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in a Developing Country:  
Simulations from Indonesia's Household Survey**

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# **Minimum Wages and Poverty in a Developing Country: Simulations from Indonesia's Household Survey**

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## **Abstract**

This study assesses the efficiency of minimum wage policy as a tool of poverty reduction in a developing country. To do this we draw on recent studies that use simulations that take into account both who benefits and who pays for the wage increase using household-level data. On the benefits side, we assume that the increases in minimum wages in 2003 boost the incomes of families with at least one minimum or low wage worker. On the cost side, we assume producers pass on the full increase in wage costs to consumers through higher final prices. Generally, a minimum wage policy is 'pro-poor' (and hence a well 'targeted' policy) if it has a disproportionately positive effect on the incomes of poor households compared with other income groups. Our simulation results indicate that minimum wage legislation is not an effective target antipoverty instrument. Only about 17 percent of the additional earnings from the minimum wage hike in 2003 flow to poor households, another 34 percent of the benefits flow to the near-poor, while half of the benefits accrue to non-poor households. Moreover, the examination of net benefits reveals that only one in four poor households gain through higher incomes, while three out of four poor households lose through higher prices.

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# 1. Introduction<sup>1</sup>

In recent years, there has been a renewed interest in policies which seek to cushion workers from harmful effects of globalization (Greenaway and Nelson, 2001; Elliot and Freeman, 2003). This has given impetus to an old debate on minimum wage policy and its implications for employment and labor welfare in both developed and developing countries. Supporters of more aggressive minimum wage policies have been encouraged by widely circulated findings of research in developed countries<sup>2</sup> (and replicated in some studies in developing countries<sup>3</sup>), which argue that increased minimum wages may have little or no effect on employment.

The debate raises the broader question of whether minimum wage policy is an effective anti-poverty instrument, in an international policy environment where poverty reduction strategies are at the centre of many government programs (World Bank, 2000). To answer this question we need to examine how increased minimum wages impact on output and prices, and cost of living of workers and their families, in addition to their direct effect on employment.

A second, related issue involves the distributional impact of minimum wages. In this case, the question relates to the extent to which the poor benefit from a minimum wage hike, relative to other income classes. In short, a minimum wage policy is ‘pro-poor’ (and hence a well ‘targeted’ policy) if it has a disproportionately positive effect on the incomes of poor households compared with other income groups (Dollar and Kray, 2001; Timmer, 2004).

This paper addresses these issues. It seeks to examine the impact of a minimum wage hike on incomes and the cost of living of poor households, in the context of their broader distributional effects, in a developing country context. The focus of the study is Indonesia, where an active minimum wage policy has been adopted in a slower growth environment, after the Asian economic crisis in the late 1990s.

The main aims of the paper are two fold. First, it seeks to illustrate rough orders of magnitude in the impact on the poor, and other income classes, of a moderate increase in minimum wages. Second, it aims to demonstrate the channels through which minimum wage increases might affect real labor incomes and poverty, rather than focus on the outcomes alone. Given difficulties in modeling the longer term, general equilibrium effects, the paper concentrates on the shorter term impact on incomes, assuming that employment remains unchanged, and the effects of minimum wages are principally passed on to consumers in the form of higher prices.

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<sup>1</sup> An earlier draft of this paper was presented at a seminar in the Division of Economics, Research School of Pacific Studies, Australian National University. The authors are very grateful for valuable comments made on the paper at that seminar. The normal disclaimers apply. The authors would like to thank Choesni Tubagus for data processing.

<sup>2</sup> Until the early 1990s there was a ‘consensus’ among economists in industrial countries that a 10 percent increase in minimum wages would reduce teenage employment by 1 to 3 percent. New impetus has been injected into this debate by the influential findings of Card and Krueger (1995) that minimum wage increases can, in some circumstances, result in net job gains rather than losses as predicted by conventional theory. Since the Card and Krueger studies there have been many reassessments of minimum wages with conflicting findings and conclusions (see for example, Koster, 1996).

<sup>3</sup> See for example Castillo-Freeman and Freeman (1991), Bell (1997) and Maloney and Mendez (2003)

Indonesia is an interesting case study. Poverty reduction strategy programs (PRSP) have become an important element in most government programs since the economic crisis of 1998. At the same time, the government has played an active role in promoting minimum wages and has justified its policies partly on the grounds that minimum wages benefit the poor. Like in other countries, research has focused on the effects on employment rather than income distribution and poverty. Implicitly it is assumed that if the employment effects of a minimum wages increase are small (or even positive), then minimum wages rises are likely to benefit the poor.<sup>4</sup>

Flagging some of the main results, we find that only a small proportion of poor households are likely to enjoy real income gains from minimum wages increases, and a significant proportion are penalized, in net terms. In short, even if there are no backwash effects on employment, we suggest that minimum wages is likely to be a blunt instrument for poverty reduction and may to impose severe penalties on the poor, at least in the case of Indonesia.

The organization of the paper is as follows. Section 2 discusses the framework for analysis. Section 3 provides a background to the Indonesian labor market and minimum wage policy while section 4 sketches out our empirical methodology. Section 5 presents the simulation results for the actual increases in minimum wages in Indonesia in 2003. The results are presented in three parts: quantifying the additional wage benefits to households, the extra expenditure households must pay for the same bundle of goods consumed after the minimum wage increase and, third, the net benefits accruing to each household, across different income groups, and especially the poor. In this way we provide an assessment of whether minimum wages is likely to have been an effective antipoverty strategy. In the sixth section we use the net benefits calculation to simulate the number of households that would have consequently moved out of or into poverty and undertakes some comparisons with findings from studies for other countries. Section 6 offers some conclusions and draws attention to some of the limitations of our study for policy formulation.

## **2. Framework of Analysis**

Minimum wages has been justified as an effective instrument of poverty reduction on two key grounds. First, it might be argued that unskilled wages make up a large share of poor households' incomes in developing countries and therefore most poor households stand to benefit from increases in minimum wages (Saget, 2001: p10).<sup>5</sup> Second, increasing minimum wages has little or no social cost. In one sense, the first belief appears uncontroversial. Wages of unskilled workers in developing countries are low, especially by advanced nation standards. In the capital city of Indonesia – the country focus of our study – a breadwinner earning the Jakarta minimum wage of US\$80 per month alone (around \$250 in PPP terms) is obviously not sufficient to

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<sup>4</sup> See especially Rama (1996), Alatas and Cameron (2003), Suryahadi et. al. (2003) and Harrison and Score (2004).

<sup>5</sup> Saget (2001) in her cross-country study statistically estimated that a 10 percent increase in the real minimum wage would reduce the poverty rate by 4.6 percent in developing countries

support an average Indonesian household of four persons above the lowest, standard, international poverty line of \$1 a day, let alone the slightly higher \$2 a day.<sup>6</sup>

However, per capita income was also low (less than \$300 per month in PPP terms in 2002) and it is the level of the minimum wage relative to national living standards that is most relevant for any special anti-poverty program. Evidence for advanced countries show that the majority of low wage workers do not live in poor households (McCurdy and McIntyre, 2001). Whether this is the case for a developing country like Indonesia is an open empirical question to be explored in the paper. In many other LDCs, it is argued that, a significant share of low wage workers do not live in the poorest households mainly because of the high proportion of poor households in the ‘uncovered’, informal sector (Livingstone, 1995; Winters et al., 2004).

The second belief that minimum wages can be raised at little or no social cost is more controversial. Aside from referring to research which suggests that minimum wages do not result in job losses for unskilled workers, adherents to this view argue that the impact on prices will be minimal, partly because wage costs make up a small share of total production costs.<sup>7</sup> Minimum wage policy can also be considered “mainly a distributional issue” whereby some persons gain and others will lose from a minimum wage hike (Card and Krueger, 1995: p 27; see also MaCurdy and McIntyre, 2001: p1). Thus one needs to ask the additional questions. Do the benefits go to the intended target, poor households and are these benefits financed or who pays for the minimum wage increase? A policy is well targeted if the benefits accrue disproportionately to the poor and the costs fall disproportionately on the non-poor.

