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Wage and Employment Effects of Minimum Wage Policy in the Indonesian Urban Labor Market

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Wage and Employment Effects of Minimum Wage Policy in the Indonesian Urban Labor Market

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EXECUTIVE SUMMARY

INTRODUCTION

During the last two years, the Indonesian Government has vigorously pursued a minimum wage policy. The levels of regional minimum wages have increased significantly since the crisis. For example, in the Jabotabek (Jakarta, Bogor, Tangerang, Bekasi) area, real minimum wages (wages adjusted to inflation) were increased by around 24 percent in 2000 and between 33 to 36 percent in 2001. Similar large increases have occurred in other regions as well and, as a result, the real minimum wages in 2001 are already higher than the peak pre-crisis levels in 1997.

This all occurred against the backdrop of an economy which is still struggling to recover from a severe economic crisis. After a massive economic contraction of 13.7 percent in 1998 and less than one percent economic growth in 1999, the economy grew by around 5 percent in 2000 and various estimates put economic growth in 2001 in a range between 3 to 3.5 percent. Given this low economic growth environment, there are growing concerns that further large increases in minimum wages may reduce long term economic growth and slow employment growth in the modern industrial sector.

Moreover, starting from January 2001 Indonesia has embarked on a major decentralization policy. With decentralization, the power to determine minimum wages has been transferred from the central to local governments at the province, *kabupaten*, and *kota* levels. There are some early indications that this transfer of power may accelerate the increase in minimum wages in some regions. In addition to the very substantial increase in minimum wages in 2001, the frequency of changes to minimum wages has also increased over the last year. This raises concerns that regional governments may be more willing to cede to the pressures for a more 'populist' approach to social policy. Consequently, there is a danger that long-term economic growth may be sacrificed for short-term unsustainable gains.

As the trend towards greater use of minimum wages as a tool of social policy by local governments gains momentum, the question of whether greater rigidities hurt or benefit the poor in Indonesia becomes particularly relevant. This study is an attempt to answer one dimension of this question. In this study, the wage and employment effects of minimum wages are investigated though an econometric approach using pooled data from the National Labor Force Surveys (Sakernas).

This study differs from previous studies on the labor market effects of minimum wages in Indonesia in several respects. First, both theory and practice suggest that increases in minimum wages do not affect all types of workers in the same way, but primarily those lower paid workers most vulnerable to changes in labor market conditions such as females, youth workers, less educated workers and blue collar workers. Therefore, unlike previous studies of Indonesia, this study estimates the effects of minimum wages on employment of these sub-samples of workers.

Second, a survey of 200 workers employed in over 40 firms in the Jabotabek and Bandung area was carried out in this study to identify the characteristics of firms that are likely to comply with minimum wage regulations as well as the characteristics of workers that make them more likely to be paid at or above the minimum rate. The findings of the survey corroborate the results of statistical analysis on the effects of minimum wages.

RESULTS OF THE STATISTICAL ANALYSIS

The study finds that as minimum wages continued to increase during most of the 1990s compliance also steadily increased, with the result of altering the entire wage distribution of urban, formal workers. In 1988, a year before minimum wage regulations were revamped, minimum wages had very little effect on the wage distribution. But this changed over time. By 1992, the effect of minimum wages on the wage distribution became more apparent. Spikes at and around the minimum wage occurred in the distribution. In 1996, the mode of the wage distribution was only slightly higher than the minimum wage. By 1999 and 2000, the minimum wage had become the mode of the distribution, indicating that minimum wages had become binding for the majority of workers.

The statistical analysis shows that increases in minimum wages push up wages of blue-collar workers. The results of the econometric analysis also show a positive link between minimum wages and average wages of most other groups of workers (female, youth, less educated, and white-collar workers). However, the relationship is not statistically significant. This does not imply that minimum wages have no effect on the wages of individual workers. Instead, it more likely indicates that the effect is mixed. The wages of some workers are pushed up by minimum wages, while the wages of other workers are depressed, resulting in no significant effect on average wages.

More importantly, the statistical analysis shows that increases in minimum wages does have a negative impact on urban, formal sector employment, with the exception of white-collar workers. For all workers, the estimated elasticity of total employment to minimum wage is –0.112 and statistically significant. This implies that for every 10 percent increase in real minimum wages, there will be more than a one percent reduction in total employment, controlling for other factors affecting employment, such as economic growth and growth in the working population.

Significantly, the negative effects of minimum wage legislation is greatest for those groups that are most vulnerable to changes in labor market conditions such as females, youth workers, and less educated workers, which make up the bulk of those employed in both the formal and informal sectors. For females and youths, the employment elasticities with respect to minimum wages are larger than –0.3, implying that for every 10 percent increase in real minimum wages employment of these workers fell by more than 3 percent. Similarly, the employment elasticity for less educated workers is relatively large at –0.2, implying that for every 10 percent increase in real minimum wages employment of these workers fell by around 2 percent.

On the other hand, white-collar workers are the only category of workers to have benefited from minimum wages in terms of employment. Their employment elasticity

to minimum wage is 1.0 and statistically significant. This means that for every 10 percent increase in real minimum wage, the employment of white-collar workers increased by 10 percent. This perhaps indicates the substitution effect of minimum wages on the employment of different types of workers. As the level of minimum wages is increased, firms reduce the employment of the other types of workers and replace them with white-collar workers. This may be due to firms substituting more capital-intensive and skill-intensive production processes in place of labor-intensive processes in response to increases in minimum wages. Due to capital-skill complementarity, a higher proportion of white-collar workers suggests that more capital-intensive technologies have been used.

Furthermore, there is evidence that compliance with the minimum wage regulations has continued to increase since the mid-1990s. The results of the econometric analysis show that a higher degree of compliance tends to strengthen the positive effect of minimum wages on average wages and the negative effect on employment.

RESULTS FROM THE SURVEY OF WORKERS AND FIRMS

The findings from the qualitative survey corroborate the econometric analysis. The survey shows that the characteristics of particular firms play an important role in determining the degree of compliance with minimum wage regulations. In general, firms in the capital-intensive sectors pay higher wages and, hence, demonstrate a higher degree of compliance with minimum wages than firms in labor-intensive industries. The size of the firm is an important determinant of compliance. In general larger firms are more likely to pay higher wages and, hence, comply with minimum wage regulations than smaller firms. Foreign-owned firms in general pay higher wages and also comply more effectively with the minimum wage regulations compared with domestic firms. Finally, firms that sell their products to the export market are, on average, paying higher wages and comply more with the minimum wage regulations than those firms that solely target the domestic market.

However, these findings for capital-intensive firms, foreign firms and exporters primarily arise because these firms fall into the large-size category in the sample. The study estimated a probit model which ascertains the probability that a certain worker will be paid above the minimum wage rate. The probit analysis shows that firm size is the primary determinant of a firm's capacity to comply with minimum wage regulations. Controlling for all other firm and worker characteristics, workers in medium sized firms have a 21 percent higher probability of being paid above the minimum wage than workers in small firms. Similarly, workers in large firms have a 44 percent higher probability of receiving a wage above the minimum wage than workers in small firms.

In addition, the characteristics of workers employed in individual firms also affect the degree of compliance with the minimum wage regulations. Male workers on average are paid more than the minimum wage and fewer of them receive a wage below the minimum, unlike female workers. The commonly found U-inverse relationship between age and wage is also evident. Wages initially increase with age, but then

decrease again for those in the older age groups. Education is also an important determinant of wages. Workers who have at most a junior secondary education level are on average paid near the minimum wage. The relationship between work experience and wage is positive. However, the probit analysis identifies gender as the main variable which influences whether workers are paid above the minimum wage rate. Controlling for all other firm and worker characteristics, female workers have a 19 percent lower probability of being paid above the minimum wages compared with male workers. Thus, both firm and worker characteristics jointly determine the probability of a worker being paid at or below the minimum wage rate.

Finally, the qualitative survey found that the type of employment contract, which reflects the working relationship between a firm and its employees, also has important consequences for the welfare of the workers. Daily casual (*harian lepas*) workers have an average wage around the minimum wage level and approximately 44 percent of these workers are paid less than the minimum. In contrast, monthly permanent workers are generally paid higher wages compared to any other category of workers.

According to firm respondents, the way in which the minimum wage policy has been implemented in recent years has created several constraints to firm growth as well as employment growth in the modern sector. This policy has also been a major cause of industrial strife. Before the crisis, minimum wages were determined annually. Recently, however, minimum wage levels have been changed more than once in a year in several provinces/regions, creating problems for the planning and cash-flow of these companies. In addition, this has also caused difficulties for those firms that have signed contracts with buyers. The calculation of costs had not factored in unexpected changes in minimum wages, contributing to unexpected falls in profits.

The binding nature of minimum wages also seems to have reduced worker incentives to raise productivity. Since the late 1980s minimum wages have increased rapidly, to the point where the minimum wages have become binding. It is close to, or equal to, actual wages, particularly in the case of medium and small size firms. All unskilled and semi-skilled workers in these firms now receive roughly the same wage level, i.e. the minimum wage. As a consequence, this has limited the capacity of firms to use wages as an incentive system to promote workers' productivity. There is a concern that this also creates a disincentive for those workers who are more productive, resulting in a decline in overall productivity within the firms.

The impact of minimum wages on firms differs across sectors. The largest impact, of course, is in the most labor-intensive sectors. Firms, however, have little choice than to comply with the regulations, even when they are actually finding it difficult to pay wages at this level. The costs of non-compliance are envisaged to be even greater due to the prospect of industrial strife. In theory, the regulations provide an opportunity for those firms that are having difficulties in complying with the minimum wage regulations to request a temporary waiver. However, the requirements for obtaining this waiver are difficult to fulfill and costly, one of which is an audit by a public accountant. Firms reported that non-compliance tended to provoke protests and strikes by workers, disrupting production and resulting in delays in product deliveries to customers.

A combination of troubled industrial relations and greater labor protection in recent years has become a concern for many firms. Firms are being pressured to comply with the minimum wage regulations, meanwhile they are experiencing difficulties in retaining their workers, especially since the generous compulsory severance payments induce workers to quit over minor disagreements with management. To overcome these problems, some firms have opted to change their hiring system, in particular by relying more on piece-work arrangements.

CONCLUSIONS

To conclude, the results of this study show that minimum wages benefit some workers and disadvantage others. Workers that keep their factory jobs clearly benefit from increases in minimum wages. White-collar workers are clear winners from a vigorous enforcement of minimum wage policy. However, those that lose their jobs as a result of increases in minimum wages are losers under the minimum wage policy. The potential losers are those workers most vulnerable to changes in labor market conditions such as female, youth and less educated workers.

In an environment of high economic growth, large increases in minimum wages are less of a problem. High growth pushes up market wages so that they can surpass the minimum and create more jobs than those lost through minimum wage policy. However, in an environment of low economic growth as in Indonesia during 2000-2001, big increases in minimum wages are most likely to have a detrimental effect on those workers most vulnerable to changes in labor market conditions. A vigorously pursued minimum wage policy, which pushes wages well above the productivity of vulnerable groups, will certainly have a detrimental effect on these groups. The qualitative survey also indicates that substantial increases in minimum wages will disadvantage small and medium sized firms, as they are the ones which can least afford increases in their cost structures.

These findings may have implications for the government's poverty reduction program. A vigorously implemented minimum wage policy will help those more productive workers that are able to keep their jobs in the modern sector. But these workers are less likely to be among those living below the poverty line. Indeed, most research shows that the poor are primarily found in the urban informal and rural sectors. If the policy reduces employment growth in the modern sector below the growth rate in the working population, more unskilled workers may be forced into inferior jobs in the informal sector.

Thus, the impact of minimum wages on employment in the modern sector is only part of the story. Their impact is perhaps equally important, if not more, on the welfare of workers in the informal sector, which accounts for the bulk of the workforce in Indonesia. An important area for further research is to assess the impact of the labor displacement effects of minimum wages in the modern sector on real earnings in the informal sector.

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ABSTRACT

Since the late 1980s, minimum wages have become an important plank of the Indonesian government's labor market policy. During much of the 1990s, minimum wages increased faster than both average wages and gross domestic product. Furthermore, during the last two years, in 2000 and 2001, the government has vigorously pursued the minimum wage policy, evident from the large increases in the levels of real minimum wages. As a result, minimum wages have become binding for the majority of workers and affect the entire wage distribution. The effects, however, differ across different types of workers. This study finds that minimum wages have had a positive but statistically insignificant effect on average wages. On the other hand, minimum wages have had a negative and statistically significant effect on employment. In particular, the disemployment effects are greatest for women, youth, and less educated workers. On the other hand, the employment prospects of white-collar workers are enhanced by increases in minimum wages.

I. INTRODUCTION

Although minimum wages were first introduced in Indonesia in the early 1970s, their importance did not gain much attention until the late 1980s when the government began to make minimum wages an important plank of its labor market policies. In the first half of the 1990s the government tripled minimum wages in nominal terms and doubled them in real terms. During the second half of the 1990s, nominal minimum wages continued to increase, but in real terms began to taper off after 1996 until they fell significantly in 1998 due to the high inflation that swept the country during the economic crisis.

However, the importance of minimum wages as a key element of economic and social policy has reappeared in the last two years. In 2000 and 2001, the government vigorously pursued the minimum wage policy. The levels of minimum wages were increased significantly. More critically, this all occurred against the backdrop of an economy which was still struggling to recover after a major economic crisis. After a massive economic contraction of 13.7 percent in 1998 and near zero economic growth in 1999, the economy grew by around 5 percent in 2000 and various estimates put the economic growth in 2001 at a range between 3 to 3.5 percent.

In addition, beginning in January 2001, Indonesia started to implement a major decentralization and regional autonomy policy. This has an implication on the power to determine the levels of minimum wages. Until the year 2000, the ultimate power to determine the levels of regional minimum wages was in the hands of the central government through decrees issued by the Minister of Manpower. With regional autonomy, the power to determine minimum wages has now been transferred to governors, mayors, and regents (*bupati*) as heads of regional governments.

It is important to note that before decentralization the Minister of Manpower determined the levels of regional minimum wages based on recommendations from the governors. In practice, the minister almost always accepted these recommendations. Therefore, it is quite possible that the transfer of power in determining the levels of minimum wages to the regional governments will have little effect on the minimum wage trends. However, the first occasion when minimum wages were determined under the decentralization policy seems to suggest otherwise.

Table 1 shows the levels of minimum wages in nominal and real terms for the Greater Jakarta (Jabotabek) area from 1999 to 2001. The table shows that minimum wage levels in 2001 are 46-49 percent higher compared to the 2000 levels in nominal terms and 33-36 percent higher in real terms. This is in addition to the 24 percent increase in real minimum wages between 1999 and 2000. As a result, the levels of real minimum wages in 2001 are already higher than their peak pre-crisis levels in 1997.

Table 1. Regional Minimum Wages in the Greater Jakarta Area, 1999-2001

	Minimum Wage (Rp/month)			Change (%)	
	1999	2000	2001	1999-2000	2000-2001
Nominal					
Jakarta	231,000	286,000	426,250	23.8	49.0
Bogor District	230,000	286,000	417,000	24.3	45.8
Bogor City	230,000	286,000	417,000	24.3	45.8
Bekasi District	230,000	286,000	426,250	24.3	49.0
Bekasi City	230,000	286,000	417,000	24.3	45.8
Tangerang District	230,000	286,000	426,500	24.3	49.1
Tangerang City	230,000	286,000	426,500	24.3	49.1
Depok City	230,000	286,000	417,000	24.3	45.8
Real (1996 prices)					
Jakarta	115,288	142,594	194,431	23.7	36.4
Bogor District	114,788	142,594	190,211	24.2	33.4
Bogor City	114,788	142,594	190,211	24.2	33.4
Bekasi District	114,788	142,594	194,431	24.2	36.4
Bekasi City	114,788	142,594	190,211	24.2	33.4
Tangerang District	114,788	142,594	194,545	24.2	36.4
Tangerang City	114,788	142,594	194,545	24.2	36.4
Depok City	114,788	142,594	190,211	24.2	33.4

This raises concerns about the likely impact of such large increases in real minimum wages on employment growth, particularly at a time when the country is still struggling to recover from the economic crisis. In addition to the substantial increases in minimum wages in 2001, some regional governments have also changed the regional regulations determining the levels of minimum wages quite frequently. This raises concerns that regional governments may be more willing to cede to the pressures for a populist approach in the economic policy. Hence, there is a danger that long-term growth may be sacrificed for short-term unsustainable gains. This all clearly shows the need to better understand how the minimum wage policy affects wages and the employment of workers.

Both theoretically and empirically, there is no consensus on the direction and magnitude of the likely impact of minimum wages on employment. At the theoretical level, a competitive labor market model predicts that a minimum wage established above the equilibrium market wage will cause a reduction in employment and create unemployment. On the other hand, a monopsonistic labor market model predicts that a minimum wage set above the monopsony wage level (but below the competitive wage level) will increase employment.

Whether a country's labor market is closer to the competitive or monopsonistic model is an empirical matter. However, although the operation of the labor market in Indonesia remains relatively poorly understood, observers have maintained that the Indonesian labor market - particularly real wages - are flexible.[1] There is no evidence to characterize the Indonesian labor market as monopsonistic, with the minor possible exception of some large, isolated employers in the outer islands.[2]

In developed countries, the recent controversy on the impact of minimum wages on employment has centered around the findings of Card and Krueger (1994). Based on data collected through a telephone survey of fast-food restaurants, they compared employment changes in two states in the United States. They found that restaurants in New Jersey, where the minimum wage was increased, expanded their workforce relative to restaurants in Pennsylvania, where there was no change in the minimum wage.

This finding has been challenged by many, notably by Neumark and Wascher (1995). They re-evaluated the evidence from Card and Krueger using different data based on actual payroll records. They found that the minimum wage increase actually led to a decrease in employment in New Jersey relative to the Pennsylvania control group.

A similar controversy has occurred in the context of developing countries. Castillo-Freeman and Freeman (1992) analyzed the imposition of U.S. minimum wage norms in Puerto Rico. They estimate that elasticity of employment to minimum wage in this country is around -0.5. Hence, they assert that the imposition of U.S. minimum wage norms led to massive job loss on the island. Krueger (1995), however, disputes this finding on methodological grounds and argues that the evidence of a negative employment effect of the imposition of U.S. minimum wage in Puerto Rico is statistically fragile.

Bell (1997) contrasted the cases of Mexico, where minimum wages are very low relative to average wages, and Columbia, where minimum wages are much closer to the mean. She found that the disemployment effect of minimum wages is zero in Mexico but substantial in Columbia. Similarly, based on a study of eight Latin

[1] See Feridhanusetyawan (1999) and Manning (2000).
[2] For a comprehensive review of the Indonesian labor market, see Manning (1998).

American countries, Maloney and Nuñez (2001) found minimum wages have significant implications for employment and affect wage distribution, not only in the neighborhood of the minimum wages but also in the higher reaches of the distribution and in the informal sector.

In the context of Indonesia, the first serious attempt to assess the impact of minimum wage policy on the labor market was conducted by Rama (1996). He found that minimum wages have had a modest impact on labor market outcomes. Based on the results of his econometric analysis, he concluded that the doubling of the minimum wage in the first half of 1990s led to an increase in average wages in the range of 5 to 15 percent, and a decrease in urban wage employment in the range of 0 to 5 percent. However, he suggested that the disemployment effects appeared to be considerable in small manufacturing firms.

