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Gender Assessment of
the Indonesian Labour Market

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GENDER ASSESSMENT OF THE INDONESIAN LABOUR MARKET

Abstract

The primary purpose of this paper is to examine the gender differentiated impact of the tremendous changes in the economic and demographic structure on the labour market in Indonesia. The specific objectives are: to identify the changing patterns of male and female labour force participation (LFP) and earnings; to provide empirical estimates of factors that determine male and female LFP and earnings; to measure any gender-based discrimination between male-female wages, and to identify whether such discrimination has declined since the mid 1980s. The determinants of female and male LFP are estimated using the Probit model. Then, a gender-based decomposition analysis is used to explain whether the female-male LFP gap is due to lower productivity-related endowments of female labour, or the existence of structural barriers – including possible discrimination – for women to enter the labour market. While the LFP gap narrowed in urban areas during 1986-97, due to lower structural barriers, the rural LFP gap has widened, mostly as a result of an increasing difference in endowments. The paper also examines male-female wage differentials during the period of rapid economic liberalization using econometric estimations of the wage equation, and gender-based decomposition analysis. The results suggest that wage discrimination persists, but its contribution to the female-male wage differential is declining. Education plays a significant role as a wage equalizer. Furthermore, it is found that the gender discrimination effect is stronger in determining the potential wages for individuals, rather than the actual wages for wage workers.

Introduction

The end of the oil boom in the early 1980s marked the beginning of a new era for the Indonesian economy – the era of economic liberalization – characterized by progressive openness in trade, investment and finance. The liberalization period, especially from 1986 onwards, accelerated the pace of economic transformation and led to massive structural changes in the Indonesian economy. Economic growth was rapid at around 7-8 per cent annually, while single digit inflation could be maintained. The trade balance increased significantly, although large capital inflows also led to a widening current account deficit in the mid-1990s.¹ Indonesian workers also benefited significantly from economic development

during the period of liberalization. Employment in the formal sector grew at around 7 per cent per annum during 1986-97, and average workers' income in the formal sector increased at the rate of around 6 per cent during 1989-97.

In the context of the economic performance during the past three decades, this paper addresses the relative performance of women compared to men, in terms of participation and earnings, in the Indonesian labour market. Female participation increased both absolutely and relative to men. The Female Labour Force Participation Rate (FLFPR) increased from around 30 per cent in the 1970s to about half of the female working age population in 1986. However, since 1986, the FLFPR has stabilized at around 50-51 per cent. With regard to comparison of earnings, while it is well known that female earnings are less than male earnings, the question is whether the male-female wage gap has narrowed following rapid economic development and liberalization since the 1980s. Identifying and explaining variations in participation, occupation and wages, across various categories of labour over time is a major challenge for all labour market studies.

The primary purpose of this paper is to examine the gender differentiated impact of the tremendous change in the economic and demographic structure on the labour market in Indonesia. The specific objectives are: to identify the changing patterns of male and female labour force participation (LFP) and earnings; to provide empirical estimates of factors that determine male and female LFP and earnings; to measure any gender-based discrimination between male-female wages, and to identify whether such discrimination has declined since the mid 1980s.

The paper will cover the dynamics of the labour force during the last two decades, especially during the period of rapid economic liberalization from the mid 1980s to the late 1990s. The major micro dataset used in this study is the *Sakernas* (*Survey Tenaga Kerja Nasional* = National Labour Force Survey), which is published by the Central Bureau of Statistics on an annual basis. The data are taken on cross-sectional bases, in all provinces nationwide in August every year. The size of the *Sakernas* data in each year is about 250,000 observations, covering all urban and rural areas. The *Sakernas* data for 1986, 1990, and 1997, are used to represent the period of rapid economic liberalization from the mid 1980s to the late 1990s, till just before the economic crisis.

This paper is organized as follows. As a general background, the first section outlines the changing patterns and structure of Indonesian economic development for the last three decades. The second section discusses the structural transformation of the economy as a

result of rapid economic liberalization that started in the mid 1980s. The third section presents the changing trends in male and female labour force participation in Indonesia. The fourth and the fifth sections provide the results of the econometric analysis. The empirical estimates of labour force participation equations for males and females in urban and rural areas, which provides the determinants of an individual's decision to participate in the labour market are outlined in the fourth section. The fifth section presents the empirical estimates of wage equations, and identifies various factors that affect wages for males and females. Gender based decomposition analysis is conducted to identify any changes in gender-based bias in the labour market. The conclusions are discussed in the final section.

The Changing Pattern and Structure of Economic Development

Although there was a broad, consistent commitment to market-oriented principles and sound macroeconomic management throughout Indonesia's economic development, there were quite distinct episodes in economic policy and development.² With the risk of oversimplification, there were three stages of economic development prior to the mid 1980s: a rehabilitation and stabilization period between 1967-1972; the petroleum boom years in the 1970s; and the early and ambivalent period of liberalization between 1982-1985. Finally, there was the period of rapid globalization, prior to the crisis, between 1986-97³ (see Table 1).

The changes in economic development are also observed in changes in the sectoral composition of the economy. Over the course of economic development, agriculture's share of value added declined while the value added of manufacturing grew rapidly, overtaking the role of the agricultural sector as the dominant sector. The share of the manufacturing sector almost reached the threshold value of industrialization of 30 per cent of GDP in 1996. While this level of industrialization was achieved by Brazil in the 1970s, Korea in the 1980s, and Malaysia and Thailand in the 1990s, the large oil and gas sector (which is included in the non-manufacturing industry in figure 1) delayed this process in Indonesia. Figure 1 shows that the share of the non-manufacturing industry increased rapidly in the 1970s, reached its peak in 1981, and has been declining rapidly since then. The share of the manufacturing sector has risen only since the mid 1980s. In 1990, the share of the manufacturing sector reached 21 per cent, overtaking the agricultural sector.

Before 1980, the manufacturing sector was still inward looking. Manufactured goods sold in international markets contributed only 1-3 per cent to Indonesia's total exports. Trade reforms, combined with sound macroeconomic management since the beginning of the New Order, resulted in an export boom from the early 1980s. Figure 2 depicts the pattern of Indonesia's exports since 1975. Until the late 1970s, manufacturing exports constituted no more than 4 per cent of total exports. By 1987, the share of manufacturing exports had surpassed the share of agricultural exports, and in 1992, overtook the share of oil, mineral, and basic metal exports. As the share of agricultural and primary product exports declined and the share of manufacturing exports increased, Indonesia became less prone to external terms of trade shocks, which is a common feature in primary product exporting countries that face large fluctuations in commodity prices.

This remarkable transformation, both in domestic production and exports attracted international recognition. By the late 1980s, Indonesia was considered to be the next newly industrialized economy and, in the 1990s, it was classified by the World Bank as one of the high performing economies. In many publications, in particular with regard to prudent macroeconomic management, economists hailed Indonesia as one of Asia's success stories. Undoubtedly, integration into the world economy accelerated the transformation of the Indonesian economy, especially since the mid 1980s.

The Changing Patterns Of The Labour Market

The labour market was also directly or indirectly affected by the changes in economic development discussed above. An analysis of the longer-term trends in employment by major sectors from 1971 to 1998 (which includes the period of the crisis) in Table 2 clearly indicates that changing patterns of employment are related to macroeconomic developments.

TABLE 2. Sectoral share and rate of growth in employment by major sector

	Labour Force (million)					Annual Growth Rate (%)			
	1971	1980	1986	1997	1998	1971-80	1980-86	1986-97	1997-98
Urban	6.1 (15)	9.7 (19)	13.5 (20)	29.6 (34)	30.3 (35)	6.7	6.4	10.9	2.4
Rural	35.2 (85)	41.8 (81)	54.7 (80)	57.5 (66)	57.4 (65)	2.1	5.1	0.5	-0.2
Wage workers*	13.3 (32)	14.5 (28)	17.5 (26)	30.5 (35)	28.8 (33)	1.1	3.4	6.7	-5.5
Non-wage workers	28.0 (68)	37.0 (72)	50.7 (74)	56.6 (65)	58.9 (67)	3.6	6.2	1.1	4.0
Agriculture	26.5 (64)	28.8 (56)	37.6 (55)	35.9 (41)	39.4 (45)	1.0	5.1	-0.4	9.9
Manufacturing	2.7 (6)	4.7 (9)	5.6 (8)	11.2 (13)	9.9 (11)	4.2	3.3	9.1	-11.4
Trade	4.3 (10)	6.7 (13)	9.8 (14)	17.2 (20)	16.8 (19)	6.3	7.7	7.0	-2.4
Services	5.2 (13)	7.1 (14)	10.2 (15)	17.4 (20)	17.2 (20)	4.3	6.7	6.7	-1.5
Other	2.7 (6)	4.2 (8)	5.2 (8)	5.4 (6)	4.3 (5)	6.4	3.8	0.3	-19.0
All	41.3 (100)	51.5 (100)	68.2 (100)	87.1 (100)	87.7 (100)	2.8	5.4	2.5	0.7

Note: Wage workers are mostly employees in the formal sectors, while non-wage workers are mostly those in the informal sectors, including the self-employed, family workers, agricultural workers, and temporary workers.

Source: Central Board of Statistics, Sakernas (various editions)

Prior to rapid globalization: 1970-86

During the oil boom period (1973-81), employment in the agricultural sector rose slowly. Agricultural employment in 1971-80 grew only 1.0 per cent a year, compared with 2.8 per cent a year for the whole economy. As a result, the share of the agriculture sector in total employment decreased from 64 per cent in 1971 to 56 per cent in 1980. The slow growth, however, was not the result of relative neglect of agriculture. Rather, it was the

consequence of rising productivity due to the introduction of new technology (green revolution). Elsewhere, the growth in employment - from 4.2 per cent a year in the manufacturing sector to 6.4 per cent a year in the “other” sector – suggests that the oil boom had stimulated substantial growth in non-agricultural employment, both in urban and rural areas. Government expenditure, especially in construction, contributed to this growth.

During 1980-1986, there was a slowdown in economic growth. In this period, the growth of employment in manufacturing was disappointing: average annual growth decreased from 4.2 per cent in 1971-80 to 3.3 per cent in 1980-86. Various factors, the most important of which were the over valued exchange rate, the plethora of controls over investment which discriminated against small industry, and an anti export bias in the structure of protection, prevented the growth of labour-intensive export industries. Similarly, a decline in government spending had an impact on the construction sector. The growth of employment in the “other sector”, which includes the construction sector, decreased from 6.4 per cent per annum in 1971-80, to 3.8 per cent in 1980-86. Fortunately, the slow employment growth in manufacturing and the “other” sector coincided with impressive growth in rice production. Therefore, in comparison, the agricultural sector, displayed a much better employment growth performance in 1980-86.

The period of rapid globalization: 1986-97

During this non-oil export boom period, the employment situation changed dramatically. Two important features characterized the transformation of the labour market during this period. First, labour transformation, characterized by movement of labour from agriculture to non-agriculture, was remarkable in the 1990s. Employment growth in the manufacturing sector recovered, and almost tripled from an annual average growth of 3.3 per cent in 1980-86, to 9.1 per cent in 1986-97. The growth of labour intensive export-oriented industries, especially in textiles, footwear, clothing, wood products, and furniture, was the major factor contributing to this new growth in manufacturing employment. In contrast, for the first time, agricultural employment fell absolutely from 37.6 million in 1986 to 35.9 million in 1997.

Second, the period witnessed the urbanization and formalization of employment. Since the mid-1980s, the growth of employment in urban areas far outpaced that of rural areas. During the export boom period, urban employment grew at the rate of 10.9 per cent, whereas rural employment only grew by 0.5 per cent during the same period. As a consequence, the share of rural employment in total employment declined from 80 per cent in 1986 to 65.4 per cent in 1998.

Labour movement from the informal to formal sectors, or the “formalization” of the economy followed a similar trend, in both urban and rural areas. Since 1986, employment in the formal sector had grown at about 7 per cent annually, compared to 3.4 per cent during the 1980-86 period. As a result, employment in the formal sector expanded from 26 per cent in 1986, to 35 per cent in 1997. In contrast, employment growth in the informal sector declined from 6.2 per cent during 1980-86 to 1.1 per cent during the export boom period. The share of informal sector employment fell from 74 per cent in 1986 to 65 per cent in 1997.

This pattern can be seen in both urban and rural areas. In rural areas, formal sector employment increased from 10.37 million in 1986, or 19.9 per cent of total rural employment, to 14.95 million, or 26.7 per cent of total rural employment in 1997. In urban areas, formal sector employment rose from 7.43 million, or 55.1 per cent of total urban employment in 1986, to 16.8 million, or 57.2 per cent of total urban employment in 1997. Initially, formal sector employment in rural areas was greater, but this trend has been reversed in recent years with increased migration to urban areas for jobs. Furthermore, the trends of urbanization and formalization seem to reinforce each other, with urban areas experiencing the strongest growth in formalization.

Labour market institutions also played an important role in labour market transformation in Indonesia. During the early stages of labour market tightening, workers became more powerful economically, but since the labour movement was politically restricted by the government, workers had relatively weak bargaining power. During the Soeharto administration, the government played a dominant role in maintaining the balance of interests between workers and firms. There was only one labour union approved and supported by the government, which made any independent labour union

illegal. Ineffective industrial relations due to such political constraints led to labour unrest throughout the 1980s. Labour unrest continued during the boom years in the 1990s, and there was apparent military involvement in dispute settlements. It was only in the mid 1990s that an effort was made to limit military involvement in labour relations. A more democratic political system during the period of political and economic reforms in the late 1990s, and greater freedom of association for labour movements facilitated greater bargaining power for workers. However, since labour demand had declined during the economic crisis, the bargaining power of workers was actually lower from an economic perspective.

The minimum wage standard was raised by more than 200 per cent in real terms from the late 1980s to the mid 1990s. However, the impact of this sharp increase on the labour market was minimal. Firstly, labour markets started to tighten, and that led to a natural increase in market wages. Secondly, the formal component of the labour market was small. Finally, the enforcement of minimum wage laws was poor. The flexibility of labour markets and labour market institutions was maintained during the economic crisis in the late 1990s. The increase in minimum wage was delayed when annual inflation reached 77 per cent during the worst time of the crisis in 1998.

Trends In Labour Force Participation And Employment

This section presents a descriptive analysis of the changing patterns of labour force participation, and the characteristics of employment for both the male and female labour force. Figure 3 illustrates the composition of the labour force in Indonesia during the period of rapid structural changes in the economy in the 1980s and 1990s. Clearly, the growth of the working age population, the labour force and employment were relatively similar. The unemployment rate increased after 1994, but this was due to definitional changes in the unemployment rate. However, there was also a clear trend of an increase in the proportion of formal sector employment, which corresponded with a decline in informal sector employment. Within the informal sector, the number of family or unpaid workers steadily declined, which also supports the notion of the formalization of the labour market in the late 1980s and early 1990s.

Labour Force Participation

The labour force participation rates (LFPR) has increased very rapidly in Indonesia in the last 20 years. The increase in LFPR was faster for the female labour force, and also in urban areas. Female LFPR increased from 32 per cent in 1971 to almost 39 per cent in 1990, while female LFPR in urban areas increased even more dramatically from 22 per cent to almost 32 per cent in the same period. Male LFPR also increased, but at a slower rate, and mainly after 1980.

TABLE 3. Indonesia: Labour Force Participation Rates, 1971-90 (%)

	1971	1980	1990	Per cent increase 1971-90
Male	68.7	68.5	71.1	3¹⁾
Urban	61.2	59.1	64.0	5
Rural	70.4	71.2	74.4	6
Female	32.1	32.7	38.8	21¹⁾
Urban	22.5	24.2	31.6	40
Rural	34.2	35.2	42.2	23
Male+Female	49.9	50.2	54.7	10

¹⁾ The total is less than the per cent increase for urban and rural areas because of changing composition of the workforce.

Source: Manning (1998)

Male labour force participation

Figure 4.a, b, and c depict male LFPR by age for 1986, 1990 and 1997. The usual inverted-U shape can be discerned, where LFPR is low for the younger age group, high for the productive age group, and then low again for the elderly. The LFPR for males in the most productive age group (30 to 50 years) reached almost 100 per cent, both in urban and rural areas. There was no significant change in LFPR among males over time during the rapid period of economic liberalization from 1986 to 1990. One possible exception was the declining LFPR of older males in urban areas during this period. This may be a reflection of increasing family income in urban areas, which provided some income security for the elderly so that they could retire early.

Figure 5.a, b, and c present the LFPR for the male labour force classified by education level. In general, a common pattern of relatively low LFPR for the less educated, and a higher LFPR for the more educated can be seen. Male LFPR was low (60-

70 per cent) and relatively similar for those with junior high school or a lower level of education, increased (to 90 per cent) for those with high school education, and then was even higher (more than 90 per cent) for those with tertiary education. The value of LFPR of the lower educated people in urban areas was significantly lower than in rural areas. There was also a clear trend of increasing LFPR for junior and senior high school graduates from 1990 to 1997. This changing trend was the result of a combination of an increase in the education level of the labour force in general, and the availability of more employment opportunities for those with high school education.

Female labour force participation

Between 1971-86, the number of women entering the job market steadily increased. The female participation rate was relatively stable at around 50-51 per cent of the total female working age population in the 1990s. However, there has been a declining trend in the growth of female LFPR since 1986. The question is whether this trend confirms that globalization, which started in 1986, has been gender biased against women in the workforce. This requires an analysis of the data at a more disaggregated level, for instance, by studying the impact of urbanization on aggregate female LFPR growth. During 1971-86, both rural and urban female LFPR grew at a positive rate, with rural female LFPR growing faster than urban female LFPR. In contrast, during the export boom period, rural female LFPR contracted by 0.4 per cent per annum, while urban female LFPR expanded quite strongly at 2.7 per cent per annum.

When the labour force is subdivided into different age categories (Figure 6. a, b and c), the general pattern of an inverted U curve - low for the younger age group, increasing for the older age group, and declining for the elderly - emerges. Given the low starting base for the younger age group, it is not surprising that the highest growth of female LFPR is found among the younger generation. Prior to the export boom, female LFPR increased in every age category, with the 25-29 age group experiencing the highest female LFPR growth. The reverse trend occurred during the export boom, and female LFPR declined in almost all age groups (except for the 20-24 and the 55-64 age groups).

However, the use of aggregate data masks the difference in labour market dynamics between rural and urban areas, especially during the export boom, and the period of rapid economic liberalization. During this period, female LFPR in the rural areas declined in almost all age categories, with the younger age group experiencing a faster rate of decline. The highest female LFPR are found in the 40-49 age category. In contrast, female LFPR in the urban areas increased in virtually all age categories during the same period. Moreover, the highest growth in female LFPR was found among the youngest age group (15-30). There was also a surge in female LFPR among the youngest women (15-19 years). As a result, the group with the highest female LFPR shifted from the 40-44 age group in 1971, to the 20-24 age group in 1997. This opposing trend between the rural and urban areas during the export boom period might indicate the increasing mobility of women workers.

If female LFPR is examined by education level (Figure 7. a, b and c), then the pattern of female LFPR resembles a U curve – or sometimes called a J curve - high female LFPR for women with primary education, a decline in LFPR for women with secondary education, and then, a very high LFPR for women with tertiary education. This indicates that women do benefit from investments in education.

A second observation is that prior to the export boom, there was a tendency for female LFPR among different education levels to diverge. In 1971, junior and senior high school educated women were the most disadvantaged group especially in rural areas. Yet, this group experienced the slowest growth of female LFPR. In contrast, women with tertiary education, who had relatively high female LFPR, experienced the highest female LFPR growth. The situation changed during the export boom period. The disadvantaged group, of women who finished junior and senior high school, caught up. In fact, those two groups experienced the fastest growth of female LFPR during the export boom, both in urban and rural areas.

Changing patterns in employment

Table 4 presents the changing patterns of employment status by major sectors and gender during the oil boom and the economic liberalization period in the late 1980s and early 1990s. There was a general trend of increasing employment in the formal and urban sectors, dominated by wage workers or employees, for both males and females. Another notable trend was that labour started to move out from the agricultural sectors in the early 1990s, which led to the negative growth of employment in agriculture during this period. In other words, while

the urbanization process started as early as the mid 1980s, the period of declining rural agricultural employment took place mostly in the 1990s.

