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The Impact of Macroeconomic Policies on Income
Distribution: An Empirical Study

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Abstract

There has been a growing awareness of the income distribution dimension of macroeconomic policies. This paper presents a framework for studying this issue empirically, and considers the case of the Philippines using data available from integrated surveys of households. After developing and estimating an analytical model, it was found that underemployment, inflation, and government spending worsen income distribution, while productivity gains, the real interest rate, and the real exchange rate were found to be progressive instruments.

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Summary

This paper studies the experience of the Philippines in the 1980s,
focusing on the effects on income distribution of the stabilization program
initiated in 1983. Although more attention has been devoted recently to
these issues, there is still a dearth of quantitative evaluation of the
distributional consequences of macro-policies. The paper addresses this
need by looking into the experience of the Philippines and, after developing
a simple analytical framework, presents evidence on the distributional
impact of macroeconomic variables. It is shown that underemployment and
inflation are strongly regressive as is government expenditure, reflecting
perhaps the specific composition of public spending during the period.
Productivity levels, the real interest rate, and the real exchange rate
proved to be progressive instruments, since the gains in these variables
improved the relative income shares of the poor.

As a whole, the Philippine experience seems to indicate that "good"
policies also have a distributional payoff. Reducing inflation, avoiding
real exchange rate overvaluation, and attaining positive real interest rates
all have a desirable incidence, while undiscriminating expansionary fiscal
policies, with no attention to public expenditure composition, will probably
result in a higher skewness of the distributional curve.

I. Introduction

The consequences of macroeconomic policies for income distribution and their impact on the poor is a topic that is attracting an increased amount of attention. Although the analysis of poverty and inequality has often been centered around microeconomic considerations, there has been, recently, a growing awareness of the macroeconomic dimension of distributional issues. This recognition has been strengthened by the need to implement severe stabilization programs in many developing countries, programs which have had an effect on economic activity, particularly in the short run, and which may have had a distributional spill-over. 1/

The channels through which macroeconomic policies affect income distribution are indeed intricate, with complexities arising not only from the difficulties in isolating, at the analytical level, the expected impact of individual variables, but also from the fact that these effects will differ depending on the nature and the composition of aggregate policy packages. Policies which could have, by themselves, clear-cut distributional consequences would, when combined with others, interact in a manner which blurs their ultimate impact. The effects of particular policies, therefore, cannot be firmly evaluated except in the specific context within which they are implemented, and such an evaluation could require, at the theoretical level, the design of quite complicated models.

A different but rather complementary alternative is to approach the distributional aspects of macroeconomic policies at the empirical level. This could facilitate the understanding of the policy tradeoffs arising in practice between macro-adjustments and income distribution and shed light on some of the dominant channels through which macro-policies and macro-variables affect income shares. Such an endeavor is complicated by statistical deficiencies and by the lack of available short-term data which would allow the tracing of the immediate as well as the lagged effects of macroeconomic policy. For this reason, only few empirical studies on this subject--which, indeed, has large political implications-- have been carried out. Among these, Blinder and Esaki (1978), and Blank and Blinder (1985) have analyzed the effects of inflation and unemployment on income distribution in the United States, and the staff of the International Monetary Fund have undertaken two broad studies of the consequences of a number of Fund-supported adjustment programs on income distribution and on the poor (see IMF (1986); and Heller, et al. (1988)). 2/

1/ For a review of the literature on the subject, see Demery and Addison (1987). See also Helleiner (1987). Kanbur (1987a, 1987b) discusses in detail the methodological issues regarding poverty measurement in the context of macroeconomic adjustment. Ahluwalia and Lysy (1981), Bruno (1979), and Knight (1976) concentrate on issues related to functional distribution.

2/ See also Papanek and Kyn (1986) for an empirical analysis of the effects of growth on income distribution.

This paper attempts to contribute to this rather under-researched area by considering an important case study--that of the Philippines in the period 1980-86. Relevant information is currently available from the integrated surveys of households, which were carried out beginning in 1978 by the National Census and Statistical Office (NCSO) of the Philippines. These surveys provide data on income, employment, and the earnings of individuals in the urban and rural sectors on a quarterly basis. Since quarterly national income accounts are available from 1980 onward, a quantitative approach could be adopted. The empirical study carried out here is undertaken within an analytical framework that intends to capture some of the specificities of the country studied and the policies adopted during the period, and attempts to trace the mechanisms through which macroeconomic policies and variables interact in affecting different income groups.

In the next section a simple theoretical model is presented from which an empirical specification is derived. In Section III the characteristics of the Philippine macroeconomic adjustment are described in some detail. Section IV discusses the empirical results and places them in the context of the Philippine developments. In Section V conclusions and some generalizations are presented.

