Anatomy of Poverty during Adjustment: The Case of the Philippines*

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I. Introduction

Recent discussions of development policy have emphasized the need for macroeconomic adjustment programs that give attention to poverty and social concerns. Conventional adjustment programs applied in developing countries are considered to have no human face, as they focus almost exclusively on promoting economic efficiency and bringing an economy to a stable and sustainable growth path.[1] In particular, observers have claimed that the poor have disproportionately borne the pain of transitional costs of adjustment, especially when the transition has been longer than initially expected.

Indeed, increases in poverty as well as sharp cuts in government expenditures on social services, including health, nutrition, education, and infrastructure programs benefiting the poor, have accompanied the implementation of adjustment policies in a number of less developed countries (LDCs). On the other hand, country cases where the transition apparently has not been antipoor, even in the short run, also exist. Indonesia's experience with adjustment in the 1980s, for example, appears to be one such case.[2] In general, the available evidence indicates that changes in living conditions in the short run do not appear to be systematically related to the presence (or absence) of adjustment programs.[3]

The lack (or the poor quality) of data—especially on social and human development indicators—in LDCs hampers the analysis of the link between adjustment policies and poverty alleviation. Moreover, because the transition in many countries is an ongoing process, the impact of the adjustment is still in the making. Thus, available information gives only a partial, and possibly even misleading, picture of the full effects of adjustment policies on the poor's standard of living. Even when reliable data are available, the analysis has to move beyond simple correlations and establish counterfactual situations. Specifi-

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cally, the economy-wide outcomes, including poverty and income distribution, associated with the adjustment need to be compared with those of a counterfactual situation involving no adjustment. Applied general equilibrium modeling is appropriate for this purpose. The advantage of this approach is that one gets a clearer resolution of what caused what, although it typically does so at the cost of many more assumptions.

This article follows a simpler approach by looking at actual changes in poverty over a period encompassing the changes in domestic policy and external environment and by employing a simulation analysis to assess the short-term impact of certain policy reforms on household welfare. The analysis uses simulation results of a macroeconomic model designed for analyzing the short-term impact of macroeconomic reforms, as inputs into a household model designed for poverty analysis. The latter model exploits the wealth of information available in household surveys, thereby providing much richer information on the characteristics of the poor than is available in either macroeconomic or computable general equilibrium models alone. While the approach is short of the counterfactual simulation required in understanding the full long-run impact of policy reforms, and while it does not address thoroughly the issue of whether the existing subsidies and poverty measures could have been maintained throughout the period if there had been no adjustment program, the information it provides is useful in designing complementary policy measures intended to cushion the short-term welfare effects of policy changes on the poor.

The focus of the analysis is on the character of poverty, especially rural poverty, which contributes the bulk of total poverty in the Philippines, from 1988 to 1991. This period saw major policy reforms in the Philippines, aimed at correcting internal and external imbalance of economic aggregates. The period also marked a deceleration of economic growth, punctuated by a contraction of economic activity in 1991.

The next section of the article discusses conceptual and practical measurement issues in poverty assessment, describes the data employed in the analysis, and examines poverty characteristics as well as sources of poverty alleviation from 1988 to 1991. Section III provides the framework underlying the welfare analysis of certain policy reforms and discusses the results of simulation exercises. Finally, Section IV discusses some implications for poverty alleviation during an adjustment period.

II. Measurement and Characteristics of Poverty Change

Poverty Measurement

Identification of the poor requires the use of a broad indicator of economic resources. Total current income is a popular choice in a large

number of poverty assessments and applied welfare analyses. However, income may overestimate or underestimate living standards. If a family can borrow or dissave, its level of living is not constrained by current income. Even in underdeveloped regions, households typically have some capability for buffering their living standards from temporary variations in income, such as by saving money or goods. Moreover, a family that can share in the income of others may have a higher standard of living than its current income would permit. Available evidence indicates that the proportion of Philippine households mainly dependent on rent, remittances, gifts, support assistance, and relief rose substantially from about 5% in 1961 to 19% in 1985 and 16% in 1988.[4] The proportion of families reporting remittances, support assistance, and relief increased from 22% in 1961 to 88% in 1985.

In this article, I use per capita consumption as an indicator of the welfare levels of households. The Family Income and Expenditure Survey (FIES) consumption data capture a wide range of implicit expenditures, such as use value of durable goods (including owner-occupied dwelling units), consumption of home-produced goods and services, and gifts and assistance or relief in goods and services received by the household from various sources. This makes this welfare measure valid even for comparisons between urban and rural households.

The determination of the poverty standard is a complex issue. Ideally, this standard (or line) should allow for differences in household composition, relative prices faced by spatially dispersed households, household tastes, health status of household members, and living conditions and amenities which are customary in the society to which they belong (often referred to as participation standard). For practical purposes, I have adopted the poverty lines for 1988 estimated by the National Statistical Coordination Board's Technical Working Group on Poverty Determination. Roughly comparable to those for Indonesia and Thailand, these estimates cover the country's 13 regions subdivided into rural and urban areas and take into account regional price differences and consumption patterns.

Poverty assessment also requires a procedure of bringing together the data on the poor into an overall measure of poverty.[5] In this article, I employ the class of poverty measures suggested by J. E. Foster et al.[6] This is given by

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{q} n_i\left(\frac{z - y_i}{z}\right)^\alpha, \qquad (1)$$

where z is the per capita poverty line, y_i is the per capita consumption of family i whose consumption is less than z, n_i is family size, q is the number of poor families, n is the total number of persons in the popula-

tion, and $\alpha \geq 0$ is a measure of poverty aversion. The parameter α indicates the importance given to the poorest poor: the larger α is, the greater is the emphasis given to the poorest families. As the value of α becomes very large, P_α approaches a Rawlsian measure giving weight only to the poorest of the poor.

The most commonly employed poverty measure, the head-count index, is a special case of the P_α class of measures. That is, for $\alpha = 0$, equation (1) is simply the proportion of the population with a standard of living below the poverty line. This index has serious shortcomings. First, it is insensitive to the depth of poverty: a poor person may become poorer, but measured poverty will remain the same. Second, it is also insensitive to transfers; an income transfer from a poor person to a less poor one—whose posttransfer income is still below the poverty line—does not change measured poverty. Its advantage is that it is easily understood and communicated.

Another familiar poverty index, the average poverty gap, is also subsumed in the P_α class of measures. This index (for $\alpha = 1$) is the average, over all persons, of the gaps between the poor persons' standard of living and the poverty line, as a ratio of the poverty line. It is sensitive to both the number of the poor and the depth of their poverty. Its advantage is that the index gives an indication of the potential savings that can be made from targeting transfers to the poor. One objection to it, however, is that it is insensitive to the redistribution of income within the poor group owing to the equal weights attached to the various consumption deficits.

Where the weights are the income gaps themselves, the resulting P_α measure is distributionally sensitive. For example, for $\alpha = 2$, the resulting measure, P_2, in equation (1) is then simply the mean of the squared consumption deficits. Measured poverty using this index decreases whenever a transfer of income takes place from a poor household to a poorer one. Its drawback is that it is not as easy to interpret as the head-count and poverty-gap indexes. Nonetheless, the key point to bear in mind is that a ranking of dates, socioeconomic groups, or policies in terms of P_2, hereafter referred to as the distribution-sensitive measure, should reflect well their ranking in terms of the severity of poverty. It is not the precise number per se that makes the measure useful, but its ability to order distributions in a better way than the alternative measures.

All members of the P_α poverty measures have the desirable property of subgroup consistency; all other things being equal, the overall level of poverty must fall whenever poverty decreases within some subgroup of the population and is unchanged outside that group.[7] Moreover, they are additively decomposable in the following sense. The aggregate (population) poverty level is simply a weighted average of the subgroup poverty levels, the weights being their population

shares. This property proves to be extremely useful for my purposes. For example, for a policy change that increases the incomes of group i and reduces those of group j, one can work out the impact of the change on each group's average poverty level and then use the groups' respective population shares to estimate the new aggregate poverty level.

