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Labor Market Transitions of Men and Women During an Economic Crisis: Evidence from Indonesia

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August 2000

1. Introduction

Indonesia is in the midst of a major financial, economic and political crisis. The magnitude and unexpected nature of the crisis are particularly stunning when contrasted with the country's recent economic success. During the three decades prior to the crisis, Indonesia enjoyed sustained economic growth, accompanied by an impressive reduction in poverty, significant improvements in the health and human capital of the population and a shift in the structure of production away from agriculture towards higher paying manufacturing and service sector jobs There are many ways one might summarize changes in the labor market; one oft-used metric is growth in hourly earnings which is likely to be related to changes in productivity. That growth has been dramatic. Real hourly earnings of the median female worker in the formal or market sector in 1997 was about twice that of the median female market sector worker a decade earlier; for men, real hourly earnings increased by about 50% during this time (Smith et al, 2000.)

In early 1998, Indonesia succumbed to the economic crisis that was sweeping South East Asia. Estimates that 5.4 million workers would be displaced by the crisis were accompanied by dire predictions of massive increases in unemployment (Feridhanusetyawan, 1999; see also World Bank, 1998, which estimated that 2 million workers had lost their jobs by April 1998 and predicted that number would double or triple by the end of 1998.). Simply put, those predictions turned out to be wrong. The *Survei Amgkatan Kerja Nasional* (SAKERNAS), a labor market and income survey conducted annually by the Indonesian Government statistical bureau, *Badan Pusat Statistik* (BPS), is the primary source of employment data in Indonesia. According to those data, between August, 1997, and August, 1998, the male employment rate declined by about 1.5% whereas female employment actually increased by about 0.8%. The immediate effect of the crisis on employment has been rather small -- a point that was made early in the crisis by Frankenberg, Thomas and Beegle (1999) based on independent survey data collected in the Indonesia Family Life Survey (IFLS).

While overall levels of employment have held remarkably stable during the crisis, it would be premature to conclude that the labor market has not felt the upheavals that have reverberated through the economy and society. The drama of the crisis is reflected not in employment but in the collapse of real wages. Based on the 1997 and 1998 SAKERNAS, Smith, et al. (2000) estimate that real hourly (market sector) wages in Indonesia declined by about 40% during the first year of the crisis -- offsetting almost all the growth in real hourly earnings of the prior decade for men and half the growth for women.[1] By this metric, the Indonesian crisis is of the same order of magnitude as the collapse of Soviet Russia in the 1980s and the Great Depression in the 1930s in the United States and dominates many of the more recent crises in Latin America and Asia (Fallon and Lucas, 1999).

This study examines the immediate effects of the Indonesian crisis on labor market outcomes using two rounds of the IFLS, a longitudinal survey collected in 1997 and 1998. Attention is focussed on transitions in work and hourly earnings.

We begin by asking why the dire predictions of rampant unemployment were so off the mark. We show that the stability of employment aggregates mask considerable churning in the labor market. It is certainly true that many people lost jobs. But, what the predictions failed to consider was that there were also many people who got jobs. Exploiting the panel dimension of our data, we demonstrate that there was a good deal of movement *both* out of *and* into employment. We also show that there was substantial mobility between employment sectors among those who were working in both years. Mobility is particularly high for women.

On the face of it, it is difficult to draw inferences about the welfare consequences of this mobility. We turn, therefore, to income and present complementary evidence on changes in hourly earnings as the crisis unfolded. Special attention is paid to the distribution of these changes -- across gender, sector of residence and sector of work. The collapse in real wages documented in SAKERNAS is replicated in IFLS. In addition, unlike SAKERNAS, IFLS collects information on income from self employment. This turns out to be key. In rural areas, many of the self-employed

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[1]Similar estimates were reported by Frankenberg, Thomas and Beegle (1999) and by Papanek and Handoko (1999) based on data sources other than SAKERNAS.

are farmers; their real earnings declined very little on average making work in that sector considerably more attractive. This is especially true at the top of the earnings distribution.

For some, the effect of the crisis was devastating: those that left the labor market, those that lost their jobs and took on much lower paying jobs and those that stayed in the same job with much lower earnings. The poor -- particularly the urban poor -- were especially vulnerable. Other families benefitted from the flexibility of the labor market and exploited new opportunities -- particularly those who were in the self-employed sector in 1997 or switched into that sector when the crisis began. There is evidence that a large number of women joined family businesses (which includes working on the family farm) and that they made a major contribution to mitigating the impact of the crisis on family incomes. The results provide yet another nail in the coffin of the argument that "unpaid family workers" and income from self-employment should be ignored in labor force surveys.

2. Data

The Indonesia Family Life Survey is a large-scale integrated socio-economic and health survey that collects extensive information on the lives of respondents, their households, their families, and the communities in which they live. These data have several features that make them particularly appropriate for understanding how the lives of Indonesian have changed as a result of the economic and political events surrounding the crisis of the late nineties. We highlight these features briefly, then provide more detail about the study methodology below. For a fuller description of the survey, see Frankenberg and Thomas (2000).

First, the IFLS is a longitudinal survey. It is thus possible to compare labor market activities of individuals interviewed in late 1997 (IFLS2) with the activities of the *same* individuals one year later, in 1998 (IFLS2+). This is key for both understanding the nature of transitions that individuals have experienced during the crisis and for drawing inferences about who has been most deleteriously impacted by the crisis. Longitudinal surveys, however, have a potentially serious drawback: it is imperative that all respondents interviewed in one wave are re-interviewed in each follow-up. If they

are not, it is very difficult to determine how much of changes observed between the waves are due to changes in the underlying population and how much is explained by changes in the composition of the sample. This is particularly germane in the context of the upheavals in Indonesia in 1998.

The IFLS was extremely successful in re-interviewing respondents. Of the 1,934 households interviewed in 1997 that were in the target sample for IFLS2+, 98.5% were re-interviewed. Attrition bias is not likely to be an important concern for the analyses presented below. (See Thomas, Frankenberg and Smith, 1999, for a detailed discussion of attrition in IFLS.)

