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In this paper the authors surveyed some of the existing literature, some of it unpublished, which deals specifically with (1) the determinants of the distribution of income in developing economies and (2) how the distribution of income affects other variables such as levels and rates of growth of employment and output. The paper is not intended to be a complete survey of the literature dealing with distribution in developing economies but rather has concentrated on theoretical contributions and issues. In the first section of the paper the authors discuss the relationship between the current concern for income distribution and other economic problems confronting developing economies. In section 2 they review briefly the literature dealing with the determinants of the size distribution of income in developing economies. Section 3A discusses work which stresses the importance of the functional distribution of income in developing economies in terms of its effect on the growth rate. Section 3B discusses some of the more recent work in which income and wealth distribution play a more central role than heretofore in the determination of output and employment growth.

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MODELS OF DEVELOPMENT INCORPORATING DISTRIBUTION ASPECTS

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Models of Development Incorporating Distribution Aspects

Economists have been interested in the question of the distribution of income and wealth for a very long time. Yet, curiously, relatively little has been done until recently to incorporate distribution in a meaningful way into models of economic growth.

The concern for distribution has so far resulted in two somewhat separate and distinct sets of literature. On the one hand there are those economists who have set out to measure the size distribution of income; and to make comparisons between countries and over time within the same country.[1]

A second literature has focused on the functional distribution of income. One strand of this literature which goes back to the classical economists links up the functional distribution of income with the aggregate savings rate and, by this means, to the growth rate of the economy. Another, more dominant portion of this second body of literature examines the relationship among the technical characteristics of production functions, the nature of technological change, and the functional distribution.[2] Little attention is given either to how the functional distribution is related to the size distribution of income

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[1] For example, see L.B. Kravis, "International Comparison of Income Size Distribution," Review of Economics and Statistics (November, 1960), pp. 408-16; S. Kuznets, "Quantitative Aspects of the Economic Growth of Nations: Distribution of Income by Size," Economic Development and Cultural Change, (January, 1963); Lampman, R.J., "Recent Changes in Economic Inequality Reconsidered," American Economic Review (June, 1954), pp. 251-68; and H.T. Oshima, "The International Comparison of Size Distribution of Family Incomes with Special Reference to Asia," Review of Economics and Statistics (November, 1962), pp. 439-45.

[2] See, for example, papers by W. Krelle, R.M. Solow and M. Branfenbrenner in The Distribution of National Income, ed. by J. Marchal and B. Ducros, (Paris: Macmillan, 1968).

or to how income distribution, either function or size, affects other economic variables. In fact, with the exception of the classical type model, there seems to be no literature concerning itself with the issue of whether or not the distribution of income makes any difference (aside from equity considerations) in terms of levels and rates of change of any economic magnitudes such as employment, output or prices.[1]

One reason for the lack of any concentrated attention on income distribution is the distaste which economists, particularly during the last century, have shown towards making "value judgments." In pursuit of a desire for a scientific, value-free approach to their discipline, modern economists have tended to push distributional questions aside as lying outside the purview of economics and have instead focused on questions of efficiency and growth. Commercial, tax, public expenditure and foreign-exchange policies have been discussed almost exclusively from the point of view of their effects on efficiency and growth.

But the problem of income distribution cannot be escaped so easily. The very concept of efficiency requires the use of social opportunity costs (or shadow prices) which themselves are determined in part by the distribution of wealth--both physical and human. In other words, it is ultimately impossible to make policy decisions on the basis of economic efficiency without explicitly making some decision about distribution. Once we have reconciled ourselves to the fact that income distribution is affected by whatever policies are followed we must then move to the question of what sort of distribution is "desirable" and what is the best way of changing the distribution of income.

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[1] Most of the "modern" macro-economic literature usually assumes that any effects due to distributional considerations cancel out. The other approach is simply to state that they are ignored.

In this paper we have surveyed some of the existing literature, some of it unpublished, which deals specifically with (1) the determinants of the distribution of income in developing economies and (2) how the distribution of income affects other variables such as levels and rates of growth of employment and output. The paper is not intended to be a complete survey of the literature dealing with distribution in developing economies but rather has concentrated on theoretical contributions and issues. In the first section of the paper we discuss the relationship between the current concern for income distribution and other economic problems confronting developing economies. In section 2 we review briefly the literature dealing with the determinants of the size distribution of income in developing economies. Section 3A discusses work which stresses the importance of the functional distribution of income in developing economies in terms of its effect on the growth rate. Section 3B discusses some of the more recent work in which income and wealth distribution play a more central role than heretofore in the determination of output and employment growth.