This finding has been challenged by Islam and Nazara (2000). They argue that the Indonesian regional minimum wage policy has not impaired employment prospects. They also argue that there is no evidence that minimum wage-induced increases in domestic labor costs have eroded business profitability in large and medium-scale manufacturing. Based on the results of their analysis, they propose that if Indonesia achieves annual economic growth of four percent, real minimum wages can be increased by 24 percent annually without incurring net job losses.

This current study offers a reassessment of the effects of minimum wage policy on labor market outcomes in Indonesia, in particular in the urban formal sector. In this study, the wage and employment effects of minimum wages are investigated though an econometric approach using the data from the National Labor Force Surveys (Sakernas). Different from previous studies on labor market effects of minimum wages in Indonesia which have only focused on the effects for the whole aggregate of workers, this study also assesses the effects for different types of workers. In addition, to back up the econometric evidence, this study also employs a qualitative survey of firms and workers.

The remainder of the paper is organized as follows. Chapter two describes the sources of the data used in this study. Chapter three highlights the macro-economic background during the period under study from the late 1980s to the late 1990s. Chapter four describes the changes that have taken place in the structure of the Indonesian labor market during the same period. Chapter five discusses the Indonesian regional minimum wage policy. Then, based on the results of the qualitative survey of firms and workers, chapter six discusses the implementation of the minimum wage policy. Chapter seven examines the impact of the minimum wage policy on wages and employment using econometric evidence from Sakernas data. Finally, chapter eight summarizes the main findings and outlines the conclusions and implications of the study results.

II. DATA SOURCES

Quantitative Data

The quantitative data analyzed in this study has mainly been drawn from the National Labor Force Surveys (Sakernas), collected annually by Statistics Indonesia (BPS). Sakernas is a nationally representative repeated cross-section survey covering all provinces in Indonesia which is conducted annually in the month of August. In particular, the analysis in this study uses Sakernas data from the 1988 to 2000 surveys, with the exception of the 1995 data which comes from the Inter-census Population Survey (Supas). The numbers of households and individuals in the sample for each year are presented in Table A1 in the Appendix.

Sakernas and the labor force module of Supas collect information on individual main employment activities, earnings, and hours of work on the primary job, as well as data on individual characteristics such as gender, age, and level of education. To make nominal wages and minimum wages comparable across years, these have been deflated by the annual provincial Consumer Price Index (CPI). In addition, the study also uses the regional gross domestic product (RGDP) data from each province, published by BPS. Minimum wage data, meanwhile, has been obtained from the Department of Manpower and Transmigration.

Qualitative Data

To obtain first-hand information on how the minimum wage policy is actually implemented, a qualitative survey of firms and workers was conducted in the Jabotabek (Jakarta, Bogor, Tangerang, Bekasi) and Bandung areas in June 2001. The survey consisted of two parts, one covering the formal sector and the other specifically directed at the informal sector.

The formal sector survey collected information from 41 firms and 200 workers in the manufacturing sector. Firms were carefully selected so as to capture certain desired characteristics. Similarly, the workers were also selected in a manner that would capture particular characteristics of the workforce. The workers were selected only from within those firms that were surveyed, so that all of the workers in the sample could be matched to the firms in the sample. The sample only included production workers who have been employed in the surveyed firms for at least one year. Although the workers interviewed are all from the surveyed firms, the management of the firms were not involved in the selection of the sample of workers and most interviews were conducted outside the factories.

The distribution of firms and workers according to particular characteristics of the firms are presented in Table A2 in the Appendix. Around 24 percent of the surveyed firms are food and beverages producers, 15 percent are textile producers, 20 percent are garment producers, 20 percent are footwear producers, 15 percent are automotive spare-part producers, and 7 percent are chemical and pharmaceutical

producers. In terms of size, 29 percent of the firms are considered small (employing less than 20 workers), 34 percent are medium-size firms (employing 20 or more but less than 100 workers), and the remaining 37 percent are large firms (employing 100 workers or more). In terms of ownership, 80 percent are domestic firms and 20 percent are foreign-owned. Finally, in terms of product marketing, 56 percent of the firms have a domestic orientation, 15 percent are solely export-oriented, and 29 percent sell their products to both the domestic and export market. As shown in Table A2, the distribution of workers in the sample by firm characteristics is roughly proportional to the distribution of firms.

The distribution of workers in the sample according to certain characteristics of the workforce is shown in Table A3 in the Appendix. Male workers make up 55 percent of the sample, 77 percent are less than 35 years old, 59 percent have junior secondary education or below, 35 percent are classified as unskilled, 45 percent have four years or less work experience, and 60 percent have permanent employment status. The skilled-unskilled classification is based on whether a worker operates machinery or whether a worker needs some training to carry out their tasks. Meanwhile, the categories used for the details of the employment arrangements follow the definitions used within each firm.[3]

Meanwhile, an additional survey of informal sector firms and workers collected information from 16 informal establishments and 45 workers. In this study, an informal establishment is so defined if it has no official permits for its operation. In general, these informal establishments are usually run as family-based operations, frequently located within the vicinities of the owners' residences. The relationship between owners or management and their workers is usually on an informal basis.

The distribution of the informal firms and their workers according to the particular characteristics of these firm are presented in Table A4 in the Appendix. Half of these' firms are food and beverages producers, one is a garment producer, six are footwear producers, and one is a wood handicraft firm. The number of workers in the sample across sectors is roughly proportional to the number of firms. All of these informal firms are small (employing less than 20 workers), all are domestically owned, and all sell their product to the domestic market.

[3] There is a large variety of the details of employment arrangement between firms and workers found in the survey, which can be grouped into five types. First, monthly permanent (*bulanan tetap*), where workers are employed on a permanent basis and receive monthly wages. Second, monthly contract (*bulanan kontrak*), where workers are employed based on a contract which is valid for a certain period, usually not exceeding one year, and they usually receive their wages on a monthly basis. Third, daily permanent (*harian tetap*), where workers are employed on a permanent basis but their wages are calculated on daily basis. Fourth, daily casual (*harian lepas*), where workers are called to work only if firms have work available for them to do and their wages are calculated based on actual work days. Fifth, piece-work (*borongan*), where workers are paid based on the number of goods produced.

Meanwhile, the distribution of informal sector workers in the sample by worker characteristics is shown in Table A5 in the Appendix. More than 85 percent of these informal sector workers are male, more than 80 percent are below 35 years of age, more than 90 percent have junior secondary education or less, more than 60 percent are classified as unskilled, more than 75 percent have four years or less work experience, and all are either employed on a daily casual or piece-work labor basis.

III. MACROECONOMIC BACKGROUND

From the mid 1970s to the mid 1980s, Indonesia adopted an inward-looking import-substitution development strategy. During that period, awash with revenue from oil exports, the government was eager to build capital-intensive industries to replace imports. In addition, the government spent a large sum of money in building infrastructure, in particular to support agricultural development. Not surprisingly, the public sector in the economy was dominant during this period.

However, starting in the mid 1980s the Indonesian economy was made more open. This was a direct result of the large drop in oil prices that began in the early 1980s (Hill, 1996). Because oil revenue shrank quickly, the government faced a sudden external imbalance. The import substitution strategy of the previous decade had left Indonesian industries inefficient and unable to compete in the world market at the maintained exchange rate. In addition, the general decline in primary commodity prices raised the premium on foreign exchange. As a result, the import substitution strategy was discarded and replaced with export oriented policies, combined with deregulation measures in the domestic economy. This was accompanied by a devaluation of the exchange rate.

Economic deregulation began in 1986 with the liberalization of export-import procedures.[4] Subsequently, various deregulation measures were introduced to make the economy more efficient. Despite some backward steps, the government was largely successful in its efforts to increase the efficiency of industry and improve international competitiveness (Fane, 1996). As a result, by the late 1980s, Indonesia appeared at last to be following the East Asian pattern of rapid growth in labor-intensive manufactured exports (Hill, 1991).

Along with trade liberalization, Indonesia also liberalized its foreign investment policy. The pattern of foreign investment in Indonesia after the liberalization of the mid 1980s was reviewed by Thee (1991). He found that after the mid 1980s there was a surge in foreign investment, mostly from the four Newly Industrializing Countries (NICs): Hong Kong, Taiwan, South Korea, and Singapore. The majority of this new foreign investment was export-oriented and occurred mainly in those sectors in which Indonesia has a strong comparative advantage, such as labor-intensive and resource-rich areas of the economy. This contrasts starkly with foreign investment in the previous period, which had a strong domestic orientation and took place mainly in capital and technology-intensive sectors. Thee (1991) also points out that the average size of the new foreign investments after the mid 1980s was much smaller than investments during the previous period.

[4] Earlier, in 1983, the government began to deregulate the banking sector by allowing banks to set their own interest rates. In the same year, the government also devalued the exchange rate.

The trade liberalization measures and investment reforms were aimed primarily at shifting the economy towards a more export-oriented structure based on non-oil exports. By all accounts these reforms, which were started in the mid 1980s, were quite effective. Figure 1 shows the annual growth rates of real gross domestic product (GDP), the consumer price index (CPI), and the exchange rate (defined as Rp/US$). This figure indicates that from the late 1980s until 1997, Indonesia had a relatively stable macro-economic environment. The economy grew at a rate of more than seven percent annually, inflation was held below10 percent per annum, and the exchange rate depreciated steadily at around five percent per year.

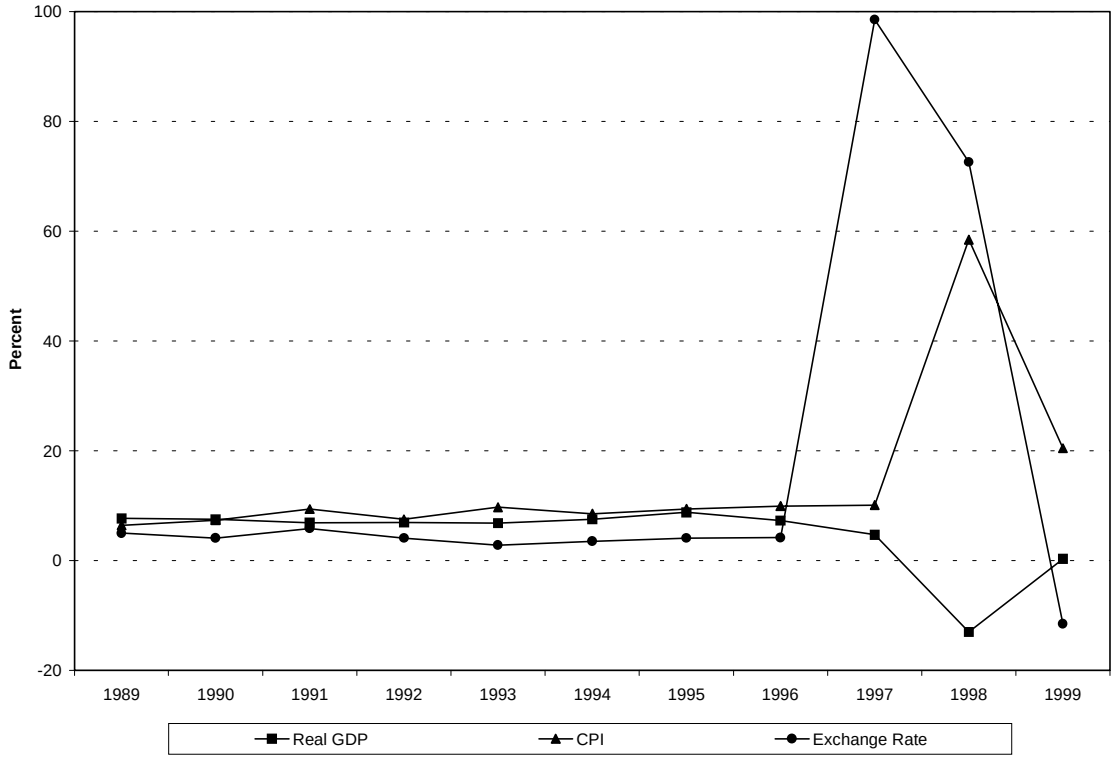

Figure 1. Annual Growth of Real Gross Domestic Product (GDP), Consumer Price Index (CPI), and Exchange Rate (Rp/US$)

As also indicated in Figure 1, this changed dramatically in 1997. Beginning in the middle of that year, Indonesia was hit by a currency crisis, which by the first half of 1998 had developed into a full-blown economic and political crisis. The value of the rupiah plummeted from its pre-crisis level of approximately Rp2,500 to around Rp15,000 to the US dollar by mid 1998. As the economy contracted by an unprecedented magnitude of 13.7 percent throughout 1998, inflation reached 78 percent and food prices escalated by an estimated 118 percent in the same year. In addition, there were mass riots in the capital, Jakarta, and several other cities, in May 1998, culminating with the fall of the New Order government which had been in power since the mid 1960s. In 1999 economic growth was near zero. In 2001, four years after the crisis began, the Indonesian economy is still struggling to make a full recovery.

IV. THE STRUCTURE OF THE LABOR MARKET

During the past decade, the structure of the Indonesian labor market has undergone considerable changes, both quantitatively as well as qualitatively. Table 2 presents in summary form some key statistics on the Indonesian labor force from 1988 to 1999. The Indonesian labor force grew by around 32 percent from 71.9 million in 1986 to 94.8 million in 1999,[5] an average annual growth of 2.5 percent. During the whole period, however, the labor force participation rate was relatively steady, only slightly fluctuating between 65 and 68 percent, suggesting that the increase in labor force size was mostly driven by natural population growth.

[5] In this paper, the labor force is defined as that section of the population 15 years of age and over who are working or looking for work. Before 1998, the official labor force statistics used the 10 year old population group as the threshold age. The change in the threshold age was in accordance with the adoption of the core ILO Convention No. 138 on the Minimum Age, which stipulated that the minimum age for employment is after the conclusion of basic education. Indonesia adopts a nine-year basic education policy.

Table 2. Descriptive Statistics of the Indonesian Labor Market

Labor Market Characteristics	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Size of labor force (in millions)	71.9	72.8	75.4	76.2	76.2	79.2	83.7	84.2	88.2	89.6	92.7	94.8
Labor force participation rate (%)[a]	66.9	66.1	66.4	66.0	67.8	67.8	66.8	65.4	66.9	66.3	66.9	67.2
Female labor force (%)	40.1	39.9	38.8	38.3	39.0	38.6	38.9	36.5	38.5	38.3	38.8	38.4
Youth labor force (%)[b]	23.1	22.5	23.1	23.1	22.8	22.2	23.0	23.9	22.3	21.5	21.3	21.3
Urban labor force (%)	23.6	23.9	25.5	27.7	28.7	29.5	31.3	34.3	33.9	35.6	36.0	38.1
Formal work force (%)[c]	26.9	27.6	28.1	30.0	30.7	32.1	36.1	37.5	37.9	39.1	35.4	36.9
Blue-collar work force (%)	-	-	-	-	-	-	89.0	82.5	81.2	85.2	81.8	80.0
Part-time work force (%)[d]	28.9	28.2	28.0	27.6	29.6	29.1	28.4	32.4	33.3	26.5	28.6	27.3
Unemployment rate (%)[e]	2.8	2.8	2.5	2.6	2.8	2.8	4.4	7.0	4.9	4.7	5.5	6.4

Source: Sakernas, except for 1995 where the data has been obtained from Supas.

Notes:
- [a] The labor force participation rate is the proportion of the labor force from the total population 15 year old and over.
- [b] Youth labor force is defined as part of the labor force whose ages are 15-24 year old.
- [c] For the definition of the formal work force, see Footnote 6 in the text.
- [d] Those who work less than 30 hours per week are considered to be working part-time.
- [e] Unemployment rates from 1994 onward are not comparable with the preceding period.

The gender composition of the labor force was also relatively stable. The proportion of females within the total labor force was relatively steady, fluctuating slightly between 36.5 and 40 percent. Similarly, the proportion of youth - those aged between 15 and 24 years - among the total labor force did not change much during the period, fluctuating only slightly between 21 and 24 percent. On the other hand, there was a notable trend towards the urbanization of the labor force. The proportion of the urban labor force increased from 23.6 percent in 1986 to 38.1 percent in 1999, an increase of more than 60 percent over this 11 year period.

The table also shows a clear trend in favor of formalization within the Indonesian economy, at least between 1988 and 1997 when the proportion of the formal work force increased from 26.9 percent to 39.1 percent.[6] There are signs that the economic crisis has temporarily reversed this trend, with the proportion of the formal work force falling back to 35.4 percent in 1998. In 1999, however, the formal work force had grown again to 36.9 percent.

Modernization in an economy can also be reflected in its labor market structure. In particular, more modern technologies usually require a higher proportion of white-collar employees. This is also reflected in the Table 2, where a decline in the proportion of blue-collar workers is readily apparent. In 1994, blue-collar workers made up 89 percent of the total Indonesian workforce,[7] but by 1999 this had declined to 80 percent.

Meanwhile, the proportion of part-time workers - working less than 30 hours per week - has been relatively steady, fluctuating between 27 and 33 percent. However, the unemployment rate has tended to increase, both during the pre-crisis period as well as during the crisis period. In the earlier period, unemployment increased from 4.4 percent in 1994 to 4.9 percent in 1996. Throughout the latter period it also increased from 4.7 percent in 1997 to 6.4 percent in 1999.[8] There is a strong

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[6] The formal work force is defined here to include those who are: (i) self-employed and assisted by non-permanent employees, except for those in the agriculture sector; (ii) self-employed and assisted by permanent employees; and (iii) wage employees, except for those in the agriculture sector. This definition largely follows the definition used by BPS, which is the same as the above three categories plus (iv) self-employed without assistance in the professional, leadership, and managerial type of jobs. This last category is not included in this study because the data on these types of jobs was not available prior to 1994. Meanwhile, some have argued that the first category is more likely to be informal rather than formal. If this first category is excluded from the definition, then the size of the formal work force in 1999 is 29.9 percent instead of 36.9 percent as indicated in Table 2.

[7] The data for the periods before 1994 are unavailable.

[8] The unemployment rates for the period before 1994 are not strictly comparable with the rates for the following years due to different concepts of job search used in the official surveys. Before 1994 the length of the job search period asked about in the survey was limited to the previous single week. In 1994 this was changed and not limited to the previous week as long as the person was still waiting for the results. Meanwhile, the 1995 unemployment rate is much higher than the years before and after. This perhaps is more likely to be a result of different sources of data rather than reflecting a dramatic change in the economic fundamentals.

possibility that the increased unemployment rate during the latter period was a direct result of the crisis, since between 1996 and 1997 the increase in the unemployment rate had actually leveled off. However, the earlier increase was more likely to have been a result of an increasing level of reservation wage. Economic growth and an improvement in living standards had allowed more people the luxury of refusing to accept the prevailing market wage rates, even preferring to be unemployed.

In addition to those significant quantitative changes, the Indonesian labor force has also changed quite considerably in a qualitative sense.[9] Table 3 shows the structure of the labor force by education levels. Those with upper secondary and higher education levels are classified here as the "educated" labor force, while those with no more than lower secondary education levels are classified as the "less educated" labor force.

