Discussion Paper No. 9207 September 1992

THE POOR DURING A PERIOD OF MACROECONOMIC ADJUSTMENT: THE PHILIPPINE CASE

by

Arsenio M. Balisacan

The Poor During a Period of Macroeconomic Adjustment: The Philippine Case

Arsenio M. Balisacan

School of Economics
University of the Philippines

Abstract

The first part of the paper describes the character of poverty alleviation during the second half of the 1980s. It shows that much of the (limited) poverty alleviation achieved during this period is attributable to intrasectoral improvement in the distribution of living standards. The relative importance of distributional effects varies substantially across locations and sectors of employment. In agriculture, where nearly two-thirds of the total poverty are found, the average proportionate increase in the incomes of the poorest 40 percent of the population was substantially higher than the average for the total population.

The second part employs a simulation analysis to assess the probable short-run impact on poverty of certain structural adjustment policies. The analysis combines the wealth of information available in household surveys with the information on changes in meso variables (e.g., product and factor prices) generated from a macroeconomic model. It is shown that aggregate poverty may increase during the transition to sustainable growth. Particularly vulnerable are the numerically-large small agricultural producers and landless workers who are net buyers of food. This suggests that the provision of safety nets to the poor during an adjustment period must go beyond the urban sector to include as well the adversely affected households in rural areas.

The Poor During a Period of Macroeconomic Adjustment: The Philippine Case

1. Introduction

Concerns have been raised in discussions of development policy that macroeconomic adjustment programs do not have a "human face." The programs are thought to have focused on promoting economic efficiency and bringing an economy to a stable and sustainable growth path, but have neglected poverty and social concerns (Cornia *et al.*, 1987). In particular, it is claimed that the poor have disproportionately born the pain of transitional costs of adjustment, especially when the transition has been longer than initially expected. Thus, many observers call for the inclusion of these concerns in adjustment programs, not merely as complementary (and sometimes conflicting) measures but as equally central component of any adjustment program.

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 anti-poor, even in the short run, also exist (see, e.g., Behrman, 1990). Indonesia's experience with adjustment in the 1980s, for example, appears to be one such case. 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 (Srinivasan, 1988; Behrman, 1990; Corbo and Fisher, 1991).

Adjustment policies affect households, both rich and poor, through any one of the three avenues: (1) changes in the prices of goods and services consumed by households; (2) changes in employment status as well as returns to production factors owned by households; and (3) changes in transfers, both public and private, and in the provision of public services to households. Changes in the prices of goods and services are often the most disruptive effect of an adjustment program, especially on the poor. This may require the withdrawal of government subsidies on basic food items as well as nonfood goods and services (e.g., petroleum and electricity). Exchange rate realignment in the form of devaluation, which often accompanies an adjustment program, also raises the prices of tradable goods, including food, consumed by households.

The changes in profit incentives induced by the adjustment program may have high transition costs for wage earners and self-employed workers. The adjustment program's objective of promoting economic efficiency may require the dismantling of tariff and nontariff barriers enjoyed by import-substituting industries. The program may also require the trimming of excess fat in the government bureaucracy. The degree of labor mobility partly determines the extent of the fall in the welfare of workers during the adjustment period. Finally, changes in the provision of public services as well as public transfers are a common feature of adjustment programs. Public funds for health, nutrition, education, family planning, and basic infrastructure (e.g., rural roads, power

and communication, electricity generation) may be reduced as part of an overall effort to reduce the government deficit.

The lack (or the poor quality) of data -- especially on social and human development indicators -- in LDCs, including the Philippines, hampers the analysis of the link between adjustment policies and poverty alleviation. Moreover, because the transition in many countries is an on-going process, the impact of the adjustment is still in the making. Thus, available information tells 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. Specifically, the economywide 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 modelling 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 paper 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 run impact of certain policy reforms on household welfare. The focus is on the character of poverty, especially rural poverty which contributes the bulk of total poverty in the Philippines, during the second-half of the 1980s. This period saw major policy and institutional reforms -- especially those affecting agriculture -- as well as changes in the external environment. The period

also marked a recovery of economic growth after a period of severe economic contraction, although the growth proved to be unsustainable.

The analysis uses simulation results of a macroeconomic model designed for analyzing the short run impact of macroeconomic reforms, as inputs into a household model designed for poverty analysis. The household 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 macro or CGE models alone. Such information can be extremely useful for efficient targeting of scarce resources to the poor.

The next section 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 during the second half of the 1980s. The third section provides the framework underlying the welfare analysis of certain policy reforms and discusses the results of simulation exercises. Finally, the fourth section, discusses some implications for poverty alleviation during an adjustment period.

2. Measurement and Characteristics of Poverty Alleviation

2.1 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 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 percent in 1961 to 19 percent in 1985 and 16 percent in 1988 (Balisacan, 1992b). The proportion of families reporting remittances, support assistance and relief increased from 22 percent in 1961 to 88 percent in 1985.

In this paper, we use per capita consumption as an indicator of the welfare levels of households. The 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 they belong (or what is often referred to as participation standard). For practical purposes,

we have adopted the NEDA-FNRI-NSO technical working group's estimates of poverty lines for 1985. These estimates cover the country's 13 regions subdivided into rural and urban areas. Although still imprecise, these estimates take into account regional price differences and consumption patterns (and thus avoid a major shortcoming of previous poverty studies).

Poverty assessment also requires a procedure of bringing together the data on the poor into an overall measure of poverty. While there remains unsettled issues in this area, most researchers agree that a list of desirable properties of an aggregate measure of poverty would have to include the so-called monotonicity, transfer, and subgroup consistency axioms. The first axiom states that, given other things, a reduction in the income of a poor household must increase the poverty measure. The second axiom simply says that, given other things, a pure transfer of income from a poor household to any other household that is richer must increase the poverty measure. Finally, the third axiom states that, all other things equal, the overall level of poverty must fall whenever poverty decreases within some subgroup of the population and is unchanged outside that group. Although these properties appear to be simple, they are often violated by many of the poverty indices suggested in recent years.[1]

A class of poverty measures which we employ here is that proposed by Foster, Greer, and Thorbecke (1984). This is given by:

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

where z is the per capita poverty line, y_i is the per capita consumption of family i, n_i is family size, q is the number of poor families (having consumption no greater than or equal to z), n is the total number of persons in the population, 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 among 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 $\alpha = 0$, (1) is simply the proportion of the population with a standard of living below the poverty line. This index fails the monotonicity axiom: A poor person may become poorer but measured poverty will remain the same. It also fails the transfer axiom: An income transfer from a person below the poverty line to one above it does not change measured poverty.

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. The index is sensitive to the *depth* of poverty, thereby satisfying the monotonicity axiom, but, because the poverty deficits are weighted equally, it is not sensitive to the *distribution* of living standards among the poor. It thus fails the transfer axiom.

