The Impact of the Indonesian Economic Crisis on Income Distribution: A Social Accounting Matrix Application

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July 1998

Keywords: Asia, Indonesia, Social Accounting Matrix, poverty

*I am grateful to Iwan Azis and Erik Thorbecke for many valuable discussions. I also thank Moez Doraid, Isabelle Grunberg-Filatov, Inge Kaul, Carrie Meyer, Andreas Steuxner, and seminar participants at the World Bank for helpful comments. Finally I am indebted to the Office of Development Studies at the United Nations Development Programme for financial support. Any errors are my own responsibility.

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Abstract

This paper examines the distributional effects of the Indonesian economic crisis. To do so it uses data from the Indonesian Central Bureau of Statistics to determine the sectors that are most affected. These are construction, finance, and trade. It then employs a Social Accounting Matrix to examine how downturns in these sectors affect the incomes of factors and households. The results indicate that rural construction workers and urban self-employed workers in the trade sector are among the groups harmed the most. Since poverty is already widespread among these workers, large reductions in their incomes will greatly multiply poverty in Indonesia.

1. INTRODUCTION

Before the currency crisis hit Indonesia its economy was regarded as one of the healthiest in Asia. The agricultural sector had achieved near self-sufficiency in rice production. Growth of real gross domestic product between 1970 and 1996 averaged almost 7% per year. The inflation rate between 1975 and 1996 averaged below 10%. The manufacturing sector between 1985 and 1996 expanded at a rate of 10% per year.[1] Exports of labor-intensive goods were booming. At the start of 1997, the Indonesian economy appeared rock solid.

Indonesia's economic success was accompanied by progress in poverty eradication and human development. The fraction of the population living below the poverty line dropped from 60% in 1970 to 11% in 1996. Adult illiteracy over this period declined by two-thirds to 16.8%. Infant mortality during these 26 years fell from 145 per 1,000 live births to 53 per 1,000. Life expectancy similarly rose from 46 years to 63.5 years. Thus, by several measures, the welfare of Indonesian citizens was steadily increasing.[2]

These economic and social gains are being threatened by the crisis that hit Indonesia in the summer of 1997. The trouble began as a speculative attack on the Indonesian rupiah. It quickly spread to the banking sector and from there to the real economy. The economic difficulties triggered rioting in May 1998, bringing economic activity to a standstill for several days. The Indonesian Central Bureau of Statistics forecasts that these and other factors will cause GDP in 1998 to fall by 13% and the price level to rise by 80%.

This paper investigates the distributional effects of the Indonesian economic crisis. To do so it first uses data from the Central Bureau of Statistics to determine the sectors that are harmed the most. These sectors include construction, finance, and trade. It then uses a Social Accounting Matrix to investigate the effects of downturns in these sectors on factorial and

household income distribution. The results indicate that the workers experiencing the largest drops in income include rural construction workers and urban self-employed workers in the trade sector. Since poverty is already widespread among these groups (see Gupta *et al.*, 1998), large reductions in these workers' incomes will multiply the amount of poverty in Indonesia.

The next Section discusses the advent of the economic crisis. Section 3 uses a Social Accounting Matrix approach to investigate the distributional effects of the crisis. Section 4 concludes.

2. THE ECONOMIC CRISIS IN INDONESIA

Prior to the currency crisis in 1997, several economists had predicted that economic growth in East Asia would decelerate. According to Yellen (1998), countries in this region had achieved the greatest record of economic growth in history over the past thirty years.[3] Young (1995), however, found that the high growth rates were the result, not of higher total factor productivity but of increased inputs of capital and labor. Krugman (1994) argued that as the capital-labor ratio in East Asia increased, diminishing returns would set in and growth rates would fall. Frankel (1998) similarly argued that as the Asian tiger economies emulated the production technologies and management practices of wealthier countries, their living standards would converge to these higher levels and their growth rates would fall.

While some economists predicted a slowdown in growth, none foresaw a crisis as virulent as actually occurred. Economists using hindsight have identified banking problems as a primary cause of the downturn. As Krugman (1998) discusses, banks in countries like Indonesia were often owned by family members or close friends of government leaders. These banks (and the

banking system) did not face the same requirements for transparency, capital adequacy, and prudential behavior that western banks face.[4] Krugman argues that this lack of oversight allowed banks to lend lots of money to highly speculative real estate ventures and overambitious corporate projects. Greenspan (1998) notes that many Asian banks also had a mismatch between liabilities and assets. Most of their liabilities were short-term (and often denominated in dollars) and most of their assets were long-term (and denominated in local currencies such as rupiahs). As discussed below, banks plagued by bad real estate loans and a mismatch of assets and liabilities played a key role in propagating the economic crisis.