Second, as indicated in Figure 1, the timing of the surveys provides an opportunity to examine the immediate effects of the crisis. The first wave of IFLS was conducted in 1993 and interviewed 7,224 households in 13 provinces in Indonesia; it is representative of about 83% of the population. The second wave, IFLS2, was fielded four years later and interviews were completed with 94% of all the original households (excluding those in which all members are known to have died). Main fieldwork for the survey was conducted during the second half of 1997, just prior to the dramatic collapse of the rupiah in January 1998. IFLS2 was uniquely well-positioned to serve as a baseline for another interview with the same respondents, which would provide insights into the effects of Indonesia's economic crisis. Given the dearth of information on the crisis -- and the fact that virtually nothing is known in the scientific literature about the immediate effects of crises on behavior, we decided to return to the field a year later and field IFLS2+.

There was neither the time nor resources to mount a survey of the same magnitude as IFLS2 (which took more than two years to plan and test) and so a scaled down survey was administered which retained as much as possible from IFLS2. In IFLS2+, a 25% subsample of the IFLS enumeration areas (EAs) were selected and all households who had lived in those EAs in 1993, including split-offs followed in 1997, were included in the target sample. The EAs were chosen to be representative of the entire IFLS sample.[2]

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[2]The sample was drawn in two stages. To reduce costs, 7 of the 13 IFLS provinces were revisited: 2 on Sumatra (North and South Sumatra), 3 on Java (DKI Jakarta, West and Central Java), West Nusa Tenggara and South Kalimantan. These provinces span the full spectrum of socio-economic status and economic activity in the fuller IFLS sample. Second, within those provinces, we purposively drew 80 EAs with weighted probabilities to match

Third, the IFLS is rich in content. The depth of the IFLS is important because Indonesia's economic crisis has the potential to affect many different aspects of well-being and to provoke a variety of responses. (See Frankenberg, Thomas and Beegle, 1999, and Thomas, Frankenberg, Beegle and Teruel, 2000, for some examples.) With respect to this study, the IFLS instrument contains an extensive battery of questions regarding type of work, sector of work, hours of work, weeks worked and earnings from work. A key difference between IFLS and many labor force surveys, including SAKERNAS, is the fact that questions are asked not only about earnings in the market or formal sector which pays a wage or a salary but questions are also asked about the earnings of the self-employed (net of their costs). Notwithstanding the fact that considerable effort was put into training interviewers to probe and help respondents estimate their income, it is important to recognize that self-employment earnings are likely to be measured with substantial noise. Nonetheless, those data turn out to be key for measuring the impact of the crisis and also for assessing the distribution of that impact.

Fourth, IFLS2+ was designed specifically to be comparable with IFLS2. Both studies were conducted as part of a collaboration between RAND, UCLA and Lembaga Demografi (University of Indonesia). The instruments in the two waves are very similar; the fieldwork protocols are essentially the same and the IFLS2+ supervisors and interviewers were drawn from the pool that had conducted IFLS2.[3] While IFLS2 and IFLS2+ were conducted in the second half of 1997 and 1998, respectively, the IFLS2+ fieldwork was conducted over a shorter time period than IFLS2. Month-to-month variation in employment and earnings may contaminate our estimates. As we will show below, the magnitudes of the changes are such that this is not likely to be a serious concern.

In sum, in IFLS, the same respondents were interviewed twice, once just prior to the collapse of the rupiah in January 1998, and once during the crisis. By tracing the same respondent through

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the IFLS sample as closely as possible. The IFLS2+ sample achieves an efficiency of close to 80%.

[3]IFLS2 and IFLS2+ did differ in that retrospective information about labor market activities stretching back several years collected in 1997 was not repeated in 1998. After repeating the questions that were used in 1997 about current labor activities, in 1998, respondents were asked to provided detail about labor market transitions during the previous twelve months.

this period of dramatic economic and political change, it is possible to provide some evidence on the immediate impact of the crisis.

One potential drawback of IFLS2/2+ is its limited geographic coverage of Indonesia. While the IFLS2/2+ sub-sample is intended to be representative of the entire IFLS sample (which is, in turn, representative of most of the Indonesian population), it is possible that because interviews are conducted in only 7 of the 26 provinces, IFLS2/2+ misses important spatial variation in the impact of the crisis. This argument has particular salience in view of the geographic diversity of the archipelago and the complexity of the crisis. Before directly addressing the issue of the representativeness of results in IFLS2/2+, a brief overview of the crisis as it pertains to labor markets is presented in the next section in order provide context for the empirical results which follow.

3. Background

The crisis in South East Asia began in Thailand in the middle of 1997. After coming under pressure for several months, in early 1998, the Indonesian rupiah collapsed. Over the space of a few days in January, 1998, it fell from 4,000 per $US to 16,000. Although it subsequently recovered, it has remained very volatile. Whereas importers -- and consumers of imported goods -- were much worse off, exporters and export producers benefitted from the increase in the rupiah-denominated value of their output. The collapse of the rupiah was followed by very high inflation which was fuelled by a reduction in subsidies on rice, oil and fuel. BPS estimates that in 1998, the consumer price index (CPI) rose by around 80%; the price of rice rose by about 120%. This imposed a heavy burden on consumers: rice, which is the main staple, accounted for around 20% of the budget of the average Indonesian household in 1997, (Thomas Frankenberg, Beegle and Teruel, 2000). Net rice producers, in contrast, were relatively better off and it seems reasonable to suppose that rural landowners would have been protected from the worst effects of the crisis. That inference needs to be tempered since the drought associated with El Nino in 1997 seriously impacted parts of the Indonesian archipelago and agricultural output was affected, particularly in the eastern islands.

As the rupiah came under pressure, credit was tightened and interest rates rocketed with much of the banking sector being declared insolvent by the middle of 1998. The Indonesian government took control of a substantial fraction of the financial sector. Employment in that sector and in sectors that had borrowed heavily, such as construction, was severely curtailed. Employment in tourism also declined. As the relative price of food rose, so too did demand for labor in the agricultural sector (Smith et al, 2000).