TABLE 4. The share of employment by major sectors, employment status, and gender

	FEMALE					MALE				
	Share (%)			Growth p.a. (%)		Share (%)			Growth p.a. (%)	
	1986	1990	1997	1986-90	1990-97	1986	1990	1997	1986-90	1990-97
General	100	100	100	2.27	1.67	100	100	100	2.88	2.17
Wage workers	20	23	29	5.70	5.15	30	31	39	4.17	5.48
Non-wage workers	80	77	71	1.37	0.48	70	69	61	2.32	0.44
Urban (U)	17	22	36	9.14	7.12	23	26	35	5.35	6.87
Rural (R)	83	78	64	0.69	1.29	77	74	65	-0.30	0.21
Agriculture (U+R)	56	56	42	2.50	-2.51	55	56	41	3.33	-2.29
Wage workers	6	6	5	5.84	-0.80	5	6	6	10.19	0.19
Non-wage workers	50	50	37	2.11	-2.74	50	49	35	2.58	-2.64
Non-Agriculture (Non-Ag)	44	44	58	-2.82	5.71	45	44	59	2.33	6.50
Urban (Non-Ag)	15	20	30	8.95	7.69	20	23	32	6.20	7.42
Wage workers	7	10	15	10.73	8.11	12	14	19	6.36	7.15
manufacturing	1	3	4	19.99	7.95	3	4	5	10.98	6.17
trade	1	1	2	14.91	12.61	1	1	2	12.91	12.27
services	4	6	8	12.45	6.90	6	7	9	7.33	6.19
Non-wage workers	8	10	15	7.32	7.26	8	9	13	5.93	7.87
manufacturing	1	1	2	16.03	8.59	0	1	1	15.91	7.96
trade	6	8	11	11.21	6.78	4	5	6	5.49	7.30
services	1	1	2	5.28	9.44	2	3	4	9.21	8.52
Rural (Non-Ag)	29	24	28	-9.03	3.83	26	22	27	-1.02	5.49
Wage workers	7	6	8	-0.51	4.96	13	11	14	-0.94	5.93
manufacturing	2	2	3	3.81	6.05	2	2	3	3.32	5.70
trade	0	0	1	2.95	13.64	0	0	1	1.01	12.98
services	3	3	4	2.52	2.78	7	6	6	-1.64	2.71
Non-wage workers	22	18	20	-11.30	3.42	13	11	13	-1.09	5.05
Manufacturing	5	6	6	5.27	2.40	2	2	3	7.17	3.90
Trade	12	10	12	-0.27	4.20	6	5	6	-0.61	4.16
Services	4	5	1	6.40	-16.22	7	6	4	0.54	-4.97
N (million)	26.9	29.4	33.1			41.4	46.4	54.0		

Source: Central Board of Statistics, SAKERNAS (various years)

Male employment

The trend of formalization and urbanization of the labour market is clear. The number of male wage workers, or male employees in the formal sector, increased by around 5 per cent per annum on average from 1990 to 1997, twice as fast as the growth of general employment by around 2.5 per cent annually during the same period. The growth of urban male employment was even higher at more than 6 per cent per annum.

Employment dynamics in the agricultural sector marked the difference between the 1980s and the 1990s. Agricultural employment somehow managed to grow despite the strong trend towards urbanization, but this growth rapidly declined in the 1990s. The share

of male employment in the non-agricultural sector was relatively constant before the 1990s, but then increased very strongly in the early 1990s, from 44 per cent in 1990 to 59 per cent in 1997. An interesting trend was that even non-agricultural employment in rural areas increased by almost 6 per cent per annum during the same period, which suggests that even non-agricultural employment in rural areas blossomed during the period of economic liberalization.

In terms of sectors, non-agricultural employment in the manufacturing and trade sectors dominated the rapid growth of male employment in the 1990s. Even the increase in employment in the informal sector occurred in these sectors, both in urban and rural areas.

Female employment

The changes in the structure of female employment mirror the general trend discussed previously: accelerated urbanization, formalization, and industrialization during the export boom period. Prior to the export boom period, the share of urban female employment in total female employment rose 1.5 times within 15 years, from 11 per cent in 1971 to 17 per cent in 1998. The urbanization trend was accelerated during the export boom period such that the share of urban female employment then doubled from 17 per cent to 32 per cent in a shorter period (11 years). There was also a strong formalization process during the export boom period, as reflected by the increasing share of female wage workers in total female employment, from 20 per cent to 29 per cent between 1986-97. The share of female non-agricultural employment in total female employment also increased from 44 per cent to 58 per cent during this period.

However, despite the changes in the structure of the female labour force, which have accelerated since 1986, export led industrialization seemed to halt the feminization within the labour force. Table 5 shows that during 1971-86, the share of females in the labour force increased in most types of work, sectors, as well as overall in both urban and rural areas. As a result, economy wide, the female share in the labour force increased from 33 per cent in 1971 to 39 per cent in 1986. The rise of the share of the female labour force was higher in the agricultural (by 8 per cent), rural (by 7 per cent) and informal sector (by 7 per cent) than in the non agricultural (by 4 per cent), urban (by 5 per cent) and formal sector (by 2 per cent). In the manufacturing sector, the proportion of the female labour force declined from 31 per cent to 27 per cent, and 37 per cent to 36 per cent in urban and rural areas respectively.

These trends were reversed during the export boom period. For the whole economy, the female share of the labour force fell slightly from 39 per cent in 1986 to 38 per cent in 1997. The decline could be attributed to the slight contraction of the female labour force in the agricultural, rural, and informal sector. On the other hand, the female share in the urban, and formal sector was much better.

The transformation pattern both for female labour force participation and the female share of the labour force seems to be consistent with the U-curve hypothesis proposed by Boserup (1970) – the initial exclusion of women from labour force activities, followed by an increase in participation with urbanization and industrialization. During rapid industrialization, with the associated trends of formalization and urbanization, women move from the rural-informal-agriculture sector. As a result, female LFPR and the female share within the labour force in those sectors declines. Conversely, female LFPR and FSLF (Female share of the labour force) increases markedly in the urban-formal-non-agriculture sector. Initially, the former sector constitutes a large proportion of the total female labour force. Hence, the decline in women's role in that sector has a larger impact (weight) on aggregate Female LFPR and FSLF than the impact of the rapid growth of female participation in the latter sector. However, as a country industrializes, the share of the informal-rural-agriculture sector diminishes, the importance of the formal-urban-non-agriculture increases, and the aggregate female LFPR and FSLF becomes more and more similar to that of the formal-urban-non-agriculture sector. In short, the decline in aggregate female participation is the result of a catch-up phenomenon, and is a necessary condition for the future rapid increase of economy-wide female participation. The positive role of globalization in this process is to facilitate the acceleration of the catch-up process. The task of policymakers is to maintain a flexible labour market required for the reallocation of female labour from the agricultural to the non agricultural sector, from rural to urban areas, and from the informal to the formal sector, and to provide necessary institutions for the transition process.

TABLE 5. Female share in the labour force (%)

	1971	1986	1990	1997
General	33	39	39	38
<i>Wage workers</i>	28	30	31	31
<i>Non-wage workers</i>	36	43	42	42
<i>Urban</i>	28	33	35	37
<i>Rural</i>	34	41	40	39
Agriculture (U+R)	32	40	39	39
<i>Wage workers</i>	32	43	39	37
<i>Non-wage workers</i>	32	40	39	39
Non-Agriculture	35	39	38	37
<i>Urban (Non-Ag)</i>	28	33	36	37
<i>Wage workers</i>	23	28	31	33
manufacturing	31	27	34	37
services	25	30	34	35
<i>Non-wage workers</i>	36	41	42	42
trade	39	49	52	51
<i>Rural (Non-Ag)</i>	39	42	41	38
<i>Wage workers</i>	24	26	27	26
manufacturing	37	36	38	38
services	20	25	28	28
<i>Non-wage workers</i>	49	52	50	48
manufacturing	56	63	61	58
trade	50	56	56	56
N (million)	13.7	26.9	29.4	33.1

Source: Central Board of Statistics, SAKERNAS (various years)

Empirical Estimates Of Labour Force Participation

This section presents the results of the empirical estimation of the determinants of labour force participation, for male and female labour, in 1986, 1990, and 1997, based on the *Sakernas* micro data. One objective of the study is to investigate whether there were some changes in the determinants of labour force participation during the period of rapid structural changes in the economy. Therefore, the data from those three years are expected to provide the bases for the empirical estimation. The year of 1986 was chosen because it marks the beginning of the period of economic liberalization in Indonesia, while 1997 was chosen to capture the latest picture of the labour market just before the economic crisis.

Research Methodology

In terms of coverage, the study focuses on the Labour Force Participation (LFP) rate as the dependent variable. The study aimed at identifying important variables that influence LFP rates for both male and female labour. Having established the relevant dependent and the independent variables, the study proceeds with an econometric estimation of the determinants of the LFP rate for males and females. Following econometric estimations of LFP and earnings equations, a gender-based decomposition analysis is conducted. To be more specific, this gender-based decomposition would provide empirical estimates of factors that lead to the difference in LFP between males and females.

The standard Probit model and estimation procedure is used to represent various factors that determine participation in the labour market⁴. The model assumes that each individual has two choices: to participate or not to participate in the labour market. An individual makes his or her best and rational decision by comparing the utility of being in the labour force, to not being in the labour force. The probability of choosing one alternative depends on his or her personal characteristics, family characteristics (especially the head of the household), and regional characteristics.

Tables 6 and 7 present the definitions and descriptive statistics of the variables that are used in the model. The 1986 and 1990 *Sakernas* does not present the information on marital status, therefore this information is not included for these years. The dependent variable, LFP is set equal to one if the individual participates in the job market, either in the formal or informal sector, or even still looks for a job or

is unemployed. The dependent variables in general consist of personal characteristics, family characteristics, and regional characteristics. Personal characteristics that matter in determining LFP include age, education, marital status, and number of children. The family characteristics are basically the characteristics of the head of the household such as education and income.

TABLE 6. Variable definitions

<u>Variable</u>	<u>Description</u>
<i>Dependent Variable</i>	
LFP	Labour force participation in the wage-sector; LFP = 1 if participating in the LF; 0 if not
<i>Independent Variables</i>	
<i>Individual Characteristics</i>	
AGE	Age in years
<i>Family Characteristics</i>	
MAR	Marital status; MAR = 1 if married; 0 if not married
CHILD	Number of family members – member below 10 years
<i>Educational Background</i>	
EDY	Respondent's years of education
<i>Household Head's Background</i>	
D	Head of household dummy; d = 1 if head of household; 0 if otherwise
LHHDWAGE *	Log of household head's income
HHDEDY *	Head of household's education in years
HHDSQ *	Square of HHDEDY / 100
	* value set as zero if the respondent is a household head
<i>Regional Dummies (Other Region in Java = control)</i>	
REG1	Jabotabek (Greater Jakarta)
REG2	West Java excluding Jabotabek
REG3	Semarang, Solo, Yogyakarta, Surabaya
REG4	Other Regions in Central Java
REG5	North, West Sumatera
REG6	Other Sumatera
REG7	Kalimantan
REG8	Maluku, Papua, East Nusa Tenggara, East Timor, North Sulawesi
REG9	Other Regions in Eastern Indonesia

TABLE 7. Mean values of variables in the Probit equations

Variables	1986				1990				1997			
	URBAN		RURAL		URBAN		RURAL		URBAN		RURAL	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
LFP	0.29	0.58	0.51	0.74	0.32	0.60	0.51	0.75	0.39	0.67	0.49	0.76
AGE	29.96	29.75	31.13	31.05	30.32	30.32	31.81	31.65	31.69	31.66	33.13	32.96
MAR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.51	0.58	0.58
CHILD	1.22	1.19	1.34	1.34	1.04	1.02	1.17	1.16	0.82	0.80	0.96	0.96
EDY	6.30	7.53	4.07	5.06	6.78	7.89	4.46	5.38	7.67	8.55	5.19	6.01
D	0.07	0.45	0.07	0.52	0.07	0.46	0.08	0.52	0.07	0.50	0.07	0.55
LHHDWAGE	4.94	2.67	1.77	0.83	1.90	3.01	1.08	1.00	5.37	2.60	2.64	1.13
HHDEDY	7.09	4.07	4.19	2.05	4.93	4.39	2.45	2.39	8.01	4.11	5.18	2.34
REG1	0.12	0.13	0.03	0.03	0.15	0.15	0.02	0.02	0.15	0.16	0.02	0.02
REG2	0.09	0.09	0.10	0.10	0.08	0.08	0.10	0.10	0.07	0.07	0.10	0.10
REG3	0.07	0.07	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00
REG4	0.12	0.11	0.15	0.15	0.12	0.11	0.15	0.15	0.12	0.12	0.15	0.15
REG5	0.07	0.07	0.08	0.07	0.07	0.07	0.08	0.08	0.07	0.07	0.08	0.08
REG6	0.15	0.15	0.16	0.16	0.14	0.15	0.16	0.17	0.14	0.15	0.16	0.17
REG7	0.08	0.09	0.09	0.10	0.09	0.09	0.09	0.10	0.08	0.09	0.09	0.10
REG8	0.09	0.09	0.11	0.12	0.08	0.08	0.11	0.12	0.08	0.08	0.11	0.11
REG9	0.14	0.14	0.14	0.13	0.14	0.14	0.14	0.13	0.14	0.13	0.14	0.13

The model described above is a selection model in which individual employment choice is based on a comparison between the utility of working and not working. However, it could not shed light on the source of gender differences in LFP. Conceptually, the observed differences in workforce participation between males and females could arise from the differences in endowments and structural factors in the labour market supply and demand. The differences in endowments, or *endowment effects*, include the relative level of education, experience, and other productivity-related characteristics. The structural factors, or *structural effects*, in the labour market can be analysed from the supply and demand sides.

On the supply side, structural factors are influenced by, among other things, differences in household characteristics as well as differences in employment preferences and the time constraint. On the demand side, structural factors are determined by several factors such as size of the market and other regional characteristics. Decomposing male-female differences in LFP into these two factors may elucidate the importance of each factor in explaining the differences in male-female LFP, and provide guidance for public policy making. For example, the decomposition result will indicate in what area the policy makers should focus their attention - in enhancing productive endowments, or in reducing barriers created by labour market structural factors.

To locate the source of observed gender differences in LFP, the male-female differences in LFP are decomposed using the method proposed by Jones (1986):

$$(1) \quad \bar{E}_M - \bar{E}_F = \left[\Phi(\bar{X}_M \hat{\beta}_M) - \Phi(\bar{X}_F \hat{\beta}_M) \right] + \left[\Phi(\bar{X}_F \hat{\beta}_M) - \Phi(\bar{X}_F \hat{\beta}_F) \right]$$

where E represents the LFP of males (m) and females (f), X is the vector of the average values of the explanatory variables used in LFP equations, and the β 's are the estimated coefficients capturing gender-specific labour market structural forces. The first term on the right-hand side of equation (1) measures the extent to which LFP differentials between men and women can be explained by the differences in male and female endowments. In other words, it calculates the difference between men's predicted LFP and the level of women's LFP if women were endowed with the same characteristics as men. The second term can be attributed to the influence of structural demand-and-supply factors on gender differences in LFP. Since this term is a residual, it also captures unobserved factors that are not equally distributed among men and women such as individual taste and preferences for employment. It may also capture societal discrimination in the labour market.

The first and the second components of (1) can be further decomposed into j sub-components. The fraction of endowment effects (the first term in the equation [1]) explained by gender differences in j^{th} variables can be estimated by:

$$(2) \quad \Delta X_j = \left[\Phi(\bar{X}_M \hat{\beta}_M) - \Phi(\bar{X}_F \hat{\beta}_M) \right] \left[(\bar{X}_{Mj} - \bar{X}_{Fj}) \hat{\beta}_{Mj} \right] / \left[(\bar{X}_M - \bar{X}_F) \hat{\beta}_M \right]$$

Similarly, the fraction of structural effects (the second term) explained by gender differences in j^{th} coefficients is given by:

$$(3) \quad \Delta \beta_j = \left[\Phi(\bar{X}_M \hat{\beta}_M) - \Phi(\bar{X}_F \hat{\beta}_M) \right] \left[(\hat{\beta}_{Mj} - \hat{\beta}_{Fj}) \bar{X}_{Fj} \right] / \left[(\hat{\beta}_M - \hat{\beta}_F) \bar{X}_F \right]$$

By decomposing further the two components of (1) into j sub-components, the importance of each individual variable or coefficient in explaining the predicted male-female differences in LFP can be analysed.

The Determinants of Female and Male LFP

Probit estimates of male and female LFP in 1986, 1990 and 1997 are presented in Tables 8, 9, and 10. In addition to the estimated coefficient and *t*-statistics, the marginal effects (M.E) evaluated at means are also presented in the tables⁵. The values of *t*-statistics, which are greater than 1.96 in general basically show the quality of the estimated parameters.

TABLE 8. Probit Estimates of LFP, 1986

	URBAN						RURAL					
	FEMALE			MALE			FEMALE			MALE		
	BETA	T-stat	M.E.	BETA	T-stat	M.E.	BETA	T-stat	M.E.	BETA	T-stat	M.E.
AGE	0.12	47.8	0.9	0.31	79.0	3.3	0.14	105.5	1.2	0.24	109.7	1.4
AGE2	-0.16	-44.7		-0.37	-79.7		-0.17	-98.7		-0.28	-111.8	
MAR	-	-	-	-	-	-	-	-	-	-	-	-
CHILD	-0.04	-6.8	-1.4	0.09	11.2	3.5	-0.05	-13.1	-2.0	0.01	2.8	0.3
EDY	-0.12	-16.9	0.8	-0.13	-11.1	-4.9	-0.03	-7.6	0.4	0.03	4.0	0.1
EDSQ	1.20	23.5		0.86	11.7		0.54	13.3		-0.20	-3.8	
D	0.43	9.5	0.9	0.30	5.7	11.5	0.39	17.0	15.7	0.24	7.9	5.2
LHHDWAGE	-0.02	-13.4	-0.7	-0.01	-3.5	-0.8	-0.03	-20.6	-1.9	-0.03	-13.0	-0.6
HHDEDY	-0.02	-3.3	-4.2	-0.04	-6.7	-2.1	-0.04	-10.7	-1.7	-0.06	-16.3	-1.4
HHDSQ	-0.05	-1.3	0.0	-0.23	-7.0	0.0	-0.04	-1.4	0.0	0.00	-0.1	0.0
REG1	-0.57	-15.8	-18.2	-0.02	-0.5	-0.9	-0.78	-23.9	-31.0	-0.34	-8.6	-7.4
REG2	-0.39	-10.3	-12.4	-0.09	-1.8	-3.3	-0.27	-14.7	-11.0	-0.25	-10.2	-5.5
REG3	-0.39	-9.7	-12.4	-0.30	-5.8	-11.2	-0.27	-3.7	-10.6	-0.53	-5.6	-11.4
REG4	0.08	2.3	2.5	-0.07	-1.5	-2.5	0.24	14.4	9.5	0.05	2.3	1.1
REG5	-0.39	-9.7	-12.5	-0.15	-2.8	-5.5	0.09	4.2	3.4	-0.16	-6.1	-3.5
REG6	-0.51	-14.8	-16.2	-0.12	-2.8	-4.5	-0.07	-4.1	-2.7	-0.18	-8.5	-3.9
REG7	-0.40	-10.2	-12.5	-0.07	-1.4	-2.6	0.15	8.0	6.0	0.04	2.0	0.9
REG8	-0.22	-5.8	-7.0	0.00	-0.1	-0.2	0.01	0.5	0.3	-0.12	-5.4	-2.6
REG9	-0.33	-9.6	-10.4	-0.17	-3.9	-6.5	-0.09	-6.7	-3.7	-0.04	-2.4	-1.0
CONSTANT	-1.80	-31.8	-57.0	-4.00	-50.6	-150.9	-1.90	-69.6	-75.9	-2.84	-70.3	-61.2
<i>Number of observations (percent)</i>												
Total	32549	(100)		32240	(100)		83698	(100)		81528	(100)	
LFP=1	9377	(29)		18818	(58)		42577	(51)		60616	(74)	

TABLE 9. Probit Estimates of LFP, 1990

	URBAN						RURAL					
	FEMALE			MALE			FEMALE			MALE		
	BETA	T-stat	M.E.	BETA	T-stat	M.E.	BETA	T-stat	M.E.	BETA	T-stat	M.E.
AGE	0.12	68.8	0.9	0.30	110.5	3.0	0.14	107.2	1.2	0.23	109.8	1.4
AGE2	-0.15	-64.0		-0.35	-111.5		-0.17	-98.8		-0.27	-111.5	
MAR	-	-	-	-	-	-	-	-	-	-	-	-
CHILD	-0.06	-12.9	-2.2	0.10	15.3	3.6	-0.07	-16.3	-2.6	-0.01	-1.7	0.3
EDY	-0.15	-28.7	0.4	-0.08	-9.9	-0.2	-0.02	-5.1	-0.1	0.06	10.5	0.1
EDSQ	1.21	35.2	0.0	0.50	9.7		0.20	5.6	0.0	-0.45	-10.0	
D	0.64	22.4	21.8	0.37	8.6	13.5	0.57	25.2	22.7	0.50	15.2	5.2
LHHDWAGE	0.01	3.6	0.2	0.00	-1.0	-0.1	0.00	-3.1	-0.2	-0.01	-3.0	-0.6
HHDEDY	0.01	2.8	-0.1	-0.02	-5.4	-1.1	-0.02	-4.7	-0.5	-0.02	-4.6	-1.4
HHDSQ	-0.12	-5.0	0.0	-0.08	-3.5	0.0	0.09	2.6	0.0	-0.06	-2.0	0.0
REG1	-0.44	-18.9	-15.0	-0.10	-3.2	-3.5	-0.63	-16.6	-25.2	-0.22	-4.9	-7.4
REG2	-0.32	-11.7	-10.7	-0.10	-2.9	-3.6	-0.26	-13.9	-10.4	-0.20	-8.4	-5.5
REG3	-0.13	-4.4	-4.3	-0.30	-8.0	-10.9	0.30	3.9	12.0	-0.13	-1.3	-11.4
REG4	0.16	6.9	5.4	0.03	1.0	1.1	0.26	15.8	10.5	0.10	4.6	1.1
REG5	-0.25	-8.9	-8.4	-0.19	-5.3	-6.8	0.19	9.1	7.6	-0.16	-6.0	-3.5
REG6	-0.50	-20.9	-17.0	-0.15	-5.1	-5.5	0.06	3.6	2.4	-0.08	-4.0	-3.9
REG7	-0.35	-13.2	-11.7	-0.12	-3.7	-4.5	0.24	12.5	9.7	0.03	1.5	0.9
REG8	-0.33	-11.8	-11.0	-0.22	-6.6	-8.1	0.14	7.8	5.7	-0.02	-0.8	-2.6
REG9	-1.85	-48.4	-62.7	-4.09	-72.0	-148.3	-2.20	-79.1	-87.9	-3.11	-75.0	-61.2
CONSTANT	-1.80	-31.8	-57.0	-4.00	-50.6	-150.9	-1.90	-69.6	-75.9	-2.84	-70.3	-61.2
<i>Number of observations (per cent)</i>												
Total	64271		(100)	63022		(100)	82407		(100)	81050		(100)
LFP=1	20284		(32)	38109		(60)	41747		(51)	60844		(75)