The initial shock that started the crisis may have been a decrease in export demand. Thailand, Malaysia, Indonesia, and the Philippines all had currencies linked to the dollar. As the dollar appreciated 45% against the Japanese yen between the second quarter of 1995 and the first quarter of 1997, these countries' currencies appreciated also and their exports became less competitive. Exports in East Asia were also hurt by the 1996 slowdown in the semiconductor and electronics markets. This fall in exports contributed to current account deficits ranging from 3.5% of GDP in Indonesia to 8% of GDP in Thailand.

Investors perceiving Thailand's fragile financial system, slowing exports, and large current account deficit launched a speculative attack on the Thai baht on 14 May 1997. The Bank of Thailand squandered its foreign currency reserves trying to maintain its peg before finally allowing the baht to float on 2 July 1997. The currency immediately fell more than 15%.

The financial contagion spread to the Philippines, Malaysia, and Indonesia. All had currencies linked to the dollar, current account deficits, and banking sectors that had loaned too much to property developers. During July and August of 1997 all three countries tried to defend

their currencies by raising interest rates and selling foreign exchange. These high interest rates damaged banks, which had primarily short-term liabilities and long-term assets. Finally on 14 August 1997 Indonesia relaxed its control on the rupiah, and it fell by 12%.

The fall in the rupiah caused local banks and firms to panic. As discussed above, many banks (and corporations) not only had short-term debt, but debt denominated in dollars and other foreign currencies. The offsetting assets were long-term and generated revenue streams in rupiahs. Since the rupiah had fluctuated in a narrow band for several years, much of the foreign currency debt was not hedged against exchange rate risk. When the rupiah fell, Indonesian banks and corporations scrambled to cover their exposure by selling rupiah and buying dollars. In the sometimes thin market for rupiah, this selling pressure caused the rupiah to snowball downwards.

On 8 October, after the rupiah had fallen from its pre-crisis value of 2,400 to the dollar to 3,600 to the dollar, Indonesia sought help from the International Monetary Fund (IMF). By the end of October, Indonesia and the IMF had reached an agreement. The IMF and other donors would provide Indonesia with loans exceeding $40 billion dollars. One key condition that the IMF imposed was that 16 banks be immediately closed. As the *Economist* magazine reports, the IMF insisted on the closures because troubled banks in Thailand were not being liquidated as quickly as the IMF wanted following an agreement signed there on 5 August 1997.[5]

This demand for bank closures decimated the banking sector. Banks were already shaky because of excessive property lending, high interest rates, and the fall of the rupiah. When depositors heard that the banks were being closed they panicked. Not being protected by deposit insurance, they started a bank run.[6] Ninety percent of the deposits in local private banks were withdrawn.[7] The banking crisis was exacerbated by a lack of transparency in the banking

system.[8] As Stiglitz (1998) and Yellen (1998) discuss, with limited information investors were unable to distinguish between healthy and unhealthy institutions and shied away from them all.

This banking crisis further undermined the confidence of international investors, and the rupiah became vulnerable to rumors. In December it fell 11% in one day on reports that Indonesian President Suharto was gravely ill. In January it fell 26% in one session amid rumors that Indonesia was considering a debt moratorium. Its level at this point was 9,500 rupiah to the dollar, compared to 2,400 to the dollar before the crisis.

The IMF, witnessing the instability, negotiated a new agreement. It signed a second letter of intent with Indonesia in January 1998. The IMF and Indonesia agreed to break up several cartels and monopolies. The accord further stipulated that bank capitalization be increased, the M2 money supply growth rate be targeted at 16%, and government subsidies of basic commodities be phased out.

The condition that subsidies be eliminated caused further trouble. In May 1998, when subsidies on fuel, electricity, and public transportation were lifted, riots broke out in Indonesia. These riots brought economic activity to a standstill for several days. The retail trade sector was especially damaged as stores were looted, distribution networks broken up, and shopping centers burned. Foreign investment ceased during the crisis, and the rupiah fell to 11,000 to the dollar. By the end of May President Suharto resigned and was replaced by vice-President Jusuf Habibie.

