5 Inequality, Poverty, and Urban-Rural Growth Linkages

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INTRODUCTION

Discussions of development policy have frequently called attention to high income disparities among the country's regions and between urban and rural areas. Specifically, critics of Philippine development policy point to the large mean income difference between Metro Manila and neighboring Southern and Central Luzon regions, on one hand, and the other regions of the country, on the other, as a prime cause of the high income inequality and poverty in the Philippines (ILO, 1974; Lamberte et al., 1993). Moreover, the poor performance of the Philippine economy over the last three decades has been attributed partly to the variation in access to infrastructure and social services between the major urban centers and rural areas (Ranis and Stewart, 1993). Regional variation in certain summary measures of human development (particularly literacy rate, mortality rate, and poverty incidence) is also evident (UNDP, 1994).

These claims imply that policy reform aimed at reducing overall income inequality and social deprivation must address regional income disparities. It is frequently suggested, for example, that bigger budgetary resources be allocated to regions with relatively low mean incomes. This presumes, however, that income inequality within each of the regions is not itself the major problem. Yet it is possible that systematic differences in levels of human capital between low- and high-income groups within a geographic area account for considerable differences in household earnings between these groups. In this case, the policy prescription to reduce overall income inequality and poverty would have to involve expanding the access of low-income groups to human capital formation.

This paper uses statistical decomposition and econometric approaches to examine sources of poverty and inequality in the distribution of welfare in the Philippines. It first examines some spatial and intertemporal aspects

of inequality and poverty. The paper then uses results from an econometric model of household income determination to assess the impact of certain policy instruments on poverty and inequality within and between subpopulation groups.

SPATIAL AND INTERTEMPORAL INEQUALITY

This section describes the quantitative significance of income inequality *between* subpopulation groups as well as *within* these groups. It examines the contribution of differences in regional mean incomes to the observed overall income inequality in any given year. Over time, there may be shifts in subpopulation groups (say, due to migration), or there may be changes in relative mean incomes between and within subpopulation groups, or both. To what extent do these changes account for the observed changes in overall inequality? What implications do these changes hold for development policy aimed at reducing inequality in the distribution of welfare?

Conceptual and Measurement Problems

Since welfare is not directly observable, a suitable proxy has to be found. *Current* income is a popular choice in a large number of welfare assessments. However, current income may overestimate or underestimate current welfare levels. If a person can borrow or use his savings, his welfare level is not constrained by current income. Even in underdeveloped regions, households typically have some capability to buffer their welfare from temporary variations in income, such as by saving money or goods. Moreover, a household that can share in the income of others may have a higher welfare level than its current income would permit.[1] Current consumption would thus be a better indicator of welfare level than current income. Indeed, using standard arguments in microeconomic theory, it can be claimed that since welfare level is determined by "life-cycle" or "permanent" income, and since current consumption is a good approximation of this income, current consumption can be justified as a better measure of current welfare.[2] This does not, of course, suggest that consumption does not vary over time. It does, and the change over the life cycle is sometimes large. This is especially true among the poor who do not have access to capital markets (or to intrahousehold transfers) and whose current consumption is thus constrained by current instead of life-cycle income. But even in this case, current consumption is as good an approximation of life-cycle income as current income.

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[1] Cox and Jimenez (1993) found evidence of substantial intrahousehold income transfers in the Philippines. Moreover, these transfers are sensitive to public transfer programs, i.e., private transfers from relatively rich households to poor households are reduced when public income transfers are made.

[2] On conceptual and practical arguments for the use of consumption rather than income in poverty assessment in developing countries, see Ravallion (1992). For an extensive review of the literature on household consumption behavior, see Deaton (1992).

In this article, per capita consumption is used as the indicator of current welfare levels.[3] 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 the form of goods and services received by the household from various sources. As is well known, consumption data give only an *indirect* measure of human development; in the section on Other Aspects of Relative Spatial Deprivation, consumption data are supplemented by available spatial data on *direct* measures of human development as well as measures relating to income-earning capabilities.

The choice of the index here for summarizing the nature and extent of inequality in the distribution of welfare levels is guided by both theoretical and practical considerations. The index must satisfy at least four basic properties. The first is *mean independence*, i.e., the index is invariant with respect to an equi-proportionate change in everyone's income. The second is *population independence*, i.e., the index remains invariant if the number of people at each income level is changed by the same proportion. This implies that the index depends only on relative population frequencies at each income level, not on absolute population frequencies. The third property is *transfer principle* (often referred to as Pigou-Dalton condition), which means that any transfer from a richer to a poorer person that does not reverse their relative rank reduces the value of the inequality index. Finally, it is required that the index be *additively decomposable*, i.e., the index can be expressed as a weighted sum of the inequality values calculated for the subpopulation groups (within-group component) plus the contribution arising from differences between group means (between-group component). Conceptually, the between-group component can be defined as the value of the aggregate index if, by hypothetical redistribution, all persons within a group receive the average income for that group. The inequality measured thus refers only to inequality between group means. Similarly, the within-group component is the value of the aggregate index if the between-group inequality is suppressed by equalizing group means through an equi-proportionate change in the income of every unit within each group.

The last property is extremely useful for the present study. For example, for a policy change that increases the incomes of group i and reduces those of group j, it is possible to work out the impact of the change on each group's inequality level and then, using appropriate group weights, estimate the new aggregate inequality index.

The most popular measure of income inequality is the Gini index. Unfortunately, while the Gini index satisfies mean and population independence as well as the transfer principle, it is not additively decomposable in the above-mentioned sense. Perversity can, for example, occur when the Gini coefficient is used for decomposing inequality by subpopulation groups

[3] From hereon, unless otherwise stated, consumption and income are used interchangeably.

(Mookherjee and Shorrocks, 1982; Cowell, 1988). Specifically, it is possible that, keeping group means and subpopulation sizes constant, an increase in inequality in every group as depicted by the Gini coefficient leads to a decrease in overall inequality. This possibility is especially common in cases where the decomposition produces not only within-group and between-group components but also an overlapping (a residual) component. Lambert and Aronson (1993) show that the residual is higher the closer together the subpopulation mean incomes are and the larger the coefficients of variation of the subpopulation distributions. For this reason, this index is not particularly useful for analyzing sources of inequality (e.g., over time or as a result of tax policy). It may, however, still offer a succinct description of cross-section income distribution (e.g., across regions), in which overlapping is of obvious interest.

Following Anand (1983), the study uses the two Theil indices (T and L) and the variance of logarithms (V) as measures of inequality. They are defined as follows:

$$T = (1/n)\sum_{i=1}^{n}(y_i/y)\ln(y_i/y),$$

$$L = (1/n)\sum_{i=1}^{n}\ln(y/y_i),$$

$$V = (1/n)\sum_{i=1}^{n}(\ln y^* - \ln y_i^*)^2,$$

where y_i is the expenditure of person i ($i=1,\ldots,n$), n is population size, y is the arithmetic mean expenditure, $\ln y^*$ the geometric mean expenditure, and $\ln y_i^*$ the natural logarithm of y_i. All these indices satisfy mean independence and population independence. T and L satisfy the principle of transfer, but V violates it for a given range of incomes.[4] Nonetheless, for most empirical purposes, the transfer principle is seldom violated (Creedy, 1977).

Sources of Inequality

If the population can be assigned into mutually exclusive and exhaustive groups, T, L, and V can be additively decomposed into within-group components (T_w, L_w, V_w) and between-group components (see Appendix 5.A). The weights for summing up the within-group components and the between-group components of L and V are the group population shares. As such, L and V are additively decomposable in a strict sense. That is, because the weights are not affected by changes in group means, the within-group component can be interpreted as the exact reduction in overall inequality if within-group inequality is eliminated and group mean incomes are held constant. Similarly, the between-group component gives the exact reduction in inequality if between-group inequality is eliminated by equalizing all the group means. In the case of T, the weights are income shares, not population shares. In this case, the value of the between-group component

[4] The transfer principle is violated for incomes y^*e, where e is the base of the natural logarithms.

may no longer be the exact reduction in overall inequality if group means are equalized. Since the elimination of between-group inequality changes equi-proportionately the income of every person in each group, and, hence, the income shares for all groups, the remaining overall income inequality is not the same as the within-group component. For this reason, T is additively decomposable only in a weak sense.

As is well known, the various alternative inequality measures suggested in the literature, including those employed in this paper, emphasize different aspects of the income distribution. There is therefore no reason to expect that the contribution of each component to the observed inequality is the same for all measures. As demonstrated by Champernowne (1974), the Theil L and V indices are more sensitive to changes at the bottom end of the income distribution than the Theil T index. The latter index is thus not ideal for measuring welfare changes when investigating extreme deprivation among the population at the bottom range of the income distribution.

Table 5.1 shows population shares and mean per capita expenditures for selected spatial characteristics (i.e., region and locality). Table 5.2 provides estimates of national inequality indices and summarizes the contribution of within-group and between-group components of these indices. Table 5.3 gives the details of these components for the selected spatial characteristics. For comparison, Table 5.2 also shows national estimates of the familiar Gini index. All calculations are based on individual household observations covered by the 1985, 1988, and 1991 FIES. Expenditures are expressed in 1985 prices, using region-specific CPI.

Table 5.1
Population Share and Mean per Capita Expenditure

	Population Share			Mean Expenditure *		
	1985	1988	1991	1985	1988	1991
Philippines	100.00	100.00	100.00	4,879	5,340	5,844
A. Region						
Metro Manila	14.02	13.84	13.98	8,354	9,028	10,650
Ilocos	7.19	7.10	6.93	4,807	5,006	5,390
Cagayan Valley	4.64	4.52	4.45	4,226	4,242	4,537
Central Luzon	9.90	9.85	10.11	6,189	6,450	7,334
Southern Tagalog	12.55	12.00	13.32	5,071	5,336	6,124
Bicol	6.76	7.21	7.12	3,481	3,734	3,787
Western Visayas	8.87	9.20	9.04	4,091	4,677	4,879
Central Visayas	7.63	7.50	7.13	3,210	4,022	4,372
Eastern Visayas	5.40	5.52	5.27	3,081	3,558	3,922
Western Mindanao	5.12	5.25	5.11	3,466	4,193	4,026
Northern Mindanao	6.08	5.90	5.90	3,892	4,915	4,470
Southern Mindanao	7.33	7.20	7.00	4,273	4,750	4,667
Central Mindanao	4.53	4.91	4.64	3,997	4,441	4,267
B. Locality						
Urban	38.71	38.01	50.08	6,948	7,564	7,720
Rural	61.29	61.99	49.92	3,573	3,977	3,963

* Expressed in 1985 prices using region-specific CPI.