II. Analytical Framework

1. The model

In order to provide an analytical framework for the quantitative assessment of the covariance between income shares and a number of indicators reflecting macroeconomic policies and to trace the possible channels through which these policies affect income distribution, a simple three-equation model is postulated here. The system describes the factors affecting relative real earnings and real wages for the higher and lower ends of the income distribution spectrum as well as the short-run determination of real income. The three basic equations are the following:

$$S_i/P = \beta_0 \, w_i^{\beta_{1i}} \, E^{\beta_{2i}} \, y^{\beta_{3i}} \qquad\qquad i = L, H \qquad\qquad (1)$$

$$w_i = \lambda_0 \, \rho^{\lambda_{1i}} \, e^{\lambda_{2i}U} \qquad\qquad\qquad\qquad (2)$$

$$y = \alpha_0 \, g^{\alpha_1} \, e^{\alpha_2 t + \alpha_3 r + \alpha_4 \pi} \qquad\qquad\qquad (3)$$

where:

S_i/P = real earnings pertaining to income class i (in particular, L is the lowest and H is the highest income groups) 1/

w_i = real wages of income class i

E = real exchange rate

y = real income

ρ = productivity level

U = underemployment rate

g = real government spending

r = real interest rate

π = rate of inflation

t = time trend.

Equation (1) is an earning function which measures, for each income group, the importance of a number of variables which are assumed here to be the main determinants of the overall level of personal income. Earnings are determined, in proportions that differ among income classes and which are measured by the coefficients β_i, by real wages, by changes in the real exchange rate, and by the level of overall economic activity. Specifically, increasing real wages and higher levels of economic activity are expected to have a positive effect on earnings (β_{1i}, $\beta_{3i} > 0$), while the influence of the real exchange rate could affect earnings of different income groups in different, even opposite, manners according to the composition of their activities in terms of traded and nontraded goods ($\beta_{2i} \gtrless 0$). Moreover, within-equation constraints could also be derived since it would be expected that earnings of low-income groups will be affected more by wages than by activity levels when compared with high-income groups, since self-employed income and capital income are probably a larger share of total earnings at high-income levels ($\beta_{1L}/\beta_{3L} > \beta_{1H}/\beta_{3H}$).

Equation (2), the real wage function, is a version of the Phillips curve which postulates a negative relationship between labor market conditions as measured by underemployment and the level of real wages.

1/ L and H do not necessarily exhaust the totality of income groups but, rather, stand for representative income groups at both ends of the distribution.

It also includes a measure of overall labor productivity, which is expected to have a positive effect on real wages. The magnitude of the effects of ρ and U on w at the different income levels are measured by the λ_i coefficients.

Equation (3) is an extended version of an IS curve, which relates aggregated real economic activity to fiscal and monetary variables as represented by the level of government spending and by the real rate of interest. In addition, it incorporates a time trend and the rate of inflation, which provide an additional variant of a short-term, augmented Phillips curve. [1]

Given the lack of infomation about real wages by income class, the structural equations cannot be directly estimated. To obtain a reduced-form version for the model--which in its present version is a recursive model--we substitute the log of equations (3) and (2) into equation (1). Then the ratio between the low-income group earnings and the high-income group earnings is calculated. The resulting equation is the logarithm of the ratio of the earnings of the low-income to the high-income groups as a function of productivity, underemployment, government spending, the real exchange rate, the real rate of interest, and the rate of inflation, with a constant and a time trend. [2] The coefficients are the following:

$$\log (S_L/S_H) = C + \beta_1\lambda_1 \log \rho + \beta_1\lambda_2 U + \beta_2 \log E$$
$$+ \beta_3\alpha_1 \log g + \beta_3\alpha_2 t + \beta_3\alpha_3 r + \beta_3\alpha_4 \pi \tag{4}$$

where:

$$C = \beta_0 + \beta_1\lambda_0 + \beta_3\alpha_0; \quad \beta_0 = \beta_{0L} - \beta_{0H}$$

$$\beta_1\lambda_1 = \beta_{1L}\lambda_{1L} - \beta_{1H}\lambda_{1H}$$

$$\beta_1\lambda_2 = \beta_{1L}\lambda_{2L} - \beta_{1H}\lambda_{2H}$$

$$\beta_2 = \beta_{2L} - \beta_{2H}$$

$$\beta_3\alpha_j = (\beta_{3L} - \beta_{3H}) \alpha_j \qquad\qquad j = 1 \ldots 4$$

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[1] Obviously, variables such as underemployment and inflation are interrelated and they cannot be taken realistically as exogenous. However, given the focus of the study and the data limitations, they are assumed to be independently determined with respect to the dependent variable.

[2] Notice that, given total income as a common denominator, the log (S_L/S_M) can also be interpreted, and measured, as the logarithm of the rate of the low-income shares to the high-income shares in total income. This interpretation is given in some of the following discussions.