1. The Distribution of Income in Developing Economies

During most of the post-war period widespread and perhaps growing inequality of income distribution in most of the less developed world has been accepted as a cost to be borne for rapid growth. In the immediate post-war period, characterized by relatively modest rates of population growth and rapidly growing foreign aid disbursements by the developed world, the emphasis on output growth in the context of savings and foreign exchange gaps--with concern for income distribution only to the extent that it might affect gross savings--had some common sense value. Developing countries saw as their major problem the need to create a social and economic infrastructure which was viewed as the

first link in the transition from a colonial or undeveloped to a modern economic system. Increasing the production of foodstuffs and generating employment were not critical issues. Rather, construction of transport and communication systems, and the electrification of urban areas were the priority areas. These projects required more foreign exchange than the developing countries could earn but at the same time the developed countries, especially the U.S., were willing and able to help.

This formula, however well suited for the fifties and early sixties, no longer works today. The rapid decline in death rates has resulted in unprecedented population and labor force growth. At the same time that developing countries could use large increases in foreign aid to finance the investment needed to employ the rapidly growing labor force, the developed countries have been more and more reluctant even to maintain current aid levels.

The most impressive aspect of the developmental policies followed by most of the developing countries lying within the "free-world" area is their failure to mobilize and use the one resource in plentiful supply--labor. To be sure, vast quantities of unskilled and undisciplined labor may not be a very productive resource, but the upgrading of labor, the creation of human capital, is itself either labor-intensive or, to the extent that capital is required, uses human capital--a type of capital which probably can be produced on a large scale in developing countries much more easily than other forms of capital since, unlike the latter, human capital formation has little import content.

Given that the quality of life of the masses could be significantly improved by providing goods and services which embody the one resource which developing countries have in plentiful supply, one is moved to ask why countries have failed to mobilize this resource and have chosen instead to adopt development strategies which rely on imported capital goods in order to produce the

amenities of a (relatively) luxurious life for the few people who are lucky and privileged enough to share in the prosperity produced by these strategies.

While the answer to this question involves many factors, an important one is the identification, by economists as well as bureaucrats, of modernity and development with the gradual shift in the distribution of population and employment from rural to urban areas and the shift in the composition of output from agricultural goods to non-agricultural goods and services. Hence, resources and energies are devoted to promote and hasten these shifts. The result of these development policies is to create an urban "middle" class whose average incomes are several times the national average and to increase the degree of inequality in the distribution of income. The increase in the size and income of the "richer" classes creates a small market for commodities--such as consumer durables, fine clothing, automobiles--which are at first imported and then produced domestically as part of the policy of import substitution.

The domestic production of these "luxury" type commodities does not absorb much domestic labor. The labor which is used often includes some relatively high skill levels, such as engineers, managers, sales personnel and accounts. As a result of this policy, there is a modest increase in employment and a small addition to the numbers and purchasing power of the rich class. Since purchasing power is concentrated in a few hands, large domestic markets are slow to develop so that firms in any industry are few in number and typically operating on the declining portion of their average cost curves. The result is high prices and inefficient production, both because of high average costs and because of the monopolistic market structure.

In considering policies which would be more labor absorbing, economists have been concerned with the possibility that there is a trade-off between

output and employment. Stewart and Streeten, for example, argue that available labor using technologies, i.e. those having a high labor-output ratio, have been developed many years ago and are likely to be capital using as well.[1] Hence, increasing employment through the use of these techniques will, because of the higher capital-output ratio, result in lower levels of output. Conversely, modern technologies, developed more recently in the affluent economies tend to be characterized by both lower labor-output and lower capital-output ratios. Therefore, the authors conclude, there is a trade-off between output and employment. This conclusion results from the assumption of limited factor substitutability in various technologies. As the authors point out, the problem cannot arise in a neoclassical world with one good where capital and labor can be combined in various proportions to produce a given quantity of output. In that case, the newer technology can be used to produce more output and more employment by substituting labor for capital. The problem of employment generation then becomes one of eliminating factor price distortions so that firms will choose a socially desirable factor input mix. In a world with more than one good one cannot, in general, make definitive statements about trade-offs involving output since both relative prices and relative quantities of various goods produced may change as we move to more labor-intensive techniques.

Our own work, reported in more detail in section 3B, stresses the linkage between employment and the composition of output.[2] Our argument is based on the fact that for any particular good there is limited substitutability given existing technology so that even with appropriate shadow prices there is some minimum capital-output ratio which is attainable. At this point, further

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[1] F. Stewart and P. Streeten, "Conflicts between Output and Employment Objectives in Developing Economies," Oxford Economic Papers (July, 1971), pp.145-68.

[2] J.W. Land and R. Soligo, "Income Distribution, Employment and Growth in Labor Redundant Economies," (Discussion Paper No. 9, Program of Development Studies, Rice University, 1971).

increases in employment are possible only by changing the composition of output towards goods which are relatively more labor-intensive. In this analysis, the distribution of income is relevant from two points of view. First, increasing employment increases the degree of equity in the distribution of income and secondly, if consumption patterns of households in different income classes have differing factor intensities then changing the distribution of income will have an effect on factor demand.