Mean expenditure levels vary substantially among the various regions of the country. Metro Manila, which accounts for about 14% of the population, has the highest mean expenditure. In 1991, its mean expenditure was almost double the national average or about three times the mean expenditures for Bicol and Eastern Visayas, the poorest regions of the country. Except for Bicol, mean expenditures for the Luzon regions are higher than for most of the regions in Visayas and Mindanao. Note, however, that the ranking of most regions changed from 1985 to 1991. Central Visayas, for example, was the second poorest region in 1985, but it ranked the fifth poorest in 1991. Only Central Luzon, Southern Tagalog, and Metro Manila—the richest regions accounting for about a third of the country's population—maintained their relative positions during the period.

High expenditure disparity between urban and rural areas is also apparent. Mean expenditure in urban areas is nearly two times that in rural areas. Interestingly, the substantial increase in the proportion of urban population from only about 39 % in 1985 to 50 % in 1991 does not significantly change relative mean expenditure. The main cause for the sharp increase in the population share of urban areas in 1991 is the reclassification of initially rural areas into urban areas. The sampling frame for the 1988 FIES is based on the 1980 population census, while that for the 1991 FIES is based on the 1990 census. Both censuses applied the same set of criteria in classifying villages into "urban" and "rural" areas. A large number of initially rural areas in 1980 were reclassified as urban areas in 1990 based mainly on their population density and presence of establishments.[5] As shall be shown below, this has important implications on intertemporal indicators of inequality and poverty for urban and rural areas.

The large income disparity between Luzon and the rest of the country as well as between urban and rural areas has attracted much attention in policy discussions. The common theme emerging from these discussions is that the disparity is largely responsible for the high income inequality in the country, implying that much of the inequality would be reduced by policy reforms aimed at closing the income gaps among regions and between rural and urban areas.

Table 5.2 suggests, however, that this claim is grossly inaccurate. While regional differences in mean expenditures are substantial, the contribution of the between-group component to overall inequality is rather small (no more than 20%). This implies that removing between-group inequality by equalizing all regional mean incomes (but keeping within-region inequality constant by equi-proportionately changing the incomes of all members of that region) will reduce overall inequality by at most 20%. Conversely, removing within-region inequality by making everyone's income within a region equal to the mean for that region will reduce overall inequality by about 80%.[6] Of this reduction, the three richest regions — Metro Manila,

[5] For details, see Balisacan (1994a).

[6] Note, however, that this interpretation, as noted earlier, does not strictly hold true for the Theil T index.

Table 5.2
Decomposition of Inequality Indices

	1985	1988	1991
National Inequality			
Theil T	0.330	0.301	0.365
Theil L	0.279	0.262	0.303
Variance of Logarithms (V)	0.482	0.458	0.516
Gini	0.345	0.354	0.400
Within-Group Contribution to Aggregate Inequality (%) [a]			
A. Region			
Theil T	84.33	85.56	82.88
	(15.67)	(14.44)	(17.12)
Theil L	82.41	84.51	80.85
	(17.59)	(15.49)	(19.15)
Variance of Logarithms (V)	81.16	83.84	80.06
	(18.84)	(16.16)	(19.94)
B. Locality			
Theil T	83.37	82.98	85.60
	(16.63)	(17.02)	(14.40)
Theil L	80.60	80.73	81.99
	(19.40)	(19.27)	(18.01)
Variance of Logarithms (V)	83.61	83.10	84.65
	(16.39)	(16.90)	(15.35)

Note: All calculations are based on expenditure data.

[a] Figures in parentheses are between-group contributions to aggregate inequality.
Source: Appendix Table 5.1.

Central Luzon, and Southern Tagalog — contribute a hefty 30 percentage-point share (Appendix Table 5.1).

Inequality arising from the large difference in mean income between urban and rural areas also accounts for no more than 20%.[7] Again, this result contradicts the widely accepted view that urban-rural disparity accounts for a very large part of the existing inequality in the Philippines. What Table 5.2 suggests is that potentially larger gains in terms of reduction in overall inequality will be achieved if efforts are focused on reducing inequality within both urban and rural areas.

[7] Essentially similar results are reported in other studies. Using the 1985 FIES, Ching (1988) obtained 27% as the contribution of mean income difference between urban and rural areas to the national Theil *T* index. She also reported a between-region contribution of about 24%. Note that, in ranking households, she used income per capita, whereas in our case, we used expenditure per capita. Decomposition analysis using the Gini index is reported in Mangahas (1974, 1976). However, as has been noted earlier, conceptual difficulty arises in interpreting the between-group component of this measure.

Note that the percentage contribution of rural areas to overall inequality based on the Theil *T* is lower than that based on the Theil *L* and *V* indices. Considering that the weights of the within-group and between-group components of *T* are income shares, and not population shares as in Theil *L* and *V* indices, this is hardly surprising. The expenditure share of rural areas is substantially lower than its population share. In 1991, its expenditure share was only one third of aggregate expenditure, while its population share was about one half of the total.

The correlation between regional mean expenditure and regional inequality is low and not statistically significant for the three inequality indices. The data also do not support any Kuznets-type (i.e., inverted U-shaped) relationship between regional expenditure and regional inequality. The inverted U-shaped hypothesis of Kuznets (1955) suggests that inequality initially rises before it falls as development (proxied by per capita income or expenditure) proceeds. The absence of any (inverted) U-shaped relationship between regional inequality and income is not incredibly surprising, considering that recent reexamination of evidence for developing countries shows no such empirically robust pattern (Anand and Kanbur, 1993a, 1993b).

For the Philippines as a whole, Theil *T*, *L*, and *V* indices consistently show similar patterns, slightly falling from 1985 to 1988 and then rising from 1988 to 1991. The fall coincides with the economic recovery, albeit unsustained, during the second half of the 1980s, suggesting that economic growth benefited more than proportionately the low-income groups. This is consistent with the finding of an earlier study (Balisacan, 1993c) showing that, in agriculture, where the large majority of the rural poor are located, the proportionate changes in the real incomes of the bottom two quintiles (poorest 40 %) are substantially higher than those for the top (richest 10 %) of the population. In contrast, the rise in aggregate inequality from 1988 to 1991 suggests that the economic slowdown during this period disproportionately affected low-income groups. Indeed, as shown in Table 5.3, the expenditure share of the poorest 40 % the population fell from 20 % to 18% during the period.

Table 5.3
Expenditure Share by Decile, Philippines

Decile	1985	1988	1991
First (poorest)	3.624	3.645	3.351
Second	4.877	4.867	4.352
Third	5.699	5.473	4.953
Fourth	6.393	6.181	5.772
Fifth	7.108	7.070	6.318
Sixth	8.322	7.913	7.374
Seventh	9.395	9.219	8.777
Eight	11.125	11.491	10.886
Ninth	14.016	13.978	14.004
Tenth (richest)	29.441	30.162	34.211

Note: Grouping of households is based on per capita expenditure.

The Gini index, unlike the other indices, rose steadily from 1985 to 1991. As noted earlier, however, this index is not particularly meaningful for analyzing sources of intertemporal changes in aggregate inequality.

Sharp differences exist in both the levels and patterns of the regional inequality indices (Appendix Table 5.1). Inequality in Western Visayas, for example, dropped sharply from 1985 to 1988 and then changed only minimally from 1988 to 1991. On the other hand, inequality did not change significantly in the Bicol Region and, to some extent, in Metro Manila during the two periods.

Decomposition of Intertemporal Change in Inequality

As observed in Tables 5.2 and 5.3, the changes in mean incomes are accompanied by population shifts (i.e., relative changes in population shares) as well as changes in inequality within subpopulation groups. Thus, the change over time in the relative importance of between-group and within-group components cannot be ascertained directly from the results given in these tables.

Following Tsakloglou (1993), the change in T, L, and V can be decomposed into three components: (a) effects of intertemporal changes in within-group inequality, holding population shares and relative mean expenditures of the subpopulation groups constant; (b) effects of changes in population shares on within-group inequality and relative mean expenditures; and (c) effects of changes in relative group means on overall inequality (see Appendix 5.A).

Table 5.4 shows the results of the decomposition for the three inequality indices. Based on the Theil L index, the change in within-region inequality contributes about 50% of the change in overall inequality from 1985 to 1988 and approximately 60% of the change from 1988 to 1991. The relative change in mean per capita expenditure among regions also contributes a sizeable proportion of the change in aggregate inequality. For the strictly additively decomposable measures, Theil L and V, this contribution is at least 40%. It appears, however, that this contribution is not exactly unrelated with the within-group component of the change in aggregate inequality. The importance of certain sources of household incomes, especially for rural households, varies greatly across regions. Changes in agricultural commodity-terms-of-trade affect relative regional incomes in the same direction as the relative incomes of the population in the bottom ranges of the income distribution (Balisacan, 1994b).

When disaggregation is based on location of residence (i.e., whether urban or rural), the change in within-group inequality contributes about three fourths of the total change in overall inequality during the first period and about two thirds during the second period. Note, however, that during the second period, the estimate may have been biased by the reclassification of geographical areas. Nonetheless, it is fairly clear that the changes in

Table 5.4
Decomposition of Inequality Change

Period		Index of Inequality	Change in Inequality Due to Change in [a]			Total Change
			Within-Group Inequality	Population Share	Mean Group Expenditure	
1985-88	Region	Theil T	-2.15 (74.27)	-0.49 (16.89)	-0.26 (8.84)	-2.90 (100)
		Theil L	-0.88 (49.61)	-0.03 (1.61)	-0.87 (48.78)	-1.78 (100)
		Variance of Log (V)	-0.66 (27.30)	-0.09 (3.87)	-1.67 (68.83)	-2.43 100
	Locality	Theil T	-2.41 (83.02)	-0.70 (24.18)	0.21 (-7.21)	-2.90 (100)
		Theil L	-1.34 (75.62)	-0.07 (4.18)	-0.36 (20.20)	-1.78 (100)
		Variance of Log (V)	-2.17 (89.50)	-0.14 (5.89)	-0.11 (4.61)	-2.43 (100)
1988-91	Region	Theil T	4.34 (68.12)	0.72 (11.27)	1.32 (20.61)	6.37 (100)
		Theil L	2.38 (57.60)	-0.02 (-0.38)	1.77 (42.78)	4.14 (100)
		Variance of Log (V)	2.90 (49.65)	0.02 (0.37)	2.91 (49.98)	5.83 (100)
	Locality	Theil T	4.92 (77.15)	11.61 (182.03)	-10.15 (-159.18)	6.38 (100)
		Theil L	2.67 (64.49)	1.08 (26.11)	0.39 (9.40)	4.14 (100)
		Variance of Log (V)	3.83 (65.72)	2.28 (39.12)	-0.28 4.84	5.83 (100)

[a] Absolute changes in inequality indices are multiplied by 100. Figures in parentheses are percentage contributions to total change.

overall inequality from 1985 to 1991 have come mainly from changes within geographic boundaries and not from changes in relative mean group incomes, in relative population shares, or both, among regions or areas of the country.