[9] The level of formal education provides both a good proxy for skill levels and is probably the most important determinant of the level of skills. In reality, the skills of workers are a continuum from the least skilled to the most skilled. Other factors - such as experience, on-the-job training, and innate ability - also play a part in skill formation. In developed countries, skilled labor is usually defined as those with tertiary education (see e.g. Baldwin, 1994). In Indonesia, however, upper secondary education is perhaps a more appropriate cutting point, as in 1999 the tertiary educated section of the labor force still made up only less than 5 percent.

Table 3. The Structure of the Labor Force by Education Level (%)

Education Level	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Less educated labor force	87.9	87.0	86.5	85.4	84.4	83.7	82.0	85.9	78.8	77.9	77.4	76.3
- No schooling	17.1	16.3	15.0	13.4	12.2	12.2	11.2	11.6	9.7	9.4	8.6	8.0
- Unfinished primary	27.2	26.4	25.3	23.3	23.7	23.3	22.5	23.0	18.9	20.4	18.2	17.0
- Primary	34.3	35.0	36.1	37.2	37.0	36.8	36.4	43.4	37.2	34.4	36.4	36.0
- Lower secondary	9.3	9.3	10.1	11.4	11.5	11.3	11.9	7.9	13.0	13.7	14.2	15.3
Educated labor force	12.1	13.0	13.5	14.6	15.6	16.3	18.1	14.1	21.2	22.2	22.6	23.7
- Upper secondary	10.4	11.1	11.5	12.4	13.2	13.6	15.1	10.2	17.4	18.1	18.4	19.1
- Tertiary	1.7	1.9	2.0	2.2	2.4	2.7	3.0	3.9	3.8	4.1	4.2	4.6

Source: Sakernas, except for 1995 data drawn from Supas

Using this definition, the size of the educated labor force has continuously increased, from 12.1 percent in 1988 to 23.7 percent in 1999. This is due to increases in the numbers of those with upper secondary and tertiary education within the labor force. Consequently, the proportion of those who are less-educated within the labor force has decreased, driven mainly by the decreasing proportion of those without any schooling at all and those with incomplete primary education. Meanwhile the proportion of the labor force with only a primary education during this same period remained relatively stable while the proportion of those with lower secondary education actually increased.[10]

Economic development has brought about structural transformation in the Indonesian economy. Table 4 shows the distribution of employment by economic sectors.[11] There was a redistribution of the sectoral share of employment away from agriculture toward industry and, in particular, services sectors, at least during the pre-crisis period. Between 1988 and 1997 agriculture's share of employment fell quite significantly from 55.2 to 40.7 percent, while industry and services increased from 8.3 to 13.9 percent and from 31.1 to 45.4 percent respectively. The fall in the employment share of agriculture was driven primarily by a fall in employment within the food crops sub-sector.

There was a temporary reversal of this trend during the crisis. In 1998 the employment share of agriculture increased again to 45 percent, while the share of industry and services dropped back to 12.1 and 43 percent respectively. In the following year, the previously identified long-term trends returned with a decrease in agriculture and increases in industry and services. The employment share of the agriculture, industry, and services sectors in 1999 was 43.2, 13.8, and 43 percent respectively.

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[10] The increase in school graduates in Indonesia began in the mid 1970s due to the government's school construction program. At the primary school level, for example, between 1973 and 1978 the government constructed over 61,000 schools throughout the country (Duflo, 2000).

[11] The sectoral disaggregation in Table 4 is dictated by the categories that are used in Sakernas. In the 1988 survey, there were only four sectors identified: agriculture, industry, trade, and services. Between 1989 and 1994, a finer disaggregation of the sectors increased the number to 17. These two different disaggregations are used to determine the sectors and sub-sectors in Table 4. Between 1996 and 1999, Sakernas used even finer two-digit sectoral codes.

Table 4. Sectoral Distribution of the Work Force (%)

Sector	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Agriculture	55.2	55.4	55.1	53.4	52.5	50.0	45.6	43.4	43.5	40.7	45.0	43.2
- Food crops	-	41.6	41.6	39.3	37.7	35.1	28.2	30.1	26.4	25.4	29.9	28.0
- Estate & other crops	-	7.0	8.0	8.1	9.0	8.2	10.1	6.8	9.0	9.1	9.3	9.5
- Livestock	-	3.3	3.7	4.5	4.5	5.4	6.2	3.1	3.4	3.1	3.2	3.1
- Forestry, fishing & hunting	-	3.4	1.8	1.4	1.3	1.3	1.2	3.2	4.7	3.2	2.5	2.7
Industry	8.3	10.7	10.9	11.1	11.3	11.9	14.1	13.5	13.5	13.9	12.1	13.8
- Mining and quarrying	-	0.6	0.7	0.7	0.7	0.8	0.9	0.8	0.9	1.0	0.8	0.8
- Manufacturing	-	10.0	10.2	10.4	10.6	11.1	13.2	12.7	12.6	12.9	11.3	13.0
• Food, beverages, & tobacco	-	2.5	2.4	2.2	2.7	2.6	3.2	2.9	3.4	3.4	2.8	3.3
• Textiles, clothing, & footwear	-	2.3	2.2	2.5	2.5	2.6	2.9	3.0	3.0	3.1	2.8	2.9
• Wood products	-	2.0	2.0	2.0	2.0	2.1	2.8	2.7	3.1	2.7	2.8	3.0
• Other manufacturing	-	3.3	3.6	3.7	3.4	3.9	4.3	4.1	3.1	3.7	2.9	3.9
Services	31.1	33.9	34.0	35.5	36.1	38.1	40.1	43.1	43.0	45.4	43.0	43.0
- Trade	14.9	15.1	14.8	15.1	15.2	16.0	17.2	17.5	18.9	19.9	19.2	19.7
- Non-Trade Services	16.2	18.8	19.2	20.4	20.9	22.2	22.9	25.6	24.1	25.5	23.8	23.3
• Utilities	-	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2
• Construction	-	2.6	2.8	3.3	3.4	3.6	4.4	4.8	4.5	4.9	4.0	3.9
• Transport & communications	-	3.1	3.1	3.3	3.4	3.8	4.2	4.4	4.7	4.8	4.7	4.7
• Finance, insurance, leasing	-	0.6	0.7	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.7	0.7
• Public service	-	5.4	4.6	4.4	5.0	4.8	4.9	4.0	4.1	3.9	4.7	4.8
• Social	-	2.9	4.2	4.7	4.2	4.9	4.0	4.7	4.3	4.4	3.5	3.1
• Other non-trade services	-	4.2	3.7	3.8	3.9	4.1	4.4	6.6	5.6	6.4	5.9	5.9

Source: Sakernas, except for 1995 data drawn from Supas

V. THE MINIMUM WAGE REGULATIONS

Minimum wage policy was first introduced in Indonesia in the early 1970s. However, until the late 1980s the policy was hardly enforced and largely ineffective (Rama, 1996). During this period, in practice the government did not intervene in wage determination, nor did it enforce regulations on the laying-off of workers. In addition, the government tightly controlled the labor movement by allowing only one government-sanctioned labor union. As a result, as noted by Manning (1994), there was little effective direct government or union involvement in the setting of wages.

The early 1990s, however, witnessed many changes in the Indonesian labor market, two of which are especially important. Firstly, several independent labor unions were established despite the government's efforts to disband them and declare them illegal. Secondly, the government began to enforce the implementation of regional minimum wage regulations, which from this period have been updated annually.

These changes came about in response to both internal and external pressures. The internal pressures came from many of those concerned about the conditions of the workers in an increasingly industrialized Indonesian economy. This included the growing concern of many senior policy makers that labor was not sharing in the high growth that had taken place in the economy (Agrawal, 1996; Edwards, 1996; Manning, 1994).

The external pressures, meanwhile, were a result of the increasing level of Indonesian exports to North America and the European Union (EU), where concerns were being expressed from many quarters about labor market conditions in developing countries. The focus was on workers in export sectors, where, it was claimed, there were poor working conditions, low wages, and the denial of fundamental rights to form labor unions. This belief led to calls for a 'social clause' in the countries trade agreement between developed and developing countries, stipulating that favored access to the markets of developed countries would not be granted to those third world countries where labor standards remained unsatisfactory (Addison and Demery, 1988).

Indonesia was one of the countries targeted by this concern. In the early 1990s, several complaints were filed under the Generalized Scheme of Preferences (GSP), threatening to deprive Indonesia of low tariffs on its exports to the US market. The withdrawal of investment guarantees to US companies that would ensue was a threat of potentially greater significance (Rama, 1996).

As part of the responses to this, the government of Indonesia revamped the mechanism to set minimum wages in 1989 and then on several subsequent occasions during the 1990s. The government's objective has been to set minimum wages with

reference to a range of factors including the so called minimum subsistence needs (*kebutuhan hidup minimum* or KHM), the cost of living, the capacity and sustainability of companies, existing market wage rates, labor market conditions, and economic and income per capita growth.[12]

Prior to 1996, minimum wages were calculated with reference to what was termed minimum physical needs (*kebutuhan fisik minimum* or KFM) rather than KHM.[13] Both KFM and KHM are bundles of consumption items which are deemed essential for the livelihood of a single worker. The KHM bundle consists of 43 items, ranging from food, clothing, housing and transport to health and recreation.[14] Essentially KHM is a broader consumption bundle, and hence represents a higher standard of living, than KFM. For example, the food bundle of KFM was set to achieve a caloric intake of 2,600 calories per day, while the food bundle of KHM was set to achieve a caloric intake of 3,000 calories per day.

Until 2000, most provinces had just one level of minimum wage which was applied throughout the entire province. Exceptions were to be found in Riau, South Sumatra, West Java, East Java, and Bali, where several minimum wages existed for different regions within these provinces. In addition, some provinces had different minimum wages for different sectors of the economy. In such cases, the sectoral minimum wages could not be set at a lower level than the general minimum wage that applied in that region.

Until the year 2000, the regional minimum wages were establish by a decree issued by the Minister of Manpower. In determining minimum wage levels, the minister received recommendations from provincial governors. In formulating the recommendations, the governors in turn received recommendations from provincial tri-partite councils, made up of representatives from employees, employers, and the government. In practice, employee and employer representatives were usually government appointees.

Beginning in 2001, as part of the regional autonomy policy adopted and implemented throughout the country, the power to set minimum wage levels has been transferred to governors, mayors, and regents (*bupati*), as the respective heads of provinces, cities, and districts (*kabupaten*).[15] As of 1999, Indonesia has 341 cities and districts. In setting the levels of minimum wages, mayors and regents also receive recommendations from tri-partite councils in their regions.

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[12] See the Minister of Manpower Regulation No. 01/1999 on Minimum Wages.
[13] The change from KFM to KHM is stipulated in the Minister of Manpower Decree No. 81/1995.
[14] The details of KHM can be seen in Depnaker (1998).
[15] See the Minister of Manpower and Resettlement Decree No. 226/2000.

VI. MINIMUM WAGE POLICY IN PRACTICE

In developing countries, the way in which a government regulation is implemented may be quite different from what is actually stipulated in the regulation. The purpose of this chapter is to assess how the minimum wage regulations are viewed by both employers and workers based on the qualitative survey of firms and workers. The first section evaluates the knowledge of both employers and workers about minimum wage policy. The second section examines the compliance of firms with the minimum wage regulations. Drawing on the experience of employers and employees, the third section discusses some key problems in the implementation of the minimum wage regulations. The final section assesses the structure of wages in the informal sector, where minimum wages do not apply.

Firms' and Workers' Knowledge of Minimum Wage Policy

Both management and workers in all firms interviewed in the formal sector survey claim to know about the minimum wage regulations. However, the level of knowledge varied greatly both between management and workers as well as across firms and across workers. In general, management and workers know about the existence of the minimum wage regulations as well as the level of the minimum wage that applies in their particular region, but they are not sure about the details of the regulations, such as which wage components can be considered as a legitimate part of the minimum wages.

One of the main reasons for the considerable differences in understanding of the minimum wage regulations is the complexity of the wage system itself. Another important reason is that both management and workers learn about the regulations from a variety of different sources. The management of large firms usually obtain their information from official sources such as the Department of Manpower, the Regional Government, or the Indonesian Businessmen's Association (Apindo). In general, the information is received soon after a new regulation is released.

The situation, however, is quite different for the management of medium and small firms. They do not usually obtain this information from official sources, or if they do there is often a considerable time lag between the issuing of a new regulation and the delivery of the information. In most cases, they receive information from the mass media such as newspapers, radio, or television.

The information sources for workers are also diverse. In large enterprises, the firms' management is an important source of information for their workforces. Often information about new minimum wage regulations is displayed on official notice boards or is passed on through supervisors. In those firms where worker unions are active, the unions play an important role in publishing new minimum wage regulations. Some workers also obtain their information from many other sources, including their fellow workers and the mass media.

The Degree of Compliance

Different interpretations about those wage components that can be considered as part of the minimum wages create complications in assessing compliance. The regulations stipulate that minimum wages are made up of basic wages and fixed allowances. An allowance is defined as a fixed allowance if its payment is unrelated to the number of work-days or output. An example of this is the family allowance. On the other hand, overtime payments may not be included in the calculation of a worker's total base salary for assessing compliance with the minimum wage. Meanwhile, meal and transport allowances can be considered either as fixed or as variable allowances, depending on the payment system used by a firm. If workers are still paid these allowances even for days when they do not attend for work, then these are considered as fixed allowances.

Additional complications can arise for a variety of reasons. Some firms pay workers' income tax or social security contributions directly and these payments are unrecorded on the workers' salary slips. Some firms pay "in kind" allowances such as workers' accommodation and transport. Sometimes firms use an inappropriate term to describe an allowance. In one case, a firm pays its workers a "bonus" that is paid regularly each month in a fixed amount and is clearly unrelated to output or performance. However, the most difficult assessment is for those workers who are paid on a piece-work basis. Such workers often receive take-home pay that is significantly higher than the minimum wage, but their total working hours are excessively long.

In practice, large firms usually interpret minimum wages as applying only to the basic wage that their workers receive, while all allowances - both fixed and variable - are not counted as part of the minimum wage. On the other hand, medium and small firms mostly interpret minimum wages as applied to the whole take-home pay, sometimes even including overtime pay. Box 1 provides an example of the components of workers' wages in a large firm surveyed in this study.

Box 1
Components of Workers' Wages in a Large Firm

	White-collar Workers	Blue-collar Workers
Basic wages	- Basic wages	- Basic wages
Fixed allowances	- Family allowance - Health allowance - Extra work allowance	
Variable allowances	- Work premium - Transport allowance - Meal allowance - Occupational allowance - Health fund allowance - Social security allowance	- Weekday overtime - Sunday overtime - Holiday overtime - Meal allowance - Health allowance - Work-level allowance - Performance bonus - Special task allowance - Extra-work allowance - Coffee allowance - Shift meal allowance - Transport allowance - Piece-work premium
Deductions	- Transport deduction - Work premium deduction - Loan deduction - Health fund deduction - Social security deduction - Worker union fee - Income tax	- Social security deduction - Income tax - Worker union fee - Workers' welfare fund

Therefore, to reliably and consistently assess the degree of compliance with the minimum wage regulations, a "normal base take-home pay" of each worker in the sample has had to be calculated. The conversion from the actual pay received to the normal base take-home pay involves the following steps: deducting any overtime and bonus payments; converting any night-shift wages to day-shift wages; converting the actual period worked to eight work hours per day for those workers employed on a piece-work basis.

The results of the assessment of compliance with the minimum wage regulations based on firm characteristics are shown in Table 5, while the same assessment based on worker characteristics is presented in Table 6. Compliance here refers to whether wages are around or above the minimum wages. It does not distinguished whether

compliance is done voluntarily or due to capacity of enforcement. The tables show that the workers in the sample on average are paid around 30 percent above the minimum wage, while 28 percent of them earn less than the minimum.

Table 5. Comparison of Wages in the Formal Sector and the Minimum Wage According to Firm Characteristics

Firm Characteristics	Ratio of Wage to Minimum Wage		Wages Below Minimum Wage (%)	Number of Observations
	Mean	Std. Dev.		
Sector:				
- Food and beverages	1.1	0.4	40.0	50
- Textiles	1.0	0.4	41.9	31
- Garments	1.3	0.7	16.7	42
- Footwear	1.4	0.8	24.3	37
- Automotive spare-parts	1.7	0.8	12.0	25
- Chemicals and pharmaceuticals	1.5	0.6	26.7	15
Size:				
- Small (number of workers < 20)	0.9	0.5	63.3	49
- Medium (20 ≤ number of workers < 100)	1.3	0.6	30.4	69
- Large (number of workers ≥ 100)	1.4	0.7	4.9	82
Ownership:				
- Domestic	1.2	0.6	33.1	157
- Foreign	1.6	0.7	9.3	43
Market orientation:				
- Domestic	1.1	0.6	43.7	103
- Export	1.2	0.6	14.3	35
- Domestic and export	1.5	0.6	9.7	62
Total	1.3	0.7	28.0	200

Table 6. Comparison of Wages in the Formal Sector and Minimum Wages According to Worker Characteristics

Worker Characteristics	Ratio of Wage to Minimum Wage		Wages Below Minimum Wage (%)	Number of Observations
	Mean	Std. Dev.		
Gender:				
- Male	1.4	0.7	20.9	110
- Female	1.1	0.6	36.7	90
Age group:				
- 15 – 24 years old	1.0	0.3	31.7	63
- 25 – 34 years old	1.3	0.5	25.8	89
- 35 – 44 years old	1.6	1.2	34.3	35
- ≥ 45 years old	1.4	0.5	7.7	13
Education level:				
- ≤ Junior secondary	1.1	0.6	42.4	118
- > Junior secondary	1.5	0.7	7.3	82
Skill:				
- Unskilled	1.0	0.4	42.3	69
- Skilled	1.4	0.7	20.2	131
Work experience:				
- ≤ 2 years	1.1	0.5	35.0	60
- 2 – 4 years	1.1	0.5	24.1	29
- 4 – 6 years	1.3	0.7	36.4	33
- 6 – 10 years	1.3	0.5	17.6	51
- > 10 years	1.7	1.1	25.9	27
Details of employment arrangements:				
- Monthly permanent	1.6	0.7	8.6	70
- Monthly contract	1.3	0.2	14.3	7
- Daily permanent	1.1	0.5	32.7	49
- Daily casual	1.0	0.6	43.8	48
- Piece-work	1.1	0.7	46.2	26
Total	1.3	0.7	28.0	200

Furthermore, Table 5 shows that firm characteristics play an important role in determining the degree of compliance with the minimum wage regulations. In general, firms in the capital intensive sectors - such as automotive spare-parts, chemicals, and pharmaceuticals - pay higher wages and, hence, exhibit a higher degree of compliance with minimum wage regulations than firms in labor-intensive industries. The workers in automotive spare-parts factories on average are paid 70 percent above the minimum wage and only 12 percent of those workers reportedly receive wages below the minimum. By contrast, the average wage of workers in the textile sector is around the minimum wage and more than 40 percent of these workers reportedly receive wages below the minimum.

The size of firms is also a significant factor, as in general larger firms can afford to pay higher wages and comply more effectively with the minimum wage regulations than smaller firms. The average wage of those workers employed in large firms is 40 percent higher than the minimum wage, while less than five percent of these workers reportedly earn less than the minimum. On the other hand, workers employed in small firms on average are paid 10 percent below the minimum, and more than 60 percent of them reportedly earn less than the minimum. Box 2 provides an example of a small firm which pays its workers less than the minimum wage.