Following M. Ravallion and M. Huppi, I exploit the additive decomposability of the P_α poverty measures to explore the factors underlying the observed changes in aggregate poverty during a specified period.[8] Let $P^t_{\alpha,i}$ be the poverty index for sector (or group) i with a population share of s_i at date t, where there are m sectors. It can be easily checked that the change in observed aggregate poverty is a sum of intrasectoral effects, population shifts, and interaction effects:

$$
\begin{aligned}
P^t_\alpha - P^{t-1}_\alpha = & \sum_{i=1}^{m} \left(P^t_{\alpha,i} - P^{t-1}_{\alpha,i}\right) s^{t-1}_i && \text{(intrasectoral effects)} \\
& + \sum_{i=1}^{m} \left(s^t_i - s^{t-1}_i\right) P^{t-1}_{\alpha,i} && \text{(population shifts)} \qquad (2) \\
& + \sum_{i=1}^{m} \left(P^t_{\alpha,i} - P^{t-1}_{\alpha,i}\right)\left(s^t_i - s^{t-1}_i\right). && \text{(interaction effects)}
\end{aligned}
$$

The intrasectoral effects are simply the contribution of the gains to the poor within each sector to the change in aggregate poverty, controlling for their base period population shares. The population shifts effects are the contribution of changes in the distribution of the population across sectors during the period. The residuals, the interaction effects, arise from the possible correlation between population shifts and intrasectoral changes in poverty.

Household Data

The 1988 and 1991 Family Income and Expenditures Surveys (FIES) constitute the database for the analysis. Both surveys have sample sizes that are deemed sufficient to provide reliable estimates of household incomes and expenditures at the regional and national levels. The 1988 survey covers 18,922 households, while the 1991 survey encompasses 24,789 households. The questionnaire design, content, and reference periods for the two surveys are generally comparable.

The FIES estimates of average per capita income and expenditure for both 1988 and 1991 are lower than those implied by the National Income Accounts (NIA; table 1). Note, however, that the NIA data include incomes and expenditures of unincorporated enterprises and nonprofit organizations besides households, as well as other receipts

TABLE 1

NIA AND FIES ESTIMATES OF PER CAPITA INCOME AND EXPENDITURES AT CURRENT PRICES

	1988	1991*
NIA personal income (million pesos)	678,823	1,046,260
NIA personal expenditures (million pesos)	558,765	916,269
NIA average per capita income	11,560	16,141 (44.0)
NIA average per capita expenditures	9,516	14,574 (53.2)
FIES average per capita income	10,290	15,655 (52.1)
FIES average per capita expenditures	8,054	12,403 (54.0)
Percent of FIES to NIA:		
Per capita income	89.0	94.1
Per capita expenditures	84.6	85.1

SOURCES.—National Statistical Coordination Board, *Philippine Statistical Yearbook* (1992); National Statistics Office, *Family Income and Expenditures Survey* (1988 and 1991).

* Figures in parentheses are 3-year growth rates (%).

and disbursements unrelated to household income generation and consumption. Following the International Labour Organisation concept of income, the FIES excludes profits from sale of stocks and bonds, back pay and proceeds from insurance, net winning from lotteries and similar activities, and inheritance as part of family income. Note also that the growth rates of expenditures per capita implied in both the FIES and NIA are about equal. This is significant since the main interest of this article is in the changes in poverty and income distribution during the period.

Characteristics of Poverty Change: 1988 and 1991

That sustained poverty alleviation requires no less than sustained, rapid growth of income and employment is a widely accepted premise. The overall economic performance of the Philippines during the 1980s was dismal, both in relation to the 1960s and 1970s and in relation to most other Asian countries. The first half of the 1980s was punctuated by a contraction of GDP per capita by an annual average of 3.1%. While open unemployment remained relatively low at an average of 6.2%, underemployment was high, averaging 17% of the labor force. Real wages fell for the most part in the 1970s and 1980s. Rural poverty, which constituted nearly two-thirds of national poverty in the 1980s, increased significantly during the first half of the decade.[9]

The economic recovery in the second half of the 1980s—GDP grew at an annual average of 5.8%—proved to be short-lived. The growth of GDP per capita plummeted from 3.8% in 1988 to −3.2% in

1991. Inflation rose from 8.8% in 1987 to 18.7% in 1991. Insupportable fiscal deficit caused largely by interest payments on domestic debt grew from 5% of GNP in 1987 to 7% in 1991. Total infrastructure spending fell substantially—the 1990 level was only 60% of that in 1981. The neglect of infrastructure investment in the energy sector eventually led to crippling power shortages beginning in 1989. Although real public spending on health and education rose steadily in the second half of the 1980s, the mix of spending favored the richer members of the society.[10] Unsustainable balance of payments (BOP) problems eventually led to a currency devaluation by about 12% in late 1990.

To be sure, the end of the recovery was precipitated by specific adverse shocks, including the loss of confidence in the political regime following the coup attempt in December 1989, the earthquake in July 1990, the Mount Pinatubo eruption in June 1991, and the Middle East crisis in late 1990. However, students of Philippine economic development contend that, even without these shocks, the economy was fast approaching a crisis.[11] The main culprits were domestic economic structures and policies that remained biased against the production and consumption of labor-intensive goods, particularly labor-intensive exports, as well as backward integration.

In this section, we examine how the sectoral and regional structure of poverty changed during the economic downturn from 1988 to 1991. On the basis of the FIES data, average real expenditure per capita virtually stagnated for rural households, while it contracted by about 7% for urban households (table 2). Urban households also saw their average income per capita falling during the period, whereas rural households saw a modest increase. The change was statistically significant (at the 5% level) for both rural and urban households.

All poverty indexes show a significant increase during the period. The head-count index rose from about 54% to 56% while the distribution-sensitive measure increased from about 8% to 9%. Notice that the significance (i.e., the *t*-ratio) of the poverty difference is higher for the measures that account for the intensity (and distribution) of poverty. This suggests that the probability that the poverty gap and distribution-sensitive measures did not change is lower than the probability that the head count did not change from 1988 to 1991.

Poverty incidence in rural areas is higher than in urban areas. Rural poverty contributed about two-thirds of national poverty in 1988 and about one-half in 1991. Accounting for the drop in rural contribution was the decline in the population share of rural areas from 62% in 1988 to 50% in 1991 owing to reclassification of villages as well as net migration from rural to urban areas. The sampling frame for the 1988 FIES was based on the 1980 population census, while that for the 1991 FIES was based on the 1990 census. Both censuses applied the same

TABLE 2

AGGREGATE POVERTY PROFILE

	RURAL			URBAN			NATIONAL		
	1988	1991	*t*-ratio	1988	1991	*t*-ratio	1988	1991	*t*-ratio
Number of households in sample	10,059	9,939		8,863	14,850		18,922	24,789	
Population share (%)	61.99	49.92		38.01	50.08		100.00	100.00	
Mean expenditure per capita	4,922	4,966	.73	11,609	10,753	−2.49	8,054	8,433	2.03
Mean income per capita	5,957	6,140	2.05	15,208	13,654	−3.03	10,290	10,641	1.26
Head count (%)	61.00	64.50	5.13	43.01	47.08	6.09	54.16	55.77	3.35
Poverty gap (%)	20.65	22.82	5.52	13.71	16.70	10.56	18.01	19.55	7.17
Distribution-sensitive measure (%)	9.10	10.42	7.01	5.92	7.89	12.12	7.89	9.15	10.11

NOTE.—Consumption and income are expressed in 1988 prices, using region-specific CPI. The *t*-test for the signficance of poverty differences is based on the methodology proposed by Nanak Kakwani in "Testing the Significance of Poverty Differences with Application to Côte d'Ivoire," Living Standards Measurement Study Working Paper no. 62 (World Bank, Washington D.C., 1990). Critical *t*-value at 5% significance level is 1.96. At 1% level, *t*-value is 2.58.

set of criteria in classifying villages into urban and rural areas. A large number of initially rural areas in 1980 became urban areas in 1990 when they were found to satisfy the criteria for urban areas.