The conclusions which we draw are that the questions of employment creation and the possible conflict of employment and output goals cannot be dealt with without reference to distributional issues.

2. The Size Distribution of Income

Economists have long attempted to construct size distributions of income and have invented a variety of statistics to measure the degree of equality in the distribution. More recently there have been several attempts to "explain' or "account for" particular distributions in terms of random processes,[1] the distribution of wealth and differential rates of return on wealth held by different income classes,[2] or in terms of the distribution and differential rates of return to education.[3] For developing countries the pioneering work is by Kuznets.[4] An important contribution by Kuznets to the discussion and

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[1] R. Gibrat, Les Inégalités Economiques (Paris, 1931); and D.G. Champerdowne, "A Model of Income Distribution," Economic Journal (June, 1953), pp. 318-51.

[2] J.E. Meade, Efficiency, Equality and the Ownership of Capital (London: George Allen and Unwin, 1964).

[3] J. Mellor and U. Lele, "A Labor Supply Theory of Economic Development," (Cornell University Department of Agricultural Economics, Occasional Paper No. 43, June, 1971), p. 11; and J. Mencir,"Investment in Human Capital and Personal Income Distribution," Journal of Political Economy (August, 1958), pp. 281-302.

[4] S. Kuznets, "Economic Growth and Income Inequality," American Economic Review (March, 1955), pp. 1-28; S. Kuznets, "Quantitative Aspects of

interpretation of income distributions is his emphasis on the need to study other factors such as the structure of spending units and how these change over time, and to distinguish between the income of the spending unit over a fairly long period of time (its permanent income) and the measured income for one point in time. These factors are particularly important in a growing economy in which fundamental changes in the structure of output, the labor force and spending units are taking place.

For example, coincident with the shift of population from the agricultural to the urban sector is a change in the structure of the family unit. The extended family in the agricultural sector includes several generations of persons as well as several sets of parents of the same generation. Typically only a subset of the extended family migrates to the city and even if the entire family migrates it is unlikely that they will continue to live as an extended family. The result, then, of rural-urban migration is the creation of new family units. At first, families with several parental groups in the child bearing age break up to form separate family units. At a later stage of development, parental groups from different generations are likely to separate. The end result is a nuclear family as we know it in the U.S. today.

An important aspect of the disintegration of the extended family into smaller groupings is to make incomparable, income distribution statistics collected in two points in time. For the earlier period the total income of the extended family is uniformly distributed, at least in the statistical sense, among all members of that family regardless of the differential earnings by individual members of the family. For the latter period, however, the total incomes of each of the smaller groupings will now reflect the differential

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the Economic Growth of Nations: Distribution of Income by Size," Economic Development and Cultural Change (January, 1963).

productivity and wealth of the members of these smaller families. In other words, even if the sum of all the incomes accruing to members of the extended family remained the same after the break-up of the extended family, the distribution of income over these persons will change. In the extended family case, the per capita income of each person is equal. After the break-up there will be some families with a relatively low per capita income and some with a relatively high per capita income.

Another feature of a developing economy is the economic mobility of family units. In a stagnant economy there will be fluctuations in family income reflecting factors such as floods, pestilence and bumper crops. Over the longer run, however, per capita incomes of any given family unit will remain constant. To be sure, income distributions calculated on the basis of data for a particular year should be adjusted for these transitory components--particularly if different income classes are affected differentially by them. Nonetheless, having corrected for transitory factors, one can be reasonably sure that a family will remain in the same percentile location in the income distribution over a fairly long period of time. In a dynamic, developing economy this is no longer true. Migration from rural to urban sectors may shift a family from one percentile in the income distribution to another. Over time, mobility will be even greater as educational opportunities and the demand for skilled labor expand. In measuring income distribution in such cases, some notion of average lifetime income would be a more appropriate measure of income.

Kuznets' best known work on income distribution is his explanation of the changes in distribution brought about by intersectoral shifts in the composition of output. He has shown that the average level of income in the agricultural sector of the typical developing economy is substantially below that of the non-agricultural sector and that the distribution of income within the

agricultural sector is much more equal than that of the non-agricultural sector. Consequently, as the relative composition of output shifts from the agricultural to the non-agricultural sector, the distribution of income derived by combining both sectors becomes more and more unequal. On the other hand, a comparison of developed countries with developing countries suggests that the distribution of income in the former is more equal than in the latter even though developed countries have a higher proportion of income generated in the non-agricultural sector. To resolve this apparent paradox Kuznets concludes that, as development proceeds, there is a narrowing of the intersectoral per capita income differentials and a reduction in the degree of inequality in distribution within the non-agricultural sector. He attributes this latter change to the tendency for advanced economies to engage more vigorously in redistributive tax policies and social insurance programs. Thus, there would seem to be a standard pattern for the way in which income distribution changes as a country moves towards full development; at first, distribution worsens as the structure of output and employment is shifted towards non-agricultural activities and then later towards more equality as progressive income taxes, welfare and related programs are established.