To do this we draw on recent studies that use simulations to take into account both who benefits and who pays for the wage increase using household-level data. On the benefits side, we assume that an increase in minimum wages boosts the incomes of households with at least one minimum or low wage worker. For simplicity, we take the advocates’ view of the world and assume a world of no job losses. As noted, research in developed and developing countries suggest that this may not be a totally unrealistic assumption. On the cost side, we assume consumers pay for the increase. That is, producers pass on the full increase in wage costs to consumers through higher final prices. We then simulate the net effects on households. Both assumptions follow the approach adopted by MaCurdy and McIntyre (2001). We also adopt the same presumption that since minimum wage is ‘mainly an income distribution issue’ the gains to beneficiaries are cancelled out by losses to those adversely affected. Their simulations equate total benefits with total costs.

We recognize that these are strong assumptions and are only likely to be relevant in the short run and for relatively small increases in minimum wages. Substitution effects and the structure of product markets will, of course, influence prices and the distribution of benefits across income classes. Nevertheless, we believe that for small changes in the minimum wage and final consumer prices— which we will show to be

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<sup>6</sup> The broad appeal of this fact has encouraged policy makers in Indonesia to pass legislation (the Manpower Protection Act of 2003) to set the minimum wage equal to a basket of goods and services that provide a household of four with a ‘decent living’.

<sup>7</sup> For example, in 2002 the Minister of Labor was reported in the local media as saying that wage costs only account for about 10 percent of total production costs in the manufacturing sector and therefore the price effects of raising minimum wages would be small.

the case in our simulations – our findings are a reasonable approximation of the minimum wage hike impact on household welfare.

### 3. The Indonesian Labor Market and Minimum Wage Policy

Indonesia is interesting as a focus for this study for several reasons. First, labor market structure is typical for a low income developing country. It has a small modern or formal wage sector (employing around less than one-third of the labor force) which stands to gain labor regulations. The rest of the workforce is engaged in the informal sector. Second, Indonesia has adopted a vigorous minimum wage policy as part of a broader social safety net strategy for providing unskilled workers with a minimum standard of living.

Minimum wage regulation is not new in Indonesia. It had already been a key element in labor policy for close to a decade prior to the downfall of the Soeharto government in 1998 (Manning, 1998).<sup>8</sup> The emphasis has been on consumption levels of the poor, as reflected in the adoption of an index of minimum living needs (the KHM – *Kehidupan Hidup Minimum* from the mid 1990s), as the main basis for assessing minimum wages relative to the needs of workers. The standard was based on regular estimates of the cost of living made by regional government Manpower Offices, according to price changes in a basket of 43 items.

In the post Soeharto era, a basic change in the basic framework for setting minimum wages occurred in January 2001.<sup>9</sup> The setting of regional minimum wages was decentralized as part of the general move towards greater regional autonomy. Beginning in 2001, the power to set minimum wage levels was transferred to provincial governors. Adjustments have been made annually, based on recommendations from the district heads, who in turn receive input from employer groups and unions councils in their region.

For our later discussion of poverty, three points are worth noting regarding both the level of minimum wages and annual adjustments across regions.

- First, the standard for evaluating the adequacy of the minimum wages, prices of 43 items, has been high by other measures of disadvantage in Indonesia. For example, the monthly absolute value of the minimum living needs for all Indonesia was substantially higher than average per capita expenditure per month, it was almost three times the per capita poverty line in urban areas and four times the per capita poverty line in rural areas.<sup>10</sup> Further, minimum wages had become much more ‘binding’ relative to average wages. By the year 2000

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<sup>8</sup> Minimum wages were set annually by the Minister of Manpower based on recommendations from provincial governors for different provinces across the country, and for some key sectors in some regions from the 1970s, although regular annual revisions across all provinces only became common in the 1990s.

<sup>9</sup> By law, the MW set at either District or Provincial level for all industries and also according to specific sectors (see Articles 87-98 of the Manpower Protection Act of 2003). See Manning (2003) Chapter 5 for a detailed discussion.

<sup>10</sup> For example, The KHM was estimated at Rp. 253,000 compared with an urban per capita poverty line of Rp. 90,000, a rural per capita poverty line of Rp. 69,000 and consumption per capita of Rp. 68,000 in 1999. See the Indonesian Yearbook of Statistics (2000), Tables 11.1.5, and 12.1.

when they were very close to average wages for all employees (Suryahadi et al., 2003).

- Second, annual revisions of the KHM estimated by the Ministry of Manpower, were typically much higher than estimated increases in the CPI, to such an extent that this raises some doubt regarding the reliability of changes in minimum needs as the main justification for minimum wage revisions.<sup>11</sup>
- Third, the compliance regime in relation to minimum wages changed dramatically after the downfall of Soeharto in 1998. Freeing up of trade unions, after tight controls exerted by the former government for more than 25 years, meant that employers could no longer rely on strong arm tactics to get around government policies. Compliance with minimum wages were likely to become much more binding than in earlier periods.

Nevertheless, it is important to note that coverage of minimum wage and other labor legislation is limited to wage employees and not workers in the informal sector, such as the self-employed and unpaid household workers. Table 1 shows the breakdown in the workforce by occupational status in 2002. Regular wage employees number about 25 million workers or 27 percent of the total workforce. Informal workers account for 64 million workers, of which 8 million are casual wage workers, the self-employed number about 40 million, and unpaid household members number 16 million.

**Table 1**  
**Composition of Work Force by Occupational Status**  
**(number of workers in million)**

Sector	Status	Total in 2002	% Share in 2002
<b>Formal sector</b>	Employers	2.5	3.0%
	Regular wage workers	25.0	27.3%
<b>Informal sector</b>	Casual wage workers in agriculture	4.5	4.9%
	Casual wage workers in non-agriculture sector	3.6	3.9%
	Self-employed	17.6	19.2%
	Self-employed with unpaid family workers	22.0	24.0%
	Unpaid family workers	16.1	17.6%
<b>TOTAL</b>		91.6	100.0%

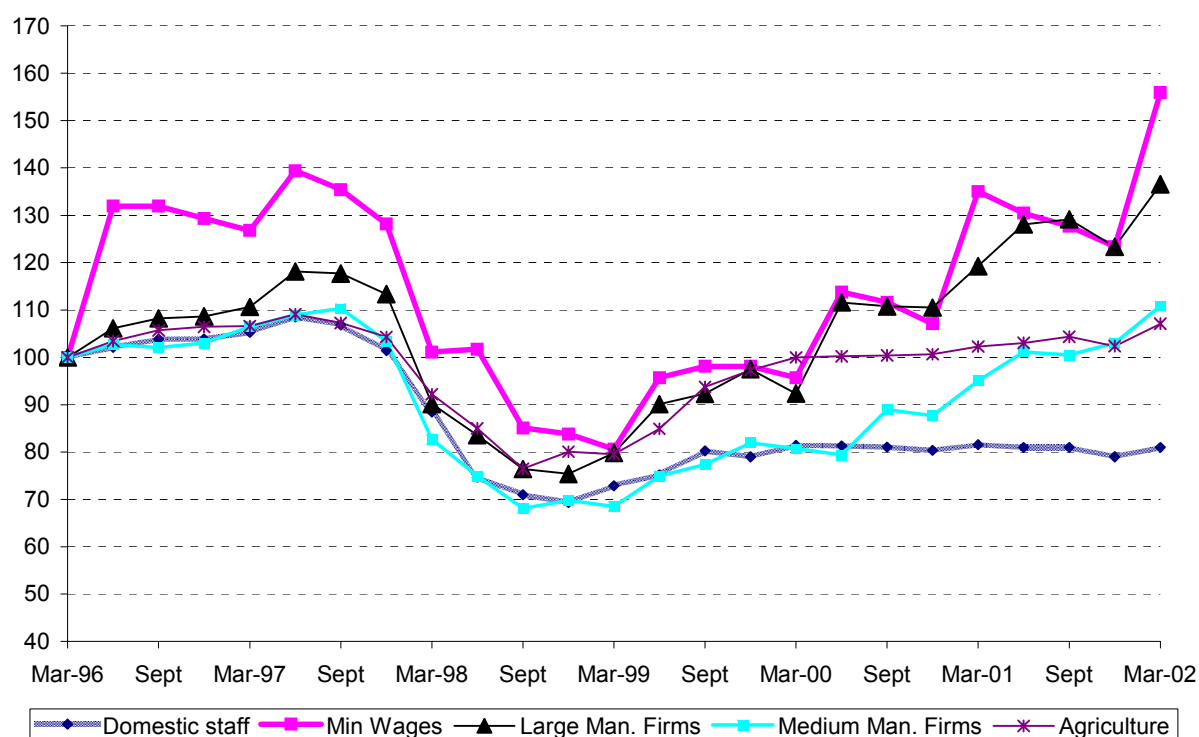
Source: National Labor Force Survey, 2002, CBS.