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 (1) is then

simply the mean of the squared poverty deficits. This index, hereafter referred to as distribution-sensitive measure, satisfies all the above axioms for a desirable summary measure of poverty.

All members of the P_α poverty measures have the desirable property of subgroup consistency. 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 our purposes. For example, for a policy change that increases the incomes of group *i* and reduces those of group *j*, we 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 Ravallion and Huppi (1991), we 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. 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:

$$
\begin{aligned}
P_\alpha^t - P_\alpha^{t-1} \;=\; & \sum_{i=1}^{m} \left(P_{\alpha,i}^t - P_{\alpha,i}^{t-1}\right) s_i^{t-1} && \text{[intrasectoral effects]} \\
& + \sum_{i=1}^{m} \left(s_i^t - s_i^{t-1}\right) P_{\alpha,i}^{t-1} && \text{[population shifts]} \qquad (2) \\
& + \sum_{i=1}^{m} \left(P_{\alpha,i}^t - P_{\alpha,i}^{t-1}\right)\left(s_i^t - s_i^{t-1}\right) && \text{[interaction effects]}
\end{aligned}
$$

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.

2.2 Data

The 1985 and 1988 rounds of the *Family Income and Expenditure Survey* (FIES) comprise the data base for the analysis. The lack of reliable surveys for the 1970s and early 1980s compels us to limit the analysis to these two years. To be sure, surveys were undertaken in 1975 and 1979, but these were not published due to some technical problems, one of which was the implausibility of the data generated arising from

substantial underrepresentation of certain groups of households (e.g., wealthy households in plush subdivisions).

Both the 1985 FIES and the 1988 FIES have sample sizes which are deemed sufficient to provide reliable estimates of household incomes and expenditures at the regional and national levels. The 1985 survey covers 17,495 households, while the 1988 survey encompasses 19,897 households. The change in the sample size reflects the increase in the total number of households listed in the sample barangays, which is based on "Listing of Households" operation conducted early in 1988. The questionnaire design, content, and reference periods for the two surveys are generally comparable.

A worrying aspect of the FIES data is that estimates of average family income and expenditures for both 1985 and 1988 are lower than those implied by the National Income Accounts (NIA). We do not know which is closer to the truth. We note, however, that the growth rates of expenditures per capita implied in both the FIES and the NIA are about equal. This is significant since our main interest is in the changes in poverty and income distribution during this period.

2.3. Characteristics of Poverty Alleviation in the Second Half of the 1980s

That sustained poverty alleviation requires no less than sustained, rapid growth of income and employment is a widely accepted premise. The Philippines' overall economic performance during the 1980s was dismal, both in relation to the 1960s and

1970s and 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 percent. While open unemployment remained relatively low at an average of 6.2 percent, underemployment was high, averaging 17 percent of the labor force. Real wages fell for the most part of the 1970s and 1980s. The economic recovery in the second half of the 1980s -- per capita GDP grew at annual average of 3.4 percent -- proved to be short-lived. By the turn of the 1990s, the growth of per capita GDP was virtually nil. The end of the recovery was precipitated by specific adverse shocks, including the loss of confidence following the coup attempt in December 1989, the earthquake in July 1990, the Mt. Pinatubo eruption in June 1991, and the Middle East crisis in late 1990. Students of Philippine economic development contend that, even without these shocks, the economy was fast approaching a crisis.[2] The main culprit was domestic economic structures and policies which 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 has changed during the unsustained upturn of economic activity in the second half of the 1980s.

Based on the FIES data, the change in average real consumption per capita in the Philippines between 1985 and 1988 was virtually nil, although this was significant (at 5 percent level) for rural households (Table 1). On the other hand, average real income per capita increased by 12 percent during the 3-year period. The increase was statistically significant for both rural and urban households.

Despite the virtual stagnation of mean consumption per capita, all poverty indices show a significant decline during the period. The head count index fell from about 68 percent to 63 percent while the distribution-sensitive measure dropped from 14 to 11 percent.[3] 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 an improvement in the command of the poor over resources. This could have come from several factors. For one thing, the inflation rate dropped from 18 percent in 1985 to 9 percent in 1988, possibly benefiting the majority of the poor who tend to be fixed-income earners and subsistent self-employed workers. For another, as we shall see below, in sectors where most of the poor are found, the increase in mean consumption appears to have been accompanied by improvement in the size distribution of consumption.

Poverty incidence in rural areas is higher than in urban areas. Poverty reduction in rural areas account for about two-thirds of the observed reduction in national poverty between 1985 and 1988. For both rural and urban areas, intrasectoral gains capture almost all the observed reduction in national poverty. The contribution of population shifts to aggregate poverty alleviation is nil owing to the virtual absence of change in population shares for urban and rural areas.

Because intrasectoral gains account for almost all of the observed aggregate poverty alleviation, it is useful to look further into the characteristics of poverty for various population groups. The sectoral employment of the household head is one useful way of disaggregation. Table 2 shows the changes in mean expenditures and mean

incomes per capita by sector of employment.[4] Table 3 presents the corresponding changes in sectoral poverty incidence as well as the contribution of each sector to aggregate poverty reduction.

There are substantial differences in mean consumption per capita (as well as mean income per capita) across sectors. Agriculture-dependent households (including those residing in urban areas), which accounted for about 44 percent of the total population, had the lowest average consumption per capita as well as the lowest average income per capita. The mean consumption per capita of rural households in agriculture was only 40 percent of the mean for all urban households. Urban households in finance and utility, which represented barely two percent of the population, had the highest average consumption and income. Their average consumption per capita was about four-fold higher than their counterpart in agriculture.

The change in mean consumption per capita between 1985 and 1988 is insignificant in all sectors, except in agriculture. Although the three-year growth rates of mean income per capita and (to a limited extent) consumption per capita are considerably high for a number of sectors, standard deviations in these sectors are likewise high. The only sectors that experienced a decline in mean consumption and mean income per capita were mining, urban manufacturing and construction, and rural transport, although the decline was insignificant. The combined share of these sectors in total population was about 15 percent in 1988. On the other hand, considering agriculture's relatively large share in total population and that its size distribution of total household income is less unequal than that of urban nonagriculture (Balisacan, 1992a),

the impact of the increase in mean consumption in agriculture on sectoral poverty (as well as aggregate poverty) is expected to be large.

In contrast to the generally insignificant change in mean consumption per capita, poverty gains are observed in almost all sectors between 1985 and 1988 (Table 3). Even for urban households in manufacturing and construction where mean consumption per capita fell during the period, the reduction in poverty is significant, especially for poverty indices that take into account the welfare deficits of the poor. Poverty gains in agriculture accounted for about 37 percent of the total reduction in the national head count index. The sector's contribution was even higher (at approximately 51 percent) if one takes into account the depth of poverty as well as the distribution of consumption (income) among the poor. The average consumption deficit of the poor in agriculture was about 40 percent of the poverty line. This was about 10 percent higher than the poverty deficits of the poor in urban nonagricultural sector.