Much has been written about the political upheavals and social unrest that has accompanied the economic crisis. That few have been left untouched by those events is an understatement.

With these sorts of facts in mind, some were quick to declare the crisis to have only affected the urban elites (Poppele, Sumarto and Pritchett, 1999). Given the multiple dimensions of the crisis, the fact that these dimensions are inter-related in complex ways, and that different sub-groups of the population likely responded to the crisis in different ways, it would seem that understanding the impact of the crisis would be feasible only with good empirical evidence. This paper seeks to provide some of that evidence, focussing attention on transitions in the labor market.

4. Evidence

Before undertaking those analyses, we describe the basic facts on employment changes between 1997 and 1998. This description is also used as a vehicle to assess the representativeness of IFLS2/2+ sample by contrasting it with SAKERNAS which interviewed a cross-section of over 120,000 respondents in August, 1997, and another cross-section in August, 1998.

Employment rates

Table 1 contrasts 1997 and 1998 employment rates of males and females age 20 through 75 in 1997. In this paper, employment is defined as working to produce either for sale or own consumption for at least one hour in the month prior to the survey. All employment rates are reported as fractions of the age-eligible population. Many people have more than one job: we focus on their main job -- the one that takes up most of the respondent's time. We exclude domestic work

done in one's own home and time spent raising one's own children. See Anker and Anker (1989) and Anker (1990) for good discussions of the issues surrounding the definition of work in surveys and Beneria (1999) and Mata Greenwood (1999) for recent reviews that pay particular attention to women's work.

Three sets of employment estimates are reported in Table 1. Panel A is based on SAKERNAS and includes all respondents in the survey; the estimates are representative of the entire country. Panel B is also based on SAKERNAS but is restricted to the seven IFLS2/2+ provinces. A comparison between panels A and B tells us whether changes in employment in Indonesia are different in the IFLS2/2+ provinces. The third set of estimates are based on IFLS panel respondents who were interviewed in both 1997 and 1998.

We begin with men, in columns 1 and 2. The first row in each panel is the percentage of adults who were working (with or without pay) during the week prior to the survey. Slightly under 90% of males were working in 1997; about 1 to 1.5% fewer were working in 1998. The percentage of adults working in what we will refer to as the "market" sector is in the second row. These are employees who earn a wage or salary; they are often called "formal" sector workers and span both the private and public sectors. About one-third of men work in this sector -- and there was about a 10% reduction in labor demand for these workers between 1997 and 1998. The third panel presents estimates for the "self-employed" -- those who work for themselves or hire others to work for them. About half the male adult population works in this sector -- and that fraction increased between 1997 and 1998. The final panel records the percentage of males who work in a family-owned business and are not paid a wage for their work. They account for a small proportion of 20 to 75 year old males.

The overwhelming impression emerging from the table is that male employment rates, overall and within sectors, remained remarkably stable in Indonesia as the crisis unfolded. Comparing Panels A and B, we see that the differences between estimates for the whole country and those for the IFLS2/2+ provinces are extremely small; this is true if we focus on levels of employment or changes between 1997 and 1998. We conclude that restricting attention to only the IFLS2/2+

provinces will likely adequately reflect broader changes that have occurred throughout Indonesia. The differences between estimates based on SAKERNAS and IFLS are also small -- at least in the context of the IFLS sample sizes. (The differences are all within a 95% confidence interval.)

Turning to women, in columns 3 and 4, the picture that emerges is slightly different. About one-half of women were working in 1997 and, in contrast with men, that fraction *increased* as the crisis unfolded. The increase was concentrated among women entering self-employment and unpaid family work. Whereas the latter account for only about 5% of the male workforce, unpaid family workers are an important component of the female workforce accounting for about one-third of female workers.

As is the case for men, the differences in the estimates between the entire country (Panel A) and the IFLS2/2+ provinces (Panel B) are very small. However, there is an important difference between the SAKERNAS and IFLS estimates (Panel C). Specifically, the estimated increase in female employment between 1997 and 1998 is much larger in IFLS. Although IFLS estimates higher rates of participation in all three employment sectors, the majority of the increase is due to a rise in unpaid family work between 1997 and 1998. SAKERNAS estimates a much smaller increase in this sector.

What explains this discrepancy? SAKERNAS and IFLS share the same conceptual definition of unpaid family work but take a different approach to measurement. Both surveys begin with the same lead-in question on whether, during the week prior to the survey, the respondent was working. In SAKERNAS, those who answer 'yes' are then asked the type of work they do, where family work is one option. The same screener question is asked in IFLS and those who answer 'yes' are asked about the type of work. The difference between SAKERNAS and IFLS lies in the treatment of those who answer 'no' to the screener question. In SAKERNAS, they are not asked any more questions about work. In IFLS, these respondents are asked a set of follow-up questions about whether they were on leave from work, whether they had worked for one hour for pay and, if they answer no to all these questions, they are explicitly asked whether they had worked in a family-owned business.

Those who answered 'yes' to either the lead-in or to any of the follow-up questions are treated as working and they complete the employment module.

In principle, this additional probing in IFLS should elicit no more unpaid family workers than are reported in SAKERNAS. Korns (1996) compares the estimates of unpaid family work in each wave of SAKERNAS collected during the late 1980s and early 1990s. He reports large year-to-year fluctuations that are difficult to explain based on auxiliary knowledge of the labor market. He attributes the fluctuations mainly to measurement error that is associated with differences in interviewer training and supervision. Well–trained interviewers, he argues, will alert respondents to the fact that work includes unpaid work in the family business or on the family farm.

If the increase in family work reported in IFLS is because of the additional probing in that survey, the follow-up question about family work should have captured more positive responses in IFLS2+ relative to IFLS2. It did. In IFLS2, 1.8% of female respondents who answer the question said they worked in a family business; in IFLS2+, 4.1% of women answered affirmatively. This suggests that many of the women who entered the family business in 1998 would not ordinarily consider this activity as work in some traditional sense. We are inclined, therefore, to give more credence to the IFLS estimates of changes in employment rates of women. (See Mata Greenwood, 1999, for a more general discussion.)