In June 1998 the rupiah was further pummeled by the depreciation of the Japanese yen. Japan represents a key market for Indonesia, and as the yen depreciated the competitiveness of Indonesian exports declined. By the end of June the rupiah had fallen to 15,000 to the dollar. The rupiah/dollar exchange rate is plotted in Figure 1.

(Insert Figure 1 here)

The crash of the rupiah, the banking crisis, and the riots have decimated the Indonesian economy. It is estimated that because of foreign debts most banking and corporate firms are technically bankrupt when the exchange rate is more than 9,000 rupiah per dollar.[9] The exchange rate has exceeded this value for most of the period from January to July 1998. Construction projects are hindered by high interest rates and the banking crisis. Export industries are stalled because they can not obtain imported inputs. Their inability to obtain imports has arisen because foreign companies no longer accept letters of credit issued by Indonesian banks. The riots in May brought economic activity to a halt for several days and severely damaged the retail and wholesale trade sector. The Indonesian Central Bureau of Statistics is forecasting that because of these and other factors real GDP will decline 13% in 1998 and the consumer price index will increase 80%.

3. EFFECTS OF THE INDONESIAN CRISIS ON THE DISTRIBUTION OF INCOME

An important question concerns how the Indonesian crisis will affect the distribution of income. As discussed in Section 1, prior to the crisis, Indonesia had experienced steady progress in poverty eradication and human development. Many observers are concerned with whether the current crisis will erode these gains, and with how the burden of adjustment will be shared across socioeconomic groups.

To shed light on these issues it is helpful to have a quantitative measure of the effect of the

crisis across sectors of the Indonesian economy. The Indonesian Central Bureau of Statistics has recently released sectoral output data for the first half of 1998 and forecasts for all of 1998. These data are presented in Table 1. Not surprisingly, the most affected sectors are construction, trade, and finance. Output in these three sectors declined, respectively, by 36.8%, 17.53%, and 16.88% during the first half of 1988.

(Insert Table 1 here)

The Central Bureau of Statistics also provided data on sectoral output at a more disaggregated level. The worst performing sectors (with growth rates in parentheses) include: automotive and electronics (-55.05%), air transport (-30.18%), basic metals (-22.31%), chemical, fertilizer, and medicine (-21.03%), retail and wholesale trade (-19.41%), and real estate (-19.1%). The best performing sectors (with growth rates in parentheses) include: fisheries (6.65%), plantations (6.46%), and forestry (2.5%).

To infer how changes in output in these sectors will affect various types of workers, the tables constructed by Warr and Azis (1997) are useful. They present data on the income earned by four different types of labor in ten different household groups from 65 different production activities. The four types of labor are agricultural, production (including production workers, transport equipment operators, and manual workers), administration (including clerical, sales, and service workers), and professional (including professional, managerial, and military workers). The ten household groups (which they refer to as hh1 through hh10) consist of four agricultural household groups (hh1 to hh4), three non-agricultural rural household groups (hh5 to

hh7), and three urban household groups (hh8 to hh10). For the agricultural households, hh1 refers to landless workers, hh2 refers to landowners owning less than 0.5 hectares, hh3 refers to landowners possessing between 0.5 and 1.0 hectares, and hh4 refers to landowners with more than 1.0 hectare. For the non-agricultural rural households, hh5 refers to low-income workers, hh6 refers to medium-income workers, and hh7 refers to high-income workers. Similarly for non-agricultural urban households, hh8 refers to low-income workers, hh9 refers to medium-income workers, and hh10 refers to high-income workers.

Data based on the Warr and Azis (1997) tables for the hardest hit sectors are presented in Table 2. Looking at the sixth row for each sector, it is evident that the largest sectors are construction and trade. In the construction sector, production workers (including manual labor) receive most of the income while in the trade sector administration labor (including sales personnel) receive most of the income. In terms of percentage of household income, rural and urban households earn approximately the same amount from construction while urban households earn more than rural households from trade. Table 2 also aggregates the ownership of labor across the seven sectors. The results indicate that about 28% of rural non-agricultural income and about 40% of urban income come from these sectors. Thus slowdowns in these sectors are likely to severely burden both rural and urban households. The results also indicate that administration labor and production labor receive the most income from these hardest hit sectors. Thus salespeople, service employees, production workers, and manual labor are likely to experience large drops in their income.