The result that income distribution becomes more unequal as workers shift from the relatively "low-wage" agricultural sector to the relatively "high-wage" non-agricultural sector depends on what assumption is made regarding the percentile location of migrants in both the agricultural sector which they leave and the non-agricultural sector to which they move. If, for example, migrants from agriculture tend to come from the upper end of the agricultural income distribution and enter the lower end of the non-agricultural distribution, the Kuznets effect could be very small. In fact, if a person's income is the same after he migrates as it was before, his migration has no

effect at all on the aggregate income distribution.

R. Albert Berry has offered an alternative explanation in terms of factor shares for the observed deterioration in the degree of equality in developing countries as per capita income increases. His approach is based on the surplus labor model whereby in the earliest stage of development the economy is characterized by an agricultural (traditional) sector in which labor is paid more than its marginal product. Berry distinguishes between a case where families own their own land so that they indirectly subsidize wages by using the rents which accrue to land and the "noblesse oblige" case where landowners feel compelled because of tradition, etc. to pay a subsistence wage even though this may exceed marginal productivity. As the economy grows, output in the modern sector will grow at a faster rate than in the agricultural/traditional sector. In the "noblesse oblige" case the total wage bill remains constant so long as the surplus labor condition continues. As modern sector output continues to grow relative to agricultural output, labor is gradually reallocated to the modern sector. However, the real wage remains constant at the subsistence level so that total wage income remains constant. In this case, the increased income generated by growth accrues to profit recipients.

In the family farm case, income distribution worsens because the agricultural sector, and hence agricultural income, grow at a slower rate than non-agricultural sector and income. Since the wage rate in the modern sector is tied to agricultural income, the share of profits increases as per capita income increases. Thus, in both cases of Berry's model the income of the migrants remains the same and the change in income distribution comes about by a change in the share of profits in total income and the unequal distribution of wealth. In the "noblesse oblige" case real wages are constant so long as the surplus labor condition prevails; in the family farm cases real wages

in both sectors rise as agricultural incomes increase but the wage share still declines.

3. Income Distribution as a Determinant of Growth

The preceding section deals with that part of the development literature that treats the distribution of income as a result of the process of economic growth. The presumption is that if one knows how far the growth process has proceeded, one also knows approximately the distribution of income. This statement has to be qualified, of course, if there are important political and demographic differences among nations, such as the existence of minority groups that are discriminated against by the ruling elites. Basically, however, this view assumes a strong relationship between income distribution, per capita income, and the structure of production. If this view is correct, then efforts to change the distribution of income directly would be either ineffective or require continuous transfers, and might even be harmful to the growth process.

Economists have also viewed the distribution of income as determining the rate and character of growth as well as being determined by the growth process. This section deals with two approaches to the way in which the distribution of income influences growth. This Part A treats the relationship between distribution of income, savings and growth. Part B treats the relationship between distribution of income, the structure of consumption and production, and the rate of growth and employment.

A. Income distribution and savings

The basic model relating savings and development which goes back to the classical economists and has its modern expression in the work of authors such

as Kaldor[1] and Pasinetti[2]. The approach ties the aggregate savings rate in some way to the share of profits in total income. Earlier economists tended to make the extreme assumption that wage recipients saved nothing while more modern versions allow for a positive savings propensity out of wage income, although one which is smaller than the propensity to save out of profits. The rate of growth of output (and employment) is then linked to the aggregate savings rate. In more modern versions, a variant of the Harrod-Domar growth model is used to show that the growth rate varies in direct proportion with the savings ratio so long as the marginal capital output remains constant and there is no effective constraint on labor supply. The implication drawn from this approach was that a high profit share was beneficial for growth while a rising wage share was not.

The link between the savings rate and the profit share has never been spelled out in any clear fashion. It probably reflects an identification of profit recipients with high incomes and the findings from cross-section household budget surveys which show that the higher income families save a higher proportion of their incomes than low income families. The first presumption, that profits accrue primarily to high income families, is probably true and policies which reduce the share of profits in total income would undoubtedly lead to a more equal distribution of income. But is the second presumption, linking the aggregate savings ratio to the distribution of income, valid? This notion is still widely held today despite the fact that there has been very little statistical corroboration for it and substantial grounds

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[1] N. Kaldor, "Alternative Theories of Distribution," Review of Economic Studies (1955/56), pp. 83-100.

[2] L.L. Pasinetti, "Rate of Profit and Income Distribution in Relation to the Rate of Economic Growth," Review of Economic Studies (October, 1962), pp. 267-79.

for doubting it. It is important to note that the linkage between aggregate savings and income distribution requires that higher income families have a higher marginal propensity to save than low income families. Even if high income families have a higher average propensity to save, redistribution would not affect aggregate savings unless there is a difference in marginal savings rates.