TABLE 10. Probit Estimates of LFP, 1997

	URBAN						RURAL					
	FEMALE			MALE			FEMALE			MALE		
	BETA	T-stat	M.E.	BETA	T-stat	M.E.	BETA	T-stat	M.E.	BETA	T-stat	M.E.
AGE	0.17	64.4	1.5	0.25	78.3	1.8	0.14	72.5	1.3	0.23	82.5	1.1
AGE2	-0.20	-62.3		-0.31	-83.5		-0.17	-70.0		-0.26	-85.7	
MAR	-0.56	-30.2	-21.0	0.52	16.5	16.1	-0.09	-5.8	-3.7	0.46	14.8	8.9
CHILD	-0.05	-7.3	-1.8	0.10	10.4	3.0	-0.07	-12.4	-2.7	0.01	0.6	0.1
EDY	-0.12	-18.3	2.3	-0.10	-9.6	2.3	-0.03	-5.9	1.1	0.05	5.9	1.0
EDSQ	1.19	29.9		1.02	16.3		0.56	14.1		0.01	0.2	
D	-0.02	-0.5	-0.8	0.41	7.6	12.7	0.31	10.2	12.5	0.18	4.1	3.5
LHHDWAGE	-0.02	-13.4	-0.6	-0.01	-3.3	-0.5	-0.02	-16.2	-0.8	-0.01	-5.9	-0.2
HHDEDY	-0.01	-1.8	-1.1	0.01	2.9	-1.0	-0.03	-6.9	-1.6	-0.02	-4.0	-0.8
HHDSQ	-0.13	-4.7	0.0	-0.58	-20.9	0.0	-0.09	-2.9	0.0	-0.44	-12.8	0.0
REG1	-0.37	-13.8	-13.8	-0.08	-2.1	-2.3	-0.72	-16.6	-28.6	-0.30	-5.6	-5.9
REG2	-0.28	-9.0	-10.7	-0.04	-0.9	-1.2	-0.32	-14.4	-12.7	-0.16	-5.1	-3.2
REG3	-0.08	-2.3	-3.0	-0.18	-3.9	-5.6	0.42	4.7	16.5	0.04	0.3	0.8
REG4	0.12	4.5	4.6	-0.02	-0.7	-0.8	0.16	8.1	6.4	0.00	0.1	0.0
REG5	-0.15	-4.6	-5.5	-0.02	-0.4	-0.6	0.26	10.6	10.3	-0.01	-0.3	-0.2
REG6	-0.31	-11.5	-11.7	0.02	0.6	0.7	0.02	1.0	0.8	0.04	1.4	0.8
REG7	-0.24	-8.0	-9.0	-0.03	-0.8	-1.0	0.22	0.0	8.9	0.15	4.5	2.9
REG8	-0.20	-6.4	-7.4	-0.14	-3.3	-4.2	0.08	3.7	3.2	0.11	3.3	2.1
REG9	-0.07	-2.8	-2.8	0.00	0.0	0.0	0.13	6.4	5.2	0.17	5.7	3.4
CONSTANT	-2.29	-44.5	-85.9	-3.50	-50.5	-108.2	-2.21	-60.1	-88.2	-3.24	-59.2	-63.4
<i>Number of observations (per cent)</i>												
Total	48101		(100)	47116		(100)	62797		(100)	61412		(100)
LFP=1	18702		(39)	31530		(67)	30978		(49)	46507		(76)

Age

The impact of age in determining labour force participation is significant, and the quadratic inverted U-shape pattern is obtained. Labour force participation rates increase when people get older, reach the peak at a certain age, and then decline thereafter. The results show that the maximum labour force participation rate is reached when age equals 39-40 years for females, and 42-43 years for males. The linearized marginal effects are generally greater for males in urban areas. For example, evaluated at the mean value of age, a year's increase in age led to around a 3 per cent increase in the probability of males entering the labour force in 1986 and 1990. The marginal effect in 1997 was smaller, or in other words, the LFP curve seemed to be flatter with respect to age. The impact of age on labour force participation was generally similar in 1986 and 1990, but differed in 1997. The age at which the LFP reached the peak for women increased from 39-40 years in 1986 and 1990 to 42-43 years in 1997. This suggests that there was no significant difference between males and females in this aspect, or from another perspective, in 1997, women seemed to stay longer in the labour force compared to 1986 and 1990.

Marital Status

There was a clearly different impact of marital status on labour force participation between males and females. The estimation results based on 1997 data reveal that being married significantly reduced the probability of women, and increased the probability for men, to participate in the labour market⁶. The marginal effects of marital status on LFP were greater in urban areas than in rural areas. In urban areas, being married reduced the probability of women participating in the labour market by 21 per cent, and increased the probability of men entering the labour market by 16.1 per cent. In rural areas, the marginal effects were -3.7 per cent and 8.9 per cent respectively.

Number of Children

The impact of the number of children on labour force participation was also different between males and females. The number of children clearly reduced the probability of women entering the job market, but increased the chances of men entering the labour force. For women, the effects of the number of children on LFP were stronger in rural areas. Having one more child would reduce the probability of women entering the labour market in rural areas by around 2.0 to 2.7 per cent. In

urban areas, the marginal effect was estimated at around -1.4 to - 2.2 per cent. The smaller impact of the number of children on female LFPR in urban areas is expected because of the availability of housemaids and servants in urban households. This result is in general consistent with that of Widarti (1998) who showed that the presence of children under five years of age reduced the probability of women entering the labour market. For men, the marginal effects tended to be higher in urban areas, and were as high as 3.6 per cent.

Education

From the model of labour force participation, it is evident that education levels play a significant role in determining labour force participation. As expected, the impact of education on labour force participation rates formed a quadratic pattern in general. The marginal effect of education on female labour force participation declines for a while as the education level increases, and then sharply increases after reaching the lowest point. Therefore, the marginal effect was generally positive and larger at high school or university level education. For males, the marginal effect of education on LFPR generally increased, and then slowed down for higher levels of education. There seemed to be an inverted U-shape curve for male, even though in general this pattern was less clear, and the impact of education on male LFPR could even be linear.

Table 11 provides the estimated marginal effects of education on the probability of entering the labour market, calculated based on the estimated parameters in the Probit equations. The marginal effect of education on female LFPR was generally negative when an individual did not finish primary school, but the marginal effect started to become positive when they completed at least 6 years of primary school, and the effect became even larger when the level of education increased. The estimates show, for example, that having high school education would increase the chance of participation in the labour force by around 4 to 5 per cent for urban females. The comparable effect on female LFPR in rural areas was weaker at around 1 to 3 per cent.

TABLE 11. The estimated marginal effects of education on LFP (per cent)

Education (years)	1986				1990				1997			
	URBAN		RURAL		URBAN		RURAL		URBAN		RURAL	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
3	-1.68	-2.51	-0.02	0.47	-2.54	-1.69	-0.31	1.20	-1.54	-1.22	0.08	1.61
6 (Primary)	0.61	-0.87	1.02	0.09	-0.24	-0.74	0.08	0.34	0.72	0.73	1.14	1.64
9 (Junior high)	2.89	0.77	2.05	-0.30	2.07	0.20	0.47	-0.52	2.98	2.68	2.20	1.66
12 (Senior high)	5.17	2.41	3.08	-0.68	4.37	1.15	0.85	-1.39	5.24	4.63	3.25	1.69
15 (Tertiary)	7.46	4.04	4.11	-1.07	6.68	2.10	1.24	-2.25	7.50	6.58	4.31	1.72

From the data, it appears that from 1986 to 1990, the marginal effect of education on LFP was stronger for females than males, and for the labour force in urban areas than in rural areas⁷. However, in 1997, the marginal effects of education on LFP were similar for males and females, even though the effect was still stronger in urban areas. In 1997, for example, the marginal effect (evaluated at mean of education) was 2.3 per cent in urban areas, which means that one year of education could increase the LFP in urban areas by 2.3 per cent for both males and females. In rural areas, the impact was 1.1 per cent in 1997. For those with education of about 12 years, the marginal effect was even stronger at around 5.2 per cent for females, and 4.6 per cent for males in urban areas. In 1986, the comparable marginal effect for males in urban areas was only around 2.4 per cent. One explanation for the larger marginal effects of education in 1997 is that education levels were in general higher in 1997.

Head of Household Characteristics

The estimated Probit equations clearly showed that the probability of entering the labour market was generally higher when an individual was a head of household. The sign of the estimated coefficient on the dummy variable indicating whether the individual was the head of the household was generally positive, and significantly different from zero. The only exception was in 1997, when the result on the urban female group was statistically insignificant. There was a general tendency that in rural areas, the marginal effect of being a head of household on LFPR was greater for women. Being a head of a household basically gave women in rural areas no choice other than to participate in the labour market. The marginal effects were as high as 22

per cent. For males, the marginal effect of being a household head on male LFPR was stronger in urban areas, at around 11 to 13 per cent.

When the individual was not a head of household, the characteristics of the household head played a significant role in determining the individual's decision to participate in the labour market. The impact of the education and earnings (wage) of the head of the household on the LFP of household members was generally negative. This implies that a higher education level and income of the household head led to a smaller probability of a household member entering the labour market. This confirms the theory of individual labour force participation in which fixed income could increase the reservation wage, and therefore lower the chances of taking a job offer. Higher fixed income, for example, the interest income or spouse's income, would certainly reduce the necessity and thereby, the probability of an individual participating in the labour market. Education and income of the household head are good proxies of fixed income, and the effects of those two variables on an individual's decision in participating in the labour markets were negative.

Gender-Based Decomposition of the LFP

In urban areas, the LFP gap between females and males narrowed slightly during 1986-97, as illustrated in Table 12. In 1986, male LFP was 63.2 per cent, or 38.4 per cent higher than female LFP. In 1997, the LFP of males increased by 6 per cent to reach 69.2 per cent, while that of females increased by only 7 per cent. As a result, the gap between female and male LFP decreased by only 1 per cent.

Table 12 also reveals that the difference in female and male endowment only provides a partial explanation of the narrowing LFP gap between males and females in urban areas. Structural factors account more for the phenomenon. While the difference in endowment widened, the structural effect narrowed between 1986-97. In 1986, the endowment effect in urban areas could explain only 23 per cent of the gap, but in 1997, it explained 37 per cent of the gap in urban areas. The changes in structural effects are -6 per cent in urban areas, suggesting that the preference and constraints faced by women in labour market became smaller. To put it simply, this indicates that the urban labour market in 1997 was less discriminatory compared with the situation in 1986.

Unlike in urban areas, the female-male LFP gap in rural areas had been widening during 1986-97. In 1986, male LFP was 86.6 per cent while female LFP was 50 per cent, resulting in a 36.6 per cent difference. Between 1986-97, there was no significant change in male LFP, while female LFP declined considerably, resulting in a widening gap from 36.6 per cent to 40.3 per cent. The decomposition analysis shown in the table reveals that both endowments as well as structural factors contributed to the increased LFP gap. However, the endowment effect was more dominant, accounting for 62.2 per cent of the increase in the LFP gap.

TABLE 12. Decomposition analysis of gender differences in employment decision

	URBAN			RURAL		
	1986	1997	1986-97	1986	1997	1986-97
Male LFP	63.2	69.2	6.0	86.6	86.4	-0.3
Female LFP	24.9	31.9	7.0	50.0	46.1	-3.9
Difference (%)	38.4 (100.0)	37.3 (100.0)	-1.0 (100.0)	36.7 (100.0)	40.3 (100.0)	3.6 (100.0)
- Endowment (%)	8.9 (23.3)	13.8 (37.1)	4.9 (-478.9)	6.4 (17.3)	8.6 (21.3)	2.2 (62.2)
- Structural (%)	29.4 (76.7)	23.5 (62.9)	-6.0 (578.9)	30.3 (82.7)	31.7 (78.7)	1.4 (37.8)

	Decomposition into <i>j</i> -th variables											
	X's	Betas	X's	Betas	X's	Betas	X's	Betas	X's	Betas	X's	Betas
Total LFP Gap	8.9	29.4	13.8	23.5	4.9	-6.0	6.4	30.3	8.6	31.7	2.2	1.4
AGE	0.2	112.6	0.2	85.1	0.0	-27.5	-0.4	64.7	-0.5	63.9	-0.1	-0.8
CHILD	-0.1	6.2	-0.1	6.2	0.0	0.0	0.0	3.0	0.0	3.1	0.0	0.1
EDY	-0.6	-8.0	-0.1	-1.6	0.4	6.4	0.2	2.1	0.5	7.2	0.3	5.1
D	4.5	-0.3	8.4	0.7	3.8	1.0	2.6	-0.4	4.4	0.0	1.8	0.4
LHHDWAGE	0.7	2.5	1.3	0.9	0.6	-1.6	0.6	0.1	0.6	0.3	0.0	0.3
HHDEDY	4.1	-9.4	4.2	-9.7	0.1	-0.3	3.3	-3.3	3.6	-5.0	0.3	-1.7
REG1	0.0	2.4	0.0	1.3	0.0	-1.1	0.0	0.4	0.0	0.3	0.0	-0.2
REG2	0.0	1.0	0.0	0.5	0.0	-0.5	0.0	0.1	0.0	0.5	0.0	0.4
REG3	0.0	0.2	0.0	-0.3	0.0	-0.5	0.0	0.0	0.0	-0.1	0.0	0.0
REG4	0.0	-0.7	0.0	-0.8	0.0	-0.1	0.0	-1.0	0.0	-0.8	0.0	0.2
REG5	0.0	0.7	0.0	0.3	0.0	-0.3	0.0	-0.7	0.0	-0.9	0.0	-0.2
REG6	0.0	2.2	0.0	1.7	0.0	-0.5	0.0	-0.6	0.0	0.1	0.0	0.7
REG7	0.0	1.0	0.0	0.5	0.0	-0.5	0.0	-0.4	0.0	-0.3	0.0	0.0
REG8	0.0	0.7	0.0	0.1	0.0	-0.6	0.0	-0.5	0.0	0.1	0.0	0.6
REG9	0.0	0.8	0.0	0.3	0.0	-0.5	0.0	0.2	0.0	0.2	0.0	0.0
CONSTANT	0.0	-82.5	0.0	-61.8	0.0	20.7	0.0	-33.3	0.0	-36.8	0.0	-3.5

Note: X's are differences due to endowment effect; Beta's are differences due to structural factors.

The second part of Table 12 presents the contributions of each variable to the change in the LFP gap. There are some interesting findings, the first being the effect of age. Apparently, the role of age in explaining the difference of individual endowments was positive in urban areas, although not too significant. It means that at the same age, average male productivity was slightly higher than for females. However, age was a much more important factor in determining structural effects,

suggesting that the structural barriers for females to enter the labour market were higher than for males in the same age group. However, structural barriers were declining between 1986-97, so the labour market became more gender neutral with respect to age. This situation applies to both urban (-27.5 per cent) and rural areas (-0.8 per cent). A more extreme case appeared in rural areas, where the market actually valued female labour productivity higher than male labour productivity.

The second interesting finding is related to how the presence of dependent children affected the structural barriers for females to enter the labour market. While the market virtually gave a relatively similar value to female and male productivity regardless of the presence of dependent children, structural factors limited females from entering the labour market. Apart from the household division of labour hypothesis, this could be due to employer's perceptions that hiring females with children could mean that females would ask for more days-off for family reasons.

The third finding is related to the role of education. Clearly, in each year, education played a role as an equalizer for the chance to enter the labour market in urban areas. This can be seen from the negative effect of education to the LFP gap in 1986 and 1997, both in terms of endowment and structural factors. However, the role of education as an equalizer diminished in 1997, as the female education level became more and more similar to that of men, due to the rapid growth of women's education between 1986-97. Conversely, the role of education as an equalizer did not occur in rural areas, where education contributed to the widening LFP gap in both endowment and structural factors. One possible explanation is the characteristic of rural labour markets, which are more unskilled-labour oriented in nature.

The other notable findings are related to the characteristics of the household head characteristics. The household head dummy variable accounted for the widening LFP gap, and its contribution to the endowment effect was higher than to the structural effect. Also, the income of the household head contributed to the narrowing urban LFP gap. This may suggest that the decision of urban female individuals to enter the labour market has become more similar to that of males, which are independent of non-earning income and the level of education of other members in the family. Lastly, the education of the household head contributed to the narrowing of the LFP gap, especially in reducing the structural barriers for female household

members to enter the labour market. This phenomenon is consistent for urban and rural areas.

Trends In Wage Differentials

During the period of rapid growth in Indonesia (1986-97), the average real wage in the formal sector increased rapidly at about 5.6 per cent per annum. This real wage increase took place in conjunction with an increase in labour productivity. Aside from the increase in labour productivity, there are two other reasons that may explain the rapid increase in the real wages during the 1990s. First, there has been a tightening of labour markets since the early 1990s (Manning 1998). Second, there was a rapid increase in the minimum wage in the modern sector in the early 1990s.

Similar to other places in the world, female wages in Indonesia are generally lower than males. While it is clear that the female-male wage differential has narrowed over time in Indonesia, the sources of the differential itself are not well measured and understood. Theoretically, the difference between female and male wage may derive from factors that can be explained and measured, such as productivity and endowment-related factors, or factors that cannot be measured, such as discrimination⁸.

Figure 8 presents the ratio of female and male earnings classified by urban and rural areas, taken from the *Sakernas* data in 1986, 1990 and 1997. The wage data was taken from the monthly earnings of wage workers, or employees, in the formal sector. The graph clearly shows that there was a significant increase in female wages relative to males, as reflected by an increase in the female-male wage ratio from less than 0.6 in 1986, to more than 0.7 in 1997. Significant progress actually took place between 1990 and 1997. The smaller gap between female and male wages during the period of economic liberalization and export boom in the early 1990s was dominated by the rapid increase in female wages in urban areas.

From Figure 9, it is clear that education played an important role in equalizing wages. The wage gap between females and males was large for those with elementary education, and became smaller as the education level increased. The ratio of female and male wages for those with elementary education or less was low at around 0.5 during the period, while the ratio for those with tertiary education reached

as high as 0.7. The female-male wage ratio was largest for those with vocational high school education.

Figure 10.a, b, and c illustrate female-male wage ratios classified by industries. In general, the figures reveal that the female-male wage ratio increased very rapidly in the trade and manufacturing sectors. In urban areas, between 1986 and 1997, there was a smaller gap between male and female wages in the trade sector, while in rural areas, there was a smaller gap in the services sectors. The U-curve pattern of the female-male wage ratio in the services sector during this period was associated with the movement of female labour across informal and formal sectors. There was massive female labour outflow from the informal (especially rural) sectors to the formal sectors. Female labour initially mostly entered the services sectors before moving to other sectors. Therefore, there was a large pool of supply of female labour in the services sectors in the late 1980s and early 1990s that depressed wages for female labour in this sector.

Estimating the Wage Equation And Discrimination: Conceptual Framework

The specification of the wage equation is based on a standard model of the earnings function, in which earnings is a function of personal characteristics, local characteristics, and employment characteristics. Following a classic specification by Mincer and Polacheck (1974) and also Mincer (1974), earnings is a function of education, experience, and other personal characteristics such as marital status and number of dependent children. Job and local characteristics are represented by the industrial and regional dummy variables.

There are two types of wages to be estimated: the actual (observed) wage and the potential wage. The actual wage is defined as the earnings of wage workers (employees) in the formal sectors. Wages of wage workers are observed and can be obtained in the Sakernas data set. Potential wage is defined as the wages that are potentially earned by the labour force in general. The potential wages are not readily available and have to be estimated based on observed or realized wages of wage workers by considering the process of non-random selection. The relation between realized wages for those who work in the formal sector, the potential wages for everyone (corrected by selection bias), and wage differentials between males and

females can be illustrated in Figure 11 below. The figure illustrates the relation between endowments, such as education, and the value of wages for male and female.

The observed wages for males (W_o^m) and females (W_o^f) are the realized market wage for wage workers (employees) working in the formal sector. The unobserved female and male wages are represented by the dashed line W_u^m and W_u^f . These unobserved wages are associated with those who are not in the labour force or those who work in the informal sector. The observed wage is measured as a result of the self-selection process, namely those who participate in the formal labour market and work as employees. Therefore, the potential wage for every individual in the labour force lies between the observed and unobserved wages. The self-selection process is not a random one. The actual or observed wages are derived from those who decide to work in the formal sector, and the individual's decision to work is based on the selection process, and depends on whether the offered wage is larger than the individual's reservation wage. Therefore, the potential wage for females (W_p^f) and males (W_p^m), which can also be interpreted as the potential value of marginal product for every individual, has to be empirically estimated by applying a selection-bias correction mechanism.

The procedure for estimating the potential wage for male and female individuals follows the standard Heckman's two-step selection-bias correction model (Heckman 1979). First, the probit equation for labour force participation⁹ of wage workers¹⁰ is estimated. Then, a selection bias variable, *lambda*, is developed, calculated as $f(\mathbf{XB}) / F(\mathbf{XB})$ for each wage worker. \mathbf{X} and \mathbf{B} are the matrix of explanatory variables and parameters in the Probit equation, while $f(\cdot)$ and $F(\cdot)$ are the normal density and distribution function. As the second step, the wage equation is re-estimated, including *lambda* as an additional independent variable. The inclusion of *lambda* in the estimation is to make an unbiased inference about the wider population, rather than just the population of wage workers. Tables 13.a and 13.b present the definitions and descriptive statistics of the variables.