(Insert Table 2 here)

While Table 2 presents data on factor ownership in the most affected sectors, it does not shed light on the general equilibrium effects of downturns in these industries. For example, while an exogenous decline in construction will directly reduce the incomes of manual workers, it will also lower spending on intermediate inputs such as cement, and thus indirectly decrease the incomes of factors such as production workers involved in producing cement. This decrease in factorial incomes will reduce the incomes of socioeconomic groups such as the urban poor. As the incomes of groups such as these decline, spending on commodities such as food will decline, depressing output in the agricultural sector. This decline in agricultural output will decrease the incomes of factors such as agricultural workers, thus reducing the incomes of socioeconomic groups such as small farmers and their expenditures on commodities such as clothing. The cycle continues as output in the clothing sector and the incomes of factors producing clothing such as production workers decline.

To capture these interdependencies and to measure the total effect of an exogenous decline in sectoral output on the incomes of factors and socioeconomic groups a Social Accounting Matrix (SAM) is useful. A SAM is a disaggregated general equilibrium accounting framework that seeks to model the interrelationships characterizing an economy at a given time. The Indonesian Central Bureau of Statistics maintains one of the most detailed SAMs in the world. Their SAM is disaggregated into 106 categories (including 23 factors of production, 12 institutions, and 22 production sectors). The most recent SAM is from 1993.[10]

Table 3 uses the 1993 Indonesian SAM to examine the effects of downturns in construction, trade, banking, and real estate on factorial and household incomes.[11] The size of

the sectoral downturns are obtained from the Central Bureau of Statistics data for the first half of 1998. The effects on incomes are measured in percentage terms to facilitate interpretation. The first column indicates that the decline in the construction sector will decrease the income of paid rural and urban production workers (including transport equipment operators and manual workers) by more than 20%. The data indicate that incomes for all household groups except landowners with more than 1 ha. of land will fall by at least 10%. The second column indicates that the decline in the trade sector will decrease the income of unpaid rural and urban administration workers (including clerical, sales, and service workers) by more than 21%. The data indicate that incomes for all household types except landowners with more than 1 ha. of land and medium-income rural workers will fall by at least 5%. The third column indicates that the decline in banking will decrease the income of rural and urban paid administration workers by more than 2%. Among households the incomes of urban high-income workers will fall the most (in percentage terms) and the incomes of landowners with more than 1 ha. of land the least. The fourth column indicates that the decline in real estate will reduce the income accruing to owner-occupied housing by almost 22%. Landowners with more than 1 ha. of land are again one of the least affected household groups. Table 3 thus indicates that incomes will plummet for all types of workers and all household types, except possibly for landowners with more than 1 ha. of land.

(Insert Table 3 here)

There are reasons to believe that the pattern of income declines reported in Table 3 will greatly increase poverty. Gupta *et al.* (1998) find that rural poverty in Indonesia is concentrated

among construction and agricultural workers and urban poverty among the self-employed in the trade sector. They also report that a large percentage of Indonesian workers are clustered close to the poverty line. The evidence in the first column that the income of rural production workers will fall 21% indicates that rural construction workers will suffer large losses. The evidence in the second column that the income of unpaid urban clerical, sales, and service workers will fall 22% indicates that urban workers in the informal sector will also be hit hard. Thus the large income declines in these vulnerable sectors will multiply the amount of poverty in both rural and urban regions.

Forecasts by the Indonesian Central Bureau of Statistics bear out this claim. The total headcount poverty index is forecasted to rise from 11.3% in 1996 to 39.1% in 1998. Among urban residents, it is predicted to rise from 9.7% to 28.8%. Among rural residents, it is forecasted to increase from 12.3% to 45.6%. These increases are all the more serious since Indonesia's poverty line, at less than $10 per month, is already low by international standards.

4. CONCLUSION

Indonesia's economic and social performance over the last thirty years has been extraordinary. It achieved a growth rate of almost 7% per year, an inflation rate of less than 10% per year, and a reduction in the headcount poverty index from 60% to 11%. Indicators of social welfare such as adult literacy, infant mortality, and life expectancy also improved steadily. The Indonesian experience of growth and poverty alleviation was held up as a model for other countries to follow.