In sum, as the Indonesian crisis unfolded, the fraction of adult males who were working remained remarkably stable, there was a slight increase in the faction of females working in the market and self-employed sectors and, according to IFLS, there was a more substantial increase in the fraction of women who were unpaid family workers. The picture that emerges is one of tremendous stability in overall employment rates. If we assume that there was not a large increase in the pool of people who were seeking work between 1997 and 1998, we would conclude that the dire predictions of a massive increase in unemployment were simply wrong.

Why were those predictions so far off base? It is possible that the stability of employment rates in 1997 and 1998 masks a good deal of change within the labor market. To fully examine that

issue, we need longitudinal data that follows respondents as they move in or out of the labor force and across sectors. We focus, therefore, on IFLS.

Employment transitions

Table 2 presents employment transition matrices, which exploit the longitudinal dimension of IFLS. As can be seen from Panel A.1, 82% of males were working in both 1997 and 1998 and 6% were not working in either year. Over 6% exited the labor force and 5% entered. There is, apparently, a good deal of mobility in the labor market. Among women, the mobility is even greater: over one-quarter of the women working in 1998 were not working in 1997.

In an effort to determine whether the extent of turnover in the labor market varies across sub-populations, Panel B of the table differentiates place of residence (in 1997) and level of education of the respondents. Among urban males, the better educated were slightly more likely to enter the labor market between 1997 and 1998 relative to exiting suggesting there was a slight upgrade in the level of education of the male workforce. In rural areas, there was a net decline in the fraction of males working and the exit rate was much higher for those with no education -- one in seven left the labor force. The entry rate for the two education groups was very similar and so, as with urban males, the education of the rural male work force increased between 1997 and 1998.

Labor market transition rates among rural women are even higher than for men. About one of every four women with no education who were working in 1997 left the labor force and an equal fraction entered the labor force in 1998. Among the better educated, the entry rate is about twice the exit rate and so, in 1998, one out of three working women were not working the year before. Again, there was an upgrade in the skill level of the workforce. The only exception to this pattern is among urban women, where the exit rate is about one-third the entry rate and women with no education are slightly more likely to have joined the labor force.

Taking the results for men and women together, it is clear that the stability of aggregate employment rates does mask considerable churning within the labor market between 1997 and 1998. Moreover, the nature of that churning differs substantially in the rural and urban sectors and the experience of males and females is quite different. Without knowledge about the amount of

churning that normally takes place in the Indonesian labor market, it is difficult to draw welfare inferences based on these transition rates. However, to the extent that exits from the labor market between 1997 and 1998 were not voluntary, it would appear that the rural poor bore a bigger share of the burden of the crisis.

Before taking up that issue, we delve a little more deeply into the labor market transitions. In addition to entry and exit into the labor force, workers may change the sector in which they work. Given the discussion of the nature of the crisis above, it seems plausible to suppose that workers will have shifted into those sectors that benefitted from the increase in the relative price of exports and food. Table 3 presents the sectoral distribution of the labor market transitions. In addition to self-employment and unpaid family labor, wage and salary workers are stratified into those in the private sector and those in the public or government sector.

Over 3 out of every 10 males and close to 4 out of every 10 females switched sectors between 1997 and 1998. Conditional on working in both years, the inter-sectoral mobility rate is about 25% for both males and females. Job mobility is, of course, even higher.

Easily the most stable sector is government. Over 80% of men and women who were working in the public sector in 1997, continued to work in that sector in 1998. The private market sector is quite different. Only about two-thirds of those in that sector in 1997 were still there in 1998. Three-quarters remained in self-employment.

About half the males who exited the private sector entered self-employment and vice-versa. Among men, there seems to be a good deal of movement between these sectors. About one-quarter of the switchers from both sectors exited the labor market while new entrants entered the private market and self-employment sectors at roughly the same rate.

Among women, it is self-employment and unpaid family work that contributed the majority of exiters and also absorbed the vast majority of new entrants. Among those women who work in both years, transitions between these two sectors are far more common than between any other pairs suggesting considerable fluidity between them.

In fact, in many respects, the distinction between self-employment and unpaid family labor is artificial. It is convenient in a survey to designate a single individual in a household as the recipient of income from a family business in order to avoid double counting that income. From a conceptual perspective, however, it is not clear that the distinction among workers within a family has any substantive content, except, perhaps, when children are "apprenticed" to one or both of their parents. To this point, we have maintained the distinction between self-employment and unpaid family work because of the difficulties associated with measurement of the latter highlighted above.

There is a good deal of mobility in the labor market in Indonesia. Did it increase at the time of the crisis? The first wave of IFLS was conducted in 1993 and so the hiatus between it and the second wave is four years. It is, therefore, not possible to compare transition rates between 1997 and 1998 with transition rates the year before with those data. (Obviously job mobility between four years is not informative about year-to-year mobility.) However, we can draw on two other sources of evidence. First, in 1997, respondents were asked about their work status one, two and three years before the interview. The rates of entry and exit into the labor force between 1995 and 1996 and also between 1996 and 1997 are about one-quarter to one-third the rates recorded between 1997 and 1998. While it is certainly the case that transitions rates based on recall data are likely to under-estimate mobility, (Sudman, Bradburn and Schwarz, 1996), it seems unlikely that the bias will be a factor of three or four. Second, qualitative work conducted early in the crisis, our own experience during the fieldwork and the local press all suggested that labor market mobility had increased at the time. The dire predictions of massive unemployment were presumably influenced by this sense of high rates of turnover.

It is rather more difficult to draw conclusions about the welfare consequences of these labor market transitions, at least among those who remained in the labor market during the turmoil of the late 1990s. There is, however, likely to be a closer tie between changes in income and changes in welfare. We turn, therefore, to an examination of the link between sectoral choice and labor market hourly earnings, focussing our attention on those people who were in the labor force in both years.

