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Balancing Trickle Down and Basic Needs Strategies
Income Distribution Issues in Large Middle-Income Countries
with Special Reference to Latin America

Marcelo Selowsky

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Marcelo Selowsky

The World Bank
Washington, D.C., U.S.A.

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Abstract

This paper addresses income distribution issues and explores various policy options to eliminate extreme poverty in a particular typology of middle income developing countries. The countries included in the typology are characterized by a relatively high per capita income (above US\$600 per year in 1976), a relatively high degree of industrialization (industry representing over 30 percent of GNP), a rather large size both in population and area, and relatively well endowed resources in agriculture. A distinctive feature is a strong inequality in the distribution of income and wealth relative to other countries of similar levels of per capita income.

The typical countries characterizing the typology are Brazil, Colombia, Ecuador, Mexico, Peru, and Turkey. Because the Latin American countries included represent two-thirds of the population of the region, this report is basically addressed to that region.

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SUMMARY

1. These countries are experiencing an impressive GNP growth--from 6 to 7 percent--and have achieved high mean per capita incomes--from 600 to 1,200 US dollars. Mean life expectancy has reached 60 years, and mean caloric consumption equals caloric requirement. The distribution of these high means is particularly striking. Income distribution is so unequal that 25 percent of the population lives in absolute poverty, at least that percentage suffers from calorie deficit, and variations of up to 20 years are observed in life expectancies. Inequality dominates the levels of these means.

Because relative income inequality seems, at best, neutral to growth, improvements over time depend on the relative force of GNP and population growth. The end result is that the absolute number of poor (100 million people for all of Latin America) will remain constant over time.

2. The very fact that per capita income is high means that the income and consumption deficits of the poor are only a small fraction of GNP. Therefore, if well implemented, these countries can afford, today, a substantial attack on poverty without hampering present growth rates. Today's growth redistribution trade-off differs from that of 25 years ago when the per capita income of the countries in question was half the present figure. Further, such a trade-off is more the result of inappropriate policy instruments, often applied in the name of improving income distribution, than of an inherent incompatibility between growth and redistribution.

3. The policy package suggested here strives for an optimal mix of a trickle-down and a basic-needs strategy. It consists of:

- (a) Policies to increase the employment effect of present GNP growth and to spread wage and employment gains to wider and poorer segments of the labor force. Additional efforts for factor costs to reflect relative scarcities must be made. This is well known; however, this problem is distinctively serious in these countries and does not seem to correct over time. A special effort is made to assess the payoff of improving labor market functioning so that increases in labor demand can be translated into stronger increases in employment.
- (b) Policies to increase investment in the assets of the poor, human and non-human, when these investments also have a high return to the economy. New evidence still shows that basic education is effective and highly productive in raising incomes. The payoff to physical investment, i.e., a small-farmers strategy, is found to be highly country-specific. First, landless labor represents the core of

poverty in these countries; second, under the present distribution and location of poor farmers, "good investments" will be exhausted rather quickly. Unless "good" land can be redistributed, new farmers can be created only if substantial additional investments are made. How quickly these investments hit low rates of return must be further studied.

- (c) A strong reorientation toward basic needs, especially toward children. Policy measures are suggested, first, to reorient public expenditures in health, education, nutrition, and shelter toward the poor; and second, to increase these expenditures from 5 to 10 percent of GNP. This additional 5 percent must have a strong basic needs content. Its features are:
- 1 percent of GNP to be spent in improving the quality of primary rural education. A fraction of the present public expenditure on higher education--1/2 of 1 percent--must be diverted to school meals in rural areas. This requires some self-financing of higher education for which a proposal is outlined here.
 - 1.5 percent to be devoted entirely to improving and expanding primary-preventive-rural health care.
 - 1 percent to be spent on preschool age nutrition programs. In a country of US\$800 per capita income, this makes available US\$160 per year for each preschool age child in the poorest quartile of the population.
 - 1.5 percent to be spent on shelter. Given present households' expenditures in housing, this allows the financing of shelter--of a unit value equal to 5 times GNP per capita--for the poorest 30 percent of urban households.
- (d) Policies (a) and (b) do not induce a trade-off with growth. Policy (c) can. We estimate that if this additional 5 percent of GNP is financed with a 12.5 percent additional income tax on the richest 10 percent, losses in their investment could, at maximum, lower GNP growth by 0.5 percent, i.e., from 6.5 to 6.0 percent. This is derived assuming the basic needs package represents only consumption. The maximum trade-off ratio between growth and distribution is estimated here to be 1:10.

- (e) Crucial in implementing the above policy is to keep uncertainty down and "rules of the game" clear. This is particularly important in mixed economies. Otherwise, uncertainty will induce expected capital losses all out of proportion to the transfer aimed at, and the trade-off will be much larger. Private investment is much more sensitive to uncertainty than to income taxation.

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I. POVERTY AND INEQUALITY: THE PRESENT
MAGNITUDE OF THE PROBLEM

During the last two decades, the growth performance of these countries has been impressive. As shown in Table 1, the (unweighted) annual growth rate of GNP has been 6.5 percent in the 1960-76 period. Despite the extremely high rate of population growth (3.1 percent per annum), per capita income growth is still almost twice that of developed nations during their long run period of growth; that is, 3.4 percent for the countries in Table 1 against the figure of 2 percent reported for developed countries by Kuznets.^{1/} In 1976, per capita income ranged from \$630 for Colombia to \$1,140 for Brazil, a weighted average equal to \$1,026; excluding countries with per capita incomes above \$2,000, they rank between the 68th and 90th percentiles of the

Table 1: PER CAPITA INCOME AND GROWTH RATES

Country	Population, 1976 (millions)	Per capita income, 1976 (dollars)	Growth Rates (1960-76)		
			GNP (%)	Population (%)	GNP per capita (%)
Brazil	110.0	1,140	7.7	2.9	4.8
Colombia	24.2	630	5.7	2.9	2.8
Ecuador	7.3	640	7.0	3.4	3.6
Mexico	62.0	1,090	6.4	3.4	3.0
Peru	15.8	800	5.5	2.9	2.6
Average: unweighted (weighted)			6.5	3.1	3.4
Turkey		990	6.7	2.5	4.2
All Middle Income Countries		750	5.5	2.7	2.8

Source: World Development Report I, IBRD, 1978

^{1/} Simon Kuznets, Modern Economic Growth, New Haven, Yale University Press, 1967.

developing countries ordered according to ascending per capita income. What is striking is that these high country means, either per capita income, per capita calorie consumption, or life expectancy, coexist with extremely low values for these same variables for particular subgroups of the population.

How many people live below a predetermined level of income defined by its welfare consequences? How sensitive are these numbers to different and debatable estimates of the relative income distribution obtained for these countries? Are these numbers dominated by the mean level of per capita income? How do they compare with numbers derived by examining welfare indicators other than income? How sensitive is our final diagnosis to the use of other indicators? This section addresses some of these questions by putting together the fragmentary information available.

A. THE NUMBER OF PEOPLE BELOW NUTRITION-RELATED LEVELS OF PER CAPITA INCOME

Income levels associated with an ideal nutritional status of households is an appealing criterion in defining an income poverty line. Income is a proxy for the purchasing power of families and nutrition is highly associated with purchasing power. This association with income is less clear for other services such as primary education or basic health, particularly when it is freely provided by governments; that is, consumption is then less dependent on the purchasing power of the family.^{1/}

Before defining a nutrition-related-critical-income-line, the acceptable degree of the voluntary leakage to "nonnutrition" expenditures

^{1/} Nutritional status can also be affected by government interventions in water supplies and sanitation systems.

must be determined. Two such leakages occur: nonfood expenditures and the "inefficiency" of the present diet. In other words, existing food expenditures would often yield a higher nutritional content if properly allocated among foods.^{1/} Two extreme definitions of a poverty line thus arise: first, the least-cost diet wherein neither leakage has a welfare value; second, the level of income at which nutrition requirements are achieved while maintaining households' intra-food and food/nonfood preferences.

Ongoing research at ECLA has developed a combination of these two criteria in defining poverty lines for urban and rural Latin America. Intra-food adjustments were made compatible with observed patterns of food preferences so as to increase the efficiency of diets. The optimal diet in terms of calorie and protein requirements was priced in urban and rural areas, and the propensity to spend on non-food items was considered in arriving at the poverty line.^{2/} These critical per capita income figures, in 1976 dollars, appear in Table 2. They range between \$200 and \$250, as compared with a mean figure of \$300 derived in earlier experiments where calorie income preferences were fully maintained.^{3/}

1/ There is ample evidence showing that, even at low levels of income, calorie-income elasticities are low. Increases in income result in a sharp tendency to turn to more expensive sources of calories.

2/ For details on the precise methodology, see S. Piñera and S. Molina, "Extreme Poverty in Latin America Project," ECLA (preliminary). Pedro Tejo, "Un Metodo para Estimar Consumos Minimos de Alimentos para los Paises de America Latina," November 1976 (ECLA-IBRD Research Project).

3/ See Reutlinger and Selowsky, Malnutrition and Poverty, World Bank Staff Occasional Papers, Number 23, Johns Hopkins University Press, 1976. This estimate is based on cross section Latin American data.

Table 2: TOTAL PER CAPITA INCOME REQUIRED TO VOLUNTARILY ALLOCATE TO FOOD AN EXPENDITURE EQUAL TO THE COST OF AN "EFFICIENT" FOOD BASKET (1976 dollars)

Country	Urban Areas			Rural Areas			National		
	Cost of food basket	Non-food expense	Implicit required income	Cost of food basket	Non-food expense	Implicit required income	Cost of food basket	Non-food expense	Implicit required income
Brazil	150	139	289	108	83	191	124	113	237
Colombia	129	120	249	97	73	170	113	102	215
Ecuador	162	150	312	121	92	213	135	118	230
Mexico	136	126	262	102	77	179	120	110	230
Peru	134	124	258	99	75	174	114	102	216

Sources: S. Piñera and S. Molina: Extreme Poverty in Latin America Project, ECLA (preliminary).
 Pedro Tejo, "Un metodo para estimar consumos minimos de alimentos para los paises de America Latina,"
 November 1976 (ECLA-IBRD Research Project).