Tables 2 and 3 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 1985 and 1988 estimates is -0.67 for the head count index, -0.53 for the poverty gap index, and -0.47 for the distribution-sensitive measure.[5] The rates of change in mean consumption per capita across sectors are also negatively correlated with the rates of change in the head count index ($r=-0.56$). However, the rates of change in the means are weakly correlated with the poverty measures that are sensitive to the welfare deficits -- as well as the distribution of these deficits -- of the poor ($r=-0.103$ for the distribution-sensitive measure). This implies that the sectors experiencing the more rapid rates of

income growth were not the sectors which had the highest average poverty deficits (expressed in proportion to the sector's population), although they were the sectors with the highest proportion of poor households. Nor were the poorly performing sectors in terms of income growth the ones which had the lowest average poverty deficits, although they were the ones which had the highest proportion of poor households.

These results suggest that the distributional effects within sectors were important to the sectoral pattern of poverty alleviation. Table 4 shows the extent by which these distributional effects can account for the observed sectoral poverty alleviation. 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. The second column presents the rates of change in sectoral poverty gaps that are associated with distributionally neutral growth, given the observed rates of change in mean consumption per capita between 1985 and 1988. The third column reproduces the rates of change in poverty gaps shown in Table 3. The last column provides the proportion of the observed poverty alleviation that can be accounted for by distributionally neutral growth.

Clearly, distributionally neutral growth accounts for only 40 percent of the observed aggregate poverty alleviation during the period. In rural areas, this contribution was 46 percent, while that in urban areas was 44 percent. In 6 of the 20 cases -- rural and urban mining, rural transport, urban manufacturing, urban utility, and urban construction -- poverty would have increased if the (negative) growth had been distributionally neutral, while it actually decreased. In these cases, over 100 percent of the poverty alleviation is attributable to improved distribution within the sector. On the

other hand, in rural utility and urban trade and finance, poverty would have decreased faster than the actual rate of poverty alleviation if the rapid growth were distributionally neutral. What is remarkable, however, is the large variation in the relative importance of distributional effects across sectors of employment.

Table 5 displays even more clearly the sources of poverty alleviation in agriculture. The proportionate changes in the real incomes of the bottom two quintiles (poorest 40 percent) of the population in agriculture were substantially higher than those for the top (richest 20 percent) of the population. Entrepreneurial incomes accounted for about one-half of the total income of the poor, and these increased by 38 percent for the poorest 20 percent and by 29 percent for the next poorest 20 percent from 1985 to 1988. In contrast, entrepreneurial incomes increased by only 4 percent for the richest 20 percent of the population. Note that this period was marked by substantial deregulation of agricultural markets, particularly in coconuts, sugarcane, and, to some extent, grains. The period also saw the recovery of world market prices for sugarcane and coconut products. In real terms, farmgate prices rose by an annual average of 13 percent for coconut and by 16 percent for sugarcane. It thus appears that the deregulation favorably affected small farmers, thereby casting doubt on the claim of deregulation critics (see, e.g., Ofreneo, 1987) that this did not benefit the agricultural sector, particularly the small farmers.

Wages and salaries accounted for about 20 percent of the incomes of the poorest 20 percent of agricultural households. From 1985 to 1988, these incomes increased by 46 percent for the first (poorest) quintile and by 18 percent for the second quintile.

The increase for the fifth quintile was similarly high (38 percent). Note that during this period agricultural real wages increased by 7 percent, a reversal from their falling trends in the first half of the 1980s.

Tables 6 and 7 show the regional dimension of poverty alleviation during the recovery period. As in sectors of employment, regional mean consumption per capita did not significantly change during the period. (Significant increases in mean income per capita occurred only in rural areas of Eastern Visayas and Northern Mindanao and in urban areas of Western Mindanao.) Nonetheless, in most regions, poverty was either significantly reduced or statistically remained the same. The exception is the urban areas of Cagayan Valley where all poverty indices significantly rose. Again, notice the varied picture depicted by the different poverty indices. The head count index, for example, does not show any significant poverty alleviation in rural areas of Ilocos Region, Central Luzon, and Bicol Region, but the distribution-sensitive measure does show.

3. 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 (Balisacan, 1992a), even among the poor, their economic and social circumstances are heterogeneous. We focus on the poverty impact of commodity price changes arising from selected macroeconomic adjustment policies.

3.1 Practical Measurement of Welfare Change

Macroeconomic and CGE 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 (Kakwani, 1990b; Ravallion, 1989). Our 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, we assume that household production and consumption decisions are separable and recursive, i.e., 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 $\pi^*(.)$ 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 a vector of other incomes (assumed fixed). The output supply and factor demand functions are derived from $\pi^*(.)$ 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

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

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, α_i is the ratio of value added to total cost.

In section II, we have followed convention in using consumption per capita to distinguish the "poor" from the "nonpoor" households. We have not attempted to link this poverty indicator with the theoretical attraction of utility-based poverty measures. In this section, instead of using consumption per capita, we base our poverty measures on distributions of money metric utility or "equivalent income."[6] 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 $y^e{}_h$ is the amount required to obtain u^h at reference prices p^r and for household characteristics d^r:

$$y_h^e = e(d^r, p^r, u^h) = e\left(d^r, p^r, v\left(d^h, p^h, y^h\right)\right) = f\left(d^r, p^r, d^h, p^h, y^h\right) \quad (6)$$

Note that, since p^r and d^r are fixed for all households, y^e_h is an exact money metric of actual utility v(.), i.e., y^e_h is an increasing monotonic transformation of v(.). (For most purposes, the choice of reference prices and household characteristics is arbitrary.) 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 paper, Deaton and Muellbauer's (1980) almost ideal demand system (AIDS) model is employed in deriving parameter estimates of consumer demand systems for the Philippines. The demand functions derived from this model are first-order approximations to any demand system derived from utility-maximizing behavior.

The system of AIDS demand equations can be written as

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

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

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

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

$$\log P^* = \sum_k w_k \log p_k \qquad (9)$$

as a reasonable approximation to (8). Then we can express the corresponding expenditure function as

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

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 our estimation of the "linear approximate" AIDS model we have chosen to impose these restrictions.

The γ_{ij} parameters measure the change in the ith budget share following a proportional change in p_j with (y/P) constant. The β_i parameters, on the other hand, indicate whether the goods are necessities or luxuries. With $\beta_i > 0$, w_i increases with m so that commodity i is a luxury; with $\beta_i < 0$, commodity i is a necessity.

For our purposes, we 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 indices for the various regions are used. The iterative Zellner estimation procedure is employed in obtaining efficient parameter estimates of the AIDS model.[7] 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.

3.2 Simulation Results

The macroeconomic model that we employ here is that by Bautista (1992). 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 our analysis since, as we have seen above, agriculture contributes the largest sectoral share in aggregate poverty; it is also the sector which has contributed most to total poverty alleviation in the second half of the 1980s.

