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Fiscal Policy, Labor Markets, and the Poor

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Abstract

In designing policy measures, including possible social safety nets, targeted to the poor, it is important to fully understand the efficiency implications of these measures. There is abundant macroeconomic literature on their negative effects on the poor's work effort. The literature, however, does not adequately recognize the positive effects of these measures on improved nutrition and health of the poor or on aggregate supply. This paper presents an analytical framework to trace both the positive efficiency implications, as well as the resource (or cost) implications of such policies.

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Summary

In designing public social expenditure measures, including social safety nets, targeted to the poor, it is important to understand fully the efficiency implications of these measures. An abundant macroeconomic literature considers the negative efficiency implications of these measures, such as their possible adverse effects on the poor's work efforts and the resources required to administer the measures. The literature, however, does not adequately recognize the possible positive efficiency implications of these policies. These positive implications are due to the fact that these measures help the poor strengthen their nutrition and health. This strengthening, in turn, enhances the poor's capacity to work, thus increasing aggregate labor supply. These positive efficiency implications are important in a country with large ultra-poor groups, particularly if they are young and therefore active or potential labor force participants.

This paper introduces a macroeconomic framework to trace both equity and efficiency implications of the government expenditure programs targeted to the poor. Within this framework, the comparative static effects of budgetary social expenditures on employment, real wages, and aggregate supply are derived. These expenditures are not to be considered a "free lunch." Therefore, the supply-side effects of budgetary social expenditures are combined with their effects on aggregate demand. This paper discusses the implications that alternative financing of these expenditures can have on the welfare of the poor and on economic growth.

I. Introduction

The impact of macroeconomic policies on the economic conditions of the poorer segments of the population is a subject that is attracting increasing analytical attention. The importance of recognizing the distributional consequences of macroeconomic policies has been enhanced, on the one hand, by the severity of the adjustment measures required in many countries, and, on the other hand, by the initial situations faced by some of these countries where poverty and deprivation had reached high levels even before stabilization programs were launched.

There are major analytical problems in dealing with this issue. It is indeed difficult to generalize the precise impact on the poor of macroeconomic policies, since country-specific conditions, the nature of the imbalances, and the interaction between policies blur the understanding of the policies' ultimate distributional consequences. Policies which, by themselves, could be thought to have clear-cut consequences on the poor would, when combined with others, result in quite different outcomes. Moreover, the channels through which each policy affects income distribution are quite intricate, and the observable results may certainly not reflect the characteristics of the dynamic process through which various policies operate.

In this paper a simple framework is developed to analyze the effects of fiscal policy, a key macroeconomic instrument which could have, by design or default, major effects on the absolute and relative income position of low-income groups. However, given the difficulties in isolating the distributional impact of specific policies, it is necessary to consider the effects of fiscal policy within a more complete macroeconomic context and to make explicit the channels through which the policy may affect the poor.

To trace the effects of fiscal policy on the poor, the channel considered here is the labor market, and the analysis is based on conceptual distinctions made in recent literature between the ultra-poor and the poor. ^{1/} The presence of ultra-poor unskilled workers imposes a constraint on the productive capacity of the country. This constraint is not always recognized in conventional macroeconomic analyses: the extremely low levels of income and social services received by the ultra-poor may result in inadequate nutrition, health, and living conditions, which reduce their productivity below their potential and effectively limit the short-run supply of labor and, therefore, aggregate output. Since these conditions are likely to be affected directly and indirectly by specific fiscal policies, some standard macroeconomic predictions have to be altered when these considerations are taken into account. Thus, some elements of conventional wisdom that stress the disincentive effects of targeted government social programs might have to be supplemented by considering the positive effect that

^{1/} Lipton (1988) elaborates on this distinction.

these programs may have on the capacity of the beneficiaries to work. Similarly, as far as the ultra-poor are concerned, the standard prediction that wage restraint would increase employment and aggregate output might have to be corrected to account for the possible detrimental effects of wage restraint on nutrition and health and hence on aggregate output. 1/

The organization of the paper is as follows. Section II presents dual (skilled-unskilled) labor markets, stressing both the particular effect of poverty on the productive capacity of unskilled workers and the output potential of the economy; this section also examines the possible role of government expenditure policy within this framework. Section III integrates the labor market within a macroeconomic framework in which aggregate demand as well as aggregate supply are affected by fiscal policies. The net impact on poverty of alternative fiscal strategies is then analyzed in a comparative static framework. Section IV presents the conclusions.

II. Dual Labor Markets, Aggregate Supply, and the Poor

1. Nutrition, health, and the poor in the production process

The study of the relationship between labor productivity and the nutritional conditions of the labor force has a long history in both nutrition and economic literature. Although it has been claimed (Seckler (1982)) that individuals who have experienced mild to moderate malnutrition in childhood suffer no functional impairment, there is some evidence suggesting that a child's slow growth resulting from malnutrition has adverse implications for his/her future productivity and capacity to work (Martorell (1989); Dasgupta and Ray (1987)). Cornia (1988) cites evidence of the negative effects of early childhood malnutrition on cognitive capacity and physical performance. He argues that substantial gains in the productivity of manual workers could be obtained through health and nutrition measures aimed at promoting growth during childhood. 2/

1/ The extent to which social programs increase aggregate production would also depend on the structure of the labor force, particularly its age composition. See the discussion in the following section.

2/ The surveys of literature by Scrimshaw (1986) and McGuire and Austin (1987) suggest that aerobic capacity has been shown to affect labor productivity among lumberjacks, sugarcane workers, construction workers, and other manual workers in Australia, Brazil, Colombia, Ethiopia, Guatemala, and India. A World Bank review of public work programs in developing countries indicates that 30 percent of those invited to participate in a food-for-work program in Bangladesh had to decline the offer as they were too weak to carry out any meaningful physical work (Burki and Weaving (1976)). See also Strauss (1986, 1990) and Deolalikar (1988).

Living conditions are, therefore, likely to have an impact on long-run trends in labor productivity. Of concern has also been the analysis of the short-run productivity implications of health and nutrition. An attempt to explain downward wage rigidity in poor countries with surplus labor is given by the so-called efficiency wage hypothesis which claims that lowering wages below a certain level would be counterproductive because workers would be unable to purchase dietary energy (Leibenstein (1957)). Moreover, according to Cornia (1988), dietary improvements have been shown to have an immediate effect on the performance of adult workers. In addition, poor nutrition and health of workers and their families are responsible for substantial losses of output due to absenteeism. ^{1/} A growing body of literature stresses the immediate adverse implications of malnutrition for labor productivity and for the number of hours of effective work.