A savings-income curve fitted to cross-section data would tend to support the hypothesis that the marginal propensity to save rises with income. Keynes noted this aspect of cross-section data and incorporated it into his hypothesis regarding the nature of the aggregate consumption function. However, the work done by Duesenberry,[1] Friedman[2] and Modigliani and Brumberg[3] and others in reconciling aggregate time series data with cross-section data has shown that conclusions regarding the relationship between aggregate savings and income cannot be derived from cross-section data. Modigliani-Brumberg point out that differences in average and marginal propensities observed from cross-section data could reflect differences in the net worth position of differing income classes. Another important implication of their work is that in a stationery economy with no growth in either population and per capita income, aggregate savings would be equal to zero, the dissaving of the retired worker just offsetting the saving of those still working. Positive aggregate savings in their model is dependent on the rate of growth of per capita income and population. Income redistribution from those with high lifetime income to those

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[1] J. Duesenberry, Income, Saving, and the Theory of Consumer Behavior (Cambridge, Massachusetts: Harvard University Press, 1964).

[2] M. Friedman, A Theory of the Consumption Function (Princeton, N.J.: Princeton University Press, 1957).

[3] R.E. Brumberg and F. Modigliani, "Utility Analysis and the Consumption Function: An Interpretation of Cross-section Data," in Post-Keynesian Economics, ed. by K.K. Kuriharas (New Brunswick, N.J.: Rutgers Univ. Press, 1954

with a lower lifetime income would reduce aggregate saving only if there is a positive income elasticity to bequeath, providing, of course, that the redistribution was between persons having the same age, life expectancy and length of time to retirement.

Duesenberry's hypothesis suggests that if income distribution were made more even the aggregate savings rate would increase since the demonstration effect and the need to enhance one's self esteem through competitive consumption is reduced. On the other hand, Friedman's hypothesis suggests that income redistribution would not affect aggregate savings at all.

Even if one were to take the more traditional position that income redistribution would reduce personal savings, one can question its empirical importance. For U.S. data, Lubell[1] points out that the differences in the marginal propensity to save are so small that it would take a very substantial redistribution of income to have any significant effect on the aggregate savings rate. Another argument points out that personal savings often account for a low proportion of Gross National Product and thus, "a high price has been paid, in terms of savings."[2] The argument here is that personal savings account for only a portion of total savings, and that a skewed distribution of income, therefore, helps increase only these personal savings. The implication is that a skewed distribution of income does not contribute to increases in either corporate or government savings.

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[1] H. Lubell, "Effects of Redistribution of Income on Consumers' Expenditures," American Economic Review (March, 1947), pp. 157-70.

[2] International Labour Organization, Towards Full Employment: A Programme for Colombia (Geneva: International Labour Office, 1970), p. 149.

Another aspect of the model of growth which links savings to the growth rate is that it takes as a constant, the marginal capital-output ratio.[1] Thus, if income redistribution reduces savings it will also reduce the rate of growth of output. This approach was followed by Cline in his study of the effects of income redistribution in several Latin American countries.[2] Cline did not investigate the possibility that the marginal capital-output ratio might itself be related to income distribution. If, for example, consumption patterns differ for different income classes in such a way that higher income groups tend to consume a more capital-intensive basket of goods than lower income classes, then greater equity in income distribution will decrease the aggregate capital intensity of consumption.[3] Thus, redistribution would reduce the coefficient in the denominator of the Harrod-Domar equation and would increase the "warranted' rate of growth. Of course, whether or not consumption patterns do differ and differ enough, in terms of capital intensities, to make any significant import on the growth rate is an empirical question, one on which there has been very little work done to date. Our own theoretical approach which is discussed in the next section takes this additional step. As a result, we show that there need not necessarily be a trade-off between output growth and equity. One can, in theory at least, have more output growth and greater equity.[4]

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[1] We are excluding from consideration here neoclassical models in which the long-run growth rate is determined by the "natural" growth rate and where a higher savings rate simply leads to a higher aggregate capital-output ratio. Our focus is on a labor redundant economy where the natural rate is not a constraint.

[2] W.R. Cline, "The Potential Effect of Income Distribution on Economic Growth in Six Latin American Countries" (Princeton University Working Paper).

[3] This point is developed further in Part B of this section. A similar point was made by International Labour Organization, op. cit., p. 138.

[4] Our empirical work, still in preliminary stages, does tend to support the hypothesis that consumption patterns of high income groups is relatively more capital-intensive than that of lower income groups.