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. In both cases, the net effect is an increase in aggregate poverty. The increases in poverty indices are higher in the second case -- a combination of devaluation and contractionary monetary policy -- than those in the first case which involves only devaluation. Although commodity price increases have 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 those in the second case, primarily owing to the larger price increases of commodities in the first case.

The pattern of change for the two cases are similar. Thus, in the discussion henceforth, only the case of devaluation is further discussed.

The impact on poverty of the devaluation, 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 two-thirds of the change in national head count index. On the 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 vis-a-vis urban families. Rural families, who comprise about 62 percent of the total population, would represent about two-thirds 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 11 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 (Balisacan, 1992b), the overall net impact of price increase on the sector is an increase in the average poverty gap. Based on the distribution-sensitive measure, the contribution of agriculture to the change in the national distribution-sensitive index is about 50 percent.

Table 11 further demonstrates the usefulness of household surveys, when combined with simulation outcomes on macro-meso relations, in characterizing the differential 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 comprise about 50 percent 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 50 percent of the change in the national distribution-sensitive index. Note, however, that the urban workers employed in private firms, represent almost one-half of the change in the national head count index, although this group accounts for only 18 percent of the total number of workers in the population. The rural workers employed in private firms -- also representing 18 percent of the population -- are poorer than their counterparts in

urban areas, hence their contribution to the change in national poverty gap is higher (22 percent).

Notice that workers in government and government corporations account for only 8 percent of the total number of workers in the population. The majority of them work in urban areas; their average poverty is less severe than the averages for other types of workers. Thus, government workers represent only about 5 percent of the national poverty gap. It thus appears that, as part of an effort to reduce fiscal deficits, the retrenchment of workers in unproductive sectors of government is not tantamount to a substantial increase in aggregate poverty.

Table 12 presents simulation results for a 20 percent increase in the price of utilities (defined broadly to include fuel, light, water, communication and transport). Not surprisingly, given the relatively small share of utilities in the total consumption expenditures of poor households, the increase hardly makes a dent on both the national poverty gap and the distribution-sensitive indices. The increase in the head count index for urban households in mining, manufacturing, construction, and transport is somewhat high, but these households represent only about 10 percent of the total number of poor households. When their welfare deficits are considered, they are not as adversely affected as the rural poor. Thus, 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.

4. Concluding Remarks

Aggregate poverty fell only slightly during the economic recovery period in the second half of the 1980s when growth averaged 5.8 percent annually. The two available household surveys – the 1985 and 1988 FIES -- covering this period indicate that, for the Philippines as a whole, the *average* standard of living (as indicated by mean consumption per capita) did not increase significantly. However, the average rural household fared slightly better than its urban counterpart. On the whole, much of the (limited) poverty alleviation achieved during this period is attributable to intrasectoral improvement in the distribution of living standards. What is even more remarkable was 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 by looking more closely into the social and economic aspects of household income determination, particularly in rural areas where the bulk of the poor are located.

The short run effects 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 contribution can rise to nearly three-fourths of the

change in aggregate poverty. This therefore suggests that, among other things, the provision of safety nets to the poor during adjustment must go beyond the urban sector to include as well the adversely affected households in rural areas.

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

Estimates of the short-run impact on poverty of certain adjustment policies may be sensitive to the way the macroeconomy is modeled (Behrman, 1990). Thus, the above results should be viewed as providing only an idea of the probable 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 of households adjusted for size and composition. However, it is seldom the case that reliable estimates of household incomes are available. Efforts to obtain such estimates are extremely expensive and often impossible. These 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 upon, or may have to complement household incomes. These may include targeting by geographical unit, by employment status, by occupation of household members, by landholding class, by subsidizing inferior commodities or inferior qualities, by nutritional status of household members, and by 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 (and hence targeting) is imperfect, 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

1. See Foster (1984) for a review of the literature on aggregate poverty measures. On the diversity of judgements concerning the measurement of poverty, see Atkinson (1987). Foster and Shorrocks (1991) characterize the class of subgroup consistent poverty indices.

2. For recent critical assessments on the Philippine economy, see Alonzo et al. (1990) and Krugman et al. (1992).

3. Poverty estimates based on consumption per capita were higher than those based on current income per capita. The headcount estimate based on the latter, for example, was 59 percent in 1985 and 48 percent in 1988. This suggests that, for the poverty lines adopted in this study, current income substantially understates poverty. In general, current income per capita may overstate or understate poverty (see Balisacan, 1991).

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

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

6. Varian (1983, p. 124) refers to it as "indirect compensation function." We follow convention in poverty assessments in calling it "equivalent income."

7. See Balisacan (1992c) for details on the estimation of the AIDS model for the Philippines.

References

Alonzo, R. et al., 1989, "A Time for Hard Decisions," University of the Philippines School of Economics, Diliman, Quezon City.

Atkinson, A.B., 1987, "On the Measurement of Poverty," *Econometrica* 55, 749-764.

Balisacan, A.M., 1991, "Aggregate Poverty Measures, Poverty Targeting and the Determinants of Household Welfare: The Philippines, 1985 and 1988," paper presented at the Consultative Workshop on the FIES, Poverty and Income Distribution, Communication Foundation for Asia, Manila, December.

Balisacan, A.M., 1992a, "Agricultural Growth, Landlessness, Off-farm Employment, and Rural Poverty in the Philippines," *Economic Development and Cultural Change*, (forthcoming).

Balisacan, A.M., 1992b, "Rural Poverty in the Philippines: Incidence, Determinants and Policies," *Asian Development Review*, 10, 125-163.

Balisacan, A.M., 1992c, "Parameter Estimates of Consumer Demand Systems 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.

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

Behrman, J. R., 1990, "Macroeconomic Policies and Rural Poverty: Issues and Research Strategies," paper prepared for the ADB Project on Priority Issues and Policy Measures to Alleviate Rural Poverty, Asian Development Bank, September.

Corbo, V. and S. Fischer, 1991, "Adjustment Programs and Bank Support: Rationale and Main Results," Country Economics Department WPS 582, World Bank, Washington, D.C.

Cornia, G.A., R. Jolly, and F. Stewart (eds.), 1987, *Adjustment with a Human Face: Protecting the Vulnerable and Promoting Growth*, Oxford: Oxford University Press.

Deaton, A. and J. Muellbauer, 1980, "An Almost Ideal Demand System," *American Economic Review*, 73, 312-326.

Foster, J.E., 1984, "On Economic Poverty: A Survey of Aggregate Measures," *Advances in Econometrics*, 3, 215-251.

Foster, J.E., J. Greer and E. Thorbecke, 1984, "A Class of Decomposable Poverty Measures," *Econometrica*, 52, 761-766.

Foster, J.E. and A.F. Shorrocks, 1991, "Subgroup Consistent Poverty Measures," *Econometrica*, 59, 687-709.