The reclassification of physical areas poses a problem for intertemporal comparison of usual rural as well as urban performance indicators. The physical area of the rural sector is, almost by definition, shifting over time. As population grows or economic activity expands, an initially rural area will be classified as urban, sooner or later. While this may not be problematic for purposes of measuring, say, urbanization trends, it tends to create a systematic downward bias on usual rural performance indicators. Such may be the case for the rural and urban performance indicators given in table 2. If one takes an extreme assumption that the reclassification affected only the nonpoor in initially rural areas, then the rural poverty change reflected in table 2 is higher than that obtainable for a rural sector whose physical areas are held fixed. Unfortunately, since the 1988 and 1991 FIES data do not permit direct estimation of poverty indicators for fixed physical rural areas, the extent of the bias is not known. In the rest of this section, further characterizing poverty change, I focus on certain population groupings that are free from the rural-urban reclassification problem.

The sectoral employment of the household head is one useful way of disaggregation. Table 3 shows substantial differences in mean consumption per capita, as well as mean income per capita, across sectors.[12] Agriculture-dependent households, which accounted for about 45% of the total population in 1991, had the lowest average consumption per capita as well as the lowest average income per capita. The mean consumption per capita of households in agriculture was only about 56% of the mean for all households. Households in finance, which represented only about 2% of the population, had average consumption per capita five times higher than that of their counterparts in agriculture.

The change in mean consumption per capita between 1988 and 1991 was insignificant (at the 5% level) for all but one of the sectors. Although the 3-year growth rates of mean income and consumption were considerably high (in absolute value) for a number of the sectors, standard deviations in these sectors were likewise high. The only sector that experienced a significant decline in mean consumption was utility. In agriculture, the change in mean consumption was insignificant, but mean income increased significantly.

Poverty, as measured by the poverty-gap and distribution-sensitive indexes, increased significantly in agriculture, mining, construction, and trade (table 4). These sectors experienced stagnant mean consumption from 1988 to 1991. Average poverty gap in agriculture rose from 25% to 28%. Intrasectoral effects in this sector contributed almost three-fourths of the observed change in the national poverty

TABLE 3

CHANGES IN SECTORAL MEAN INCOMES AND EXPENDITURES

SECTOR OF EMPLOYMENT*	NUMBER OF HOUSEHOLDS IN SAMPLE		POPULATION SHARE		MEAN CONSUMPTION PER CAPITA				MEAN INCOME PER CAPITA			
	1988	1991	1988	1991	1988	1991	t-ratio	Growth Rate (3-year, %)	1988	1991	t-ratio	Growth Rate (3-year, %)
Agriculture	7,685	9,823	45.34	44.51	4,519	4,722	1.62	4.50	5,349	5,634	2.12	5.33
Mining	155	178	.92	.78	5,997	12,398	1.21	106.73	7,506	14,387	1.74	91.67
Manufacturing	1,574	2,048	7.97	7.80	9,701	11,375	1.74	17.26	12,254	14,621	1.69	19.32
Utility	98	143	.46	.62	13,587	10,198	−2.12	−24.94	15,853	13,323	−1.13	−15.96
Construction	985	1,473	5.33	6.12	6,486	7,252	1.15	11.82	7,867	9,547	1.72	21.35
Trade	1,696	2,176	8.05	7.92	9,738	10,522	1.58	8.05	13,936	14,369	.38	3.11
Transport	1,254	1,605	6.58	6.28	8,598	8,331	−.44	−3.12	11,465	11,611	.09	1.27
Finance	342	456	1.62	1.62	28,798	21,784	−1.85	−24.36	44,087	28,362	−2.19	−35.67
Services	2,545	3,270	12.32	12.20	10,887	11,286	.99	3.67	13,606	14,310	1.29	5.17
Others	2,551	3,617	11.40	12.17	11,224	11,587	.50	3.24	14,036	13,918	−.16	−.84

SOURCE.—Consumption and income are expressed in 1988 prices, using region-specific CPI.

* Sector definitions: agriculture = agriculture, fishery, and forestry; mining = mining and quarrying; utility = electricity, gas, and water; trade = wholesale and retail trade; transport = transportation, storage, and communication; finance = finance, insurance, real estate, and business; services = community, social, and personal services.

TABLE 4

SECTORAL SOURCES OF POVERTY CHANGE (%, except *t*-ratio)

SECTOR	HEAD-COUNT INDEX			POVERTY-GAP INDEX			DISTRIBUTION-SENSITIVE MEASURE			INCREASE DUE TO INTRASECTORAL EFFECTS		
	1988	1991	*t*-ratio	1988	1991	*t*-ratio	1988	1991	*t*-ratio	Head-Count Index	Poverty-Gap Index	Distribution-Sensitive Measure
Agriculture	69.52	72.25	3.94	24.82	27.65	8.02	11.27	13.34	9.34	76.65	73.67	74.18
Mining	53.75	60.74	1.29	15.82	20.91	2.19	6.34	9.57	2.41	4.00	2.70	2.36
Manufacturing	43.91	43.86	−.03	13.25	13.65	.61	5.51	5.89	1.06	−.24	1.80	2.37
Utility	21.93	25.55	.65	5.83	7.76	1.00	2.28	3.12	.88	1.03	.51	.30
Construction	59.68	65.08	2.71	19.08	22.58	3.92	8.05	10.22	4.15	17.80	10.70	9.10
Trade	40.59	41.57	.62	12.08	13.62	2.47	4.84	5.95	3.32	4.87	7.11	7.07
Transport	48.73	49.07	.18	14.44	15.22	1.04	5.84	6.58	1.79	1.38	2.96	3.83
Finance	20.54	20.36	−.06	4.84	5.77	.99	1.75	2.32	1.19	−.18	.87	.73
Services	33.96	34.53	.45	9.62	10.30	1.46	3.89	4.31	1.69	4.34	4.83	4.11
Others	38.54	38.36	−.14	11.72	11.54	−.37	4.97	4.85	−.45	−1.27	−1.22	−1.03
Population shifts										−9.26	−3.68	−2.48
Interaction effects										.89	−.25	−.54
National										100.00	100.00	100.00

gap. The high contribution was due mainly to the relatively high increase in the average consumption deficit of the poor in agriculture (about 2.6% of the poverty line) vis-à-vis nonagriculture (about 1.7%) as well as the relatively large share (45%) of agriculture in total population. On the other hand, poverty in utility did not increase in spite of the significant decline in mean consumption.

Tables 3 and 4 suggest a relatively strong correlation between the sector's poverty level and its mean consumption per capita. The simple correlation coefficient, r, for the combined 1988 and 1991 estimates is -0.74 for the head-count index, -0.71 for the poverty-gap index, and -0.68 for the distribution-sensitive measure.[13] However, no significant correlation exists between the rates of change in mean consumption per capita and the rates of change in any of the three poverty measures. This suggests that the poorly performing sectors in terms of consumption growth were not necessarily the ones that had the lowest poverty reduction.