Hourly earnings

Table 4 provides the basic facts: median real hourly earnings of males and females collapsed by between 30 to 40% in the first year of the crisis. This decline is nothing short of stunning. Given the evidence on aggregate employment rates described above, one might conclude that the attention given to unemployment and calls for job creation through public works at the start of the crisis would seem to be misplaced. The drama of the crisis lies not in employment but in earnings.[4]

The upper panel of Table 4 is based on earnings of all people who work in either 1997 or 1998; the lower panel restricts attention to those who worked in both years. The differences between the estimates are small. We thus focus on the latter group as we explore the inter-sectoral distribution of the earnings declines in order to understand the nature of the employment transitions experienced by the Indonesian workforce.

To lay the groundwork, Table 5 provides estimates of the percentage difference in hourly earnings of workers in the government sector, self-employed sector and private market. In line with the discussion above, unpaid family workers are treated as self-employed. Earnings from a family business is divided by the sum of the hours worked by all family members in that business to compute implied hourly earnings which is then attributed to all members. *Faut de mieux,* it is assumed that an hour of work by each family member is of equal value in the business.

We have estimated a series of regressions of (log) hourly earnings on sector of employment, controlling age, education and province of residence. Models have been estimated separately for males and females living in urban and rural areas. Table 5 presents estimates of the premium (in percentage terms) associated with working in the government sector relative to the private market sector (in the first row of each panel) and the premium associated with being self-employed relative to a private market employee. These adjusted hourly earnings gaps are presented for workers in 1997 (in column 1), in 1998 (in column 2) and the change between the two years, estimated at the

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[4]See Gunawan (1999) for a description of the public works program and Suryahadi, Suharso and Sumarto (1999) for an evaluation of the program. They conclude the program has neither expanded much nor is it particularly well targeted.

mean (in column 3). This is a measure of the "shock" to hourly earnings for workers in each sector, relative to private employees. Because that shock may not be uniformly distributed, the last three columns report estimates of the (adjusted) change in the premium at the 25th, 75th and 90th percentiles of the hourly earnings distribution based on quantile regressions.

For example, in 1997, holding age, education and location of residence constant, urban males working in the Government sector earned 13% more than those who were private employees (row 1, column 1); by 1998, that premium had increased to 31% (row 1, column 2) -- a rise of 18% (row 1, column 3). Government workers at the top of the earnings distribution saw a slightly bigger increase in the gap (48%, column 6), and those towards the bottom of the earnings distribution saw a smaller increase (25%, column 4) although none of these differences is significant. We conclude that, among urban males, Government work was not only more secure but, by 1998, had become better remunerated than working in the private sector and that these benefits were enjoyed across the spectrum of jobs.

On average, rural males in the Government enjoyed a substantially higher premium in 1997 which persisted into 1998. At the mean, the change between 1997 and 1998 was rather muted. Among Government executives, however, the gap between Government work and private sector worked increased substantially -- by over 60% (which is estimated very imprecisely and is not significant).

The public-private sector wage gap is considerably larger for females and it also rose between 1997 and 1998 although, like males, the change in the premium is not significant. A Government job not only carried security but also considerably higher earnings in 1998: for example, holding age, education and location constant, women in Government jobs earned about twice their private sector counterparts.

The impact of the crisis on the private-public wage gap is small in contrast with changes in self-employment earnings. In 1997, urban males in self-employment earned, on average, the same as a private sector employee. By 1998, however, self-employment carried with it a 24% premium. The benefits, however, accrued entirely to those at the top of the earnings distribution as indicated

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by the fact that at the 25th and 75th percentiles, employees and the self-employed took an equal hit in terms of hourly earnings.

In 1997, self-employment was a decidedly unattractive option for males in the rural sector: it carried a 60% discount relative to being an employee. However, in 1998, that discount was entirely wiped out. While the increase in the relative attractiveness of self-employment is concentrated at the top of the earnings distribution, the benefits trickled down much further in the rural sector than among urban males.

It may be that the discount associated with self-employment in the rural sector in 1997 is a reflection of the drought and that earnings simply bounced back to their equilibrium in 1998. While this likely explains some of the difference, there are two reasons why we think that is not likely to be the entire story. First, we would expect to see the same pattern among rural female workers. We do not. In fact, in 1997, earnings of self-employed females and those who were private employees were identical. In 1998, like their male counterparts, earnings of female employees declined by about 50% more than those of the self-employed. Second, as noted above, the drought did not affect the entire Indonesian archipelago equally: those areas that were more seriously affected by the drought did not enjoy a larger increase in the self-employment premium.

Finally, urban females in self-employment earned more than private employees in 1997, the premium increased at the beginning of the crisis and, as with urban males, it was those at the top of the earnings distribution for whom self-employment became relatively more attractive.

Much of the limited evidence that exists on the effect of the crisis on incomes of Indonesians is based on only market sector wages (see, for example, ILO, 1998; Feridhanusetyawan, 1999; Papanek and Handoko, 1999). Not only does that evidence overstate the magnitude of the crisis -- since earnings in the market sector declined considerably more than among the self-employed. (See also, Skoufias and Surayahadi, 1999, which examines the evolution of inequality using only wage incomes; those inferences are likely to be especially misleading.) Studies based only on wage incomes also miss an important dimension of the likely response to the crisis: since self-employment became relatively more attractive during the crisis, particularly among the higher earners, we would

expect people to have moved into that sector. This suggests a considerably more nuanced interpretation of the inter-sectoral mobility documented above. Specifically, the relatively skilled who moved out of the market into the self-employed sector were apparently able to mitigate the deleterious impact of the crisis on their earnings.

This idea is explored in detail in Table 6 which focusses on labor market transitions among respondents who were working in 1997 and 1998. Estimates of the percentage change in hourly earnings are reported for males and females who stayed in the same sector and for those who switched sectors. The first column in each panel reports the change for the average respondent; the remaining three columns report the change at the 25th, 75th and 90th percentile which we interpret as reflecting heterogeneity in the effect of the crisis across the distribution of skills.[5] Those transitions that were very infrequent are not included in the table.