SPATIAL AND INTERTEMPORAL POVERTY

Apart from the issue of income inequality, differences in poverty among the country's geographic regions have acquired prominence in recent policy discussions. This is not entirely unexpected considering that official poverty

estimates show large differences in poverty incidence among the regions. However, the regional poverty profile is not robust; there are also considerable differences in opinions concerning the changes in intertemporal poverty.[8] This section goes beyond official poverty profiles to characterize unambiguously poverty rankings of geographic areas and dates.

First, some conceptual and empirical aspects of poverty measurement are noted. The first of these is the proper identification of the poor. For practical purposes, the identification of the poor requires the use of a broad indicator of welfare household levels. The section on Spatial and Intertemporal Inequality of this paper argues for the use of current household consumption, adjusted for differences in household size and composition. A household is deemed poor if its per capita consumption is less than the predetermined poverty line. There are many ways of arriving at such a line,[9] but this study employs as benchmark the set of nutrition-based poverty lines estimated by the National Statistical Coordination Board's Technical Working Group on Poverty Determination (TWG, 1993). The robustness of poverty profiles vis-à-vis poverty lines is also explored.

The second issue pertains to the aggregation of the data on the poor into a single measure of poverty. Official estimates of poverty in the Philippines have focused on the familiar *headcount index* as an overall measure of aggregate poverty. This is simply the proportionate number of the population deemed poor. 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 post-transfer income is (still) below the poverty line does not change measured poverty. Its advantage is that it is easily understood and communicated.

Another familiar measure of aggregate poverty is *poverty gap*, which is the arithmetic mean of the income shortfall (expressed in proportion to the poverty line) over the whole population. This measure is sensitive to both the number of the poor and the depth of their poverty. Its main advantage is that it 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 poverty deficits.

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[8] See also Balisacan (1994a), in particular Chapter 2.

[9] See Callan and Nolan (1991) and Ravallion (1992). Ravallion and Bidani (1994) evaluate two standard approaches—cost-of-basic-needs (CBN) method and food-energy-intake (FEI) method — to arrive at a poverty line. The CBN method stipulates a consumption bundle considered adequate for basic consumption needs and estimates the costs of this bundle for the various subgroups of the population. The FEI method proceeds by finding the total expenditure (or income) level at which a person's FEI just satisfies the predetermined food energy requirement.

Sen (1976, 1981) contends that an aggregate poverty index must convincingly capture differences in the severity of poverty. This concern is captured by a distribution-sensitive index belonging to the class of poverty measures proposed by Foster et al. (1984). The index, hereafter referred to simply as *distribution-sensitive measure*, is calculated in the same way as the poverty gap index except that the weights are simply the squared income shortfalls.[10] Measured poverty using this index decreases whenever a transfer of income takes place from a poor household to a poorer one, thereby overcoming the limitation of the poverty gap index. Its drawback is that it is not as easy to interpret as the headcount and poverty gap indices. Nonetheless, the key point to remember is that a ranking of dates, socioeconomic groups, or policies in terms of the distribution-sensitive index 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.

One common appealing property of the three measures is that they are additively decomposable in the following sense: the aggregate 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 the purposes of the present study. 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.

Spatial Poverty Profile

Table 5.5 shows the spatial dimension of poverty in 1991, based on the official poverty lines. Rural poverty is significantly higher than urban poverty. The rural sector contributes nearly 60% of the national poverty (based on the headcount index); this share is considerably higher than its population share of about 50%. The average income shortfall of the poor in rural areas is slightly higher than that in urban areas. Note, however, that the contribution of urban areas to total poverty is probably overblown owing to the reclassification of many rural areas into urban areas after the 1990 population census. The economic structure of many of the reclassified areas is still largely rural.

Poverty levels vary substantially across regions. Metro Manila, which accounts for 14% of the population, has the lowest poverty level in the country (only one half of the national headcount level and approximately one third of the national poverty gap level). Average income deficit for the poor in Metro Manila is also the lowest among the regions, even after accounting for cost-of-living differences. This significantly confirms the fact that basic

[10] This measure has been popular in recent empirical work owing to its appealing properties. See, for example, Greer and Thorbecke (1986), Ravallion and Van de Walle (1991), and Besley (1990)

social services and poverty reduction programs are concentrated in Metro Manila. The highest incidence of poverty is found in Bicol and Northern and Central Mindanao. Bicol accounts for about 10% of the total income shortfalls of the population, while Northern and Central Mindanao account for about 15%. Other major contributors to aggregate poverty are Southern Luzon, Western and Central Visayas, and Southern Mindanao.

Table 5.5
Spatial Poverty Profile, 1991

Region	Population Share	Head-count	Poverty Gap	Distribution-Sensitive Measure	Contribution to Total Poverty		
					Headcount	Poverty Gap	Distribution-Sensitive Measure
Total	**100**	**55.66**	**19.70**	**9.12**	**100**	**100**	**100**
Urban	50.08	46.90	16.64	7.86	42.20	42.30	43.17
Rural	49.92	64.44	22.78	10.39	57.80	57.70	56.83
Metro Manila	13.98	28.39	7.11	2.54	7.13	5.04	3.90
Ilocos Region	6.93	60.19	21.32	9.60	7.49	7.49	7.29
Cagayan Valley	4.45	61.49	22.38	10.68	4.92	5.06	5.22
Central Luzon	10.11	45.06	12.99	5.18	8.19	6.67	5.74
Southern Tagalog	13.32	50.62	16.22	7.00	12.11	10.97	10.22
Bicol Region	7.12	71.24	27.63	13.49	9.12	9.99	10.54
Western Visayas	9.04	60.84	20.86	9.25	9.88	9.57	9.17
Central Visayas	7.13	65.34	26.01	13.05	8.37	9.41	10.21
Eastern Visayas	5.27	65.17	23.62	11.08	6.17	6.31	6.40
Western Mindanao	5.11	60.77	22.23	10.47	5.58	5.77	5.87
Northern Mindanao	5.90	69.72	29.68	15.33	7.39	8.89	9.91
Southern Mindanao	7.00	63.45	24.38	11.81	7.98	8.66	9.07
Central Mindanao	4.64	68.01	26.18	12.74	5.68	6.17	6.49

How robust is the regional ranking? Table 5.6 summarizes the result of dominance analysis on the ranking of the country's 13 administrativ regions. A negative (-) mark in a cell indicates that, for all plausible poverty lines and for a set of poverty indices (including the three indices employe in this paper), poverty in the column region is unambiguously lower tha that in the row region. A plus (+) mark connotes the opposite result: poverty in the row region is lower than that in the column region. A "U" mar indicates that an unambiguous ranking of the row and column region cannot be made. In this case, a higher-order dominance condition employed by restricting the structure of poverty measures so as not t include those which are not sensitive to the depth of poverty. Given th restriction, a "U-" indicates that the column region "second-order dom nates" the row region; otherwise, the mark is "U+".

Table 5.6
Dominance Conditions for the Regional Poverty Profile

Region	Metro Manila	Ilocos Region	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol Region	Western Visayas	Central Visayas	Eastern Visayas	Western Mindanao	Northern Mindanao	Southern Mindanao	Central Mindanao
Metro Manila	•												
Ilocos Region	-	•											
Cagayan Valley	-	-	•										
Central Luzon	-	+	+	•									
Southern Tagalog	-	+	+	-	•								
Bicol Region	-	-	-	-	-	•							
Western Visayas	-	-	U+	-	-	+	•						
Central Visayas	-	-	-	-	-	U	-	•					
Eastern Visayas	-	-	-	-	-	U-	-	U	•				
Western Mindanao	-	-	-	-	-	U+	-	U+	U+	•			
Northern Mindanao	-	-	-	-	-	U	-	U-	+	U	•		
Southern Mindanao	-	-	U	-	-	+	U-	+	+	+	+	•	
Central Mindanao	-	-	-	-	-	+	U-	U+	+	U+	U+	-	•

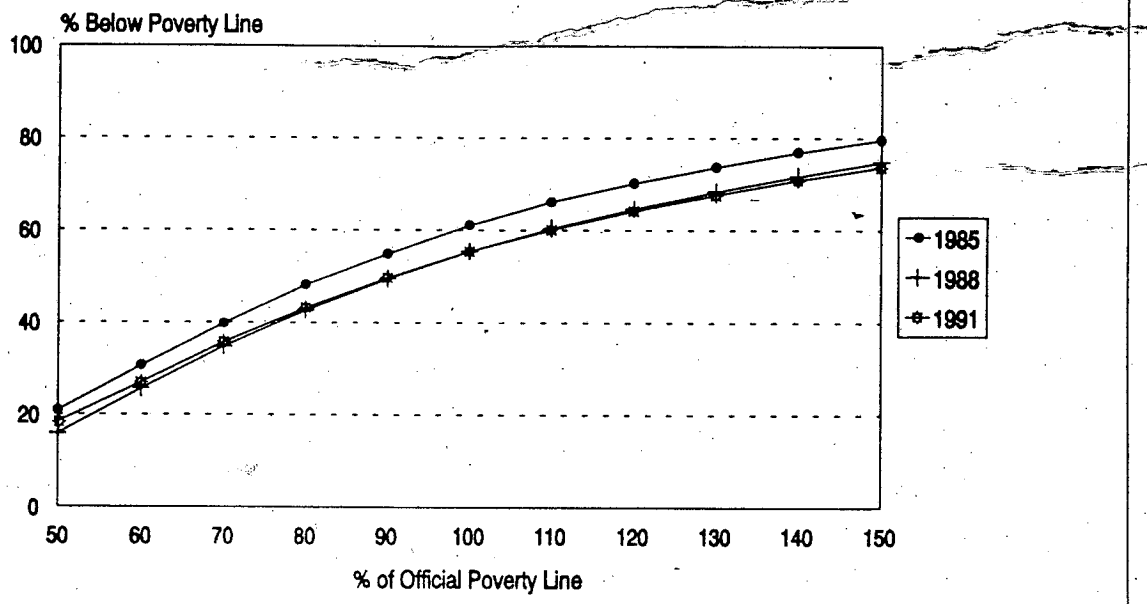
"-" means the region in the column is dominated by the region in the row for all poverty measures.
"+" means the region in the row is dominated by the region in the column for all poverty measures.
"U" means unambiguous ranking of the two regions cannot be made.
"U-" means the region in the column is dominated by the region in the row only if poverty measures are restricted to those which take into account the depth of poverty.
"U+" means the region in the row is dominated by the region in the column only if poverty measures are restricted to those which take into account the depth of poverty.

Clearly, poverty is unambiguously lower in Metro Manila than in any other region. Poverty in Central Luzon and Southern Tagalog is also lower than in most of the other regions. However, the poverty rank of Bicol and practically all of the Visayas and Mindanao regions is ambiguous. Some poverty lines, for example, would rank Bicol to have lower poverty than Central and Eastern Visayas, while other lines indicate otherwise. This ambiguity has an important bearing on policy. There have been suggestions, for example, to incorporate relative poverty incidence in decisions concerning the spatial allocation of public resources (UNDP, 1994).