What is the number of people living below these poverty lines? How sensitive are these numbers to the use of the several, and sometimes quite different and debatable estimates of the distribution of income? Given the wide range of estimates reported, it is helpful to explore how the number of poor people change under extreme ranges of values. (And this will also be true in the future for countries where at present only one estimate is available.)

Table 3 presents selected estimates of the income distribution for these countries. Other estimates have not been reported because their reliability is even more questionable.

Table 4 presents three hypothetical distributions covering most of the range observed in Table 3. The first is the most unequal, a share of 2 percent and 7 percent for the poorest 20 and 40 percent of the population, respectively. In the second estimate, these shares become 3.5 and 10.5 percent. These ranges cover most of the estimates for Latin America. In the third distribution, the share of all four deciles are 25 percent higher, reflecting the "better" estimate in Colombia and the present situation in Turkey. Using these distributions and the country per capita income figure of Table 1, Table 5 derives the fraction of the population with incomes below the poverty lines.

Because Mexico and Brazil have almost the same country per capita income and very similar poverty lines, they have the same fraction of individuals in poverty for a given hypothetical income distribution, ranging from 13 percent for distribution II to 24 percent for distribution I. The latter figure becomes more plausible if the recent income distribution

Table 3: THE DISTRIBUTION OF INCOME

	Colombia		Peru	Mexico			Brazil			Ecuador	Turkey
	1964	1974	1961	1964	1968	1975	1960	1970	1973	1970	1973
(1) Poorest 20%	4.0 ^{a/}	5.2	2.4	3.5	3.4	1.9	3.5	3.1	1.8	1.8	3.4
(2) Poorest 40%	9.6	14.3	7.4	10.3	10.5	8.1	11.5	10.0	7.0	5.2	11.3
(3) Richest 5%	33.7	22.2	43.0	28.7	27.9	30.3	27.7	34.9	38.2	43.0	
(4) Richest 10%	49.4	39.3	52.8	41.9	42.1	43.5	39.7	47.8	51.9	56.6	39.1
Ratio of shares											
(3)/(1)	8.4	4.2	17.9	8.0	8.2	15.9	7.9	11.2	21.2	23.8	
(4)/(1)	12.3	7.5	22.0	12.0	12.4	22.9	11.3	15.4	28.8	31.4	11.5
(4)/(2)	5.1	2.7	7.1	4.1	4.0	5.4	3.4	4.8	7.4	10.9	3.5
Gini coefficient	.57	.50	.61	.51	.52	.56	.50	.56	.61	.68	.50
Composition of poorest 20%:											
rural		.65	.80			.75 ^{b/}			.67 ^{c/}		.72
urban		.35	.20			.25			.33		.28

a/ Refers to bottom quartile.

b/ Composition of the poorest 45 percent of total households.

c/ Composition of the poorest 32 percent of the population.

Sources: Colombia - 1964 - Economically Active Population: Miguel Urrutia, "Income Distribution in Colombia" International Labor Review, March-April 1976.
 1974 - Households: Marcelo Selowsky, Who Benefits from Government Expenditure, A Case Study of Colombia, Oxford University Press (forthcoming).

Peru: Labor Force: Richard Webb, Government Policy and the Distribution of Income in Peru, 1963-1973, Harvard University Press, 1977.

Mexico: Households: World Bank Mission Estimates from Household Survey Data.

Brazil - 1960)- Economically Active Population: C. Langoni, Distribucao do Renta e Desenvolvimento Economico do Brasil.
 1973 - Economically Active Population: Pesquisa Nacional por Amostragem de Domicilios, IBGE.

Turkey - Households: K. Dervis and S. Robinson, "The Sources and Structure of Inequality in Turkey (1950-73), mimeo.

Table 4: SHARES OF POOREST DECILES ACCORDING TO HYPOTHETICAL DISTRIBUTIONS OF INCOME (percentages)

Decile	Very Unequal I	Typical Inequality II	Moderate Inequality III
1	0.67	1.50	1.87
2	1.33	2.00	2.50
3	2.00	3.00	3.75
4	3.00	4.00	5.0
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Poorest 40%	7.00	10.50	13.12

Table 5: PERCENTAGE OF "POOR" UNDER HYPOTHETICAL INCOME DISTRIBUTIONS (Percent)

Country	I	II	III	Midpoint
Brazil	24 (.62) ^{1/}	13 (.61)		18.5
Mexico	24 (.62)	13 (.61)		18.5
Ecuador	40 (.65)	35 (.60)		37.5
Peru	35 (0.6)	24 (.62)		29.5
Colombia		26.5 (.57)	22 (.68)	24.2
<hr style="border-top: 1px dashed black;"/>				
Weighted mean		25.4		20.3

Note: Values in parentheses show the share of rural families among the poor.

figures reported for these countries are accepted. The fraction of poor is higher in Colombia, and the results do not seem sensitive to the use of distributions II or III. Ecuador and Peru have reported distributions closer to I, which implies that 40 and 35 percent of the people live in poverty.

Adjustments for the higher cost of living in urban areas reduces the rural share in the poverty group: while 75 percent of the population in the bottom quintile is rural, only 60 percent of the population below the poverty line is rural.

By using the most plausible hypothetical distributions, the weighted (by the population of each country) mean figure of Table 5 yields a value of 25.4 percent of families in poverty, namely, those families who are unable to finance, given their food-nonfood preferences, their calorie requirements through an "efficient diet." This figure should be (and is) lower than an estimate of the observed fraction of people experiencing calorie deficits, 36 percent for 1975.^{1/}

Finally, it is interesting to observe the sensitivity of the aggregate income gap--the fraction of GNP that, if transferred, would lift poor families to the poverty line--to the alternative income distributions I and II. Even under I, one cannot escape the conclusion that these countries do have the resource capability of solving the problem of extreme poverty.

^{1/} Reutlinger and Selowsky, Malnutrition and Poverty, op. cit.

Aggregate Income Gaps (%), 1976

	I	II
Brazil	2.2	0.7
Colombia	6.5	3.6
Ecuador	8.9	5.4
Mexico	2.3	0.3
Peru	4.1	1.9

B. THE INCIDENCE OF POVERTY IS HIGHER AMONG YOUNG CHILDREN

The fact that poor families have larger family sizes gives origin to a larger incidence of poverty among children: the fraction of children that are poor is larger than the fraction of adults. What is the precise magnitude of this differential incidence of poverty and what are its implications for analyzing the consequences of poverty?

Table 6 shows that whereas 16.5 percent of all adults suffer the welfare consequences of being in the poorest quintile, the figure for young children is 27 percent. If poverty is defined by the welfare consequences of living in households accounting for the bottom 40 percent of the population, the conclusion is that 50 percent of young children are poor, while only 35 percent of adults are poor. Poverty, then, is more a "children's problem."

This way of presenting the poverty problem becomes more relevant: (a) if the welfare consequences of living in the bottom deciles are measured in terms of different indicators for children than for adults; that is, anthropometric deficit, life expectancy at birth, etc.; and (b) if the propensity to spend in children--where expenditure is broadly defined, encompassing physical and psychological elements--from increases in household per capita income is "low." Policy instruments to increase the

Table 6: URBAN LATIN AMERICA: CHILDREN (BELOW AGE 10) AND ADULTS BELONGING TO EACH INCOME DECILE

Fraction of population (deciles)	<u>/a</u> f	Percentage of total number of children in the country belonging to each decile <u>/b</u>	Percentage of total number of adults in the country belonging to each decile
.10	.46	14%	8.0%
.10	.43	13%	8.5%
Poorest 20%	.445	27%	16.5%
.10	.40	12%	9.0%
.10	.36	11%	9.5%
Poorest 40%	.41	50%	35.0
Country	.33	.33	.67

/a From Table A-1.

/b Denoting N as children and T as population. The fraction of the total number of children in the country that belong to a decile i can be written:

$$\frac{N_i}{N} = \left(\frac{T_i}{T} \right) \left(\frac{T}{N} \right) \left(\frac{N_i}{T_i} \right) = (0.1) \frac{(N_i/T_i)}{(N/T)} = (0.1) \left(\frac{f_i}{\bar{f}} \right)$$

earnings capacity of the family will have a slow effect on the extent of children's poverty. This issue will be addressed below.

C. THE DISTRIBUTION OF OTHER WELFARE INDICATORS

During the last two decades, the countries in question experienced substantial gains in the mean level of selected welfare indicators. Mean life expectancy at birth in 1975 ranged from 56 to 63 years, with gains between 5 to 10 years since 1960. Infant mortality, between 50 and 70 per thousand in 1975, declined by 30 to 40 deaths after 1960. In the 1974-75 period, the mean calorie consumption of these countries reached levels between .95 and 1.1 times the mean calorie requirement.

How unequal is the distribution of these indicators across the population? Can one observe the same pattern here as that seen for per capita income, that is, "good" means coexisting with a large fraction of the population showing low levels of these welfare indicators? Because, unlike income data, country wide information on these distributions is not yet available, many must be inferred from case studies and submeans for regions.

In Brazil, differences in life expectancy of 21 years are found between the poorest groups in Rural Northeast and the richest group in urban areas. Factors other than income are associated with these differences, since even within the poorest income group differences of up to 20 years can be found across regions.^{1/} Sharp differences in child mortality across regions are found in Mexico and Ecuador. In Mexico, percentages range

^{1/} See Table A-2.

from 39.2 to 105.9 deaths per 1,000 live births in different states, and in Ecuador from 45.4 to 122.1.^{1/}

Perhaps malnutrition best reflects the distributive problems in these countries. A large number of undernourished individuals--in terms of caloric intake or anthropometric deficit--coexist with a mean per capita caloric consumption equal to or above requirements.^{2/}

The distribution of caloric intake at the country level was estimated by food consumption surveys in Brazil in the early 1960s and in Turkey in 1974. (The 1974 Brazil ENDEF survey will provide a more recent and reliable source.)^{3/} The results are reported below.