Box 2
A Small Company with Wages Below the Minimum Wage

Z is a small firm in Jakarta producing *sari kelapa*, a type of drink made from frozen coconut juice. The company was established in 1979, but it was not until 1981 that it became a legal entity and its distribution of *sari kelapa* spread to include several supermarkets in Jakarta. The company has always employed a 'family style' of management, with an informal relationship between the management and its employees. It always insisted that both the company and its employees would 'share the good and the bad times together'. Management has always been extremely lenient about minor breaches in its workplace regulations. For example, if an employee was late there was no deduction from his or her wage. On the other hand, whenever changes were made to the official minimum wage regulations, workers were generally understanding and able to reach a compromise with the company, based on the idea that the company would adjust their wages in line with the minimum wage if and when the company was able to do so.

From 1992 to 1995 this company exported *sari kelapa* to Japan, Malaysia and Australia. During this period about 40 workers were producing 1,200 cartons of drink a day. However, as a result of the economic crisis, since 1998 production has drastically declined. Only 16 staff remain and the company is only able to produce about 180 cartons a day.

Presently, this company is only able to pay its male workers Rp6,500 and female workers Rp6,000 per day. This discrepancy is a result of the different type of work that each perform, with men carrying out those tasks that require greater physical labor. In addition to these wage discrepancies, male employees also receive better health insurance, which covers their wife and two children, while female employees only receive health insurance for themselves. Working hours are from 8.00 to 12.00. There are no set work days. Every employee is required to contact the office on a daily basis to find out whether they are required to work that day based on information from the marketing department. Those employees that contact the office first receive a Rp1,000 – Rp1,500 transport allowance.

Most of the company's employees do not know the details of the official minimum wage, as they receive almost no information on the subject from their employer or from any other sources. So far, the existing wage discrepancies and health cover issues have not caused any problems. Employees will receive a bonus if they are able to produce more than 150 kg of *sari kelapa* per day, irrespective of whether they are able to exceed their production target inside the set working hours. During the fasting month, as production increases sharply to keep up with the market demand, workers can earn an extra Rp750,000 over this period.

The company also offers a money lending facility for their employees who are having difficulties putting their children through school. The money that they borrow is then repaid in installments. It would seem that this company does what it can to improve the welfare of its employees. For example, when one of their employees got married and didn't have the funds to rent a house, the company permitted this employee to use one of the rooms in the workplace as a temporary living quarters.

It appears that most workers are happy in their jobs. A majority of them have been working for this firm since the 1980s. During this period no new employees have been hired. Apart from wages, health cover, and a transport allowance, the company also gives its employees a *Hari Raya* bonus at the end of the fasting month which is equivalent to one month's wage.

Foreign-owned firms in general pay higher wages and comply more effectively with the minimum wage regulations than domestic firms. The average wage of workers employed in foreign-owned firms is 60 percent higher than the minimum wage, while the average wage of those workers employed by domestic firms is 20 percent above the minimum wage. Consequently, while less than 10 percent of workers in foreign-owned firms earn less than the minimum, around one third of the workers in domestic firms earn less than the minimum.

Finally, firms which sell their products to export markets, generally, pay higher wages and comply more closely with the minimum wage regulations than those firms which solely target the domestic market. Those workers employed in firms which solely orient their products towards the domestic market are paid on average 10 percent above the minimum and around 44 percent of these workers earn less than the minimum. In contrast, the workers employed by firms which only market their products abroad are paid on average 20 percent above the minimum and only around 14 percent of them earn less than the minimum. However, firms which sell to both domestic and foreign markets seem to pay higher wages, on average their workers are paid 50 percent above the minimum and less than 10 percent of these workers earn less than the minimum.

Table 6 reveals that worker's characteristics influence the wages they receive and, hence, also affect the degree of compliance by their employers with the minimum wage regulations. For example, male workers on average are paid 40 percent higher than the minimum wage and only around 20 percent of them receive wages below the minimum. In contrast, the average wage of female workers is 10 percent above the minimum wage and almost 40 percent of them are paid below the minimum. This of course may be due to other characteristics of the workers. But even for those workers with similar characteristics, female workers still tend to be paid less than male workers. The reason most often given by the firms' management is that female workers are assigned less physically demanding tasks compared to male workers. Box 3 provides an example of a profile of a female worker who earns less than the minimum wage.

Box 3
Profile: A Female Worker Who Earns Below the Minimum Wage

Mrs A is 42 years old and works for a small firm producing garments for export in Jakarta. Her husband, who works as a bird trader, spends a large amount of time away from home looking for birds to be sold in Jakarta. Mrs A only completed junior secondary school and has worked as a seamstress for nearly two years, receiving a daily wage of Rp8,000. This has not changed during the entire period she has worked for the business. However, since March 2001, she has received regular monthly bonus of Rp30,000 paid on the 15th of each month. In addition, around *Lebaran* - the end of the fasting month - she receives a *Hari Raya* bonus of Rp50,000.

Mrs A is definitely aware that the official minimum wage in her area is Rp426,250 per month because she was told by her neighbor who works for a large company. She also realizes that the amount she now receives is well below the minimum wage. However, she doesn't object because she is familiar with the conditions in small business and considers her income to be comparable with the work load. She also regards this to be a more relaxed workplace compared to large enterprises, since the workers have more freedom to choose not to come to work even though this means they will not receive any wages for the days they do not attend.

Previously, Mrs A had worked for large firms, and has changed jobs several times. These include large garment factories and more recently a doll factory. While she worked for these firms she always received the minimum wage. However, in 1998, because of illness and her age she has decided that she no longer wishes to work for large enterprises with their highly disciplined environment.

The wage she receives now is relatively small. However, it is still enough to cover her basic living expenses. In fact, sometimes she even manages to send a small amount of money to her parents. Her daily expenses are few and include Rp1,000 for transport and approximately Rp5,000 for food. The rent for the room where she lives is Rp73,500 per month and is paid by her husband.

The commonly found U-inverse relationship between age and wages is also observed in this sample. Wages initially increase with age, but then decrease again amongst the older age group. Youth workers, aged 15 to 24 years, have an average wage at about the minimum wage level, while more than 37 percent of them receive less than the minimum. The peak wage is obtained by workers in the 35 to 44 year age bracket who receive an average wage 60 percent above the minimum. However, this group also has the highest degree of wage variability, about 34 percent of them still earn less than the minimum. For those workers in the highest age group, 45 years and over, their average wage is about 40 percent higher than the minimum with only around 8 percent of them earning less than the minimum.

Education is an important wage determinant. Workers with a level of education higher than junior secondary school receive an average wage 50 percent higher than the minimum wage. Most workers in this group are paid above the minimum wage level, with only around seven percent earning less than the minimum. By contrast, workers who have at most a junior secondary education level are paid on average only 10 percent above the minimum wage and more than 42 percent of them are

actually paid less than the minimum. Box 4 provides an example of a lowly educated worker who cannot find better alternative employment. Even though he has repeatedly quit his job, he has always returned to the same job in the same firm.

Box 4
A Worker Who Repeatedly Quits His Job

Mr O is 33 years old and has only a primary school education. For the last 5 years he has worked for a small textile company that produces mattress and curtain material in Majalaya, Bandung. He is from Lampegan village, in Kecamatan Ibun, not far away from Majalaya. He has quit his job three times at this textile company and each time he has been re-employed.

He started working for the company in 1983, but only lasted 3 years. He decided to quit because his wages were only sufficient to cover his transport expenses which then amounted to Rp9,000 every week. He was however later re-employed and was paid Rp15,000 per week. Yet, on that occasion he only lasted 5 months at the factory before quitting again due to illness. Luckily, after he recovered, he was able to resume work at the same factory on the same wage. When his wife suggested returning to farming in her village near Banjar, Ciamis, he again resigned. However, in 1996 he returned to Bandung and again joined the same company on a wage of Rp26,000 per week. Over the last five years he has persevered with his job and as a consequence his nominal wage has grown to Rp94,000 per week, or around Rp40,870 in 1996 prices. This means that on average his wage is increased by around 9.5 percent per year in real terms.

Similarly, skill is an important determinant of wages. The table shows that unskilled workers are paid significantly less than skilled workers. The average wage of unskilled workers is about the level of the minimum wages and more than 42 percent of them are paid less than the minimum. On the other hand, the average wage of skilled workers is 40 percent above the minimum wages and only around 20 percent of them earn less than the minimum.

Work experience is also an important determinant of wages. However, Table 6 indicates that unlike age, the relationship between experience and wages is continuously increasing instead of U-inverse. Employees with work experience of less than four years are paid on average 10 percent above the minimum wage and between 24 and 35 percent of them are paid less than the minimum. Meanwhile, those workers who have been employed for over six years receive an average wage of 30 to 70 percent above the minimum wages and between 18 to 26 percent of them earn less than the minimum.

Finally, the details of employment arrangement, which describes the working relationship between a firm and its employees, have important consequences for the welfare of the workers. In general, workers in daily hire arrangement receive much

lower wages than monthly hire workers. The daily casual workers have an average wage at about the minimum wage level while around 44 percent of them are paid below the minimum. By contrast, monthly permanent workers in general seem to have the best wage conditions compared with other groups of workers. Their average wage is 60 percent above the minimum wages and less than nine percent of them earn less than the minimum.

The results presented in Tables 5 and 6 indicate that there are many characteristics of both firms and workers that contribute to determining the degree of compliance by employers with the minimum wage regulations. However, these results cannot tell us which of these factors are the most important as they were obtained from an uncontrolled simple tabulation. For example, the effect of levels of education may not be as great as is suggested by the results in Table 6 if it is controlled by firm size, as larger firms are more likely to employ the better-educated workers than smaller firms. Hence, it is possible that actually firm size is the more important factor in determining compliance with the minimum wage regulations rather than education level.

To assess this, a probit analysis has been conducted and the results are presented in Table 7.[16] In this probit regression, the dependent variable is a dummy variable of whether or not a worker's wage is above the minimum wage. Meanwhile, the independent variables are dummy variables for firm and worker characteristics as defined in Tables 5 and 6. The first category of each characteristic is chosen as the base category and omitted from the regression. The coefficients presented in Table 7 are in terms of the probability of having a wage above the minimum wage relative to the base category.

[16] Probit is a type of limited dependent variable models. These models have categorical variable as the dependent variable. In this analysis, the command used is DPROBIT in STATA program.

Table 7. Probit Analysis of the Determinants of Compliance with the Minimum Wage Regulations
(Dependent variable: Dummy of whether wage is higher than the minimum wage)

Independent Variable	dF/dx	z-value
Sector:		
- Textiles	-0.033	-0.30
- Garments	0.115	1.14
- Footwear	0.051	0.49
- Automotive spare-parts	0.110	1.15
- Chemical and pharmaceuticals	0.055	0.42
Size:		
- Medium (20 ≤ number of workers < 100)	0.208*	3.32
- Large (number of workers ≥ 100)	0.439*	4.05
- Foreign ownership	-0.281	-1.61
Market orientation:		
- Export	0.115	1.30
- Domestic and export	0.119	1.51
- Females	-0.191*	-2.65
- > Junior secondary education level	0.126	1.62
- Skilled	0.012	0.18
Work experience:		
- 2 – 4 years	0.066	0.81
- 4 – 6 years	-0.130	-1.20
- 6 – 10 years	0.131	1.77
- > 10 years	0.026	0.28
Details of employment arrangements:		
- Monthly contract	-0.073	-0.30
- Daily permanent	-0.242	-1.78
- Daily casual	-0.143	-1.20
- Piece-work	-0.194	-1.23

Notes: ** is significant at 1 percent level
* is significant at 5 percent level

The signs of the probit coefficients in Table 7 in general are consistent with the findings in Tables 5 and 6, except for foreign ownership.[17] However, only the coefficients of firm size and gender are statistically significant. This means that firm size and gender are the variables which matter in determining compliance to the minimum wage regulations. Controlling for all other firm and worker characteristics, workers in medium firms have 21 percent higher probability to be paid above the minimum wages than workers in small firms. Similarly, workers in large firms have a 44 percent higher probability of being paid above the minimum wages than workers in small firms. Meanwhile, female workers have a 19 percent lower probability of being paid above the minimum wages than male workers.

Some Implementation Problems

More than a decade after the revamping of the minimum wage regulations in 1989, the minimum wage has evolved from merely playing a symbolic role to its present position as an integral and important part of wage setting in Indonesia. Both firms and workers take minimum wages into account in their wage determination processes.

As expected, firms mostly view minimum wage regulations as a restriction or an impediment to free wage determination. However, the managers of a significant number of firms acknowledge that even with minimum wages, workers still struggle to make a decent living. On the other hand, most workers feel that the current levels of the minimum wage are still well below their needs. Nevertheless, many workers also realize that increasing minimum wages excessively may have detrimental effects on the sustainability of the firms which employ them. In this section, some problems that have emerged as a result of the implementation of minimum wage policy - viewed from both firm and worker perspectives - are discussed.

Management Perspectives

In general, both large and foreign-owned firms consider that the current levels of minimum wages are still acceptable. However, these firm strongly object to the way the minimum wage regulations have been issued in recent years. Before the crisis, minimum wages were determined annually. Recently, however, the level of minimum wages has been adjusted more frequently. In one particular case, the local government changed the level of the minimum wage in its region up to four times

[17] Although statistically insignificant, the coefficient of foreign ownership is negative. This is contrary to what is indicated by Table 5. The reason can be found in Table A6 in the Appendix. Although the average wage in foreign owned firms is higher than in domestic firms, the proportion of workers who earn less than the minimum in large domestic firms is actually much smaller than in large foreign owned firms.

over a 12 months period.[18] This has created problems for the planning and cash-flow of these firms. In addition, those enterprises which have signed contracts with buyers have been put into a difficult position as their calculation of costs has not been able to take into account these unanticipated changes in minimum wages.

Since the late 1980s minimum wages have increased rapidly, to the point where they have become the market wage, particularly in the case of medium and small firms. This means that all workers in these firms receive roughly the same level of wages, i.e. around the minimum wage. As a consequence, these firms are constrained in their capacity to use wages as an incentive to promote the productivity of their workers. With binding minimum wages, workers are paid equally irrespective of the level of their productivity. In turn, this creates disincentives for those workers who are more productive, resulting in a decline in the overall productivity of these firms. Box 5 provides an example of the view of a firm's management on why minimum wages do not help the firm improve the productivity of its workers.

Box 5
Missing Link Between Wages and Productivity

PT AR in Tangerang was established in 1990. This company produces spare parts and control cables for automated vehicles. Several types of raw materials are imported and the products sold locally under the K brandname.

Since the economic crisis began in 1997, sales of the company's products have fallen by up to 40 percent. One strategy adopted by firms to deal with this problem has been to reduce the size of their workforce. It also changed the employment status of most of its workers from the status of permanent staff employed on a monthly or daily basis to a piece-work system. Another problem faced by the firm is the limited skills of its workers where education levels range from average to low.

Adjustments in the official minimum wage have resulted in large increases on two occasions over the past year. According to the management of PT Automobile Repairs, this means that at present there is no reward system for hard-working employees because it is impossible for the firm to increase workers' wages after fulfilling the official minimum wage requirements. At the same time, the working environment in this firm has become unpleasant and inflexible as a result of government policies which they believe to be unfair.

The impact of minimum wages on firms differs across sectors. The greatest impact is of course on those enterprises in the labor-intensive sectors. These firms, however,

[18] This is actually in contravention with the Minister of Manpower and Resettlement Decree No. 226/2000, which stipulates that a review on the level of minimum wage is conducted once every year.

have little choice other than to comply with the minimum wage regulations, even when they are actually having difficulties in doing so, since the costs of non-compliance are almost certainly greater. Non-compliance may incite protests and strikes by workers which may disrupt production and cause delays in deliveries to buyers.

Actually the regulations provide an opportunity for firms which are facing difficulties in complying with the minimum wages to request a temporary waiver. However, the requirements for obtaining this waiver are both difficult and costly, one of which includes a financial audit from a public accountant. Box 6 provides an example of a firm which experienced difficulties as a result of an increase in the minimum wage.

Box 6
Profile: A Middle Sized Company Affected by an Increase in Minimum Wages

PT SB is a shoe embossing company in Tangerang that has been in existence since 1982. Previously, the company employed about 100 workers, divided equally between male and female employees. The company was then producing embossments for 10,000 pairs of shoes of various brands every day.

When the government issued a new minimum wage regulation in January 2001, the company did not immediately comply with the new regulation. Hence, almost all the company's employees took part in demonstrations, demanding that their wages be increased. Consequently, work was left unfinished and orders were delivered late, causing many buyers to cancel all of their existing orders. As a result, some employees had to be retrenched and some others resigned. These workers were given a redundancy package in line with Decree No. 150/2000 of the Ministry of Manpower.

The impact of this conflict has continued up until now. Orders continue to decline and payments to the company are as much as five months late. Currently, the company is only producing 3,000 embossments a day and the number of employees has dropped to 25, only a quarter of the original work force size.

As a result of limited capital, this company has made an effort to reduce overtime by dividing the available working hours of their 25 employees into three shifts. Salaries are eventually paid in accordance with the official minimum wage, that is Rp426,500 per month, with an additional Rp1,000 per day shift compensation and Rp2,000 daily food allowance.

Troubled industrial relations in recent years have become a concern for many of the firms interviewed. On the one hand, firms are pressured to comply with the minimum wage regulations. On the other, firms are experiencing difficulties in

maintaining their workforce as the generous compulsory severance payment often induces workers to quit over minor disagreements with management.[19] For firms that do not have the capacity to comply with big increases in minimum wages, such increases become a major cause of industrial strife. In an attempt to cope with this problem, some firms have opted to change their system of employment from a daily hire to a piece-work basis.

Worker Perspectives

Under the regulations, minimum wages are intended only for workers at the entry level. In practice, however, in many firms minimum wages have become the norm, as all workers roughly receive the minimum wage. Firms argue that this is a result of increases in minimum wages which has occurred at a much faster rate than what they can afford to pay. Among workers, however, this has created problems for those who have a long work history with their firm since they are now being paid nearly the same as entry-level workers. Those who have these long work histories feel that their experience is of no value to the firms.

Workers in some firms think that their employees view the minimum wage as 'the standard', instead of the minimum standard, for paying employees. These workers believe that their employees can actually afford to pay them higher wages, but because of the minimum wage regulations, they are only receiving wages at the minimum wage level. Even in good years when the firms perform well and earn higher profits, workers are still being paid the minimum. In this case, the workers feel that minimum wages have a detrimental effect on their earnings, rather than being of positive assistance.

The Minimum Wages and the Informal Sector

More than 60 percent of the Indonesian workforce are employed in the informal sector (see Table 2). Currently, the informal sector is not covered by the minimum wage regulations for the obvious reason that it is not practical to enforce. Although the regulations do not stipulate that minimum wages only apply to the formal sector, hitherto government supervision and enforcement have been limited to the formal sector, and in particular large firms. Table 8 presents a comparison between wages in the informal sector - as observed from the sample of workers in the informal firms surveyed - and the minimum wage.

[19] This compulsory severance payment is regulated by Decree No. 150/2000 of the Ministry of Manpower.