B. Income distribution, the structure of production and consumption, and the rate of output growth and employment

Two theoretical approaches will be described in this section relating the distribution of income, the structure of production and consumption and the rate of growth and employment. These are referred to as the Land-Soligo model[1] and the Mellor-Lele model.[2] In both models labor is assumed to be redundant, that is, unemployment persists either because technology prevents further substitution of labor for capital, or imperfections in the labor market prevent the price of labor from falling to the full employment level. Also, both models are concerned with the size distribution of income and the composition of consumption for all income classes. However, the reason for this concern is different in the two models. Land and Soligo deal with the composition of demand for different income classes in order to show how the aggregate capital-labor ratio changes as the distribution of income changes. Mellor and Lele are concerned with the surplus that must be transferred from the agricultural to the industrial sector if modern growth is to occur.

The Land-Soligo model is a general equilibrium model that permits analysis of how changes in income distribution affect the capital and labor requirements of the production needed to satisfy the consumption demands corresponding to a given distribution. Originally established to determine how a redistribution of income would affect production and employment through changes in capital requirements, the model is capable of handling technological change, changes in consumer preferences, and changes in related parameters.

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[1] J.W. Land and R. Soligo, op. cit.

[2] J. Mellor and U. Lele, op. cit.

There are two factors of production, two classes of goods, and two income classes in the model. The two factors of production, capital and labor, are both available in fixed quantities. Labor is a perfectly homogeneous factor of production. Capital is assumed to be fully employed, and all unemployed labor to be owned by the poor. The two classes of final goods are S goods, which use simple, labor-intensive production techniques, and C goods, which require more complicated capital-intensive production techniques. In order to achieve simplicity in the analysis, only one production activity is considered for each good, and each activity is assumed to exhibit constant returns to scale.[1] The two income classes are the rich, who own relatively large amounts of capital and consume relatively great amounts of sophisticated C goods, and the poor who own relatively small amounts of capital and consume relatively large amounts of S goods. To simplify the analysis, it is assumed that the proportions with which the commodities are consumed by the two classes do not change in response to price changes.

Using this model it is easy to demonstrate that increases in production of S goods, or labor-intensive goods, are always associated with decreases in unemployment and increases in consumption by both income classes, and will tend to increase the share of total consumption by the poor class. For example, an increase in the proportions with which S goods are consumed relative to C goods either by the rich or the poor will increase the production of S goods, reduce unemployment, and increase real income of the poor.

Suppose now the assumption is dropped that the proportions with which S goods and C goods are consumed do not respond to price changes. For any price elasticity of demand other than zero, both the poor and the rich are likely to

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[1] The assumption of fixed proportions in production is not as restrictive as it at first appears if the redundancy of labor occurs because of limited

substitute the consumption of C goods for S goods and the proportion of S to C goods consumed by these two classes will fall. Consequently, the employment and consumption effects of the initial increase in S production would be somewhat reduced by the change in consumption patterns. However, the final equilibrium position would still be a superior one for the poor class since a reduction in S goods to the initial level would restore the initial prices of S and C goods, and eliminate the induced changes in the proportions with which these commodities are consumed.

Since the relative consumption of S to C goods is important in the determination of the level of employment and real consumption by the poor, an appropriate direction for government policy may be to undertake measures to increase these proportions. One possibility is to impose a tax on C goods, and subsidize S goods. In this way the government can increase the production of S goods, reduce unemployment, and increase real consumption of the poor.

Another, and perhaps more realistic, way in which to influence the production of S goods is to increase the capital stock or the proportion of the capital stock owned by the poor. It can be shown that any increase in the capital stock benefits the poor. However, an increase in the capital stock through an increase in the ownership of capital by the poor has the most significant effects on employment and consumption by the poor. It benefits the poor not only from the increase in income earned from the additional capital, but also from decreased unemployment and higher real wage rates brought about by the increased production of S goods. The decrease in income resulting from the lower return to capital owned by the poor is not sufficient to offset these factors.

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factor substitutability. The assumption of fixed proportions means that only the most labor-intensive production activity need be considered. The more capital-intensive activities will be dominated by this activity as long as labor redundance persists.

Employment and consumption are also affected by technological change, though the effects depend upon whether the technological change is labor-saving, neutral or capital-saving, and whether such change is occurring in the S goods sector or in the C goods sector. Capital-saving technological change, for example, will always result in a higher real consumption level for the poor. On the other hand, for reasonable values of the parameters, the model indicates that the level of employment and consumption by the poor will be reduced for labor-saving technological change combines elements of both labor-saving and capital-saving changes. However, the results from such change depend crucially upon the values of the parameters of the model.

The effect of redistribution of income on savings and the rate of growth has been discussed in the first part of this section. Here, it needs only to be pointed out that, to the extent the rich save a larger proportion of additional income, a redistribution will result in a lower level of savings, lower increments to the capital stock, and a lower rate of growth. Consequently, a redistribution that in the short run benefits the poor in terms of employment and consumption may reduce these benefits in the long run. However, the reduction of savings does not mean the level of production will decrease from its previous level since the capital requirements to sustain the same level of production are now lower.