<u>Calorie consumption as a fraction of requirements</u>	<u>Percentage of the population</u>	
	<u>Turkey</u>	<u>Brazil</u>
below.75	17.4%	11.9%
below.90	41.0%	29.1%
Mean per capita consumption as a fraction of requirements	1.04	1.07

Although they report a country mean consumption above requirements (consistent with FAO Food Balances) these surveys show 41 and 29 percent of the population with at least a 10 percent caloric deficit in Turkey and Brazil, respectively.

^{1/} See Table A-3.

^{2/} See Table A-4.

^{3/} The requirements take into account the demographic composition of the population. Brazil: Fundacio Getulio Vargas, "Food Consumption in Brazil, Family Budget Studies in the early 60s." Reported in Malnutrition and Poverty; Turkey: Nutrition in Turkey, National Nutrition, Health and Food Consumption Survey, Ankara, 1974.

A review of different studies where undernutrition in young children is measured in terms of weight deficits shows, as expected, a higher incidence of undernutrition than in the total population. In Turkey, 20 percent of preschool children are underweight, according to Turkish standards;^{1/} in rural Colombia the figure is 65 percent for preschool children.^{2/} A breakdown of these figures for different degrees of undernutrition shows that, even by choosing a less strict standard (degrees II and III, i.e., a deficit larger than 25 percent of the Gomez standard), between 20 and 40 percent of preschool children in rural Mexico are malnourished.^{3/}

D. THE ECONOMIC CHARACTERISTICS OF THE FAMILIES IN THE POVERTY GROUP

Most surveys indicate that when households are classified by per capita household income, most of the poorest 20 to 40 percent of families live in rural areas. This is shown in Tables A-6 to A-9, for example, where the share of rural households in the poverty group ranges from 58 percent for Colombia (where rural households are those in towns with fewer than 1,500 inhabitants) to 82.7 percent for Peru. Brazil's figure falls between 64.3 and 72.9 percent, whereas Mexico and Turkey's figure is approximately 75 percent. In several countries, rural poverty is associated with particular regions; in the case of Brazil half the families in the poverty group are located in the Rural Northeast, and in the case of Peru, in the Mancha India.

^{1/} Nutrition in Turkey, op. cit.

^{2/} La Política de Salud, Departamento Nacional de Planeación, República de Colombia, Color Osprey Impresores Ltda., Bogota, D.E., Colombia.

^{3/} See Table A-5.

Clearly, the above figures exaggerate the participation of rural households in poverty since the purchasing power of the reported income figures must be corrected by different price levels, particularly those of food. In the case of Peru, for example, such adjustments lowered the percentage of rural households in the poverty group to 59 percent^{1/}. The use of differential poverty lines provided by ECLA for urban and rural areas show that approximately 60 percent of households in the poverty group are rural.

How are these households linked to the urban and rural economies? What are their sources of income? These are important questions for identifying points of policy intervention. Ideally, one would like to classify rural households according to the relative importance of their share of income from ownership of land, sharecropping, and the provision of wage labor to other farmers. Because the typical population census or household survey from which these poverty groups are constructed usually does not provide this data, sectorial (i.e., agricultural census or urban employment) surveys must be used to derive this information.

Scattered evidence tends to show that the mixture of sources of earnings for the rural poor varies considerably in the countries explored. In Peru, 80 percent of the rural poor are subsistence farmers of distinct ethnic background. "Subsistence farmers are mostly Indian, Quechua or Aymara speaking, and in 1961 about 70% were illiterate. Their principal source of livelihood was on the average about 0.9 hectares of Sierra cropland, three heads of cattle, and some other livestock. Most earned some

^{1/} Vinod Thomas, "The Measurement of Spatial Differences in Poverty: the Case of Peru," World Bank Staff Working Paper No. 273, January 1978.

cash income by seasonal labor on larger farms or occasional sales of livestock products."^{1/} In Colombia, approximately half the rural households in poverty are small producers, the rest landless labor. Nevertheless, even small producers perceived at least two-thirds of their earnings as wage labor in larger farms.^{2/}

In contrast to Peru, where most rural poor are subsistence farmers, the evidence for Brazil shows that most of the poor are landless labor. According to the SUDENE-IBRD survey in Northeast Brazil, only 1.7 million of the 6 million rural labor force (heads of households plus working family members of landowners) own land. Of this 6 million, "about three million have no access to land, and subsist on temporary employment or scrounge out a living on lands so poor or remote that they were not captured by any of the censuses, cadastral survey or the SUDENE/IBRD survey. These three million and their families constitute the hard core of poverty in the Northeast. Most landowners (even if they own only two or three hectares of poor land), sharecroppers, renters and permanent workers, realize real incomes at or above the absolute poverty line, but the remaining persons presumably do not, and this situation is easily traceable to their lack of access to land."^{3/}

The above evidence shows that rural poverty cannot be characterized by a single, simple occupational classification. Small farmers do not seem

1/ Richard C. Webb, Government Policy and the Distribution of Income in Peru, 1963-1973, Harvard University Press, 1977, p. 13.

2/ Urrutia and Berry, Income Distribution in Colombia, Yale University Press, 1967.

3/ G. Kutcher and P. Scandizzo, The Agricultural Economy of Northeast Brazil, forthcoming.

to represent the core of rural poverty, as is usually believed. For most countries, landless labor is at least equally represented in the poverty group, and wage earnings represent an important component of income, even in the case of subsistence farmers. This has important policy implications, as will be seen below.

Who are the urban poor and what are their occupational characteristics? Two patterns seem to emerge from the data: Most of the urban poor are located in nonmetropolitan areas (as shown in Tables A-7 and A-10), particularly concentrated in small towns; and about half of them are associated with commerce and the service sector. Depending on the country, between half and two-thirds of heads of households in the poor families are salaried employees, the rest self-employed.

There is no single relationship between unemployment status and households in poverty. Open unemployment does not seem to characterize the households in the poverty group. A recent study at ECLA shows that most heads of households in the poverty group are employed, although a large percentage of them are underemployed, working fewer than 39 hours a week, and willing to work additional hours.^{1/} This information is consistent with the estimates of the ILO, which show that open unemployment in Latin America is approximately 5 percent, while underemployment characterized around 30 percent of the labor force.

E. TRENDS AND PERSPECTIVES

Evidence indicates that relative income inequality has, at best, remained constant over these long periods of sustained economic growth.

1/ S. Piñera, "Cuantificación, análisis y descripción de la pobreza en algunos países Latinoamericanos," Proyecto Interinstitucional de pobreza crítica, ECLA, 1978.

Although the fraction of people in poverty has declined, the force of population growth has resulted in a constant absolute number of people in poverty. In Latin America, 100 million people live and will remain in absolute poverty during the next two decades.

Despite a constant number of poor, the economic capability of solving the problem of poverty has increased substantially. The aggregate income gap defined earlier declined from 8 percent in 1960 to 4.5 percent in 1970, and today does not exceed 3 percent.^{1/}

These figures clearly show that in this typology of countries poverty is, and will increasingly be, a purely distributive problem rather than the result of a lack of aggregate resources. Eliminating extreme poverty while maintaining a high growth rate should be feasible. It is the option explored in this report.

^{1/} S. Piñera, "¿Se benefician los pobres del crecimiento económico?", ECLA, mimeo, 1978.

II. HISTORICAL AND INSTITUTIONAL BACKGROUND

The present distribution of income and consumption is the result of three factors: (a) the distribution of human and nonhuman assets in the population; (b) the demand for the services of these assets derived from the structure and functioning of the economic system; and (c) net transfers induced by the public sector (taxes and expenditures).

Ideally we would like to know how much of the past evolution and present levels of inequality and poverty can be explained by these different factors; to what extent was the trend in these factors the result of forces exogenous to public policy on the one hand, and attributable to government intervention on the other; and most important, what might have resulted if alternative government policies had been followed, particularly if those policy alternatives involved a trade off between redistribution and growth.

We have neither the data nor the theory to fully explore these questions, and it is conceivable we never will. This section simply speculates about the probable effect that various initial conditions, trends exogenous to public policy and government interventions had, through the mechanisms described above in (a) to (c), on poverty and inequality. We think this framework can be useful in identifying future points of government intervention.

A. INITIAL CONDITIONS

Initial conditions must be discussed in relative terms, i.e., relatively to other typologies of countries. One comparison to be made is with other middle income countries such as Costa Rica, Taiwan, and Korea

which, at similar levels of per capita income, have achieved a much more equal distribution of income.

The countries discussed in this report are characterized by a strong historical inequality in the distribution of wealth, particularly land. Except in Mexico, land reform programs never took place. The distribution of nonphysical assets, especially education, followed the distribution of family wealth given the small role of public education in the prewar periods. In many countries, these inequalities have been associated with the ethnic composition of the population, creating strong cultural segmentations.

The sheer size of these countries, their geographical complexity, and their strong differences in resource endowments across regions, compounds the problem of ethnic segmentation. In several countries, the ethnic subpopulations are located in the poorest regions, resulting in cultural and geographical segmentation that diminishes the mobility of capital and labor and dampens the potential of such mobility for improving regional equality. These conditions are quite different from those of countries like Costa Rica, Taiwan, and Korea.

B. TRENDS EXOGENOUS TO PUBLIC POLICY

Two basic trends have prevented improvements in the distribution of income over time. One is demographic growth, unparalleled in most development experiences; the second has been the emergence of strong tendencies in the economy toward dualism and segmentation in most factor markets, creating large economic rents and preventing the transmission of the gains of growth to wider segments of the population.