Table 8. Comparison Between Wages in the Informal Sector and the Minimum Wage According to Firm and Worker Characteristics

Firm and Worker Characteristics	Ratio of Wage to Minimum Wage		Wages Below Minimum Wage (%)	Number of Observations
	Mean	Std. Dev.		
Sector:				
- Food and beverages	0.9	0.5	68.4	19
- Garments	1.3	0.2	0.0	5
- Footwear	0.8	0.5	70.0	20
- Other	1.1	-	0.0	1
Gender:				
- Male	0.9	0.4	59.0	39
- Female	0.8	0.8	66.7	6
Age group:				
- 15 – 24 years old	0.9	0.5	60.0	25
- 25 – 34 years old	0.8	0.4	66.7	12
- ≥ 35 years old	1.0	0.5	50.0	8
Education level:				
- ≤ Junior secondary	0.9	0.4	61.9	42
- > Junior secondary	1.4	0.7	33.3	3
Skill:				
- Unskilled	0.8	0.5	75.0	28
- Skilled	1.1	0.4	35.3	17
Work experience:				
- ≤ 2 years	0.9	0.5	64.0	25
- 2 – 6 years	0.9	0.4	53.3	15
- > 6 years	0.8	0.3	60.0	5
Details of employment arrangement:				
- Daily casual	0.9	0.5	52.0	20
- Piece-work	0.9	0.5	70.0	25
Total	0.9	0.5	60.0	45

The table reveals that workers in the informal sector are paid on average 10 percent less than the minimum wage and 60 percent of these workers are paid below the minimum. These figures are similar to those that apply in small firms in the formal sector. In fact, informal firms and small formal firms share many other similar characteristics.

In informal firms, the owners are usually also the managers of the firms. In addition, they usually involve members of their own family as employees in their firms. Workers do not receive any formal or written contract on their employment status. Wages can be paid on a daily or a weekly basis. In one case wages are held in store by the owners of the business and are only withdrawn about once every four months when the workers return home to visit their families. Such an arrangement is possible because many of informal firms also provide accommodation and meals for their workers. Meanwhile, the incomes of those workers who are paid on a piece-work basis fluctuate significantly because of market uncertainties.

Workers in informal firms usually work long hours, between 10 and 14 hours per day is commonplace. They usually work six days per week and in some cases even seven days a week. To meet next day deliveries, workers in small firms producing *tempe* (soybean cake) have to start work in the middle of the night, while workers in small footwear producing factories work from 8 in the morning until 5 in the afternoon, then following a break return to work again from 8 to 11 in the evening.

All of the informal firms surveyed are extremely labor-intensive, so that labor costs constitute a large part of the production costs. On the other hand, the value added from their activities is low, so that worker productivity is also low. Hence, these workers receive low wages. Not surprisingly, these workers also have a low level of both education and skills. These features in fact are a typical characterization of the informal sector in developing countries. Box 7 provides an example of a profile of an informal firm visited in the survey.

Box 7
Profile: An Informal Firm in the Footwear Industry

HU's small business in Bogor produces shoes and sandals which are sold by the unit (1 unit = 20 pairs of shoes) to various shops in Pasar Anyar in Bogor and Pasar Jatinegara in Jakarta. At present, he employs 11 workers paid on a piece-work basis. Approaching *Lebaran*, when orders always increase significantly, the number of employees can reach 30-40.

HU is lucky as he already has reliable customers so his small factory has remained viable. Those shops that have become his established customers have in the past contributed a large portion of the working capital he needs to purchase raw materials and labor. However, over the last five years, these shops have only contributed minimal capital to cover his labor costs as a sort of 'insurance' because they are concerned that their capital will be used to produce orders for other customers. Eventually, HU has discovered that he can buy raw materials by taking a loan from shoe shops in Bogor. He repays these loans after his customers have bought his products.

Customers do not pay in cash, but prefer to use a credit transfer system which takes about a month for clearance. Although the customer is required to pay for the official payment stamp and transfer tax, this whole process often causes difficulties for small businesses like HU's, because the owner of the business is required to pay their employees' wages on a weekly basis.

Since a majority of HU's employees are his own neighbors, they usually return home during their lunch break to eat and pray. Due to the fact that they are paid according to their output, their work hours are flexible. This means that the longer they work, the more they produce. Therefore, they often continue working after evening prayers, right through to 10 or 12 o'clock. They work 6 days a week, and are paid every Saturday afternoon. HU outlays Rp3 million per week on wages, including drivers, pattern makers, sorters, and general workers. He also has a weekly outlay of Rp10 million for raw materials.

Although HU's business would seem financially viable, his profit margin remains quite small, approximately Rp4,000 – Rp5,000 per unit. The only way he can make a satisfactory profit is by producing and selling his shoes and sandals in bulk. HU estimates that his employees produce between 100 and 200 units per week during their most productive periods. As a result, his profit ranges between Rp400,000 and Rp1 million per week.

Employees wages are determined by an agreement made between them and HU whenever a new order is received. Their wage is set so that there is some congruence between the prices of the products ordered and the degree of difficulty in making the particular model of shoe requested. HU determines his wages this way in order to retain his employees because if they were to leave it would be extremely difficult to find suitable replacements. After they receive their pay on Saturday, his employees often don't come to work on Monday or sometimes even for several days. Based on his own experience, HU admits that his employees rarely reject the wages that he proposes because they are generally better than what they might receive elsewhere. Employees in this industry on average receive about Rp12,000 per unit. Previously, HU was paying his employees Rp15,000 per unit, but because of increasing unemployment in the area, he decided to employ some of the unemployed to pack his products and so he reduced his employee's wages by Rp3,000.

HU complains about the low prices that his customers have been offering. He is concerned that his employees may look for work elsewhere if he were to reject his customer's prices by arguing that there has been a rise in the price of raw materials. Ultimately, he felt he had no choice but to accept his customer's offers although this required him to reduce his employee's wages. However, HU was in no position to do this because of his fears about his workers leaving.

In contrast to most workers in the formal sector, none of the workers from the informal firms in the sample knew about the minimum wage. Similarly, most of the owners of those informal enterprises also claim to know little about the minimum wage regulations. However, it is important to realize that policies applied to the formal sector can have a great impact in the informal sector. For example, if minimum wage policy reduces employment growth in the formal sector, then workers are crowded into the informal sector, which in turn depresses earnings in the informal sector. Hence, it is quite possible that policies which are designed to help workers in the formal sector can have a detrimental effect on workers in the informal sector.

VII. LABOR MARKET IMPACT OF MINIMUM WAGE POLICY

Studies on the impact of minimum wages on labor market outcomes in Indonesia are scant. Two oft cited studies are Rama (1996)[20] and Islam and Nazara (2000). Both studies similarly use an econometric approach, using the same data from the National Labor Force Survey (Sakernas). Nevertheless, both come to opposing conclusions, in particular on the impact of minimum wages on employment.

Based on the results of his econometric analysis, Rama (1996) found that the doubling of the minimum wage in the first half of 1990s had led to an increase in average wages in the range of 5 to 15 percent, and a decrease in urban wage employment in the range of 0 to 5 percent. However, he suggested that this modest effect on aggregate employment hid considerable disparities across firms. Employment in small firms might decrease substantially, while large firms may actually see their employment increase. Hence, he concluded that workers in large firms are the winners from the minimum wage hike as their wages would increase and they would not risk losing their jobs.

On the other hand, Islam and Nazara (2000) argue that the minimum wage policy in Indonesia has not impaired employment prospects. They also argue that there is no evidence that minimum wage-induced increases in domestic labor costs have eroded business profitability in large and medium-scale manufacturing firms. In fact, they propose that if Indonesia achieves annual economic growth of four percent, real minimum wages can be increased by 24 percent annually without incurring net job losses. They, however, do not assess the impact of minimum wages on workers' wages.

In light of the contradictory results of these two studies, the investigation in this chapter has set out to reexamine the labor market effects of minimum wage policy in Indonesia. The analysis concentrates on the urban formal sector, as this is the segment of the labor market most affected by minimum wage regulations. Theoretically and empirically, the effects of minimum wage policy may differ across various groups of workers. Hence, different from Rama (1996 and 2001) and Islam and Nazara (2000) who focus only on the whole aggregate of workers, in this study separate analyses are conducted for different groups of workers within the urban formal sector.

[20] This study is subsequently published as Rama (2001).

Trends in Minimum Wages

As a result of the changes in labor market policy in the late 1980s, minimum wages have become an important plank of government policy. This is evident from the speed at which the level of minimum wages has been increased by the government. Figure 2 shows the trend in the real minimum wage from 1989 to 2000 compared to the trends in the average real wage and real Gross Domestic Product (GDP) during the same period.[21]

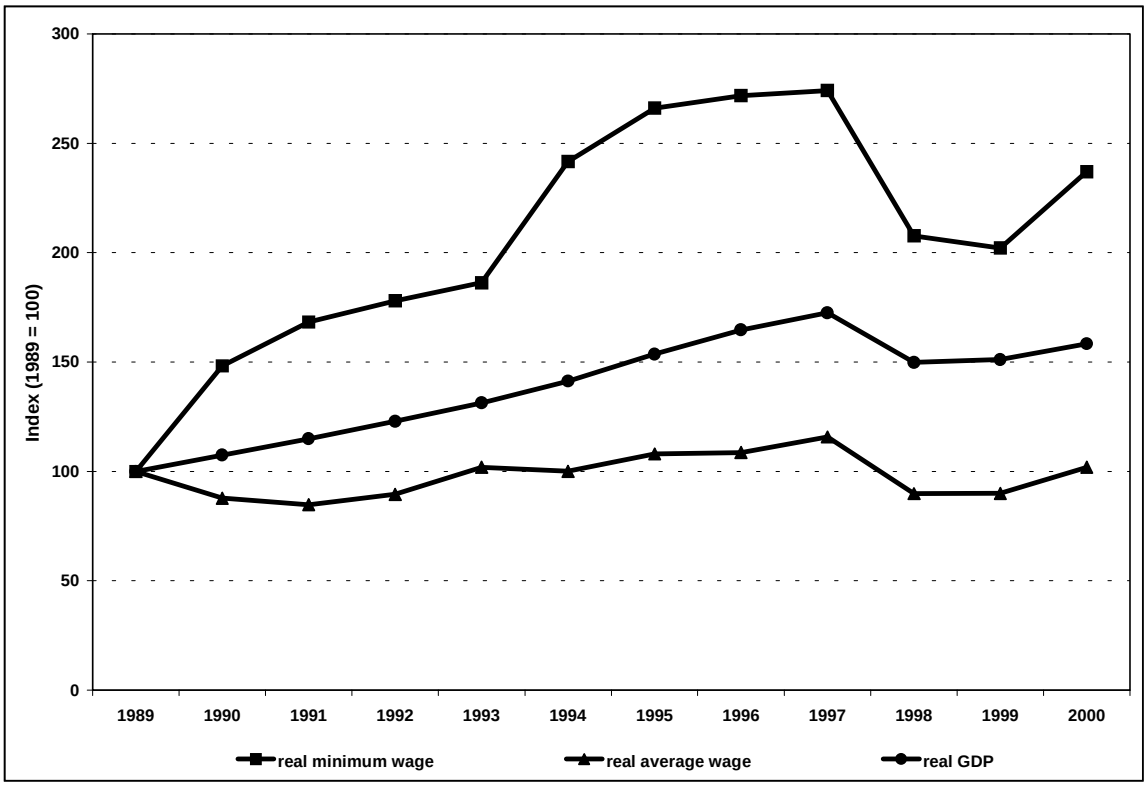

Figure 2. Trends in the Real Minimum Wage, Real Average Wage, and Real Gross Domestic Product in Indonesia, 1989-2000

The figure shows that in real terms minimum wages in Indonesia have increased much faster than both the average wage and GDP. The level of the real minimum wage in 1994 was around 2.4 times its 1989 level, mainly the result of large increases in minimum wages in 1990 and 1994. Curiously, Figure 2 also indicates that those two large increases in minimum wages coincided with a decline in average wages.

[21] This "national level" minimum wage is calculated as the average of regional minimum wages weighted by the number of urban formal sector workers in each region.

When real minimum wages were increased by almost 50 percent in 1990, the real average wage declined by more than 12 percent in the same year. Similarly, when real minimum wages were increased by 30 percent in 1994, the real average wage declined by around 2 percent. During the other periods before the crisis, when the increases in real minimum wages were more modest, generally real average wage also increased, more or less in line with increases in real GDP.

The figure also shows that the real minimum wage in 2000 was increased substantially, much more than real average wage and real GDP. The increase in weighted average of real regional minimum wages was more than 17 percent, while the increase in real average wage was around 13 percent and the real GDP grew by less than 5 percent. Although it cannot be shown in the figure yet, the even much higher increase in real minimum wages in the following year would certainly have brought the 2001 level of minimum wage to a new peak, higher than the pre-crisis peak in 1997.

As a result of the faster increases in minimum wages relative to average wages, Figure 3 shows that the ratio of minimum to average wages increased markedly from around 20 percent in 1989 to around 50 percent in 1994. This ratio has stayed at around that point since then with only a slight decline during the crisis. The figure also shows the proportion of workers whose monthly earnings were less than the minimum wages. In general, this proportion tended to increase up until 1994 and then steadily decrease after that time. It increased from around 7 percent in 1989 to around 21 percent in 1994 and 1995, and then continuously declined to reach less than 11 percent by 2000. This clearly shows a tendency for a higher compliance with the minimum wage regulations over time.

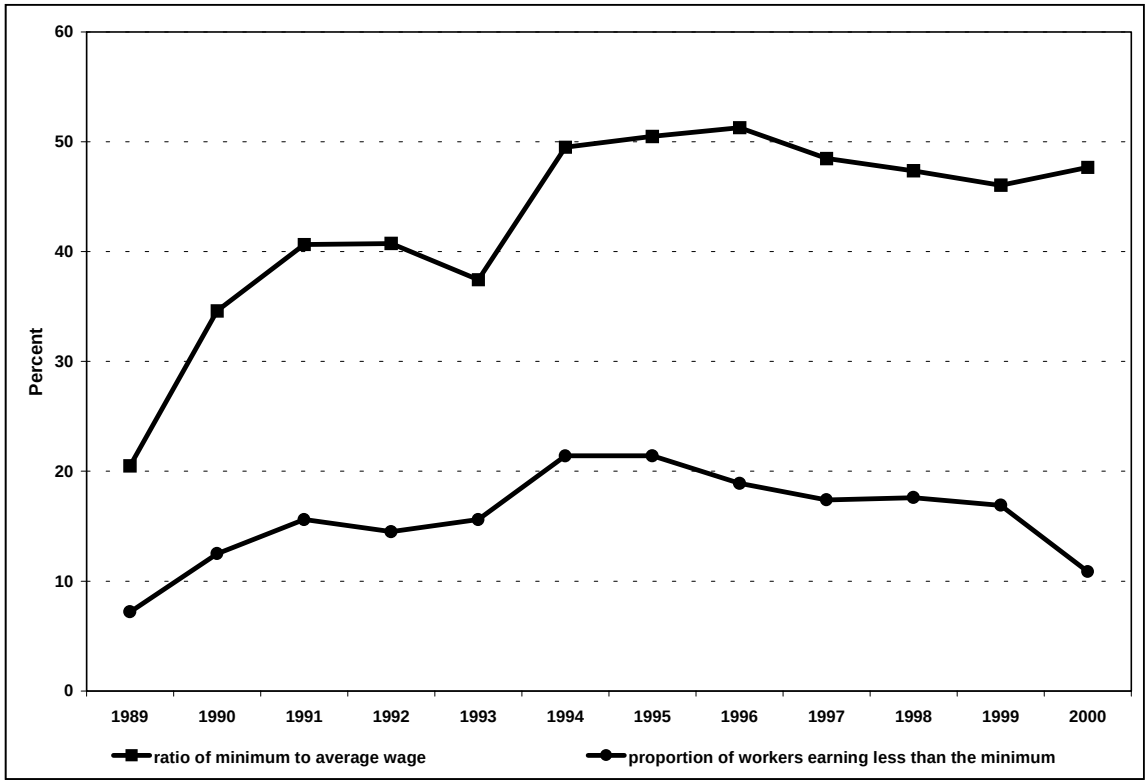

Figure 3. Ratio of Minimum Wage to Average Wage and Proportion of Workers Earning Less Than Minimum Wages, 1989-2000

Minimum Wages and the Wage Distribution

Some studies have shown that the effects of minimum wages are not limited to workers with wages around the minimum but also to the whole wage distribution (e.g. Maloney and Nuñez, 2001; Neumark *et al.*, 2000). Figure 4, which is a kernel density of the wage distribution in the Indonesian urban formal sector, shows the evolution of how minimum wages have affected the wage distribution in Indonesia over time. In this series of diagrams, each worker's wage is measured as a ratio of their nominal wage to the nominal regional minimum wage applying in the region where the worker lives. Therefore, the vertical line at point 1 in each of the graphs represents the minimum wage level.

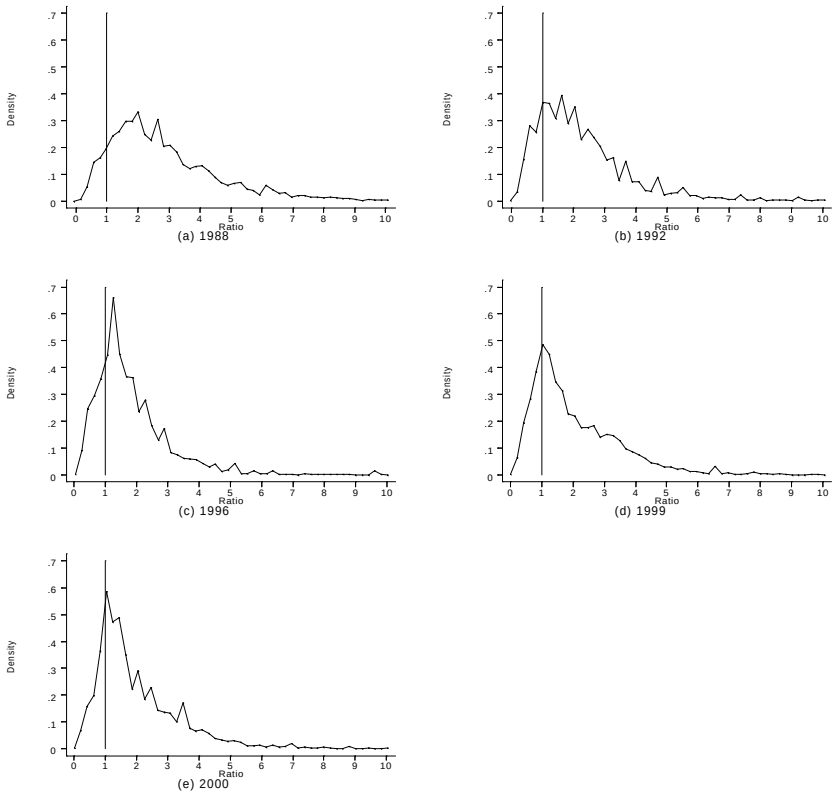

Figure 4. The Effect of Minimum Wages on Wage Distribution, 1988-2000

Note: The vertical line in each graph represents minimum wage.

Figure 4 reveals that in 1988, a year before the minimum wage regulations were revamped, minimum wages had very little effect on the wage distribution in Indonesia. There was no apparent spike in the wage distribution around the minimum wages. But this has changed over time. By 1992, the effect of minimum wages on the wage distribution had become more apparent. Spikes at and around the minimum wage occurred in the distribution. In 1996, the mode of the wage distribution was only slightly higher than the minimum wage. By 1999, and also in 2000, the minimum wage has become the mode of the distribution, indicating that minimum wages have become binding for the majority of workers.