If these results are correct, the poverty issue is important not only as a moral and political problem, but also as an economic efficiency question. The analysis of poverty in the context of economic efficiency has largely focused on the work-disincentive effects that are alleged to arise from social programs targeted to the poor. However, if social programs also affect productivity levels and effective labor supply, this focus may need to be corrected or extended. In the case of the ultra-poor, it is apparent that better nutrition and health can have positive short-run implications for both the quality and the quantity of labor services and, therefore, for the actual and potential effective supply of labor in the system. An improvement in the nutrition and health of workers and their families may increase the supply of labor services, measured either in "effective man-hours" or in "tasks" performed by the ultra-poor. Under these circumstances, it would be necessary to develop a framework to distinguish, analytically, the labor services provided by the ultra-poor from those provided by the rest of the population. The extent to which these expenditures have positive efficiency implications would depend not only on the share of the poor or the ultra-poor in the population, but also on the share of the young. ^{2/}

This section introduces a model of production in which insufficient nutrition and health are a binding constraint on the effective quantity of labor services for a given wage rate. Poor nutrition and health, in turn, reflect both low real earnings and insufficient government services. Focusing on the supply side, we analyze the effects of targeted government social expenditure on the real wages of unskilled workers (largely the ultra-poor), on their capacity to work, and on production. However, there is no discussion of many other aspects of

^{1/} Cornia (1988) indicates that millions of workdays are lost every year through the incidence of malaria. McGuire and Austin (1987) estimate that at least 140-280 million workdays are lost annually to the care of about 140 million malnourished children.

^{2/} See Tanzi (1974) for a discussion of this point.

targeted social expenditure, such as their disincentive effects and political and institutional difficulties associated with their implementation (e.g., see Besley and Kanbur (1990), Nelson (1988), and Liebenthal and others (1989)).

2. Aggregate supply and dual labor markets

The following is a postulation of a simple economy producing a composite good, using three inputs: capital, skilled labor, and unskilled labor. Assume a Cobb-Douglas production function for the single good and consider a production function. It is referred to here as the aggregate production function:

$$QS = K^{a_1} LD_s^{a_2} LD_u^{a_3} \quad (2.1)$$

where, with subscripts s and u denoting, respectively, skilled and unskilled labor,

QS = level of production,
K = capital services,
LD = labor services, and
 $a_1, a_2, a_3 \geq 0$, with, as usual, $a_1 + a_2 + a_3 = 1$.

Regarding labor services, the following is postulated. (1) There are separate markets for skilled and unskilled workers. The real wage rate for skilled workers is determined, due to collective bargaining or government intervention, at a rate higher than the market-clearing level. On the other hand, the real wage rate for unskilled workers is determined at the market-clearing level. (2) Unlike skilled workers, unskilled workers who constitute the ultra-poor population usually cannot work the normal number of hours (or perform the standard number of required tasks). Under these assumptions, the supply of unskilled labor services for a given wage rate can be measured as a varying proportion, α , of the number of unskilled workers. The proportion α is assumed, in turn, to depend on the state of their nutrition and health, which is a function of both the level of their per capita real income, which in turn depends on the real wage rate in the unskilled labor market, and the amount of government social expenditure targeted to the ultra-poor. (3) For simplicity, the number of both skilled and unskilled workers is assumed constant, and therefore the labor supply is completely inelastic with respect to real wages except for the effect that wages have on α , that is, on the capacity of unskilled workers to provide labor services. 1/

1/ This implies that the supply of unskilled labor is elastic with respect to wages, not because of the effect of higher wages on work efforts but because of their effect on the capacity to work.

The segmented labor markets can be formally described as follows:

(a) Skilled labor market

$$\text{Supply} \quad LS_s = \bar{N}_s \quad (2.2)$$

$$\text{Demand} \quad LD_s = a_2 \frac{QS}{w_s}, \text{ and} \quad (2.3)$$

where \bar{N}_s stands for the given number of skilled workers available, and w_s the negotiated, nonmarket-determined real wage rate of employed skilled workers. Since w_s is usually set above market-clearing levels, an excess supply of skilled labor tends to emerge. We denote it by x_s , which is equal to:

$$x_s = \frac{LS_s}{LD_s} = \frac{\bar{N}_s w_s}{a_2 QS}. \quad (2.4)$$

(b) Unskilled labor market

$$\text{Supply} \quad LS_u = \alpha \bar{N}_u x_s^\beta \quad 0 < \beta \leq 1, \quad (2.5)$$

$$\text{where } \alpha = \left(\frac{y'_u}{y'_u} \right)^{b_1} \left(\frac{g}{g^*} \right)^{b_2}.$$

$$\text{Demand } \underline{1/} \quad LD_u = a_3 \frac{QS}{w_u}, \quad (2.6)$$

where $y' (= \frac{LS_u w_u}{\bar{N}_u x_s g})$ denotes per capita real income of the poor (or workers in the unskilled labor market) and g is per capita government social expenditure targeted to the poor. 2/

For the unskilled labor market, market clearing ($LS_u = LD_u$) is assumed to hold at all times. Equation (2.5) embodies three assumptions: that there is a given number of unskilled workers (\bar{N}_u); that unskilled labor services are also offered by skilled workers^u displaced from the skilled labor market, as measured by x_s ; and that the amount of

1/ The demand for labor services may be expressed as a function of, among other variables, capital services and skilled labor services employed, rather than of output (QS). This formulation of labor demand function, using QS, is aimed at illustrating the relationship between the real wage rate and output (see the following discussion).

2/ This type of expenditure includes spending on nutrition and health for the poor (e.g., primary health clinics, food stamps, and child care).

effective unskilled labor services depends on the capacity to work of all those engaged in this market. The coefficient α translates the number of available workers in the unskilled labor market to the effective supply of unskilled labor services as an input in the production process. The coefficient β indicates the extent of spillover of unemployed skilled workers to the unskilled labor market.

The coefficient α is a function of two ratios which could be seen as substitutable "inputs" in the production of unskilled labor services. These inputs depend on the ratio between actual and critical levels of per capita real income of unskilled workers (y'_u/y'^*) and the ratio between actual and critical levels of per capita targeted real government expenditure on nutrition, health, and other social services (g/g^*). With a sufficiently high unskilled workers income and an adequate government social expenditure targeted to the poor, α will tend to approach unity, implying that the state of nutrition and health is no longer a binding constraint of their capacity to work. In the following analysis, it is assumed that the actual levels of these two crucial variables, y'_u and g , are always lower than their critical levels, and, therefore, α is always less than unity.