Table 13.a. Definition of variables and descriptive statistics of wage equations for wage workers

<i>Dependent Variable</i>	1986				1997			
	Urban		Rural		Urban		Rural	
	Female	Male	Female	Male	Female	Male	Female	Male
WHR Hourly Wage - (Monthly Wage/weekly working hours)/4	373.80	559.64	288.51	393.05	1401.8	1829.3	990.1	1263.1
<i>Independent Variables</i>								
EXP Years of experience=Age-Years of Education-6	16.20	19.98	19.02	20.03	14.65	18.81	19.60	20.50
EDY1 Years of education	8.40	9.04	5.81	6.83	10.00	10.21	7.11	7.61
CHILD Number of children under 10 years	1.04	1.33	1.12	1.36	0.71	0.88	0.81	0.98
<i>Head of Household Characteristics</i>								
D Household head dummy	0.10	0.71	0.12	0.67	0.08	0.68	0.11	0.68
LHHDWAGE Log of Household head wage	9.61	3.26	8.88	3.62	10.99	3.98	10.05	3.88
HHDEDY Years of household head education	6.11	2.50	3.20	2.23	7.96	3.14	4.01	2.26
<i>Industrial Dummy (Agriculture=control)</i>								
INDS2 Industry	0.15	0.16	0.18	0.14	0.21	0.19	0.23	0.16
INDS3 Trade	0.09	0.07	0.03	0.02	0.15	0.12	0.05	0.04
INDS4 Services	0.58	0.53	0.35	0.43	0.59	0.50	0.34	0.34
INDS5 Other and undefined sectors	0.14	0.21	0.10	0.19	0.02	0.15	0.03	0.21
<i>Regional Dummy (Other Region in Java=control)</i>								
REG1 Jabotabek (Greater Jakarta)	0.13	0.15	0.04	0.06	0.19	0.19	0.03	0.03
REG2 West Java excluding Jabotabek	0.09	0.08	0.13	0.13	0.06	0.07	0.13	0.13
REG3 Semarang, Solo, Yogyakarta, Surabaya	0.08	0.07	0.01	0.01	0.07	0.05	0.01	0.01
REG5 North, West Sumatera	0.07	0.06	0.09	0.08	0.06	0.06	0.08	0.07
REG6 Other Sumatera	0.10	0.15	0.09	0.11	0.12	0.14	0.12	0.13
REG7 Kalimantan	0.05	0.09	0.04	0.08	0.07	0.08	0.07	0.09
REG8 Maluku, Papua, East NT, East Timor, N 'Swesi	0.09	0.10	0.06	0.07	0.08	0.08	0.06	0.08
REG9 Other Regions in Eastern Indonesia	0.10	0.11	0.11	0.11	0.13	0.12	0.13	0.11
LAMDA	0.67	0.51	0.69	0.63	0.62	0.50	0.68	0.61
N Number of valid observations	3428	9811	4378	11463	7969	16485	4901	12229

Table 13.b. Definition of variables and descriptive statistics of wage equations for the whole population

<i>Dependent Variable</i>	1986				1997			
	Urban		Rural		Urban		Rural	
	Female	Male	Female	Male	Female	Male	Female	Male
WHR Hourly Wage - (Monthly Wage/Weekly Working Hours)/4	40.20	173.35	15.53	58.20	232.24	640.04	77.27	251.52
<i>Independent Variables</i>								
EXP Years of experience=Age-Years of Education-6	17.67	16.23	21.06	19.99	18.03	17.12	21.94	20.95
EDY1 Years of education	6.29	7.52	4.07	5.06	7.67	8.54	5.19	6.01
CHILD Number of children under 10 years	1.22	1.19	1.34	1.34	0.82	0.80	0.96	0.96
<i>Head of Household Characteristics</i>								
D Household head dummy	0.07	0.45	0.07	0.52	0.07	0.50	0.07	0.55
LHHDWAGE Log of Household head wage	2.26	3.00	0.94	0.98	5.37	2.60	2.64	1.13
HHDEDY Years of household head education	4.78	4.25	2.33	2.25	8.01	4.11	5.18	2.34
<i>Industrial Dummy (Agriculture=control)</i>								
INDS2 Industry	0.03	0.06	0.04	0.04	0.06	0.09	0.06	0.06
INDS3 Trade	0.11	0.12	0.06	0.05	0.15	0.16	0.09	0.07
INDS4 Services	0.08	0.22	0.03	0.09	0.12	0.25	0.04	0.11
INDS5 Other and undefined sectors	0.02	0.09	0.03	0.05	0.01	0.07	0.00	0.06
<i>Regional Dummy (Other Region in Java=control)</i>								
REG1 Jabotabek (Greater Jakarta)	0.12	0.13	0.03	0.03	0.15	0.16	0.02	0.02
REG2 West Java excl. Jabotabek	0.09	0.09	0.10	0.10	0.07	0.07	0.10	0.10
REG3 Semarang, Solo, Yogyakarta, Surabaya	0.07	0.07	0.00	0.00	0.05	0.05	0.00	0.00
REG5 North, West Sumatera	0.07	0.07	0.08	0.07	0.07	0.07	0.08	0.08
REG6 Other Sumatera	0.15	0.15	0.16	0.16	0.14	0.15	0.16	0.17
REG7 Kalimantan	0.08	0.09	0.09	0.10	0.08	0.09	0.09	0.10
REG8 Maluku, Papua, East NT, East Timor, N 'Swesi	0.09	0.09	0.11	0.12	0.08	0.08	0.11	0.11
REG9 Other Regions in Eastern Indonesia	0.14	0.14	0.14	0.13	0.14	0.13	0.14	0.13
N Number of valid observations	32549	32240	83698	81528	48101	47116	62797	61412

Gender-based decomposition analysis

To analyse the sources of female-male wage differentials, a decomposition analysis proposed by Blinder (1973) and Oaxaca (1973) is applied. They utilized the fact that the fitted regression line passes through point of sample means. Therefore, the earning of males and females evaluated at means may be written as a function of the form:

$$(4) \quad \overline{\ln W_m} = \overline{X_m} b_m$$

$$(5) \quad \overline{\ln W_f} = \overline{X_f} b_f$$

$\ln W_m$ and $\ln W_f$ denote mean value of predicted log wages, X_m and X_f denote a vector of observable productivity characteristics for the two groups, while b_m and b_f are the estimated parameters from the wage equation.

The mean difference in the predicted log wages for the two groups is:

$$(6) \quad \overline{\ln W_m} - \overline{\ln W_f} = \overline{X_m} b_m - \overline{X_f} b_f$$

The difference between the male and female coefficient vectors is:

$$(7) \quad \Delta b = b_m - b_f \text{ implying that } b_f = b_m - \Delta b$$

Substituting (6) in (7) and rearranging yields:

$$(8) \quad \overline{\ln W_m} - \overline{\ln W_f} = (\overline{X_m} - \overline{X_f}) b_m + \overline{X_f} \Delta b$$

Equation (8) states that the mean difference of the female-male log wage is the result of: the difference in average endowments, and the “unexplained” or structural factors in the labour market. It is the latter part that has been identified as market discrimination (Goldin and Polachek 1987). Intuitively, if the labour market is gender neutral, then the same endowments will produce the same effects on wages regardless

of gender differences, and hence the regression will produce very similar coefficients ($b_m=b_f$). The difference in the coefficients between men and women, therefore, reflects the bias in the labour market.

The discrimination effects can be derived from both the realized and the potential wages. Using the illustration in Figure 11, for a similar endowment value, the actual or observed female wage is W_o^f , and if there is no discrimination effect, the value of observed male wage (W_o^m) should be equal to W_o^f . Therefore, the effect of discrimination based on the observed or realized wage can be measured as the difference between W_o^m and W_o^f for a given similar endowment level. Similarly, the discrimination effect can also be measured by the difference between W_p^f and W_p^m for a given similar endowment level. Again, if there is no discrimination between males and females, the potential wages for every individual W_p^f and W_p^m should be equal.

The Observed Wage of Wage Workers

The Determination of Wage Workers Earnings

Table 14 below presents the parameter estimates of wage equations for wage workers in urban and rural areas for 1986 and 1997. The dependent variable is log hourly wage, calculated by dividing the monthly wage and monthly working hours. Since the equations for 1986 and 1997 are estimated separately, the time trend variable is not put into the model, and it is implicitly assumed that the time trend, or any changes in price index, is captured by the intercept terms. The t-statistics for individual parameters are large in general, indicating the quality of parameter estimates.

Experience

The impact of experience on earnings is significant. The signs suggest a clear quadratic effect, or an inverted U-shape curve. In other words, earning increases as working experience increases, reaches the peak at a certain point, and then declines. Because year of experience is a linear combination of age and education (Experience = Age – Education – 6), it can also be shown that earning is a quadratic function of age. Furthermore, given a certain value of education, the value of optimal age in which earning reaches the peak can be calculated.

Table 14. Estimates of wage equations for wage workers, 1986 and 1997

Dependent variable: Log Hourly Wages								
Variables	1986				1997			
	Urban		Rural		Urban		Rural	
	Female	Male	Female	Male	Female	Male	Female	Male
(Constant)	3.37	3.61	4.36	4.31	4.74	4.37	4.69	4.14
	<i>23.08</i>	<i>22.28</i>	<i>36.95</i>	<i>32.92</i>	<i>38.69</i>	<i>27.24</i>	<i>29.38</i>	<i>22.72</i>
EXP	0.04	0.05	0.03	0.04	0.03	0.04	0.03	0.03
	<i>18.26</i>	<i>27.25</i>	<i>14.97</i>	<i>30.29</i>	<i>18.68</i>	<i>30.97</i>	<i>12.63</i>	<i>18.87</i>
EXPSQ	-0.04	-0.06	-0.04	-0.05	-0.04	-0.06	-0.04	-0.05
	<i>-9.03</i>	<i>-19.85</i>	<i>-10.46</i>	<i>-21.21</i>	<i>-10.16</i>	<i>-24.27</i>	<i>-9.04</i>	<i>-16.00</i>
EDY1	0.11	0.04	0.01	0.02	0.08	0.00	0.03	0.03
	<i>11.56</i>	<i>5.77</i>	<i>1.65</i>	<i>4.66</i>	<i>10.31</i>	<i>-0.27</i>	<i>3.21</i>	<i>4.74</i>
EDYSQ	0.37	0.37	0.74	0.45	0.36	0.55	0.54	0.31
	<i>6.63</i>	<i>10.99</i>	<i>14.43</i>	<i>14.67</i>	<i>8.76</i>	<i>19.09</i>	<i>10.16</i>	<i>8.73</i>
CHILD	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.02
	<i>-0.20</i>	<i>-0.37</i>	<i>0.30</i>	<i>0.35</i>	<i>1.10</i>	<i>-0.71</i>	<i>1.64</i>	<i>2.92</i>
D	0.47	0.70	-0.08	0.05	0.59	1.45	0.75	1.62
	<i>3.37</i>	<i>4.34</i>	<i>-0.72</i>	<i>0.41</i>	<i>5.04</i>	<i>9.08</i>	<i>4.71</i>	<i>8.91</i>
LHHDWAGE	0.04	0.06	-0.01	0.01	0.04	0.12	0.06	0.14
	<i>2.77</i>	<i>3.82</i>	<i>-0.95</i>	<i>0.49</i>	<i>3.91</i>	<i>8.86</i>	<i>4.28</i>	<i>8.92</i>
HHDEDY	0.00	-0.01	0.00	0.00	0.00	-0.02	0.00	-0.02
	<i>-1.42</i>	<i>-2.36</i>	<i>0.89</i>	<i>-1.99</i>	<i>-2.10</i>	<i>-6.35</i>	<i>-0.36</i>	<i>-5.65</i>
INDS2	-0.03	0.26	0.00	0.18	-0.06	0.11	0.08	0.18
	<i>-0.61</i>	<i>7.97</i>	<i>-0.18</i>	<i>10.36</i>	<i>-1.32</i>	<i>4.43</i>	<i>3.09</i>	<i>10.69</i>
INDS3	-0.10	0.13	-0.07	0.12	-0.26	0.01	-0.07	0.05
	<i>-1.69</i>	<i>3.68</i>	<i>-1.36</i>	<i>3.43</i>	<i>-5.86</i>	<i>0.35</i>	<i>-1.67</i>	<i>1.80</i>
INDS4	-0.17	0.27	0.03	0.27	-0.23	0.11	0.06	0.23
	<i>-3.26</i>	<i>8.76</i>	<i>1.08</i>	<i>18.73</i>	<i>-5.59</i>	<i>4.50</i>	<i>2.26</i>	<i>14.75</i>
INDS5	-0.11	0.30	0.09	0.24	0.02	0.22	0.18	0.24
	<i>-1.89</i>	<i>9.45</i>	<i>2.83</i>	<i>14.75</i>	<i>0.38</i>	<i>8.92</i>	<i>3.15</i>	<i>15.37</i>
REG1	0.18	0.35	0.29	0.36	0.43	0.37	0.63	0.33
	<i>5.48</i>	<i>19.16</i>	<i>6.35</i>	<i>15.65</i>	<i>19.02</i>	<i>26.39</i>	<i>11.12</i>	<i>10.71</i>
REG2	0.08	0.18	0.18	0.20	0.28	0.19	0.19	0.17
	<i>2.18</i>	<i>8.24</i>	<i>6.80</i>	<i>12.30</i>	<i>9.31</i>	<i>10.23</i>	<i>6.61</i>	<i>10.06</i>
REG3	-0.11	0.07	-0.12	0.08	0.08	0.10	0.03	0.08
	<i>-3.03</i>	<i>3.04</i>	<i>-1.10</i>	<i>1.51</i>	<i>2.83</i>	<i>4.94</i>	<i>0.26</i>	<i>1.09</i>
REG5	0.26	0.26	0.34	0.35	0.15	0.16	0.17	0.18
	<i>6.28</i>	<i>10.50</i>	<i>10.66</i>	<i>17.88</i>	<i>5.07</i>	<i>8.16</i>	<i>4.59</i>	<i>8.45</i>
REG6	0.31	0.34	0.46	0.37	0.20	0.20	0.24	0.18
	<i>8.55</i>	<i>18.36</i>	<i>14.69</i>	<i>20.89</i>	<i>7.97</i>	<i>13.62</i>	<i>7.90</i>	<i>10.47</i>
REG7	0.41	0.47	0.58	0.48	0.23	0.29	0.27	0.31
	<i>8.95</i>	<i>21.65</i>	<i>13.81</i>	<i>24.81</i>	<i>8.01</i>	<i>16.65</i>	<i>6.97</i>	<i>15.85</i>
REG8	0.24	0.37	0.40	0.38	0.12	0.21	0.28	0.22
	<i>6.24</i>	<i>17.78</i>	<i>10.15</i>	<i>18.66</i>	<i>4.06</i>	<i>11.73</i>	<i>6.91</i>	<i>10.43</i>
REG9	0.27	0.25	0.28	0.24	0.08	0.05	0.09	0.01
	<i>7.47</i>	<i>12.19</i>	<i>9.76</i>	<i>13.94</i>	<i>3.29</i>	<i>3.36</i>	<i>3.08</i>	<i>0.73</i>

Note: figures in italics are T-statistics

Education

Education plays a significant role in determining individual earnings. In general, the results show that the marginal effect of education was larger for females, and for individuals living in urban areas. Table 15 below presents the estimated marginal effect of education on earnings, evaluated at 3, 6, 9, 12 and 15 years of education. The effect of education on earnings shows a clear upward trend: the marginal effect was larger as the education level increased. There is also a significant

quadratic trend meaning that the increase in marginal effect increased at a faster rate with the increase in education level. This result is similar to previous estimates on the earnings function in Indonesia, which showed that the effect of education on earnings was larger for those with a higher level of education (Manning 1998). One explanation for this is the scarcity of skilled labour in Indonesia, which led to rapid increases in wages of those with higher education. There is also a clear sign that the marginal effect of education declined from 1986 to 1997, especially for females with a higher level of education, even though the marginal effect was still larger compared to males.

Table 15. Marginal effects of education on wages (in %)

Education (years)	1986				1997			
	URBAN		RURAL		URBAN		RURAL	
	Female	Male	Female	Male	Female	Male	Female	Male
3	12.9	5.73	5.67	4.95	10.24	3.15	6.00	4.76
6 (Primary)	15.10	7.92	10.08	7.64	12.38	6.47	9.21	6.62
9 (Junior high)	17.31	10.12	14.50	10.33	14.52	9.78	12.43	8.47
12 (Senior high)	19.51	12.31	18.91	13.02	16.67	13.09	15.65	10.33
15 (Tertiary)	21.71	14.51	23.33	15.71	18.81	16.40	18.86	12.18

It is evident from Table 15 that female and urban groups experienced stronger marginal effects of education. The marginal effect of one year of education on hourly wages for female individuals was estimated at 15.1 per cent for primary school graduates, 19.5 per cent for senior high school graduates, and 21.7 per cent for university graduates in 1986. As expected, these are much larger than the marginal effects of education for the urban male group, which ranged from 5.7 per cent to 14.5 per cent. A one year increase in education could lead to a larger increase in earnings for females partly because of the narrower range of formal sector occupations held by more educated females. In addition, increasing labour demand and employment opportunities for more educated females tended to pull up female wages in urban areas. In rural areas, the marginal effect of education on female wages was also larger than for males, but the difference was less dramatic. This is mainly because the marginal effect of education on female wages in rural areas was generally smaller than urban areas.

The marginal effects of education on male wages in rural and urban areas were relatively similar in 1986, while in 1997, there was a slightly smaller marginal effect

in rural areas. The declining trend of marginal effects in rural areas was also seen for female wages, especially for those with higher education. It seems that the slower growth of the rural economy in the early 1990s led to a weaker demand for educated workers in these areas.

While the marginal effects of education on female wages in urban areas continued to be large in magnitude, their values tended to decline over time. The marginal effect of education among urban females, evaluated at primary school level, declined from 15.1 per cent in 1986 to 12.4 per cent in 1997. In the urban-male group, the marginal effect declined from 7.9 per cent to 6.5 per cent in the same period. One possible explanation for this declining trend is a strong increase in urban workers' level of education, which led to a significant increase in the supply of skilled labour, and a smaller growth of the wage of skilled labour over time. In rural areas, the marginal effects of education on earnings also declined from 1986 to 1997, but the adjustment was less drastic.

Head of the household characteristics

Variables associated with the head of household mattered in determining wages. If an individual was the head of household, his or her earnings tended to be higher, and the marginal effect was stronger for males, both in urban and rural areas. There was also a tendency for a stronger impact in 1997 compared with 1986. For those who were not the head of the household, the income of the household head mattered in determining their wages. The impact of the head of the household's income on the earnings of members of the household was positive, and the marginal effects were larger for male individuals. This is a clear example of how family characteristics matter in determining individual wages.

Predicted Wage of Wage Workers

Predicted wage as a function of age are calculated and presented in Figures 12 and 13 below. The graphs show the predicted or estimated hourly wages for a certain age, given other variables are kept constant at their mean values. The predicted wage in 1997 is deflated by the 1986 consumer price, so that wages in those two years are comparable. The relation between age, education, and predicted hourly wages that are presented in those figures reflect the common characteristics of age earning-profiles. The pattern is clearly an inverted U-curve, in which the wage increased as an individual became older, reached the peak at a certain age, and then declined.

Figures 12 and 13 show that the predicted real wage increased significantly for both females and males, although in general female workers received less than males. One noteworthy trend was that female workers experienced their peak earnings at an older age than males. Comparing geographically, urban real wages were generally 20-40 per cent higher than rural wages, and the urban-rural wage difference increased from 1986 to 1997. Part of the reason for this is the steeper age earning profile of female and male urban wages in 1997, which is a reflection of the sharper increase in urban wages both for males and females from 1986 to 1997.

Figure 14 illustrates the changing patterns in female-male wage ratios from 1986 to 1997. There are some interesting phenomena related to the changing trends. First, a clear U-shape pattern can be discerned for female-male wage ratios with respect to age. The female-male wage ratio tended to decline when an individual gets older, reached the bottom at 30–40 years of age, and then tended to increase afterwards. The reason is technical in nature. As the peak earnings for females is predicted to take place at an older age than for males, the female-male wage ratio tends to decline first before increasing when an individual gets older. In other words, as the age earning profile for males is more concave than that of females, the corresponding wage ratio would be convex with respect to age in nature.

Second, this U-shape pattern might also reflect the gender-based differences in age earning profiles. The female-male wage ratio was lower during the childbearing age for women, which suggests some gender specific effects on earnings. The presence of children under five years old, for example, tends to reduce both labour force participation and wages for women.

And third, the graph indicates clearly that female-male wage ratios tended to increase from 1986 to 1997, suggesting that female wages increased relatively faster than male wages. The increase in female-male wage ratios was more prevalent in urban areas. Does it mean that gender discrimination on wages has decreased for the last decade? The graph does not really answer this question because the increase in female-male wage ratio could be because female education levels had increased faster than that of males. In other words, there are two possible effects that could explain this trend: higher endowment level (such as education) for female workers and/or smaller discrimination effect. The next section answers this question by decomposing

the difference between female and male wages based on endowment effects and residual (or discrimination) effects.

Decomposition Analysis of Wage Workers' Earnings

Urban

In 1986, the differential in the predicted log hourly wage of female and male workers was 0.53.¹¹ Table 16 shows that part of this differential was due to endowment effects (54 per cent), and the rest (46 per cent) was due to discrimination effects. The wage differential decreased to 0.35 in 1997. This reduction of wage differential is the result of a large decline in the discrimination effect, while the endowment effect has been relatively constant. In 1997, the discrimination effect only accounted for 30 per cent of the wage differential.