The graphs in Figure 4 show the wage distribution for all workers. As mentioned earlier, minimum wage regulations may have a different impact on different groups of workers. Figure 5 shows the effect of minimum wages on the wage distributions across various groups of workers in 2000. Again the vertical line at point 1 in each of

the graphs represents the minimum wage level. As indicated before, only wage workers in the urban formal sector are included.

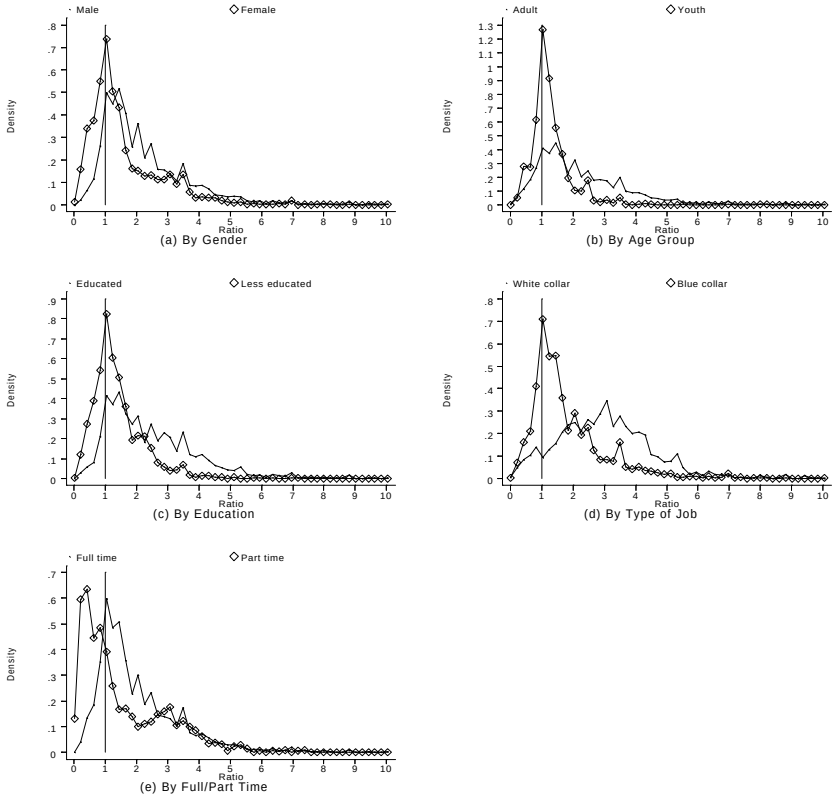

Figure 5. The Effect of Minimum Wages on Wage Distribution across Various Categories of Workers, 2000

Note: The vertical line in each graph represents minimum wage.

Graph (a) reveals that the wage distributions of both male and female workers are affected by minimum wages, but it appears that the wage distribution of female workers is more affected than that of male workers. The proportion of female workers receiving minimum wages is higher than the proportion of male workers. In addition, while the mode of the wage distribution for female workers is at the level of minimum wages, the mode for male workers is still slightly higher than the minimum.

In terms of age, Graph (b) indicates that the wage distributions of both adult and youth workers are affected by minimum wages.[22] The graph reveals that the wages of most youth workers are at or around the minimum, only a few youth workers earn more than double the minimum. The graph, however, still indicates that the effect of minimum wages on adult workers is also significant as the mode of the wage distribution is only slightly higher than the minimum.

Education is also an important determinant of earnings. In Graph (c), workers are grouped into two categories, the "educated" and "less educated", where the less educated workers are defined as those with lower secondary education or below. As expected the graph reveals that the wage distribution of less educated workers is more affected by minimum wages compared to that of educated workers. However, the graph indicates that the effect of minimum wages in altering the shape of the wage distribution of educated workers is also still significant.

When workers are separated into white-collar and blue-collar workers as shown in Graph (d), it becomes clear that minimum wages have very different consequences for their wage distributions. The graph suggests that the wage distribution of white-collar workers is not greatly affected by the presence of minimum wages as their earnings are mostly well above the minimum. On the other hand, the majority of blue-collar workers are clearly affected by the minimum wages, indicated by the fact that the minimum is the mode of the wage distribution for these workers.

Finally, Graph (e) shows the wage distribution for full-time and part-time workers. A worker is classified as a part-time worker if they work for less than 30 hours per week. The graph shows that minimum wages are only binding for full-time workers and the minimum is the mode of their wage distribution. For part-time workers, however, minimum wages are of no consequence, since most earn less than the minimum. This indicates that minimum wages are not binding for this group.

The Impact of Minimum Wages on Wages and Employment

The purpose of minimum wage regulations is to attempt to lift the wages of those workers who currently earn below the minimum wage. All other things being equal, this will also increase the average of all workers' wages. Unfortunately, in reality things are not that simple. The imposition of minimum wages by a government affects both supply and demand in the labor market. Hence, the impact of minimum wages is not only limited to wages, for there is also an effect on employment. Of equal importance, minimum wages can also be expected to have a different impact on different groups of workers.

[22] Youth workers are defined as those between 15 and 24 years old.

The Model

To formally establish the stage of how minimum wages may affect wages and employment, let us define supply and demand for workers as follows:

$$l^S = \alpha^S + \beta^S w + \gamma^S m(w) + \theta^S X \quad (1)$$

$$l^D = \alpha^D + \beta^D w + \gamma^D m(w) + \theta^D Y \quad (2)$$

where *S* and *D* indexes supply and demand respectively, so that l^s represents labor supply, l^p represents labor demand, *w* represents wages, *m* represents the minimum wage, X is a vector of labor supply shifters, Y is a vector of labor demand shifters, while α's, β's, γ's, and θ's are vectors of parameters. The minimum wage is defined as a function of wages due to the fact that the prevailing wage rates are one of the factors that is considered in the regulation on setting minimum wages.

In equilibrium, labor supply is equal to labor demand, and hence:

$$\alpha^S + \beta^S w + \gamma^S m(w) + \theta^S X = \alpha^D + \beta^D w + \gamma^D m(w) + \theta^D Y \quad (3)$$

The reduced form solutions for wages and employment respectively are:

$$w = \Lambda^w + \Omega^w m(w) + \Pi^w Y + \Sigma^w X \quad (4)$$

$$l = \Lambda^l + \Omega^l m(w) + \Pi^l Y + \Sigma^l X \quad (5)$$

where $\Lambda^w = \dfrac{\alpha^D - \alpha^S}{\beta^S - \beta^D}$, $\Omega^w = \dfrac{\gamma^D - \gamma^S}{\beta^S - \beta^D}$, $\Pi^w = \dfrac{\theta^D}{\beta^S - \beta^D}$, $\Sigma^w = \dfrac{-\theta^S}{\beta^S - \beta^D}$,

$\Lambda^l = \dfrac{-\alpha^S \beta^D - \alpha^D \beta^S}{\beta^S - \beta^D}$, $\Omega^l = \dfrac{\beta^S \gamma^D - \beta^D \gamma^S}{\beta^S - \beta^D}$, $\Pi^l = \dfrac{\beta^S \theta^D}{\beta^S - \beta^D}$, $\Sigma^l = \dfrac{-\beta^D \theta^S}{\beta^S - \beta^D}$.

Equations (4) and (5) show that both wages and employment are affected by the minimum wage, labor demand shifters, and labor supply shifters. Since the parameters of interests are Ω^w and Ω^l - that is how the minimum wage affects wages and employment - equations (4) and (5) can be directly estimated to obtain the estimates of these parameters. In estimating equation (4), however, the minimum wage variable is an endogenous variable as it is a function of wages, the dependent variable. Hence, to obtain a consistent estimate, it is necessary to estimate this wage equation using the instrumental variable method. Meanwhile, in equation (5) the minimum wage variable can be treated as an exogenous variable. Hence, an estimation of this employment equation using the ordinary least squares (OLS) method will produce consistent and efficient estimates.

Panel Data Construction

Data on individual wages and employment from the Sakernas are aggregated at the provincial level. This data on provincial average wages and employment levels, which is calculated for all workers as well as certain segments of the workforce in the urban formal sector, is then combined across years to form a set of panel data with the province as the unit of observation. This panel data set is then merged with other provincial-level data on the yearly consumer price index (CPI), regional gross domestic product (RGDP), and demographic variables. The complete panel data set can be constructed for 26 provinces, covering the period from 1988 to 1999, so in total there are 312 points of observation.

The Estimation Results

The wage regression of equation (4) is estimated using the Two-Stage Least Squares (2SLS) method on the provincial panel data for all workers as well various segments of the workforce. In these estimations, the minimum wage variable is instrumented by its one period lag and other exogenous variables in the model. The labor supply shifter is the population group of 15 years and over, while the labor demand shifter is real regional gross domestic product. Province dummies are included to measure the fixed effects of provincial specific characteristics which do not vary across time. Meanwhile, year dummies are included to measure specific time effects which affect all provinces in any given year.

In addition, a variable of degree of compliance to minimum wages is included in the estimations. As shown by Figures 3 and 4, compliance to minimum wages in Indonesia has increased over time. This has important consequences on how minimum wages affect labor market outcomes. Therefore, it is necessary to control for the effect of varying degree of compliance to measure the true effects of minimum wages.[23] Consistent with Figure 3, in these estimations the degree of compliance is approximated by the proportion of workers who earn above the minimum wage.

The results of the estimations are presented in Table 9. The F-tests indicate that the model is valid and the R-squared values indicate that the model can explain

[23] Rama (1996) asserts that minimum wages would have a limited impact on labor market outcomes if firms were not forced to comply. He argues that in the context of Indonesia in the early 1990s, there were two main sources of non-compliance. Firstly, firms that that were unable to afford the minimum wage could request a waiver from the government. Secondly, and more importantly, there was a weakness in the enforcement capabilities of the government. In spite of this, both Rama (1996) and Islam and Nazara (2000) did not control for compliance in their regression estimations.

between 30 to 83 percent of variations in the provincial wage data. The table indicates that the elasticities of average wages with respect to the minimum wage in general are positive but statistically insignificant. This is true for all workers as well as all segments of the workforce, except for female and adult workers where the coefficients are negative. Meanwhile, the coefficient for blue-collar workers is statistically significant.

Table 9. Results of 2SLS Estimation of Wage Regression
(Dependent variable: log of real wage)

Independent Variable	All workers	Male	Female	Adult	Youth	Educated	Less educated	White-collar	Blue-collar	Full-time	Part-time
Log of real minimum wage	0.122 (0.336)	0.148 (0.533)	-0.011 (-0.019)	-0.047 (-0.153)	0.834 (1.440)	0.030 (0.081)	0.231 (0.603)	0.587 (0.848)	0.890* (2.015)	0.183 (0.501)	0.341 (0.995)
Degree of compliance[a]	1.261 (1.164)	0.997 (1.202)	1.663 (0.988)	0.602 (0.655)	3.318 (1.929)	0.506 (0.467)	2.040 (1.794)	0.092 (0.181)	1.217** (3.754)	1.157 (1.064)	1.879 (1.847)
Log of population group 15 years and over	0.020 (0.189)	0.093 (1.153)	-0.044 (-0.269)	0.048 (0.546)	-0.090 (-0.556)	0.266** (2.772)	-0.291** (-2.659)	0.059 (0.198)	0.114 (0.599)	-0.002 (-0.015)	0.025 (0.251)
Log of real regional gross domestic product	0.031 (0.841)	0.056* (1.986)	-0.051 (-0.875)	0.039 (1.252)	0.004 (0.059)	0.041 (1.089)	0.018 (0.467)	0.003 (0.044)	-0.014 (-0.391)	0.037 (0.980)	-0.002 (-0.059)
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	9.095 (1.831)	7.856* (2.111)	11.907 (0.122)	11.169** (2.643)	0.327 (0.042)	7.508 (1.487)	10.464* (2.044)	5.085 (0.481)	-0.212 (-0.031)	8.739 (1.753)	5.850 (1.254)
R-squared	0.514	0.664	0.303	0.585	0.375	0.829	0.806	0.750	0.924	0.516	0.677
F-test	6.59**	12.42**	2.74**	8.92**	3.62**	30.50**	26.03**	10.54**	42.89**	6.63**	13.09**
Number of observations	286	286	286	286	286	286	286	156	156	286	286

Notes: - [a] Measured as the proportion of workers who earn above the minimum wage
- Numbers in parentheses are t-values
- ** is significant at 1 percent level
- * is significant at 5 percent level

These results imply that the impact of minimum wages on pushing up average wages across the workforce is in general statistically no different to zero. This does not mean that minimum wages have no impact on the wages of individual workers. Rather, it suggests that the impact is mixed. The wages of some workers are pushed up by minimum wages, while the wages of others are depressed by minimum wages, resulting in no significant impact on average wages. The exception is for blue-collar workers, where minimum wages have a statistically significant positive effect on their average wages. The estimated elasticity of 0.89 implies that a 10 percent increase in real minimum wages will increase the real average wages of blue-collar workers by 8.9 percent.

The coefficients of the degree of compliance variable are also positive although statistically not significant, except again for blue-collar workers. This means that higher compliance with the minimum wage regulations tends to add to the positive impact of minimum wages on average wages. In particular, blue-collar workers benefit significantly from higher compliance with minimum wages.

Meanwhile, the employment regression of equation (5) is estimated using the Ordinary Least Squares (OLS) method on the same data set for all workers and various segments of the workforce. The set of independent variables used in these estimations is the same as in the wage regressions. The results of the estimations are presented in Table 10. The results of the F-tests indicate that the model is valid and the R-squared values indicate that the model can explain between 96 to 99 percent of the variations in the provincial employment data.

Table 10. Results of OLS Estimation of Employment Regression
(Dependent variable: log of employment)

Independent Variable	All workers	Male	Female	Adult	Youth	Educated	Less educated	White-collar	Blue-collar	Full-time	Part-time
Log of real minimum wage	-0.112** (-3.031)	-0.065 (-1.874)	-0.307** (-4.642)	-0.066 (-1.801)	-0.307** (-3.349)	-0.017 (-0.480)	-0.196** (-3.787)	1.000* (2.086)	-0.140 (-0.699)	-0.086* (-2.248)	-0.364* (-2.560)
Degree of compliance[a]	-0.371* (-2.194)	-0.137 (-0.860)	-1.177** (-3.879)	-0.165 (-0.984)	-1.414** (-3.371)	0.059 (0.360)	-0.838** (-3.537)	0.009 (0.010)	-0.609 (-1.687)	-0.217 (-1.236)	-1.958** (-3.003)
Log of population group 15 years old and over	0.997** (35.016)	1.004** (38.260)	0.949** (18.411)	0.975** (35.655)	1.052** (15.304)	0.960** (37.694)	1.038** (26.433)	1.145* (2.114)	0.779** (3.457)	1.007** (34.134)	0.911** (8.299)
Log of real regional gross domestic product	0.014 (1.275)	0.020* (1.935)	0.013 (0.652)	0.018 (1.597)	-0.004 (-0.131)	-0.001 (-0.065)	0.034* (2.190)	-0.127 (-1.177)	0.047 (1.058)	0.010 (0.828)	0.068 (1.577)
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.055 (0.088)	-0.471 (-0.831)	2.895** (2.604)	-0.108 (-0.178)	1.762 (1.173)	-0.262 (-0.445)	0.174 (0.205)	-13.879 (-1.384)	2.786 (0.667)	-0.532 (-0.828)	2.037 (0.852)
R-squared	0.998	0.998	0.994	0.998	0.989	0.998	0.996	0.966	0.995	0.998	0.964
F-test	2973.0**	3198.8**	1038.1**	2894.3**	606.8**	2771.7**	1741.1**	102.4**	744.8**	2806.4**	179.5**
Number of observations	312	312	312	312	312	312	312	156	156	312	312

Notes: - [a] Measured as the proportion of workers who earn above the minimum wage
- Numbers in parentheses are t-values
- ** is significant at 1 percent level
- * is significant at 5 percent level

The table shows that the coefficients of the minimum wage variable for all workers and all segments of the workforce are negative, except for white-collar workers. The coefficient for all workers indicates that the elasticity of total employment to the minimum wage is –0.112 and statistically significant. This implies that every 10 percent increase in real minimum wages will result in a 1.1 percent reduction in total employment. Similarly, the coefficients for female, youth, less educated, full-time, and part-time workers are also all negative and statistically significant. Their employment elasticities with respect to minimum wages are –0.307 for female and youth workers, -0.196 for less educated workers, –0.086 for full-time workers, and –0.364 for part-time workers.

Meanwhile, the only group of workers which benefit from the minimum wage in terms of employment are white-collar workers. Their employment elasticity to the minimum wage is 1.0 and statistically significant. This implies that a 10 percent increase in real minimum wages will also increase the employment of white-collar workers by 10 percent. This perhaps indicates the substitution effect of minimum wages on the employment of different types of workers. As the level of minimum wages is increased, firms reduce the employment of the other types of workers and replace them by employing more white-collar workers. This also provides an indication that firms change technologies in response to increases in minimum wages. Due to capital-skill complementarity, a higher proportion of white-collar workers employed usually indicates that more capital-intensive technologies have been adopted.

Like the impact on average wages, the coefficients of the degree of compliance variable indicate that higher compliance tends to strengthen the negative impact of minimum wages on employment. The signs of the coefficients of this variable in general are the same as the signs of the coefficients of the minimum wage variable. In particular, the coefficients for all, female, youth, less educated, and part-time workers are statistically significant. However, higher compliance has no effect on the employment of white-collar workers.

Sensitivity Analysis

The results of the analysis have shown that in general minimum wages have a positive but insignificant effect on average wages, and simultaneously a negative and significant effect on employment, with the exception of white-collar workers where the employment effect is found to be positive. Higher compliance is found to strengthen these opposing effects of minimum wages on average wages and employment. This sub-section seeks to verify whether these findings are robust to different model specifications and estimation procedures.

The inclusion of the degree of compliance in the regression is an innovation in this study. Hence, the first sensitivity analysis is to run the wage and employment regressions without this degree of compliance variable. The results for the wage regression are presented in Table A7 in the Appendix, while the results for the employment regression are shown in Table A8. The coefficients of the minimum

wage variable in Table A7 still indicate that the effects of minimum wages on average wages are not statistically significant. Most of the coefficients still have a positive sign, but in addition to the coefficients for female and adult workers, the coefficient for educated workers is now also negative. Furthermore, the magnitudes of the coefficients in Table A7 in general are smaller compared to those in Table 9.

For employment regression, all coefficients in Table A8 have the same signs as those in Table 10. However, the coefficients for youth, full-time, and part-time workers are now statistically insignificant. Like wage elasticities, the magnitude of the employment elasticities in Table A8 are in general smaller compared to those in Table 10. Hence, these results still indicate that the effects of minimum wages on employment mostly tend to be negative, with the exception of white-collar workers. In fact, the coefficients for white-collar workers in the two tables are almost exactly the same.

The results of this first sensitivity analysis indicate that the degree of compliance variable has strengthened the estimated effects of minimum wages on average wages and employment. This is an expected result as higher compliance means increased effectiveness of the minimum wage regulations in affecting both the wage and employment decisions of firms and workers. However, it is necessary to test whether a different measure of the degree of compliance will produce a different effect. Hence, a second sensitivity analysis is to re-run the wage employment regressions in Tables 9 and 10 using a different measure of the degree of compliance.