FIGURE 1
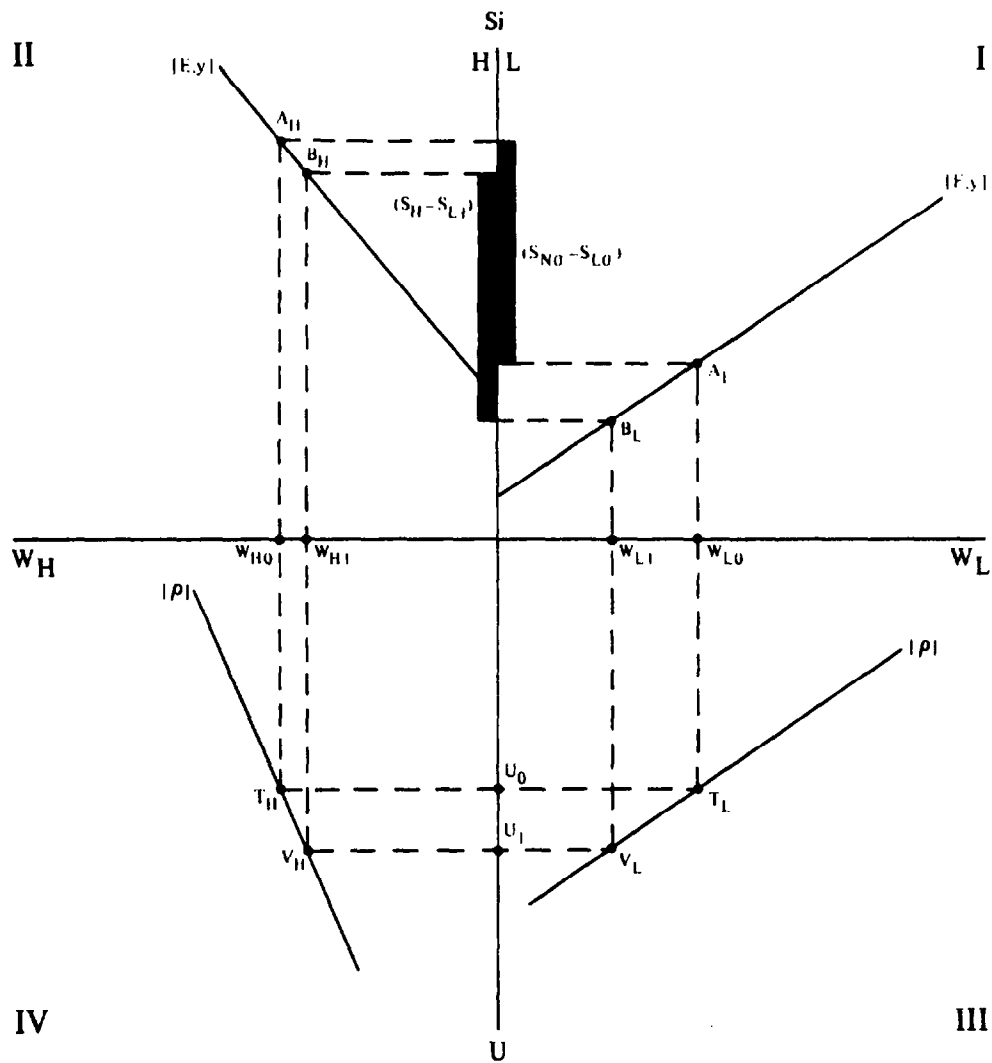
For the most part, the β coefficients in the reduced form represent the net difference between the effect of a variable on the earnings, or on the income shares, of the low-income group and its effect on the high-income group. A positive coefficient is "progressive" in the sense that it indicates a relative improvement in the share of the low-income group with respect to the high-income group, while a negative coefficient is "regressive" in the same sense. Take, for example, the coefficient of the rate of underemployment, $\beta_1 \lambda_2 = (\beta_{1L}\lambda_{2L} - \beta_{1H}\lambda_{2H}) \gtrless 0$. It reflects the relationship between the underemployment semi-elasticities of real wages for each income group (the slope of their Phillips curves) weighted by the importance of wages in the total earnings of each group. If $\beta_1 \lambda_2 < 0$, an increase in underemployment tends to worsen the relative share of the low-income group, reflecting a higher sensitivity of low-income wages to the employment conditions and/or a higher share of wages in the total earnings of the lower-income group. 1/ Similarly, a positive sign for the coefficient of the real interest rate variable, $\beta_3 \lambda_3 > 0$, implies a negative impact of interest rates on economic activity combined with a stronger effect of economic activity (when employment effects are accounted for independently) in determining the level of real earnings for the high-income groups compared with the low-income groups $(\beta_{3H} > \beta_{3L})$.