Intertemporal Poverty Comparison

As demonstrated above, a poverty profile may be affected by the choice of poverty measures and poverty lines. Figure 5.1 summarizes the results of dominance analysis on the aggregate poverty profile from 1985 to 1991. The range of poverty lines employed encompasses almost all those that have been suggested for the Philippines. The curve for an indicated year traces the poverty incidence (proportion of persons below the poverty line) associated with the poverty line. If one curve is lower than the other for the range of plausible poverty lines, then the direction of the change in poverty is unambiguous. Clearly, one can say that poverty in 1988 and in 1991 is unambiguously lower than in 1985, although one may not be able to say the precise difference since the shifts are not uniform. The possibility of disagreement on the direction of poverty change applies to 1988 and 1991,

Figure 5.1
Intertemporal Poverty Profile



where the curves intersect. Thus, in general, one cannot rank 1991 and 1988 if the range of plausible poverty lines extends both above and below the official poverty lines (which is the point of intersection in this case).

However, if poverty measures are restricted only to those which take into account the depth of poverty and the distribution of living standards among the poor (i.e., excluding the headcount index), then the ambiguity of the ranking tends to vanish. This is demonstrated in Balisacan (1994a). For the admissible range of poverty lines, poverty in 1991 is higher than in 1988. Only at extreme ranges of poverty lines can poverty in 1991 be the same as that in 1988.

Decomposition of Poverty Change

It would help to look into the additive decomposability of the poverty measures used in this paper to explore the factors underlying the observed changes in aggregate poverty during a specified period. The household's region of residence will be used as basis for disaggregating the population. Following Ravallion and Huppi (1991), the change in observed aggregate poverty can be expressed as a sum of: (a) intraregional effects; (b) population shifts; and (c) interaction effects. The intraregional effects are simply the contribution of the gains in the poor within each region to the change in aggregate poverty, controlling for their population shares during the base period. The population shifts are the contribution of changes in the distribution of the population across regions during the period. The

residuals, or the interaction effects, arise from the possible correlation between population shifts and intraregional changes in poverty. (Technical details are given in Appendix 5.A.)

Table 5.7 shows the decomposition of poverty change from 1985 to 1991. The estimates are based on official region-specific poverty lines. The observed increase in poverty from 1988 to 1991, when the growth of GDP per capita dropped from 3.8% to -3.2%, is attributable mainly to *intraregional* deterioration in the distribution of living standards. Balisacan (1994c) shows that even with only a modest increase in national mean consumption (Table 5.1), the average poverty gap would have been reduced by approximately 10% if the increase was distributionally neutral.

Suppose that the economic growth experienced in 1986-1989, i.e. a GDP per capita of 3.2%, continues. How long will it take the average poor to cross

Table 5.7
Sources of Change in Aggregate Poverty

Period		Head Count	Poverty Gap	Distribution-sensitive Measure
1985 - 1988	Intraregional Effects	101.38	100.74	100.40
	Population Shifts	-1.66	-1.25	-0.95
	Interaction Effects	0.29	0.51	0.53
	Total [a]	100.00	100.00	100.00
1988 - 1991	Intraregional Effects	117.13	108.86	106.95
	Population Shifts	-10.93	-4.76	-3.34
	Interaction Effects	-6.20	-4.10	-3.58
	Total [a]	100.00	100.00	100.00

[a] Components may not sum up to 100% due to rounding errors.

Source: Appendix Table 2.

over the official poverty line? The answer depends much on whether growth will be accompanied by changes in the size distribution of income. Assuming that income distribution remains the same, it will take about 15 years for the average poor to cross over the poverty line. A faster growth of 5%, not a far-fetched possibility given the experience of neighboring Asian countries, will shorten the crossover time to about 10 years. The implied (point) elasticity of the distributionally neutral growth is about -1.8. That is, a 10% growth in GDP per capita would reduce the average poverty gap by 18%. On the other hand, if growth is accompanied by an improvement in income distribution in favor of the poor, the average poor will, for a given growth rate, move up the poverty line in a much shorter time. The elasticity of the poverty gap index with respect to the Gini index is about 2.4%. That is, a reduction of the Gini index by 1% will decrease the average poverty gap by 2.4%. Clearly, income growth accompanied by a decrease in income inequality will go a long way toward reducing Philippine poverty.

OTHER ASPECTS OF RELATIVE SPATIAL DEPRIVATION

A household's well-being has so far been viewed simply in terms of its command over commodities, namely expenditures (or incomes). The implicit assumption is that household expenditures, adjusted for household size and for spatial and intertemporal variation in prices, are what matter in assessing well-being across space and time. This approach has its limitations. First, there are non-privately provided goods and services that enter into household consumption but are not captured adequately in either household incomes or expenditures. These include the standard public goods and certain publicly provided private goods, like environment, infrastructure (such as roads), education, water and electricity, and health and sanitation services. If access to these goods varies substantially across groups as well as among members of the same group, the correlation between well-being (which has something to do with *being* well or in its most elementary sense, being literate, being healthy, being able to live long, and so on) and income may be weak.[11] Second, there may be intrafamily problems associated with the distribution of command over resources. Food allocation within a household may not, for example, reflect relative nutritional needs of infants and young children.

The *Philippine Human Development Report* (UNDP, 1994) focuses on certain *direct* measures of spatial (especially regional) well-being, among them longevity, literacy, and infant and child mortality rates. This report shows a fairly general positive relationship between regional poverty incidence on the one hand, and longevity, literacy, and child mortality, on the other. Discrepancy exists, however, for some regions. Bicol, for example, has the highest poverty incidence (hence the "worst off" region), but ranks somewhere in the middle in terms of educational attainment and life expectancy.[12]

While we recognize that household incomes or expenditures provide only an indirect measure of the household well-being and that the appropriate focus of public action should be on human "doings and beings," we argue that the single most important component of human deprivation is the lack of command over resources (as reflected in household expenditures), at least in the Philippines. Differential access to publicly provided human development services may, however, either accentuate or diminish the income poverty of certain population groups.

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[11] Sen (1981, 1985) argues that the object of public action should be the enhancement of the capability of people to undertake valuable and valued "doings and beings." The general concern is with "doings and beings," rather than just with incomes or wealth. Although larger incomes or wealth contribute to wider capabilities, the relationship is not the same for different persons. A person's capability to avoid undernourishment, for example, may depend not only on his or her food intake, but also on the person's access to health care services, education, and drinking water and sanitary facilities. Similarly, between-region nutritional status depends not only on the level and distribution of regional income but also on relative access to publicly provided social services.

[12] See, in particular, Chapter 1 of the Report.

An important policy issue is the extent by which aggregate poverty and income inequality can be reduced by measures intended to reduce spatial variation in access to basic services and land resources. This issue is explored in the section on Household Income Determination and Spatial Choice of Employment. To provide a background to that discussion, selected aspects of regional disparity in access to infrastructure, health, education, and land resources will be described here. Given the unavailability of comparable data, the focus will only be on the 1980s and early 1990s.

More than one third of Filipino families had no electricity at the turn of the 1990s (Figure 5.2). From 1985 to 1991, the drop in the percentage of families without electricity was a measly five-percentage point, i.e., from 43% to 38%. Families in Eastern Visayas were the most deprived: 74% of them did not have electricity in 1985, and in 1991, 63%. Families in Metro Manila were the most favored region; only 3% of them had no electricity in 1991. In general, families in the Visayas and Mindanao regions were the most deprived of electricity.

Road density, measured as the ratio of paved roads to total farm area, barely changed from 1985 to 1991, largely reflecting the minimal investment in road infrastructure by the Aquino administration during that period (Figure 5.3). Outside Metro Manila, the regions with the highest road density are Ilocos and Central Luzon. Mindanao regions, with the exception of Northern Mindanao, have the lowest road density.

Road infrastructure is an important element of a strategy aimed at strengthening urban-rural growth linkages. A number of studies (Bautista, 1992; Balisacan, 1993b; Ranis and Stewart, 1993) point to the poor state of rural infrastructure as a major reason for the rural economy's inability to respond adequately to the stimulus provided by sectoral growth. The weak response of the economy to the rapid agricultural growth from the second half of the 1960s to the early 1980s is a case in point.

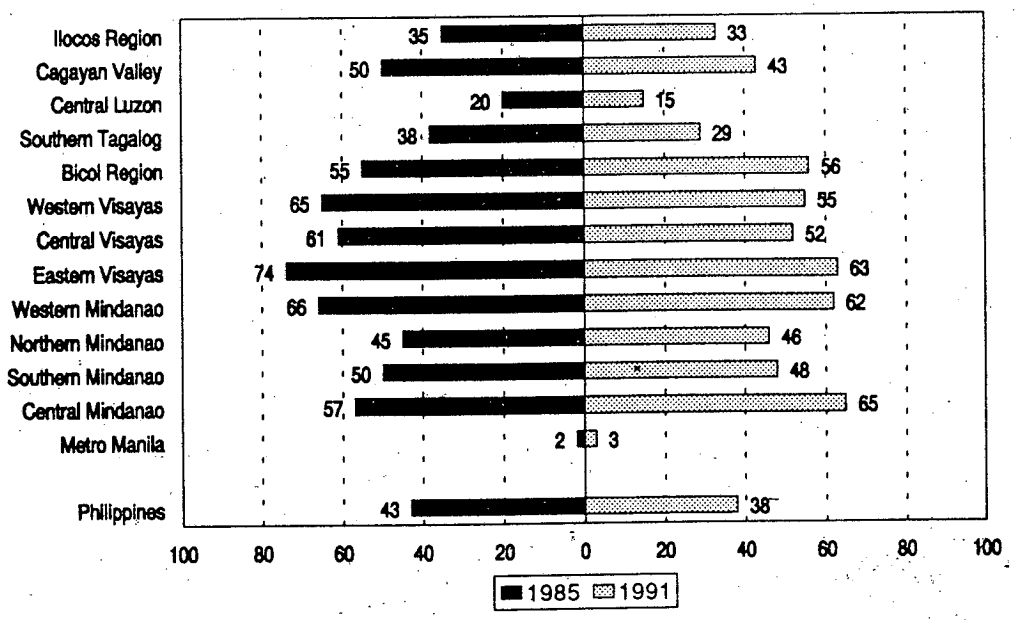
Improvements in the education and health of the population have positive effects on productivity, entrepreneurial skill, and technological innovation which are crucial to building a dynamic economy (Shultz, 1981). For the poor, these improvements represent the main avenue for increasing the returns to their only major asset, labor, as well as for the accumulation of income-generating physical assets. These improvements to their human capital become even more useful if complementary investments in physical infrastructure (transport, electricity, water, and waste disposal facilities) are adequate and accessible to them.