The unskilled labor supply function may be expressed more explicitly as:

$$LS_u = \alpha \bar{N}_u x_s^\beta$$

$$= \left(\frac{LS_u w_u}{\bar{N}_u x_s^\beta y'^*_u} \right)^{b_1} \left(\frac{g}{g^*} \right)^{b_2} \bar{N}_u x_s^\beta, \quad (2.5)'$$

$$\text{or } LS_u = \left(\frac{w_u}{y'^*_u} \right)^{\alpha_1} \left(\frac{g}{g^*} \right)^{\alpha_2} \bar{N}_u x_s^\beta \quad (2.5)''$$

where

$$\alpha_1 = \frac{b_1}{1-b_1} \quad \text{and}$$

$$\alpha_2 = \frac{b_2}{1-b_1}.$$

The coefficients b_1 and b_2 are assumed to be positive, but less than 1. These coefficients, however, would tend to approach zero in a situation where real wages and targeted government services are sufficiently high (i.e., exceeding the critical levels); in such a situation, α would be close to unity. If b_1 and b_2 are zero, α_1 and α_2 will also be zero. It is assumed here that better nutrition and health only increase the effective supply of unskilled labor services. While it is conceivable that better nutrition and health would also improve the productivity of each unit of unskilled labor services, this is not

incorporated in the model. Note that, unlike in the efficiency hypothesis, the unskilled real wage rate in this model is below the level that would ensure an adequate level of nutrition and health. The real wage determination process in the unskilled labor market may reflect many factors. For example, the competitive firm with a contract to pay daily wages would consider whether an increase in wages would enable workers to work a larger number of hours per day; a competitive firm hiring workers on an hourly basis may not. In some cases, social legislation may restrict the number of hours of work per day; this will affect labor supply and the real wage rate. While there are scattered episodes that firms are interested in improving their services to enable workers to work more (e.g., employer-provided health or child care services), a competitive market equilibrium, in either case, does not necessarily ensure an equilibrium wage level (including services provided by the firm) for adequate nutrition and health of the workers. Market imperfection also contributes to this outcome. For example, the private rate of return on the firm's spending on workers' nutrition and health (or paying a higher wage) might diverge from its social rate of return. The firm might expect workers to leave the firm and, therefore, the firm would be unable to capture fully the returns on its investment.

Figure 1 depicts the two labor markets. In the skilled labor market, given the exogenously determined real wage rate, $\ln \bar{w}_s$, the employment of skilled labor services is shown at $\ln D_{s0}$; the supply of skilled labor services at $\ln S_{s0}$; and the unemployment by x_{s0} (upper panel). In the unskilled labor market, the equilibrium real wage rate is shown at $\ln w_{u0}$, and the equilibrium employment of unskilled labor services at $\ln E_{u0}$, which includes the services of displaced skilled workers (x_{s0}) (lower panel).

The unskilled labor market is a central channel through which fiscal policy affects the earnings of the poor and the aggregate supply in this model. Several factors affect the equilibrium unskilled wage rate (w_u), which in turn affects aggregate supply or production (QS) through a rather unconventional channel. As regards the factors affecting the equilibrium unskilled wage rate, it should be mentioned, on the supply side, spilled-over skilled labor services (x) and government social expenditure targeted to the poor (g) and, on the demand side, aggregate production (QS). An increase in either of the supply-side factors would result in a rightward shift in the unskilled labor supply curve; an increase in aggregate production would result in a rightward shift in the unskilled labor demand curve.

The supply curve has an upward slope at a low range of the real wage rate, but becomes vertical as the real wage rate approaches a sufficiently high level. The upward-slope portion indicates that an increase in the real wage rate affects positively the capacity of the unskilled worker to work. The demand curve has a downward slope. Note, however, that the relationship between the real wage rate and labor services demanded here reflects the net results of two factors: (a) for

a given aggregate production (QS), as the real wage rate declines, labor services demanded would increase; (b) as the real wage declines, aggregate production would decline because a lower real wage rate would reduce α . 1/

An increase in the supply of unskilled labor services, other things being equal, would result in a rightward shift in the supply schedule in the lower panel of Figure 1, and the equilibrium real wage rate would therefore decline unambiguously. A rise in skilled real wages, given the spillover effect, would also tend to reduce the equilibrium real wage rate for unskilled workers. In both cases, unskilled employment would increase. On the other hand, a reduction in demand for unskilled labor services would reduce both the wage rate and unskilled labor services employed. An increase in the levels of nutrition and health would raise the supply of unskilled labor services, but would reduce the wage rate. Production, however, would increase. 2/

3. Unskilled wages and aggregate supply

The previous section described how the conditions in the unskilled labor market affect aggregate supply. It also described how the equilibrium real wage rate and employment of unskilled labor services and aggregate supply are jointly determined for given levels of physical capital stock, real skilled wage rate, and government social expenditure targeted to the poor. An unconventional aspect of the equilibrium is that a change in the unskilled real wage rate affects aggregate supply through the production function. Thus, not only is the unskilled real wage rate affected by aggregate production, but the former affects the latter. This relationship will be elaborated on further in this section.

In the presence of dual labor markets, and with unskilled labor services constrained by low nutrition and health, the relationship between aggregate supply and real wages becomes more complex than usual, the complication arising mainly from the setting postulated for the unskilled labor market. The equilibrium linkage between w_u and QS

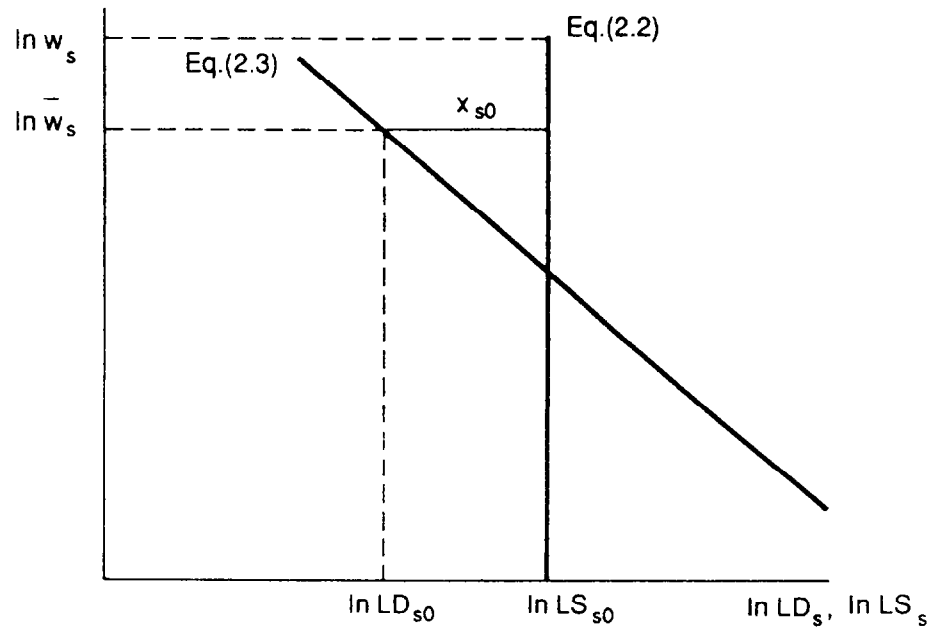
1/ One could conceive of an upward-sloping demand curve for unskilled workers when $\alpha_1 > 1$; for this condition to hold, b_2 should be greater than 0.5. The unskilled labor market would still be stable as far as the slope of the unskilled labor supply exceeds the slope of the unskilled labor demand.