In most Latin American countries, population and labor growth have fluctuated around 3 percent per annum over the last couple of decades, a substantially higher rate than that experienced by most other developing countries. (See Table 7.) At these rates, one might expect unskilled labor to be absorbed by the economy only at declining wages. That this does not seem to be the case is partly explained by the high growth rate at which the urban economy has absorbed rural migration.

A second feature of demographic growth is the different rate of population growth for different income groups. There is evidence that the population of lower income families is increasing at a faster rate than total population. Despite lack of direct data on demographic growth for

Table 7 : POPULATION AND LABOR FORCE GROWTH RATES
Average Annual Growth Rates
(percentages)

	Total Population		Labor Force	
	1960-70	1970-75	1960-70	1970-75
Brazil	2.9	2.9	2.8	2.9
Colombia	2.8	2.8	3.0	3.2
Ecuador	3.3	3.5	3.1	3.2
Mexico	3.4	3.5	2.8	3.3
Peru	2.9	2.9	2.1	3.0
All middle income	2.7	2.7	2.3	2.7
All low income	2.4	2.4	1.9	2.0

Source: World Development Report I, The World Bank, 1978.

families with different per capita incomes, regional data provides some evidence. Using state data on mean per capita income, fertility, and mortality rates, preliminary estimates for Brazil showed substantial differences in demographic growth at different per capita income levels. In the poorest states of Northeast Brazil, natural population growth (3.5% a year) was almost double that of the richest states in the country (1.95% a year)^{1/}.

What are the implications of these differential rates of population growth? First, unskilled labor supply tends to grow at a higher rate than the total labor force; if, in addition (and we do have some evidence on this), the demand for unskilled labor grows less than for skilled for a given GNP growth, the effect on the unskilled wage becomes even worse.

The second implication of a higher population growth in lower income groups is its effect on their per capita capital formation, human and nonhuman. Unless strong public interventions complement the low savings rate in the poorer groups, such as the provision of education and complementary physical assets when they already own some capital, the historical trends will be characterized by a widening gap in the rates of capital accumulation per capita across income groups.

The past tendency of all socioeconomic groups to create barriers and pressures to market entry, what might be called "rent seeking behavior," is unique to several of these countries, and quite different from the experiences of other countries like Taiwan and Korea. Part of this behavior has been induced by government policies such as quantitative restrictions

^{1/} Constantino Lluich "Brazil: World Bank Human Resources Special Report," Annex II, draft, August 4, 1978.

and licensing in trade, credit rationing, and wage legislation increasing the labor cost to the urban modern sector far above the opportunity cost of labor. As a result, any sustained increase in the demand for labor has been mostly translated into increases in wages for a relatively small fraction of labor already employed in those sectors: lack of competition within labor has led to higher wages for the few already employed rather than in spreading that additional income to other workers through increased employment. This explains part of the different employment performance when we compare these Latin American countries on the one hand, and Korea and Taiwan on the other.

As shown in several studies, labor market segmentation, defined as wage differences (for labor of equal skill or education) associated to particular occupation or sector of employment, explains a larger part of income differentials of workers. Earnings surveys in urban Peru indicate that, controlling for all personal attributes of workers (such as education, age, and experience), size of firm, which probably is the best proxy for unionization or restrictions to entry, had the same contribution in explaining wage differences as workers' education.^{1/}

C. GOVERNMENT POLICIES

i. Rather than reviewing all past government policies that might have had a redistributive effect, we examine those (a) undertaken with a distributive objective in mind but which, because of their implementation, were

^{1/} O. Altimir and S. Piñera, "Decomposition Analysis of the Inequality of Earnings in Latin American Countries": ECLA-World Bank Project, August 1977, mimeo.

less successful than predicted; (b) which were under consideration but judged incompatible with other objectives, particularly growth; (c) abandoned because they meant a degree of redistribution unacceptable under past political scenarios.

Two major features characterized the implementation of policies that in spirit had a distributive objective. First, the implementation was to be fiscally cheap: that is, the instruments selected were not to overburden the fiscal budget. Second, many were accompanied with an atmosphere of political rhetoric that induced a degree of uncertainty and expected capital losses completely out of proportion (and unnecessary) to the real transfer among income groups being sought.

Policy instruments that were fiscally cheap and geared to a distributive objective usually had two consequences. If they did show a positive distributive effect, it was only short term; in the long run, it backfired. Second, they induced a trade off with economic efficiency and growth that alternative implementations would have avoided. Trade interventions are good examples. Several of the forced industrial import substitutions policies by means of tariff protection were undertaken to increase industrial output and employment in the short run. In most countries the long-term effect was a disincentive to the growth of the export sector and of the most efficient import competing activities, particularly agriculture. Several studies show that the long-term employment effect was completely opposite to the short term objectives originally intended by these policies.

Policies to reduce the price of foodstuffs at minimum fiscal cost, sometimes even increasing government revenues, were also classical examples. Fiscal expediency always meant that lower prices to consumers could only be achieved by reducing incentives to domestic producers. Price controls on food prices have zero fiscal cost but create black markets that, in the long run, never benefit poor consumers. When foodstuffs were imported, subsidies on imports only (not on total consumption) meant lower prices to consumers at the expense of disincentives to domestic producers in the agricultural sector; the larger the share of domestic production in total consumption, the cheaper becomes the instrument (the price to consumers can be reduced at a minimal fiscal cost) but the higher the real resource or efficiency loss. When foodstuffs were initially exported, export taxes or export prohibitions became cheaper instruments to reduce domestic prices than general consumption subsidies. In short, lower internal prices were reached only by discouraging domestic production and exports, fiscal expediency always induced a trade off between distributive objectives and economic efficiency objectives.

Government interventions raising the cost of labor above its opportunity cost, either by minimum wage legislation, tenure legislation, or social security contributions, were conceived with the objective of guaranteeing the real income and employment of urban workers. In several countries, such legislation has become substantially more important than that observed today in Western Europe.

These policies--quite different from those undertaken by countries like Taiwan and Korea, where employment growth was a key feature of development--created strong rents among labor and prevented the increase in labor

demand to absorb the already high growth of the labor force. Again, these employment objectives could have been better served by more (fiscally) expensive instruments; increases in Social Security benefits could have been financed by the general budget instead of through a tax on the employment of labor. Further, employment of unskilled labor could have been subsidized by tax exemptions proportional to the additional labor employed relative to a moving base year.

ii. Economic policies in general, and redistributive policies in particular, have fluctuated widely over time in most of these countries, imparting a high degree of uncertainty and unpredictability to the decision making process of most economic units. This has been a distinctive feature of the history of these countries relatively to other country experiences.

The economic costs of uncertainty have been particularly high and unnecessary during periods when more radical redistributive policies were under consideration. For example, tax and land reforms occurred during political regimes when the very concept of private property was being reevaluated--at least in the arena of political rhetoric. The resulting uncertainty about future capital losses was usually all out of proportion to the real transfer carried out by these reforms. The resulting capital flights and reductions of private investment could have been avoided if clearer rules of the game concerning "not expropriatable sectors" had been established. These lessons are crucial for any redistributive policies to be undertaken in the future.

iii. Much of the present inequality can undoubtedly be explained by a low level of public investment in the assets of the poor. What explains this behavior of public policy? To what extent was this policy defended on

the grounds it represented a trade off with growth, namely, those investments having a lower return than alternative investments? To what extent did it represent a real underinvestment (their return being higher than those of alternative investments) only explainable by past political scenarios under which transfers of investment across income groups were unfeasible?

It is impossible to identify the extent to which this behavior of public policy can be attributed to either of these two factors. The implicit importance of each factor can be evaluated only if the rate of return to invest in the poor is measured: if most of that underinvestment yielded high returns, the trade off issue cannot be used as an argument.

What is certain is that the trade off issue was unduly exaggerated in the past. The growth-distribution trade off resulted from extremely mechanistic views on the factors determining GNP growth, implicit in most postwar growth models. In these models (the best example being the labor surplus model), asset formation in the poor did not have a driving force on growth. Investment meant physical capital accumulation in the industrial sector, the poor benefitting only through an increased demand for labor. Any transfer to the poor, through taxing capital incomes in the industrial sector, meant a consumption transfer lowering aggregate investment. No such transfer was considered to have an asset creation effect on the poor, i.e., to have had an investment component in itself. A more modern and flexible interpretation of this view is that no asset formation in the poor, in small farmers or investing in human capital of the poor, could have a rate of return larger than investment in physical capital with which the poor are associated as hired labor. This remains a hypothesis to be tested empirically.

III. AREAS OF INTERVENTION

Areas of intervention for poverty alleviation can be classified according to multiple criteria. They are grouped here into three major categories. The first includes the elimination of distortions that are adverse to a stronger trickle down effect of growth. Its objective is to increase the employment content of growth. The second area refers to investment policies to increase the endowment of human and physical capital of the poor. Here we are only interested in high yielding investments, namely, those that are good for the poor but also for the growth rate. Both sets of policies have two features. First, they increase the welfare of the poor by increasing their earnings capacity. Second, they do not impose a trade-off between distribution and growth or efficiency. On the contrary, they can benefit both, equity and growth.

The third area is "basic needs," the provision of goods and services required to achieve a minimum level of "quality of life." In some circumstances, these policies can also increase the long-term productive capacity of the poor. Sections A, B, and C address these three areas of intervention.

A. POLICIES WITHOUT TRADE-OFFS: ELIMINATING DISTORTIONS THAT ARE ADVERSE TO BOTH EMPLOYMENT AND GROWTH 1/

This section reviews policies to eliminate those distortions that not only have, by definition, a negative effect on output, but also adversely affect employment. Of special concern is the employment generation effect of

1/ This section identifies distortions to be removed and past policies to be replaced. It does not attempt to spell out the specific way and timing of the suggested changes. This should be addressed by specific studies in the fields of trade, agriculture, capital, and labor markets.

GNP growth, because it is the basic mechanism by which economic growth trickles down to the poverty groups.