2. Graphical presentation

The functional relationships described by equations (1) - (3), as well as the interactions among them, are illustrated in Figure 1. The upper quadrants I and II represent the relationship between real wages and earnings for the low-income and the high-income groups, respectively. The slope of the curves is given by the β_i coefficients, while the parameters determining the location of each curve are real income (y) and real exchange rate (E). If changes in real wages account for a larger portion of earnings fluctuations in low-income groups than in high-income groups, $\beta_{1L} > \beta_{1H}$, the earnings curve in quadrant II will be steeper than in quadrant I. An increase in real income will shift both curves upward, the extent of the shift being determined by the coefficients β_{3i}, while changes in the real exchange rate may shift the curves in either direction, depending on the type of effects that earnings arising from tradable and nontradable goods may have on each income class. Quadrants III and IV represent the Phillips curves of the L and H groups, respectively, with the productivity level as a parameter. If unemployment (or underemployment) has a stronger impact on the level of real wages in the low-income than in the high-income bracket (that is, $|\lambda_{2L}| > |\lambda_{2H}|$), the Phillips curve in quadrant IV will be steeper than in quadrant III.

1/ Since $\beta_{1i} > 0$ and $\lambda_{2i} < 0$, $\beta_1 \lambda_2 < 0$ when $|\beta_{1L}\lambda_{2L}| > |\beta_{1H}\lambda_{2H}|$.

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Given an initial position represented by a general level of
unemployment equal to U_0, real wages will be W_{L0} and W_{H0} for the low-
income and the high-income groups, respectively. At these real wage
levels, total earnings are determined along the respective earning
curves with the low-income group at point A_L and the high-income group
at point A_H. The difference between the two levels of earnings is
represented along the common vertical axis by the shaded area to the
right, with the length of the segment measuring the extent of distribu-
tional inequality. An increase in the rate of unemployment to U_1
induces a movement along the Phillips curves (from T_L to V_L in panel III
and from T_H to V_H in panel IV), reducing real wages to w_{L1} and w_{H1}. At
the lower wage levels, earnings will fall for both income groups (to B_L
and B_H). Given the set of parameters assumed in Figure 1, however, the
higher level of unemployment causes a larger fall in the earnings of the
low-income group, and this leads to a widening in inequality as measured
by the larger difference in earnings shares depicted by the shaded area
at the left of the vertical line.

The effects of other macro-variables can also be analyzed using
this framework. For example, if $b_{3L} < b_{3H}$, indicating a higher positive
effect of economic activity on the earnings of high-income compared with
low-income groups, an increase in government spending would tend to
increase inequality by shifting upward the earnings curve more in
panel II than it would in panel I, increasing, for a given level of real
wages, the vertical difference between S_H and S_L. Similarly, if real
devaluations are progressive, that is, they improve the earnings of the
L group relatively more than those of the H group (if, for example, low-
income farmers producing exportable crops are benefited by an
improvement in their competitiveness), the earnings schedule in panel I
will shift upward more than in panel II. Moreover, it is conceivable,
as mentioned above, that both curves could move in opposite directions.

III. The Philippine Experience with Macroeconomic
Adjustment in the 1980s

Following a decade of substantial growth, the Philippine economy
reached a crisis situation in 1983. Although GNP and exports grew
rapidly during the 1970s (see Table 1), manufacturing growth largely
occurred in highly protected sectors and the incentive system was not
conducive to a broad-based export expansion. Investment rates were
about 30 percent of GNP, but did not result in an efficient allocation
of productive capacity. At the same time, government intervention in
productive activities was on the rise.

Table 1.   Philippines: Selected Macroeconomic Indicators, 1970-86

	1975-79	1980	1981	1982	1983	1984	1985	1986
Real GNP growth rate (%)	6.4	5.0	3.4	1.9	1.1	-6.8	-4.2	2.0
Inflation (CPI) (yearly averages)	9.9	18.2	12.4	10.2	10.0	50.3	23.1	0.8
Current account deficit/ GNP (%) (- = deficit)	-4.6	-5.4	-5.4	-8.1	-8.1	-4.0	0.1	3.3
Real exchange rate 1/ (Index 1980 = 100)	93.2	100.0	84.8	87.9	73.8	72.9	79.2	61.2
External debt (US$ billion)	8.8	17.1	20.9	24.2	24.8	25.4	26.3	28.3
Consolidated public sector deficit/GNP (%)	n.a.	3.0	5.5	7.0	9.0	8.3	5.9	5.4
Investment/GNP (%)	28.8	30.7	30.7	28.8	27.2	17.4	14.3	13.2
Real interest rates (deposit)	--	--	4.5	7.0	6.0	-19.7	10.6	17.0

1/   Period average; increase indicates real effective appreciation.