Also, even within the wage employment sector, compliance with minimum wage legislation is likely to vary across different types of occupations. About 30 percent of wage employees in urban areas receive monthly wages below the minimum rate (Suryahadi et al, 2001). Figure 1 depicts the trends in real minimum wages,

<sup>11</sup> Thus, official data reported by the Ministry of Manpower, find that increases in the KHM were around 25% (averaged across all provinces) in 2000 and 2001. In contrast, December on December CPI increases were estimated by the Central Board of Statistics at 13% in each of the same two years.

manufacturing wages in large and medium scale establishments, and wages of workers that are considered as typical of the “uncovered” urban sector – female domestic helpers.<sup>12</sup> For comparison purposes we also include agriculture wages to proxy wages in the rural sector. Most strikingly is the diverging trend in wages between the informal sector and the formal sector from 1999, with large spikes in wages of workers in large manufacturing establishments (more than 50 workers) coinciding with big increases in minimum wages in the first quarter of each year since 1999. In the main simulations, we assume that the minimum wage increase is passed on to all wage employees whose wages are just below the new minimum rate set in 2003. However these trends suggest that wages in more traditional sectors have lagged behind the minimum wage increase in recent years. Assuming that poor employees are more heavily concentrated in traditional sectors, our simulations will probably tend to overstate the impact of minimum wages increases on poverty alleviation.

**Figure 1**  
**Trends in Official Minimum and Average Real Wages in Indonesia**  
**(Index 1996Q1 = 100)**



Sources: Ministry of Manpower (unpublished data on minimum wages, various years); Central Statistics Agency, Quarterly Survey of Large and Medium Manufacturing Establishments, 1996-2002; Agricultural wage rates in rice agriculture (national, average) and Cost of Living Indicators, March 1996-September 2002

<sup>12</sup> The Indonesian labor force survey does not collect incomes of non-wage workers in the urban centres. Incomes of informal sector workers by wages of domestic helpers and male barbers are taken from the monthly consumer price survey conducted by the Central Bureau of Statistics.



The employment effects of minimum wage adjustments are not addressed in this paper. However, the impact of minimum wages on poverty depends critically on the structure of employment and trends in employment between formal and informal sectors. Table 2 provides some information on this subject. Two points are worth mentioning. First, a high proportion of all workers are employed in agriculture (most of them self employed on small farms) or informal sector jobs outside agriculture, and hence their incomes are not directly influenced by the minimum wage increase. They are affected mainly as consumers. Second, while formal sector employment in manufacturing and services expanded more quickly in Indonesia during the period of rapid growth before the economic crisis in 1998, the reverse was the case after the crisis. In particular, growth rates of employment in manufacturing slowed in the recovery period 1999-2003. Unemployment rates rose significantly during the crisis years after 1996/97 (see the last row of data in Table 2).<sup>13</sup> But it stabilized and then actually fell after 1999-2000. In the latter period, the informal sector and agriculture absorbed a high proportion of new jobs. By 2002-2003, a higher proportion of all workers (and especially workers employed outside agriculture) were not in a position to benefit directly from minimum wages, compared with before the economic crisis.<sup>14</sup>

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<sup>13</sup> The Table also shows that unemployment had risen from quite low levels from the mid 1980s, although this was partly a result of changes in the way unemployment is measured from 1994 onwards.

<sup>14</sup> Table 2 indicates, however, that the number of agricultural wage workers expanded quite rapidly, although a major share of these (approximately two-thirds in 2002-2003) worked in casual jobs

**Table 2: Employment distribution and growth, Indonesia 1986/87-2002/2003**

Sector/Activity	Distribution (%)				Growth Rates (% p.a.)	
	1986/87	1996/97	1999/2000	2002/2003	1986/7- 1996/7	1996/7- 2002/3
<b>EMPLOYMENT</b>						
<b>All Sectors</b>						
Agriculture	55	43	44	45	-0.2	3.1
Manufacturing	8	13	13	13	6.7	2.0
Other	37	45	43	42	4.3	1.1
Total	100	100	100	100	2.4	2.1
<b>Agriculture</b>						
Wage employment (formal)*	9.8	13.3	13.7	16.2	2.6	5.5
Non-wage employment(informal)	91.2	86.7	86.3	83.8	-0.8	1.5
<b>Non-Agriculture</b>						
Urban	42	53	59	64	7.5	5.2
Rural	58	47	41	36	3.0	-2.4
Wage employment (formal)	46	50	48	44	6.0	-0.1
Non-wage employment (informal)	54	50	52	56	4.4	4.0
<b>LABOR FORCE, EMPLOYMENT, UNEMPLOYMENT</b>						
Working age population (millions)	103.0	133.5	141.2	150.1	2.6	1.9
Labor force (millions)	68.6	88.9	95.3	101.8	2.6	2.3
Employment (millions)	66.8	84.7	89.3	95.9	2.4	2.1
Unemployment (millions)	1.8	4.3	6.0	5.9	8.3	5.3
Participation Rate	66.6	66.6	67.5	67.8		
Unemployment Rate	2.7	4.7	6.3	5.7		

**Note:** All data are for ages fifteen and above. Owing to several sharp year to year fluctuations, data are averaged over two years. For 2003, revised figures are used, based on the Central Board of Statistics adjustments to labor force data. Unemployment rates are defined according to standard labor force measure used before 2001: that is, those persons out of work and actively looking for work.

\*Includes casual agricultural worker.

\*\* Casual wage workers were distinguished as a separate category from 2001. Outside agriculture, casual wage workers were classified by CBS as self-employed before 2001, and are included with the self employed in this table for 2002-2003.

**Source:** CBS, National Labor Force Surveys

## 4. Approach and Methodology

In our simulation framework we distinguish between two types of households.<sup>15</sup> The first type has at least one household member working as a low wage employee in the ‘covered’ formal sector, and therefore these households stand to gain from a minimum wage increase. A low wage employee in the formal sector is defined as a regular wage employee earning a monthly wage in 2002 below the new minimum hourly rate set for 2003. There may be other members of the same household employed at higher wages or working in the informal sector either as self-employed or unpaid household members. The second type of household is one that does not have a low wage employee working in the formal sector, and hence this household cannot (by definition) benefit from a hike in the minimum wage. These households either have members employed at relatively higher wages – above the minimum rate in 2003 - or work in the informal sector.

How an economy pays for a minimum wage increase may be less obvious than how people benefit. The cost of higher wages must be paid by someone. MaCurdy and McIntyre (2001) suggest three possible groups of may pay for the minimum wage increase, depending on how firms respond to the increase in wage costs.<sup>16</sup>

- First, employers may reduce employment or adjust other aspects of the employment relationship (e.g., less fringe benefits, reduced working hours), in which case workers pay.
- Second, firms may absorb all of the wage increase through lower profits, in which case owners of capital pay, assuming the firm is sufficiently profitable to absorb the extra costs.
- Finally, employers can increase prices so that consumers pay for the minimum wage increase, and accept the risk of losing customers as a result.

Besides assuming that producers do not reduce employment or hours of work, this study makes the additional assumption that shareholders do not pay through a reduction in profits. Although the extra resources needed to cover higher labor costs could theoretically come out of profits, several factors suggest that this source may not incur significant costs.<sup>17</sup> Employers in low wage industries are typically in highly competitive industries such as garments, footwear, restaurants and retail stores, and the only option for these low-profit-margin industries becomes lowering exposure to low wage labor or raising prices.

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<sup>15</sup> Aside from MacCurdy and McIntyre, several other empirical studies for advanced nations have followed this analytical approach to simulate the expected benefits of increases in minimum wages by household income. See for example Sutherland (1995) and Horrigan and Mincy (1993), Neumark (1997). However, except for MaCurdy and McIntyre, none of these studies incorporated the price effects on consumers, although a few of the studies did incorporate the disemployment effects of minimum wage hikes.

<sup>16</sup> In one sense, firms do not pay for the minimum wage, since they are merely economic entities that bring together the factors of production (capital, labor, land) to facilitate transactions among individuals.

<sup>17</sup> Of course in the long run capital is mobile and will eventually leave any industry that does not yield a return comparable to that earned elsewhere in an economy. The authors are unaware of any research on the link between minimum wages and returns to capital.