These gains are being erased by the crisis that hit Indonesia in 1997. What began as a currency crisis quickly spread to the banking sector and the real economy. Sectors such as finance, construction, and trade are especially hard hit.

This paper investigates the effects of downturns in these sectors on the distribution of income. To do so it uses a Social Accounting Matrix approach. Evidence from this methodology indicates that the decline forecasted for the construction sector will reduce the incomes of rural production workers by more than 20%. The results also indicate that the downturn forecasted in the trade sector will reduce the income of urban unpaid administration workers by more than 20%. Gupta *et al.* (1998) report that rural poverty in Indonesia is concentrated among construction and agricultural workers and urban poverty among the self-employed in the trade sector. Thus the large declines in the incomes of rural construction workers and of urban workers in the informal sector will multiply both rural and urban poverty. The Indonesian Central Bureau of Statistics is forecasting that the headcount poverty index will increase from 11.3% in 1996 to 39.1% in 1998. Future research should investigate both why Indonesia so quickly forfeited the gains of almost thirty years and how the human costs of this unfolding tragedy can be mitigated.

Table 1. *Growth rates of real gross domestic product by sector*

Sector*	Percentage Change from January - July 1998	Percentage Change for 1998 (forecast)
1. Agriculture	0.25	0.26
2. Mining	-7.57	-6.87
3. Manufacturing	-13.30	-12.00
4. Electricity	0.30	-2.19
5. Construction	-36.8	-35.44
6. Trade	-17.53	-21.42
7. Transportation	-6.49	-11.56
8. Finance	-16.88	-18.58
9. Services	-5.11	-5.17
GDP	-12.23	-13.06

Source: Indonesian Central Bureau of Statistics

* Sector definition:

1. agriculture, husbandry, forestry, and fishing.
2. mining and quarrying.
3. manufacturing.
4. electricity, gas, and drinking water.
5. construction.
6. retail and wholesale trade, restaurant, and hotel.
7. transportation and communication.
8. banks, financial institutions, and business rental and services.
9. government services, social services, and personal services.

Table 2. *Ownership of Labor in the Most Affected Sectors*

Sector and type of labor	Agricultural households				Non-ag rural households			Non-ag urban households		
	hh1	hh2	hh3	hh4	hh5	hh6	hh7	hh8	hh9	hh10
Air Transport										
Agric. Labor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prodn. Labor	3.00	28.05	6.52	12.86	15.60	4.75	92.28	24.18	10.00	98.73
Admin. Labor	0.10	1.11	0.25	0.49	1.47	0.16	7.51		4.21	0.65
18.63										
Profes. Labor	0.00	0.05	0.02	0.03	0.10	0.01	0.54	0.10	0.01	1.27
All Labor (rupiah)	3.10	29.21	6.80	13.38	17.17	4.92	100.33	28.49	10.66	118.63
All Labor (% of hh income)	0.07	0.14	0.10	0.11	0.24	0.41	0.27	0.24	0.38	0.21
Automotive & Electronics										
Agric. Labor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prodn. Labor	6.44	60.30	14.03	27.64	33.53	10.22	198.35	51.97	21.49	212.21
Admin. Labor	0.91	9.90	2.25	4.41	13.12	1.40	67.11	37.63	5.84	166.50
Profes. Labor	0.18	3.34	1.36	2.17	7.09	0.83	38.75	6.85	0.98	90.84
All Labor (rupiah)	7.53	73.54	17.63	34.22	53.74	12.45	304.22	96.45	28.31	469.55
All Labor (% of hh income)	0.16	0.35	0.25	0.27	0.76	1.05	0.81	0.80	1.02	0.85
Basic Metals										
Agric. Labor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prodn. Labor	2.67	24.96	5.81	11.44	13.88	4.23	82.12	21.52	8.90	87.85
Admin. Labor	0.38	4.10	0.93	1.83	5.43	0.58	27.78	15.58	2.42	68.93
Profes. Labor	0.07	1.38	0.56	0.90	2.93	0.34	16.04	2.83	0.41	37.61
All Labor (rupiah)	3.12	30.44	7.30	14.17	22.25	5.16	125.94	39.93	11.72	194.39
All Labor (% of hh income)	0.07	0.15	0.11	0.11	0.31	0.43	0.34	0.33	0.42	0.35
Chemicals										
Agric. Labor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prodn. Labor	7.42	69.50	16.17	31.86	38.65	11.78	228.63	59.90	24.77	244.59
Admin. Labor	1.23	13.37	3.04	5.96	17.72	1.90	90.64	50.83	7.88	224.87
Profes. Labor	0.11	1.97	0.80	1.28	4.18	0.49	22.86	4.04	0.58	53.58
All Labor (rupiah)	8.75	84.84	20.01	39.10	60.55	14.17	342.13	114.77	33.23	523.05
All Labor (% of hh income)	0.18	0.41	0.29	0.31	0.85	1.19	0.91	0.95	1.19	0.94