Although some distortions are the result of historical forces unrelated to public policy, most have been policy-induced and, ironically, were initially conceived to improve income distribution and employment growth. ^{1/} The central point here is that the distortions introduced were not the result of the objective per se, but of the specific policy instruments selected to achieve it. Thus, the trade-off between these objectives and economic efficiency is more the outcome of choosing the wrong instruments than of an inherent incompatibility between them.

Why were these instruments chosen in the first place? Why were they not replaced by instruments capable of achieving the desired redistributive effects without efficiency losses? The answer is fiscal expediency. The trade-off between employment and distributive objectives, on the one hand, and economic efficiency on the other is the result of using fiscally cheap instruments. The cheaper the instrument, the higher the inefficiency generated in the process of achieving a redistributive goal. The main thrust of this chapter is to show that, today, these countries can afford "expensive" policy instruments, and therefore, avoid such trade-offs.

Two sets of distortions that have adversely affected the employment generation effect of growth are explored. First, those that have distorted the composition of output either by trade policies or by internal price policies; and second, those that have increased the relative

^{1/} For a general taxonomy of policy and not policy-induced distortions, see J. N. Bhagwati, "The Generalized Theory of Distortions and Welfare" in J.N. Bhagwati, et al., Trade, Balance of Payments and Growth (North Holland, 1971).

cost of labor over and above the one corresponding to the relative abundance of labor in the economy.

1. Changes in the output mix from reducing trade restrictions

Trade restrictions provide a different premium to the export sector (when they generate one dollar's worth of exports) than to the import competing sector (when they substitute one dollar's worth of imports). The distortion is defined by the end result of the policy: the import substituting sector expands relative to the export sector and ends up by using more resources per dollar substituted than those used by the export sector per dollar generated through exports. If import restrictions are concentrated in particular import-competing industries (those requiring higher protection) the import-competing sectors without (or with small) protection also tend to be discriminated against.

Agriculture, either through its exports or its import competing activities without protection, received most of the negative effects of such policies. To the extent that its labor intensity is greater than that of the highly protected industrial activities, the net effect on global employment becomes negative.

On several occasions employment creation was the objective of tariff protection policies to the industrial sector. The question arises why government chose such policies. One explanation is that the positive and negative effects on employment resulting from industrial protection are not symmetric in terms of timing or visibility. New industrial activities emerge quickly when they are the result of tariff barriers; the barrier is simply the result of negotiations with domestic investors or multinational

enterprises, i.e., the new investment has been "latent." The positive effects on employment are immediate, highly visible, and concentrated in urban areas. Urban labor usually has a stronger political militancy than rural labor. The negative effects of such policies usually occur over the long run and are less visible: the mechanism is the exchange rate, which tends to increase less than it would otherwise have, and the effect is spread across a large number of productive units and regions (it is less visible from a political point of view).

Trade restrictions adversely affecting the agricultural sector have also been undertaken to keep consumer food prices below world prices. When this is achieved by food import subsidies or prohibitions on food exports, prices to domestic producers go down below world prices. A policy that lowers consumer prices without discriminating against domestic producers involves a subsidy on total consumption, independent of the source of supply. Obviously, this entails a larger fiscal burden than that of alternative instruments.

Unless consumption subsidies are used, policies to keep the price of food down will discriminate against agriculture. The cheaper (fiscally) the instrument used, the less successful it is in reaching the objective without adversely affecting agricultural output and employment.

2. Subsidies to the use of capital. Interest rate policies

Most countries place ceilings on nominal interest rates that, under inflation, yield low or negative real rates and strong excess demands for credit. Thus, credit becomes allocated to pressure groups and to large enterprises where risk is minimal (interest rate differentials are not allowed

legally so as to compensate for differential risks). Large enterprises in the industrial sector receiving that credit are perhaps the less labor intensive activities in the economy.

Undervalued exchange rates and imports of capital goods without import duties are further sources of a cheap use of capital, as are tax credits and tax exemptions for investing in "backward regions."

3. Policies to reduce the discrepancy between the cost of labor and labor incomes

Minimum wage laws, social security legislation, and laws governing the stability of employment have been typical interventions to increase the real income of labor.^{1/} Such policies have been enforced in particular sectors of the economy, in registered enterprises and particularly in the urban economy. For some labor skills, especially the lower ones, this legislation has become binding and thereby increased their real wages. To the extent the demand for labor has some price elasticity, this increase has been achieved at the expense of a lower employment in these sectors.

From a political point of view, the room for maneuver in this field is limited. Of importance is to avoid adverse employment effects as governments extend wage legislation in the future to larger sectors of the economy, such as agriculture and the informal urban sector, particularly services. The issue is how to increase the coverage of these benefits without substantially increasing the cost of labor to these other sectors.

^{1/} This is less true for Social Security contributions; to the extent workers perceive as benefits only a fraction of these contributions, this legislation becomes partly a tax on the use of labor.

Present minimum wage legislation and social security contributions cover only a small fraction of the labor force, that in the modern urban sector. Because this sector uses more skilled labor and is subject to more labor union pressures, only a fraction of their employment is bound by the minimum wage law (most workers earn a higher wage); the basic effect of such legislation is to increase the cost of labor through social security legislation, which sets a percentage contribution as a fraction of the wage. Extending legislation to more traditional sectors, such as agriculture and the informal urban sector, implies reaching activities of higher labor intensity, higher factor substitution, and employing labor of lower skills. Labor not covered by legislation has the lowest wages and incomes, as shown in Table 8 for Colombia; only 8.5 percent of workers covered by the social security system belong to the poorest quintile of households.

The employment effects of extending labor legislation, minimum wages coupled with legal social security contributions by employers, can be significantly more important than the effects of that legislation in the present. Minimum wages will increasingly become binding and therefore cover a much larger fraction of the labor force; the joint effect of both minimum wage plus social security will involve a more important increase in the cost of labor than presently exists. If demand elasticities are higher in these new sectors, because of higher labor intensity and higher factor substitution, the potential negative employment effects are reinforced.

Table 9 shows some orders of magnitude by which social security legislation increases the cost of labor. In some countries it reaches 20 percent of the wage. If the price elasticity of demand for the output

Table 8: COLOMBIA 1974: DISTRIBUTION OF HOUSEHOLDS COVERED BY THE SOCIAL SECURITY SYSTEM

Quintile	% of Household
1	8.5
3	17.1
3	20.7
4	24.3
<u>5</u>	<u>29.4</u>
Total	100.0

Source: Marcelo Selowsky, "Who Benefits from Government Expenditures: A Case of Colombia," (forthcoming), Oxford University Press, 1979.

Table 9: SOCIAL SECURITY CONTRIBUTIONS AS A PERCENT OF THE WAGE, 1970

Country	Range
Brazil	20.7 - 21.1
Colombia	10.8 - 18.3
Ecuador	13.5 - 14.5
Mexico	15.2 - 20.8
Peru	9.5 - 13.0

Source: OAS: Guidelines for Achieving Maximum Employment and Growth in Latin America, 1973.

as well as the elasticity of factor substitution is one and the share of labor is 0.5, an increase of 20 percent in the cost of labor will diminish employment in those activities also by 20 percent.

To avoid such increases in the cost of labor, minimum wage laws should be complemented by subsidies (or tax exemptions) on the use of labor, and social security financed by the central budget instead of by the employer. This is well known; the issue is selectivity so as to make this policy fiscally feasible.

One solution is to use these instruments at the margin and in sectors where labor demands are price-elastic. Subsidies could be given on the basis of additional employment, relative to a base year or relative to a fraction (i.e., 0.90) of the employment over, say, the last two years. The same would apply to social security contributions; employers would be exempt only for additional employment, the contribution to be financed by the central budget. Sectors with high labor-intensity and high capital-labor substitution such as certain activities in agriculture, construction, and commerce are likely candidates for these policies.

The notion of policies at the margin can also be applied to other types of legislation. Laws imposing high penalties on the dismissal of workers, for example, have become a typical feature of wage legislation, even more so than in developed countries. The result is that the hiring of labor has become a capital investment whose cost is governed by law. These laws could be replaced by unemployment insurance schemes financed by the public budget, providing unemployment payments that gradually decline over time and only last for a limited period.

4. Labor market segmentation and the mobility of labor

In most of these countries, wage levels are strongly associated with the degree of "modernity" of the sector of employment and with the size of enterprises. Labor market segmentation, the extent to which labor of equal skills receive very different salaries, is also associated with these characteristics. The empirical evidence shows that such segmentation not only has not diminished, but has perhaps increased over time. These wage differentials are partly explained by the differential enforcement of labor legislation described earlier and partly the result of labor contracts in enterprises with strong labor unions or multinational firms paying higher wages than domestic firms.

The end result is that "protected" or formal labor markets face an excess supply of applicants, those failing to obtain employment ending up in the "informal" or free entry sectors where the wage tends to clear the market, reflecting supply-demand conditions.

What are the implications of this segmentation in labor markets for income distribution and the returns to unskilled labor? Two studies undertaken for Colombia shed some light on this question. Table 10 shows the strong redistribution occurring when labor segmentation disappears. By eliminating wage differentials for laborers of equal education in urban Colombia, the real wage of the most unskilled category of labor rises by 8 percent. This is a lower bound as only factor substitution takes place in this exercise. As a result, a high degree of income inequality within

this category of labor is eliminated. At the same time, workers in the utilities sector, basically government, experience a decline in income of 20 percent, whereas workers in the commerce sector experience a gain of 35 percent.

Table 10: COLOMBIA 1965: WAGES OF UNSKILLED LABOR
(pesos per hour)

	Present segmentation	Wage equalization
Manufacturing	1.95	1.81
Construction	1.66	1.81
Utilities	2.31	1.81
Commerce	1.34	1.81
Transport	1.47	1.81
AVERAGE	1.68	1.81

Source: C. Dougherty and M. Salowsky, "Measuring the Effects of Misallocation of Labor," Review of Economics and Statistics, August 1973.