In many situations, foreign exchange, rather than savings, is regarded as the binding constraint on increases in output. Even in countries where the imports of final consumer goods are relatively low as the result of import substitution industrialization policies, a country may benefit in its growth prospects from a redistribution of income. The ILO study of Colombia points out three ways in which the consumption bundle of the rich uses up valuable foreign

exchange.[1] One of these are the relatively large foreign exchange expenditures for tourists, largely by higher income groups. A second is the level of contraband, which in Colombia official estimates indicate are considerably higher than the value of imported consumer goods. More important than these two, however, is the use of foreign exchange to purchase intermediate goods or capital goods required in the production of commodities consumed by higher income classes. Here again the empirical evidence is neither clear nor trustworthy. However, the available information indicates that the import content of the consumption bundle of the rich is probably twice that of the poor.

The conclusions drawn from the Land-Soligo analysis depend crucially upon assumptions about certain parameters. Preliminary research[2] indicates these assumptions are correct, but a great deal more information is needed to test the analysis thoroughly. Better information is needed on consumption patterns by income classes, particularly for the rural sector. Production data in the detail required by the Land-Soligo model are particularly lacking in developing countries. Furthermore, relatively little is known about how consumer tastes respond in a dynamic or growth context. For example, household budget studies, particularly of the rural area, seem to indicate wide differences in consumption patterns between income classes. However, we know relatively little about how tastes, preferences, consumption patterns will change as these groups participate more in the growth process.

As indicated earlier the Land-Soligo model employs comparative statics analysis. It asks, for example, how a redistribution of existing income affects

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[1] International Labor Organization, op. cit., p. 146.

[2] For a description of ongoing research related to the Land-Soligo analysis, see J.W. Land, "A Proposal for Research on Distribution of Gains, Wealth and Income from Economic and Political Development" (Discussion Paper No. 24, Rice University, 1972).

the structure of demand, production and employment. Although providing useful insight into the growth process, there are several reasons why the analysis needs to be pushed further into a more explicit dynamic analysis. These reasons are partly economic and partly political. Nowhere in the free world have governments succeeded in greatly altering the distribution of income through transfers. Most tax and expenditures systems are, at best, only mildly progressive. It is difficult to imagine, short of revolution, a government which could enforce a system of taxation that sharply taxes middle and high income groups and redistributes this income to the poor.

All this is not to say that government policy does not influence the distribution of income. Rather, it suggests that it is the sum of government policy acting over time that helps determine the distribution of income. For example, a government's education, agricultural and industrial policies may, over time, help redistribute income more equitably if these policies are designed gradually to place more human capital and employment opportunities in the hands of the poor. This conclusion poses a strong argument for considering the distribution of gains from growth over a period of time rather than the redistribution of existing income at a moment of time.

A second reason for considering income distribution in a dynamic context has to do with capital, both human and fixed, and its role in determining the distribution of income. The preceding analysis has treated capital as a homogeneous factor of production, whose components may be land, human capital or fixed capital. This assumption is equivalent to saying that one form of capital can readily be substituted for another. Although it makes the model analytically easier to work with, this assumption needs to be modified.

Household budget studies show that much of the capital intensity of upper income consumption is accounted for through the consumption of housing services,

and durable goods.[1] Though formally all of these services are capital-intensive, in fact quite different kinds of capital goods are used up in the course of their production. Housing, a stock of teachers and physicians, and plant and equipment all require savings. However, they differ in the amount of time required for their production and in the factors of production used up in their production. For example, residential housing may take as little as six months to produce and use mainly domestically produced goods and large amounts of unskilled labor. A cadre of skilled teachers also uses domestically produced resources but takes a long time to produce and requires substantial amounts of human capital in its production. Finally, the plant and equipment necessary to produce durable goods may require foreign exchange for its purchase, take a moderate amount of time for its construction, and use both skilled and unskilled labor in its production.

Consequently, it is seen that capital may represent many different constraints on growth--from imported commodities, to human skills, to kinds of capital rather easily reproduced using large quantities of labor. These different constraints mean different things for different economies, depending upon their factor endowment. Consequently, redistribution of wealth and income will have different effects on employment generation depending upon the composition of consumption by income classes and the production techniques employed in producing these goods and services.

A dynamic model needs to be developed that can take account of both points discussed in the preceding section. It can then be used to analyze the effects

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[1] See G. Jimenez, "The Capital Labor and Import Content of Urban Consumption Patterns in Colombia " (Thesis, Rice Iniversity, 1972); R. Soligo, "Factor - Intensity of Consumption Patterns, Income Distribution and Employment Growth in West Pakistan " (Mimeographed, Rice University); and T. Sunman, "Short-run Effects of Income Distribution on Some Macroeconomic Variables" (Unpublished dissertation in progress, Rice University).

of redistributing a given amount of income. It can be used to analyze a situation in which the amount of savings is the binding constraint on growth rather than a fixed amount of capital. Related to this latter point is the fact that a dynamic model can analyze the effects of a change in the distribution of the gains from growth on the growth rate, employment and distribution of income when an optimal policy with respect to capital formation is being followed.