The two indicators often used in the development literature to proxy for the knowledge level of the population are: (a) adult literacy rate and (b) average educational attainment, measured as mean years of schooling. The literacy rate measures only the basic outcome (in the Philippine context, whether a person can read and write his or her name or a simple message),

while educational attainment reflects the degree or quality of knowledge. However, making a spatial comparison of these indices is problematic owing to large differences in the quality of formal education for the same level of attainment and even for the same region or locality. Nonetheless, it can be argued that a minimal level of literacy is necessary for developing the population's capacity to learn.

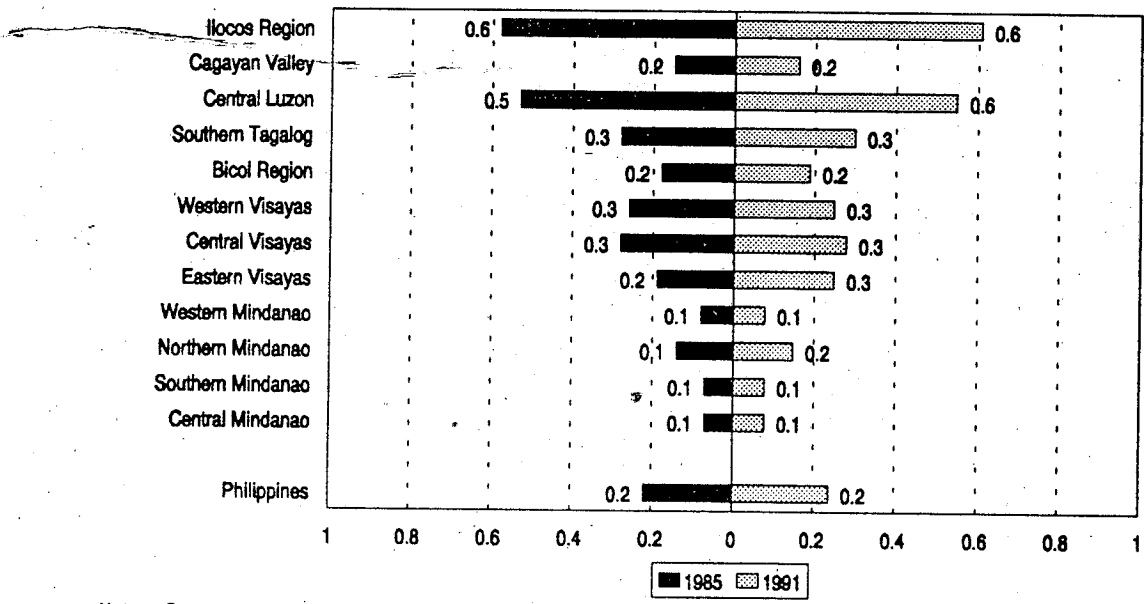
Figure 5.4 shows literacy rates and mean years of schooling for the country's 13 regions. Metro Manila tops the regions in both ranks. Its literacy rate is almost universal (99%), and its mean educational attainment is about 10 years (approximately high school graduate). Western Mindanao, on the other hand, has the lowest mean years of schooling, representing only about one half of that for Metro Manila; it also has the lowest literacy rate (81%). For the entire country, the average literacy rate and educational attainment level are 93% and 7 years, respectively.

Figure 5.2
Families Without Access to Electricity
(Percent)



Sources: NSO, Family Income and Expenditures Survey, 1985, 1991.

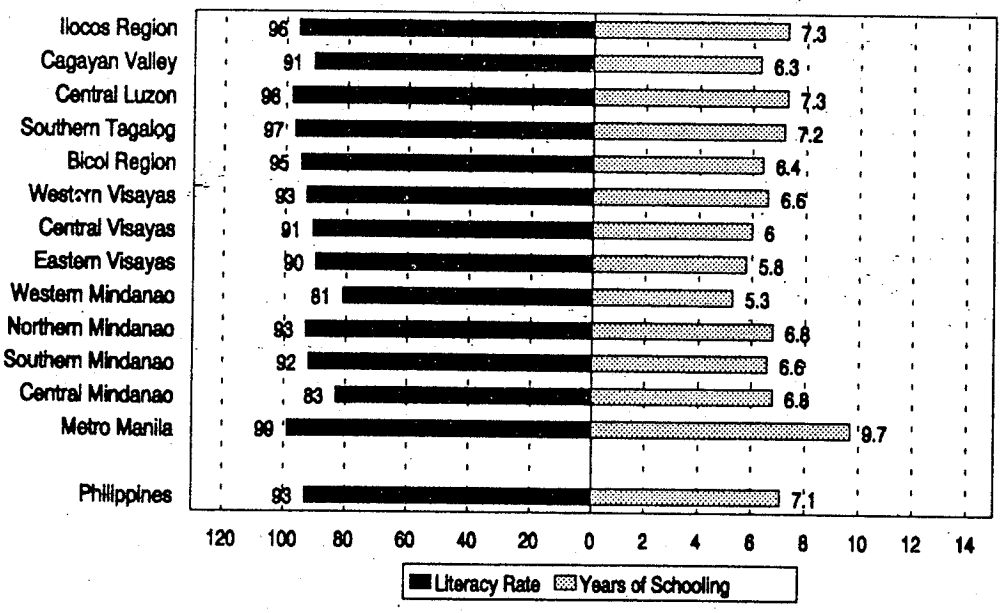
Figure 5.3
Road Density



Notes: Computed as the ratio of total paved roads (km) to total farm area (sq. km.).
1980 farm area is used for both years.
Figures shown on the graph have been rounded off to the nearest tenths.

Source: DPWH, Planning Division.

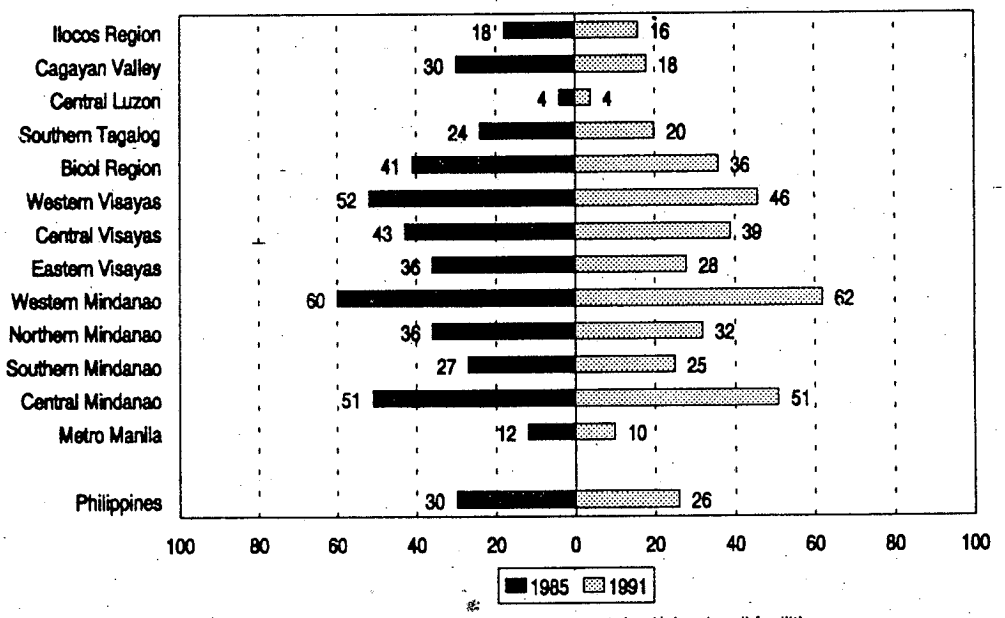
Figure 5.4
Literacy Rate and Mean Years of Schooling



Source: UNDP, *Philippine Human Development Report*, 1994.

Inadequate sanitation and impure water for domestic consumption encourage the spread of infectious and parasitic diseases.[13] The country's record in addressing this aspect of health is dismal. Clean water supply is inaccessible to a sizeable proportion of Filipino families — about one-fourth in 1991 (Figure 5.5). Western Mindanao has the highest proportion of families without access to either community water systems or tube/pipe facilities (about 60%). Access improved significantly for families in Cagayan Valley, the proportion falling from 30% in 1985 to 18% in 1991. Families in Central Luzon were most favored, the proportion being only 4% both in 1985 and 1991.

Figure 5.5
Families Without Access to Clean Water Supply
(Percent)



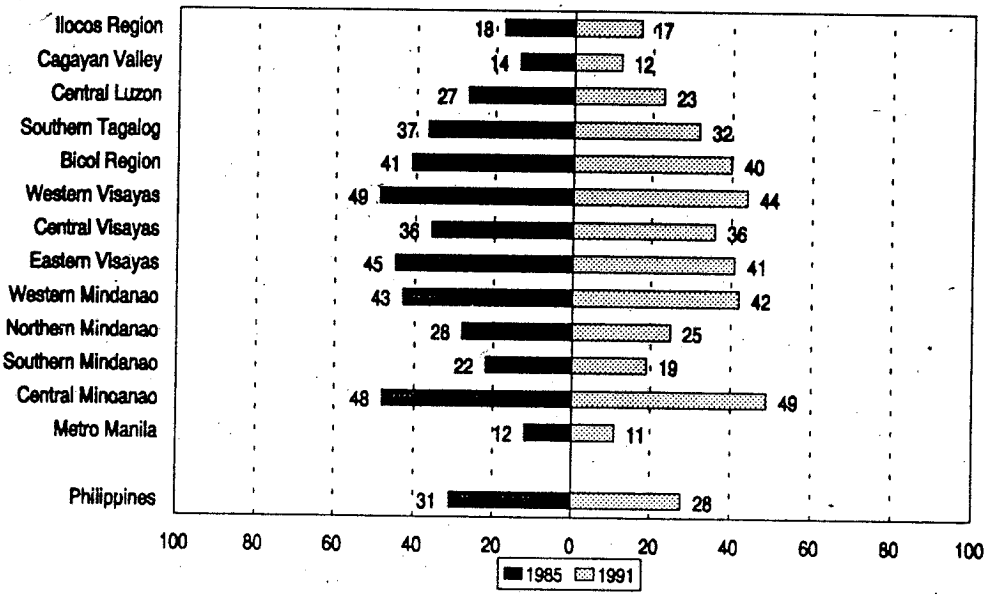
Note: Access to clean water supply refers to community water system or tubed/piped well facilities.

Source: Family Income and Expenditures Survey, 1985, 1991.

The inadequacy of access to water affects the disposal of human wastes. In 1991 about 28% of Filipino families did not have sanitary toilet facilities; the comparable figure in 1985 was 31% (Figure 5.6). Metro Manila has the least proportion of families not using water sealed or closed-pit toilet facilities. At the other extreme are Western Visayas and Central Mindanao which have the highest percentage of families not equipped with sanitary toilet facilities.