Kakwani, N., 1990a, "Testing for Significance of Poverty Differences, with Application to Cote d'Ivoire," Living Standards Measurement Study Working Paper No. 62, World Bank, Washington, D.C.

Kakwani, N., 1990b, "Poverty and Economic Growth, with Application to Cote d'Ivoire," Living Standards Measurement Study Working Paper No. 63, World Bank, Washington, D.C.

Krugman, P.R. et al., 1992, *Transforming the Philippine Economy*, Quezon City: APO Production Unit, Inc.

Ofreneo, R.E., 1987, *Deregulation and the Agrarian Crisis*, Quezon City: Institute of Industrial Relations, University of the Philippines.

Ravallion, M., 1989, "Land-Contingent Poverty Alleviation Schemes," *World Development*, 17, 1223-1233.

Ravallion, M. and D. van de Walle, 1991, "The Impact on Poverty of Food Pricing Reforms: A Welfare Analysis for Indonesia," *Journal of Policy Modeling*, 13, 281-299.

Ravallion, M. and M. Huppi, 1991, "Measuring Changes in Poverty: A Methodological Case Study of Indonesia during an Adjustment Period," *World Bank Economic Review*, 5, 57-82.

Srinivasan, T.N., 1988, "Structural Adjustment, Stabilization, and the Poor," EDI Working Papers, World Bank, Washington, D.C.

Varian, H.R., 1984, *Microeconomic Analysis*, second edition, New York: W.W. Norton and Company.

Table 1

Aggregate Poverty Reduction

	Rural			Urban			National		
	1985	1988	t-ratio	1985	1988	t-ratio	1985	1988	t-ratio
Number of households in sample	9,089	10,049		7,952	8,836		16,961	18,885	
Population share (%)	62.14	62.09		37.81	37.72		100.00	100.00	
Mean consumption per capita	3,820	3,992	2.05	8,086	8,416	0.85	5,841	6,067	1.20
Mean income per capita	4,311	4,800	4.48	9,648	10,901	2.10	6,840	7,663	2.86
Headcount (%)	72.87	68.51	-6.55	59.27	54.98	-5.63	67.67	63.28	-8.75
Sectoral gains								98.09	
Population shifts								0.02	
Interaction effects								1.89	
Poverty gap (%)	30.12	25.95	-11.68	23.29	19.92	-8.98	27.52	23.63	-14.93
Sectoral gains								99.21	
Population shifts								0.01	
Interaction effects								0.78	
Distribution-sensitive measure	15.47	12.37	-13.22	11.72	9.43	-9.65	14.05	11.24	-16.64
Sectoral gains								99.48	
Population shifts								0.01	
Interaction effects								0.52	

Note: Consumption and income are expressed in 1985 prices, using region-specific CPI.
The t-test for the significance-of poverty differences is based on Kakwani's (1990) methodology.
Critical t-value at 5% significance level is 1.96. At 1% level, t-value is 2.58

Source: Author's calculation based on the 1985 and 1988 PIES.

Table 2

Changes in Sectoral Mean Incomes and Expenditures per Capita

Sector of Employment	Number of HHs in Sample		Population Share		Mean Consumption Per Capita		t-ratio	Growth Rate (3 yr. %)	Mean Income Per Capita		t-ratio	Growth Rate (3 yr. %)
	1985	1988	1985	1988	1985	1988			1985	1988		
Rural												
Agriculture	5,477	6,379	37.94	39.49	3,244	3,417	1.92	5.33	3,569	3,985	3.58	11.66
Mining	57	108	0.40	0.67	4,640	4,363	-0.39	-5.97	5,288	5,125	-0.17	-3.08
Manufacturing	395	534	2.72	3.30	4,146	4,691	1.48	13.15	4,996	5,848	1.52	17.05
Utility	25	23	0.18	0.15	5,140	6,550	0.87	27.43	5,037	7,707	1.48	53.01
Construction	281	370	1.92	2.27	3,553	3,761	0.45	5.85	3,913	4,652	1.51	18.89
Trade	398	503	2.73	3.11	4,886	5,142	0.67	5.24	5,664	6,622	1.87	16.91
Transport	306	420	2.10	2.58	4,579	4,461	-0.36	-2.58	5,340	5,289	-0.08	-0.96
Finance	53	47	0.37	0.29	7,481	8,012	0.25	7.10	8,016	10,021	0.92	25.00
Services	492	758	3.42	4.68	5,537	6,138	1.26	10.85	6,270	7,707	2.46	22.92
Others	1,525	907	10.36	5.55	4,809	5,028	0.72	4.55	5,669	6,349	1.68	12.00
Urban												
Agriculture	1,184	1,306	5.13	5.00	4,902	4,964	0.18	1.26	5,438	5,997	1.28	10.28
Mining	30	47	0.14	0.19	7,939	5,543	-1.02	-30.18	9,241	7,034	-0.67	-23.88
Manufacturing	839	1,040	4.16	4.65	9,868	8,653	-0.77	-12.31	11,589	10,924	-0.30	-5.74
Utility	49	75	0.24	0.31	10,579	10,612	0.01	0.31	12,274	12,308	0.01	0.28
Construction	508	615	2.48	2.73	6,165	5,829	-0.45	-5.45	7,055	7,077	0.02	0.31
Trade	945	1,193	4.63	5.12	7,850	8,733	1.22	11.25	10,420	12,626	1.43	21.17
Transport	681	834	3.40	3.62	7,177	7,332	0.15	2.16	8,573	9,668	0.64	12.77
Finance	263	295	1.31	1.28	16,110	20,354	0.95	26.34	20,972	29,660	0.96	41.43
Services	1,572	1,787	7.45	7.61	8,336	9,150	1.47	9.76	9,427	11,428	2.87	21.23
Others	1,881	1,644	8.87	7.21	8,917	9,512	0.52	6.67	10,756	11,902	0.74	10.65

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

Note: Consumption and income are expressed in 1985 prices, using region-specific CPI.

