mincer and Polachek noted that women, on average, spent less than half their working life in the labour market, with variations in this 'lifetime participation rate' by marital status, number of children, and other circumstances. Furthermore, the lower rate of market participation of married women was characterised by several entries into and exits from the labour market.

Mincer and Polachek drew several implications from these observations. First, the shorter expected and actual duration of work experience provided women a weaker incentive to augment their job skills over the life cycle. Employers too will have a lower incentive to invest in training women, given their expected short duration of stay in the labour market. Second, the interruptions in work experience do not enable them to optimise their human-capital investments. Third, women without children and without husbands may be expected to engage in continuous job experience.

Based on these conjectures, the framework suggests that the differences in gender earnings may be explained by the differences in their earnings profiles. The earnings profiles of men tend to be the steepest and concave, where steeper growth of earnings reflect greater

investment ratios, while concavity of earnings profile indicate declining investment profiles. The profiles of childless women are less steep while those of mothers have a double peak and showed least overall growth.

2.2.3 Job Market Signaling Model

In the Job Market Signaling model, Spence (1973) questioned if schooling, particularly at high school or diploma levels, actually increases productivity. Nevertheless, it conferred some advantage because it functioned as a ‘signaling’ device; it increased earnings not because it raised productivity but because it provided a signal to the employer that the candidate has some ability. This is particularly useful in situations when the potential employer has little else to rely upon in choosing a candidate. Despite downplaying the impact of some types of education on productivity the model still predicts that difference in education may result in different jobs with different earnings.

2.2.4 The Crowding Hypothesis

The observation that disadvantaged groups tend to concentrate in low paying occupations because social restrictions hinder mobility or deny them access to better paying jobs was made by Edgeworth (1922). In particular, he pointed out the lower pay of women was due to the fact that unions and other institutional barriers prevented them from accessing occupations that were seen as being the preserve of men. This forced women to crowd in a limited number of jobs and receive a low pay due to excess supply. Much later, Bergmann (1971) used a similar argument to explain earnings differences between Whites and Blacks before extending the argument to account for differences in gender earnings (Bergmann, 1974). The basic hypothesis was that a major source of gender earnings differential was the segregation of males and females by occupation.

The theory does not need conscious prejudice or discrimination to be operative since personal preferences, educational attainments, apart from barriers erected by unions and professional bodies do restrict entry and facilitate crowding. However, crowding can also arise from conscious discriminatory policies.

It has also been argued that in a competitive situation with perfect mobility wages should equalize over time. However, evidence indicates that since crowding benefits the more dominant groups in society by reducing competition for the most desirable occupations, it is likely to be perpetuated by powerful interests (Bates and Fusfeld, 2005).

2.2.5 Dual (Internal) Labour Market Hypothesis

Doeringer and Piore (1971) highlighted an observation that the labour market was segmented into two separate spheres— primary and secondary—prompting them to suggest that the labour market had a dual structure. They stylized the primary market as being characterised by jobs with higher earnings, good working conditions, better status and greater opportunities for upward mobility. In contrast, the secondary labour market had proportionately more poorer paying jobs, with less favourable working conditions, lower job security and status and limited prospects for upward mobility.

A key element in explaining the differences in the primary and secondary markets is the nature of the internal labour markets within each one (Doeringer and Piore, 1971; Kelley, 1978). An internal labour market within an office, firm or factory that determines wages and employment in response to market forces would be no different from the external labour market. However, an internal labour market that determines employment, wages, and promotions based on internal regulations would differ considerably from the external labour market. By giving preferential treatment to those already working in the firm, the latter

structure discriminates against outsiders trying to get in. The primary sector was thought to be characterised by internal markets largely divorced from market forces while in the secondary sector internal labour markets were either absent or very susceptible to labour market forces. An absence of well-defined career paths and a high degree of competition among workers resulted in unstable jobs.

Empirical observations in the 1970s and 80s in the US showed the secondary market to be populated by women, ethnic minorities and other disadvantaged groups.² The implications drawn from early analysis of the dual labour market suggested that individuals employed in the secondary sector were there on account of their lower skills, or inability to shoulder responsibilities. In effect, differences in education, training and other human capital attributes were presumed to be responsible for dividing workers between these two sectors. Thus the cause for gender wage differentials was no different from the factors postulated by the human capital earnings function. However, it was recognised much later that the predominance of women in the secondary sphere might also be due to conscious discrimination against them.

2.2.6 Monopsonistic Discrimination

Joan Robinson (1993) put forth the theory of monopsonistic discrimination to explain wage differences based on gender. For monopsonistic discrimination to occur a monopsonist must not only face separate supply curves for males and females but the supply curve of women should be less elastic than that of men. Then, even if both are equally productive (and therefore have identical marginal revenue product of labour (MRP_L)), the points equating the MRP to their respective marginal cost of labour (MCL_M and MCL_F) curves will yield a higher wage rate for men (W_M) than women (W_F) as shown in Figure 2.1.

² In Malaysia, the secondary labour market, particularly in manufacturing, would include migrant workers. Their presence will almost certainly affect (depress) the earnings of wages of unskilled or semi-skilled workers as a whole. Women constitute the bulk of unskilled and semi-skilled workers. Our data, however, do not include migrant workers.