Table 16. Decomposition of female-male log hourly wage differential in urban areas, 1986-97

Variables	Urban					
	1986			1997		
	Log earning differential	Endowment effects	Discrimination effects	Log earning differential	Endowment effects	Discrimination effects
Constant	0.24	0.00	0.24	-0.35	0.00	-0.35
Experience	0.09	0.11	-0.02	0.04	0.10	-0.06
EXP	0.25	0.18	0.07	0.18	0.19	-0.01
EXPSQ	-0.17	-0.08	-0.09	-0.14	-0.09	-0.05
Education	-0.56	0.05	-0.60	-0.66	0.01	-0.67
EDY1	-0.58	0.02	-0.60	-0.88	0.00	-0.88
EDYSQ	0.02	0.02	0.00	0.22	0.01	0.21
Household	0.28	0.08	0.19	0.99	0.11	0.87
CHILD	0.00	0.00	0.00	-0.02	0.00	-0.02
D	0.45	0.42	0.02	0.97	0.88	0.09
LHHDWAGE	-0.17	-0.36	0.19	0.05	-0.84	0.89
HHDEDY	0.01	0.02	-0.02	-0.01	0.07	-0.08
Industry	0.38	0.01	0.38	0.33	0.02	0.31
INDS2	0.05	0.00	0.04	0.04	0.00	0.04
INDS3	0.02	0.00	0.02	0.05	0.00	0.05
INDS4	0.24	-0.01	0.25	0.21	-0.01	0.22
INDS5	0.08	0.02	0.06	0.03	0.03	0.01
Regional	0.10	0.04	0.06	0.01	0.01	0.00
REG0	0.03	0.01	0.02	-0.01	0.00	-0.01
REG2	0.01	0.00	0.01	0.00	0.00	-0.01
REG3	0.01	0.00	0.02	0.00	0.00	0.00
REG5	0.00	0.00	0.00	0.00	0.00	0.00
REG6	0.02	0.02	0.00	0.01	0.00	0.00
REG7	0.02	0.02	0.00	0.01	0.00	0.00
REG8	0.01	0.00	0.01	0.01	0.00	0.01
REG9	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.53	0.28	0.25	0.35	0.25	0.11
% of log earning differential	100	54	46	100	70	30

A detailed analysis on the source of the wage differential shows that almost all variables in experience, education, household characteristics, industry, and regional dummies groups showed positive endowments effects. This indicates that female workers had less productivity endowment than males, resulting in lower female wages. The sign and magnitudes for discrimination effects are more varied. Negative discrimination effect on a specific variable indicates that the related variable contributes to an equalizing role. The strongest equalizer was education, indicating that returns to education were higher for women than for men. Experience and education of the head of household also contributed to smaller discrimination effects. Returns to experience were stronger for women than men, especially for the higher age group (sign of age square coefficients is negative). Similarly, if the head of the household's education level was higher, a female household member tended to receive higher earnings. This could be an indirect effect, since the higher the education level of the head of household, it is more likely that the education level of the household members will be higher. Furthermore, since it has been suggested that the returns on education were higher for female workers, the final effect was the smaller wage differential.

Rural

As discussed earlier, the wage gap in rural areas was lower than in urban areas. In 1986, the differential in the predicted log earnings between men and women in rural areas was 0.39 (compared to 0.53 for urban areas), as shown in Table 17. The endowment difference between female and male workers was 44 per cent, also smaller than in the urban areas. This is highly related to human capital variables, educational level and years of experience, which were generally more gender-equal in rural areas.

Table 17. Decomposition of log earning differentials in rural areas, 1986-97

Variables	Rural					
	1986			1997		
	Log earning differential	Endowment effects	Discrimination effects	Log earning differential	Endowment effects	Discrimination effects
Constant	-0.05	0.00	-0.05	-0.55	0.00	-0.55
Experience	0.14	0.04	0.09	-0.02	0.03	-0.05
EXP	0.21	0.04	0.17	0.00	0.03	-0.04
EXPSQ	-0.07	0.00	-0.07	-0.02	0.00	-0.02
Education	-0.03	0.06	-0.09	-0.14	0.02	-0.16
EDY1	0.08	0.02	0.06	0.02	0.01	0.00
EDYSQ	-0.11	0.04	-0.15	-0.15	0.01	-0.16
Household	0.14	0.00	0.14	0.93	0.09	0.83
CHILD	0.00	0.00	0.00	0.00	0.00	-0.01
D	0.04	0.03	0.02	1.03	0.92	0.11
LHHDWAGE	0.12	-0.03	0.15	-0.07	-0.86	0.79
HHDEDY	-0.02	0.00	-0.02	-0.03	0.03	-0.06
Industry	0.17	0.03	0.14	0.13	0.03	0.10
INDS2	0.03	-0.01	0.03	0.01	-0.01	0.03
INDS3	0.00	0.00	0.00	0.01	0.00	0.01
INDS4	0.11	0.02	0.08	0.06	0.00	0.06
INDS5	0.04	0.02	0.01	0.05	0.04	0.00
Regional	0.02	0.03	-0.01	-0.01	0.01	-0.03
REG0	0.01	0.01	0.00	-0.01	0.00	-0.01
REG2	0.00	0.00	0.00	0.00	0.00	0.00
REG3	0.00	0.00	0.00	0.00	0.00	0.00
REG5	0.00	0.00	0.00	0.00	0.00	0.00
REG6	0.00	0.01	-0.01	-0.01	0.00	-0.01
REG7	0.01	0.02	0.00	0.01	0.01	0.00
REG8	0.00	0.01	0.00	0.00	0.00	0.00
REG9	-0.01	0.00	0.00	-0.01	0.00	-0.01
Total	0.39	0.17	0.22	0.33	0.19	0.14
% of log earning differential	100	44	56	100	58	42

In 1997, the female-male wage gap declined slightly to 0.33. However, unlike in urban areas, in which both endowment and discrimination effects declined, the gap due to endowment effects rose in rural areas, mostly due to household factors. A more gender-neutral labour market contributed to the narrowing wage gap in rural areas especially with regard to the reference group. Reduction in discrimination because of education, which became stronger in 1997, remained the main factor. However, rural areas displayed similar trends to urban areas with regard to the strong division of labour in the family. The effect of family income on the wage gap became very strong in 1997 compared to 1986.

Turning to the discrimination effects, education did not contribute as much in reducing the wage gap between men and women in rural areas as in urban areas. This indicates that returns to education were equally low in rural areas for both men and women. Years of experience even contributed to a widening wage gap between men

and women in rural areas. Household variables and industry dummies also contributed to the widening gap in rural areas.

The Potential Wage of Individuals

The Determination of Individual's Potential Wage

The empirical estimates of potential wage equations for male and female workers are presented in Table 18. The dependent variable is log hourly wage. Similar to the actual wage equation previously, the time trend in the equation is not included. The values of t-statistics in general indicate the quality of the parameter estimates. The significance of *lambda* clearly shows that this added variable has functioned well in correcting the error from the selection-bias, and therefore has improved the estimation results. With the inclusion of *lambda*, the parameter estimates of the earnings function are consistent and can be used to derive statistical inferences for the whole population rather than just the population of wage workers.

The estimated coefficients of *lambda* are generally positive, suggesting that the estimated potential wage for the whole population was somewhat lower than the estimated wage for wage workers. The estimated coefficients of *lambda* in 1997 are generally larger than in 1986, even though the mean values of *lambda* are similar in those two years. The larger value of *lambda* illustrates the greater impact of self-selection bias in the wage estimation, meaning that the process of self-selection was becoming more prevalent from 1986 to 1997. This could be associated with the fact that those who decide to work as employees in the formal labour market tend to have a larger endowment base (such as higher levels of education) than those who decide not to enter the labour market. In other words, the difference between the realized or observed wages for wage workers, and the unobserved wages for other individuals was larger in 1997 than in 1986.

Table 18. Empirical estimates of the potential wages for individuals

Variables	1986				1997			
	Urban		Rural		Urban		Rural	
	Female	Male	Female	Male	Female	Male	Female	Male
(Constant)	2.59	3.30	4.92	5.00	3.57	3.92	4.35	4.36
	<i>8.48</i>	<i>16.87</i>	<i>28.15</i>	<i>33.42</i>	<i>24.12</i>	<i>21.27</i>	<i>19.78</i>	<i>20.02</i>
EXP	0.05	0.06	0.03	0.03	0.05	0.05	0.04	0.03
	<i>16.42</i>	<i>18.33</i>	<i>12.70</i>	<i>18.83</i>	<i>31.77</i>	<i>23.85</i>	<i>17.15</i>	<i>13.74</i>
EXPSQ	-0.06	-0.08	-0.03	-0.04	-0.07	-0.08	-0.05	-0.04
	<i>-8.71</i>	<i>-13.86</i>	<i>-8.27</i>	<i>-12.45</i>	<i>-19.39</i>	<i>-18.93</i>	<i>-11.77</i>	<i>-10.55</i>
EDY1	0.07	0.03	0.03	0.03	0.04	-0.002	0.02	0.03
	<i>5.02</i>	<i>5.60</i>	<i>3.40</i>	<i>5.92</i>	<i>4.28</i>	<i>-0.29</i>	<i>2.32</i>	<i>4.98</i>
EDYSQ	0.70	0.41	0.51	0.26	0.82	0.61	0.65	0.26
	<i>5.53</i>	<i>11.03</i>	<i>6.89</i>	<i>5.96</i>	<i>15.56</i>	<i>19.30</i>	<i>9.40</i>	<i>5.63</i>
CHILD	-0.01	0.0004	0.001	0.002	0.01	0.003	0.02	0.02
	<i>-0.82</i>	<i>0.09</i>	<i>0.18</i>	<i>0.40</i>	<i>0.77</i>	<i>0.75</i>	<i>1.86</i>	<i>3.12</i>
D	0.57	0.70	-0.08	-0.02	0.58	1.49	0.70	1.63
	<i>3.96</i>	<i>4.39</i>	<i>-0.68</i>	<i>-0.15</i>	<i>4.93</i>	<i>9.38</i>	<i>4.42</i>	<i>8.99</i>
LHHDWAGE	0.04	0.06	-0.01	-0.001	0.04	0.12	0.06	0.14
	<i>2.88</i>	<i>3.80</i>	<i>-0.91</i>	<i>-0.09</i>	<i>3.88</i>	<i>8.95</i>	<i>4.26</i>	<i>8.92</i>
HHDEDY	-0.004	-0.01	0.002	-0.004	-0.004	-0.02	-0.001	-0.01
	<i>-1.41</i>	<i>-2.86</i>	<i>0.82</i>	<i>-1.63</i>	<i>-2.29</i>	<i>-7.00</i>	<i>-0.43</i>	<i>-5.07</i>
INDS2	-0.04	0.26	0.002	0.18	-0.08	0.11	0.07	0.18
	<i>-0.75</i>	<i>7.95</i>	<i>0.06</i>	<i>10.55</i>	<i>-1.80</i>	<i>4.26</i>	<i>2.66</i>	<i>10.73</i>
INDS3	-0.11	0.13	-0.06	0.12	-0.28	0.00	-0.09	0.05
	<i>-1.89</i>	<i>3.66</i>	<i>-1.19</i>	<i>3.50</i>	<i>-6.49</i>	<i>0.11</i>	<i>-2.18</i>	<i>1.86</i>
INDS4	-0.18	0.27	0.04	0.27	-0.26	0.10	0.04	0.23
	<i>-3.46</i>	<i>8.76</i>	<i>1.43</i>	<i>18.83</i>	<i>-6.43</i>	<i>4.29</i>	<i>1.60</i>	<i>14.77</i>
INDS5	-0.12	0.30	0.10	0.24	0.004	0.22	0.17	0.24
	<i>-2.11</i>	<i>9.45</i>	<i>3.02</i>	<i>14.85</i>	<i>0.06</i>	<i>8.80</i>	<i>3.01</i>	<i>15.39</i>
REG1	0.13	0.35	0.31	0.33	0.40	0.36	0.62	0.33
	<i>3.33</i>	<i>19.20</i>	<i>6.82</i>	<i>14.44</i>	<i>17.66</i>	<i>26.33</i>	<i>10.98</i>	<i>10.58</i>
REG2	0.03	0.17	0.18	0.19	0.23	0.18	0.19	0.17
	<i>0.83</i>	<i>7.37</i>	<i>6.85</i>	<i>12.00</i>	<i>7.65</i>	<i>9.57</i>	<i>6.53</i>	<i>10.03</i>
REG3	-0.16	0.07	-0.09	0.06	0.07	0.09	0.04	0.08
	<i>-3.88</i>	<i>2.95</i>	<i>-0.82</i>	<i>1.09</i>	<i>2.48</i>	<i>4.22</i>	<i>0.41</i>	<i>1.15</i>
REG5	0.19	0.24	0.37	0.38	0.05	0.14	0.14	0.20
	<i>3.79</i>	<i>9.35</i>	<i>11.34</i>	<i>18.88</i>	<i>1.64</i>	<i>6.70</i>	<i>3.74</i>	<i>8.49</i>
REG6	0.22	0.33	0.52	0.43	0.09	0.18	0.22	0.20
	<i>4.40</i>	<i>17.43</i>	<i>15.22</i>	<i>21.35</i>	<i>3.53</i>	<i>11.99</i>	<i>6.78</i>	<i>9.78</i>
REG7	0.31	0.46	0.63	0.52	0.14	0.28	0.25	0.33
	<i>5.35</i>	<i>21.08</i>	<i>14.48</i>	<i>25.62</i>	<i>4.89</i>	<i>15.84</i>	<i>6.28</i>	<i>15.25</i>
REG8	0.18	0.37	0.47	0.45	0.02	0.19	0.24	0.24
	<i>4.03</i>	<i>17.75</i>	<i>11.04</i>	<i>19.56</i>	<i>0.83</i>	<i>10.88</i>	<i>5.50</i>	<i>9.80</i>
REG9	0.17	0.22	0.31	0.28	0.00	0.03	0.08	0.03
	<i>3.40</i>	<i>10.30</i>	<i>10.57</i>	<i>15.30</i>	<i>0.05</i>	<i>2.09</i>	<i>2.48</i>	<i>1.48</i>
LAMBDA	1.16	0.40	-0.77	-0.79	1.79	0.57	0.46	-0.30
	<i>2.92</i>	<i>2.76</i>	<i>-4.30</i>	<i>-6.35</i>	<i>13.50</i>	<i>4.74</i>	<i>2.23</i>	<i>-1.85</i>

Note: figures in italics are T-statistics

The empirical results show that the impact of education on individual earnings is strong. Similar to the observed wage equation, the marginal effect of education was larger for females and for individuals living in urban areas. The effect of education on earnings also shows how the marginal effect became larger as the education level increased, and the significant quadratic trend shows that the marginal effect in fact increased at a faster rate than the increase in education. Table 19 below presents the

estimated marginal effect of education evaluated at 3, 6, 9, 12 and 15 years of education. This difference in marginal effects between males and females for the whole population was much larger than those for wage workers only. In rural areas, the difference was less dramatic even though there was a consistent pattern that the marginal effects were stronger for females.

Table 19. Marginal effects of education on individual's potential wages (in %)

Education (years)	1986				1997			
	URBAN		RURAL		URBAN		RURAL	
	Female	Male	Female	Male	Female	Male	Female	Male
3	11.56	5.91	5.92	4.48	8.62	3.51	6.07	4.63
6 (Primary)	15.76	8.39	8.96	6.01	13.53	7.20	10.00	6.17
9 (Junior high)	19.95	10.86	12.00	7.55	18.44	10.88	13.92	7.72
12 (Senior high)	24.14	13.34	15.05	9.09	23.34	14.57	17.85	9.26
15 (Tertiary)	28.34	15.82	18.09	10.62	28.25	18.25	21.77	10.80

While the marginal effects of education on earnings in urban areas continued to be large in magnitude, their values tended to decline overtime. The marginal effect of education for urban females, evaluated at primary school level, declined from 15.8 per cent in 1986 to 13.5 per cent in 1997. In the urban-male group, the marginal effect declined from 8.4 per cent to 7.2 per cent in the same period. In rural areas, the marginal effects of education on earnings were more or less constant over time. This is different from the results for wage workers, whose marginal effects tended to decline over time in rural areas.

Predicted potential wage in the urban manufacturing industry

Only the calculation of predicted potential wage for the urban manufacturing sector is presented for two reasons. First, the observed wage data was available only for those who were wage workers. Therefore, it is impossible to predict the general wage for the whole population without knowing the industry specification. Due to such limitations, the predicted wage for any individual in the labour force was derived as if he or she worked in the manufacturing sector.¹² Second, given that the proportion of wage workers in rural areas is generally small, the focus was solely on the potential wage in urban areas.¹³

Predicted values of the potential wages in the urban manufacturing sectors for males and females as function of age were calculated and are presented in Figure 15. These potential wages are the predicted values of W_p^f and W_p^m illustrated in Figure 11

previously. These predicted values were calculated based on the parameter estimates of the potential wage equations and the mean values of the independent variable derived from the whole population in urban areas. In other words, the graph of potential wages represents the predicted or estimated hourly wages in the manufacturing sector for males and females at a certain age in urban areas, in 1986 and 1997. The predicted wage for 1997 was deflated by the consumer price deflator, so that wages in those two years are comparable.

Similar to the predicted observed wage in the previous section, the predicted age-earning profile for the whole population also shows a clear inverted U-shape curve. The results also show that the predicted wage in the manufacturing sector for the whole population was lower than the predicted wage for wage workers ($W_p^f < W_o^f$; $W_p^m < W_o^m$). This is consistent with the premise that the potential wage for the whole population was lower than the realized wages for wage workers (illustrated in Figure 15). Calculated at the mean values of the independent variables, the predicted wages of wage workers could be twice as large as the predicted manufacturing wages for the whole population in urban areas. For example, the peak hourly wage for urban male wage workers in 1986 was estimated at around Rp550 in 1986, while the estimated potential wage for the whole urban male population in the manufacturing sector was Rp300. Similar trends occur in 1997.

Between 1986-97, since the potential female wage increased faster than potential male wages, the female-male potential wage difference was declining (Figure 16). This trend is similar to the smaller male-female wage gap derived from the predicted wage of the wage workers in the previous section. But, it is also seen that the female-male wage ratios calculated from the predicted wages for the whole population (at around 0.3 to 0.4) was lower than the ratios derived from the predicted wages of the wage workers (at around 0.7 to 0.8). This suggests that the female-male realized wage differentials (of the wage workers) were in fact smaller than the potential female-male wages for the whole population. Using the illustration in Figure 11, this is similar to saying that the distance between W_o^m and W_o^f was smaller than W_p^m and W_p^f .

Does it mean that the *actual* female-male wage discrimination calculated from the wage workers was in fact smaller than the potential wage discrimination for the

whole population? The answer depends on the decomposition analysis of the potential wages, as given below.

Decomposition Analysis of the Potential Wage in the Urban Manufacturing Sector

Using a similar decomposition technique as discussed previously, it is seen that the differential in potential wages between men and women was much higher than the differential in actual wages. In 1986, the differential in the predicted log potential wages between men and women in urban manufacturing was 1.15 (which is equivalent to saying that average potential male wages in nominal terms was 3.15 times higher than female wages). This is much higher than the ratio for actual wages discussed previously, which was 1.7.

The factors explaining the male-female potential wage differentials were also different to the actual wage. The discrimination effect accounted for 64 per cent of the potential wage difference, while it only accounted for 46 per cent of the actual wage difference (Table 20). Based on these findings, it could be speculated that the self-selection bias among women was quite strong. Women who faced discrimination in labour markets were discouraged from entering the labour market, leaving only a small proportion of women in the labour force who were lucky enough to experience less discrimination.

Nevertheless, the gap in potential wage of both genders had been narrowing between 1986-97. The log of potential earning differential between men and women had been declining from 1.15 in 1986 to 0.93 in 1997. This is similar to saying that while in 1986, the potential wage for male workers was 3.15 times higher than for females, in 1997, this difference had declined to 2.54. Moreover, the narrowing of the potential wage gap was the result of a reduction in discrimination effects. As mentioned earlier, the contribution of discrimination effects in 1986 was 64 per cent whereas it declined to 51 per cent in 1997.

A more detailed analysis on the source of discrimination effects reveals that a large proportion of discrimination was due to sector and region specific effects, while education was the main equalizing factor. In 1986, education effects reduced discrimination by 0.4 point of log potential earning differentials, and by 0.45 points for 1997. For household factors, the positive discrimination effect adds to the endowment effect, resulting in a greater earnings differential due to household factors.

Moreover, the discrimination effect due to household factors increased from 0.04 in 1986 to 0.4 in 1997.

Table 20. Decomposition of log potential earning differentials in the urban manufacturing industry

	Urban					
	1986			1997		
	Log earning differential	Endowment effects	Discrimination effects	Log earning differential	Endowment effects	Discrimination effects
Constant	0.71	-	0.71	0.35	-	0.35
Experience	(0.05)	(0.01)	(0.03)	(0.04)	0.01	(0.05)
EXP	0.02	(0.08)	0.10	(0.02)	(0.05)	0.03
EXPSQ	(0.07)	0.07	(0.13)	(0.02)	0.06	(0.08)
Education	(0.29)	0.11	(0.40)	(0.37)	0.08	(0.45)
EDY1	(0.21)	0.04	(0.25)	(0.30)	(0.00)	(0.30)
EDYSQ	(0.08)	0.07	(0.15)	(0.07)	0.08	(0.15)
Household	0.35	0.32	0.04	0.77	0.37	0.40
CHILD	0.01	(0.00)	0.01	(0.00)	(0.00)	(0.00)
D	0.28	0.27	0.01	0.70	0.64	0.07
LHHDWAGE	0.08	0.04	0.04	0.10	(0.33)	0.44
HHDEDY	(0.02)	0.00	(0.02)	(0.04)	0.07	(0.10)
Industry	0.30	-	0.30	0.18	-	0.18
INDS2	0.30	-	0.30	0.18	-	0.18
INDS3	-	-	-	-	-	-
INDS4	-	-	-	-	-	-
INDS5	-	-	-	-	-	-
Regional	0.11	0.01	0.11	0.04	0.00	0.04
REG0	0.03	0.00	0.03	(0.00)	0.00	(0.00)
REG2	0.01	(0.00)	0.01	(0.00)	0.00	(0.00)
REG3	0.01	(0.00)	0.02	0.00	(0.00)	0.00
REG5	0.00	(0.00)	0.00	0.01	(0.00)	0.01
REG6	0.02	0.00	0.02	0.01	0.00	0.01
REG7	0.01	0.00	0.01	0.01	0.00	0.01
REG8	0.02	0.00	0.02	0.01	0.00	0.01
REG9	0.01	(0.00)	0.01	0.00	(0.00)	0.00
Total	1.15	0.42	0.73	0.93	0.46	0.48
% of log earning differential	100.00	36.49	63.51	100.00	48.95	51.05

CONCLUSION

The rapid process of economic liberalization from the 1980s to the late 1990s led to a remarkable transformation in the Indonesian economy, strong economic performance and massive structural transformation. Resources moved from primary and traditional sectors like agriculture and mining to modern sectors such as manufacturing, trade, services, and finance.