Table 3

Sectoral Sources of Poverty Alleviation
(In percent, except t-ratio)

Sector	Head count Index		t-ratio	Poverty Gap Index		t-ratio	Distribution-sensitive measure		t-ratio	Reduction due to Sectoral Gains		
										Head count	Poverty Gap	Distribution-sensitive measure
	1985	1988		1985	1988		1985	1988				
Rural												
Agriculture	80.93	76.75	-5.58	35.03	30.47	-10.19	18.42	14.86	-11.53	36.10	44.37	48.00
Mining	56.42	68.15	0.71	20.92	19.48	-0.37	10.84	8.22	-1.02	-0.52	0.15	0.37
Manufacturing	66.06	59.19	-2.15	26.82	21.27	-3.41	13.52	10.14	-3.16	4.26	3.88	3.28
Utility	49.83	31.06	-1.35	16.08	8.73	-1.42	6.74	3.14	-1.35	0.77	0.34	0.23
Construction	77.55	68.83	-2.52	29.89	25.34	-2.48	14.30	11.81	-2.09	3.81	2.24	1.70
Trade	60.87	52.67	-2.48	19.73	16.98	-1.94	8.51	7.18	-1.65	5.10	1.93	1.29
Transport	61.23	57.06	-1.13	30.56	17.11	-2.15	9.16	7.00	-2.35	2.00	1.86	1.62
Finance	37.83	38.16	0.03	14.54	8.24	-1.89	6.19	2.28	-2.52	-0.03	0.60	0.51
Services	47.26	41.58	-1.98	15.65	11.97	-3.16	6.95	4.80	-3.34	4.43	3.23	2.62
Others	58.60	51.49	-3.41	22.84	18.10	-4.79	11.61	8.35	-5.27	16.77	12.60	12.04
Urban												
Agriculture	78.81	77.58	-0.75	36.27	34.92	-1.29	20.25	18.76	-1.96	1.44	1.78	2.72
Mining	64.23	60.47	-0.33	32.30	22.10	-1.65	18.43	10.34	-1.95	0.12	0.37	0.49
Manufacturing	58.62	52.08	-2.84	21.81	16.95	-4.61	10.55	7.26	-5.29	6.19	5.20	4.87
Utility	30.09	35.06	0.58	7.24	9.67	0.91	2.10	3.86	1.44	-0.27	-0.15	-0.15
Construction	72.55	72.91	0.14	30.42	26.48	-2.71	15.63	12.26	-3.50	-0.20	2.51	2.97
Trade	56.52	50.94	-2.57	21.06	17.73	-3.28	10.28	8.08	-3.54	5.88	3.96	3.63
Transport	66.44	63.76	-1.09	24.30	23.17	-0.95	11.15	10.77	-0.52	2.08	0.98	0.46
Finance	34.58	27.36	-1.84	11.36	8.08	-2.16	4.92	3.39	-1.87	2.15	1.10	0.71
Services	51.72	45.60	-3.55	19.02	15.39	-4.65	9.05	7.06	-4.22	10.38	6.94	5.27
Others	53.35	47.21	-3.64	20.60	15.60	-6.38	10.45	7.08	-6.90	12.39	11.38	10.65

Source: Author's calculations based on the 1985 and 1988 FIES.

Table 4

Contribution of Distributionally Neutral Growth
to Sectoral Poverty Alleviation

Sector	Poverty Gap Elasticity with Respect to DNG	Rate of Change in Poverty Gap		Contribution of DNG
		Assuming DNG	Observed	
National	-1.45	-5.65	-14.14	39.94
Rural	-1.42	-6.38	-13.84	46.12
Agriculture	-1.31	-6.99	-13.00	53.77
Mining	-1.76	10.13	-6.87	-147.58
Manufacturing	-1.46	-19.33	-20.70	92.93
Utility	-2.10	-57.57	-45.72	125.93
Construction	-1.59	-9.34	-15.22	61.33
Trade	-2.08	-10.92	-13.98	78.14
Transport	-1.98	5.10	-16.79	-30.35
Finance	-1.60	-11.37	-43.31	26.25
Services	-2.02	-21.93	-23.50	93.29
Others	-1.57	-7.13	-20.74	34.39
Urban	-1.54	-6.30	-14.47	43.57
Agriculture	-1.17	-1.48	-3.72	39.88
Mining	-0.99	29.83	-31.59	-94.40
Manufacturing	-1.69	20.78	-22.31	-93.11
Utility	-3.16	-0.98	33.61	-2.93
Construction	-1.39	7.55	-12.94	-58.35
Trade	-1.68	-18.93	-15.80	119.85
Transport	-1.73	-3.75	-4.63	80.82
Finance	-2.04	-53.85	-28.85	186.68
Services	-1.72	-16.79	-19.06	88.08
Others	-1.59	-10.61	-24.25	43.74

Note: DNG = distributionally neutral growth

Table 5

Income Sources of the Bottom Two and the Top Two Quintiles of Agricultural Households

	First (Poorest) Quintile		Second Quintile		Fourth Quintile		Fifth (Richest) Quintile	
	1985	1988	1985	1988	1985	1988	1985	1988
Income Source (P/person)								
Wages and salaries	312	453	533	627	774	989	1,636	2,252
Entrepreneurial incomes	757	1041	1088	1,403	2,062	2,392	3,991	4,148
Other sources	503	636	588	700	850	971	1,790	1,867
Total	1572	2130	2209	2,730	3,686	4,352	7,417	8,267
Share								
Wages and salaries	19.85	21.27	24.13	22.97	21.00	22.73	22.06	27.24
Entrepreneurial incomes	48.16	48.87	49.25	51.39	55.94	54.96	53.81	50.18
Other sources	32.00	29.86	26.62	25.64	23.06	22.31	24.13	22.58
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Percent Change								
Wages and salaries		45.19		17.64		27.78		37.65
Entrepreneurial incomes		37.52		28.95		16.00		3.93
Other sources		26.44		19.05		14.24		4.30
Total		35.50		23.59		18.07		11.46