The deterioration in the terms of trade in the late 1970s, followed by rising interest rates in the early 1980s, brought out into the open these underlying structural weaknesses in 1983. Growing import requirements were not met with higher exports receipts and the current account deficit increased from an average deficit of 4.6 percent of GNP in the 1975-80 period to nearly 8 percent in 1982. As most of these deficits were financed by foreign borrowing, total external debt increased from US$5 billion at the end of 1975 to US$24 billion in 1982. The growing public sector gap resulted in the doubling of the consolidated public sector deficit from 3 percent of GDP in 1980 to about 6 percent in 1982. The adjustment continued to be postponed by the increasing short-term debt but the external debt problem became insurmountable as commercial lenders refused to roll over short-term credits or extend new loans. Capital flight followed the political crisis, and this further exacerbated the balance of payments problems. The option of continuing to postpone the adjustment was no longer available.

The Philippines started its stabilization process in late 1983 and, by 1985, the short-run external imbalances were brought under control. The current account reversed from a deficit equivalent to 8 percent of GNP in 1983 to a small surplus in 1985, with both imports and exports falling at the same time. This was achieved through a large drop in real absorption and a consequent sharp output contraction. Drastic cuts in public expenditures and restrictive monetary policies resulted in a drop in GNP of 6.8 percent in 1984 and 3.8 percent in 1985. The consolidated public sector deficit was reduced to 2.6 percent of GDP in 1985. Total investment fell from 27 percent of GNP in 1983 to 16 percent in 1985.

In contrast, the real exchange rate, which was initially depreciated, was back to its 1981 level by 1985. Furthermore, quantitative import restrictions, increases in import duties, and taxes on exports were also introduced as part of the Government's stabilization program. The intensification of import controls at the time of the initial 1983 nominal devaluations, complemented with accommodating monetary policies at the time, resulted in an acceleration of inflation from 10 percent in 1983 to 50 percent in 1984, which contributed to the erosion of the effects of the nominal devaluations on the real exchange rate. Another 28 percent devaluation took place in June 1984 and a managed float was implemented shortly thereafter.

Monetary policy was highly restrictive in 1985, contributing to a nominal currency appreciation and to a sharp increase in real interest rates. Real lending rates went up from 7 percent in 1982 to 21 percent by the last quarter of 1985, while the stock of credit to the private sector decreased by 54 percent during the adjustment period.

The stabilization period, during which output and government expenditures contracted, affected all sectors of society but, clearly,

its negative impact was not evenly distributed. In the next section, the reduced form derived from the analytical framework is estimated in order to evaluate the quantitative impact of the stabilization package on income distribution and the specific contribution of each of its components to the distributional outcome of the adjustment effort.

IV. Empirical Results

The empirical implementation of the model centers around the estimation of equation (4) for the period 1980-86. The data used are discussed in the Appendix. The dependent variable, $\log (S_L/S_H)$, is calculated as the ratio of the share of income of the lowest three deciles of income earners to the share of income of the highest decile. The reasons for this split are that a very high proportion of income is received by the top 10 percent and that the incidence of poverty can be better captured by focusing on a wider proportion of earners such as the one selected here. 1/ 2/

The results of estimating equation (4) are reported in Table 2. 3/ The fit of the regression is very good, with all the variables yielding statistically significant coefficients. The coefficients of labor productivity, the real exchange rate, the real interest rate, and the time trend are positive, while those of underemployment, the inflation rate, and government spending are negative.

Thus, the estimated coefficients indicate that, over the sample period, gains in productivity, probably by inducing real wage improvements, tend to reduce inequality. A rise in the real exchange rate also tends to reduce dispersion, supporting the view that low-income groups tend to benefit relatively more from gains in external competitiveness than the high-income groups. The positive sign of the real rate of interest may arise from its negative correlation with economic activity and probably stems from the fact that $\beta_{3H} > \beta_{3L}$, or that short-run

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1/ Within the data set used, the average fraction of income received by families in the lowest 30 percent was 6.3 percent, while the highest 10 percent received 44.6 percent.

2/ As explained in the Appendix, a limitation of the data is the lack of information on returns from financial assets. This probably affected S_H much more than S_L but could not be corrected on the basis of the available information.

3/ The estimation is performed using OLS with a Cochrane-Orcutt Iterative adjustment to account for serial correlation. It was not felt that there was a need for additional complexity in the estimation techniques since no serious reverse causation from relative shares to independent variables could be expected, and heteroskedasticity is not likely to be present given that most of the variables (except, of course, t) show much of a time trend.