[13] The World Health Organization (WHO) defines access to safe drinking water in terms of access to a piped water system within 200 meters of a dwelling (for urban areas) or as a condition in which a family member need not spend a disproportionate part of each day fetching water (for rural areas). For sanitation, a person has an access if he is connected to a public sewer, or has adequate disposal facilities including septic tanks, communal toilets, and other such facilities. See Mink (1993).

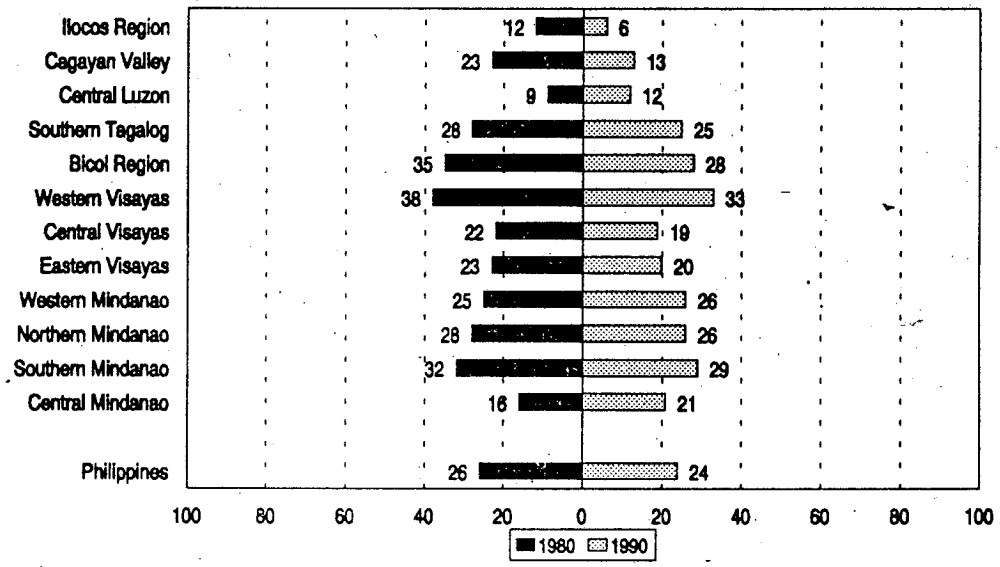
Figure 5.6
Families Without Sanitary Toilet Facilities (Percent)



Note: Sanitary toilet facilites refer to water-sealed or closed-pit facilities.
Source: NSO, Family Income and Expenditures Survey, 1985, 1991.

The root of the rural poverty problem is often associated with agrarian relations in the country. Landholding, for example, is viewed to be highly skewed compared to other Asian countries of similar income levels (Hayami et al., 1990). Related to this is the high incidence of share tenancy which is claimed to be an inferior contractual relation vis-à-vis owner cultivation and direct-lease agreement. That is, the practice of share tenancy is blamed for inefficient resource allocation as well as exploitation of the tenant by the landlord. These will be discussed below. For now, it suffices to note that landholding inequality, tenancy incidence, and average farm size vary considerably across regions (Figures 5.7-5.9). Moreover, during the past decade, landholding inequality fell slightly, but tenancy and average farm size increased in most regions. This partly reflects the growing population pressure on agricultural land as well as the inadequate income-earning opportunities outside of agriculture.

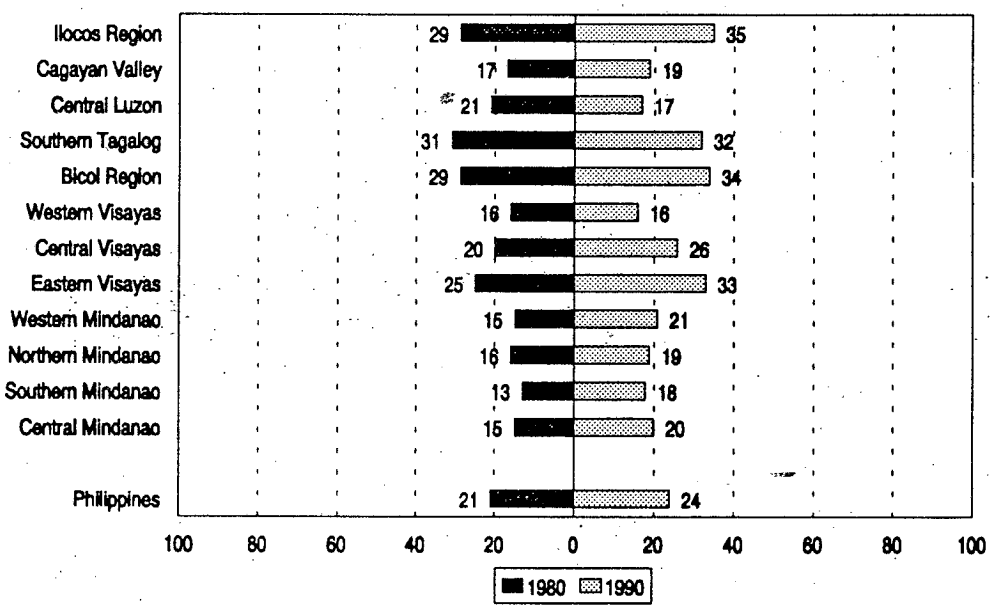
Figure 5.7
Landholding Inequality
(Percent)



Note: Landholding inequality is expressed as the ratio of farm areas exceeding 10 hectares to total farm area.

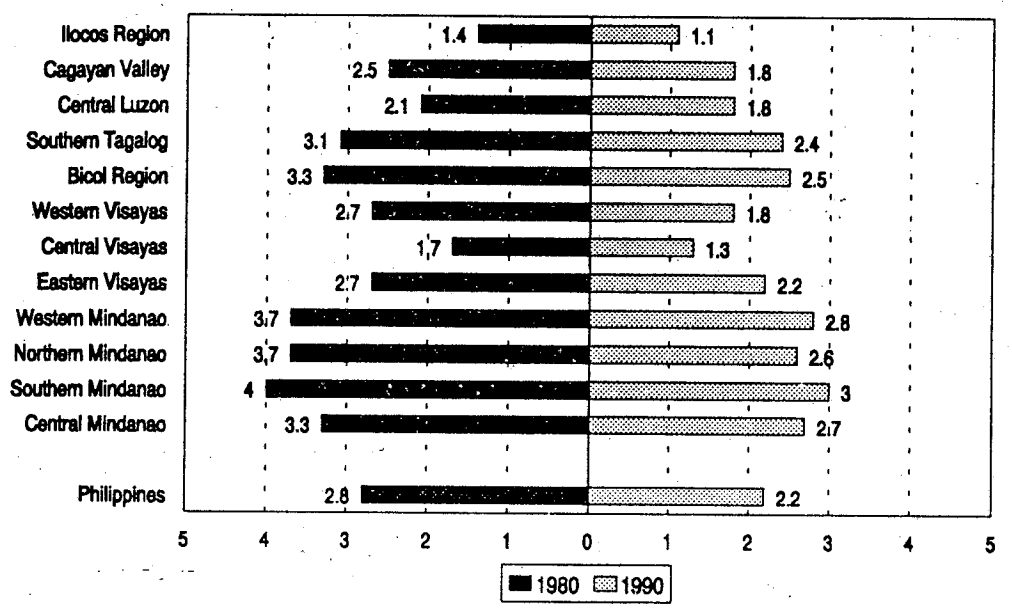
Source: Census of Agriculture, Vols. 1 & 2, 1980, 1990 (unpublished).

Figure 5.8
Farm Area Under Share Tenancy
(Percent)



Source: Census of Agriculture, Vols. 1 and 2, 1980, 1990 (unpublished).

Figure 5.9
Average Farm Size
(Hectares)



Source: Census of Agriculture, Vols. 1 and 2, 1980, 1990 (unpublished).

HOUSEHOLD INCOME DETERMINATION AND SPATIAL CHOICE OF EMPLOYMENT[14]

The decomposition analysis has indicated an overwhelmingly important contribution of intrasectoral or within-group effects on the pattern of aggregate poverty and income inequality. The analysis, however, does not show the relative impact of certain "policy handles" on household incomes and, hence, does not adequately inform policymakers about policy choices for reducing inequality and alleviating poverty. Moreover, the analysis is silent about the relative impact of these policy handles on locational choice of employment. As noted earlier, rural-urban migration has increasingly become an important policy concern. Yet, it is not known how certain policies affect the decision of households to locate in urban (or rural) areas.

Behavioral Model and Data

In this section, household behavioral equations are used to explain the various factors accounting for the variation in household earnings. It is assumed that workers choose between urban and rural employment partly on the basis of anticipated incremental returns. A person who chooses a given alternative probably has a more tangible basis for expecting a more favorable return than those who choose otherwise. This implies that workers tend to be nonrandomly distributed within the population as a

[14] This section is drawn largely from Balisacan (1994d).

whole. Thus, observations on wages or earnings in a particular location may not convey much information about what other workers earn in that occupation. Put differently, estimates of the impact of certain worker attributes on wages or earnings may be biased if based on sector- or location-specific samples.

In this paper, a switching regression technique is employed to control for selectivity bias inherent in the choice between urban and rural employment. The technique involves incorporating appropriate "selectivity variables" into the earnings functions. From the estimated equations, predicted earnings are estimated and incorporated into a decision equation relating the probability of urban employment to the anticipated earnings differential and other exogenous variables. (The technical details of the model are given in Appendix 5.B.)

The earnings functions have the standard Mincerian form (Mincer, 1974), regressing the logarithm of earnings on education, experience, and other exogenous (predetermined) variables. Education is measured by the number of schooling years of the household head. Experience is proxied by the household head's age, and this variable is entered in the regression in quadratic form. Regional indices for access to electricity and markets are included to capture the effects of the location of physical infrastructure on productivity and earnings. Access to markets is proxied by road density, expressed as the ratio of paved roads (in kilometers) to total farm area (in square kilometers).

The variation in earnings among rural workers is expected to be influenced by the prevailing agrarian structure, as posited in models of agrarian institutions (Hayami and Otsuka, 1993). The variables included to capture these effects are the regional indices of tenancy incidence, farmholding distribution, and farm size. Tenancy incidence, expressed as the area of farms under share tenancy to total area of farms, is expected to have a negative influence on rural workers' earnings, all other things remaining the same. Farm distribution, expressed as the ratio of the area with excess of 10 hectares to total farm area, is also expected to negatively affect rural workers' earnings. Access to irrigation, defined as the ratio of irrigated to total farm area, is included as a proxy for land quality.