2/ This model does not explicitly consider the possibility that a larger number of self-employed workers in the informal market constitute major poor groups. However, the unskilled labor market could be taken as representing the informal market and the unskilled wage rate could be taken as representing the level of self-employed earnings. Results will not be altered by this alternative interpretation.

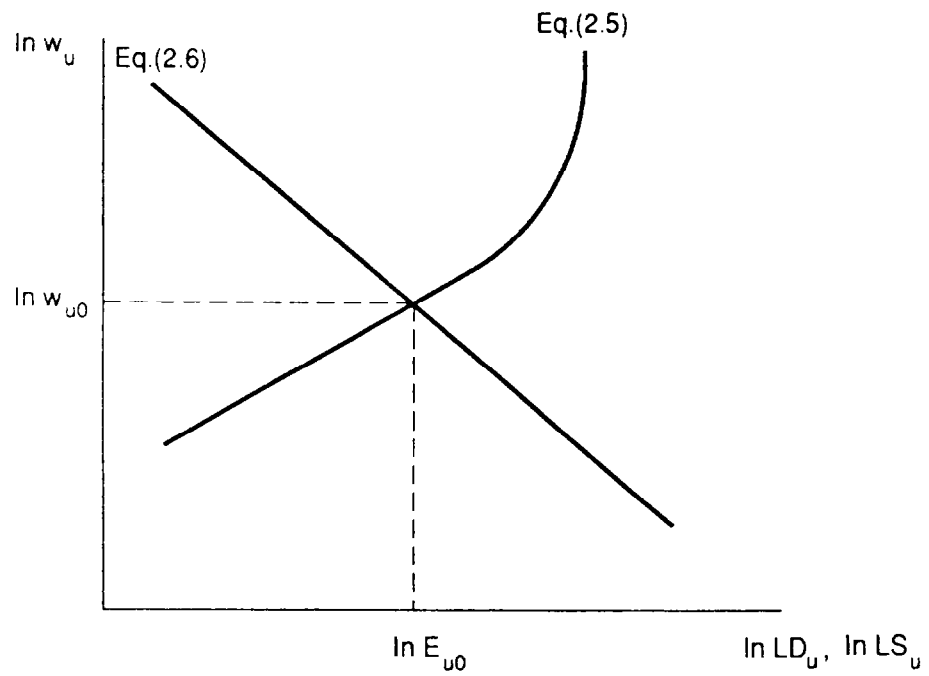
Figure 1

Dual Labor Markets

(a) Skilled Labor Market



(b) Unskilled Labor Market



arises from the combination of labor market equilibrium, on the one hand, and the technical (and biological) relationships embodied in the production function on the other.

Equating equation (2.5)'' with equation (2.6) and solving them for the equilibrium real wage in the unskilled labor market, one obtains: 1/

$$w_u = d_0 g^{-\frac{\alpha_2}{1+\alpha_1}} Q S^{\frac{1+\beta}{1+\alpha_1}}, \quad (2.7)$$

which expresses the real wage rate for unskilled workers as a function of, among others, aggregate production. 2/ On the other hand, by combining the production function (2.1) with the labor market conditions, one obtains an equation for aggregate supply, QS , as a function, inter alia, of the equilibrium real wage for unskilled workers:

$$QS = d_1 K^{\frac{\alpha_1}{1-\alpha_2+\beta\alpha_3}} g^{\frac{\alpha_2\alpha_3}{1-\alpha_2+\beta\alpha_3}} w_u^{\frac{\alpha_1\alpha_3}{1-\alpha_2+\beta\alpha_3}}. \quad (2.8)$$

From equation (2.8) we observe that, when the supply of unskilled labor services is constrained by a low real wage rate (and the consequent low levels of nutrition and health), aggregate production is an increasing function of the real wage rate of unskilled workers, in a normal situation, since an increase in the real wage rate would enhance the capacity to work and therefore raise the effective supply of labor services. 3/

Equations (2.7) and (2.8) are presented in the $(w_u; QS)$ plane in Figure 2. The slope of equation (2.7) is positively related to β , but negatively related to α_1 . Thus, a larger β implies that a given increase in aggregate production, resulting, for example, from capital accumulation, would cause a larger increase in the unskilled workers' real wage rate through a larger effect on demand for skilled workers and a reduction in the spillover effect of the skilled unemployed on the

1/ The constant terms, d_0 and d_1 , in equations (2.7) and (2.8) are complicated nonlinear functions of several variables and coefficients, including N_s and N_u , and the quantity of skilled and unskilled workers, respectively. See the Appendix for a derivation.

2/ Note that if $\alpha_1 = \alpha_2 = \beta = 0$, equation (2.7) reduces to $w_u = d_0' QS$, which is the standard result showing the unskilled labor share on aggregate income (see the Appendix).

3/ Aggregate production would be a negative function of g and w_u only if $1-\alpha_2+\beta\alpha_3 < 0$, that is, $1 < \alpha_2-\beta\alpha_3$, which is an unlikely condition to be met under normal circumstances.

unskilled labor market. The slope of equation (2.8), on the same plane, is positively related to a_3 , but negatively related to a_2 . ^{1/} A larger a_3 , for example, implies that the positive effect on aggregate production of an increase in the unskilled workers' real wage rate would be reinforced by the reduction in unemployment in the skilled labor market resulting from the increase in aggregate production.

In the conventional case, where the supply of unskilled labor services is not assumed to be constrained by either low real wages or insufficient government services, $\alpha_1 = \alpha_2 = 0$ and equation (2.8) would be vertical in the logarithmic scale (Case A in Figure 2). An increase in aggregate production, resulting, for example, from capital accumulation, would cause a rightward shift of equation (2.8); the movement along equation (2.7) would adequately explain the consequent increase in the real wage rate for unskilled workers. An increase in targeted social expenditure would have no effect on either the real wage rate or aggregate production.