The changing structure of the economy also led to changes in the pattern of employment and wages in the labour market. During the period of economic liberalization from the early 1980s to the late 1990s, the labour market was characterized by a rapid process of formalization and urbanization. Since the early 1980s, urban employment increased very rapidly for both males and females, while rural agricultural employment started to decline only after 1990, when non-agricultural employment started to emerge in rural areas.

The share of females in the labour market increased rapidly from 1971 to 1986, and then flattened up to 1997. Since 1986, a different pattern between urban and rural female labour force participation emerged. While female participation in the urban-formal-non-agricultural sector increased, the share in rural-informal-agricultural sectors declined.

The Determinants Of Labour Force Participation

During the period of liberalization, there was a tendency for females to stay longer in the labour market. The value of age at which the LFP reached the peak was generally smaller for women in 1986 and 1990. But in 1997, these peak-ages for women and men were similar, which suggests that women seemed to stay longer in the labour force in recent years, and that there was no significant difference between male and female LFP in this aspect.

Education played a significant role in determining LFP, especially in urban areas. There appears to be a general trend from the data in 1986 to 1990 that the marginal effect of education on LFP was stronger for females than for males, and for the labour force in urban areas compared to rural areas. However, in 1997, the marginal effects of education on LFP were similar for males and females, even though the effect was still stronger in urban areas. One explanation for larger marginal

effects of education in 1997 was that the education level was in general higher in 1997.

The estimated model confirms the “household division of labour” hypothesis. The probability of an individual female entering the labour market declines significantly if she is married, or has more dependent children in the family. On the contrary, being married and having more dependent children increases the probability of an individual male entering the labour market.

The model also confirms the theory of individual LFP in which fixed income could increase the reservation wage and therefore, lower the chances of taking a job offer. Higher fixed income, for example, the interest income or spouse’s income, would certainly reduce the necessity and the probability of an individual participating in the labour market. When the individual is not a head of household, the impact of the education and earnings (wage) of the head of the household on the LFP of household members was generally negative. In other words, higher education and income of the household head led to a lower probability of household members entering the labour market. Education and income of the household head are good proxies of fixed income, and the effects of those two variables on an individual’s decision to participate in the labour markets were generally negative.

Decomposition analysis based on the estimated LFP equation suggests that the urban labour market was less discriminating against females. This is demonstrated by the narrowing urban female-male LFP gap during 1986-97, which can be explained more by the decline of structural factors. Important structural factors that contributed to the closing gap were age, wage of the household head, and the education level of the household head. However, the closing of the gap due to structural effects has been offset by an almost equally widening LFP gap due to endowment effects. Therefore, the LFP gap between men and women in urban area had not narrowed much during the period between 1986-97.

In rural areas, however, the LFP gap had widened during 1986-97, as male LFP was relatively constant while women’s LFP had declined considerably. Both endowment and structural factors contributed to the widening of the gap, but the role of endowment effects was greater. One reason was that the role of education as an equalizer did not appear in rural areas, given the nature of the rural labour market that was more unskilled-labour intensive.

The Determinants Of Wages

One important finding in the study is the changing patterns of actual female-male wage ratios from 1986-97. First, observed wage ratios with respect to age reveals a U-shape pattern. Female-male wage ratio tended to decline when an individual became older, reached the bottom at the age of 30-40 years, and then tended to increase afterwards. Second, actual wage ratios tended to increase from 1986 to 1997, which implies that female wages increased relatively faster than male wages, and that the female-male wage differentials tended to decline over time.

A similar trend is also observed for the female-male potential wage ratio. However, the potential wage ratios were much lower than the observed wage ratios. This suggests that the realized female-male wage differentials (of the wage workers) were smaller than the potential female-male wages for the whole population. In other words, the realized male-female wage differential was smaller than the potential wage differentials.

Decomposition analysis reveals that the main factor contributing to the smaller actual wage gap was the reduction in discrimination, especially for uneducated women. Education continued to be an important factor contributing to the closing of the wage gap. However, in rural areas, the wage gap between men and women only declined slightly in the same period. Unlike in urban areas, in rural areas, the smaller discrimination effect was offset by the widening endowment gap.

The difference in the potential wage of female and male workers in general was much higher than the difference in the actual wage. A considerable proportion of the difference in potential wages between men and women was attributable to discrimination effects. This may suggest that the impact of self-selection bias on wages was stronger for women compared to men. Women who faced or expected some form of wage discrimination were discouraged from entering the labour market. As a result of this self-selection process, there would be only a small proportion of women in the labour force who were lucky enough to experience less discrimination and receive relatively higher wages. Nevertheless, the gap in potential wages between men and women had also been narrowing between 1986-97, with education being the most important factor contributing to the narrowing of the potential wage gap.

Suggestions for Further Research

The LFP and wage equations were estimated separately using data from different years. The data set for each year contains around 200,000-250,000 observations. Therefore, each data set was treated independently, and the time trend variable was not included in any of the equations. While this separate estimation technique is advantageous due to its simplicity, it has the weakness of hiding the effects of time trend or structural changes. It was implicitly assumed that time trends, or any structural changes such as price changes that occurred between periods were captured in the intercept terms.

Alternatively, the scope of this research could be expanded using more advanced techniques. Instead of estimating separately, the data sets could be pooled and estimated as panel data. However, the pooled data set may be very large and increase the complexity of the estimation. Reducing the number of observations could compensate for this problem.

NOTES

1. For further discussion see Feridhanusetyawan (2000), Hill (1996) and Pangestu (1996).
2. Part of this chapter is taken from Feridhanusetyawan (2000a)
3. The demarcation of sub-periods is consistent with Hill (1996) and Pangestu (1996).
4. See Greene (1994) or Maddala (1983) for a standard Probit estimation procedure.
5. The value of the marginal effect is calculated as: $\partial LFP / \partial X = \beta \cdot \phi(X'\beta)$ evaluated at means on X , where f is the normal density function.
6. *Sakernas* micro data 1986 and 1990 do not have data on marital status.
7. When the marginal effects is evaluated at the mean values of education, the value of the marginal effect could be negative because the mean value of education could be smaller than the value of education in which the LFP curve reaches the minimum in a quadratic curve.
8. See Blinder (1973) and Oaxaca (1973).
9. This is the same estimation as in the previous chapter. But here, the dependent variable is set to equal to one if the individual is participating in the formal labour market by becoming an employee. In the previous section on labour force participation, LFP is set equal to one if an individual is participating in the labour market, either in the informal or in the formal sectors.
10. Wage workers, or employees are part of the formal sector labour market.
11. This is equivalent to saying that average male wages in nominal term was 1.7 times higher than that of females.
12. In the calculation, this is done by setting the industrial dummy variable equal to one for the manufacturing sector and zero for the others.
13. As mentioned by Feridhanusetyawan and Aswicahyono (2001:51), the share of wage workers in total working age population was 21 to 26 per cent in urban areas and 10 to 14 per cent in rural areas during the period. The proportion of wage workers in the

manufacturing sector is even smaller at around 4-5 per cent of the total working age population in urban areas, and around 1.6 to 2.5 per cent in rural areas.

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TABLE 1. Indonesia: Changes in policy direction and economic conditions

	1967-72 Rehabilitation & Stabilization	1973-81 Oil Boom	1982-85 Initial Oil Price Decline	1986-97 (Pre-crisis) Rapid Oil Price Decline & Increased capital Inflow
Economic Setting				
GDP Growth	High – 10 per cent p.a.	Moderately high – 7-8 per cent p.a.	Slow– 3-5 per cent p.a.	Moderately high– 5-8 per cent p.a.
Debt Service Ratio (DSR) as per cent of Total Exports	14-20	14-20	20-25	30-38
Inflation	1-10 per cent (Average: 6 per cent)	10-47 per cent (Average: 20 per cent)	4-12 per cent (Average: 8 per cent)	5-10 per cent (Average: 8 per cent)
Oil as per cent of exports	60	60-80	60-70	50
Manufacturing as per cent of exports	1	1-3	4-11	18-25
Oil as per cent of Government Revenue	50	60-70	50-60	40-50
Changes in external environment		Sharp increase in oil price (1973), non-oil commodity boom (1975-79), second oil price increase (1979)	Decline in oil prices; decline in primary commodity prices.	Sharp decline in oil prices and further decline in primary commodity prices. By 1988, stable oil prices, followed by massive capital inflows.
Macro Policy				
Fiscal	Relatively prudent	Balanced budget, high government spending	Austerity, the beginning of restricted mobilization	Continued austerity and restricted mobilization
Monetary	Anti inflation	Debt sterilization, oil money – credit ceiling failure	Tight	Tight, but difficult to target both inflation and exchange rate
Exchange rate	Unify multiple exchange rates; devaluation – 1971; open capital account.	Devaluation - 1978, Dutch Disease; Beginning 1978: Managed float	Devaluation 1983	Devaluation 1986 and 1988; Depreciation at 5-6 per cent a year since then
Industrial Policy	Initial Phases Import substitution (final goods)	Continued Import Substitution (IS) (international and capital goods)	Continued IS – industrial deepening; localization. Begin export orientation	Export oriented Strong non-oil exports Some inconsistencies (due to vested interest group)
Trade Policy	Liberalized in the early years, followed by the beginning of protection in the later years	Increased protection (some decline, 1980), mainly tariffs; High and variable Effective Rates of Protection	Increased protection (proliferation of Non Tariff Barriers) Some export promotion	Decline in protection, Strong export promotion; Some mixed signals on sensitive sectors
Investment	Liberal	Increasingly restrictive	Still restrictive	Fall in restrictions
Financial Policy	Open (increased competitiveness)	Closed; Banks channel credit from oil money	Still closed but increased competitiveness	Open, deregulation, but then followed by re-regulation; Increased competitiveness

Source : Feridhanusetyawan (2000a) ; Updated from Pangestu (1996)

Figure 1. Indonesia: Structural Change, 1965-96

Source: Central Board of Statistics, various years



Figure 2. Indonesia: Composition of Exports

Source: Central Board of Statistics, various years

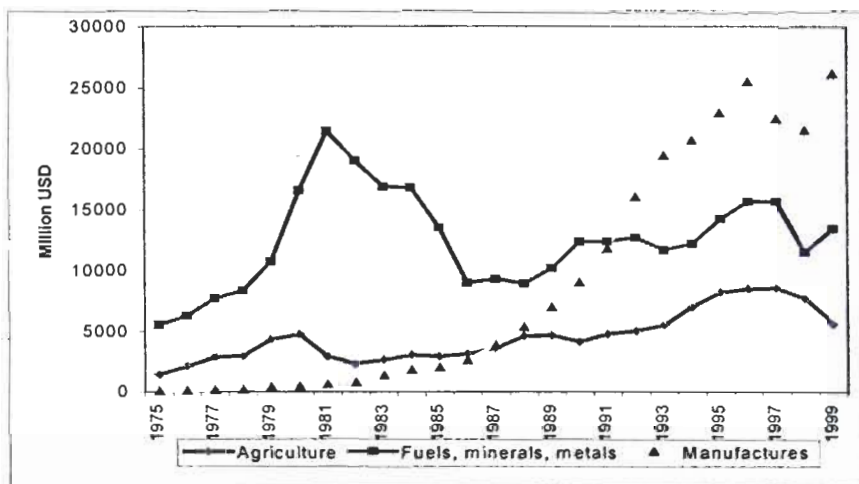


Figure 3. The composition of the Indonesian labour force
(In millions of people, figures in brackets are in per cent)
 Source: Central Board of Statistics, SAKERNAS (various years)

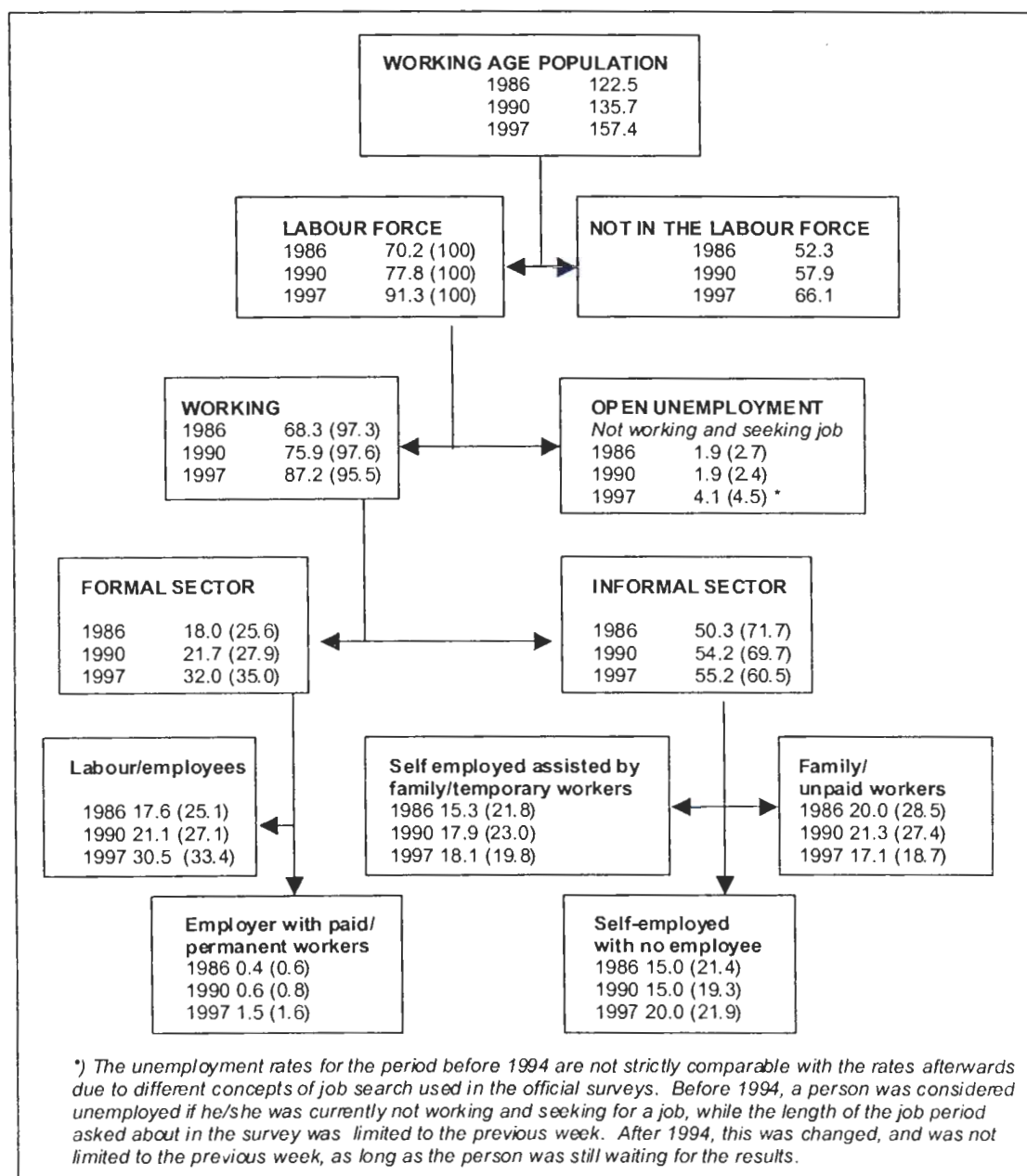
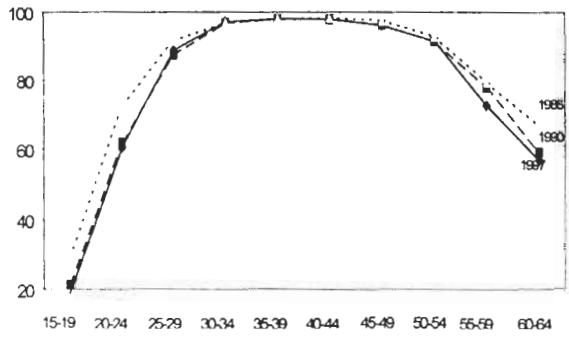
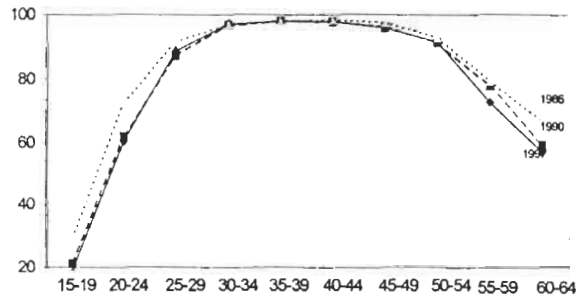


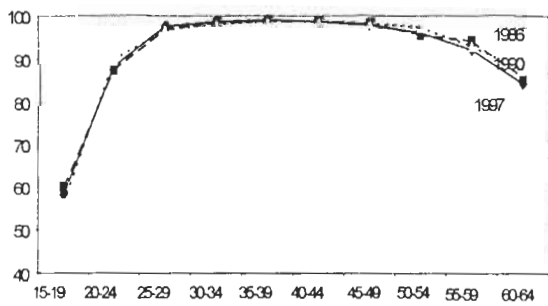
FIGURE 4. Male Labor Force Participation Rate by age group



a) Urban + Rural

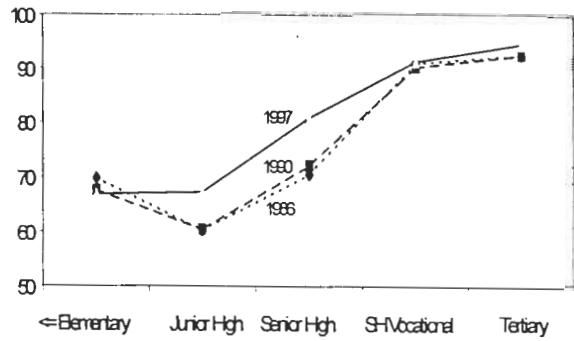


b) Urban

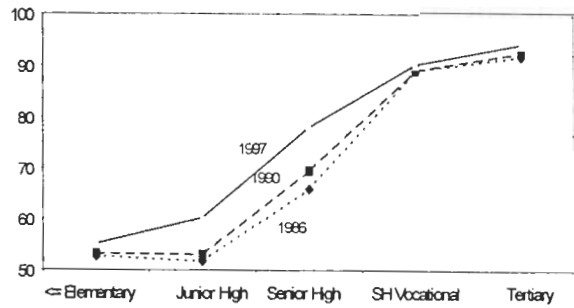


c) Rural

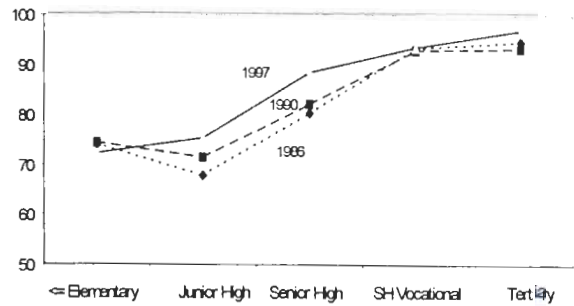
FIGURE 5. Male Labor Force Participation Rate by Educational Attainment



a) Urban + Rural



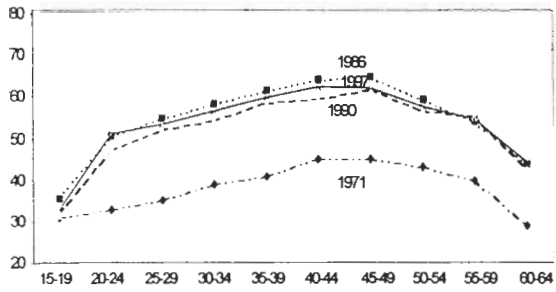
b) Urban



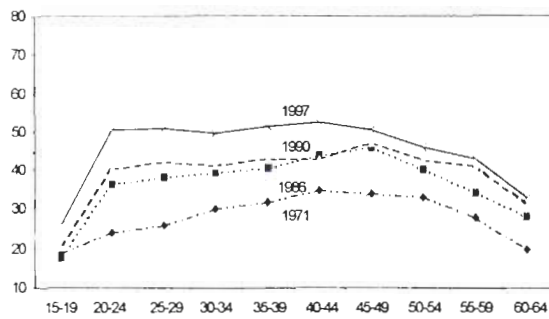
c) Rural

Source: Central Board of Statistics, SAKERNAS (various years)