Apart from expected earnings difference, the structural equation for urban-rural employment choice is hypothesized to be positively influenced by their endowment of household assets. The empirical literature on migration in the Philippines (Pernia, 1978; and Herrin, 1985) suggests that rural-to-urban migrants tend to be those who have household assets. Presumably, these assets enable potential migrants to bear the fixed costs of migration. Rental incomes are assumed to adequately represent the (predetermined) ownership of these assets. Age and other attributes of the household head are also included to control for any direct influence of these variables on locational choice of employment. These variables also affect locational choice indirectly via the earnings equations.

The data source is primarily the 1985, 1988, and 1991 FIES of the NSO. For the present analysis, a subsample representing one fourth of the sample size of each survey has been randomly selected. As noted above, substantial reclassification of initially rural areas into urban areas occurred in the 1991 FIES. To eliminate potential biases introduced by this reclassification, 1991 FIES households which cannot be reclassified into their original 1985 and 1988 classification have been excluded from the analysis. That is, the urban-rural geographic boundaries are made constant for the combined panel data. The total sample consists of 7,676 urban households and 7,202 rural households. Table 5.8 gives the definitions and means of the variables.

Table 5.8
Variables, Definitions and Means

Variables	Definition	Means	
		Rural	Urban
SEX	1 if household head is male, 0 otherwise	0.882	0.831
AGE	Age of household head	45.915	45.962
AGESQ	AGE squared	2312.600	2305.400
FSIZE	Number of family members	5.383	5.461
TOTEMP	Total employed members of the household	1.612	1.637
EDUC1	1 if completed elementary, 0 otherwise	0.263	0.197
EDUC2	1 if attended or completed high school, 0 otherwise	0.205	0.333
EDUC3	1 if attended college, 0 otherwise	0.051	0.137
EDUC4	1 if completed college, 0 otherwise	0.042	0.143
WATER	Proportion of households with access to water supply in region of residence	0.687	0.760
ELEC	Proportion of households with electricity in region of residence	0.532	0.674
ROAD	Road density in region of residence	0.257	1.641
TENANCY	Tenancy incidence in region of residence	0.239	
FARMSIZE	Average farm size in region of residence	2.291	
FARMDIST	Farmholding distribution in region of residence	0.223	
IRRIG	Proportion of irrigated to total farm area	0.213	
YEAR88	1 if year is 1988, 0 otherwise	0.334	0.292
YEAR91	1 if year is 1991, 0 otherwise	0.367	0.441
ASSETS	Household assets	9.298	9.428
EARNINGS	Earnings from employment	12.295	12.636
	Number of observations	7,202	7,676

Regression Results

Table 5.9 summarizes the parameter estimates of the earnings equations.[15] Rates of return to education are higher for urban households than for rural households, all other things remaining equal. This difference is especially more pronounced for tertiary education. Earnings in rural households with tertiary education are 51% higher than those which have not completed elementary. The comparable figure for urban households is 104%. Earnings of workers in rural households who have completed only elementary education are not statistically different from those who have not completed or attended elementary education.

Among urban households, earnings of workers who have completed elementary education are about 15% higher than those who have either not completed elementary education or have not gone to school, all other things remaining the same. Earnings of urban workers who have completed secondary education are 32% higher than those who have not attended school and 17% higher than those who have completed only elementary education. On the average, earnings of those who have attended (but not completed) college are about 30% higher than those who have completed secondary education only. The incremental earnings are even higher for workers who have completed college. Their earnings are, on the average, 42% higher than those who have attended (but not completed) college.

After controlling for educational attainment and other household characteristics, the sex of the household head does not have a significant influence on either rural or urban household earnings. This is inconsistent with findings in some earlier studies (Balisacan, 1994a) showing that households headed by females have, on the average, lower earnings than those headed by males. These studies did not, however, explicitly consider urban-rural employment choice.

Experience, proxied by age, is also not a significant determinant of rural workers' earnings, but it is for urban workers. This might be due to the higher skill requirements for urban employment.

The infrastructure variables, namely roads and electricity, are positive and significant in the urban regression; only electricity is significant in the rural regression. A 10% increase in access to electricity increases household earnings by 2% in rural areas and by 19% in urban areas. Irrigation in the rural regression is also not significant. It is possible that this variable, as constructed, does not adequately reflect land quality. Poor maintenance of existing irrigation systems is, for example, a major area of concern by funding agencies (World Bank, 1991).

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[15] Dummy variables for regions were also included to control for other region-specific effects on household earnings. However, the F test indicates that their joint coefficients are not statistically different from zero at conventional significant levels.

Table 5.9
Regression Estimates of Earnings Functions *

Variables	Rural Workers		Urban Workers	
	Coefficient	t-ratio	Coefficient	t-ratio
SEX	-0.044	-0.80	-0.027	-1.41
AGE	0.001	0.25	0.013	3.63
AGESQ	0.000	-0.14	0.000	-2.15
FSIZE	0.092	24.35	0.077	19.22
TOTEMP	0.114	13.08	0.134	15.53
EDUC1	0.068	0.99	0.141	4.69
EDUC2	0.199	2.12	0.279	7.14
EDUC3	0.350	2.36	0.483	9.87
EDUC4	0.415	2.50	0.711	14.67
ELEC	0.891	3.24	1.145	16.46
ROAD	0.100	0.75	0.092	8.97
TENANCY	-0.512	-1.78		
FARMSIZE	0.067	2.87		
FARMDIST	-0.392	-2.16		
IRRIG	0.173	0.96		
YEAR88	0.256	12.23	-0.061	-2.76
YEAR91	0.329	6.02	-0.011	-0.51
LAMBDA	0.294	0.73	0.417	6.01
CONSTANT	11.020	97.08	10.143	69.85
R-squared		0.425		0.314
F-value		115.70		250.25

* Corrected for selectivity bias. See Appendix 5.B for details

As expected, certain aspects of the agrarian structure significantly affect earnings of rural workers. On the average, an increase in landholding inequality reduces earnings of rural workers, while an increase in farm size raises their earnings. Tenancy has a negative but insignificant effect on earnings. This is consistent with recent theoretical and empirical studies suggesting that tenancy, by itself, is not as important and compelling a correlate of poverty as expected: The variation in incomes within tenure classes (reflecting the effect of farm size, yield, cropping intensity, and land quality) has been found to be much greater than the variation between classes (Hayami and Otsuka, 1993). In an earlier study (Balisacan, 1993a), tenancy was shown to be also not significantly related with regional poverty incidence.

Also of interest are the estimated coefficients of the selectivity variables. In the rural employment equation, the coefficient is insignificant, while in the urban employment equation, it is significant and positive. This result lends support to the hypothesis of self-selection, at least as it pertains to urban workers among the population. The finding may support the notion

that urban workers in the population choose their location of employment because they fail to perceive more favorable earnings elsewhere.

The final step in the regression analysis is the estimation of the structural equation pertaining to the choice between urban and rural employment. The estimates of this equation are given in Table 5.10. The significant and positive value of the coefficient of the earnings differential lends support to the hypothesis that large expected gains from urban employment vis-à-vis rural employment increase the probability of workers choosing urban employment. The probability of choosing urban employment also increases with the endowment of household assets. This confirms the observation that urban workers originating from rural areas are typically those who have the resources to finance the fixed cost of migration. On the average, older workers have lower probability of choosing urban employment than younger ones. Female workers are also less inclined to choose urban employment. This does not appear to jibe well with common observation. Note, however, that the sample of workers employed in this analysis are heads of households who may be less mobile than the young, female workers who are not household heads.

Table 5.10
Structural Employment-Choice Equation

Variable	Coefficient	t-ratio
SEX	-0.357	-10.340
AGE	-0.056	-10.760
FSIZE	0.051	9.550
CTOTIN [a]	4.937	5.490
ASSETS	0.560	23.280
CONSTANT	3.913	
Long-Likelihood	-7,505.55	
Chi-Squared	5,499.09	
Percent of Cases Predicted	71.06	

[a] Predicted difference between earnings from urban employment and earnings from rural employment. Earnings are in natural logarithms.

Simulation

The parameter estimates of the earnings equations are used to simulate the impact of certain policy changes on overall income inequality and poverty. The question asked is: What would the picture of aggregate inequality and poverty be if the distribution of certain welfare indicators is such that the unfavored regions get the mean value for all regions, without changing the value of this indicator for all the other regions? The analysis makes use of the 1991 FIES; the benchmark values of poverty and inequality indices pertain to 1991.

Table 5.11 summarizes the results for policy changes involving agrarian structure (specifically farm area distribution, tenancy, and farm size), physical infrastructure (mainly road density and electricity), and human capital (mainly formal education). Simply redistributing landholding in regions with landholding inequality above the national mean would have little effect on the picture of aggregate poverty and inequality. Note, however, that this simulation covers only about 17% of the total farm area and only six of the 12 agricultural regions.[16]

Table 5.11
Simulation Results

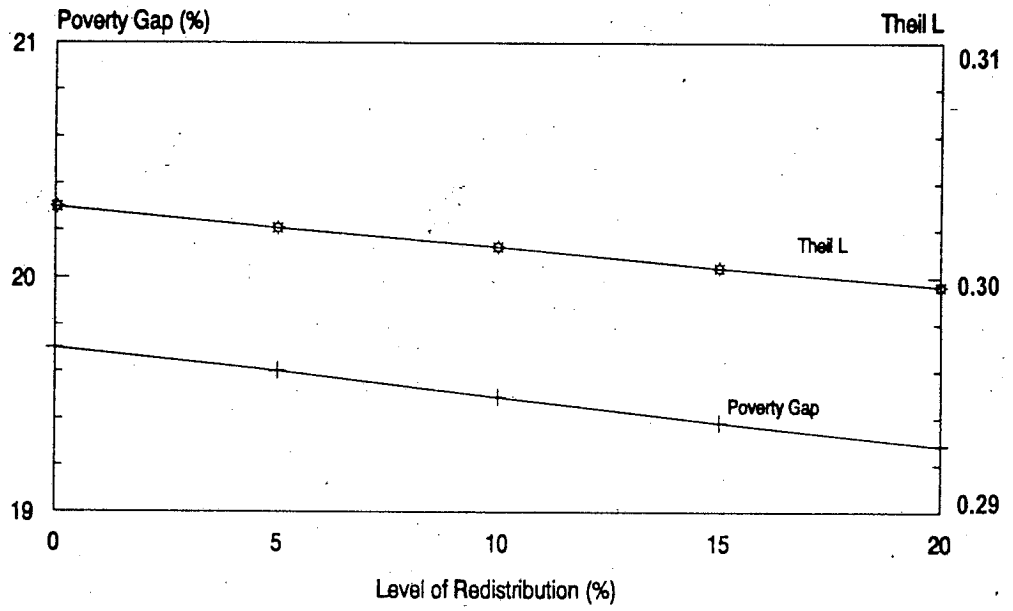
	Base Estimate	Value for Simulation Less Base Estimate						
		Land Distribution	Farm Size	Tenancy	Road Density	Electricity	Education[b]	Education[c]
Poverty								
Headcount	55.66	-0.50	-0.84	-0.89	-3.32	-4.72	-0.27	-11.29
Poverty Gap	19.70	-0.29	-0.50	-0.47	-1.85	-2.86	-0.21	-5.93
Distribution-Sensitive Measure	9.12	-0.18	-0.29	-0.27	-1.12	-1.72	-0.14	-3.33
Income Inequality[a]								
Theil T	36.53	-0.24	-0.36	-0.37	0.48	-0.88	-0.17	0.84
Theil L	30.30	-0.26	-0.30	-0.33	0.72	-0.65	-0.16	0.66
Variance of Logarithm	51.64	-0.43	-0.49	-0.55	1.57	-1.05	-0.28	0.87

[a] Indices are multiplied by 100.
[b] Used elementary graduate as minimum educational attainment.
[c] Used high school graduate as minimum educational attainment.