In the case postulated here, both α_1 and α_2 are positive (Case B). An increase in aggregate production resulting from capital accumulation would shift equation (2.8) rightward, thus increasing both the unskilled workers' real wage rate and aggregate production more than in the conventional case. ^{2/} An increase in targeted social expenditure, g , would cause a rightward shift in equation (2.8) coupled with a downward shift in equation (2.7). In normal circumstances, aggregate supply will increase, while real wages in the unskilled labor market will decrease. ^{3/}

III. Fiscal Policy, Macroeconomic Equilibrium, and the Poor

In this section, using the building blocks discussed in Section II, an aggregate supply function is derived. This aggregate supply function is then combined with an aggregate demand function to discuss the role of fiscal policy, particularly the role of targeted government social expenditure in the macroeconomic adjustment process. ^{4/}

^{1/} The condition for a positive relationship between a_3 and $\alpha_1 a_3 / (1 - a_2 + \beta a_3)$ can be shown to be $1 - a_2 > 0$, which is easily satisfied in the model.

^{2/} In Figure 2 (Case B), the differential effects of an expansion of capital stock in Cases A and B are compared. In the conventional Case A, the new equilibrium is E_{1a} ; in this case, the new equilibrium is E_{1b} . The additional output and wage effects are denoted by ΔQ_S and Δw_u , respectively.

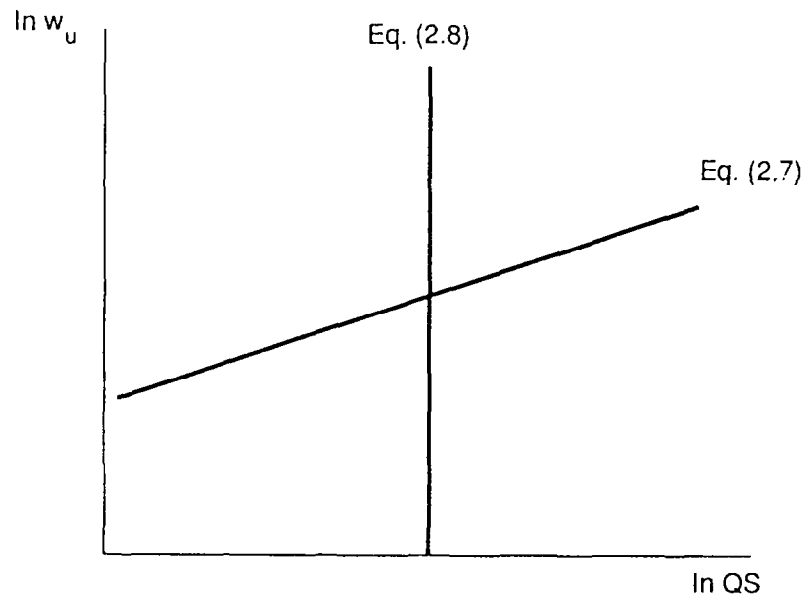
^{3/} See Section III for further discussion. The reduced form equations for Q_S and w_u are shown as equations (3.1) and (3.4).

^{4/} For a discussion of the longer-term implications of targeted social expenditure for stable growth, see Tanzi and Chu (1989).

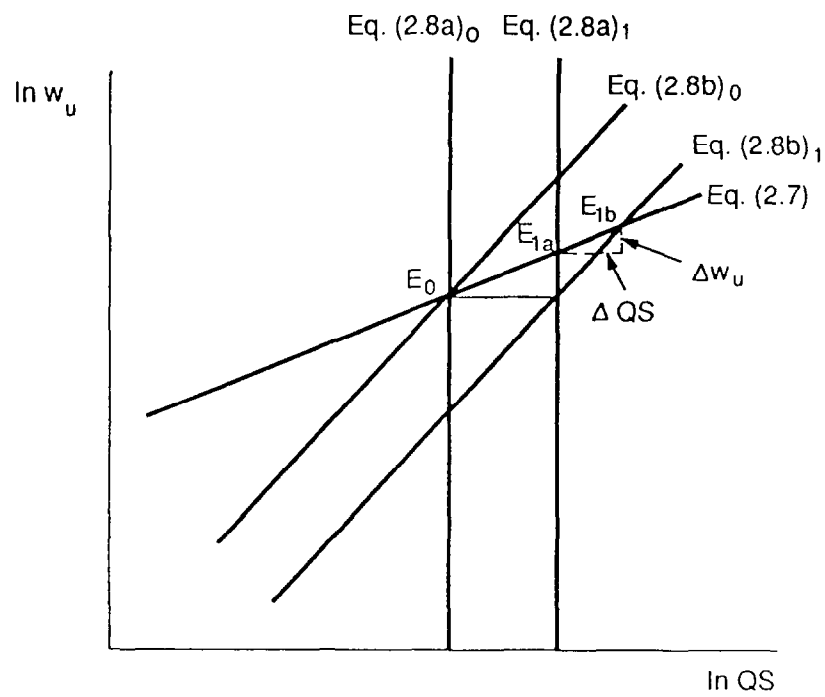
Figure 2

UNSKILLED REAL WAGES AND AGGREGATE SUPPLY

Case A



Case B



1. Macroeconomic equilibrium

Equations (2.7) and (2.8) can be solved for aggregate supply (QS). In the solution, shown as equation (3.1) below, aggregate supply can be expressed as a function of, among others, capital services (K) and real government social expenditure targeted to the poor (g):

$$QS = d_1' K^{\frac{a_1(1+\alpha_1)}{\theta}} g^{\frac{\alpha_2 a_3}{\theta}}, \quad (3.1)$$

where d_1' is defined in the Appendix, and θ is equal to:

$$\begin{aligned} \theta &= (1+\alpha_1)(1-a_2) + a_3(\beta-\alpha_1) \\ &= 1-a_2+\beta a_3+\alpha_1 a_1. \end{aligned}$$

Equation (3.1) is an aggregate supply function. As in the case of capital services (K), targeted government social expenditure (g) can be interpreted as an input. Within the analytical framework discussed in Section II, an increase in g (as long as its level is below the critical value g^*) enhances the capacity of unskilled workers to work and thus increases aggregate supply. The coefficients $\frac{a_1(1+\alpha_1)}{\theta}$ and $\frac{\alpha_2 a_3}{\theta}$ in equation (3.1) are the elasticity of aggregate output with respect to physical and human capital. Note that neglecting the effects of the nutrition and health on the poor's capacity to work may bias the estimate of the elasticity of output with respect to capital. Equation (3.1) indicates two possible supply-side roles of fiscal policy: the government could use its budgetary resources either on capital outlays to accumulate physical capital and increase the supply of capital services (K), or on targeted social expenditure (g) to enhance human capital in the form of more productive unskilled labor services.