The results so far indicate that, on the whole, the distributional effects within a sector aggravated the stagnation of average consumption on sectoral poverty. Table 5 shows the extent to which these distributional effects can account for the observed sectoral poverty change. The first column gives point estimates of the elasticity of the poverty gap. The calculation assumes that all incomes within a sector change at the same rate.[14] The second column presents the rates of change in sectoral poverty gaps that are associated with distributionally neutral growth of consumption, given the observed rates of change in mean consumption per capita from 1988 to 1991. The third column reproduces the rates of change in poverty gaps shown in tables

TABLE 5

CONTRIBUTION OF DISTRIBUTIONALLY NEUTRAL GROWTH (DNG) TO SECTORAL POVERTY CHANGE

Sector	Poverty Gap Elasticity with Respect to DNG	Rate of Change in Poverty Gap		Contribution of DNG
		Assuming DNG	Observed	
National	−2.01	−9.44	8.55	−110.46
Agriculture	−1.80	−8.10	11.41	−70.94
Mining	−2.40	−255.96	32.19	−795.20
Manufacturing	−2.31	−39.93	2.97	−1,345.33
Utility	−2.76	68.95	33.26	207.32
Construction	−2.13	−25.16	18.34	−137.20
Trade	−2.36	−18.99	12.75	−148.96
Transport	−2.38	7.40	5.43	136.35
Finance	−3.25	79.05	19.30	409.62
Services	−2.53	−9.28	7.10	−130.71
Others	−2.29	−7.41	−1.56	474.03

2 and 4. The last column provides the proportion of the observed poverty alleviation that can be accounted for by distributionally neutral growth.

Clearly, national poverty would have decreased if the growth in mean consumption had been distributionally neutral, while it actually increased. More than 100% of the increase in national poverty is attributable to deterioration in the distribution of consumption. What is remarkable, however, is the large variation in the relative importance of distributional effects across sectors of employment. Relatively large distributional effects are apparent in mining, manufacturing, finance, and the sector referred to as "others." In utility, transport, and finance, poverty would have increased faster than the actual rate if the decline in consumption were distributionally neutral. On the other hand, poverty would have fallen in agriculture, mining, manufacturing, construction, trade, and services if the increase in mean consumption were distributionally neutral.

The large contribution of distributional effects to the observed poverty change in agriculture during the economic downturn from 1988 to 1991 was almost symmetrical to that during the economic upturn from 1986 to 1988. On the basis of an earlier study, the proportionate changes in the real incomes of the bottom two quintiles (poorest 40%) of the population in agriculture were substantially higher than those for the top (richest 20%) of the population.[15] Entrepreneurial incomes accounted for about one-half of the total income of the poor, and these increased by 38% for the poorest 20% and by 29% for the next poorest 20% from 1985 to 1988. In contrast, entrepreneurial incomes increased by only 4% for the richest 20% of the population. During this period, substantial deregulation of agricultural markets, particularly in coconuts, sugarcane, and, to some extent, grains, took place. The period also saw the recovery of world market prices for sugarcane and coconut products. In real terms, farm-gate prices rose by an annual average of 13% for coconut and by 16% for sugarcane.

Tables 6 and 7 show the regional dimension of poverty change during the economic downturn. As in sectors of employment, the change in regional mean consumption and mean income as well as the contribution of intrasectoral effects to national poverty change varied substantially across regions. Average consumption and income increased significantly in four of the 14 regions, three of which were from Luzon. There was no significant change in mean consumption and income in Metro Manila, the nation's capital region, but poverty level in the region decreased significantly, indicating substantial improvement in its distribution of income during the period. The only other region that had an improved poverty situation was Southern Tagalog, Metro Manila's southern neighbor. These two regions accounted for about one-fourth of the total population. In contrast, pov-

TABLE 6

REGIONAL CHANGES IN MEAN INCOME AND EXPENDITURES

REGION	NUMBER OF HOUSEHOLDS IN SAMPLE		POPULATION SHARE		MEAN CONSUMPTION PER CAPITA				MEAN INCOME PER CAPITA			
	1988	1991	1988	1991	1988	1991	*t*-ratio	Growth Rate (3-year, %)	1988	1991	*t*-ratio	Growth Rate (3-year, %)
Metro Manila	2,726	3,907	13.84	13.98	18,951	18,132	−.73	−4.32	25,978	23,107	−1.70	−11.05
Ilocos Region	1,124	1,347	5.80	5.61	6,077	6,539	2.07	7.59	7,550	8,466	1.97	12.13
Cagayan Valley	789	961	3.90	3.81	5,680	6,507	2.89	14.56	7,737	8,650	2.12	11.81
Central Luzon	1,939	2,659	9.85	10.11	8,276	9,160	2.72	10.68	10,206	11,386	3.59	11.56
Southern Tagalog	2,421	3,521	12.00	13.32	7,297	8,377	4.77	14.80	8,791	10,874	4.81	23.69
Bicol Region	1,200	1,415	7.21	7.12	5,132	5,028	−.47	−2.03	5,911	5,984	.26	1.22
Western Visayas	1,676	2,019	9.20	9.04	6,088	6,192	.52	1.72	7,145	7,031	−.53	−1.60
Central Visayas	1,482	1,861	7.50	7.13	5,022	5,421	1.83	7.93	6,401	6,922	1.73	8.14
Eastern Visayas	967	1,141	5.52	5.27	4,442	5,161	2.62	16.18	5,448	6,344	2.07	16.45
Western Mindanao	870	1,177	5.25	5.11	4,907	4,881	−.14	−.52	6,365	6,287	−.27	−1.23
Northern Mindanao	1,117	1,407	5.90	5.90	5,933	5,392	−2.54	−9.12	7,102	6,430	−1.94	−9.46
Southern Mindanao	1,304	1,725	7.20	7.00	6,468	6,191	−1.25	−4.28	8,082	7,840	−.71	−3.00
Central Mindanao	893	1,147	4.91	4.64	5,935	5,463	−2.17	−7.96	7,544	6,780	−2.60	−10.13
Cordillera Autonomous Region	414	502	1.92	1.96	7,202	6,815	−.95	−5.37	8,858	9,362	.69	5.69

NOTE.—Consumption and income are expressed in 1988 prices, using region-specific CPI.

TABLE 7

POVERTY MEASURES AND INTRASECTORAL EFFECTS BY REGION (%, except *t*-ratios)

REGION	HEAD-COUNT INDEX			POVERTY-GAP INDEX			DISTRIBUTION-SENSITIVE MEASURE			INCREASE DUE TO INTRASECTORAL EFFECTS		
	1988	1991	*t*-ratio	1988	1991	*t*-ratio	1988	1991	*t*-ratio	Head-Count Index	Poverty-Gap Index	Distribution-Sensitive Measure
Metro Manila	34.29	28.39	−5.09	9.28	7.11	−5.52	3.65	2.54	−5.64	−50.58	−17.22	−12.13
Ilocos Region	62.42	60.92	−.76	20.20	21.40	1.39	8.44	9.54	2.23	−5.37	4.02	5.01
Cagayan Valley	59.15	59.99	−.36	20.47	21.30	.75	9.29	10.01	1.07	2.03	1.84	2.21
Central Luzon	39.16	45.06	4.02	10.22	12.99	5.31	3.77	5.18	5.31	35.99	15.66	10.99
Southern Tagalog	53.64	50.62	−2.29	17.99	16.22	−3.15	7.92	7.00	−2.89	−22.44	−12.23	−8.75
Bicol Region	68.62	71.24	1.45	23.63	27.63	4.44	10.38	13.49	5.53	11.70	16.58	17.77
Western Visayas	60.74	60.84	.06	20.19	20.86	.94	8.59	9.25	1.63	.53	3.56	4.82
Central Visayas	62.58	65.34	1.65	23.75	26.01	2.65	11.37	13.05	3.10	12.81	9.74	10.01
Eastern Visayas	64.62	65.17	.27	23.57	23.62	.03	10.74	11.08	.56	1.91	.14	1.50
Western Mindanao	56.43	60.77	1.97	18.54	22.23	3.66	8.20	10.47	3.77	14.12	11.14	9.42
Northern Mindanao	59.00	69.72	5.60	21.21	29.68	8.75	9.78	15.33	9.04	39.21	28.71	25.93
Southern Mindanao	59.63	63.45	2.14	21.07	24.38	3.83	9.79	11.81	3.78	17.05	13.71	11.52
Central Mindanao	51.22	68.01	7.75	16.36	26.18	9.93	6.81	12.74	10.18	51.07	27.71	23.03
Cordillera Autonomous Region	59.75	67.42	2.40	21.08	26.06	3.21	9.37	13.05	3.79	9.10	5.49	5.59
Population shifts										−10.93	−4.76	−3.34
Interaction effects										−6.20	−4.10	−3.58
National										100.00	100.00	100.00

erty increased significantly in all of the Mindanao regions. The headcount and poverty-gap indexes do not show any significant poverty increase in the Ilocos region, but the distribution-sensitive measure does show an increase.