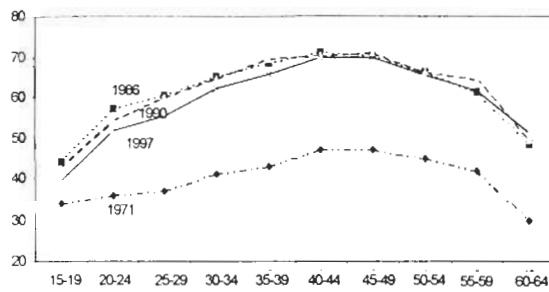
FIGURE 6. Female Labor Force Participation Rate by age group



a) Urban + Rural

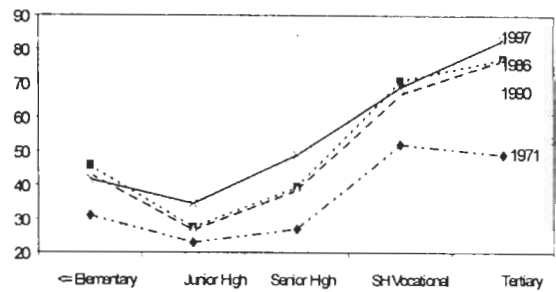


b) Urban

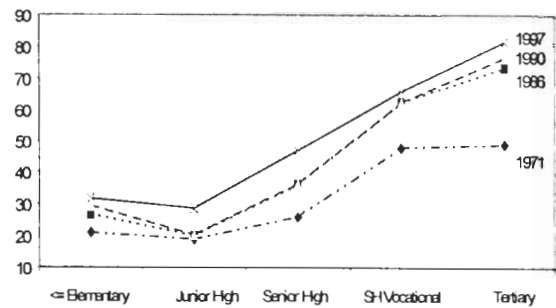


c) Rural

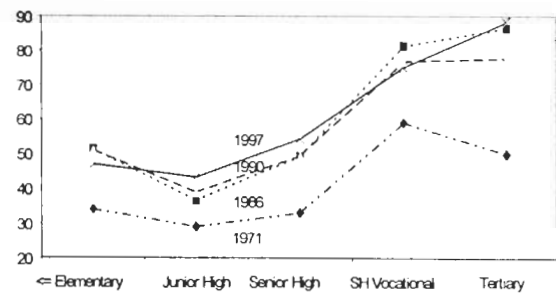
FIGURE 7. Female Labor Force Participation Rate by Educational Attainment



a) Urban + Rural



b) Urban



c) Rural

Source: Central Board of Statistics, SAKERNAS (various years)

Figure 8. Ratio of Female and Male Wages by Area, 1986-97

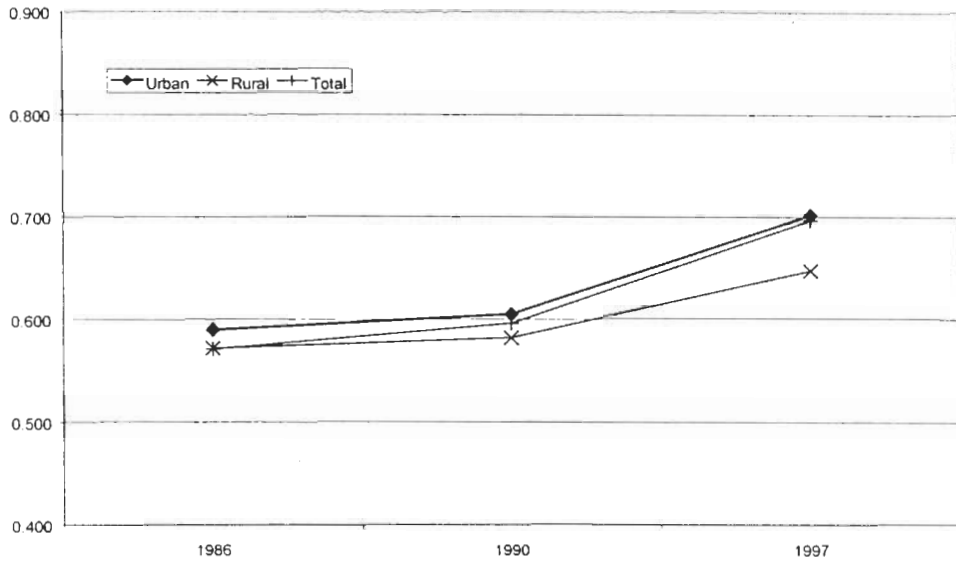
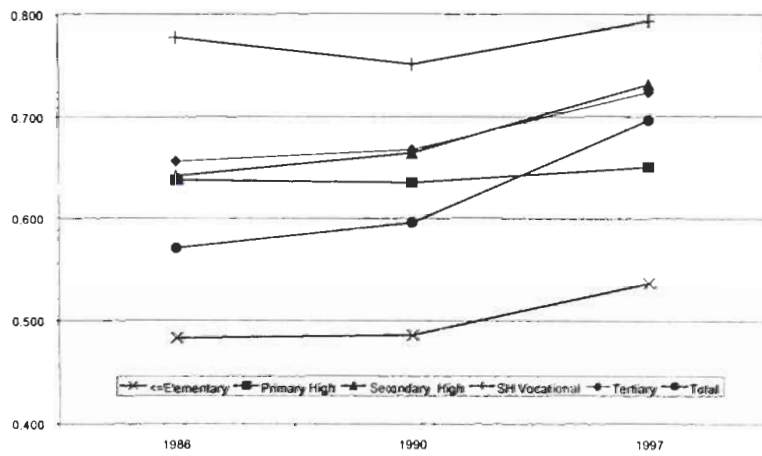


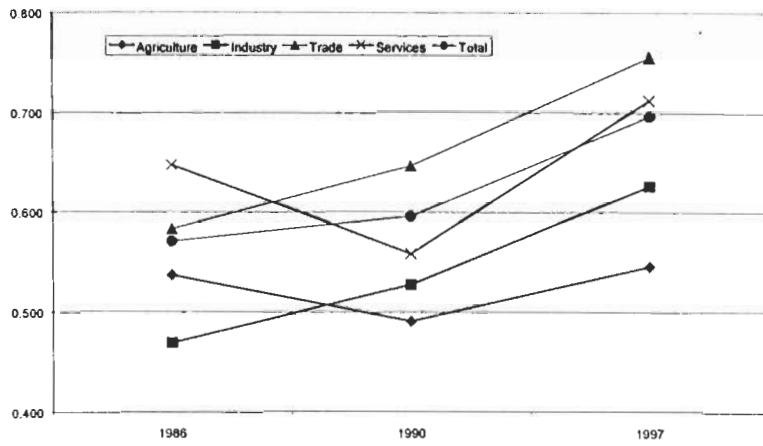
Figure 9. Ratio of Female and Male Wages by Educational Attainment (All Areas), 1986-97



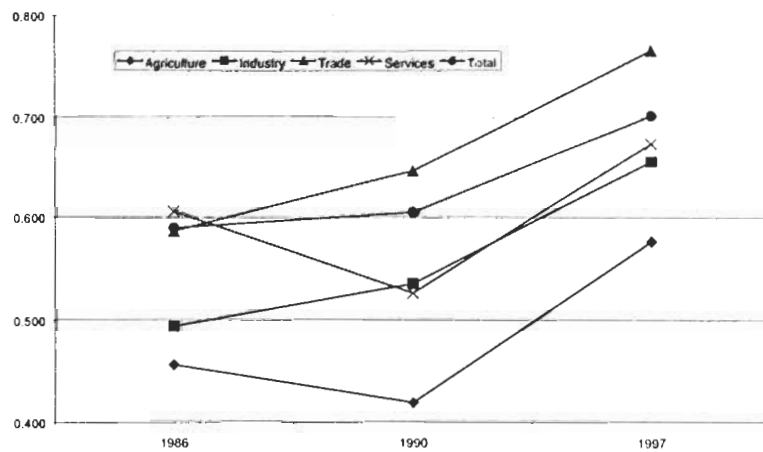
Source: Central Board of Statistics, SAKERNAS, various years

Figure 10. Ratio of Female and Male Wages by Industrial Sectors, 1986-97

a) Urban + Rural



b) Urban



c) Rural

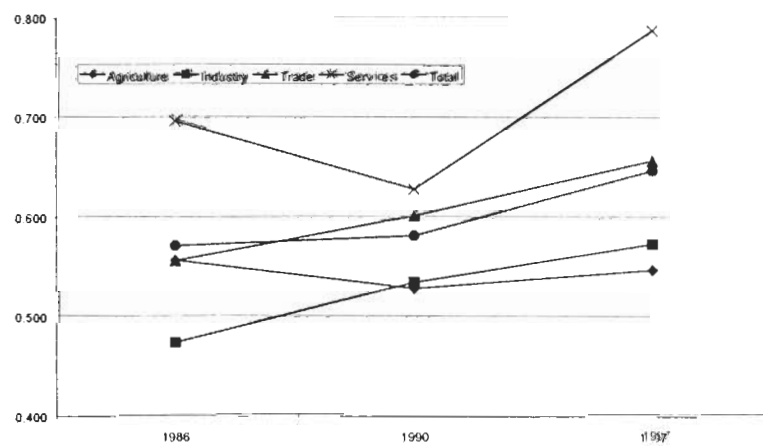


Figure 8. Ratio of Female and Male Wages by Area, 1986-97

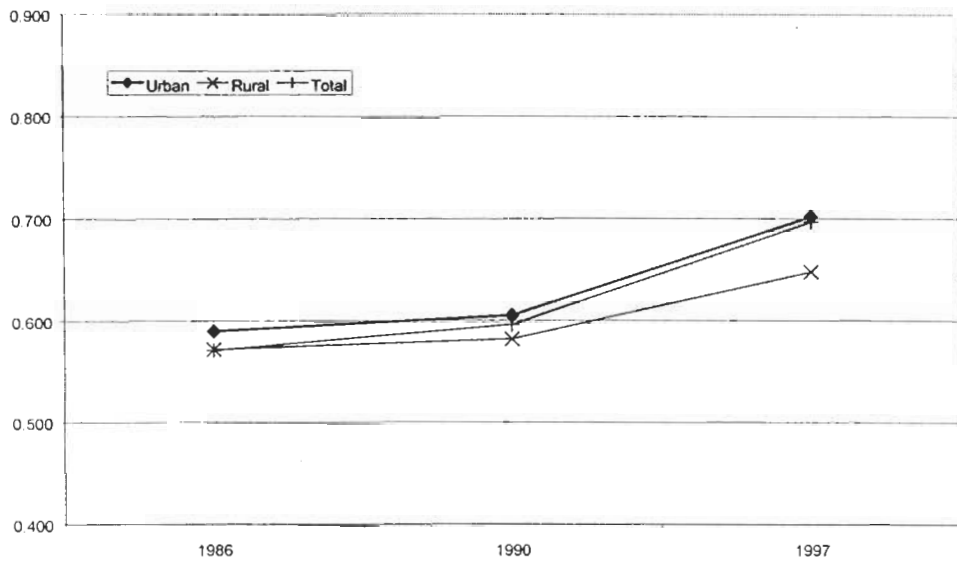
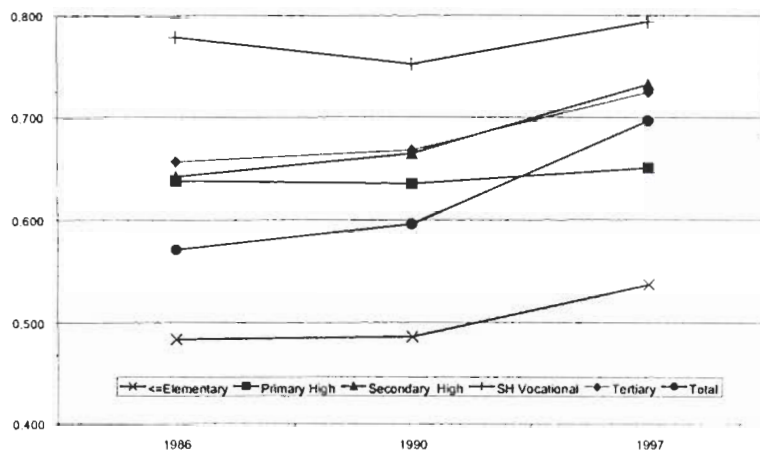


Figure 9. Ratio of Female and Male Wages by Educational Attainment (All Areas), 1986-97



Source: Central Board of Statistics, SAKERNAS, various years

Figure 11. Observed wages, potential wages, and unobserved wages

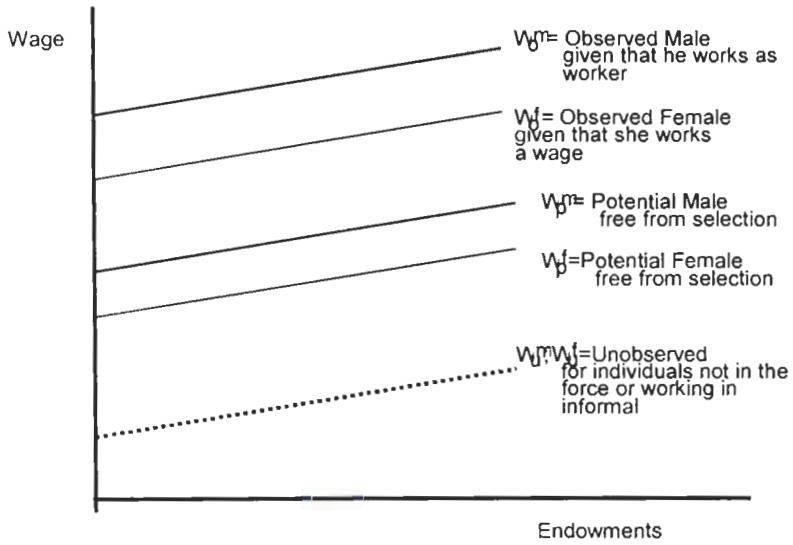
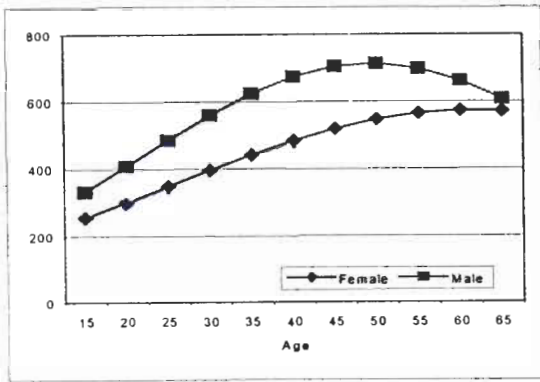
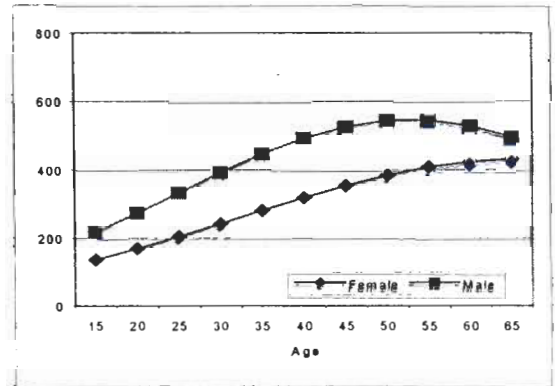


Figure 12. Predicted wages for urban male and female wage workers, 1986-97 (in 1986 Rupiah)

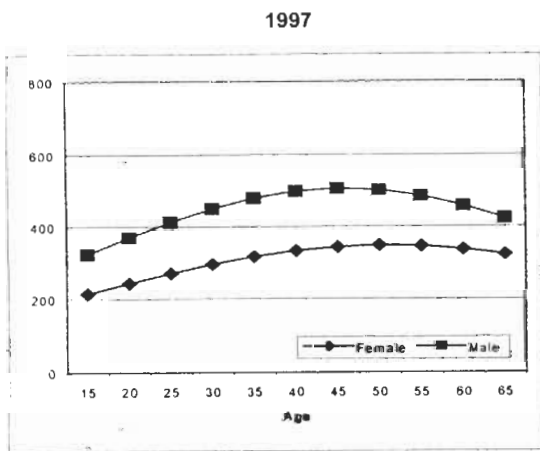


1997

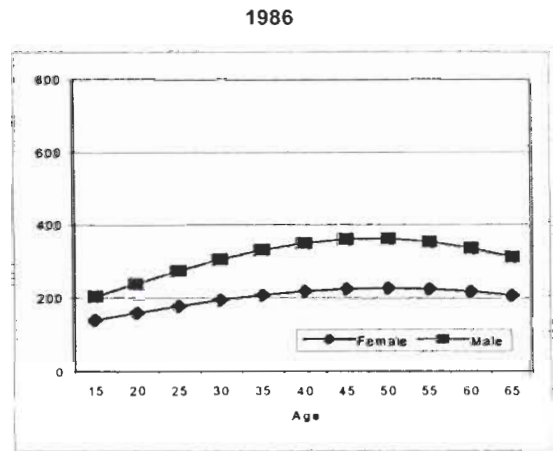


1986

Figure 13. Predicted wages for rural male and female wage workers, 1986-97 (in 1986 Rupiah)

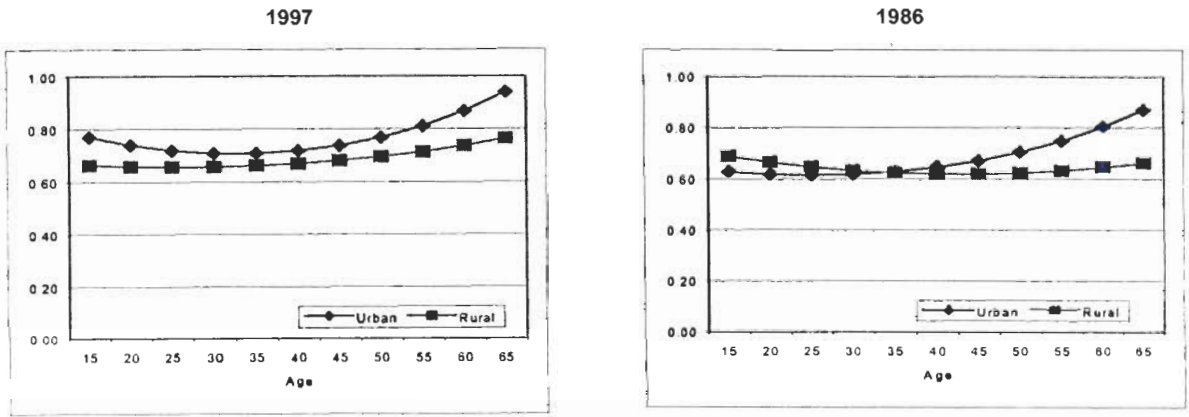


1997



1986

Figure 14. Ratios of predicted wages of female and male wage workers, 1986-97



**Figure 15. Predicted potential wages in urban manufacturing industry, 1986-97
(in 1986 Rupiah)**

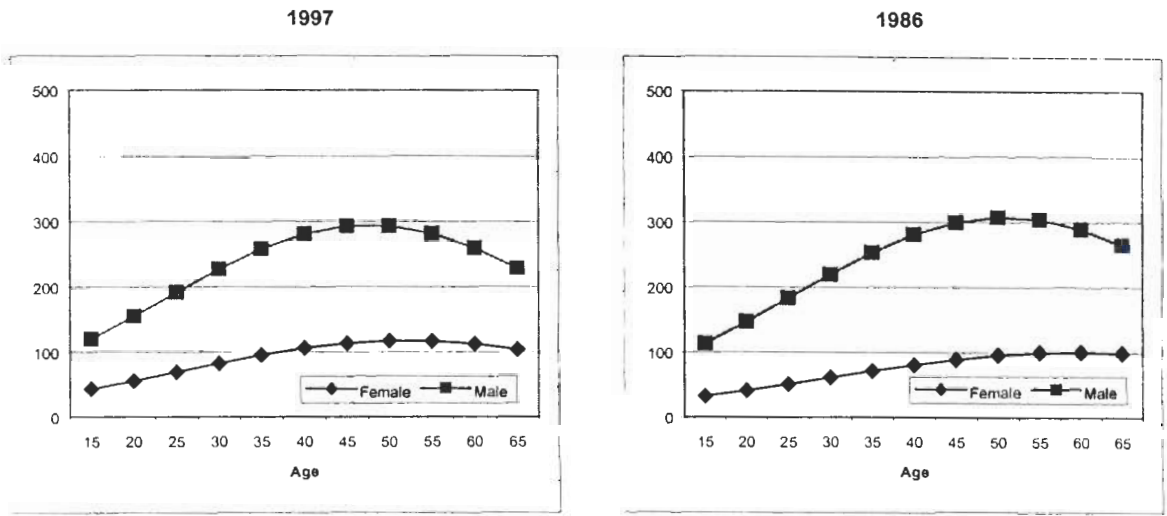
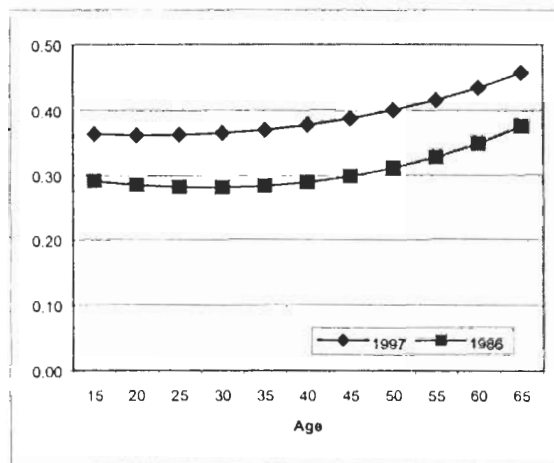


Figure 16. Ratios of potential female and male wages in urban manufacturing industry, 1986-97



APPENDIX

TABLE A.1.1. Employment Status by Region, Occupational Status and Gender, 1986-97
(In percentage of total national labour force)