Table 2. *Ownership of Labor in the Most Affected Sectors (continued)*

Sector and type of labor	Agricultural households hh1	hh2	hh3	hh4	Non-ag rural households hh5	hh6	hh7	Non-ag urban households hh8	hh9	hh10
Construction										
Agric. Labor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prodn. Labor	68.25	639.19	148.68	293.04	355.45	108.33	2,102.73	550.94	227.81	2,249.59
Admin. Labor	9.62	104.97	23.88	46.78	139.10	14.89	711.47	398.96	61.87	1,765.09
Profes. Labor	1.91	35.38	14.37	22.99	75.13	8.81	410.81	72.58	10.39	962.95
All Labor (rupiah)	79.78	779.55	186.92	362.81	569.68	132.03	3,225.01	1,022.47	300.07	4,977.64
All Labor (% of hh income)	1.68	3.73	2.68	2.85	8.03	11.09	8.62	8.45	10.77	8.99
Real Estate										
Agric. Labor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prodn. Labor	3.32	31.09	7.23	14.25	17.29	5.27	102.26	26.79	11.08	109.41
Admin. Labor	2.69	29.35	6.68	13.08	38.89	4.16	198.93	111.55	17.30	493.53
Profes. Labor	0.23	4.17	1.69	2.71	8.85	1.04	48.40	8.55	1.22	113.45
All Labor	6.24	64.61	15.60	30.04	65.03	10.47	349.60	146.90	29.60	716.39
All Labor (% of hh income)	0.13	0.31	0.22	0.24	0.92	0.88	0.93	1.22	1.06	1.29
Trade										
Agric. Labor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prodn. Labor	3.86	36.15	8.41	16.57	20.10	6.13	118.91	31.15	12.88	127.21
Admin. Labor	81.47	888.67	202.12	396.03	1,177.60	126.02	6,023.08	3,377.45	523.81	14,942.69
Profes. Labor	0.18	3.31	1.34	2.15	7.03	0.82	38.43	6.79	0.97	90.07
All Labor (rupiah)	85.51	928.12	211.87	414.75	1,204.73	132.97	6,180.41	3,415.39	537.66	15,159.97
All Labor (% of hh income)	1.80	4.44	3.03	3.26	16.97	11.17	16.52	28.24	19.30	27.35
Sum of All 7										

Hard Hit Sectors									
Agric. Labor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0									
Prodn. Labor	91.95	861.18	200.31	394.81	478.89	145.96	2,833.00	742.27	306.92
3,030.87									
Admin. Labor	96.30	1,050.36	238.90	468.09	1,391.87	148.95	7,119.02	3,992.00	619.12
17,661.62									
Profes. Labor	2.68	49.55	20.12	32.19	105.22	12.34	575.29	101.64	14.55
1,348.50									
All Labor	194.02	1990.30	466.13	908.47	1993.15	312.17	10627.64	4864.40	951.25
22,159.61									
(rupiah)									
All Labor (%	4.09	9.52	6.67	7.15	28.08	26.22	28.40	40.22	34.14
39.98									
of hh income)									

Source: Warr and Azis (1997) and calculations by the author.