Drawing from Figures 4 and 5, the skewness of the wage distribution is used as the alternative measure of the degree of compliance. The results are presented in Table A9 in the appendix for wage regressions and in Table A10 for employment regressions. The coefficients of the minimum wage variable in Table A9 in general have the same signs as those in Table 9, except that the coefficient for educated workers is now negative and the coefficient for blue-collar workers becomes insignificant. In addition, the magnitudes of the coefficients in Table A9 are generally smaller than those in Table 9. The magnitudes of both of the coefficients of the degree of compliance variables cannot be directly compared as a different factor is being measured in each case. However, the coefficients in the two tables all have the same signs and most of the coefficients in Table A9 are statistically significant.

Similarly, the coefficients of both the minimum wage and the degree of compliance variables in Table A10 generally have the same signs as those in Table 10. Like the coefficients in the wage regressions, the magnitudes of the coefficients of the minimum wage variable in Table A10 are in general smaller compared to those in Table 10. On the other hand, all of the coefficients of the degree of compliance variable in Table A10 are insignificant. These results, and the comparison between the coefficients in Tables A9 and A10 with those in Tables A7 and A8, strengthen the conclusion that the higher the compliance with minimum wages, the greater the impact minimum wages will have on increasing average wages and lowering employment.

The wage and employment regressions in Tables 9 and 10 are run with the variables in levels. The third sensitivity analysis is to run these regressions with the variables in changes. In effect, this will remove the fixed effects of the individual province and, hence, the provincial dummy variables can be omitted from the regressions. Theoretically, the results are statistically identical. In addition, the variables in changes can be viewed as the instruments of the variables in levels, so that the wage model can now also be consistently estimated using the OLS method instead of the 2SLS method.

The results of these wage regressions are presented in Table A11 in the Appendix, while the results of the employment regressions are shown in Table A12. In the wage regressions, the coefficients of both the minimum wage and degree of compliance variables are mostly positive. This is consistent with the results obtained from running the regressions in levels. Similarly, the only coefficient of the minimum wage which is statistically significant is that for blue collar workers. However, now there are five coefficients of the degree of compliance variable which are statistically significant, while using levels there is only one coefficient that is significant.

The results of the employment regressions indicate that the coefficients of both the minimum wage and the degree of compliance variables are mostly negative. This is also consistent with the results obtained from running the regressions in levels. However, the coefficient of the minimum wage variable that is statistically significant now is only for youth workers. Nevertheless, running the regressions with variables in changes leads to the same conclusions as running the regressions with variables in levels.

In examining the impact of minimum wages on employment, Rama (1996) uses various measures of minimum wages. In particular, he stresses the ratio of minimum wages to average wages as a measure of minimum wages relative to market wages. This alternative measure of minimum wages is examined in the fourth sensitivity analysis in this study. As this alternative measure of minimum wages has average wages as one of its components, the regressions are only run for the employment equation. The results are presented in Table A13 in the appendix.

The coefficients of the minimum wage and the degree of compliance variables resulting from the regressions using their alternative measure of minimum wages is in general still negative. In addition to female and part-time workers, the minimum wage coefficients for male and adult workers now are also significant. However, the coefficients for all workers and for youth, less educated, white-collar, and full-time workers become statistically insignificant.

The fifth and final sensitivity analysis is to distinguish between the short-run and long-run impacts of minimum wages on employment. This is achieved by employing

the partial adjustment hypothesis,[24] which is based on the assumption that employers cannot instantaneously change the number of workers they employ in an attempt to adjust to any increase in the minimum wage. Instead, they gradually change the number of workers they employ over time to reach a long-run equilibrium after the minimum wage is increased. This is carried out by regressing the change in the log employment on the change in the log of independent variables, the lagged one period of log employment, and the lagged one period of the log of the independent variables. The results of these regressions are presented in Table A14 in the Appendix.

The coefficients of the change in log minimum wage represent the short-run elasticities of employment to minimum wages. The coefficients of the lag in log employment are the partial adjustment parameters, while the long-run elasticities of employment to minimum wages are obtained as the negative of the result from dividing the coefficients of the lag in log minimum wages by the partial adjustment parameters. Table A15 in the Appendix presents the short-run and long-run elasticities of employment to minimum wages. Ignoring statistical significance, it reveals that in the long-run female, youth, low educated, white-collar, and part-time workers have lower employment prospects due to increases in minimum wages.

[24] For a discussion of the partial adjustment hypothesis, see Berndt (1991) pp. 315-320.

VIII. CONCLUSIONS

During the last two years, the Indonesian Government has vigorously pursued a minimum wage policy. The levels of regional minimum wages have increased significantly since the crisis. As a result, the real minimum wages are now already higher than the peak pre-crisis levels. This all occurred against the backdrop of an economy which is still struggling to recover from a severe economic crisis. Given the low economic growth environment, there are growing concerns that further large increases in minimum wages may reduce long term economic growth and slow employment growth in the modern industrial sector.

Moreover, starting from January 2001 Indonesia has embarked on a major decentralization policy. With decentralization, the power to determine minimum wages has been transferred from the central to local governments. There are some early indications that this transfer of power may accelerate an increase in minimum wages in some regions. As the trend towards greater use of minimum wages as a tool of social policy by local governments gains momentum, the question of whether greater rigidities hurt or benefit the poor in Indonesia is particularly relevant.

This study is an attempt to answer one dimension of this question. In this study, the wage and employment effects of minimum wages are investigated though an econometric approach using pooled data from the National Labor Force Surveys (Sakernas). In addition, a survey of 200 workers employed in over 40 firms in the Jabotabek (Jakarta, Bogor, Tangerang, Bekasi) and Bandung area was carried out to identify the characteristics of firms that are likely to comply with minimum wage regulations.

The study indicates that as minimum wages continued to increase during most of the 1990s compliance also steadily increased, resulting in the entire wage distribution of urban, formal workers being altered. In 1988, a year before minimum wage regulations were revamped, minimum wages had very little effect on wage distribution. But this changed over time. In 1999 and 2000, the minimum wage had become the mode of the distribution, indicating that minimum wages had become binding for the majority of workers.

The statistical analysis shows that increases in minimum wages push up wages of blue-collar workers. The results of the econometric analysis also show a positive link between minimum wages and the average wages of most other groups of workers (female, youth, less educated, and white-collar workers). However, the relationship is not statistically significant.

More importantly, the statistical analysis shows that increases in minimum wages have a negative impact on urban formal sector employment, with the exception of white-collar workers. For all workers, the estimated elasticity of total employment to minimum wage is –0.112 and statistically significant. This implies that for every 10 percent increase in real minimum wages, there will be more than a one percent

reduction in total employment, controlling for other factors affecting employment, such as economic growth and growth in the working population.

Significantly, the negative effects of minimum wage legislation are greatest for those groups that are most vulnerable to changes in labor market conditions such as females, youth workers, and less educated workers, which make up the bulk of those employed in both the formal and informal sectors. For females and youths, the employment elasticities with respect to minimum wages are larger than –0.3, while for less educated workers it is around –0.2.

On the other hand, white-collar workers are the only category of workers to have benefited from minimum wages in terms of employment. Their employment elasticity to minimum wage is 1.0 and statistically significant, which perhaps indicates the substitution effect of minimum wages on the employment of different types of workers. As the level of minimum wages is increased, firms reduce the employment of other types of workers and replace them with white-collar workers. This may be due to firms substituting more capital and skill-intensive production processes in place of labor-intensive processes in response to increases in minimum wages.

The findings from the qualitative survey corroborate the econometric analysis. The survey shows that the characteristics of particular firms play an important role in determining the degree of compliance with minimum wage regulations. A probit analysis shows that firm size is the primary determinant of a firm's capacity to comply with minimum wage regulations. Controlling for all other firm and worker characteristics, workers in medium sized firms have a 21 percent higher probability of being paid above the minimum wage compared to workers in small firms. Similarly, workers in large firms have a 44 percent higher probability of receiving a wage above the minimum wage than workers in small firms.

To conclude, the results of this study show that minimum wages benefit some workers and disadvantage others. Workers that keep their factory jobs clearly benefit from increases in minimum wages. White-collar workers are clear winners from a vigorous enforcement of minimum wage policy. However, those that lose their jobs as a result of increases in minimum wages are losers under the minimum wage policy. The potential losers are those workers most vulnerable to changes in labor market conditions such as female, youth, and less educated workers.

In a environment of high economic growth, large increases in minimum wages are less of a problem since growth place upward pressure on wages at or above the minimum can create more jobs than those lost through minimum wage policy. However, in an environment of low economic growth as in Indonesia during 2000-2001, big increases in minimum wages are most likely to have a detrimental effect on those workers most vulnerable to changes in labor market conditions. A vigorously pursued minimum wage policy, which pushes wages well above the productivity of vulnerable groups, will certainly have a detrimental effect on these groups. The qualitative survey also indicates that substantial increases in minimum wages will

disadvantage small and medium sized firms, as they are the ones which can least afford increases in their cost structures.

These findings may have implications for the government's poverty reduction program. A vigorously implemented minimum wage policy will help those more productive workers that are able to keep their jobs in the modern sector. But these workers are less likely to be among those living below the poverty line. Indeed, most research shows that the poor are primarily found in the urban informal sector and the rural sector. If the policy reduces employment growth in the modern sector below the growth rate in the working population, more unskilled workers may be forced into inferior jobs in the informal sector.

Thus, the impact of minimum wages on employment in the modern sector is only part of the story. Their impact is perhaps equally important, if not more, on the welfare of workers in the informal sector, which accounts for the bulk of the workforce in Indonesia. An important area for further research is to assess the impact of the labor displacement effects of minimum wages in the modern sector on real earnings in the informal sector.

APPENDIX

Table A1. Number of Households and Individuals (15 year old and over) in the Sakernas Sample, 1988-2000

Year	Household	Individuals
1988	64,032	190,582
1989	42,858	183,302
1990	80,704	240,090
1991	78,391	234,178
1992	77,088	233,489
1993	79,458	231,689
1994	71,561	205,006
1995*	211,248	605,056
1996	72,925	208,371
1997	64,752	185,720
1998	48,478	139,266
1999	47,580	135,295
2000	31,432	86,488

Note: *The 1995 data is from Supas

Table A2. Number of Firms and Workers in the Formal Sector Survey According to Firm Characteristics

Firm Characteristics	Number of Firms		Number of Workers	
	Number	%	Number	%
Sector:				
- Food and beverages	10	24	50	25
- Textiles	6	15	31	16
- Garments	8	20	42	21
- Footwear	8	20	37	19
- Automotive spare-parts	6	15	25	13
- Chemical and pharmaceutical	3	7	15	8
Size:				
- Small (number of workers < 20)	12	29	49	25
- Medium (20 ≤ number of workers < 100)	14	34	69	35
- Large (number of workers ≥ 100)	15	37	82	41
Ownership:				
- Domestic	33	80	157	79
- Foreign	8	20	43	22
Market orientation:				
- Domestic	23	56	103	52
- Export	6	15	35	18
- Domestic and export	12	29	62	31
Total	41	100	200	100

Table A3. Number of Workers in the Formal Sector Survey by Worker Characteristics

Worker Characteristics	Number of Workers	%
Gender:		
- Male	110	55
- Female	90	45
Age group:		
- 15 – 24 years old	63	32
- 25 – 34 years old	89	45
- 35 – 44 years old	35	18
- 45 – 54 years old	11	6
- ≥ 55 years old	2	1
Education level:		
- ≤ Junior secondary	118	59
- > Junior secondary	82	41
Skill:		
- Unskilled	69	35
- Skilled	131	66
Work experience:		
- ≤ 2 years	60	30
- 2 – 4 years	29	15
- 4 – 6 years	33	17
- 6 – 10 years	51	26
- > 10 years	27	14
Nature of employment:		
- Monthly permanent	70	35
- Monthly contract	7	4
- Daily permanent	49	25
- Daily casual	48	24
- Piece-work	26	13
Total	200	100

Table A4. Number of Firms and Workers in the Informal Sector Survey According to Firm Characteristics

Firm Characteristics	Number of Firms		Number of Workers	
	Number	%	Number	%
Sector:				
- Food and beverages	8	50	19	42
- Garment	1	6	5	11
- Footwear	6	38	20	44
- Other	1	6	1	2
Size:				
- Small (number of workers < 20)	16	100	45	100
Ownership:				
- Domestic	16	100	45	100
Market orientation:				
- Domestic	16	100	45	100
Total	16	100	45	100

Table A5. Number of Workers in the Informal Sector Survey by Worker Characteristics

Worker Characteristics	Number of Workers	%
Gender:		
- Male	39	87
- Female	6	13
Age group:		
- 15 – 24 years old	25	56
- 25 – 34 years old	12	27
- 35 – 44 years old	3	7
- 45 – 54 years old	2	4
- ≥ 55 years old	3	7
Education level:		
- ≤ Junior secondary	42	93
- > Junior secondary	3	7
Skill:		
- Unskilled	28	62
- Skilled	17	38
Work experience:		
- ≤ 2 years	25	56
- 2 – 4 years	9	20
- 4 – 6 years	6	13
- 6 – 10 years	2	4
- > 10 years	3	7
Nature of employment:		
- Daily casual	20	44
- Piece-work	25	56
Total	45	100

Table A6. Comparison of Wage to Minimum Wage by Firm Size and Ownership

Firm Size	Ratio of Wage to Minimum Wage		Workers Earning Less Than the Minimum Wage (%)	
	Domestic	Foreign	Domestic	Foreign
Small	0.9	-	63.3	-
Medium	1.3	1.6	31.3	20.0
Large	1.3	1.6	2.3	7.9

Table A7. Results of 2SLS Estimation of Wage Regression without Degree of Compliance Variable
(Dependent variable: log of real wage)

Independent Variable	All workers	Male	Female	Adult	Youth	Educated	Less educated	White-collar	Blue-collar	Full-time	Part-time
Log of real minimum wage	0.040 (0.131)	0.082 (0.354)	-0.118 (-0.247)	-0.087 (-0.336)	0.618 (1.256)	-0.003 (-0.011)	0.096 (0.296)	0.592 (0.843)	0.952* (1.960)	0.108 (0.352)	0.218 (0.750)
Log of population group 15 years and over	0.043 (0.400)	0.113 (1.414)	-0.018 (-0.110)	0.060 (0.683)	-0.053 (-0.322)	0.274** (2.844)	-0.260* (-2.362)	0.053 (0.182)	0.029 (0.146)	0.019 (0.178)	0.059 (0.578)
Log of real regional gross domestic product	0.040 (1.054)	0.063* (2.185)	-0.039 (-0.662)	0.044 (1.367)	0.027 (0.434)	0.044 (1.175)	0.032 (0.796)	0.002 (0.039)	-0.019 (-0.465)	0.045 (1.173)	0.011 (0.305)
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	10.793** (2.860)	9.202** (3.293)	14.197* (2.392)	11.971** (3.743)	5.109 (0.873)	8.211* (2.186)	13.314** (3.450)	5.201 (0.509)	1.322 (0.187)	10.298** (2.727)	8.382* (2.336)
R-squared	0.501	0.656	0.285	0.580	0.343	0.828	0.795	0.750	0.910	0.505	0.660
F-test	6.51**	12.43**	2.62**	9.00**	3.48**	31.27**	25.20**	10.95**	37.71**	6.63**	12.68**
Number of observations	286	286	286	286	286	286	286	156	156	286	286

Notes: Numbers in parentheses are t-values
** is significant at 1 percent level
* is significant at 5 percent level

Table A8. Results of OLS Estimation of Employment Regression without Degree of Compliance Variable
(Dependent variable: log of employment)

Independent Variable	All workers	Male	Female	Adult	Youth	Educated	Less educated	White-collar	Blue-collar	Full-time	Part-time
Log of real minimum wage	-0.063* (-2.131)	-0.047 (-1.698)	-0.155** (-2.833)	-0.044 (-1.512)	-0.123 (-1.635)	-0.025 (-0.864)	-0.087* (-2.042)	0.999* (2.135)	-0.073 (-0.369)	-0.058 (-1.880)	-0.109 (-0.943)
Log of population group15 years and over	0.988** (34.792)	1.001** (38.587)	0.926** (17.636)	0.971** (35.879)	1.028** (14.756)	0.961** (38.118)	1.020** (25.659)	1.144* (2.143)	0.834** (3.711)	1.003** (34.240)	0.867** (7.856)
Log of real regional gross domestic product	0.012 (1.066)	0.019 (1.863)	0.006 (0.279)	0.017 (1.510)	-0.012 (-0.439)	-0.000 (-0.029)	0.029 (1.836)	-0.127 (-1.185)	0.052 (1.144)	0.008 (0.714)	0.056 (1.282)
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.697 (-1.341)	-0.749 (-1.607)	0.452 (0.481)	-0.441 (-0.884)	-1.234 (-1.000)	-0.139 (-0.291)	-1.562* (-2.204)	-13.848 (-1.452)	0.694 (0.173)	-0.971 (-1.812)	-1.934 (-0.957)
R-squared	0.998	0.998	0.993	0.998	0.989	0.998	0.996	0.966	0.995	0.998	0.962
F-test	3006.9**	3284.0**	1012.1**	2968.8**	599.3**	2851.8**	1713.0**	106.4**	755.9**	2872.7**	178.6**
Number of observations	312	312	312	312	312	312	312	156	156	312	312

Notes: Numbers in parentheses are t-values
** is significant at 1 percent level
* is significant at 5 percent level

Table A9. Results of 2SLS Estimation of Wage Regression with Alternative Measure of Degree of Compliance Variable
(Dependent variable: log of real wage)

Independent Variable	All workers	Male	Female	Adult	Youth	Educated	Less educated	White-collar	Blue-collar	Full-time	Part-time
Log of real minimum wage	0.012 (0.042)	0.063 (0.290)	-0.156 (-0.342)	-0.112 (-0.478)	0.601 (1.231)	-0.027 (-0.094)	0.071 (0.230)	0.527 (0.758)	0.869 (1.834)	0.079 (0.279)	0.214 (0.735)
Degree of compliance[a]	0.012** (6.584)	0.008** (5.722)	0.015** (5.213)	0.011** (7.155)	0.007* (2.324)	0.010** (5.271)	0.011** (5.488)	0.001 (0.589)	0.002 (1.102)	0.012** (6.728)	0.002 (0.839)
Log of population group 15 years and over	0.030 (0.300)	0.107 (1.428)	-0.040 (-0.253)	0.042 (0.521)	-0.052 (-0.320)	0.257** (2.812)	-0.268* (-2.576)	0.063 (0.215)	0.042 (0.210)	0.006 (0.058)	0.057 (0.560)
Log of real regional gross domestic product	0.037 (1.050)	0.061* (2.243)	-0.043 (-0.767)	0.041 (1.402)	0.024 (0.402)	0.042 (1.162)	0.029 (0.766)	0.001 (0.016)	-0.020 (-0.513)	0.041 (1.182)	0.011 (0.293)
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	11.268** (3.228)	9.477** (3.600)	14.864** (2.626)	12.474** (4.268)	5.290 (0.911)	8.664* (2.423)	13.682** (3.747)	5.838 (0.576)	2.134 (0.309)	10.782** (3.098)	8.444* (2.345)
R-squared	0.577	0.698	0.356	0.653	0.358	0.846	0.818	0.750	0.913	0.584	0.661
F-test	8.60**	14.60**	3.52**	11.89**	3.63**	34.59**	28.38**	10.58**	37.54**	8.86**	12.37**
Number of observations	286	286	286	286	286	286	286	156	156	286	286