Table 6

Regional Changes in Mean Income and Expenditures Per Capita

Sector	Number of HHs in Sample		Population Share		Mean Consumption Per Capita		t-ratio	Growth Rate	Mean Income Per Capita		t-ratio	Growth Rate
	1985	1988	1985	1988	1985	1988		(3 yr. %)	1985	1988		(3 yr. %)
Rural												
Ilocos Region	825	780	5.57	4.59	4,593	4,524	-0.25	-1.48	5,483	5,503	0.05	0.36
Cagayan Valley	617	597	4.03	3.55	4,118	3,982	-0.39	-3.30	4,937	5,289	0.76	7.14
Central Luzon	840	972	5.66	5.75	5,434	5,234	-0.55	-3.68	5,773	6,003	0.52	3.98
Southern Tagalog	1,211	1,303	8.16	7.98	4,279	4,342	0.25	1.47	4,864	5,168	0.97	6.25
Bicol Region	752	843	5.48	5.53	3,182	3,152	-0.14	-0.94	3,313	3,601	1.05	8.68
Western Visayas	961	1,048	6.49	6.58	3,507	3,866	1.37	10.22	3,804	4,343	1.78	14.17
Central Visayas	791	870	5.45	5.36	2,607	2,885	1.21	10.64	3,135	3,596	1.49	14.69
Eastern Visayas	629	678	4.54	4.41	2,890	3,202	1.32	10.78	3,174	3,946	2.56	24.33
Western Mindanao	593	642	4.23	4.24	3,451	3,852	1.35	11.61	4,301	4,909	1.22	14.13
Northern Mindanao	610	736	4.25	4.28	3,712	4,388	1.94	18.21	4,153	5,466	2.46	31.62
Southern Mindanao	645	720	4.66	4.47	3,760	3,688	-0.24	-1.90	4,228	4,391	0.45	3.85
Central Mindanao	541	658	3.65	3.89	3,703	4,155	1.62	12.21	3,963	5,188	3.76	30.90
CAR		212		1.55		4,493				5,051		
Urban												
NCR	2,404	2,726	13.32	13.63	11,499	12,215	0.60	6.22	14,023	16,601	1.40	18.38
Ilocos Region	415	344	1.66	1.34	6,895	6,301	-1.09	-12.96	8,168	7,608	-0.57	-6.85
Cagayan Valley	231	192	0.67	0.60	6,794	5,698	-1.27	-16.13	8,075	7,731	-0.28	-4.26
Central Luzon	871	967	4.06	4.11	8,480	8,134	-0.62	-4.08	9,825	10,360	0.68	5.45
Southern Tagalog	1,148	1,118	4.99	4.21	7,028	7,326	0.89	4.25	7,923	8,686	1.64	9.63
Bicol Region	318	357	1.39	1.48	5,921	5,967	0.06	0.78	6,527	6,879	0.39	5.40
Western Visayas	554	628	2.47	2.50	6,621	6,824	0.37	3.06	7,652	8,103	0.60	5.89
Central Visayas	533	612	2.52	2.51	5,005	6,115	1.90	22.19	6,332	7,858	1.78	24.09
Eastern Visayas	257	289	1.22	1.27	4,489	4,798	0.40	6.90	5,318	5,924	0.52	13.54
Western Mindanao	192	228	0.80	0.88	4,641	5,211	1.10	12.27	5,341	7,063	2.88	32.25
Northern Mindanao	328	381	1.49	1.48	5,809	6,515	1.24	12.14	7,757	7,832	0.06	0.96
Southern Mindanao	481	584	2.45	2.53	6,104	6,617	0.88	8.41	7,451	8,491	1.05	13.96
Central Mindanao	215	235	0.78	0.79	6,360	6,725	0.30	5.74	7,222	8,840	1.29	22.40
CAR		202		0.48		6,556				8,342		

Note: Consumption and income are expressed in 1985 prices, using region-specific CPI.

Table 7

Regional Sources of Poverty Alleviation
(in percent, except t-ratio)

Sector	Head count Index		t-ratio	Poverty Gap Index		t-ratio	Distribution-sensitive measure		t-ratio	Reduction due to Sectoral Gains		
										Head count	Poverty Gap	Distribution-sensitive measure
	1985	1988		1985	1988		1985	1988				
Rural												
Ilocos Region	62.96	61.83	-0.34	25.80	18.34	-5.87	13.64	7.64	-8.09	1.07	9.88	11.96
Cagayan Valley	70.52	67.35	-1.19	26.46	24.23	-1.65	12.65	11.34	-1.53	2.96	2.32	1.87
Central Luzon	49.02	46.44	-1.10	13.73	12.16	-1.85	5.38	4.40	-2.30	3.39	2.29	2.00
Southern Tagalog	69.08	67.24	-0.99	26.73	26.49	-0.24	13.00	12.94	-0.09	3.51	0.51	0.16
Bicol Region	81.99	82.26	0.14	35.65	34.24	-1.19	18.67	16.90	-2.14	-0.33	1.98	3.42
Western Visayas	84.15	75.50	-4.87	38.70	28.71	-9.50	20.74	13.55	-9.91	13.01	16.76	16.67
Central Visayas	83.66	78.85	-2.52	41.11	34.28	-5.48	23.47	18.07	-5.88	6.87	9.63	10.51
Eastern Visayas	78.67	72.98	-2.41	33.57	29.31	-3.13	17.48	14.25	-3.69	5.99	5.00	5.56
Western Mindanao	76.74	68.04	-3.44	31.22	26.36	-3.49	15.85	12.86	-3.23	8.54	5.33	4.53
Northern Mindanao	74.31	63.36	-4.37	31.93	23.63	-6.04	17.12	11.13	-6.49	10.80	9.13	9.10
Southern Mindanao	71.88	71.28	-0.24	28.35	28.30	-0.03	13.97	13.89	-0.09	0.64	0.85	0.13
Central Mindanao	73.72	67.78	-2.26	28.54	24.70	-2.85	13.53	11.47	-2.46	5.02	3.62	2.69
CAR		62.76			21.99			9.64				
Urban												
NCR	52.52	46.78	-2.68	18.10	15.47	-4.37	8.22	6.70	-4.31	11.55	9.08	7.22
Ilocos Region	65.63	70.49	1.44	30.99	29.54	-0.75	17.67	14.94	-2.07	-1.87	0.62	1.62
Cagayan Valley	60.89	70.23	2.03	25.38	32.84	2.92	12.96	17.89	2.90	-1.45	-1.29	-1.18
Central Luzon	50.26	47.23	-1.30	16.36	14.18	-2.25	7.28	5.95	-2.40	2.86	2.29	1.93
Southern Tagalog	57.72	53.99	-1.79	21.57	18.85	-2.81	10.30	8.57	-2.97	4.32	3.51	3.07
Bicol Region	67.51	61.64	-1.60	27.98	25.22	-1.39	14.45	12.91	-1.21	1.90	0.99	0.77
Western Visayas	68.11	66.60	-0.55	33.63	28.08	-3.52	19.58	14.13	-5.05	0.86	3.54	4.81
Central Visayas	70.06	55.36	-5.20	31.07	22.02	-5.87	16.98	10.98	-5.79	8.58	5.90	5.41
Eastern Visayas	78.62	72.56	-1.66	38.77	33.81	-2.12	22.74	18.58	-2.35	1.72	1.57	1.82
Western Mindanao	69.43	60.17	-1.99	29.73	25.09	-1.87	15.16	12.78	-1.49	1.71	0.95	0.68
Northern Mindanao	70.09	60.30	-2.75	32.24	23.44	-4.54	17.53	11.55	-4.56	3.38	3.39	3.18
Southern Mindanao	65.99	58.90	-2.39	26.02	21.24	-3.17	12.93	10.27	-2.72	4.03	3.03	2.33
Central Mindanao	60.36	57.43	-0.63	20.76	22.20	0.67	9.38	10.28	0.74	0.53	-0.29	-0.25
CAR		58.94			20.81			10.10				

Table 8

Simulation Results on Meso Variables Based on the Bautista Model

	Base a/	Simulation 1	Simulation 2
		Percent Change	
Policy:			
Exchange Rate		5.00	5.00
Money Supply		0.00	-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	0.73
Wheat	4.76	4.37	2.34
General Price Level	1.00	4.88	3.37

a/ Agricultural prices under base simulation are in pesos per kilogram.

Source: Table 3 of Bautista (1992).