III. Measuring the Impact of Policy Reforms on Poverty

As discussed earlier, typical components of adjustment programs are exchange rate realignment in the form of devaluation as well as elimination of food price subsidies and trade restrictions that distort efficient resource allocation. The need to restore balance in government budgets may also require similar elimination of price subsidies on utilities and basic social programs such as education, nutrition, and family planning. These changes affect households differently, depending on the importance of certain commodities in their consumption basket, on their physical and human endowments, and on their employment status as well as social circumstances at the time of the policy change. As shown in the preceding section and elsewhere, even among the poor, their economic and social circumstances are heterogeneous.[16]

In this section, I focus on the short-term poverty impact of commodity price changes arising from selected macroeconomic adjustment policies. An analysis of the long-run impact of the adjustment program, though likewise important, is not pursued here. I simply assume that the program's intent is to restore macroeconomic imbalances and bring the economy to a sustainable growth path, recognizing that certain policy measures that existed before the adjustment, including those affecting the poor directly, could not have been maintained indefinitely. I also assume that an adjustment program, if properly designed, need not increase poverty in the short run. This analysis, by focusing on the short-term effects of certain commodity price changes, provides fairly rich information useful in designing complementary policy measures intended to mitigate the short-term effects of price changes on the welfare of the poor at reduced fiscal and economic costs.

Practical Measurement of Welfare Change

Macroeconomic and computable general equilibrium models are appropriate for understanding the nature of relations between macro policies and the meso variables (factor and product prices, infrastructure, etc.) that determine the context in which households and production entities operate. These models, however, are typically too aggregated for poverty analysis. They are silent with respect to the human face of the poor (who they are, what their socioeconomic circumstances are, where they live, etc.). Available evidence indicates that, if true household income or expenditure is unobserved or can be obtained only at high costs, the efficiency of providing income transfers to the poor can be enhanced by employing household characteristics—such

as area of residence, educational attainment of the household head, occupation of household members, landholding class, or a combination of characteristics—as targeting indicators.[17] My approach builds on this aspect of the poverty-targeting literature by combining the wealth of information typically available in household surveys with the information on meso variables generated by macro models.

For reasons of practical measurement, I assume that household production and consumption decisions are separable and recursive; that is, production decisions concerning choice of production technology, crop mix, and input levels are made prior to consumption decisions. Households choose optimal bundles of consumption goods and services in order to maximize their well-being (i.e., utility), given their maximized profits in production, labor and rental incomes, and other fixed incomes. For producers whose incomes are directly affected by commodity price changes owing to policy reforms, their total household income is

$$y = \pi^*(V, F) + \Gamma, \tag{3}$$

where $\pi^*(\cdot)$ is the household's maximized variable profits from all production activities, $V = (P, W)$ is a vector of prices of outputs (P) and variable inputs (W), F is a vector of fixed inputs, and Γ is other incomes (assumed fixed). The output supply and factor demand functions are derived from $\pi^*(\cdot)$ via Shephard's lemma; that is, the vector of output (Y) and (negative) variable inputs ($-X$) is written as

$$Q = [Y, -X] = \frac{\partial \pi^*}{\partial V}. \tag{4}$$

Utilizing (4) and with little manipulation, the proportionate change in variable profit arising from proportionate changes in output and variable factor prices can be written as

$$\hat{\pi}^* = \frac{1}{\pi^*} \sum_{i=1}^{m} \left(\frac{\pi_i}{\alpha_i}\right) \left(\hat{P}_i - \sum_j b_{ij} \hat{R}_{ij}\right), \tag{5}$$

where the hat above a variable denotes proportionate change, π_i is initial variable profit (value added) from activity i, b_{ij} is the cost share of variable input j in activity i, and α_i is the ratio of value added to total cost.

In Section II, I have followed convention in using consumption per capita to distinguish the poor from the nonpoor households. I have not attempted to link this poverty indicator with the theoretical attraction of utility-based poverty measures. In this section, following

M. A. King, I base my poverty measures on distribution of equivalent income (also referred to as "money metric utility").[18] Changes in household welfare owing to price changes during adjustment are measured as changes in equivalent income.

Let the expenditure function of the household, which relates the minimum amount of money y^h required to obtain the utility level u^h, be $e(d^h,p^h,u^h)$, where d^h is a vector of household characteristics (e.g., family size and composition), and p^h is a vector of prices facing the household. Assuming strictly positive marginal utility of income (i.e., nonsatiation), this function can be inverted to give the indirect utility function $v(d^h,p^h,y^h)$ of the household. Then the equivalent income y_h^e is the amount required to obtain u^h at reference prices p^r and for household characteristics d^r:

$$\begin{aligned} y_h^e &= e(d^r, p^r, u^h) = e[d^r, p^r, v(d^h, p^h, y^h)] \\ &= f(d^r, p^r, d^h, p^h, y^h). \end{aligned} \tag{6}$$

Note that, since p^r and d^r are fixed for all households, y_h^e is an exact money metric of actual utility $v(\cdot)$; that is, y_h^e is an increasing monotonic transformation of $v(\cdot)$.[19] Notice too that, for the reference household, the equivalent income is equal to the money income. Finally, note that the equivalent income poverty line corresponding to the fixed utility level $\bar{u}$ can be defined readily as $e(d^r,p^r,\bar{u})$.

The form of the equivalent income function can be derived if one knows the specific functional form of the indirect utility function (or of the expenditure function). Thus, starting from any well-behaved demand model and household-level data on budget constraints and household characteristics, a distribution of equivalent incomes can be obtained. In this article, the familiar almost ideal demand system (AIDS) model is employed in deriving parameter estimates of consumer demand systems for the Philippines. Demand functions derived from this model are first-order approximations to any demand system derived from utility-maximizing behavior.[20]

The AIDS equations can be written as

$$w_i = \alpha_i + \sum_j \gamma_{ij} \log p_j + \beta_i \log\left(\frac{y}{P}\right), \quad i = 1, 2, \ldots, m, \tag{7}$$

where w_i is the budget share of commodity i, y is total nominal expenditures, and P is a cost-of-subsistence index defined by

$$\log P = \alpha_0 + \sum_j \alpha_j \log p_j + \frac{1}{2} \sum_i \sum_j \gamma_{ij} \log p_i \log p_j. \tag{8}$$

Following convention, I have used the Stone price index given by

$$\log P^* = \sum_k w_k \log p_k \tag{9}$$

as a reasonable approximation to (8). Then the corresponding expenditure function can be expressed as

$$\log c(u, p) = \log P^* + u \prod_j p_j^{\beta_j}, \tag{10}$$

from which the equivalent income function in (6) can be readily derived.

Adding-up and homogeneity restrictions implied by utility maximization require that $\Sigma_i \alpha_i = 1$ and $\Sigma_i \beta_i = \Sigma_i \gamma_{ij} = \Sigma_j \gamma_{ij} = 0$ (where all summations are over m goods). Symmetry of the Slutsky matrix requires that $\gamma_{ij} = \gamma_{ji}$. In my estimation of the linear approximate AIDS model, I have chosen to impose these restrictions.

For my purposes, I have classified expenditures into four groups: cereals, meat (broadly defined to include meat and dairy products, eggs, and fish), utilities (broadly defined to include fuel, light, water, and transportation and communication), and other expenditures. Data on expenditures were derived from the FIES for 1985 and 1988. Because the FIES data do not contain prices, price indexes for the various regions are used. The iterative Zellner estimation procedure is employed in obtaining efficient parameter estimates of the AIDS model.[21] The estimated model yielded an own-price elasticity of -0.703 for cereals, -0.954 for meat, -1.135 for utilities, and -0.782 for other expenditures.