		1986			1990			1997		
		M	F	M + F	M	F	M + F	M	F	M + F
Urban	Formal	12.89	6.97	10.55	21.18	13.91	18.37	23.89	18.69	21.97
	Informal	9.26	9.68	9.43	15.22	16.53	15.72	15.31	17.81	16.23
	F + I	22.15	16.65	19.98	36.39	30.44	34.10	39.19	36.49	38.20
	Unemployment	1.54	1.40	1.48	2.12	2.26	2.17	2.97	4.39	3.49
	ALL	23.69	18.05	21.46	38.51	32.70	36.27	42.16	40.89	41.69
Rural	Formal	15.32	9.99	13.21	12.64	8.74	11.14	17.40	10.92	15.00
	Informal	59.99	70.80	64.27	48.13	57.60	51.78	39.02	45.68	41.48
	F + I	75.31	80.79	77.48	60.77	66.34	62.92	56.41	56.60	56.48
	Unemployment	1.00	1.16	1.06	0.71	0.96	0.81	1.43	2.51	1.83
	ALL	76.31	81.95	78.54	61.49	67.30	63.73	57.84	59.11	58.31
All	Formal	28.20	16.96	23.76	33.82	22.64	29.51	41.28	29.60	36.97
	Informal	69.25	80.49	73.70	63.35	74.14	67.51	54.32	63.49	57.71
	F + I	97.46	97.44	97.45	97.17	96.78	97.02	95.61	93.10	94.68
	Unemployment	2.54	2.56	2.55	2.83	3.22	2.98	4.39	6.90	5.32
	ALL	100.0	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Central Board of Statistics, SAKERNAS (various years)

TABLE A.1.2. Employment Status by Educational Attainment, Occupational Status and Gender, 1986-97: Urban and Rural (In percentage of total national labour force)

STATUS EDUCATION		1986			1990			1997		
		M	F	M + F	M	F	M + F	M	F	M + F
Formal	<= Elementary	15.17	10.72	13.41	15.40	12.27	14.19	16.14	11.62	14.47
	SLTP	4.11	1.15	2.94	5.25	1.82	3.93	7.04	3.59	5.77
	SLTA General	3.42	1.29	2.58	5.53	2.67	4.43	8.25	5.16	7.11
	SLTA Vocational	3.83	3.04	3.52	4.95	4.23	4.67	5.54	5.31	5.46
	Tertiary	1.67	0.77	1.31	2.68	1.66	2.29	4.31	3.91	4.16
	ALL Education	28.20	16.96	23.76	33.82	22.64	29.51	41.28	29.60	36.97
Informal	<= Elementary	60.68	75.06	66.37	51.51	66.09	57.13	38.46	48.99	42.35
	SLTP	5.96	4.08	5.21	7.42	5.42	6.65	8.79	8.53	8.70
	SLTA General	1.54	0.70	1.21	2.75	1.53	2.28	4.70	3.84	4.38
	SLTA Vocational	0.91	0.59	0.78	1.44	0.99	1.26	1.86	1.72	1.81
	Tertiary	0.16	0.06	0.12	0.24	0.12	0.19	0.51	0.42	0.48
	ALL Education	69.25	80.49	73.70	63.35	74.14	67.51	54.32	63.49	57.71
F + I	<= Elementary	75.86	85.77	79.78	66.90	78.36	71.32	54.60	60.61	56.82
	SLTP	10.06	5.23	8.15	12.67	7.23	10.57	15.84	12.12	14.47
	SLTA General	4.97	1.99	3.79	8.28	4.19	6.70	12.95	9.00	11.49
	SLTA Vocational	4.75	3.62	4.30	6.39	5.21	5.94	7.41	7.03	7.27
	Tertiary	1.82	0.83	1.43	2.92	1.78	2.48	4.82	4.33	4.64
	ALL Education	97.46	97.44	97.45	97.17	96.78	97.02	95.61	93.10	94.68
Employed	All Education	97.46	97.44	97.45	97.17	96.78	97.02	95.61	93.10	94.68
Unemployed	All Education	2.54	2.56	2.55	2.83	3.22	2.98	4.39	6.90	5.32
TOTAL	All Education	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Central Board of Statistics, SAKERNAS (various years)

TABLE A.1.3. Employment Status by Educational Attainment, Occupational Status and Gender, 1986-97: Urban (In percentage of total national labour force)

STATUS	EDUCATION	1986			1990			1997		
		M	F	M + F	M	F	M + F	M	F	M + F
Formal	<= Elementary	5.04	3.26	4.34	7.11	5.85	6.62	6.19	5.17	5.81
	SLTP	2.33	0.67	1.68	3.69	1.38	2.80	4.26	2.51	3.62
	SLTA General	2.38	0.93	1.81	4.68	2.36	3.79	6.36	4.22	5.57
	SLTA Vocational	1.95	1.58	1.80	3.38	2.89	3.19	3.62	3.58	3.61
	Tertiary	1.18	0.53	0.92	2.32	1.43	1.98	3.46	3.20	3.36
	ALL Education	12.89	6.97	10.55	21.18	13.91	18.37	23.89	18.69	21.97
Informal	<= Elementary	6.37	7.68	6.89	9.85	12.72	10.95	8.04	10.71	9.03
	SLTP	1.67	1.34	1.54	2.85	2.25	2.62	3.29	3.48	3.36
	SLTA General	0.77	0.41	0.63	1.57	0.94	1.33	2.61	2.27	2.49
	SLTA Vocational	0.37	0.21	0.30	0.77	0.54	0.68	0.98	1.01	0.99
	Tertiary	0.09	0.04	0.07	0.18	0.09	0.14	0.37	0.33	0.36
	ALL Education	9.26	9.68	9.43	15.22	16.53	15.72	15.31	17.81	16.23
F + I	<= Elementary	11.41	10.94	11.22	16.95	18.57	17.57	14.23	15.88	14.84
	SLTP	4.00	2.02	3.22	6.54	3.63	5.42	7.56	5.99	6.98
	SLTA General	3.16	1.34	2.44	6.26	3.30	5.12	8.97	6.49	8.05
	SLTA Vocational	2.31	1.79	2.11	4.15	3.42	3.87	4.61	4.59	4.60
	Tertiary	1.27	0.57	0.99	2.49	1.52	2.12	3.83	3.54	3.72
	ALL Education	22.15	16.65	19.98	36.39	30.44	34.10	39.19	36.49	38.20
Employed	ALL Education	22.15	16.65	19.98	36.39	30.44	34.10	39.19	36.49	38.20
Unemployed	ALL Education	1.54	1.40	1.48	2.12	2.26	2.17	2.97	4.39	3.49
TOTAL	ALL Education	23.69	18.05	21.46	38.51	32.70	36.27	42.16	40.89	41.69

Source: Central Board of Statistics, SAKERNAS (various years)

TABLE A.1.3. Employment Status by Educational Attainment, Occupational Status and Gender, 1986-97: Rural (In percentage of total national labour force)

STATUS	EDUCATION	1986			1990			1997		
		M	F	M + F	M	F	M + F	M	F	M + F
Formal	<= Elementary	10.13	7.46	9.07	8.29	6.42	7.57	9.95	6.45	8.66
	SLTP	1.77	0.48	1.26	1.56	0.44	1.13	2.78	1.08	2.15
	SLTA General	1.04	0.36	0.77	0.85	0.31	0.64	1.89	0.93	1.54
	SLTA Vocational	1.88	1.46	1.72	1.57	1.34	1.48	1.92	1.73	1.85
	Tertiary	0.48	0.24	0.39	0.37	0.23	0.31	0.85	0.71	0.80
	ALL Education	15.32	9.99	13.21	12.64	8.74	11.14	17.40	10.92	15.00
Informal	<= Elementary	54.32	67.37	59.48	41.66	53.38	46.17	30.41	38.28	33.32
	SLTP	4.29	2.74	3.68	4.57	3.16	4.03	5.50	5.05	5.33
	SLTA General	0.77	0.29	0.58	1.18	0.58	0.95	2.08	1.57	1.89
	SLTA Vocational	0.55	0.38	0.48	0.67	0.45	0.58	0.88	0.70	0.81
	Tertiary	0.07	0.02	0.05	0.06	0.03	0.05	0.14	0.08	0.12
	ALL Education	59.99	70.80	64.27	48.13	57.60	51.78	39.02	45.68	41.48
F + I	<= Elementary	64.45	74.83	68.55	49.95	59.79	53.74	40.37	44.73	41.98
	SLTP	6.06	3.21	4.94	6.13	3.61	5.16	8.28	6.13	7.49
	SLTA General	1.81	0.65	1.35	2.02	0.90	1.59	3.98	2.50	3.43
	SLTA Vocational	2.43	1.83	2.20	2.24	1.79	2.07	2.80	2.44	2.66
	Tertiary	0.55	0.26	0.44	0.43	0.26	0.36	0.99	0.79	0.92
	ALL Education	75.31	80.79	77.48	60.77	66.34	62.92	56.41	56.60	56.48
Employed	ALL Education	75.31	80.79	77.48	60.77	66.34	62.92	56.41	56.60	56.48
Unemployed	ALL Education	1.00	1.16	1.06	0.71	0.96	0.81	1.43	2.51	1.83
TOTAL	ALL Education	76.31	81.95	78.54	61.49	67.30	63.73	57.84	59.11	58.31

Source: Central Board of Statistics, SAKERNAS (various years)

Table A.2. Probit Estimates of Labour Force Participation for Wage Employment, 1986-97

	1986						1997					
	Urban			Rural			Urban			Rural		
	Female Coeff.	Male Coeff.	M.E.	Female Coeff.	Male Coeff.	M.E.	Female Coeff.	Male Coeff.	M.E.	Female Coeff.	Male Coeff.	M.E.
AGE	0.09	0.21	0.02	0.06	0.12	0.00	0.15	0.01	0.18	0.01	0.10	0.12
AGE2	22.43	51.96	23.74	23.74	43.11	0.00	41.14	53.28	28.75	39.65	28.75	39.65
MAR	-0.12	-0.27	-0.09	-0.09	-0.15		-0.19	-0.22	-0.15	-0.13	-0.13	-0.15
CHILD	-22.58	-51.90	-24.83	-24.83	-44.50		-40.28	-55.36	-28.82	-42.28	-28.82	-42.28
EDY	-	-	-	-	-		-0.70	0.22	0.04	0.01	-0.36	-0.04
EDSQ	-	-	-	-	-		-32.82	8.48	1.45	1.45	-14.87	1.45
D	-0.04	0.01	0.00	-0.06	-0.01	0.00	-0.03	-0.01	0.00	0.00	-0.07	-0.01
LHHDWAGE	-5.15	1.58	-0.11	-8.21	-2.29	0.01	-3.68	-0.29	0.00	0.01	-8.05	-2.79
HHDEDY	-0.14	-0.02	0.01	-0.11	-0.05	0.01	-0.10	-0.01	0.02	0.01	-0.05	-0.01
HHDSQ	-15.52	-2.19	-17.07	-17.07	-8.50	-0.01	-12.26	-1.10	-0.02	-0.02	-7.38	-0.83
REG1	1.48	0.43	1.79	1.79	0.92	0.00	1.06	0.39	0.47	0.47	1.13	0.47
REG2	23.95	7.24	33.47	33.47	20.89	0.03	23.18	7.97	21.98	9.97	21.98	9.97
REG3	0.18	-0.35	-0.11	0.35	-0.37	-0.07	-0.42	-0.08	-0.23	0.02	0.19	0.02
REG4	3.08	-7.88	10.93	10.93	-13.98	0.01	-7.67	-15.69	4.51	-13.21	4.51	-13.21
REG5	0.01	0.02	0.01	0.07	0.05	0.01	0.02	0.00	0.01	0.01	0.05	0.01
REG6	6.15	7.90	40.46	40.46	21.27	-0.01	12.06	8.65	34.59	18.09	34.59	18.09
REG7	-0.04	-0.09	-0.02	-0.06	-0.11	-0.01	-0.05	-0.09	-0.09	0.00	-0.05	0.00
REG8	-6.59	-20.23	-11.99	-11.99	-29.09	0.00	-9.92	-22.66	-8.45	-22.43	-8.45	-22.43
REG9	0.26	0.27	0.08	0.08	0.56	0.00	0.29	0.24	0.38	0.38	0.07	0.38
CONSTANT	6.40	9.33	2.04	2.04	20.24	0.03	9.56	11.11	14.13	14.13	1.86	14.13
Total	-0.39	0.04	0.01	-0.33	0.17	0.03	-0.08	-0.02	0.05	0.02	-0.05	0.05
	-9.37	0.95	-7.06	-7.06	4.86	0.00	-2.69	7.86	-1.00	1.12	-1.00	1.12
	-0.31	-0.20	-0.06	-0.03	0.07	0.01	-0.13	-0.03	-0.01	0.00	-0.04	0.00
	-6.95	-4.70	-1.05	-1.05	3.21	0.04	-3.39	-1.00	-0.03	0.00	-1.23	-0.08
	-0.33	-0.05	-0.01	-0.25	0.21	0.04	-0.01	0.00	-0.08	0.01	0.09	0.01
	-6.94	-1.03	-2.45	-2.45	2.58	0.00	-0.29	-2.12	-0.07	-0.78	0.79	-0.78
	-0.12	-0.01	0.00	0.03	0.03	0.00	0.03	0.04	0.01	-0.01	-0.08	-0.01
	-3.07	-0.24	1.06	1.06	1.25	-0.04	0.85	1.42	-3.11	-2.10	-3.11	-2.10
	-0.48	-0.25	-0.08	-0.27	-0.21	-0.04	-0.29	-0.15	-0.05	-0.03	-0.31	-0.03
	-9.63	-5.62	-8.14	-8.14	-7.83	-0.09	-7.65	-4.21	-8.86	-11.30	-8.86	-11.30
	-0.63	-0.14	-0.04	-0.57	-0.52	-0.09	-0.33	-0.11	-0.04	-0.41	-0.37	-0.41
	-14.82	-3.78	-18.48	-18.48	-22.74	-0.06	-10.14	-3.66	-17.69	-17.69	-12.43	-17.69
	-0.69	-0.13	-0.04	-0.63	-0.34	-0.06	-0.27	-0.05	-0.02	-0.35	-0.39	-0.35
	-13.50	-3.08	-16.37	-16.37	-13.49	-0.10	-7.38	-1.51	-13.49	-13.49	-10.95	-13.49
	-0.44	0.03	0.01	-0.69	-0.57	-0.10	-0.28	-0.05	-0.02	-0.50	-0.57	-0.50
	-9.39	0.65	-19.44	-19.44	-22.04	-0.06	-7.77	-1.52	-18.76	-18.76	-15.86	-18.76
	-0.63	-0.32	-0.09	-0.35	-0.35	-0.06	-0.24	-0.11	-0.04	-0.37	-0.27	-0.37
	-14.82	-8.20	-12.48	-12.48	-15.03	-0.03	-7.39	-3.75	-15.43	-15.43	-9.00	-15.43
	-1.90	-3.86	-1.15	-2.16	-2.64	-0.46	-2.75	-3.21	-2.51	-2.70	-2.70	-2.51
	-25.47	-47.85	-42.77	-42.77	-54.99	-0.16	-41.10	-47.94	-45.95	-44.14	-44.14	-45.95
Total	32549	32240	83698	83698	81528	(100)	48101	47116	62797	61412	(100)	61412

TABLE A.3.4. Ratio of Female and Male Wages by Industrial Sectors, 1986-97

	1986			1990			1997		
	Urban	Rural	U + R	Urban	Rural	U + R	Urban	Rural	U + R
	Agriculture	0.456	0.557	0.538	0.419	0.529	0.491	0.577	0.548
Industry	0.494	0.474	0.469	0.536	0.535	0.528	0.656	0.574	0.627
Trade	0.587	0.557	0.583	0.646	0.602	0.647	0.766	0.658	0.756
Services	0.606	0.697	0.648	0.527	0.629	0.559	0.674	0.788	0.713
Other	0.662	0.837	0.739	0.793	0.938	0.834	0.896	1.024	0.965
All Industry	0.590	0.572	0.571	0.605	0.582	0.596	0.702	0.648	0.697

Source: Central Board of Statistics, SAKERNAS (various years, calculated)

TABLE A.3.2. Average Monthly Wage/Salary of Wage Workers by Educational Attainment and Gender, 1986-97 (In Rp/month)

EDUCATION	SEX	1986			1990			1997		
		Urban	Rural	U + R	Urban	Rural	U + R	Urban	Rural	U + R
		Elementary or less	M	65,094	48,420	53,990	87,535	66,375	76,139	197,946
	F	29,741	24,488	26,098	41,586	32,776	37,008	107,257	89,037	96,934
	M + F	54,491	40,590	45,112	71,574	55,277	62,902	165,748	145,542	153,526
Primary High	M	90,412	78,308	85,216	111,465	92,195	105,733	248,481	216,217	235,888
	F	57,070	50,552	54,380	70,047	58,244	67,184	160,385	137,250	153,540
	M + F	85,043	74,088	80,369	103,494	87,010	98,755	225,414	201,304	216,539
Secondary High (General)	M	113,279	101,111	109,536	148,050	114,336	142,855	331,189	268,672	316,849
	F	72,515	64,746	70,349	97,794	74,110	94,986	242,006	186,090	231,925
	M + F	104,831	94,373	101,675	135,836	106,625	131,579	305,640	249,776	293,577
Secondary High (Vocational)	M	106,670	97,919	102,362	145,330	123,725	138,467	347,814	325,312	340,022
	F	80,956	78,277	79,668	106,837	98,266	104,122	267,895	274,299	269,987
	M + F	97,723	91,290	94,581	131,765	114,777	126,374	318,207	307,448	314,558
Tertiary Education	M	158,595	139,591	160,073	243,586	154,611	231,251	552,643	404,830	522,983
	F	107,715	99,296	105,128	159,540	122,502	154,476	398,657	290,338	378,747
	M + F	154,562	129,837	147,219	219,826	145,638	209,582	497,768	366,834	472,270
All Education	M	94,381	64,599	78,232	131,691	82,699	113,407	316,328	215,987	273,540
	F	55,674	36,936	44,579	79,709	48,129	67,594	222,033	139,935	190,549
	M + F	84,147	56,268	68,676	116,284	72,130	99,668	285,601	194,087	247,796

Source: Central Board of Statistics, SAKERNAS (various years)

Table A.2. Probit Estimates of Labour Force Participation for Wage Employment, 1986-97 (continued)

LFP=1	1986						1997									
	Urban			Rural			Urban			Rural						
	Female Coeff.	Male M.E.	M.E.	Female Coeff.	Male M.E.	M.E.	Female Coeff.	Male M.E.	M.E.	Female Coeff.	Male M.E.	M.E.				
	3593	(11)	9944	(31)	5085	(6)	11784	(14)	8064	(17)	16683	(35)	5016	(8)	12403	(20)

Note: dependent variable is LFP1; value=1 if the respondent is a wage worker, 0 if otherwise; values in italics are T-statistics

TABLE A.3.1. Average Monthly Wage/Salary of Wage Workers by Industrial Sectors and Gender, 1986-97 (In Rp/month)

INDUSTRY	SEX	1986			1990			1997		
		Urban	Rural	U + R	Urban	Rural	U + R	Urban	Rural	U + R
Agriculture	M	52,697	36,198	38,045	82,170	53,687	59,718	181,102	141,685	148,170
	F	24,038	20,169	20,451	34,449	28,391	29,340	104,570	77,647	80,961
	M + F	43,697	29,418	30,787	67,827	43,993	48,558	158,529	118,003	124,069
Industry	M	82,416	63,935	73,082	116,739	77,059	104,519	287,949	210,087	257,846
	F	40,736	30,301	34,301	62,548	41,241	55,199	188,899	120,623	161,588
	M + F	71,900	52,255	61,313	98,843	63,863	87,628	252,516	176,922	222,923
Trade	M	84,296	57,336	76,126	119,826	73,037	112,882	269,478	200,466	255,481
	F	49,469	31,919	44,392	77,448	43,963	73,033	206,446	131,883	193,117
	M + F	72,930	49,405	65,905	105,418	64,028	99,505	246,087	177,458	232,769
Services	M	99,326	76,864	88,377	132,908	96,007	120,789	316,584	246,879	292,368
	F	60,183	53,571	57,250	69,998	60,372	67,490	213,330	194,586	208,391
	M + F	88,345	71,126	80,151	110,306	85,752	102,804	275,745	230,907	261,549
Other	M	100,999	72,022	86,087	146,175	106,232	133,974	364,160	255,132	318,334
	F	66,909	60,289	63,623	115,876	99,697	111,780	326,128	261,263	307,209
	M + F	94,337	69,860	81,825	139,598	105,082	129,424	356,833	255,864	316,517
All Industry	M	94,381	64,599	78,232	131,690	82,699	113,408	316,328	215,987	273,540
	F	55,668	36,936	44,677	79,709	48,129	67,594	222,033	139,935	190,549
	M + F	84,143	56,268	68,675	116,284	72,130	99,669	285,601	194,087	247,796

Source: Central Board of Statistics, SAKERNAS (various years)

TABLE A.3.4. Ratio of Female and Male Wages by Educational Attainment, 1986-97

	1986			1990			1997		
	Urban	Rural	U + R	Urban	Rural	U + R	Urban	Rural	U + R
	≤Elementary	0.457	0.506	0.483	0.475	0.494	0.486	0.542	0.523
Primary High	0.631	0.646	0.638	0.628	0.632	0.635	0.645	0.635	0.651
SH General	0.640	0.640	0.642	0.661	0.648	0.665	0.731	0.693	0.732
SH Vocational	0.759	0.799	0.778	0.735	0.794	0.752	0.770	0.843	0.794
Tertiary	0.639	0.711	0.657	0.655	0.792	0.668	0.721	0.717	0.724
All Education	0.590	0.572	0.571	0.605	0.582	0.596	0.702	0.648	0.697

Source: Central Board of Statistics, SAKERNAS (various years, calculated)

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