When additional substitution and rural-urban migration is introduced (that is, long run adjustments are allowed), the results can be substantially stronger. By introducing substitution in the final goods market, as well as the possibility of international trade, and by assuming that urban-rural wage differentials are maintained (which limits the degree of migration), the elimination of urban wage differential increases the real wage of unskilled labor, urban and rural, by 35 percent. The results of such an exercise are shown in Table 11. Segmentation is defined by a "modern" sector employing one-third of the unskilled urban labor force at

Table 11: EFFECT ON WAGES AND EMPLOYMENT OF UNSKILLED LABOR OF ELIMINATING LABOR MARKET SEGMENTATION IN URBAN AREAS

Sector	Wage Levels for Unskilled Labor (pesos per man year)		Percentage Change		
	Segmentation	No Segmentation	Wages	Employment	
Coffee	370	(.09)	498	34.5	6.2
Agriculture	410	(.38)	552	34.6	-10.6
Services and artisans	570	(.36)	1145	132.5	-11.7
Food industry	1850	} (.17)	1145	-38.1	115.2
Textiles	1660		1145	-31.0	121.5
Paper, Wood	1850		1145	-38.1	153.0
Rubber, chemicals	2660		1145	-56.9	263.0
Metals	1820		1145	-37.0	143.4
Non-metallic	1660		1145	-31.0	125.8
Mining	800		1145	43.1	-14.5
Machinery	2560		1145	-55.2	359.2
Diverse industries	1980		1145	-42.1	183.7
Light domestic	3920		1145	-70.8	129.7
Construction	1470		1145	-22.1	30.2
Transportation, communication	1320		1145	-13.2	7.1
Total	640		861	34.5	

1/ J. de Melo, "Distortions in the Factor Market: Some General Equilibrium Estimates," Review of Economics and Statistics, November 1977.

wages substantially higher than the informal sector--services and artisans. By eliminating the urban wage differential and allowing for migration, employment in most manufacturing activities increases at the expense of the urban informal sector and agriculture. Manufacturing wages fall while they rise in the other sectors. The net effect is a substantial increase in real wages. These extreme but illustrative examples show the importance of preventing conditions that would generate an increase in wage differentials over time.

5. Trade-offs between increases in employment and increases in wages

The literature shows a growing pessimism about the possibility of the manufacturing sector absorbing the high growth rate of labor supply in these countries. It is argued that manufacturing employment is still a small share of total employment (15-20 percent), and that its growth, therefore, cannot absorb important fractions of the total labor force. It is also argued that the rate of job creation in these sectors is low for a given output growth, that is, employment-output elasticities are lower than one--in other words, employment grows more slowly than output.

The second argument, however, overlooks the fact that job creation has taken place with quite substantial increases in real wages. Clearly, one cannot have both: Given the high growth rates in real wages, the employment growth has been substantial, particularly relative to other historical experiences.

Table 12 shows that, on the average, employment and real wages have been growing at 3.6 and 3.7 percent, respectively. The question is what the increase in employment would be if additional effort were made to translate

Table 12: ANNUAL GROWTH RATES IN EMPLOYMENT AND WAGES IN THE INDUSTRIAL SECTOR, 1963-72 (Percentages)

Country	Employment	Real Wages
Brazil	4.7	2.8
Colombia	4.2	2.7
Ecuador	5.8	2.5
Mexico	1.9	6.9
Peru	1.8	3.7
Unweighted Average	3.6	3.7

Source: UN Growth of World Industry, reported in P. Meller, "Enfoques Sobre la Demanda de Trabajo: Relevancia para America Latina," CIEPLAN, June 1978.

these increases in labor demand into additional employment rather than into additional wage increases, and what policy instruments should be employed in such effort. The answers to these questions are relevant to the issue of increasing the trickle down effect of an increase in labor demand.

If the increases in labor demand that led to the combination of increases in wages and employment observed in Table 12 are maintained in the future, the following trade-off between wage increases and employment increases will occur.^{1/}

^{1/} Assume a Cobb Douglas function $X = L^\alpha e^{\lambda t}$ where λ is the growth rate of all other complementary factors of production, capital and technical progress. Differentiating logarithmically the first order conditions yields.

$$d \log w = (\alpha - 1) d \log L + \lambda \text{ where } w \text{ is the wage rate.}$$

Assuming $\alpha = 0.5$, the value of λ consistent with Table 12 is 0.055. Given λ , we can derive the trade off between $d \log w$ and $d \log L$.

<u>Growth in Wages</u>	<u>Growth in Employment</u>
2%	7%
3%	5%
4%	3%

If wages were kept at a 2-3 percent growth rate, the employment growth rate in these sectors could reach 5-7 percent.

The figures in Table 12 are averages for workers of all skills. As mentioned above, evidence indicates that real wages for educated workers have grown faster because of the short-run inelasticity of the supply of educated manpower. Expansions of the educational sector (discussed in the next section) will increase this elasticity and assure that additional labor demand results in a wider employment effect rather than higher rents of already employed workers. For lower skills, wage increases coexist with elastic labor supplies stemming from the rest of the economy. The issue of labor market segmentation discussed above is central to the explanation of this phenomenon.

B. INCREASING THE EARNINGS CAPACITY OF THE POOR BY AUGMENTING THEIR
ENDOWMENT OF ASSETS: IDENTIFYING THE GOOD INVESTMENTS

1. Introduction

i. One way of increasing the earning capacity of poor households is increasing their ownership of productive (human and physical) assets. This policy alternative has been advanced several times by the Bank, the small farmers' strategy being perhaps the best example. This option is appealing because it automatically takes care of the long run, by

increasing present ownership it increases the future flow of productive capacity, and second, it is perceived as less paternalistic than policies that directly subsidize the consumption of the poor.

A more explicit statement of the limitations and trade-offs of such an option is needed. For example, what are the limits of using this instrument for distributive purposes without a substantial trade-off with growth objectives? What are the criteria by which this trade-off can be judged? Can an optimal level of intervention in this area be identified, that is, a level of additional asset-creation in the poor that does not adversely affect growth?

ii. Investments in the poor that do not adversely affect growth are, by definition, those whose rate of return (valued at shadow prices, without any distributive weights element) is higher than the opportunity cost of capital to the economy. Therefore, the magnitude of the underinvestment in the poor can be defined as that amount of high yielding asset formation which does not materialize because of the market imperfections facing the poor, particularly in capital markets. Correcting such underinvestment does not introduce a trade-off between distribution and growth; on the contrary it has positive effects on both equity and growth.

Why have not governments taken care of this underinvestment if they indeed were interested in growth? Two reasons are possible: either few of these good investments remain, or the market imperfections facing the poor were a way of channelling credit and investment toward higher income groups. In other words, credit rationings allowed income groups with access to credit to undertake investments with returns below the opportunity cost of capital to the economy.

iii. The first task, therefore, is to exhaust the search for good investments in the poor. Only by first identifying and evaluating the contribution of these investments to their incomes can we then proceed to other interventions involving a higher degree of trade-off.

The availability of "good investments" depends on the particular characteristics of the poor; the existence of such investments is highly country specific, highly interdependent and highly dynamic; it depends on the age characteristics of the poor (there are fewer good investments to be made in the very old), their human capital potential (for example, the fraction of physically and mentally handicapped in the poverty group), and their initial ownership of physical capital (for example, the fraction of artisans and small farmers or sharecroppers among the poor). Some empirical evidence helpful in identifying these investments is discussed below.

2. Investments in human capital

These investments include all interventions that, by influencing the characteristics of individuals, affect their productivity as labor inputs. Investment in education and on-the-job training are interventions whose productivity effects have been well studied. Interventions at preschool age among poor children, infant nutrition, and other environmental variables such as health and psychological stimulation, have been analyzed but not yet quantified for their economic impact.

These investments are particularly important because half of the poor individuals are children below age 15, whose future productive potential is influenced by early interventions; raising the income of households in

the present does not guarantee a sufficient investment in children on the part of their parents; in most societies the impossibility of borrowing against human-capital formation (there is no collateral) increases the possibility of underinvestment in education by poor families.

2a. Interventions at preschool ages in children of poor families

Growing empirical evidence shows that preschool children of poor families have a lower performance in most ability tests than matching controls from higher income groups. Much of this difference can be attributed to the nutritional-health-psychological environment of preschool age children. If environmental deficits affect the future productivity of the individual as well as his future capability of benefitting from schooling, the question arises whether countries are not indeed underinvesting in preschool age interventions for poor children.

Table 13 presents a survey of studies whose specific aim was to evaluate the effect of infant malnutrition on specific types of abilities in young children that are crucial to basic learning. They show the mechanism by which early malnutrition can affect the effectiveness of later schooling.

Other causal mechanisms by which early malnutrition affects learning have been suggested in the literature. Evidence shows, for example, that infectious diseases are likely to be less severe and less frequent in well-nourished children;^{1/} to the extent that infectious diseases affect the child's responsiveness to his environment, they also affect his cognitive development.

^{1/} N. Scrimshaw, "Nutrition and Infection," in Recent Advances in Human Nutrition, ed. J. Brock (London: J. Churchill, 1961).

Table 13: STUDIES ON THE EFFECT OF MALNUTRITION ON LEARNING

Authors	Deficit in Performance	Probable Effect on Consequent Learning
Cravioto and De Licardie (Mexico)	Auditory-visual integration	Reading ability
Cravioto et al. (Mexico)	Visual-kinesthetic integration	Writing and drawing abilities
Champakam et al (India	Visual identification	Reading abilities
Cravioto et al. (Mexico, Guatemala); Guthrie, et al. (Philippines)	Kinesthetic-visual, kinesthetic-haptic, haptic-visual, and auditory-visual integration	General learning abilities

Source: J. Cravioto and E. de Licardie, "The Effect of Malnutrition on the Individual," Nutrition, National Development, and Planning, ed. A. Berg et al. (Cambridge, Mass.: M.I.T. Press, 1973).