Simulation Results

The macroeconomic model that I employ here is that of C. C. Bautista.[22] This model, specifically tailored for an analysis of the probable short-run impact of macroeconomic adjustment policies, allows a fairly disaggregated characterization of how the major agricultural sectors are likely to be affected by these policies. This feature is important to my analysis since, as shown above, agriculture contributes the largest sectoral share in aggregate poverty; it is also the sector that has contributed most to total poverty change from 1988 to 1991.

Typical components of an adjustment program are exchange rate realignment in the form of devaluation and a contractionary monetary

and fiscal policy. Table 8 shows part of the Bautista model's simulation results for (i) a devaluation alone and (ii) a combination of devaluation and contractionary monetary policy. The devaluation, as expected, tends to raise agricultural (as well as nonagricultural) prices. The contraction of money supply partially offsets the inflation effect of the devaluation.

Tables 9 and 10 present the implication of the two cases on poverty by sectors of employment.[23] In both cases, the net effect is an increase in aggregate poverty. The increases in poverty indexes are higher in the second case—a combination of devaluation and contractionary monetary policy—than in the first case, which involves only devaluation. Although commodity price increases have a welfare-reducing effect on households as consumers, these raise the incomes of the numerically large entrepreneurial self-employed households. The profit effects are much greater in the first case than in the second case, primarily owing to the larger price increases of commodities in the first case.

The patterns of change for the two cases are similar. Thus, only the case of devaluation is discussed further.

The impact of the devaluation on poverty, when viewed in terms of the head-count index, is greater for urban families than for rural families. Urban poverty, based on the head-count index, represents about one-half of the change in the national head-count index. On the

TABLE 8

SIMULATION RESULTS ON MESO VARIABLES BASED ON THE BAUTISTA MODEL

		PERCENT CHANGE	
	BASE*	i	ii
Policy:			
Exchange rate		5.00	5.00
Money supply		.00	−5.00
Results:			
Nonagricultural price	1.00	5.00	3.34
Agricultural price:			
Rice	5.14	4.01	3.56
Corn	2.73	5.38	4.85
Livestock	31.45	4.58	2.67
Coconut	15.40	5.74	6.60
Sugar	8.17	2.90	1.41
Fish	18.55	3.67	.73
Wheat	4.76	4.37	2.24
General price level	1.00	4.88	3.37

* Agricultural prices under base simulation are in pesos per kilogram.

TABLE 9

SHORT-RUN IMPACT ON POVERTY OF A 5% INCREASE IN EXCHANGE RATE

SECTOR OF EMPLOYMENT	PERCENTAGE POINT CHANGE			CONTRIBUTION TO TOTAL		
	Head-Count Index	Poverty-Gap Index	Distribution-Sensitive Measure	Head-Count Index	Poverty-Gap Index	Distribution-Sensitive Measure
National	1.90	1.08	.66	100.00	100.00	100.00
Rural	1.52	1.18	.79	49.36	67.52	73.49
Agriculture	.74	.99	.76	14.90	35.26	44.00
Mining	3.38	1.37	.85	.73	.53	.53
Manufacturing	2.48	1.72	1.10	3.53	4.33	4.51
Utility	5.79	1.31	.65	.57	.23	.18
Construction	4.16	2.24	1.27	4.68	4.44	4.07
Trade	2.63	1.67	.87	3.77	4.23	3.57
Transport	4.73	1.67	.87	5.54	3.46	2.91
Finance	.00	1.23	.69	.00	.43	.39
Services	2.90	1.24	.67	5.21	3.93	3.42
Others	2.15	1.25	.71	10.43	10.71	9.91
Urban	2.50	.91	.46	50.64	32.48	26.51
Agriculture	1.29	.94	.62	3.60	4.62	4.94
Mining	.00	1.48	.87	.00	.23	.22
Manufacturing	2.64	.89	.45	5.88	3.50	2.89
Utility	3.19	.18	.01	.39	.04	.01
Construction	1.92	1.26	.67	2.65	3.07	2.64
Trade	2.82	.93	.45	6.84	3.99	3.09
Transport	2.57	1.05	.46	4.76	3.44	2.45
Finance	.79	.53	.20	.57	.67	.41
Services	2.97	.85	.38	12.13	6.15	4.47
Others	3.03	.84	.41	13.82	6.77	5.39

TABLE 10

SHORT-RUN IMPACT ON POVERTY OF A 5% INCREASE IN EXCHANGE RATE AND A 5% DECREASE IN MONEY SUPPLY

SECTOR OF EMPLOYMENT	PERCENTAGE POINT CHANGE			CONTRIBUTION TO TOTAL		
	Head-Count Index	Poverty-Gap Index	Distribution-Sensitive Measure	Head-Count Index	Poverty-Gap Index	Distribution-Sensitive Measure
National	3.64	1.94	1.18	100.00	100.00	100.00
Rural	3.32	2.18	1.42	56.22	69.10	74.56
Agriculture	2.31	2.04	1.46	24.27	40.00	47.56
Mining	5.70	2.26	1.35	.65	.48	.48
Manufacturing	4.34	2.78	1.77	3.23	3.86	4.07
Utility	10.58	2.29	1.06	.54	.22	.17
Construction	6.23	3.61	2.06	3.65	3.96	3.73
Trade	5.38	2.74	1.43	4.02	3.84	3.32
Transport	9.40	2.82	1.43	5.74	3.22	2.71
Finance	.00	1.99	1.15	.00	.38	.37
Services	6.24	2.05	1.09	5.85	3.59	3.15
Others	3.26	2.01	1.15	8.26	9.55	9.02
Urban	4.14	1.56	.78	43.78	30.90	25.44
Agriculture	2.64	1.85	1.15	3.85	5.04	5.20
Mining	3.13	2.36	1.40	.14	.20	.20
Manufacturing	4.96	1.51	.75	5.77	3.28	2.71
Utility	5.05	.39	.04	.32	.05	.01
Construction	3.49	2.06	1.10	2.51	2.78	2.45
Trade	4.64	1.57	.74	5.87	3.72	2.91
Transport	3.90	1.75	.78	3.78	3.17	2.32
Finance	2.13	.89	.34	.81	.63	.40
Services	4.27	1.44	.64	9.09	5.72	4.21
Others	4.89	1.41	.68	11.64	6.30	5.03

other hand, when one takes into account the welfare deficits of the poor as well as the distribution of these deficits among them, the living standards of rural families are reduced disproportionately compared to those of urban families. Rural families, who made up 62% of the total population in 1988, would represent about three-fourths of the change in the national distribution-sensitive poverty index.

It is frequently claimed that because agriculture is largely tradable—more so than industry—a devaluation would have relatively large income effects for agricultural households. This should reduce poverty in the sector, even in the short run. Table 9 shows, however, that this may not necessarily be the case. Because the severity of poverty is greatest among the disproportionately numerous landless and small farmers who are net buyers of staples,[24] the overall net impact of price increase on the sector is an increase in the average poverty gap. On the basis of the distribution-sensitive measure, the contribution of agriculture to the change in the national distribution-sensitive index is about 50%. This result contrasts sharply with the implication of John Budd's study that commodity price increases arising from adjustment policies will have little effect on the economic welfare of poor farmers in Côte d'Ivoire.[25]

Table 11 further demonstrates the usefulness of household surveys, when combined with simulation outcomes on macro-meso relations, in characterizing the differential short-run impact of policy reforms on various groupings of households. In this table, households are reclassified according to the type of work of the household head. The self-employed workers figure dominantly as the largest block of workers—they represent about 41% of all workers—who would be adversely affected by the devaluation, at least in the short run. In both urban and rural areas, they represent about two-thirds of the change in the national distribution-sensitive index. Note, however, that the urban workers employed in private firms represent about 35% of the change in the national head-count index, although this group accounts for only 15% of the total number of workers in the population. The rural workers employed in private firms—also representing about 15% of the population—are poorer than their counterparts in urban areas; hence their contribution to the change in the national poverty gap is higher (32%).