Table 2. Philippines: Earning Shares and Macroeconomic
Variables (Equation (4)), Quarterly, 1980-86

Dependent Variable: $\log (S_L/S_H)$

Variable	Coefficient	t-value	Beta coefficient
Constant	22.145	3.86	--
ρ - Productivity (log)	2.713	3.89	1.003
U - Underemployment	-0.202	6.25	-0.915
E - Real exchange rate (log)	1.500	2.19	0.362
g - Government spending (log)	-3.639	4.46	-0.613
r - Real interest rate	0.021	2.94	0.548
π - Inflation rate	-0.041	2.41	-0.532
t - time trend	0.962	7.56	1.731

$$R^2 = 0.961$$
$$D.W. = 2.611$$
$$S.E.E. = 0.128$$

Note: The variables are defined and the data sources reported in
Appendix I. The estimations were performed using a Cochrane-Orcutt
Iterative technique.

improvements in economic activity benefit high-income groups more than low-income groups. 1/

The negative signs for underemployment is consistent with the findings of Blank and Blinder (1985) for the United States. In the case of the Philippines, the size and significance of the coefficients strongly suggest that underemployment, probably through its depressing effects on wages, affects low-income groups more adversely than high-income groups. Regarding inflation, and unlike in the United States, it is found that it is indeed a regressive tax which probably arises, in addition to its effects through economic activity, from the better ability of the upper-income groups to protect their real earnings from being eroded by price increases.

A somehow striking result arises from the sign of the government expenditure variable. 2/ It is apparent from the results that government spending has had regressive redistributive effects. This could be caused by the positive relationship between y and g (if $\beta_{3H} - \beta_{3L} > 0$), and also from a government expenditure composition which has a low (or falling) component of social expenditures. This type of result, although not clearly expected, is not necessarily surprising. Tanzi (1973) reports a number of similar results arising from studies of government expenditure incidence in Latin America, and discusses at length the reasons for, and the consequences of, non-progressive patterns of public spending in developing countries.

Because the units of measurement for the dependent variables are different, one way of determining the relative influence of the explanatory variables on income shares is to calculate the Beta coefficients which are also reported in Table 1. 3/ We can observe from those coefficients that labor market conditions are the most important variables in explaining inequality because the higher Beta values correspond to productivity and underemployment (abstracting from the time trend). The negative effect of government spending seems to follow

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1/ Clearly, the fact that earnings in the survey used (see Appendix) do not include returns to financial assets may affect this conclusion. Increases in real interest rates probably benefit more the higher decile. This particular conclusion could change depending on the magnitudes involved. However, the lack of information on returns to financial assets does not allow us to incorporate this effect in our calculations.

2/ Although government consumption is used in the estimation as a proxy for government expenditures, adding construction expenditures did not alter the results.

3/ Beta coefficients measure the change in income shares, other things being equal, for a unit change in each of the independent variables. Since all the variables are expressed in standard deviation, the Beta coefficients are independent of the unit of measurement, and can thus be compared directly within the equation.

in importance. Inflation and the real interest rate have a similar (although opposite) impact while the real exchange rate, although significant, is substantially less quantitatively important in explaining the changes in income inequality.

How could these results be interpreted within the specific Philippine context? Clearly, the recent macroeconomic adjustment negatively affected the poorer sectors mainly through the increase in underemployment that followed the stabilization program. Increases in underemployment have a high social cost because they have a larger effect on those workers who have the least specific skills and, therefore, are the first ones to become underemployed when aggregate employment falls. The low brackets were also hit by the increase in inflation and by the overvaluation of the exchange rate. The poorest segments seem to bear most of the burden of the inflation tax since both the urban and rural poor cannot protect their real incomes because they do not have indexed wages, and they seldom have any other assets that keep their real value in times of inflation. Inflation was indeed found in this study to be a regressive tax.

The lack of a significant real devaluation during the stabilization program had a negative effect on the poor because they are mostly involved in the production of tradables, and export production is intensive in labor, their main resource. A devaluation, on the other hand, does not have serious adverse effects on the purchasing power of the poor since their consumption basket contains a small share of imported goods. 1/ In the medium term, the landless workers will also benefit from a real devaluation, to the extent that this expands employment opportunities in rural areas.

Regarding the high-income group, its share was affected negatively primarily by increasing real interest rates and cuts in government spending, both leading to the sharp drop in economic activity. There are two components to this result. One, which has been observed in other countries, is that periods of macroeconomic difficulties are usually accompanied by a reduced concentration in the distribution of income (although certainly not by a reduction in the incidence of poverty). This seems to be confirmed here by the significance of the time trend. A channel for this effect to take place is the buoyancy of nonmarket and informal market activities in the face of a deteriorating formal economy. A second reason for the results observed in the Philippines is the type of government spending that took place in the past. It benefited mainly the high-income group through large capital-intensive projects, and through a social service system that did not reach the poor.

1/ In the Philippines, 72 percent of the expenditures of the poor are on locally produced cereal and cereal preparations, fish, and fruits and vegetables.

At the normative level, the results indicate that, although a drop in absorption was indeed necessary in order to correct the large external and internal imbalances, the impact of such an adjustment on income distribution could have been perhaps softened, if there had been a larger change in the real exchange rate and if the drop in government spending had been accompanied by a drastic change in the composition of public expenditures.