With regard to the price response, firms that compete in tradable-goods markets and are price takers, lowering exposure to low wage labor is the only option for these firms when wage costs rise. However, many firms that employ minimum wage workers compete in non-tradable-goods markets, including service industries such as retail, restaurants, and transportation. For these industries, an increase in minimum wage may represent an industry-wide increase in costs. Therefore, prices for low wage goods will rise – output would also fall depending on price sensitivity of consumers. Thus, some of the burden of the minimum wage increase falls on consumers of low-wage products.<sup>18</sup>

Of course, in order to have no job or profit losses, consumers must continue to purchase the same amount of low wage goods at the higher price. Thus, following MaCurdy and McIntyre (2001), we make four assumptions when we simulate the minimum wage effects:

- All increased labor costs are passed on in higher prices
- Low-wage workers remain employed at the same number of hours after the minimum wage rises (demand for low wage labor is perfectly inelastic).
- Consumers do not reduce consumption as price rises (product price elasticities of demand are perfectly inelastic)
- Foreign consumers do not reduce consumption of Indonesia's exported goods as prices rise.

Taken together, the four assumptions allow us to simulate the expected effects of minimum wage increase in a relatively simple manner. Of course these assumptions may not hold in reality, and several violate the general equilibrium conditions of price substitutability. In practice, producers will use a combination of all three strategies depending on the conditions of the market. For example, in a competitive market with mobile capital, producers are more likely to respond to an increase in wage costs through a combination of increases in their product prices and reductions in employment. With increases in product prices, we would expect both income and price substitution effects to affect the real level and composition of household consumption, which in turn would affect industry profit margins and employment across sectors. Also, increases in the relative price of low wage labor would shift factor demand towards skilled labor and capital intensive production processes in the long run.

Despite these complications, we believe that assessing these minimum wage effects in a simulation environment allows us to better understand the distributional implications of the minimum wage on poor households, and to demonstrate the key adjustment processes, which are of interest in policy making. If we try to model the consequences of firms using all three strategies at once, the effects on employment, output, prices, household

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<sup>18</sup> While rigorous research on this subject is limited in the U.S. several recent studies in that country have analyzed the impact of a minimum wage increase on prices. These studies, using either an Input-Output model or a computable general equilibrium model, show that some proportion of minimum wage increase will pass through into higher consumer prices. The Card and Krueger study on New Jersey/Pennsylvania (1995: p54) observed “prices rose 4 percent faster as a result of the minimum wage increase.”

consumption, exports and profits are all individually diluted and it is difficult to detect these effects empirically with precision.

### *Data and Methodology*

Indonesia has a rich micro-database on household income and expenditure to evaluate the effects of minimum wage increases on income distribution and poverty. The Central Body of Statistics (CBS) produces a nationally representative survey of household income and expenditure known by its acronym SUSENAS. The SUSENAS survey covers some 200,000 households and provides detailed information on household members' characteristics, occupational status, wages, hours of work, as well as household expenditure on goods and services. This allows us to identify low wage workers and simulate their additional earnings from the minimum wage increase.

Figure 2 shows the steps in developing our simulations of the distributional effects of the minimum wage increase.<sup>19</sup> We use SUSENAS to simulate the additional earnings of each identified low wage worker after an increase in the statutory minimum rate, assuming that all employees continue to work at the same hours as they did in 2002. If a household has more than one worker benefiting from the minimum rate increase, we aggregate across household members to derive the increase in total household income ( $\Delta Y$ ) as follows:

$$\Delta Y_{j,2003} = \sum_i^n \Delta W_{i,2003} * HR_{i,2002}$$

where  $i = 1 \dots n$  low wage workers in the household,  $\Delta W$  is the change in the low wage worker's hourly wage rate in 2003 and HR is the 'i' worker's hours of work in 2002

In simulating the costs, we assume that firms pass on the increase in wage costs in the form of higher prices. To demonstrate the effects, a three sector model comprising agriculture, manufacturing and services is adopted. Using data in SUSENAS on the three sectors employing low-wage workers, we can identify how much total wage costs rise in each sector. The Input-Output table is used to translate higher labor costs into total production costs in each sector. Once household purchases of goods and services are mapped to the employment sectors, we use SUSENAS to relate price increases to goods actually consumed by households. We then simulate the extra expenditure households ( $\Delta E$ ) must pay to consume the same bundle of goods as before the minimum wage increase as follows:

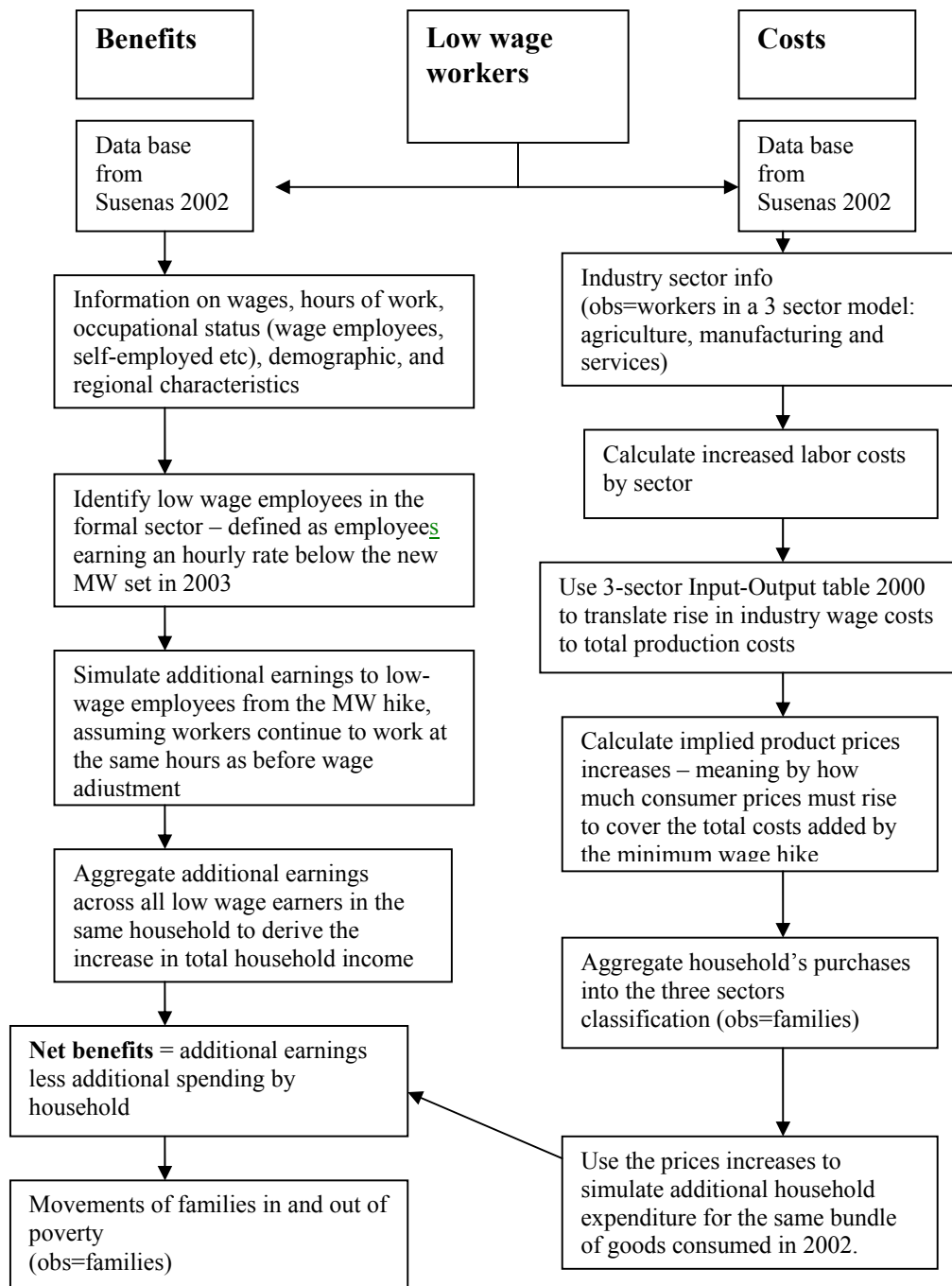
$$\Delta E_{j,2003} = \sum_{i=1}^3 \Delta P_{i,2003} * Q_{2002}$$

where  $i = 1..3$  product sectors,  $\Delta P$  is change in price of good  $i$  in 2003, and  $Q$  is the quantity of good  $i$  consumed in 2002. The final step in our simulations us to calculate the net benefits for each household as  $\Delta Y - \Delta E$ .