Notes: - [a] Measured as the skewness of the wage distribution
- Numbers in parentheses are t-values
- ** is significant at 1 percent level
- * is significant at 5 percent level

Table A10. Results of OLS Estimation of Employment Regression with Alternative Measure of Degree of Compliance Variable (Dependent variable: log of employment)

Independent Variable	All workers	Male	Female	Adult	Youth	Educated	Less educated	White-collar	Blue-collar	Full-time	Part-time
Log of real minimum wage	-0.062* (-2.068)	-0.045 (-1.631)	-0.155** (-2.822)	-0.042 (-1.445)	-0.122 (-1.624)	-0.026 (-0.884)	-0.083 (-1.952)	1.000* (2.127)	-0.073 (-0.367)	-0.055 (-1.800)	-0.116 (-0.999)
Degree of compliance[a]	-0.001 (-0.960)	-0.001 (-1.050)	-0.000 (-0.003)	-0.001 (-1.078)	-0.000 (-0.082)	0.000 (0.378)	-0.001 (-1.483)	-0.001 (-0.202)	-0.001 (-0.669)	-0.001 (-1.312)	0.002 (0.950)
Log of population group 15 years and over	0.988** (34.768)	1.000** (38.556)	0.926** (17.604)	0.971** (35.881)	1.028** (14.720)	0.961** (38.053)	1.019** (25.677)	1.132* (2.100)	0.818** (3.608)	1.002** (34.262)	0.869** (7.868)
Log of real regional gross domestic product	0.012 (1.070)	0.020 (1.869)	0.006 (0.278)	0.017 (1.515)	-0.012 (-0.438)	-0.000 (-0.030)	0.029 (1.848)	-0.127 (-1.181)	0.051 (1.139)	0.008 (0.721)	0.056 (1.277)
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.711 (-1.366)	-0.760 (-1.631)	0.452 (0.480)	-0.459 (-0.919)	-1.236 (-1.000)	-0.131 (-0.273)	-1.588* (-2.246)	-13.692 (-1.425)	0.911 (0.226)	-0.990 (-1.849)	-1.883 (-0.931)
R-squared	0.998	0.998	0.993	0.998	0.989	0.998	0.996	0.966	0.995	0.998	0.963
F-test	2930.9**	3203.1**	983.2**	2896.4**	582.1**	2771.8**	1677.5**	102.4**	730.3**	2808.4**	174.1**
Number of observations	312	312	312	312	312	312	312	156	156	312	312

Notes: - [a] Measured as the skewness of the wage distribution
- Numbers in parentheses are t-values
- ** is significant at 1 percent level
- * is significant at 5 percent level

Table A11. Results of OLS Estimation of Wage Regression Using First Difference Specification
(Dependent variable: change in log of real wage)

Independent Variable	All workers	Male	Female	Adult	Youth	Educated	Less educated	White-collar	Blue-collar	Full-time	Part-time
Change in log of real minimum wage	0.065 (0.364)	0.150 (1.144)	0.275 (1.034)	0.238 (1.789)	-0.057 (-0.191)	0.215 (1.385)	-0.142 (-0.687)	0.136 (0.464)	0.384* (2.149)	0.090 (0.533)	0.238 (1.091)
Change in degree of compliance[a]	1.394* (1.987)	0.719 (1.386)	3.068** (2.919)	0.725 (1.376)	3.158** (2.678)	1.076 (1.755)	1.021 (1.245)	-0.033 (-0.080)	0.923** (3.690)	1.348* (2.025)	1.321 (1.531)
Change in log of population 15 years and over	-0.027 (-0.102)	-0.001 (-0.007)	-0.028 (-0.072)	0.077 (0.414)	-0.442 (-1.191)	0.259 (1.782)	-0.289 (-1.059)	-0.037 (-0.071)	-0.248 (-0.787)	-0.064 (-0.254)	0.369 (1.132)
Change in log of real regional gross domestic product	-0.080 (-1.426)	-0.088* (-2.121)	-0.008 (-0.100)	-0.077 (-1.825)	-0.036 (-0.378)	-0.093 (-1.903)	-0.009 (-0.134)	0.031 (0.655)	-0.028 (-0.978)	-0.080 (-1.497)	-0.008 (-0.117)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.032 (0.461)	0.036 (0.489)	0.110 (1.048)	0.153** (2.905)	-0.269* (-2.307)	0.326** (5.297)	-0.008 (-0.101)	-0.020 (-0.349)	-0.000 (-0.003)	0.116 (1.758)	-0.406 (-4.727)
R-squared	0.105	0.163	0.075	0.178	0.112	0.140	0.116	0.413	0.740	0.118	-0.406
F-test	2.26**	3.77**	1.57	4.18**	2.44**	3.14**	2.54**	10.63**	42.96**	2.58**	4.32**
Number of observations	286	286	286	286	286	286	286	156	156	286	286

Notes: - [a] Measured as the proportion of workers who earn above the minimum wage
- Numbers in parentheses are t-values
- ** is significant at 1 percent level
- * is significant at 5 percent level

Table A12. Results of OLS Estimation of Employment Regression Using First Difference Specification
(Dependent variable: change in log of employment)

Independent Variable	All workers	Male	Female	Adult	Youth	Educated	Less educated	White-collar	Blue-collar	Full-time	Part-time
Change in log of real minimum wage	-0.032 (-0.879)	-0.030 (-0.832)	-0.073 (-1.067)	0.000 (0.002)	-0.276** (-2.658)	0.017 (0.475)	-0.037 (-0.670)	1.131 (1.943)	-0.408 (-1.656)	-0.029 (-0.742)	-0.100 (-0.674)
Change in degree of compliance[a]	-0.253 (-1.753)	-0.103 (-0.722)	-0.856** (-3.175)	-0.004 (-0.030)	-1.789** (-4.360)	0.016 (0.115)	-0.475* (-2.187)	0.001 (0.001)	-0.708* (-2.056)	-0.186 (-1.184)	-1.216* (-2.068)
Change in log of population 15 years and over	0.991** (18.195)	0.960** (18.639)	1.032** (10.424)	0.942** (18.376)	0.984** (7.617)	0.984** (29.390)	0.950** (13.128)	0.572 (0.557)	0.779 (1.793)	0.959** (16.161)	1.366** (6.142)
Change in log of real regional gross domestic product	-0.010 (-0.891)	0.001 (0.098)	-0.023 (-1.077)	-0.009 (-0.767)	-0.042 (-0.058)	-0.002 (-0.166)	-0.003 (-0.038)	-0.244** (-2.611)	0.064 (1.626)	-0.008 (-0.631)	-0.052 (-1.108)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.001 (0.055)	-0.001 (-0.054)	0.017 (0.651)	0.002 (0.132)	-0.058 (-1.417)	-0.021 (-1.506)	-0.001 (-0.038)	0.259 (2.290)	-0.075 (-1.578)	0.002 (0.137)	0.005 (0.089)
R-squared	0.668	0.673	0.427	0.659	0.368	0.911	0.696	0.294	0.429	0.621	0.271
F-test	38.9**	39.9**	14.4**	37.4**	11.25**	199.4**	44.3**	6.3**	11.4**	31.7**	7.2**
Number of observations	286	286	286	286	286	286	286	130	130	286	286

Notes: - [a] Measured as the proportion of workers who earn above the minimum wage
- Numbers in parentheses are t-values
- ** is significant at 1 percent level
- * is significant at 5 percent level

Table A13. Results of OLS Estimation of Employment Regression Using Alternative Measure of Minimum Wage
(Dependent variable: log of employment)

Independent Variable	All workers	Male	Female	Adult	Youth	Educated	Less educated	White-collar	Blue-collar	Full-time	Part-time
Ratio of minimum wage to average wage	-0.068 (-0.946)	-0.233** (-3.111)	-0.202* (-2.120)	-0.191* (-2.363)	-0.024 (-0.246)	-0.034 (-0.397)	0.113 (1.438)	0.231 (0.411)	-0.491 (-2.010)	-0.064 (-0.814)	-0.534** (-4.028)
Degree of compliance[a]	-0.151 (-916)	-0.209 (-1.394)	-0.748* (-2.362)	-0.191 (-1.196)	-0.636 (-1.509)	0.077 (0.506)	-0.081 (-0.324)	-0.334 (-1.382)	-0.887* (-2.302)	-0.058 (-0.343)	-1.940** (-3.412)
Log of population group 15 years and over	0.990** (34.288)	0.997** (38.553)	0.936** (17.614)	0.968** (35.517)	1.040** (14.772)	0.959** (37.356)	1.022** (25.529)	1.001 (1.833)	0.771** (3.493)	1.002** (33.719)	0.904** (8.385)
Log of real regional gross domestic product	0.014 (1.275)	0.020 (1.929)	0.018 (0.844)	0.018 (1.619)	-0.004 (-0.133)	-0.001 (-0.063)	0.035* (2.182)	-0.151 (-1.382)	0.056 (1.265)	0.010 (0.826)	0.076 (1.784)
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-1.294** (-3.134)	-0.978** (-2.733)	-0.745 (-1.023)	-0.671 (-1.743)	-2.229* (2.385)	-0.442 (-1.219)	-2.589** (-4.661)	0.178 (0.024)	1.608 (0.529)	-1.553** (-3.641)	-1.788 (-1.197)
R-squared	0.998	0.998	0.993	0.998	0.989	0.998	0.996	0.965	0.995	0.998	0.965
F-test	2884.8**	3270.9**	977.2**	2919.1**	582.6**	2770.9**	1665.9**	98.9**	766.7**	2761.6**	186.0**
Number of observations	312	312	312	312	312	312	312	156	156	312	312

Notes: - [a] Measured as the proportion of workers who earn above the minimum wage
- Numbers in parentheses are t-values
- ** is significant at 1 percent level
- * is significant at 5 percent level

Table A14. Results of OLS Estimation of Employment Regression Using Partial Adjustment Model
(Dependent variable: change in log of employment)

Independent Variable	All workers	Male	Female	Adult	Youth	Educated	Less educated	White-collar	Blue-collar	Full-time	Part-time
Change in log of real minimum wage	-0.013 (-0.357)	-0.001 (-0.032)	-0.055 (-0.801)	0.022 (0.594)	-0.256* (-2.483)	0.034 (0.924)	-0.042 (-0.758)	-0.033 (-0.068)	-0.175 (-0.704)	-0.000 (-0.001)	-0.295* (-2.103)
Change in degree of compliance[a]	-0.228 (-1.541)	-0.039 (-0.275)	-0.840** (-3.081)	0.004 (0.031)	-1.612** (-3.940)	-0.025 (-0.174)	-0.466* (-2.116)	0.408 (0.577)	-0.650 (-1.800)	-0.123 (-0.759)	-1.814** (-3.273)
Change in log of population 15 years and over	0.998** (18.469)	0.956** (19.292)	1.052** (10.906)	0.961** (19.287)	0.917** (7.450)	0.988** (30.445)	0.935** (13.342)	1.262 (1.428)	0.750 (1.657)	0.979** (16.614)	1.111** (5.470)
Change in log of real regional gross domestic product	-0.004 (-0.368)	0.012 (1.009)	-0.024 (-1.097)	-0.004 (-0.380)	-0.006 (-0.175)	0.006 (0.505)	0.001 (0.048)	-0.170* (-2.221)	0.070 (1.779)	-0.003 (-0.257)	-0.009 (-0.200)
Lag in log of employment	-0.228** (-5.776)	-0.314** (-7.167)	-0.257** (-6.476)	-0.276** (-6.698)	-0.346** (-7.201)	-0.225** (-5.952)	-0.274** (-6.516)	-0.817** (-9.285)	-0.412** (-4.888)	-0.230** (-5.813)	-0.501** (-9.752)
Lag in log of real minimum wage	0.017 (0.766)	0.042 (1.928)	-0.030 (-0.716)	0.029 (1.323)	-0.090 (-1.480)	0.022 (1.058)	-0.031 (-0.921)	-0.353 (-1.919)	0.133 (1.361)	0.032 (1.315)	-0.359** (-3.992)
Lag in degree of compliance[a]	-0.084 (-0.758)	0.038 (0.359)	-0.373 (-1.748)	-0.031 (-0.289)	-0.543 (-1.720)	-0.154 (-1.520)	-0.197 (-1.130)	0.188 (0.320)	-0.334 (-1.078)	-0.002 (-0.019)	-1.728** (-3.876)
Lag in log of population 15 years old and over	0.232** (5.798)	0.311** (7.141)	0.282** (6.387)	0.273** (6.761)	0.366** (6.339)	0.216** (5.900)	0.298** (6.573)	0.715** (7.210)	0.409** (4.492)	0.240** (5.832)	0.367** (7.494)
Lag in log of real regional gross domestic product	0.000 (0.014)	0.008 (0.937)	-0.016 (-1.061)	-0.004 (-0.455)	0.037 (1.618)	0.005 (0.587)	-0.004 (-0.300)	0.072 (1.247)	0.013 (0.452)	-0.003 (-0.341)	0.077* (2.368)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.455 (-1.641)	-0.849** (-3.063)	0.138 (0.274)	-0.478 (-1.777)	-0.124 (-0.169)	-0.250 (-1.005)	-0.169 (-0.412)	2.191 (1.171)	-2.086 (-2.024)	-0.746* (-2.378)	4.120 (3.756)
R-squared	0.705	0.726	0.507	0.709	0.473	0.922	0.740	0.605	0.529	0.664	0.464
F-test	33.5**	37.2**	14.4**	34.1**	12.5**	165.8**	39.7**	13.6**	10.0**	27.7**	12.1**
Number of observations	286	286	286	286	286	286	286	130	130	286	286

Notes: - [a] Measured as the proportion of workers who earn above the minimum wage
- Numbers in parentheses are t-values
- ** is significant at 1 percent level
- * is significant at 5 percent level

Table A15. Short-run and Long-run Elasticity of Employment to the Minimum Wage

Type of workers	Short-run elasticity of employment to minimum wage	Long-run elasticity of employment to minimum wage
All workers	-0.013	0.075
Male	-0.001	0.134
Female	-0.055	-0.117
Adult	0.022	0.105
Youth	-0.256	-0.260
Educated	0.034	0.098
Less educated	-0.042	-0.113
White-collar	-0.033	-0.432
Blue-collar	-0.175	0.323
Full-time	0.000	0.139
Part-time	-0.295	-0.717

REFERENCES

Addison, Tony and Lionel Demery (1988), 'Wages and Labor Conditions in East Asia: A Review of Case-Study Evidence', *Development Policy Review*, 6(4), pp. 371-393.

Agrawal, Nisha (1996), *The Benefits of Growth for Indonesian Workers*, Policy Research Working Paper No. 1637, World Bank, Washington, D.C.

Baldwin, Robert E. (1994), 'The Effects of Trade and Foreign Direct Investment on Employment and Relative Wages', *OECD Economic Studies*, No. 23, Winter, pp. 7-54.

Bell, Linda A. (1997), 'The Impact of Minimum Wages in Mexico and Columbia', *Journal of Labor Economics*, 15(3), pp. S102-S135.

Berndt, Ernst R. (1991), The Practice of Econometrics: Classic and Contemporary, Addison-Wesley, Reading, Massachusetts.

Card, David and Alan Krueger (1994), 'Minimum Wages and Employment: A Case Study of the Fast Food Industry in New Jersey and Pennsylvania', *American Economic Review*, 84(4), pp. 772-793.

Castillo-Freeman, Alida and Richard Freeman (1992), 'When the Minimum Wage Really Bites: The Effect of the U.S.-Level Minimum on Puerto Rico', in George Borjas and Richard Freeman (eds.), *Immigration and the Work Force*, University of Chicago Press, Chicago.

Depnaker (1998), *Pedoman Pengisian Data Kebutuhan Hidup Minimum (KHM)*, Bagian Proyek Peningkatan Kesejahteraan Tenaga Kerja 1998/1999, Departemen Tenaga Kerja R.I., Jakarta.

Duflo, Esther (2000), *Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experimen*t, NBER Working Paper No. 7860, National Bureau of Economic Research, Cambridge, Massachusetts.

Edwards, Alejandra Cox (1996), *Labor Regulations and Industrial Relations in Indonesia*, Policy Research Working Paper No. 1640, World Bank, Washington, D.C.

Fane, George (1996), 'Deregulation in Indonesia: Two Steps Forward, One Step Back', *Agenda*, 3(3), pp. 341-350.

Feridhanusetyawan, Tubagus (1999), *The Impact of the Crisis on the Labor Market in Indonesia*, Report prepared for the Asian Development Bank, Centre for Strategic and International Studies, Jakarta.

Hill, Hal (1991), 'The Emperor's Clothes can Now be Made in Indonesia', *Bulletin of Indonesian Economic Studies*, 27(3), pp. 89-127.

Hill, Hal (1996), *The Indonesian Economy Since 1966: Southeast Asia's Emerging Giant*, Cambridge University Press, Cambridge.

Islam, Iyanatul and Suahasil Nazara (2000), *Minimum Wage and the Welfare of Indonesian Workers*, Occasional Discussion Paper Series No. 3, International Labour Organization, Jakarta.

Krueger, Alan B. (1995), 'The Effect of the Minimum Wage When It Really Bites: A Reexamination of the Evidence from Puerto Rico', in Solomon W. Polachek (ed.), *Research in Labor Economics*, JAI Press, Greenwich, C.T.

Maloney, William F. and Jairo Nuñez (2001), *Measuring the Impact of Minimum Wages: Evidence from Latin America*, Policy Research Working Paper No. 2597, The World Bank, Washington, D.C.

Manning, Chris (1994), 'What has Happened to Wages in the New Order?', *Bulletin of Indonesian Economic Studies*, 30(3), pp. 73-114.

Manning, Chris (1998), *Indonesian Labour in Transition*, Cambridge University Press, Cambridge.

Manning, Chris (2000), 'Labour Market Adjustment to Indonesia's Economic Crisis: Context, Trends and Implications', *Bulletin of Indonesian Economic Studies*, 36(1), pp. 105-136.

Neumark, David and William Wascher (1995), *The Effect of New Jersey's Minimum Wage Increase on Fast-Food Employment: A Re-Evaluation Using Payroll Records*, NBER Working Paper No. 5224, National Bureau of Economic Research, Cambridge, M.A.

Neumark, David, Mark Schweitzer, and William Wascher (2000), *The Effect of Minimum Wages Throughout the Wage Distribution*, NBER Working Paper No. 7519, National Bureau of Economic Research, Cambridge, M.A.

Rama, Martin (1996), *The Consequences of Doubling the Minimum Wage: The Case of Indonesia*, World Bank Policy Research Working Paper No. 1643, World Bank, Washington, D.C.

Rama, Martin (2001), 'The Consequences of Doubling the Minimum Wage: The Case of Indonesia', *Industrial and Labor Relations Review*, 54(4), pp. 864-881.

Thee Kian Wee (1991), 'The Surge of Asian NIC Investment into Indonesia', *Bulletin of Indonesian Economic Studies*, 27(3), pp. 55-88.