The results reported in Table 2 present evidence on the effects of macroeconomic activity on income inequalities rather than on poverty levels. Obviously, however, in a country like the Philippines, the impact of macroeconomic policies on the absolute incidence of poverty could be of equal or more importance for policy makers. But even if one is only interested in poverty, a case has been made [1] that the share of income received by families below some particularly defined poverty line (or some other measure for the bottom part of the distribution) is at least as good an indicator of advances made against poverty as is the absolute count below an official poverty line. Still, the measure used in the estimations above, being an indication of the relative performance of high-income and low-income groups, may not reveal the full extent of the impact of macro-variables on the poorest groups of the population, or the results may be misleading in their respect, if they mainly reflect redistributions between middle-income and high-income classes. In order to shed additional light on the distributional incidence of macro-policies, a specification similar to equation (4) was estimated, with the share of income received by the lowest quintile of households as a dependent variable (S_{20}). [2] The results of the estimation are reported in Table 3.

The results in Table 3 are very consistent with those obtained in Table 2. Clearly, underemployment, the rate of inflation, and government spending are highly regressive. However, contrary to equation (4), and as indicated by the Beta coefficients, the importance of inflation seems to exceed that of underemployment in affecting negatively the income share of the poor, which strengthens the observed regressive aspect of the inflation tax. As in equation (4), productivity gains and real exchange rate depreciations improve the relative lot of the poor. As a whole, the results in Table 3 strongly confirm the inferences made on the base of the ratio of income shares regarding the significance, direction, and size of the effects of all the variables considered.

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[1] See Blinder (1980).
[2] This group, the poorest of the poor, is considered to be below subsistence income levels.

Table 3. Philippines: Earning Shares and Macroeconomic
Variables, Quarterly, 1980-86

Dependent Variable: $\log (S_{20})$

Variable	Coefficient	t-value	Beta coefficient
Constant	33.645	5.16	--
ρ - Productivity (log)	3.921	4.93	2.544
U - Underemployment	-0.175	4.77	1.396
E - Real exchange rate (log)	2.165	2.82	0.919
g - Government spending (log)	-5.128	5.54	-1.515
r - Real interest rate	0.027	3.31	1.221
π - Inflation rate	-0.075	3.89	-1.700
t - time trend	0.061	4.20	1.941

$$R^2 = 0.850$$
$$D.W. = 2.682$$
$$S.E.E. = 0.148$$

Note: See Table 2.

S_{20} = share of income received by the lowest 20 percent of households.

V. Concluding Remarks

This paper studies the experience of the Philippines in the 1980s, focusing on the effects of the stabilization program initiated in 1983. A simple analytical framework is developed to examine the evidence on the distributional impact of macroeconomic variables. The results show that underemployment and inflation are strongly regressive in the Philippines. The same is true for the level of government expenditure, reflecting the specific composition of public spending during the period. Productivity levels, the real interest rate, and the real exchange rate were found to be progressive instruments, since gains in these variables improved the relative income shares of the poor.

While the evidence also shows that, when accounting for employment effects, the income distribution narrows when the economy shrinks and widens when it expands, such distributional "improvements" certainly could not be construed to be welfare-increasing. The fact that a fall in real activity may have hurt higher-income groups relatively more should not distract from the need to devise policy packages that soften the brunt of the adjustment on those groups that are largely deprived in absolute terms and therefore lack the ability to protect themselves during periods of austerity.

On the sobering side, the Philippine experience seems to indicate that "good" policies also have a distributional payoff. Reducing inflationary pressures, avoiding real exchange rate overvaluation, and attaining positive real interest rates all have a desirable incidence, while undiscriminating expansionary fiscal policies, with no attention to public expenditure composition, will probably result in a higher skewness of the distributional curve.

Data Sources and Definitions

The NCSO integrated survey of households contains quarterly data on the earnings of individual earners for 19 quarters from 1980/III to 1986/IV. The dependent variables, log (S_L/S_H) and log (S_{20}), were calculated as follows: data on the earnings distribution of individual workers were derived from Table 6 of the Integrated Survey of Households Bulletin. This includes earnings from all sources, including those derived from capital holdings but excludes income from financial assets (and probably from all assets held abroad). This table reports the number of days worked against the earnings from the primary job of those in the sample. 1/ In order to derive decile earnings distribution, the income ranges cum number of workers data from Table 6 were converted to actual income earned for each income class. The earnings classes in Table 6 range from no earnings, to less than ₱ 500 per quarter, to the highest and open-ended class of ₱ 50,000 and over. The NCSO did not report the actual averages within each earnings class as a basis for calculating incomes earned in each class, but the overall average income for all workers is reported. Thus, information for the overall income was derived by multiplying the total number of workers by the average income.