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<sup>19</sup> This also includes workers earning a wage below the minimum rate in 2002, as it is a popular argument that minimum wage policy has spillovers to wage workers at the bottom of the wage distribution. We therefore assume these workers benefit by the same percentage increase in the statutory rate.

**Figure 2**  
**Steps in Developing Simulations of Distributional Effects**



Source: Adapted from MaCurdy and McIntyre (2001: Figure 3.1).

## 5. Who Benefits and Who Loses from the Minimum Wage Increase?

This section identifies low-wage earners and examines how the additional benefits from a minimum wage increase are distributed across households by income group, with an emphasis on the type of households that might be the main targets of minimum wage policy.<sup>20</sup> For this purpose we define poverty across households rather than individuals. In presenting the findings we group households according to their income position relative to the poverty line (also known as income-needs ratio).<sup>21</sup> This is because household poverty depends on both total income (of which wages are one component) and the size-composition of the household. The use of the the income-needs ratio allows us to assess the impact on economic well-being of households of different sizes. It also allows us to consider the question of what share of the benefits from the minimum wage goes to households in poverty. Therefore, we will categorize households as follows:<sup>22</sup>

- Poor households defined as households with income-needs ratio below 100%
- Near poor households with income-needs ratio between 100% and 150%
- Non-poor households with income-needs ratio above 150%.

### 5.1 Who are the beneficiaries?

The first issue in determining which types of households benefit from the minimum wage increase is to ask which households in 2002 include wage workers who earned less than the new minimum rate set in January 2003. Table 3 shows the share of households that have at least one low wage worker by each income-needs group. The first column shows the share of total households in each income-needs group. The second column shows the share of households that have a low wage worker and therefore benefit from a minimum wage increase. The final column shows the percentage distribution of households with low wage workers across the income-poverty line thresholds. As we can see from the first column, the poverty rate is about 17 percent of all households in Indonesia (i.e., households with per capita income less than the poverty line). Another 34 percent of households are classified as near-poor. The remaining 49 percent of all households are classified as non-poor.

Perhaps surprising for a developing country, the low wage population is remarkably evenly spread across income-needs thresholds. Overall, 23.5 percent of all Indonesian households have at least one household member employed on a low wage in the formal sector. Twenty-five percent of households living in poverty have a low wage worker. This share decreases by two percentage points as we move from the poverty group to the highest income group: 22 percent of households with per capita incomes at least 3 times higher than the poverty line have a low wage worker who will benefit from a minimum wage increase.

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<sup>20</sup> In January 2003 the Indonesian government exempted all minimum wage earners from income tax. Thus, in our study we do not need to consider the tax implications of minimum wage increases for these workers and their families.

<sup>21</sup> We proxy household income by their consumption because of limitations in the non-wage data reported in the income module of the SUSENAS. There is a consensus among researchers familiar with the SUSENAS that the non-wage component of the income module may be misreported because of difficulties with collecting the data in the informal sector or non-wage sector.

<sup>22</sup> We adopt this classification used by Burkhauser, Couch and Wittenburg (1996) in their note on minimum wages and poverty in the U.S.

**Table 3**  
**Percentage of Households with Low Wage Earners in the Formal Sector**

<b>Income-poverty thresholds</b>	<i>Percentages</i>		
	<b>Households in each income-poverty group</b>	<b>Households with a low-wage worker</b>	<b>Distribution of households with low-wage workers</b>
Poor households	17.4	24.9	18.4
Near Poor	33.8	23.6	34.0
Non-poor households	48.8	23.0	47.6
<i>Of which non-poor households with:</i>			
---Income-needs ratio 150% to 200%	21.5	23.2	21.2
---Ratio 200% to 300%	16.9	23.0	16.5
---Ratio > 300%	10.3	22.4	9.8
Average/total	100	23.5*	100

\*Average

Note: Aggregation of households across provincial poverty thresholds

Source: Susenas 2002

Why do so many households in the higher income quintiles have household members earning a low wage? This question is important because, as noted, the Indonesian government is considering revamping the minimum wage to reflect the 'decent living needs' of a household of four in addition to the current policy of a single worker. Demographic characteristics of low wage earners by per capita income relative to the poverty line provide part of the answer. Table 4 shows that the 'average' low wage worker living in a poor household has some different characteristics from the 'average' low wage worker living in a better-off household. Low wage workers in poor and near poor households are mainly low educated workers (78 percent), adults over the age of 24 years (68 percent), male (63 percent) and married (58 percent). These percentages decline as we move from poor to non-poor households. The differences are most striking between poor households and those households with per capita incomes higher than 300 percent of the poverty line. Whereas the average low wage worker in poor households is more likely to be the main breadwinner in a household with children, the average low wage worker in wealthy households is more likely to be a secondary earner.

Do the benefits from the minimum wage increase accrue disproportionately to poor households? Figure 3 answers this question. From Figure 3 we see that the benefits are divided among the different income-needs groups about equal to their distribution in the population. Poor households account for 17 percent of the population and receive about 17 percent of the benefits. Non-poor account for 49 percent of the population and receive about half of the benefits.. This suggests that minimum wage policy is an inefficient way to boost the incomes of poor households, as more than 50 percent of the benefits go to the non-poor.



**Table 4**  
**Characteristics of Low Wage Workers by Income-Poverty Ratio**  
 (% of total low wage workers in each income group)

Income-poverty threshold	Youths	Adults	Less Educated	More educated	Female	Male	Single
Poor households	32	68	78	22	37	63	42
Near poor households	32	68	71	29	35	65	42
Non-poor households	35	65	55	45	41	59	49
<i>Of which non-poor households with:</i>							
---Ratio 1.5 to 2	33	67	59	41	38	62	43
---Ratio 2 to 3	34	66	52	48	41	59	47
---Ratio > 3	42	58	53	47	53	47	65

Source: Susenas 2002

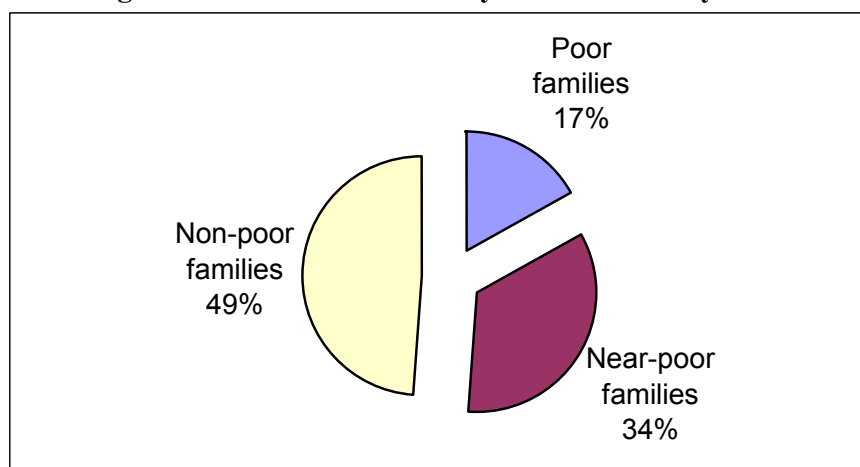
Teenagers and youths – workers aged 15-24 years

Low educated workers - workers with junior high school or less

Number of low wage workers equals 15,824,452

Number of all wage workers equals 28,612,036

**Figure 3**  
**Percentage of Benefits Distributed by Income-Poverty Ratio**

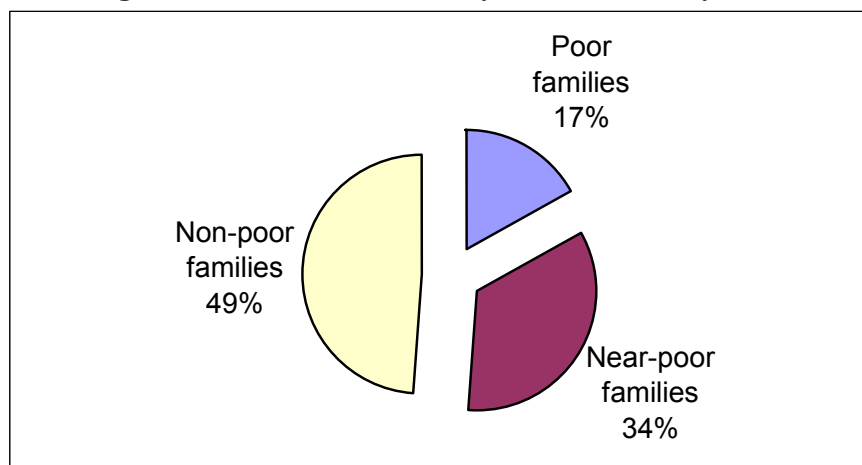


Note: Aggregation of households across provincial poverty lines

Source: Susenas 2002

Poverty in Indonesia has regional dimensions. For example, poverty rates are higher in rural areas compared to urban centers and poverty is highest off Java and Bali. Figures 4 and 5 show the benefits are captured by households in urban areas and in Java. Urban centers account for about 44 percent of the national population, but urban households receive about 64 percent of the benefits. Java and Bali account for a little over 60 percent of the population and receive almost 80 percent of the benefits. Much smaller benefits go to the poorest regions of Sumatra and East Indonesia, mainly because these areas have smaller modern sectors.