Turning now to the aggregate demand side of the model, it is postulated that aggregate demand depends on the aggregate income of skilled workers (y_s), aggregate income of unskilled workers (y_u), total government expenditure (e), and money balances in the hands of the public (m), all in real terms: 1/

$$(3.2) \quad QD = y_s^{\delta_1} y_u^{\delta_2} e^{\delta_3} m^{\delta_4},$$

where

$$\delta_1, \delta_2, \delta_3, \delta_4 \geq 0.$$

Total government expenditure (e) changes monotonically with the level of targeted social expenditure (g).

Finally, it is postulated that the rate of increase in prices depends on the excess demand in the goods market ($QD-QS$): 2/

$$\dot{P} = \phi_1(QD-QS). \quad (3.3)$$

To center the discussion on the role of targeted expenditure policy, it is convenient to illustrate graphically equations (3.1) and (3.2), as in Figure 3, where aggregate supply and aggregate demand (QS and QD) are measured along the vertical axis and targeted social expenditure (g) is measured along the horizontal axis. The aggregate supply and demand functions are denoted by S and D . The slope of the aggregate supply function reflects the coefficient

$$\frac{\alpha_2 a_3}{\theta},$$

whereas the slope of the aggregate demand function reflects the coefficient δ_3 . Assuming normal multiplier effects for e (and g), it would not be unrealistic to postulate that the latter coefficient is larger than the former, that is, $\delta_3 > \frac{\alpha_2 a_3}{\theta}$.

1/ The specific (log-linear) nature of the functional form for the aggregate demand function is not critical for the analysis; the substantive part of the conclusions would not change even if we assumed an alternative functional form.

2/ For simplicity, no external factors are specifically considered. Opening the system will change the process of adjustment as well as the magnitude of the effects, but not the qualitative conclusions reached here.

Figure 3

TARGETED SOCIAL EXPENDITURE AND
MACROECONOMIC BALANCE

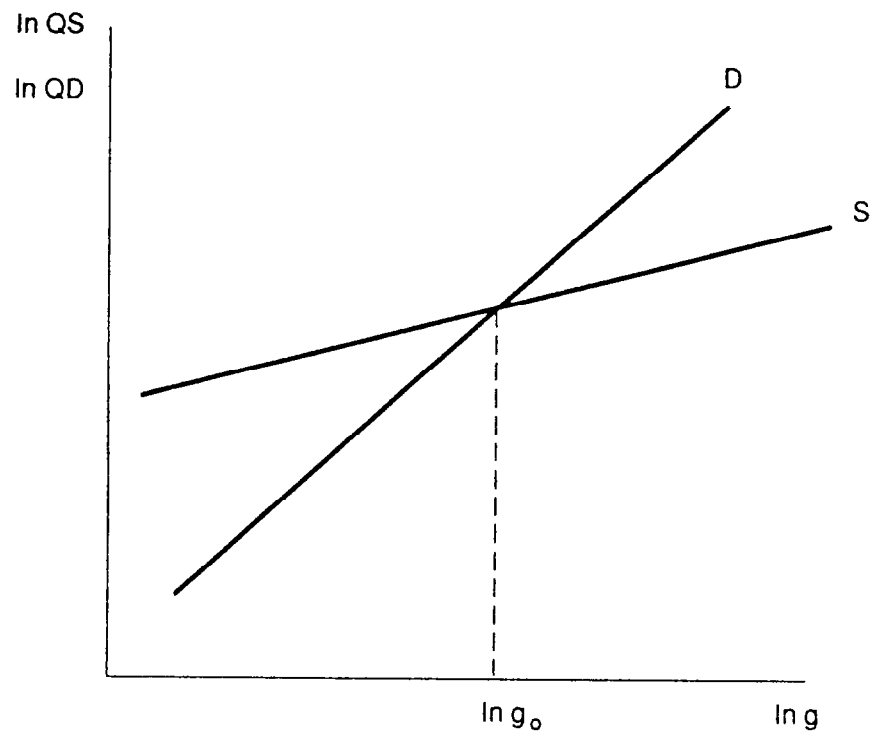


Figure 3 shows both the supply-side and the demand-side effects of targeted government social expenditure, and thus, its potential contribution to an increase in aggregate production as well as its limitations. The level of g associated with the intersection of the two lines, (g_0), may be interpreted as its equilibrium level in the sense that any other level of targeted social expenditure is bound to create a macroeconomic imbalance that will trigger price changes and other macroeconomic adjustments that will tend to feed back into the system. Note, however, that g_0 , the equilibrium level of targeted government social expenditure, should not be confused with g^* , the critical level of targeted government social expenditure that allows ultra-poor unskilled workers to reach their full productive capacity. It would be a coincidence if, under arbitrary initial conditions, $g_0 = g^*$.

The equilibrium level of g can change due to both demand-side and supply-side factors: on the demand side, a reduction in real incomes of either skilled or unskilled workers, in government expenditures other than targeted social expenditure or in real balances, will cause a downward shift of the D line and an increase in the equilibrium targeted government social expenditure, that is, in the level of g consistent with macroeconomic equilibrium. On the supply side, physical capital accumulation or an exogenous increase in the demand for skilled workers will result in an upward shift of the S line and an increase in the equilibrium level of targeted government social expenditure.

2. Fiscal policy and the poor

Assuming initial market equilibria, the overall effect of an increase in g beyond g_0 would depend on (i) the manner in which the government resolves its budgetary imbalance created by the increase in g , and (ii) the way the products and factor markets react to any resulting market imbalances.

a. Targeted government social expenditure and unskilled wages

Before the implications of fiscal policy for the poor are analyzed, it is useful to examine the effect of targeted government social expenditure on the unskilled labor market, and particularly on the real wage rate and on the earnings of unskilled workers who are considered to be the ultra-poor group. Note that this analysis is confined to the supply side. It is assumed here that the government could obtain free resources for an increase in g . This assumption is relaxed in the next section.

Solving equations (2.7) and (2.8) for w_u , one obtains:

$$w_u = d_1 K \frac{a_1(1+\beta)}{\theta} - \frac{\alpha_2(1-a_2-a_3)}{\theta}, \quad (3.4)$$

where d_1 is defined as in the Appendix. (Note the negative sign of the coefficient of g .) In this model, $a_2 + a_3 < 1$ and therefore $\alpha_2(1 - a_2 - a_3)$ is positive, and, unless θ is negative, the coefficient of g will be negative. ^{1/} This implies that an increase in targeted government social expenditure will have a negative effect on the equilibrium real wage rate of unskilled workers. Note, however, that this does not imply that an increase in g will have a negative effect on "per capita real income of unskilled workers." To see this point, per capita real income of unskilled workers is defined as:

$$PC_u = \alpha w_u, \quad (3.5)$$

assuming, for simplicity, that $\beta = 0$. By substituting equation (3.4) for w_u in equation (3.5), it can be shown that per capita real income of unskilled workers is defined as:

$$PC_u = d_1 K \frac{a_1(1+\beta)(1+a_1)}{\theta} \frac{a_2 \alpha_3}{g \theta},$$

which shows that an increase in g will have an unambiguously positive effect on their per capita real earnings. This result arises because an increase in targeted government social expenditure would increase the effective supply of unskilled labor services and, in this case, such an increase in labor supply would more than offset the decrease in the wage rate. In other words, unskilled workers, assisted by targeted social expenditure (on nutrition and health), would acquire higher monthly (or daily) earnings by being able to complete more working days in a month (or work a standard number of hours each day) even if the (hourly) real wage falls.