As a first approximation, the midpoint of each earnings class range was used as the average for all classes except for the open-ended highest one. The overall income less the sum of all the other classes provided an estimate for income earnings in the highest class. Adjustments were then made on the income averages for each class, deducting some from the lower income classes until reasonable values for the average income in the highest class could be derived. ·

The resulting shares of income and their corresponding fraction of total income earners for each income class were then converted to a decile basis using a linear interpolation of a Lorenz curve. The shares of income by decile formed the basis for the dependent variables.

Independent variables

a.   Labor productivity (ρ) was derived by estimating the total number of actual days worked by earners in the sample, by multiplying the midpoint of the number of days worked by the number of earners working within the corresponding bracket of number of days worked. The actual productivity variable was the ratio of the quarterly GDP to the estimated number of hours worked as derived from Table 6, NCSO.

1/ Data on Table 6 after 1980 have not yet been published by the NCSO but were taken from special tabulations. Professor M. Montes, from the University of the Philippines, provided technical assistance on data analysis and on the empirical specification of the variables.

   b.   Underemployment (U) was measured as one minus the ratio of the
actual number of days worked (estimated as in the previous paragraph) to
the potential number of days worked (estimated by assuming that all
workers worked 65 days in the corresponding quarter).

   c.   The inflation rate (π) was represented by the quarterly rate
of change of the consumer price index as reported in the IMF, Interna-
tional Financial Statistics. In estimating equation (4), to allow for
lagged effects, π_{t-1} was used.

   d.   The real rate of interest (r) was estimated as the difference
between the nominal rate (i) at the beginning of the period and the
inflation rate over the period. The nominal rate (i) was represented by
the domestic 91-day treasury bill rate.

   e.   Government spending (g) was represented by real government
consumption expenditures, as reported in the quarterly national income
accounts. Using government construction expenditures, or the sum of
government consumption and government construction, does not materially
change the results.

   f.   The real exchange rate (E) was computed by deflating the
nominal peso to the dollar exchange rate by the corresponding consumer
price index. In the estimations, the one-period lagged rate (E_{t-1}) was
used.

References

Ahluwalia, M.S., and F.J. Lysy, "Employment, Income Distribution and Programs to Remedy Balance of Payments Difficulties," in W.R. Cline and S. Weintraub (eds.), Economic Stabilization in Developing Countries (Washington: Brookings Institution, 1981), pp. 149-90.

Blank, Rebecca M., and Alan S. Blinder, "Macroeconomics, Income Distribution, and Poverty," NBER Working Paper, No. 1567 (Cambridge, Massachusetts: National Bureau of Economic Research, 1985).

Blinder, Alan S., "The Level and Distribution of Economic Well-Being," in M.S. Feldstein (ed.), The American Economy in Transition (Chicago: University of Chicago Press, 1980), pp. 415-79.

_____, and Howard Y. Esaki, "Macroeconomic Activity and Income Distribution in the Postwar United States," Review of Economics and Statistics (November 1978), pp. 604-09.

Bruno, Michael, "Income Distribution and the Neoclassical Paradigm," Journal of Development Economics, Vol. 6, No. 1 (March 1979).

Demery, Lionel, and Tony Addison, "Stabilization Policy and Income Distribution in Developing Countries," World Development, Vol. 15, No. 12 (Oxford: Pergamon Press, December 1987), pp. 1483-98.

Helleiner, Gerald K., "Stabilization, Adjustment, and the Poor," World Development, Vol. 15, No. 12 (Oxford: Pergamon Press, December 1987), pp. 1499-1513.

Heller, Peter S., and others, "The Implications of Fund-Supported Adjustment Programs for Poverty: Experiences in Selected Countries," IMF Occasional Paper, No. 58 (Washington: International Monetary Fund, May 1988).

International Monetary Fund, Fund-Supported Programs, Fiscal Policy and Income Distribution, IMF Occasional Paper, No. 26 (Washington: International Monetary Fund, September 1986).

Kanbur, S.M.R. (1987a), "Measurement and Alleviation of Poverty: With an Application to the Effects of Macroeconomic Adjustment," Staff Papers, International Monetary Fund (Washington), Vol. 34, No. 1 (March 1987), pp. 60-85.

_____ (1987b), "Structural Adjustment, Macroeconomic Adjustment and Poverty: A Methodology for Analysis," World Development, Vol. 15, No. 12 (Oxford: Pergamon Press, December 1987).

Knight, J.B., "Devaluation and Income Distriubtion in Less Developed Economies," Oxford Economic Papers, Vol. 28, No. 2 (July 1976), pp. 200-27.

Papanek, Gustav F., and Oldrich Kyn, "The Effect on Income Distribution of Development, the Growth Rate, and Economic Strategy," Journal of Development Economics, Vol. 23 (1986), pp. 55-65.

Tanzi, Vito, "Redistributing Income through the Budget in Latin America," Banca Nazionale del Lavoro Quarterly Review (Rome, Italy), Vol. XXVI (1973), pp. 66-87.