Table 3. *Percentage Changes in Factorial and Household Income Due to Declines in Sectoral Output Between January and June 1998.*

Factor or Household	Sector			
	Construction	Trade	Banking	Real Estate
Factor				
Paid Rural Agriculture	-13.2	-5.2	-0.9	-1.8
Paid Urban Agriculture	-13.0	-5.3	-0.9	-1.9
Unpaid Rural Agriculture	-12.3	-5.6	-1.0	-1.9
Unpaid Urban Agriculture	-12.3	-5.6	-1.0	-2.0
Paid Rural Production	-21.4	-2.9	-0.5	-1.0
Paid Urban Production	-20.0	-3.3	-0.8	-1.3
Unpaid Rural Production	-13.1	-4.7	-0.7	-1.3
Unpaid Urban Production	-12.1	-4.8	-2.3	-1.3
Paid Rural Administration	-8.6	-7.4	-3.2	-1.4
Paid Urban Administration	-9.5	-8.0	-0.6	-1.8
Unpaid Rural Administration	-9.7	-21.5	-0.6	-1.1
Unpaid Urban Administration	-9.7	-21.2	-0.7	-1.1
Paid Rural Professional	-5.9	-2.8	-1.6	-1.0
Paid Urban Professional	-8.0	-3.4	-0.7	-1.5
Unpaid Rural Professional	-8.3	-4.0	-0.7	-1.3
Unpaid Urban Professional	-8.1	-4.2	-0.8	-1.4
Land and Agricultural Capital	-15.1	-4.9	-1.6	-1.8
Owner Occupied Housing	-12.8	-7.2	-0.9	-21.5
Unincorporated Rural Capital	-15.2	-4.4	-1.0	-1.5
Unincorporated Urban Capital	-13.1	-5.5	-2.2	-1.7
Incorporated Private Capital	-17.2	-5.8	-1.0	-2.0
Public Capital	-7.1	-6.4	-1.6	-0.8
Incorporated Foreign Capital	-6.7	-2.7	-0.9	-0.6
Agricultural Households				
Agricultural Employees	-13.4	-4.9	-0.9	-2.4

Land Owner (O-0.5 ha)	-13.8	-5.0	-1.0	-1.9
Land Owner (0.5-1 ha)	-13.7	-5.4	-0.6	-2.6
Land Owner (>1 ha)	-7.7	-3.1	-1.0	-1.7
Non-Agricultural Households				
Low-Skilled Rural	-12.9	-6.9	-0.8	-3.2
Non-Labor Force Rural	-13.2	-3.8	-0.8	-1.8
High-Skilled Rural	-13.1	-7.3	-1.1	-1.4
Low-Skilled Urban	-11.8	-7.7	-1.3	-3.7
Non-Labor Force Urban	-13.7	-5.4	-1.6	-3.3
High-Skilled Urban	-11.9	-7.3	-1.7	-1.9

Note: Changes in income are measured as a percentage of the group's original income.
Source: Indonesia Central Bureau of Statistics and calculations by the author

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Notes

1. These data were obtained from the Indonesian Central Bureau of Statistics.

2. These data were taken from the World Bank country brief on Indonesia (available from the World Bank web site at www.worldbank.org).

3. Hong Kong, Indonesia, Malaysia, and Thailand all had growth rates of real GDP averaging more than 6.9% per year between 1970 and 1996. China, Singapore, South Korea, and Taiwan had growth rates averaging more than 8% over this period. These data are reported in *The Economist,* 1 March 1997.

4. Part of the difficulty with the Indonesian banking system began following deregulation of the banking sector in October 1988. In an effort to increase the number of banks, the government loosened regulatory standards. As Azis (1998) discusses, many of the banks that began operation following deregulation were badly managed.

5. *The Economist*, 8 November 1997.

6. The IMF's own studies conclude that their conditions sparked a bank panic in Indonesia. This fact is discussed in press release number 105-112 of the Congress of the United States, Joint Economic Committee. The release is dated 13 February 1998.

7. Reported in personal communication with Prof. Iwan Azis, Cornell University, 8 February 1998.

8. Examples of the lack of transparency include the fact that Indonesian banks could treat bad loans as confidential information and the fact that they did not have to publish financial reports quarterly. This is discussed in *The Washington Post,* 31 October 1997.

9. *The Straits Times,* 3 March 1998.

10. The structure of the Indonesian economy has changed since 1993. Thus the general equilibrium effects measured here are not strictly accurate. They should nonetheless provide useful approximations.

11. Because the SAM has 22 production sectors whereas the Warr and Azis (1997) tables have 65 sectors, some of the smaller sectors employed in Table 2 could not be used. As Table 2 indicates, sectors such as air transport and automotive & electronics provided only a minuscule fraction of household income. Focusing on larger sectors such as construction and trade should thus be more relevant when analyzing the overall effects of the crisis.