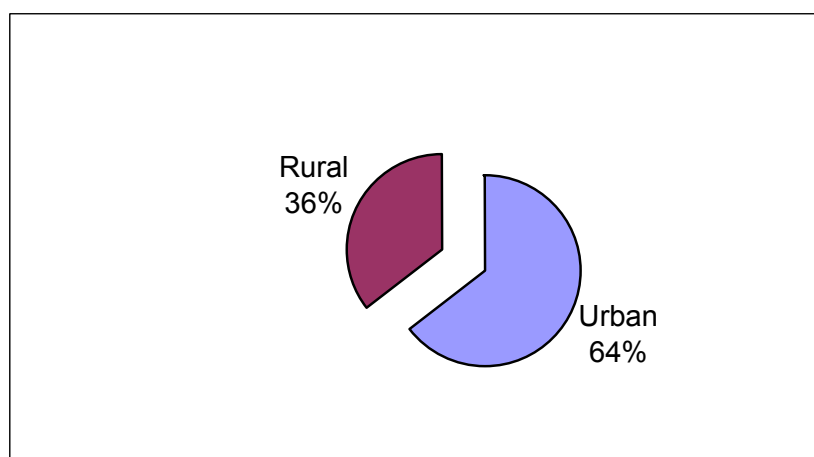
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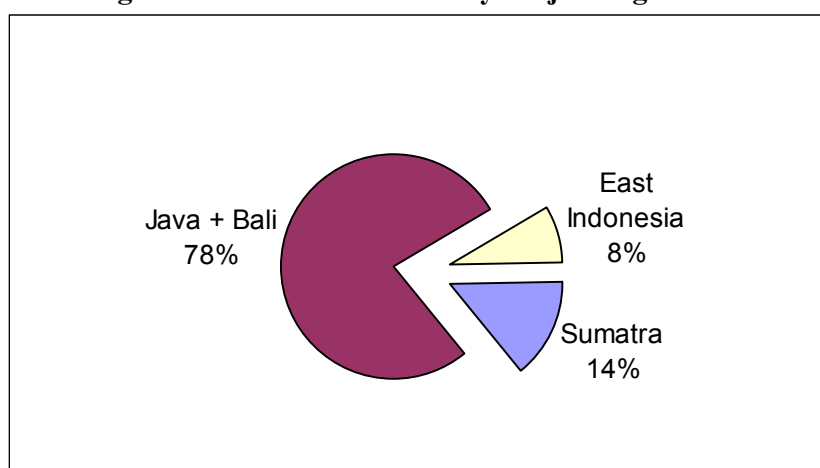
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**Figure 4**  
**Percentage of Benefits Distributed Between Urban and Rural Households**



**Figure 5**  
**Percentage of Benefits Distributed by Major Region**



The distribution of benefits depicted in Figures 3 to 5 assumes incomplete compliance with minimum wage legislation.<sup>23</sup> It is of interest to examine whether full compliance with the legislation would benefit poor households more than other households. To examine this possibility we carried out simulations of the distribution of benefits assuming all sub-minimum wage workers in 2002 received the new minimum wage in 2003. These results are presented in annex 1 to this paper. Perhaps surprisingly, while full compliance obviously increases aggregate earnings of low wage workers, the distribution of benefits across households does not change substantially. Our simulations actually show that non-poor households continue to capture a slightly larger share of the benefits: non-poor receive 52 percent of the benefits compared to 49 percent when there is incomplete compliance.<sup>24</sup>

Our assessment of the distribution of the minimum wage increase in 2003 indicates that minimum wage policy is not an efficient way to boost the incomes of poor households. In most countries almost all antipoverty programs will have some degree of leakage outside the target group due to weak government administrative capacity, insufficient information to identify target groups, and in some cases corruption in the delivery mechanism. Program efficiency is conveniently summarized the targeting ratio.<sup>25</sup> Based on the figures presented above, the minimum wage had a targeting ratio of 1.0 which was higher (less favorable) compared with most other programs (public works, scholarships for the poor subsidized rice, medicine and credit) evaluated by the SMERU research group for various anti-poverty programs in Indonesia in 1998 (SMERU, 1999).

<sup>23</sup> As mentioned in section 4, we assume sub-minimum wage workers in 2002 receive a percentage increase in wages equal to the percentage increase in the minimum rate in 2003.

<sup>24</sup> In Annex 1 we also take a look at the distribution of benefits after we include positive spillovers to workers with wages above the new minimum wage in 2003. Again the simulation results show that the distribution of benefits across families does not change significantly.

<sup>25</sup> The targeting ratio (TR) is defined as  $TR = B_n / P_n$  where  $B_n$  is the share of participants in the program who are non-poor and  $P_n$  is the share of the non-poor in the total population. A targeting ratio of zero ( $B_n = 0$ ) indicates perfect targeting. A ratio equal to one ( $B_n = P_n$ ) indicates that the benefits are distributed according to the population distribution. A ratio greater than one suggests the benefits accrue disproportionately to the non-poor. As a 'rule of thumb' a program is considered relatively effective in targeting if the value of TR is closer to zero, indicating that the benefits accrue disproportionately to the poor.

## 5.2 Who Pays for Minimum Wage Increase?

The second part of our study simulates the extra expenditure households must pay for the same bundle of goods consumed in 2002 after the minimum wage increase in 2003. In contrast to the benefits, estimating the costs to households is more challenging. While about one quarter of households benefit from the increase in the minimum wage, all households are assumed to pay through higher consumer prices. The minimum wage increase results in higher labor costs due to both higher wages and higher social security contributions. We assume that firms respond to higher labor costs by increasing prices; consumers of goods produced with low-wage labor face higher prices than before the wage increase. To assess the distributional effects of the minimum wage increase, we translate the additional labor costs into product prices to gauge how much prices have to increase to cover the new costs. We then examine household consumption patterns to identify the added costs per household.

To summarize our methodology discussed in Section 4, the procedure we adopt is as follows:

- Using information in SUSENAS on sectors employing low-wage workers, we calculate by how much total wage costs rise in different sectors.
- We then use the Input-Output table to translate higher industry wage costs into total production costs. The Input-Output table allows us to trace both the direct and indirect labor costs.<sup>26</sup> It is through this feedback process that the price shock from the minimum wage hike spillovers to the entire economy.
- We then map employment sectors with household purchases of goods and services sectors. We use SUSENAS to relate ‘implicit’ price increases to the goods actually consumed by households
- For each good dividing the additional production costs by total household expenditures on that good yields a percentage cost increase. These cost increases are referred to as ‘implicit’ incremental tax rates or ‘implicit’ prices. Essentially, the implicit tax rate tells us the rate by which consumer prices must increase to cover the total costs added by the minimum wage hike. These prices ensure total benefits to households with low wage workers equate to total costs paid by consumers (MaCurdy and McIntyre, 2001; p17).
- We use these implicit prices to simulate the additional costs to households in 2003, assuming households continue to purchase the same bundle of goods as in 2002.

The average increase in minimum wages of 13 percent in 2003 raised earnings of workers by approximately Rp7.7 trillion (or US\$800 million) or Rp. 8.1 from an employer’s perspective, if social security contributions are included.<sup>27</sup> Domestic consumers will not pay for the full cost. Rather in our simulation framework the costs are shared between domestic and foreign consumers depending on the share of domestic production exported. Earlier we assumed that foreign consumers do not reduce consumption of Indonesian

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<sup>26</sup> Direct labor costs are the increase in labor costs in that sector. The indirect labor costs are traced through higher intermediate input prices due to minimum wage increases in the intermediate input sector. Thus, even if an industry does not employ low wage labor, the prices for that industry’s output may rise because the industry uses intermediate goods and services produced with minimum wage labor.