The simulation results for changes in tenancy and farm size are similar to those for landholding distribution. The result on tenancy is worth noting, as it casts doubts on the conventional view that rural and national poverty are associated with tenancy. It is possible, however, that the simulation glosses over the substantially high incidence of tenancy in practically all regions. Nevertheless, earlier studies have also failed to show any causal link between share tenancy and poverty incidence (Balisacan, 1993a; Quibria and Srinivasan, 1993). The results on farm size should be interpreted with caution. In this experiment, average farm sizes for unfavored regions are increased to the level of the national mean, while averages for regions having farm sizes above the national mean are kept constant. The experiment is plausible only if there is either a substantial outmigration of farm workers from unfavored regions or an expansion of the

[16] Based on the 1990 Census of Agriculture, farms exceeding 10 hectares comprise only 23% of the total (national) farm area. Thus, the simulation covers about three fourths of all lands with sizes exceeding 10 hectares.

Figure 5.10
Landholding Redistribution, Poverty and Inequality

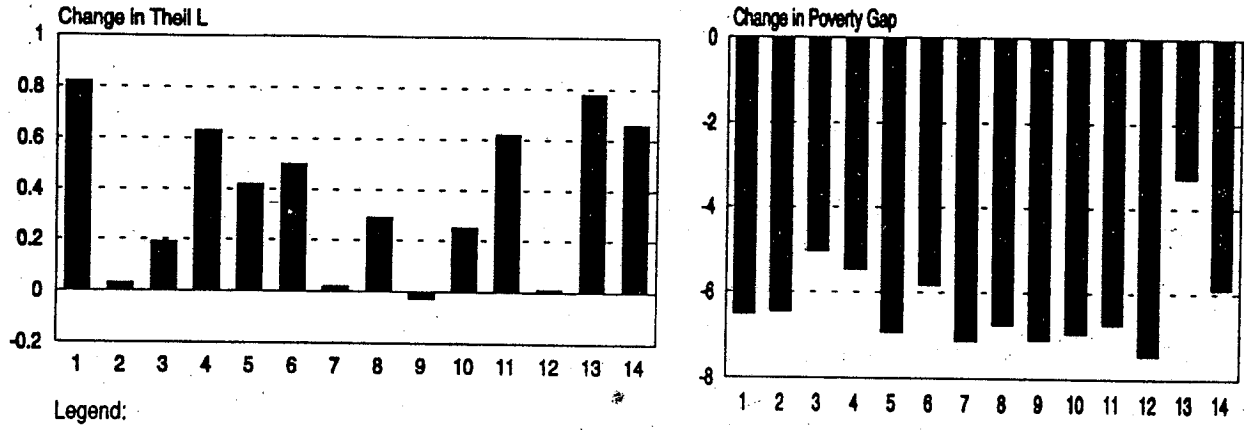


agricultural land frontier through further forest clearing. Since the latter is no longer a plausible scenario, outmigration is a more likely option, but this may have profound effects on both rural and urban household welfare (through, for example, the labor market). These effects have not been captured by the simulation analysis.

Suppose landholding inequality is reduced proportionately across all rural regions. Figure 5.10 summarizes the effects on the aggregate poverty gap and Theil *L* indices for alternative levels of landholding redistribution. The results are not much different from those of the earlier simulation case where only rural regions with landholding inequality exceeding the national mean are covered by land redistribution reform.

Reducing regional differences in access to paved roads and electricity by increasing the levels of access of unfavored regions up to the national mean level has favorable effects on poverty. This is particularly the case for electricity. The simulation shows a decrease in aggregate headcount poverty by about five percentage points, and in the national income shortfalls (i.e., poverty gap) by about three percentage points. Overall income inequality is also reduced, although only minimally. In the case of access to paved roads, income inequality decreases a little bit, owing partly to the larger income effects of road access on urban households. The overall headcount poverty index is reduced by three percentage points, while the poverty gap is reduced by two percentage points.

Figure 5.11
Regional Change in Inequality and Poverty[a]



Legend:

1 - Ilocos Region	8 - Eastern Visayas
2 - Cagayan Valley	9 - Western Mindanao
3 - Central Luzon	10 - Northern Mindanao
4 - Southern Luzon	11 - Southern Mindanao
5 - Bicol Region	12 - Central Mindanao
6 - Western Visayas	13 - Metro Manila
7 - Central Visayas	14 - Philippines

[a] Simulation assumes a formal schooling of at least 10 years for all households.

Simply raising the average educational attainment of households in unfavored regions to the national mean level does not make a substantial dent on aggregate poverty and inequality. This is because the national mean level has a low base: The 1991 FIES data indicate that the average household head has attended (but not completed) only elementary education. The regional variation in average years of schooling of household heads is also low.

To further examine the effectiveness of human capital formation as a policy tool for reducing poverty and income inequality, the income effects of raising the educational levels of the regional population to at least high school has been simulated. The result is given in the last column of Table 5.11; a regional breakdown of the result is shown in Figure 5.11. Clearly, the poverty reduction effects are significant: National headcount index is reduced by about 10 percentage points and the poverty gap index by about five percentage points. Owing largely to the relatively greater income effects of secondary education among low-income urban households (which typically have real income levels higher than those of low-income rural households), the overall income inequality increases, but only by a relatively small amount. In general, regions with initially high poverty levels have the highest percentage-point reduction of poverty.

CONCLUSIONS

Recent public policy discussions have called attention to the need for reducing interregional inequality in the distribution of income and wealth as well as other aspects of well-being. Particular reference has been made to the relatively high income inequality and poverty in the Philippines, which are attributed partly to large income disparities among regions as well as between urban and rural areas. Regional income (and expenditure) data confirm the existence of such disparity. Indicators of access to infrastructure, health and sanitation, and education also reveal glaring disparities among the regions. However, analysis of household expenditure data shows that between-region inequality or rural-urban inequality accounts for only a small proportion of the total (national) inequality. Redistributing income away from economically advanced regions to lagging regions may not reduce overall income inequality and poverty as substantially as expected. This is because more than three fourths of the observed inequality in any given year comes from inequality within regions or locations. Within-region inequality arises from differences in possession of both physical and human assets. The distribution of these assets is within the influence of public policy.

The recent changes in overall inequality and poverty, albeit small, are also accounted for largely by changes in intraregional or intralocational inequality. The observed increase in poverty from 1988 to 1991 is attributable mainly to intraregional deterioration in the distribution of living standards, not so much to changing relative fortunes (or misfortunes) of regions or locations. This observation suggests a crucial point: It is how the economic and institutional environment affects the rewards to owners of factors of production (which are distributed highly unevenly within a region or location) which largely determines the country's performance in poverty and inequality reduction.

In recent years, efforts to reduce rural poverty have centered on reforming agrarian relations, specifically land redistribution and tenancy reforms. Land redistribution, as pursued in the simulation analysis of this paper (i.e., leveling of the landholding inequality in regions with above-mean inequality to the national mean), increases rural household incomes. These increases, however, are not likely to alter the picture of aggregate poverty and inequality substantially. The same thing can be said about tenancy reform. The observations in this paper and recent empirical and theoretical studies suggest that tenancy by itself is not as important a correlate of poverty and inequality as expected: the variation in incomes within tenure classes (reflecting the effect of farm size, yield, cropping intensity, land quality, and access to technology and markets) has been found to be much greater than the variation between classes.

Infrastructure development and human capital formation appear to be very promising areas for poverty alleviation. Improvement in access to infrastructure in relatively infrastructure-deprived regions substantially reduces poverty without seriously aggravating inequality. This is one of

perhaps only a few cases where a move to equalize access to public resources across regions or locations of the country is clearly a big push to the poverty-reduction objective.

In the case of human capital formation, the average level of formal education is low: The average adult is barely an elementary graduate. Furthermore, differences in mean years of schooling across regions are small. Thus intraregional improvement in access to education is highly desirable. The simulation suggests that increasing the level of educational attainment of the population in every region to at least high school graduate will reduce aggregate poverty incidence by about 11 percentage points. Because incomes of rural households respond to the increase almost as well as those of urban households, improvement in intraregional access to high education does not aggravate inequality.

A major lesson one can draw from this exercise is that policymakers need not form new agencies or go far in search of "new models" to effectively alleviate poverty, reduce inequality, and promote balanced urban-rural growth. Much can be achieved simply by improving performance in traditional areas of development management: the financing and public-sector coordination of investments in social and physical infrastructure, promotion of rules ensuring incentive compatibility in government and in the private sector, maintenance of macroeconomic stability, and pursuit of peace and order. In recent years, the state performed poorly in these areas and hence failed in laying the foundation for long-term economic growth and development.

The maintenance of economic growth is crucial to the reduction of poverty. But even with economic growth sustained at the rate targeted in the Medium-Term Philippine Development Plan (i.e., an average GDP per capita growth of about 4%), it will take many years for the average poor to cross over the official poverty line. Assuming that income distribution remains essentially unchanged, as it has in recent decades (Balisacan, 1993a), it will take about 12 years for the average poor person to cross over the poverty line. A lower GDP per capita growth of 2%—the average for the 1960s and 1970s— will substantially lengthen the crossover time to about 22 years. Thus, even with growth, it takes a long time—and, for some groups in society, a lot of pain—to win the war on poverty. But there is no easy alternative. Efforts aimed at promoting and sustaining economic growth induce far more poverty reduction than any of the direct, untargeted intervention schemes proposed in recent years (e.g., food and credit subsidies).

The positive effect of growth on poverty is even stronger if it is accompanied by a proportionate improvement in access of low-income groups to social services. The provision of these services needs to be properly targeted, ensuring that the benefits of social programs intended for the poor are not pre-empted by the nonpoor. 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. Minimum (legislated) wages

are not, for example, efficient means of providing safety nets to the poor during a period of macroeconomic adjustment (e.g., during an episode of devaluation). In contrast, public works programs with offered wages lower than legislated wages and wage levels prevailing in the formal labor market are likely to attract only poor workers who need work the most.

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