An example may serve to make the last point clearer. A possible development strategy to increase the share of income earned by the poor is to encourage production of labor-intensive commodities. Indeed this is the strategy suggested by the Land-Soligo model. An interesting variation of this policy is to encourage construction of middle income and upper income housing. Although encouraging capital-intensive consumption, this strategy generates considerable employment in the short run while the construction activity is ongoing.[1] It is probably impossible to choose between these quite opposite strategies without a dynamic model that takes into account (1) initial factor endowment, (2) tastes and propensities to save of different income classes, (3) technology, and (4) appropriate time horizon.

The second model discussed here, developed by Mellor and Lele, deals with an additional dynamic problem of development. Many economists, for example, W. Arthur Lewis, Gus Ranis and John Fei, have seen development as a process of moving labor from low productivity employment to high productivity employment and the simultaneous generation of an agricultural surplus with which to feed the newly urbanized workers. Unfortunately, the import substitution policies pursued by developing countries have resulted in a relatively small transfer

[1] Such a policy is being implemented in Colombia. For a discussion of this strategy see Colombia: The National Planning Department, Guidelines to a New Strategy (Bogota, 1972).

of labor from low productivity employment to high productivity employment. The reason for this relatively small transfer, and perhaps the relatively low rate of success in this development effort, lies in the adoption of import substitution policies, which use large amounts of capital and relatively small amounts of employment. It is easy to criticize such policies but in the past it has been difficult to prescribe other remedies. Efforts, say by India in the 1960s, to pursue high employment policies have nearly always resulted in rapid increases in the prices of food grains and general inflation in the economy, a phenomenon which the politically powerful urban classes were unwilling to tolerate. The reason for such rapid inflation appears to lie in the inelasticity of agricultural production to increased prices. The Green Revolution has changed all that, however, by making it possible to achieve rapid increases in output of agricultural products, particularly food stuffs. The question which the Mellor-Lele analysis addresses itself is whether it is now possible to pursue high employment generating policies without the inflation that accompanied earlier such efforts.

The economy in the Mellor-Lele model is separated into the food grains sector, the non-agricultural sector, and the labor market. Food grains production is a linear homogeneous function of land, labor and technological change. Per capita output can be increased only by technological change. The implicit assumption of zero price elasticity, the authors explain,[1] is meant to apply only to food grains production, where farming is mainly on small plots. The modern agricultural sector will most probably respond to price increases since they use a small proportion of total land area and relatively more non-land inputs.

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[1] See J. Mellor and U. Lele, op. cit., p. 11.

The agricultural population consists of two classes: Laborers who have an income elasticity of food less than unity and a negative price elasticity of demand, and landlords who have zero income and price elasticity for food. Laborers consume all their incomes, whereas the incremental share of landowners is used to purchase goods from the non-agricultural sector.

Production in the non-agricultural sector is assumed to be a function of labor and capital. The demand for agricultural commodities is a function of the relative price of agricultural commodities and the laborers' real incomes The industrial wage rate is the same as the per capita income of agricultural laborers. Non-agricultural workers also consume all their incomes.

Although in the family of dualistic economy models, the main thrust of the Mellor-Lele model is the separation of agricultural production from agricultural marketings.

An increase in food grains production will not lead to an increase in food grains marketings if, for example, the gains from production accrue to farm laborers who use their increased incomes to increase their consumption of food grains. Hence, to the extent that technological change in the agriculture sector leads to an increased labor share in output, the resulting increase in agricultural production may lead to relatively little improvement in non-agricultural employment opportunities since (1) the marketable agricultural surplus may not increase significantly and (2) the rise in the wage rate in the industrial sector brought about by the improvement in the real agricultural wage rate may retard non-agricultural employment.

What if agricultural marketings cannot be increased? Producers in the non-agricultural sector will substitute capital for labor, and the capital-labor ratio will rise. Hence, technological change in the agricultural sector

accruing to landlords will result in increased agricultural marketings and expansion of employment opportunities in the non-agricultural sector.

The importance of the Mellor-Lele analysis in terms of the Land-Soligo model needs to be explored further. On its face, however, the Mellor-Lele analysis poses a major qualification to redistribution efforts. If income or wealth were to be redistributed in such a way as to increase lower income groups' share of total income, and if these income groups spend their money largely on food grains and if this increased consumption thwarts the transfer of workers from low productivity to high productivity areas. then the Mellor-Lele admonition must be taken into account and redistribution efforts modified in an appropriate way. However, if technological change is sufficiently rapid, if tastes of urban dwellers are changing, if imports of food are readily available, then the Mellor-Lele admonition is not needed. Indeed, redistribution of income would have the effect of increasing consumption of labor-intensive commodities, employment and growth.

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