In almost all studies apathetic behavior is identified as one of the clearest effects of malnutrition. Cravioto and De Licardie hypothesize about the further effects of apathy: "It should be recognized that the mother's response to the infant is to a considerable degree a function of the child's own characteristic of reactivity.... Apathetic behavior in its turn can reduce the value of the child as a stimulus and diminish the adult's responsiveness to him. Thus, apathy can provoke apathy and so contribute to a cumulative pattern of reduced adult-child interaction."^{1/}

Direct nutritional interventions to reach young children in poor families will be discussed at length in the next section. Here we address other preschool age interventions.

^{1/} Cravioto and De Licardie, op.cit.

Policies to change the out-of-home environment through widescale preschool compensatory programs are difficult to undertake in the short run, unless such programs are simply extensions of existing elementary schooling that can draw children into kindergarten programs one or two years earlier. Experience in the United States shows that because extensions of the "kindergarten type" are either insufficient in themselves or improperly designed, they cannot compensate for the environmental deprivation suffered by low income children. A more complex program is required.

A partial solution, at least in the short run, might be a corrective policy geared to lower income children who enter primary school at a later age (1-3 years later) than higher income students. Educational programs for young women concerning childrearing practices would provide another type of solution.

Two kinds of educational programs are important. First, nutrition education, particularly that relevant to infant-feeding and breastfeeding practices. Growing evidence indicates that the decline in breastfeeding practices in low-income families of urban areas is a main determinant of infant malnutrition. The resource cost of substituting breast milk appears quite large; preliminary estimates suggest that if 20 percent of the mothers in the urban areas of developing countries do not breastfeed, the loss in breast milk is around \$365 million per year; if half of the other 80 percent discontinue breastfeeding after the sixth month, the total loss reaches \$780 million.^{1/}

^{1/} A. Berg, The Nutrition Factor: Its Role in National Development, (The Brookings Institution, Washington, D. C., 1973).

Second, education on childrearing practices with particular emphasis on early stimulation is another course of action. Implementing educational programs of this type requires some preliminary research, which has not taken place on a wide scale in developing countries. Questions that arise are: How different are childrearing practices across families in developing countries? What are the factors determining these differences? Are they related to income or to particular ethnic groups of the population?

2b. Investment in formal education

In spite of spectacular expansions in enrollments and in the supply of educated labor, the evidence suggests that basic education is still an effective and productive way of increasing the earnings of poor households. Arguments against, based on presumably high levels of unemployment among educated labor and on the notion that education is simply a screening device (to allocate "scarce" jobs in the modern sector), cannot be confirmed by existing evidence.

What is the evidence? First, still today, poor households are characterized by extremely low levels of schooling among their working members, as well as low levels of school enrollment among their children; second, basic education has an important net impact on the earnings of labor, even if unemployment is taken into account and only possibilities of work in the informal sector are considered; third, education not only has an important potential impact on the incomes of the poor, but it also represents a high yielding investment from an efficiency point of view. In other words, it is good for equity and for growth.

Data by income groups show that 30 percent of heads of household in the poorest quintiles of families in Colombia have zero years of schooling. Almost 60 percent have only two years or less. In the same income group, only 54 percent of children age 6-11 attend school.^{1/} Cross-section regional data for the other countries show that an important number of provinces still have enrollment rates under 60 percent for children below age 10.

Controlling for other factors positively associated with schooling and having an independent effect on labor earnings, the effect of schooling is still important. Table 14 presents a summary of results for nine Latin American countries; even controlling for occupation and type of activity (employment variables), years of schooling explains between 7 and 25 percent of earnings inequality. This is a strong test for education: education also changes productivity by inducing cross occupational and cross sectorial mobility, an effect that is not captured by these estimates. These percentages are, therefore, a lower bound for the capacity of education in explaining productivity differentials.^{2/}

Similar results are reported for several cities of Colombia. Controlling for occupation, economic sector, and social stratum, primary

1/ Marcelo Selowsky, Who Benefits from Government Expenditures: A Case Study in Colombia (Oxford University Press, 1979), forthcoming.

2/ If any change in a worker's occupation (associated with additional schooling) is the result of education acting as a rationing device in highly paid sectors or occupations, the above results would be the relevant ones. In this case the change in workers' wage does not reflect a productivity gain.

achieving increases in earnings capacities. The question is: What is the rate of return on investing in primary education?

Table 15 shows rates of returns for different levels of schooling. Not only is the return on primary education higher than any conceivable opportunity cost of capital (the mean rate of return is 28.7 percent), but it is substantially higher than the return on other levels of schooling.^{1/} Clearly, countries are underinvesting in basic education relative to higher levels of schooling!

Why do not poor households increase their enrollment in basic education as a reaction to its high rate of return? Why do rich households still invest in higher education in spite of its low rate of return? Although public primary education is free, other costs of schooling, basically forgone earnings, are important costs for poor families. Their implicit discount rate is also high, even in comparison with the high rates of return to primary education. Higher education is highly subsidized in most countries, consequently the private rate of return faced by rich households is substantially

^{1/} How does unemployment affect these rates of return? How do these estimates capture the popular notion that unemployment makes education a less appealing policy instrument? Unemployment affects both the costs (foregone earnings) and benefits (additional earnings) of additional schooling, and it is not obvious that the rate of return may fall after this adjustment. Second, even if it falls it may still be quite large. Some of the estimates in Table 15 automatically take unemployment into account. Most of them are based on yearly or monthly incomes of the total population: the earnings reflect unemployment periods in shorter units of time.

The most important downward adjustment is unemployment that results from search activities when school graduates enter the labor force. (The first flows of earnings, to which rates of return are highly sensitive.) In Colombia, this adjustment brought down rates of return to basic education from 40 to 28 percent, still a respectable rate of return.

Table 15: SOCIAL RATES OF RETURN TO EDUCATION, BY EDUCATIONAL LEVEL

Country	Year	Primary	Secondary	Higher
Mexico	1963	25.0	17.0	23.0
Venezuela	1957	82.0	17.0	23.0
Colombia	1966	40.0	24.0	8.0
Chile	1959	24.0	16.9	12.2
Brazil ^{1/}	1962	23.5	13.1	14.5
Turkey	1968	-	-	8.5
India	1960	20.2	16.8	12.7
Malaysia	1967	9.3	12.3	10.7
Philippines	1966	7.0	21.0	11.0
South Korea	1967	12.0	9.0	5.0
Thailand	1970	30.5	13.0	11.0
Nigeria	1966	23.0	12.8	17.0
Ghana	1967	18.0	13.0	16.5
Kenya	1968	21.7	19.2	8.8
Uganda	1965	66.0	28.6	12.0
Average	1965	28.7	16.7	12.9

^{1/} For primary and secondary, Jallade.

Source: G. Psacharopoulos, Returns to Education: An International Comparison, 1973.

larger than the one shown in Table 15. This becomes clear in Table 16: not only rich households are being subsidized but this subsidy encourages investment in a sector with an economic return barely matching the opportunity cost of capital relevant to most countries!

The policy implications of the above are that the incentives for poor families to increase their enrollment rates must be increased. The constraint is not the capacity of schools but the demand for schooling by poor households. Additional incentives to compensate for foregone earnings (particularly in rural areas where employment opportunities for children are higher) and transportation costs are easy to implement; school breakfast and lunches, free transportation by school buses are some examples. Such measures can be easily financed by a redistribution of subsidies within the educational sector, specifically by eliminating subsidies to higher education. These measures will be analyzed in detail in Section C.

Table 16: TOTAL (INCLUDING ALL ECONOMIC COSTS) AND PRIVATE (INCLUDING ONLY PRIVATE COSTS) RATES OF RETURN TO HIGHER EDUCATION

Country	Total	Private
Brazil	8.0	15.5
Turkey	14.5	38.1
Colombia	8.5	26.0
Philippines	11.0	12.5
Thailand	11.0	14.0

Source: G. Psacharopoulos, Rates of Return to Education, op. cit.

2. Investment in education. Rural-urban migration

Enrollment in primary education is especially low in rural areas. Because education increases the probability of migration toward urban areas (especially among young school graduates), expansions of enrollment in rural areas will increase, or at least maintain, the present high migration rates. How apprehensive should we feel about schooling inducing further migration flows?

The estimated rates of return reported above are based on samples that do include migrants presently working in urban areas. However, these are average rates (for migrants and nonmigrants), and do not provide independent evidence on the rate of return specific to rural students who eventually will migrate to urban areas. The reason for a possible lower rate of return for migrants is the notion that migrants experience high rates of unemployment upon arrival and that only informal, low paying jobs are available to them. This notion is not supported by the facts.^{1/} Indeed, most migrants find jobs in a reasonably short period of time (see Table 17) and those beginning in low paying jobs move up the occupational ladder rather quickly. In sum, there seem to be few occupational differences over time between migrants and nonmigrants of the same sex, age, and level of schooling.

3. Increasing the physical assets of the poor in the rural areas. Identifying the good investments. Complementarities between investments and the transfer of land

Policies to increase the ownership of physical assets by poor households are particularly relevant in rural areas. As illustrated in Table 18, the possibilities of such policies depend heavily on the initial

^{1/} The best survey of the empirical evidence is by L. Yap, "Internal Migration in Less Developed Countries," World Bank Staff Working Paper #215, September 1975.