The average urban male saw a large cut in his real hourly earnings -- no matter what he did. However, at the bottom of the distribution, those who stayed in the government sector saw an increase in their real wage. All other urban males with limited skills took a very deep cut -- over 80% among those who stayed in the private sector. Apparently the insurance associated with a government job is especially valuable among the poorest. At the top of the skill distribution, wages increased by about 30% among those who stayed in the private sector and by around 60-70% among those who were either in the self-employed sector or moved into that sector in 1998. Switchers from self-employment to the private sector fared much worse.

In the rural sector, the hourly earnings of the low skilled male workers who stayed in the private sector were devastated: at the bottom quartile, wages declined by over 160%. By contrast, among those who moved into or stayed in the self-employment sector, real hourly earnings rose by about 50% at the bottom quartile, doubled at the top quartile and increased by more than 150% at the top decile. As with urban males, government jobs provided considerable income protection,

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[5]Our working assumption is that workers at the top of the hourly earnings distribution will tend to be more skilled than workers at the bottom of the distribution.

particularly among the least skilled. Switching out of the private sector also construed benefits in terms of hourly earnings.

The evidence for females is remarkably similar although the effects are estimated with less precision. Those that were self-employed in 1997 and those that switched into self-employment were protected from the crisis relative to those that worked as private employees.

In our calculations, income from self-employment includes the return on assets such as land for farmers and equipment for businesses. Part of the apparent protection associated with working in self-employment may reflect an increase in the returns to these assets. Part of the protection may also reflect an increase in the return to entrepreneurship in which case one might expect it is the more entrepreneurial who have switched into self-employment during this time of uncertainty resulting in a re-sorting of skills across sectors of the economy. It is not possible to distinguish these mechanisms in the IFLS.

In complementary analyses, Smith et al (2000) examine the effects of the crisis on family income. They show that the deleterious impact of the crisis was felt much more heavily among families at the bottom of the income distribution. For example, families whose incomes placed them at the top quartile of the distribution in 1997 saw a 20% cut in their real incomes, independent of whether they lived in rural or urban areas. To be sure, this reduction is very large. However, those at the bottom quartile fared even worse: rural families had their real incomes cut by 30% and urban dwellers suffered a 60% decline in real family income in one year.

What were the sources of protection? We have shown that among higher income workers, income from self-employment was relatively resilient. This is particularly clear among rural households and likely reflects the fact that the relative price of food rose during the crisis, that many of the net food producers are self-employed and landowners tend to be among the better off in the rural sector. Among the rural poor, Smith et al conclude that protection came from the contribution of "unpaid family workers". They draw the same conclusion in the urban sector except that it is relatively well-educated urban women who entered the labor market to work in the family business and so the incomes of those families were protected more than the incomes of the urban poor.

5. Conclusions

Predictions that the Indonesian crisis would be accompanied by massive unemployment were simply wrong. The drama of the crisis is not reflected in unemployment but rather in the devastation it has wreaked on earnings. On average, real hourly earnings declined by over 40% between 1997 and 1998.

There has been considerable change in the structure of employment in Indonesia as evidenced by the high rates of turnover. Many males left the labor force and about the same number entered the labor force; many female workers exited the labor force but even more entered, and most of the new entrants worked in their own or the family business. There was also a good deal of shifting among sectors of employment. Some of that turnover reflects shifts in the relative attractiveness of different sectors. Specifically, there was a substantial tilt in favor of self-employment, particularly among those at the top of the income distribution. The picture that emerges is one of a remarkably flexible labor market, tremendous resilience of families in the face of a devastating crisis and of women playing a key role in supporting family income that would otherwise be drastically diminished because of huge cuts in real hourly earnings.

At a more general level, these results provide another compelling counter-example to two perennial arguments about the collection of data on labor market activities. First, collecting information on income from self-employment, including family enterprises, is not straightforward. However, ignoring income from self-employment would lead to seriously misleading inferences about the magnitude of the economic crisis in Indonesia, the distribution of the effects and the nature of individual and family responses to the crisis. Second, a key mechanism whereby families have mitigated the impact of the crisis on household income has been through an increase in the time allocated to the family business. It is women who have born the brunt of this re-allocation of time. Failure to collect information on so-called "unpaid family workers" would completely miss this important fact.

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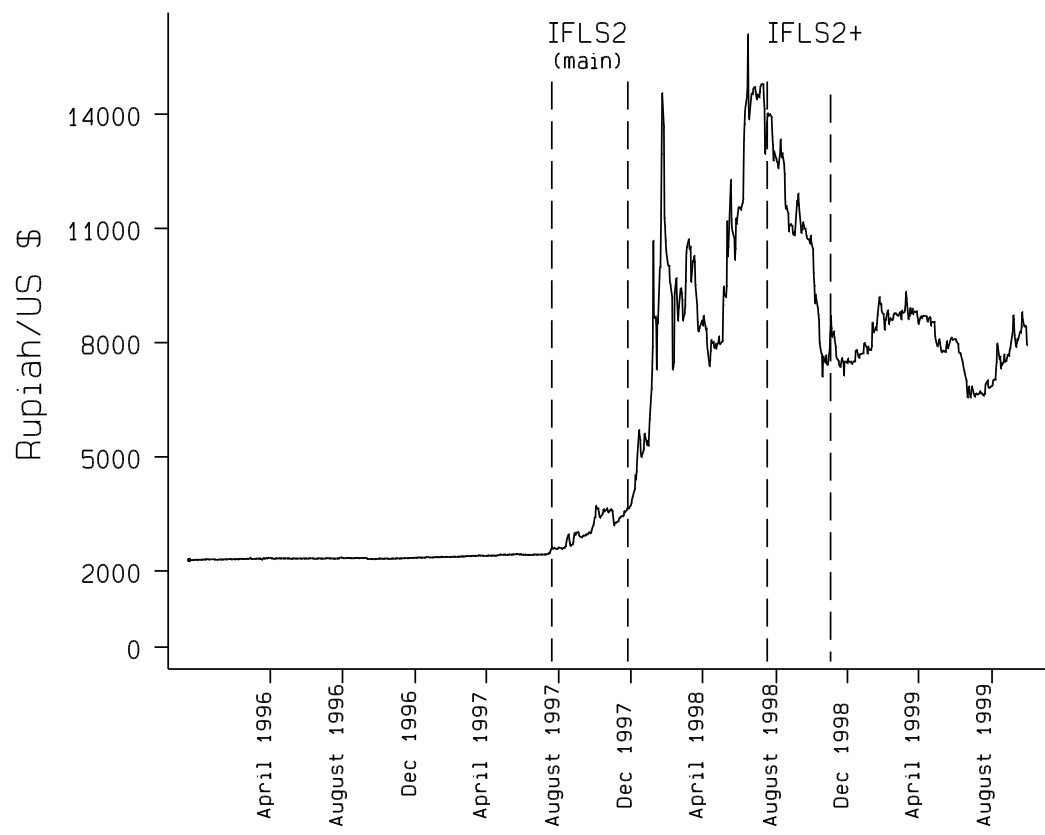Figure 1: Timing of IFLS and Indonesian exchange rate