In sum, an increase in g will have a positive effect on aggregate supply and a negative effect on the real wage rate of unskilled workers, but a positive effect on their per capita earnings.

b. Targeted government social expenditure and the poor

To complete the analysis, however, one must consider the cost of acquiring the resources for an increase in g . This analysis rules out the possibility of financing the increase in g by foreign borrowing, grants, or domestic taxation. Therefore, it is assumed that the entire amount of the increase in g is financed by money creation.

Suppose the government attempts to increase the level of g beyond g_0 . This action will create a macroeconomic imbalance in the form of an

^{1/} The coefficient $\theta = (1 + \alpha_1)(1 - a_2) + a_3(\beta - \alpha_1)$ is unlikely to be negative in the normal situation in which a_1 , a_2 , and a_3 are all positive and less than unity.

excess aggregate demand. Prices will rise and continue until the macro-economic balance is restored through some combination of reductions in the real earnings of skilled and unskilled workers and in the real value of the stock of money balances. The distributional implications depend on the relative changes in the nominal earnings of skilled and unskilled workers and on the initial distribution of money balances among the income groups. A large reduction in the real earnings of unskilled workers would make self-defeating the policy of promoting welfare through increases in targeted government social expenditure. Note that y_u may be defined as $\alpha \bar{N} w_u$ and, as before, per capita real income of unskilled workers as αw_u .^{1/} For unskilled workers, an increase in g , coupled with an inflation-induced reduction in their per capita real income, constitute a clear trade-off. This analysis indicates, however, that the trade-off is more complex than one might assume: it has both demand-side and supply-side dimensions. Ignoring the positive supply-side effect of an increase in g , and concentrating only on the likely negative impact of excess demand, would give a distorted picture of the trade-off.

Suppose that while increasing g , the government keeps e constant by not making new investment and by reducing maintenance expenditures on the existing capital stock, thus allowing K to decline. In this case, the S line will shift downward. At the same time, the reduction in government expenditure on the maintenance of capital stock would result in a downward shift in the D line. If these changes do not fully resolve the excess aggregate demand generated by the initial increase in g , prices will rise until a macroeconomic balance is restored. In this case, the final outcome of poverty alleviation will depend on the trade-off described above. Depending on the extent of the cut in public capital outlays, the government may achieve an alleviation of poverty. However, such an alleviation of poverty, based on strengthening human capital, will inevitably imply physical capital decumulation.^{2/}

The government, while increasing g , could reduce unproductive government expenditure. In this case, the S line will not shift, but the D line will shift downward. This type of fiscal policy will help the government to achieve increases in both aggregate production and targeted government social expenditure. In this case, poverty alleviation and economic growth could be attained in a mutually reinforcing manner.

In the conventional analysis, where better nutrition and health do not have aggregate supply implications, the S line is horizontal,

^{1/} We again assume that $\beta = 0$. In other words, for this purpose, the existence of unemployed skilled workers spilled over to unskilled labor markets is disregarded.

^{2/} Tax financing of the increase in g may raise other problems (e.g., distortionary effects), as well as the distributionary effects of taxation. Foreign financing will increase the debt service burden.

resulting generally in a lower equilibrium level of targeted government social expenditure. Setting targeted government social expenditure at that lower level, as suggested by the conventional analysis, implies a possible overestimation of the inflationary implications of increasing these expenditures, compared with other public forms of spending. By ignoring the positive impact of g on the capacity of the ultra-poor to work, a policy bias is introduced against targeted government social expenditure, resulting in a loss of output, with the extent of the loss depending on the slope of the S line. Note, again, that the analysis is predicated on the existence of a large group of the ultra-poor. Also, the analysis ignores any disincentive effect of targeted government social expenditure, and the cost of implementing targeted social programs.

c. Labor market policy and the poor

The model features dual labor markets and the possibility of the spillover of skilled labor from the skilled to the unskilled labor market. Therefore, the model provides a stylized setting for analyzing both the macroeconomic implications of labor market policy and their effects on the poor. It suggests that an increase in the wage rate for skilled labor reduces demand for skilled labor and aggregate output. At the same time, the increase in unemployment in the skilled labor market and the reduced aggregate output would result in a lower wage rate in the unskilled labor market by increasing the supply of, and reducing demand for, labor in the unskilled labor market.

The dual labor market model of this type also indicates the possibility that labor market efficiency has distinct implications for the two types of labor markets. For the skilled labor market, a major issue is to reduce the downward rigidity of real wages which usually results in inefficient use of skilled labor resources. For the unskilled labor market, an important issue is to minimize the possibility that due to downward rigidity of nominal wages, an increase in consumer prices results in a temporary decline in real wages. Such a decline in real wages, even if temporary, would have a significant adverse effect on the nutrition and health of the poor and could also have significant adverse implications for aggregate output.

IV. Concluding Remarks

Severe poverty may create its own vicious circle. The deterioration of living conditions below minimum standards causes an erosion in the ability of unskilled workers to attain their own productivity potential, reducing, in this manner, the effective amount of labor services available, with the consequent fall in aggregate output. This, in turn, may result in macroeconomic imbalances (with a further inflation-induced deterioration in real earnings) and a spillover of unemployed skilled workers into the already depressed unskilled labor market. Real wages

could then be expected to fall even farther below the critical minimum, pushing down the levels of nutrition and health of the poor and curtailing their productivity.

To break this circle, some sort of well-targeted government social expenditures could be helpful, since they might help raise productivity and output, particularly in countries where a large segment of the population is ultra-poor. These expenditures, however, are not to be considered a "free lunch" even if they are, indeed, supply enhancing. They should be financed in a noninflationary fashion to avoid a perverse trade-off in which the negative incidence of macroeconomic imbalances cancel the beneficial impact of a better network of social services. 1/

In this paper, a simple analytical framework was presented to consider the nature of this trade-off. Within this framework, the comparative static effects of budgetary social policies on employment, prices, real wages, and aggregate production can be derived and the net impact on the poor can be assessed in relation to the relevant parameters of the system. The conclusion that well-targeted government social expenditures could, indeed, render dividends in terms of both equity, efficiency, and welfare, is intrinsically tied to the need to pursue these policies while preserving stability and macroeconomic balance.