<sup>27</sup> For the employer’s perspective, the increase in labor costs will exceed the increase in earnings, since employers also have to pay higher social security contributions.

exported goods as prices rise. According to the I-O table, about 23 percent of total domestic output is exported, thus, we assume that 23 percent of additional production costs are paid by foreign consumers through higher export prices.<sup>28</sup> Therefore domestic consumers pay 77 percent of additional production costs and foreign consumers will pay the remaining 23 percent.

The increases in the implicit prices for the three product groups range from 0.7 percent for agriculture, 1.3 percent for manufactured goods and 2.5 percent for services. While these increases are relatively small and provide some justification for our assumption of no price substitutability, most households facing these higher prices do not receive additional earnings. In reality the higher prices will require either a reduction in consumption or a cut in savings. As noted, these implicit prices should be treated as maximum increases, as they assume no price substitutability in the system and no-job-losses or profit reductions.

### *The Distribution of the Costs Across Households*

These implicit tax rates allow us to calculate the distribution of costs across households, just as we previously calculated the distribution of benefits across households. Nationally, consumers pay Rp7.2 trillion more for goods and services after the minimum wage increase. As we did for the benefits side, we consider the different costs relative to the poverty line for households by income group.

On average, each household pays Rp. 137,000 (US\$15) more per year for their purchases after the minimum wage increase (Table 5). Households living in poverty pay Rp. 66,000 (or 1.3 percent) more on average per year for their purchases. The amount increases as we move from poor to better-off households. Households with per capita income at least three times the poverty line pay Rp. 389,000 (or 1.8 percent) more per year for their purchases. Non-poor households bear a slightly higher percentage increase in costs through a higher share of their expenditure on utilities and services (these goods have a higher minimum wage content compared with agriculture produced goods).<sup>29</sup>

Figure 5 presents the share of total costs by per capita income relative to the poverty line. When we looked at the benefits we saw that households living in poverty received a smaller share of the benefits than households with incomes double or triple the poverty line. On the cost side, households living in poverty pay only 8.4 percent of the costs, compared to with the 69.4 percent paid by the non-poor. The costs are better ‘targeted’ than the benefits.

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<sup>28</sup> According to the I-O table, 2.4 percent of agriculture output is exported, 27 percent of manufactured goods are exported and 9.7 percent of services are exported.

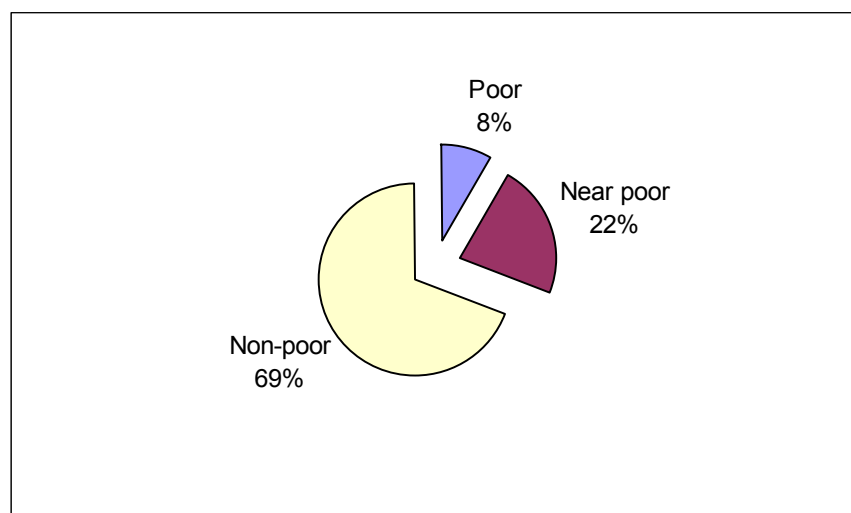
<sup>29</sup> For example, poor families spend about 47 percent of their budget on food items, 30 percent on manufactured goods and 23 percent on utilities and services. Families with income-needs ratio above 300% spend 21 percent of their budget on food items, 31 percent on manufactured goods and 48 percent on utilities and services.

**Table 5**  
**Additional Costs to Households After the Minimum Wage Hike**  
**(Rp and US\$ annually)**

Income-poverty thresholds	Extra household cost*	Percentage increase in household expenditure
Poor Households	Rp66,000 or \$7.0	1.3%
Near Poor Households	Rp90,000 or \$10.0	1.3%
Non-Poor Households	Rp194,000 or \$21.0	1.6%
<i>Of which non-poor households:</i>		
---Ratio 150% to 200%	Rp120,000 or \$13.0	1.4%
---Ratio 200% to 300%	Rp170,000 or \$18.0	1.5%
---Ratio > 300%	Rp389,000 or \$43.0	1.8%

\* Dollar figures at official exchange rates

**Figure 5**  
**Distribution of Costs by Income Groups, Relative to the Poverty Threshold**



## 6. Net Effects and the Impact on Poverty

We now bring the benefits and costs together to examine the net effects across different households and explore how well the minimum wage increase targets poor households. We explore how these net effects impact on the transition of households in and out of poverty and near poverty.

Table 6 presents these net effects by household ordered by per capita income relative to poverty thresholds. In each case, we distinguish households with low wage workers in the formal sector from other households. The two types of households are the basis for understanding the impact of the minimum wage law on income distribution: only some households with a wage earner benefit, but all households pay through higher prices. Net benefits are calculated as the average benefit to a household with a low wage worker minus the average cost the household will pay for higher priced goods. For example, 25 percent of poor households have a low wage worker in the formal sector and therefore

benefit from a minimum wage hike. These households on average get Rp567,000 (US\$ 61) in benefits. On average, they pay Rp66,000 in higher prices. Thus, their net benefit as reported in Table 5 is Rp501,000 (US\$54). In contrast, households with no low wage employee in the formal sector do not receive any benefits, but they have to pay the costs through higher consumer prices. The 75 percent of poor households who do not have a low wage worker on average pay Rp66,000 in higher prices but receive no benefit. The last column presents the net benefit averaged across all households in the group.

The table shows that about 40 percent of the redistribution of income to poor households occurs **between** poor households. For example, a household living in poverty received Rp75,000 (US\$8) annually, on average, in net terms from the minimum wage increase. In contrast, non-poor households, on net, lost Rp47,000 (\$5), with the richest households losing Rp264,000 (or \$30) annually. Thus, there is some redistribution from rich households to poorer households.

However, unfortunately, the ‘average’ household we present does not exist, as there is a sharp distinction between a households that win and lose **within** income groups. As noted, among poor households, only the 25% of households with a low wage employee received a net benefit (Rp501,000) whereas the other 75% lost an average of Rp66,000. Thus the 2003 minimum wage increase is equivalent to taking Rp66,000 from three poor households, (totaling Rp200,000) plus Rp301,000 from non-poor households, making sum, Rp501,000. This is given to the fourth poor household. Thus, three out of four poor households pay about 40 percent of the benefits to one-fourth of poor households.

**Table 6**  
**Winners and Losers from the Minimum Wage Increase in 2003**  
**(Rp per year net benefits)**

Per capita- income relative to the poverty line	Share of Households (%)		Net Benefits/costs (Rp. 000)		
	<i>With Low Wage Workers</i>	<i>Without Low Wage Workers</i>	<i>With Low Wage Workers</i>	<i>Without Low Wage Workers</i>	<i>Average net benefit</i>
Poor households	24.9	75.1	501	(66)	75
Near poor households	23.6	76.4	544	(90)	60
Non-poor households	23.0	77.0	446	(195)	(47)
<i>Of which non-poor households:</i>					
---Ratio 150% to 200%	23.2	76.8	546	(120)	35
---Ratio 200% to 300%	23.0	77.0	481	(170)	(20)
---Ratio > 300%	22.4	77.6	170	(389)	(264)

Net benefits = additional income to household from the minimum wage increase less additional expenditure households must spend as a result of wage-induced price increases. Figures in parentheses are negative numbers

The central goal of any poverty reduction strategy is to reduce the number of poor households. Indeed, policy makers will often measure the success of a strategy in these terms. Table 7 presents simulations for the number of households that move out of

poverty and the number of near-poor households that fall into poverty as a result of the minimum wage increase. We again distinguish households with low wage workers from other households, in these simulations. Households with low wage workers get a boost in income equal to the additional earnings from the minimum wage hike. Other households do not receive benefits, so their nominal income in 2003 remains the same as in 2002. We are interested in comparing households' real per capita incomes in 2003 with the poverty line in 2002. Thus, we deflate nominal incomes in 2003 by the 'implicit' incremental price increases listed in table 4. We then calculate the number of households' that have escaped poverty and the ones that have entered into poverty.