Table 1: Employment rates and sectoral distribution of workers
Comparison of SAKERNAS and IFLS estimates
Males and females age 20-75 years

	MALES		FEMALES	
	1997	1998	1997	1998
	(1)	(2)	(3)	(4)
A. Sample: ALL COUNTRY				
Data source: SAKERNAS				
Worked				
1. in week prior to survey	88.9	87.9	51.2	52.7
2. in market sector	35.5	32.2	14.2	14.1
3. in self-employment	49.0	50.8	19.2	19.8
4. unpaid in family business	4.4	4.8	17.9	18.8
Sample size	76,023	57,051	79,803	59,628
B. Sample: IFLS2/2+ PROVINCES				
Data source: SAKERNAS				
Worked				
1. in week prior to survey	88.0	86.3	48.6	50.1
2. in market sector	38.7	35.0	15.3	15.5
3. in self-employment	46.0	47.6	18.2	18.8
4. unpaid in family business	3.3	3.7	15.1	15.9
Sample size	31,817	24,023	33,321	25,071
C. Sample: IFLS2/2+ PROVINCES				
Data source: IFLS				
Worked				
1. in week prior to survey	88.3	87.1	52.2	58.8
2. in market sector	40.7	39.4	15.4	16.7
3. in self-employment	43.7	43.7	23.7	24.4
4. unpaid in family business	4.0	4.0	13.1	17.7
Sample size	1,913	1,913	2,228	2,228

Notes: SAKERNAS (*Survei Amgkatan Kerja Nasional*) is annual national labor force survey conducted by Government of Indonesia. IFLS (Indonesia Family Life Survey) is an on-going longitudinal survey that was started in 1993 in 13 provinces of Indonesia. It is representative of 83% of the population of Indonesia at that time. IFLS2 was conducted in 1997. IFLS2+ was conducted in 1998 on a sub-sample of the IFLS respondents; 7 provinces are covered in the survey.

Table 2: Employment transitions
By gender, residence, and level of education

A.1 MALES

1998:	Not Working	Working
1997:		
Not working	6.3	5.4
Working	6.6	81.8

A.2 FEMALES

1998:	Not Working	Working
1997:		
Not working	31.1	16.7
Working	10.1	42.1

B. RESIDENCE:

| | *Urban* | | *Rural* | |

B.1 MALES

1998:	Not Working	Working	Not working	Working
EDUCATION				
No education				
1997:				
Not working	5.7	7.6	5.0	4.3
Working	7.6	79.3	12.1	78.6
Some education				
1997:				
Not working	9.9	7.2	3.4	3.9
Working	6.2	76.6	6.0	86.7

B.2 FEMALES

1998:	Not Working	Working	Not working	Working
EDUCATION				
No education				
1997:				
Not working	37.1	16.0	21.7	17.1
Working	5.7	41.1	16.6	44.6
Some education				
1997:				
Not working	42.1	12.4	24.1	20.6
Working	6.4	39.1	11.5	43.8

Source: IFLS2/2+

Table 3: Employment transitions by gender and sector of work

Males

1998:	Not Working	Private market	Govern- ment	Self- Employed	Unpaid family Labor	Σ
1997:						
Not working	6.3	2.3	0.1	2.1	0.8	11.7
Private market	2.6	21.6	0.9	6.3	1.1	32.5
Government	0.4	1.2	6.4	0.3	0.0	8.2
Self employed	3.1	6.0	0.2	33.5	0.8	43.7
Unpaid family labor	0.5	0.7	0.1	1.5	1.3	4.0
Σ	12.9	31.7	7.7	43.7	4.0	100.0

Females

1998:	Not Working	Private market	Govern- ment	Self- Employed	Unpaid family Labor	Σ
1997:						
Not working	31.1	3.9	0.0	6.3	6.5	47.8
Private market	2.3	7.7	0.4	1.3	1.3	12.9
Government	0.1	0.2	2.2	0.0	0.0	2.5
Self employed	3.9	1.4	0.0	14.9	3.6	23.7
Unpaid family labor	3.8	0.9	0.0	2.0	6.4	13.1
Σ	41.2	14.1	2.6	24.4	17.7	100.0

Source: IFLS2/2+

Table 4: Median hourly earnings
1997, 1998 and change

	1997	1998	Change	%Change
Workers in either 1997 or 1998				
Males	923	608	-315	-39
	[25]	[21]	[33]	[4]
Females	480	344	-136	-31
	[18]	[14]	[22]	[7]
Workers in both 1997 and 1998				
Males	923	593	-330	-40
	[35]	[24]	[36]	[4]
Females	476	326	-150	-34
	[19]	[17]	[25]	[7]

Notes: Source: IFLS2/2+. Hourly earnings measured in rupiah. Deflated by Government of Indonesia province-specific consumer price index. Standard errors in parentheses.