1/ For empirical evidence on the negative impact of macroeconomic imbalance on income distribution and on the poor, see Blejer and Guerrero (forthcoming).

Technical Note on the Model

The constant term, d_0 , in equation (2.7) can be shown to be:

$$(a_2^\beta a_3) \frac{1}{1+\alpha_1} \left(\frac{y_u'^{\alpha_1} l g^{\alpha_2}}{\bar{N}_u \bar{N}_s^\beta \bar{w}_s^\beta} \right) \frac{1}{1+\alpha_1}, \quad (2.4)'$$

whereas, the constant term, d_1 , in equation (2.8):

$$a_2 \frac{a_2^{-\beta a_3}}{1-a_2+\beta a_3} \left(\frac{\bar{N}_u^{a_3} \bar{N}_s^{\beta a_3} \bar{w}_s^{\beta a_3-a_2}}{y_u'^{\alpha_1} l a_3 g^{\alpha_2} a_3} \right) \frac{1}{1-a_2+\beta a_3}. \quad (2.8)'$$

The former is a negative function of \bar{N}_u or \bar{N}_s , whereas the latter is a positive function. The former is a negative function of \bar{w}_s , whereas the latter may be either a positive or negative function of \bar{w}_s , depending on whether or not $a_3 > a_2$.

If $\alpha_1=\alpha_2=\beta=0$, equations (2.7)' and (2.8)' are reduced to the conventional results:

$$w_u = \frac{a_3^{QS}}{\bar{N}_u} \quad (2.7)''$$

$$QS = K \bar{N}_u^{a_1-a_3} \left(\frac{a_2^{QS} a_2}{w_u} \right). \quad (2.8)''$$

Equation (2.7)'' indicates that the unskilled labor share of aggregate income is a_3 ; this equation is identical with the equation in footnote 1 on page 10 of this paper, where $d_0' = a_3/\bar{N}_u$. Equation (2.8)'' is the aggregate production function.

In the aggregate supply function (3.1), the constant term d_1' is defined as:

$$d_0 \frac{(1+\alpha_1)(\alpha_1^{-\alpha_3})}{(1+\alpha_1)(1-a_2+\beta a_3)-a_3\alpha_1(1+\beta)} d_1 \frac{(1+\alpha_1)(1-a_2+\beta a_3)}{(1+\alpha_1)(1-a_2+\beta a_3)-a_3\alpha_1(1+\beta)},$$

where d_1 and d_0 are as defined above. The constant term d_1'' in wage equation (3.4) can be shown to be:

$$(d_0 d_1)^{\frac{1+\beta}{1+\alpha_1}} \frac{(1+\alpha_1)(1-a_2+\beta a_3)}{(1+\alpha_1)(1-a_2+\beta a_3)-a_3\alpha_1(1+\beta)},$$

and the constant term d_1''' in equation (3.5) for per capita real income for unskilled workers is:

$$\frac{d_1'''^{1+\alpha_1}}{y_u'^{\alpha_1} g^{*\alpha_2}} .$$

These coefficients are all complicated functions of \bar{N}_s , \bar{N}_u , and \bar{w}_s , depending, among other factors, on the productivity of skilled and unskilled labor services and capital.

References

- Besley, Timothy, and Ravi Kanbur, "The Principles of Targeting," World Bank Working Papers No. WPS 385 (Washington: World Bank, 1990).
- Blejer, Mario I., and Isabel Guerrero, "The Impact of Macroeconomic Policies on Income Distribution: An Empirical Study of the Philippines," Review of Economics and Statistics (forthcoming).
- Burki, Shahid J., and R.V. Weaving, "Public Works Programs in Developing Countries: A Comparative Analysis," World Bank Staff Working Paper No. 224 (Washington: World Bank, 1976).
- Cornia, Giovanni Andrea, "Investing in Human Resources: Health, Nutrition and Development for the 1990s" (mimeographed, Florence, Italy, June 1988).
- Dasgupta, P., and D. Ray, Adapting to Undernourishment: The Clinical Evidence and Its Implications, WIDER Working Paper 10 (Helsinki, Finland: United Nations University, April 1987).
- Deolalikar, A., "Nutrition and Labor Productivity in Agriculture: Estimates for Rural South India," Review of Economics and Statistics (North-Holland), Vol. LXX, No. 3 (August 1988), pp. 406-13.
- Leibenstein, H.A., Economic Backwardness and Economic Growth (New York: Wiley, 1957).
- Liebenthal, Robert, Soniya Carvalho, Helena Ribe, Peter Nicholas, and Elaine Zuckerman, "How Adjustment Programs Can Help the Poor: The Experience in the World Bank," paper prepared for an IMF seminar, September 1989.
- Lipton, Michael, "The Poor and the Poorest: Some Interim Findings," World Bank Discussion Papers No. 25 (Washington: World Bank, 1988).
- McGuire, J., and J. Austin, "Beyond Survival: Children's Growth for National Development," Assignment Children, No. 2 (1987).
- Martorell, R., "Body Size, Adaptation, and Function," Human Organization (Oklahoma City), Vol. 48, No. 1 (Spring 1989).
- Nelson, Joan, "Politics of Pro-Poor Measures" (mimeographed, paper presented at a World Bank Symposium on Poverty and Adjustment, March 1988).
- Scrimshaw, N., "Nutritional and Health Consequences of Economic Adjustment Policies that Increase Poverty," paper prepared for the North-South Roundable on Development, Salzburg, September 1986.

Seckler, D., "'Small But Healthy': A Basic Hypothesis in the Theory, Measurement, and Policy of Malnutrition," in Newer Concepts in Nutrition and Their Implications for Policy, ed. by P.V. Sukhatme (Pune, India: Maharashtra Association for the Cultivation of Science Research Institute, 1982).

Strauss, John, "Does Better Nutrition Raise Farm Productivity?," Journal of Political Economy (Chicago), Vol. 94, No. 2 (April 1986), pp. 297-320.

_____, "Households, Communities and Preschool Children's Nutrition Outcomes: Evidence from Rural Côte d'Ivoire," Economic Development and Cultural Change (Chicago), Vol. 38, No. 2 (January 1990), pp. 231-61.

Tanzi, Vito, "Redistributing Income Through the Budget in Latin America," Banca Nazionale del Lavoro Quarterly Review (Rome), Vol. XXVII, No. 108 (March 1974), pp. 65-87.

_____, and Ke-young Chu, "Fiscal Policy for Stable and Equitable Growth in Latin America," IMF Working Paper, WP/89/93 (Washington: International Monetary Fund, 1989).