Looking at Table 7, we see that prior to the minimum wage increase 9.2 million households were classified as poor. After the minimum wage increase, some half a million households escape poverty and move into the near-poor category, and out of poverty. On the other hand, almost 410,000 near-poor households (who received no benefits) fall into poverty as a result of having to pay higher prices. Overall, the number of poor households declined by 95,000 to 9,066,094, or a fall of one percent on 2002. The total number of near-poor households increased by about 100,000 households or an increase of 0.6 percent (500,000 poor households became near poor, and about 600,000 non-poor households in 2002 become near poor in 2003).

**Table 7**  
**Change in the Number of Households by Status Relative to the Poverty Line,**  
**Indonesia, 2002-2003**

	2003			Total 2002
	Poor households	Near Poor	Non-poor	
Poor households	8.7	0.5	0	9.2
Near Poor	0.4	16.8	0.6	17.8
Non-poor	0	0.6	24.6	25.2
<b>Total 2003</b>	9.1	17.9	25.2	52.2
% Change (2002-03)	-1.1	0.6	0	

The simulations reported in tables 6 and 7 demonstrate that looking at aggregate figures on poverty masks the pattern of redistribution of income between households. As we saw from the two tables, one in four poor households are unambiguously better off and 500,000 of these households escape poverty as a result. On the other hand, three in four poor households are ambiguously worse off as a result of having to pay higher prices for their household purchases.

## 7. Conclusions

At the beginning of the paper it was noted that advocates of minimum wage policy often cite helping the poor as the primary motive for minimum wages. Hence the need to assess the effectiveness of minimum wage policy as an anti-poverty instrument. An anti-poverty program is well targeted if the benefits accrue disproportionately to the poor, and the costs fall disproportionately on the non-poor.

Our simulation results indicate that minimum wage legislation is not an effective target antipoverty instrument. Only about 17 percent of the additional earnings from the



minimum wage hike in 2003 flow to poor households, another 34 percent of the benefits flow to the near-poor, while half of the benefits accrue to non-poor households. Moreover, the examination of net benefits reveals that only one in four poor households gain through higher incomes, while three out of four poor households lose through higher prices. Thus, we conclude that minimum wage policy is not effective in terms of reaching the poor, even when we assume no-job-losses.

It is of interest to compare our results with findings from other countries. Based on a similar approach, the findings of MaCurdy and McIntyre (2001) for the U.S.A are surprisingly similar to those for Indonesia. Poor households in the U.S. account for 15 percent of the population and they received about 15 percent of the benefits. MaCurdy and McIntyre also found that three in four low income households were unambiguously worse off due to higher consumer prices. They concluded that minimum wage legislation is not an effective antipoverty instrument. Neumark and Wascher (1997) adopted an econometric approach [logit model] and found that increases in the U.S. Federal minimum wage rate during the 1980s increased the probability that both poor households escaped from poverty and previously non-poor households fell into poverty. Numbers for the latter slightly outweighed those for the non-poor.

Unfortunately there have been many fewer studies on the relationship between minimum wages and poverty in developing countries (and no simulations of the kind presented in our paper) where unskilled wage workers might be expected to account for a higher proportion of the urban poor than in developed countries (where the poor are more likely to benefit from social welfare).<sup>30</sup> The majority of studies rely on cross-country analysis. Saget (2001), for example, using regression analysis on a sample of 31 developing countries found that reductions in poverty rates were substantially larger (in fact implausibly so) in countries with bigger increases in minimum wages.<sup>31</sup> However, cross-country studies have well known weaknesses that can bias estimation results. The cross sectional (or panel) assumption that the same model and parameter set applies to all countries is questionable; so too is the cross-sectional assumption that the data reflects a stable steady-state relationship. There are huge differences in the measurement of many of the variable used.<sup>32</sup>

Recent empirical work on poverty emphasizes the need for detailed case studies of particular countries and analysis at the household level (Ravallion, 2001, 2003; Winters et al 2004). This has been the approach adopted in this paper. By using household-level data we can gain greater insight into the distributional effects of a specific policy that can not be easily done using aggregated data across-countries.

### ***Limitations of the Analytical Approach***

Our study has three limitations. We assumed no employment or profit losses from the minimum wage increase, no price substitution effects and, finally, we did not incorporate spillovers to the informal sector.

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<sup>30</sup> Warr (2004) in his paper on globalization, growth and poverty in Thailand observed from household-level data that the majority of minimum wage workers live in non-poor households, and concluded that poverty can not be reduced effectively by raising minimum wages. He did not carry out simulations of the impact of increases in minimum wages on income distribution and poverty.

<sup>31</sup> Lustig and McLeod (1997), using a sample of 22 countries mainly from Latin America, also found increases in minimum wages are correlated with reduction in poverty rates.

<sup>32</sup> Of particular concern is the variation in compliance rates with minimum wage legislation, and hence the effectiveness of minimum wages policies across countries.

The first limitation is our assumption that producers finance the minimum wage hike through higher consumer prices and not through employment cuts or profit reductions. If we relax the no-job-loss assumption the aggregate benefits would be reduced and all households would be faced with smaller price increases. The impact on the distribution of benefits depends on the distribution of job losses within the low wage population. Some studies show that less skilled workers and youths are more likely to lose their jobs from minimum wage hikes compared with more skilled workers and adults (Suryahadi et al., 2002). Thus, employment losses might be expected to disproportionately affect poor households, bearing in mind that less educated, low wage workers are more likely than average to reside in poor or near-poor households (see data cited in Table 2 above).

The outcomes are likely to change in two ways if we allowed for profit losses in our simulations. The benefit side would not change, but there would be smaller price increases. To incorporate profit losses we would need to quantify the distribution of profits from firms with low wage workers. This information is not available. We might predict, however, that this change would shift net benefits towards lower income households, given that wealth is more concentrated than income (see MaCurdy and McIntyre, 2001).

Second, we assumed no price substitution in the model: consumers buy the same bundle of goods, despite higher prices. In reality, changes in relative prices of consumer goods would create both income and price substitution effects. Consumer demand would shift away from higher priced low wage goods to other goods, depending on price elasticities. Consequently, additional costs would not be as high as simulated in this paper. However, the shift in consumer demand would also affect profit levels and employment across sectors and would complicate the calculation of net benefits.

The final limitation of our study relates to disregard of the potential spillovers to the informal sector, and feedbacks to household incomes and poverty. The impact on the informal sector depends on whether there are job losses in the formal sector, and whether there is capital flight to the informal sector. With job losses, more workers enter the informal sector and put pressure on earnings and lower household incomes. Since informal workers are more likely to live in poor households, increased competition and lower earnings in the informal sector might disproportionately hurt poor households. On the other hand, if increased labor costs in the formal sector encourage capital flight to the informal sector, this may offset some of the pressure on earnings in this sector.

To incorporate all these equilibrium conditions requires an elaborate general equilibrium model and this is a useful area for future research. An attempt to model all these behavioral adjustments at once would dilute the individual effects on employment, output, prices, household consumption, and profits across sectors. It would make it difficult to detect these effects. Focusing on price effects only allows us to better understand the distributional implications of the minimum wage on poor households. Moreover, we argue that the assumption of no price substitution may be a reasonable approximation for an experiment in which there are small changes in consumer prices.

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**Annex 1**  
**Distribution of Benefits under Different Assumptions about Compliance and Spillovers**

<b>Income group</b>	<b>Percentage population in each category</b>	<b>Benefits under incomplete compliance (Figure 2)</b>	<b>Benefits under full compliance</b>	<b>Benefits under full compliance plus positive spillovers</b>
Poor households	17.4%	16.8%	17.6%	17.0%
Near poor households	33.8%	34.4%	30.1%	30.0%
Non-poor households	48.8%	48.8%	52.2%	53.0%

Notes:

Full compliance means all sub-minimum wage workers in 2002 receive the new minimum wage in 2003.

Spillovers to wage workers refer to those workers with wages in 2002 up to 50 percent higher than the new minimum wage in 2003. These workers receive a wage increase equal to the percentage increase in the minimum wage in 2003.