Table 5: Regression estimates of changes in inter-sectoral gaps in log(hourly earnings)

	Gap in 1997 (1)	Gap in 1998 (2)	Change at Mean (3)	Change at 25%ile (4)	Change at 75%ile (5)	Change at 90%ile (6)
Urban males						
Government	0.125 [0.111]	0.306 [0.097]	0.181 [0.148]	0.251 [0.189]	0.352 [0.206]	0.482 [0.364]
Self-employed	0.017 [0.108]	0.237 [0.115]	0.220 [0.157]	0.026 [0.222]	0.070 [0.219]	0.728 [0.321]
R^2	0.168	0.224	0.244	0.170	0.162	0.176
F	7.36	12.24	13.60			
Rural males						
Government	0.364 [0.156]	0.423 [0.143]	0.059 [0.212]	-0.093 [0.267]	0.314 [0.319]	0.612 [0.481]
Self-employed	-0.570 [0.127]	0.046 [0.095]	0.615 [0.159]	0.295 [0.229]	0.896 [0.256]	1.508 [0.337]
R^2	0.185	0.159	0.197	0.136	0.122	0.145
F	12.36	10.90	12.53			
Urban females						
Government	0.592 [0.183]	0.925 [0.201]	0.332 [0.272]	0.321 [0.327]	0.369 [0.355]	0.161 [0.544]
Self-employed	0.297 [0.152]	0.583 [0.164]	0.286 [0.224]	0.112 [0.261]	0.319 [0.330]	0.776 [0.434]
R^2	0.316	0.267	0.316	0.246	0.236	0.219
F	18.27	11.11	18.14			
Rural females						
Government	1.022 [0.349]	1.488 [0.671]	0.466 [0.757]	0.558 [1.299]	0.526 [1.008]	0.320 [0.875]
Self-employed	0.004 [0.182]	0.457 [0.178]	0.453 [0.255]	0.595 [0.332]	0.431 [0.358]	1.269 [0.554]
R^2	0.176	0.238	0.221	0.143	0.161	0.175
F	9.86	44.33	26.96			

Notes: Source: IFLS2/2+. Coefficient estimates are %age hourly earnings differentials relative to working in private market sector. Self-employed includes unpaid family workers. Change in gap=gap in 1998-gap in 1997. Mean change estimated by OLS; changes at percentiles estimated by quantile regressions. Standard errors in brackets based on jackknife (for OLS) and bootstrap with 500 replications (for quantile regressions).

Table 6: Regression estimates of changes in log(real hourly earnings) and inter-sectoral transitions

	URBAN				RURAL			
	MEAN (1)	25%ile (2)	75%ile (3)	90%ile (4)	MEAN (5)	25%ile (6)	75%ile (7)	90%ile (8)
MALES								
Stay in private market	-0.580 [0.060]	-0.839 [0.054]	-0.077 [0.053]	0.300 [0.080]	-0.842 [0.113]	-1.646 [0.262]	-0.107 [0.110]	0.310 [0.235]
Stay in self-employment	-0.443 [0.105]	-0.235 [0.169]	0.360 [0.165]	0.710 [0.208]	-0.095 [0.097]	0.464 [0.300]	1.016 [0.176]	1.587 [0.358]
Stay in government	-0.372 [0.081]	0.205 [0.089]	-0.024 [0.105]	-0.009 [0.175]	-0.528 [0.104]	0.982 [0.279]	-0.056 [0.137]	-0.183 [0.267]
Private market to self-emp	-0.572 [0.267]	-0.664 [0.478]	0.504 [0.287]	0.639 [0.349]	-0.472 [0.279]	-0.125 [0.544]	0.764 [0.383]	1.985 [0.700]
Self-emp to private market	-0.700 [0.207]	-0.495 [0.221]	-0.231 [0.291]	-0.079 [0.738]	-0.396 [0.194]	0.472 [0.366]	0.972 [0.385]	0.979 [0.291]
Private market to govt	-0.458 [0.147]	0.187 [0.255]	-0.131 [0.206]	-0.020 [0.254]	-0.079 [0.625]	1.079 [0.657]	-0.195 [1.275]	1.972 [1.296]
Govt to private market	-0.688 [0.290]	-1.073 [0.618]	0.242 [0.406]	0.628 [0.416]	-0.494 [0.094]	0.953 [0.297]	-0.167 [0.189]	-0.494 [0.262]
Aggregate % change	-0.543	-0.930	-0.008	0.594	-0.504	-1.256	0.311	1.149
R^2	0.215	0.040	0.029	0.079	0.118	0.034	0.089	0.097
FEMALES								
Stay in private market	-0.650 [0.080]	-0.889 [0.150]	-0.178 [0.053]	0.081 [0.088]	-0.615 [0.190]	-1.009 [0.312]	0.073 [0.163]	0.478 [0.386]
Stay in self-employment	-0.314 [0.154]	-0.301 [0.239]	0.944 [0.319]	1.782 [0.256]	-0.213 [0.099]	0.037 [0.366]	0.565 [0.196]	0.986 [0.502]
Stay in government	-0.403 [0.124]	0.229 [0.223]	0.099 [0.158]	0.165 [0.389]	-0.429 [0.139]	0.383 [0.351]	-0.222 [0.262]	-0.265 [0.444]
Private market to self-emp	-0.504 [0.315]	-0.174 [0.356]	0.151 [0.438]	1.139 [1.031]	-0.628 [0.684]	-1.007 [1.482]	0.290 [0.730]	1.900 [1.044]
Self-emp to private market	-0.656 [0.373]	-0.354 [0.595]	0.560 [0.595]	0.719 [0.667]	-1.218 [0.446]	-1.164 [0.616]	-0.006 [0.738]	0.718 [0.675]
Aggregate % change	-0.478	-1.016	0.083	1.153	-0.397	-1.061	0.548	1.474
R^2	0.125	0.015	0.053	0.170	0.083	0.037	0.033	0.046

Notes: Source: IFLS2/2+. Change = log(real hourly earnings) in 1998-log(real hourly earnings) in 1997 for same respondent. Coefficients are interpreted as % changes. Changes at mean estimated by OLS; changes at percentiles estimated by quantile regressions. Standard errors in brackets estimated by jackknife (for mean) and bootstrap with 500 replications (for percentiles). Aggregate % change is change for all respondents in each gender and sector of residence sub-group calculated at mean and percentiles of distribution.