Notice that workers in government and government corporations account for only 7% of the total number of workers in the population. The majority of them work in urban areas; their average poverty is less severe than that for other types of workers. Thus, government workers represent only about 5% of the national distribution-sensitive measure. It thus appears that, as part of an effort to reduce fiscal deficits, the retrenchment of workers in unproductive sectors of gov-

TABLE 11

SHORT-RUN IMPACT ON POVERTY OF A 5% INCREASE IN EXCHANGE RATE BY CLASS OF WORKER

SECTOR OF EMPLOYMENT	POPULATION SHARE	PERCENTAGE POINT CHANGE			CONTRIBUTION TO TOTAL		
		Head-Count Index	Poverty-Gap Index	Distribution-Sensitive Measure	Head-Count Index	Poverty-Gap Index	Distribution-Sensitive Measure
Rural:							
Worker in private firms	14.39	2.02	1.61	1.10	24.88	31.52	33.97
Government worker	2.59	2.39	1.02	.50	5.29	3.61	2.76
Self-employed	32.17	.98	1.06	.76	26.90	46.52	52.37
Employer in family business	3.02	2.24	.37	.15	5.77	1.50	.97
Worker in family business	.17	2.09	.61	.59	.31	.15	.22
Urban:							
Worker in private firms	14.53	2.81	1.09	.54	34.97	21.57	16.77
Government worker	4.52	1.37	.56	.22	5.32	3.44	2.14
Self-employed	9.23	2.10	.94	.53	16.61	11.86	10.48
Employer in family business	1.41	1.94	.34	.16	2.34	.65	.48
Worker in family business	.10	5.72	.92	.36	.48	.12	.08

ernment is not tantamount to a substantial increase in aggregate poverty.

Table 12 presents simulation results for a 20% increase in the price of utilities (defined broadly to include fuel, light, water, communication, and transport). It is not surprising, given the relatively small share of utilities in the total consumption expenditures of poor households, that the increase hardly makes a dent in both the national poverty-gap and the distribution-sensitive indexes. The increase in the head-count index for rural households in construction, transport, and finance is relatively high, but these households represent only about 7% of the total population. Note, too, that the overall poverty effects of the price increase are lower for urban households than for rural households. The latter contribute about three-fourths of the overall increase in national poverty gap. Overall, the result suggests that adjustment programs involving removal of subsidies in power, fuel, water, and transport are not likely to have significantly adverse immediate effects on the welfare of the large majority of the poor.

IV. Concluding Remarks

Aggregate poverty increased significantly during the economic downturn from 1988 to 1991. During this period, the growth of GDP per capita dropped from 3.8% in 1988 to −3.2% in 1991. The two available household surveys—the 1988 and 1991 FIES—covering this period indicate that, for the Philippines as a whole, the average standard of living (as indicated by mean consumption per capita) increased only modestly. But even this modest increase would have reduced the average poverty gap of the population by approximately 9% if the increase was distributionally neutral. Indeed, the observed increase in poverty during this period is attributable mainly to intrasectoral deterioration in the distribution of living standards.

What is even more remarkable is the large variation in the relative importance of distributional effects across locations and sectors of employment. Future research could substantially improve understanding of the process of poverty alleviation in LDCs by looking more closely into the social and economic aspects of household income determination, particularly in rural areas where most of the poor are located.

The short-run effect of commodity (particularly food) price increases that may accompany an adjustment program is an increase in aggregate poverty, even within the agricultural sector. Particularly vulnerable are the numerically large small agricultural producers and landless workers who are net buyers of food. Taking into account the extent of deprivation of living standards, agricultural households can contribute nearly one-half of the change in aggregate poverty due to commodity price increases. Taking all rural households together, the

TABLE 12

SHORT-RUN IMPACT ON POVERTY OF A 20% INCREASE IN THE PRICES OF UTILITIES

SECTOR OF EMPLOYMENT	PERCENTAGE POINT CHANGE			CONTRIBUTION TO TOTAL		
	Head-Count Index	Poverty-Gap Index	Distribution-Sensitive Measure	Head-Count Index	Poverty-Gap Index	Distribution-Sensitive Measure
National	1.34	.65	.40	100.00	100.00	100.00
Rural	1.44	.80	.51	66.45	75.27	79.87
Agriculture	1.26	.86	.58	35.83	50.25	56.35
Mining	1.99	.49	.32	.61	.31	.34
Manufacturing	1.46	.78	.50	2.95	3.23	3.40
Utility	.00	.48	.21	.00	.14	.10
Construction	3.84	1.01	.56	6.12	3.28	3.02
Trade	1.00	.77	.40	2.04	3.21	2.72
Transport	2.41	.64	.34	4.01	2.17	1.91
Finance	.00	.58	.36	.00	.33	.33
Services	2.13	.52	.28	5.42	2.74	2.43
Others	1.38	.68	.40	9.47	9.60	9.26
Urban	1.17	.42	.21	33.55	24.73	20.13
Agriculture	1.32	.62	.37	5.23	5.03	4.91
Mining	.00	.61	.35	.00	.16	.15
Manufacturing	.83	.38	.19	2.61	2.45	2.02
Utility	.00	.05	.01	.00	.02	.00
Construction	.90	.56	.30	1.76	2.26	1.96
Trade	1.37	.42	.19	4.71	2.94	2.25
Transport	1.11	.43	.18	2.92	2.29	1.62
Finance	.00	.24	.08	.00	.51	.29
Services	.94	.36	.16	5.45	4.27	3.04
Others	1.68	.36	.18	10.88	4.81	3.91

contribution can rise to nearly three-fourths of the change in aggregate poverty. This result is consistent with the observed increase in poverty, especially in rural areas from 1988 to 1991, following the devaluation in late 1990 and a period of rapid inflation. Note, however, that partly contributing to the increase was the cyclical downturn that was going to happen whether or not there was a devaluation.

The removal of price subsidies on fuel, light, water, and transport is unlikely to adversely affect the picture of aggregate poverty in the short term, largely because of the small share of these goods and services in the budget of poor households. Yet recent policy discussions in the Philippines and elsewhere have given much attention to providing subsidies on these goods and services, especially during macroeconomic adjustment.

Estimates of the impact on poverty of certain adjustment policies may be sensitive to the way the macroeconomy is modeled. In particular, the way the labor market is assumed to respond to adjustment policies may substantially influence the poverty and distributional effects of adjustment policies.[26] The direct welfare effects of devaluation, for example, on net consumers and producers of the goods in question may be more rapid if there is sluggishness in labor market adjustment. Allowing for greater flexibility in the labor market than is assumed in this article may reveal a different picture of poverty in the Philippines during an adjustment period. Unfortunately, little is known empirically about the dynamics of labor market adjustment in LDCs such as the Philippines.[27] Surely, this is an area of research that deserves more attention than it is presently given in the development literature. Given this limitation, the simulation results in this article should be viewed as providing only an idea of the probable short-term impact of certain adjustment policies.

Household targeting is a key element in providing safety nets to the poor at reduced fiscal and economic costs. This would reduce benefit leakages to the nonpoor households. Ideally, targeting would be based on incomes or consumption of households adjusted for size and composition. However, it is seldom the case that reliable estimates of household incomes are available. Efforts to periodically obtain such estimates for tens of thousands, or even millions, of households are extremely expensive and often impossible. The acquisition of this information can easily raise the administrative costs of income transfers, and such costs may outweigh the savings from reducing leakages to the nonpoor households. Moreover, these costs may add severely to the budget-deficit problem, which may have been partly the raison d'être for an adjustment program.