Table 9

Short-Run Impact on Poverty of a 5 Percent Increase in the Exchange Rate

Sector	Percentage Point Change			Contribution to Total		
	Head count	Poverty gap	Distribution-sensitive measure	Head count	Poverty gap	Distribution-sensitive measure
All Families	1.75	1.27	0.84	100.00	100.00	100.00
Rural	0.97	1.28	0.95	34.43	62.24	69.61
Agriculture	0.23	1.13	0.95	5.04	34.13	43.41
Mining	0.00	1.65	1.06	0.00	0.54	0.53
Manufacturing	1.68	1.89	1.34	2.60	4.04	4.31
Utility	0.00	1.72	0.96	0.00	0.25	0.21
Construction	2.24	2.23	1.58	2.74	3.76	4.00
Trade	2.10	1.97	1.17	3.27	4.21	3.77
Transport	2.55	2.00	1.19	3.25	3.52	3.16
Finance	0.00	1.22	0.84	0.00	0.36	0.38
Services	2.31	1.57	0.91	4.51	4.22	3.68
Others	2.86	1.48	0.91	15.08	10.70	9.99
Urban	2.98	1.25	0.67	65.57	37.76	30.39
Agriculture	1.70	1.27	0.86	5.19	5.31	5.47
Mining	3.92	1.54	1.06	0.38	0.20	0.21
Manufacturing	3.41	1.25	0.65	8.23	4.14	3.24
Utility	0.00	0.56	0.13	0.00	0.10	0.04
Construction	6.48	1.66	0.90	9.73	3.42	2.82
Trade	3.01	1.24	0.65	7.89	4.48	3.52
Transport	5.07	1.49	0.70	10.19	4.11	2.92
Finance	0.76	0.63	0.33	0.59	0.68	0.53
Services	2.74	1.20	0.58	12.11	7.31	5.31
Others	2.26	1.15	0.60	11.13	7.76	6.15

Note: See Table 8 for values of meso variables.

Table 10

Short-Run Impact on Poverty of a 5 Percent Increase in the Exchange Rate and a 5 Percent Decrease in the Money Supply

Sector	Percentage Point Change			Contribution to Total		
	Head count	Poverty gap	Distribution-sensitive measure	Head count	Poverty gap	Distribution-sensitive measure
All Families	2.07	1.50	1.00	100.00	100.00	100.00
Rural	1.39	1.56	1.16	38.44	64.23	71.36
Agriculture	0.34	1.35	1.13	6.29	34.29	43.00
Mining	0.00	1.83	1.19	0.00	0.51	0.49
Manufacturing	1.68	2.05	1.46	2.20	3.70	3.93
Utility	0.00	1.77	1.01	0.00	0.22	0.19
Construction	2.70	2.44	1.72	2.79	5.47	5.66
Trade	2.86	2.16	1.30	3.75	3.90	3.51
Transport	3.14	2.16	1.28	3.39	3.20	2.85
Finance	1.76	1.36	0.94	0.32	0.34	0.35
Services	3.18	1.69	0.98	5.24	3.83	3.33
Others	3.12	1.72	1.08	13.88	10.53	9.89
Urban	3.20	1.35	0.73	59.43	34.58	27.72
Agriculture	1.93	1.45	0.98	4.96	5.13	5.22
Mining	3.92	1.63	1.13	0.32	0.18	0.19
Manufacturing	3.49	1.35	0.70	7.11	3.79	2.94
Utility	0.00	0.61	0.15	0.00	0.09	0.03
Construction	6.74	1.78	0.98	8.56	3.11	2.55
Trade	3.25	1.37	0.71	7.19	4.17	3.26
Transport	5.67	1.59	0.75	9.62	3.72	2.64
Finance	1.39	0.68	0.35	0.86	0.62	0.48
Services	2.73	1.28	0.62	10.19	6.59	4.77
Others	2.53	1.22	0.64	10.52	6.97	5.50

Table 11

Short-Run Impact on Poverty of an Increase in the Exchange Rate, by Class of Worker

Class of Worker	Population share	Percentage Point Change			Contribution to Total		
		Head count	Poverty gap	Distribution-sensitive measure	Head count	Poverty gap	Distribution-sensitive measure
Rural							
Worker in private firms	14.15	0.38	1.61	1.28	4.26	22.01	25.62
Government worker	2.57	1.63	1.22	0.69	3.25	3.00	2.49
Self-employed	31.78	0.78	1.23	0.95	19.49	37.64	42.41
Employer in family business	3.12	0.94	0.78	0.45	2.20	2.22	1.87
Worker in family business	0.02	0.00	1.14	1.45	0.00	0.03	0.06
Urban							
Worker in private firms	14.06	3.96	1.42	0.76	44.62	19.66	15.35
Government worker	4.33	1.90	0.84	0.36	6.65	3.61	2.25
Self-employed	9.17	2.59	1.26	0.73	18.51	11.06	9.34
Employer in family business	1.31	1.66	0.51	0.24	1.81	0.69	0.46
Worker in family business	0.62	0.00	1.34	0.41	0.00	0.02	0.01

Note: Population shares do not add up to 100 due to the exclusion of workers who did not indicate their class category.

Table 12

Short-Run Impact on Poverty of a 20 Percent Increase in the Prices of Utilities

Sector	Percentage Point Change			Contribution to Total		
	Head count	Poverty gap	Distribution-sensitive measure	Head count	Poverty gap	Distribution-sensitive measure
All Families	1.12	0.77	0.53	100.00	100.00	100.00
Rural	0.89	0.86	0.62	49.25	69.21	75.45
Agriculture	0.69	0.89	0.68	23.79	44.22	51.54
Mining	0.00	0.61	0.39	0.00	0.33	0.33
Manufacturing	1.23	0.85	0.60	2.98	2.99	3.23
Utility	0.00	0.66	0.33	0.00	0.16	0.12
Construction	0.99	0.99	0.70	1.90	2.75	2.96
Trade	0.88	0.90	0.53	2.15	3.21	2.86
Transport	0.67	0.79	0.46	1.35	2.29	2.05
Finance	1.76	0.59	0.41	0.59	0.29	0.31
Services	0.52	0.67	0.38	1.59	2.96	2.59
Others	1.68	0.80	0.50	13.84	9.59	9.20
Urban	1.36	0.57	0.30	46.79	28.46	22.73
Agriculture	1.21	0.71	0.46	5.77	4.91	4.84
Mining	3.92	0.64	0.43	0.59	0.14	0.14
Manufacturing	1.85	0.56	0.28	7.00	3.06	2.31
Utility	0.00	0.21	0.05	0.00	0.06	0.02
Construction	2.13	0.71	0.40	5.01	2.45	2.08
Trade	1.10	0.55	0.28	4.50	3.31	2.59
Transport	2.79	0.59	0.28	8.79	2.72	1.94
Finance	0.00	0.28	0.14	0.00	0.50	0.38
Services	1.00	0.52	0.24	6.90	5.25	3.69
Others	1.05	0.51	0.26	8.08	5.68	4.45