Thus, other targeting mechanisms, albeit not perfect, may have to be relied on or may have to complement household incomes. These may include targeting by geographical unit, employment status, occu-

pation of household members, landholding class, nutritional status of household members, or season of the year (say, in periods where seasonal fluctuations severely limit the ability of poor households to acquire sufficient food). Available evidence indicates that, when information is costly to acquire, these mechanisms may be superior to targeting by household income or to a case where transfers are untargeted. As a general rule, targeting approaches that contradict household behavior the least are most likely to be successful in achieving income transfer or nutrition goals, given the government outlay for safety nets. Two examples that meet this rule are subsidies on food less preferred by rich households, and rural work programs with offered wages lower than minimum (legislated) wages and those prevailing in the formal labor market. In the latter example, only poor workers who need work the most are likely to seek employment in rural work programs.

Notes

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1. This view is exemplified by Giovanni A. Cornia, Richard Jolly, and Frances Stewart, eds., *Adjustment with a Human Face: Protecting the Vulnerable and Promoting Growth* (Oxford: Oxford University Press, 1987). See also David Woodward, *Debt, Adjustment and Poverty in Developing Countries* (London: Pinter Publishers in association with Save the Children, 1992), for a discussion of this view as well as the conventional view often associated with the World Bank and International Monetary Fund.

2. Erik Thorbecke, in "Adjustment, Growth and Income Distribution in Indonesia," *World Development* 19 (November 1991): 1595–1614, shows that the adjustment package was successful in restoring internal and external equilibrium without worsening the distribution of income. See also Monika Huppi and Martin Ravallion, "The Sectoral Structure of Poverty during an Adjustment Period: Evidence for Indonesia in the Mid-1980s," *World Development* 19 (December 1991): 1653–78.

3. See T. N. Srinivasan, "Structural Adjustment, Stabilization, and the Poor," EDI Working Papers (World Bank, Washington, D.C., 1988); Jere R. Behrman, "Macroeconomic Policies and Rural Poverty: Issues and Research Strategies" (paper prepared for the Asian Development Bank Project on Priority Issues and Policy Measures to Alleviate Rural Poverty, Asian Development Bank, Manila, September 1990); and Vittorio Corbo and Stanley Fischer, "Adjustment Programs and Bank Support: Rationale and Main Results," Country Economics Department WPS 582 (World Bank, Washington, D.C., 1991).

4. Arsenio M. Balisacan, "Rural Poverty in the Philippines: Incidence, Determinants and Policies," *Asian Development Review* 10 (1992): 125–63.

5. There is extensive discussion in the literature on aggregate poverty measurement. See, e.g., A. B. Atkinson in "On the Measurement of Poverty," *Econometrica* 55 (July 1987): 749–64.

6. James E. Foster, Joel Greer, and Erik Thorbecke, "A Class of Decomposable Poverty Measures," *Econometrica* 52 (May 1984): 761–66.

7. James E. Foster and Anthony F. Shorrocks, in "Subgroup Consistent Poverty Measures," *Econometrica* 59 (May 1991): 687–709, characterize the class of subgroup consistent poverty indexes.

8. Martin Ravallion and Monika Huppi, "Measuring Changes in Poverty: A Methodological Case Study of Indonesia during an Adjustment Period," *World Bank Economic Review* 5 (1991): 57–82.

9. The evidence was based on reconstructed Labor Force Survey data since there were no available FIES data between 1971 and 1985. For details of the estimation, see Arsenio M. Balisacan, "Rural Performance and Agricultural Growth: A Philippine Perspective" (paper presented at the First Conference of the Asian Society of Agricultural Economists, Ansung, Korea, August 1993).

10. In health, e.g., the public delivery system emphasized hospital-based curative care, which was largely inaccessible to low-income households because of its prohibitive costs. See Alejandro N. Herrin, "An Assessment of Population, Health, and Education Policies in the Philippines, 1986–1988," Working Paper Series, no. 90-10 (Philippine Institute for Development Studies, Makati, 1990).

11. For recent critical assessments of the Philippine economy, see Paul R. Krugman et al., *Transforming the Philippine Economy* (Makati: NEDA/UNDP, 1992); Mario B. Lamberte et al., *Philippine External Finance, Domestic Resource Mobilization and Development in the 1970s and 1980s* (Makati: Philippine Institute for Development Studies and Institute of Social Studies, 1992); and Emmanuel S. de Dios and Associates, *Poverty, Growth and the Fiscal Crisis* (Makati: Philippine Institute for Development Studies and International Development Research Center, 1993).

12. The share of "other sectors" in total population is overblown owing to the clustering of families whose occupations were not declared in this category.

13. The same order of magnitude is obtained for the correlation of sectoral per capita income and poverty incidence.

14. For a discussion of methodology on measuring separately the impact of changes in average income and income inequality on poverty, see Nanak Kakwani, "Poverty and Economic Growth with Application to Côte d'Ivoire," *Review of Income and Wealth* 39 (June 1993): 121–39.

15. Arsenio M. Balisacan, "The Human Face of Poverty during a Period of Macroeconomic Adjustment," in *Perspectives on Philippine Poverty*, by Arsenio M. Balisacan et al. (Quezon City: University of the Philippines Center for Integrative and Development Studies, 1993).

16. See Balisacan, "Rural Poverty" (n. 4 above), and "Urban Poverty in the Philippines: Nature, Causes, and Policy Measures," *Asian Development Review* 12 (1994): 117–52. For an international perspective on the characteristics of poverty, see Michael Lipton and Martin Ravallion, "Poverty and Policy" (paper presented at the First Asian Development Bank Conference on Development Economics, Manila, October 1992); and M. G. Quibria and T. N. Srinivasan, "Introduction," in *Rural Poverty in Asia: Priority Issues and Policy Options*, ed. M. G. Quibria (Oxford: Oxford University Press, 1993).

17. See, e.g., Kakwani; Martin Ravallion, "Poverty Alleviation through Regional Targeting: A Case Study for Indonesia," in *The Economics of Rural Organization: Theory, Practice, and Policy*, ed. Karla Hoff, Avishay Braverman, and Joseph E. Stiglitz (Oxford: Oxford University Press for the World Bank, 1993); and S. M. Ravi Kanbur, "Structural Adjustment, Macroeco-

nomic Adjustment and Poverty: A Methodology for Analysis," *World Development* 15 (1987): 1515–26.

18. Mervyn A. King, "Welfare Analysis of Tax Reforms using Household Data," *Journal of Public Economics* 21 (1983): 183–214.

19. For most purposes, the choice of reference prices and household characteristics is arbitrary.

20. Angus Deaton and John Muellbauer, "An Almost Ideal Demand System," *American Economic Review* 73 (1980): 312–26.

21. See Arsenio M. Balisacan, "Parameter Estimates of Consumer Demand System in the Philippines" (paper prepared for the Technical Change in Agriculture, Income Distribution and Economic Policy in the Philippines Project, supported by the Australian Centre for International Agricultural Research, Canberra, 1992).

22. Carlos C. Bautista, "Microeconomic Impact of Macroeconomic Stabilization and Exchange Rate Policies on Agriculture: The Case of the Philippines" (paper prepared for the Food and Agriculture Organization of the United Nations and the Philippine Department of Agriculture, Quezon City, 1992).

23. The household data set used is the 1988 FIES.

24. Arsenio M. Balisacan, "Agricultural Growth, Landlessness, Off-Farm Employment, and Rural Poverty in the Philippines," *Economic Development and Cultural Change* 41 (April 1993): 533–62.

25. John W. Budd, "Changing Food Prices and Rural Welfare: A Nonparametric Examination of Côte d'Ivoire," *Economic Development and Cultural Change* 41 (April 1993): 587–602.

26. On this issue, see Lionel Demery and Tony Addison, "The Impact of Macroeconomic Adjustment on Poverty in the Presence of Wage Rigidities," *Journal of Development Economics* 40 (1993): 331–48; and Behrman (n. 3 above).

27. An important contribution toward this understanding is that by James K. Boyce and Martin Ravallion, "A Dynamic Econometric Model of Agricultural Wage Determination in Bangladesh," *Oxford Bulletin of Economics and Statistics* 53 (November 1991): 361–76.