**Table 17: TIME REQUIRED FOR MIGRANTS TO FIND FIRST JOB
IN CITIES**

City	Sample Description	Cumulative Percentage Finding Work Within a Period of Time		
<u>City-wide Samples</u>				
Santiago, Chile	Economically active migrants who arrived in Santiago within previous decade	43%	Immediately (2 days)	
		66%	1 month	
		85%	6 months	
Brazil: 6 cities including Rio and Sao Paulo	Adult migrants	<u>Male</u>	<u>Female</u>	
		85%	74%	1 month
		95%	90%	Less than 6 months
Seoul, Korea	Household heads, of whom 80% are migrants	26%	Immediately (pre-arranged)	
		64%	"Soon"	
		76%	6 months	
Lima, Peru	1967 survey of migrants	Over 75%	3 months	
<u>Poor Sections of City</u>				
Santiago, Chile	Family heads or their wives in a <u>callampa</u> settlement. 85% manual laborers or self-employed artisans.	47%	"Immediately"	
		91%	3 months	
Buenos Aires, Argentina	Residents of a <u>villa miseria</u> , mostly recent migrants, 61% day laborers or unskilled workers	75%	2 weeks	
		85%	1 month	
Rio de Janeiro, Brazil	Residents of 3 favelas (a) those with experience in unskilled urban or rural work	85%	1 month	
		(b) those with previous skilled jobs	65%	1 month

Source: From L. Yap, op cit.

Table 18: POSSIBILITIES OF FINDING GOOD INVESTMENTS THAT INCREASE
 AGRICULTURAL ASSETS OF THE RURAL POOR
 (SF/LL = ratio of subsistence farmers to landless labor
 in the poverty group)

Country	Without Redistributing Ownership of Land			With Land Reform
	Proportional to the ratio (SF/LL)	Investment in intensive margin of SF (constraints)	Possibilities of investing in extensive margin	Proportional to the ratio of "good land" per landless labor
Peru	High (SF/LL) 3/1	Low (location, quality of land, water)	Low	Moderate
Mexico Colombia	Medium (SF/LL) 1/2	Medium (water, leakages)	Medium	Moderate - High
Brazil Turkey	Low (SF/LL) 1/3	Medium (water, leakages)	Medium	High

occupational distribution of rural households. Without considering transfers of existing land, this option depends on: the fraction of existing landowners in the poverty group, such as the ratio of subsistence farmers to landless laborers among the poor, SF/LL; the possibility of finding high yielding investments among subsistence farmers; and the yield on the investment in extending cultivable land eventually to be transferred to poor households. When a redistribution of existing land is feasible, such investments can then be calibrated to take into account the complementarity between investment and transfers.

3a. Investments in the absence of redistributions of land

The effectiveness of this option depends on how important is the fraction of landowners or small farms in the poverty group. Unlike in Asia, most rural poor in Latin America are landless; a possible exception is Peru. In most Latin American countries landless families account for two-thirds of the rural poor. The question arises, therefore, whether the present enthusiasm for a "small farms strategy" to poverty alleviation can be justified in the context of Latin America. Without redistributions of land, that strategy reaches only a small fraction and the better off of the rural poor.

Credit, extension services, and investment in roads and irrigation schemes are typical interventions that could increase the productive capacity of small farmers. The question is how many of these investments have a high rate of return and could easily be targeted to the poor. Two features of these countries limit the effectiveness of such policies: location and country size, and the problem of targeting without substantial leakages to high income groups.

Subsistence farmers are rarely concentrated so that regional policy packages could be designed. In Peru's Sierra, farmers are still dispersed

Table 19: INDICATOR OF DISPERSION OF RURAL POOR IN PERU

Percentage of poor in Rural Labor Force	Number of Sierra Provinces
0 - 20	9
21 - 40	20
41 - 60	32
61 - 80	30
81 - 100	<u>2</u>
Total	93

Source: R. Webb, Government Policy and the Distribution of Income in Peru,
op. cit.

(see Table 19), and with physical barriers making some of these policies extremely costly. Because in most countries subsistence farmers coexist with large farms, only specific programs can be targeted (credit, technical assistance); other programs such as roads or irrigation would subsidize other farmers as well. Unless "nontarget farmers" are charged for the programs, the financial cost per "subsistence farmer reached" becomes prohibitive.

Because of their crop pattern, irrigation is perhaps the main constraint to increase the productivity of the small farmers. Their location, however, (basically the high plateaus) makes investment in irrigation a costly undertaking and economies of scale resulting from cooperative arrangements are prevented by distance and geographical dispersion.

The conclusion is that with present patterns of ownership and spatial distribution of land, possibilities of increasing farmers' income by means of high yielding investments are limited.

3b. Investments with changes in the ownership of land^{1/}

Countries that have undertaken land reform include Mexico (1940) and Bolivia (1955), where large "haciendas" farmed with traditional technology were subdivided into small farms. Peru is still implementing the land reform begun in 1973. The general evidence as to long-term effects of such reforms indicate that small farmers have increased their previously low income, and farm output has increased overall.

Several specific lessons seem to emerge from those experiences: the minimum farm size required to sustain farmers' incomes and to take advantage of minimum economies of scale is still high, consistently ranging between 30 and 40 hectares, of which at least two-thirds is cropland and pasture; given this required farm size, only 30 to 50 percent of the rural population benefits. Over time, high population growth erodes the relative initial effect of the reform by increasing the relative number of landless families; maintenance of productivity gains not only requires high initial levels of investment, but also high levels of technical assistance and credit over time; the positive effects are less clear when large commercial estates or modern livestock operations were subject to land reform. There is a difference between redistributing land from "haciendas" with traditional crops and redistributing land from high technology, highly mechanized estates.

What can we learn from these experiences so as to evaluate options available today? In countries where some reforms have taken place

^{1/} Parts of this section draw heavily on Shlomo Eckstein, et al., "Land Reform in Latin America: Bolivia, Chile, Mexico, Peru and Venezuela," World Bank Staff Working Paper #275, April 1978.

and where unreformed land consists basically of large, commercial estates, for which economies of scale and technology are important (livestock, sugar, cotton), or of large traditional haciendas with small cropland potential (large estates in Mexico and Peru have only 10 percent of the cropland but 35 percent of pasture land) agrarian reform options are less clear. Redistribution of highly commercialized estates can entail a high efficiency cost unless cooperatives are implemented to maintain the gains of economies of scale; but the latter involve changing difficult social and institutional constraints. Redistributing traditional haciendas of lower quality land, basically suited for pasture, requires high additional investments to support smaller family units.

The agrarian reform option becomes more important for countries that have not experienced redistributions of land and where the increase in output from reformed land could be achieved at good rates of return on the additional investment required. Brazil, Colombia, and to a lesser degree, Turkey, are countries where this is more probable.

What is the possibility, in some of these countries, of redistributions of land, that either maintain their production level without additional investment resources or, if additional investment resources are required to raise the incomes of the beneficiaries, they do it with a high rate of return.

Several simulation exercises have been made assuming that the high productivity per hectare, usually observed in smaller farms, will be replicated when land is redistributed. Obviously, this always yields an increase in output. The problem is that the associated investment cost

to maintain this replication--i.e., roads, irrigation, water, extension-- is not brought explicitly into the picture so as to allow the computation of the net return to the reform.

The IBRD-SUDENE study on Northeast Brazil provides such an information. This study develops a model simulating the effects of land redistribution where 790,000 new farm modules of 34.8 hectares each are created.^{1/} The initial conditions and the results of the land reform are summarized in Table 20. Workers without access to land currently represent two-thirds of the rural labor force and the main core of Brazilian poverty. The establishment of such "module farms" gives land access to 20 percent of the landless labor in the poverty group (temporary and permanent workers and sharecroppers), increasing their per capita family income from 50 to 130 dollars per year. The net increase in value added of the region, net of accruals to all factors other than land and over and above the opportunity cost of labor, is 219 million dollars. The required additional investment per module is \$3,500, a total of \$2.7 billion. The implied rate of return to this redistribution cum investment is 8 percent.

The effects of this rather radical agrarian reform on the regional distribution of income are shown in Table 21. The percentage of households below a poverty line of \$78 per capita decline from 86.6 to 77.8 percent, a substantial change in absolute numbers, but clearly not the solution for the problem of poverty in the rural Northeast. Although the absolute number of beneficiaries is high, around three-quarters of a million households, the absolute base of people in poverty is equally large; four million members of the rural labor force still remain in absolute poverty.

^{1/} G. Kutcher and P. Scandizzo, The Agricultural Economy of Northeast Brazil, (forthcoming).

Table 20: RURAL NORTHEAST BRAZIL ^{1/}

I. The Rural Poor in the Present: A Functional Breakdown

<u>Poverty Level</u>	<u>Classification</u>	<u>Number of Agents</u>	<u>Dependent Population (million)</u>
Less than US\$50 per capita	Temporary workers	2.7 million or less	3.5
Not substantially above US\$50 per capita	Sharecroppers	240,000	1.2
	Permanent workers	895,000	4.5
	Smallest farmers	67,000	.335
Above US\$50 per capita but less than \$130	Medium farmers	384,000	<u>1.92</u>
Totals		4.3 million	<u>10-12 million</u>

II. Potential for Land Redistribution

Number of existing large farms	37,038
Average size, ha.	742
Module size	34.8
Potential number of modules	790,000

III. Effects of the Land Redistribution

Net money income per module	US\$781 (\$130 per capita)
Net increase in value added ^{1/}	US\$219.2 millions
Required additional investment per module (US\$3500 per module)	US\$2,765 millions
Rate of return of the investment cum redistribution	8%

^{1/} Net of accruals to all factors other than land and over and above the opportunity of labor.

Source: Kutcher and Scandizzo, op. cit.

Table 21: NORTHEAST BRAZIL: EFFECTS OF THE REFORM
ON THE DISTRIBUTION OF RURAL INCOMES

Family Income US\$	% of Households		(2) - (1)
	Base Case (1)	Land Reform (2)	
Below 469	88.6	77.8	- 10.8
469 - 938	1.3	14.0	+ 12.7
938 -1875	4.9	8.1	+ 3.2
+1875	<u>5.2</u>	<u>0.1</u>	<u>- 5.1</u>
	100.0	100.0	0

Source: Kutcher and Scandizzo, op. cit.

C. THE DIRECT PROVISION OF SERVICES: THE "BASIC NEEDS APPROACH"

1. Introduction: Toward a children-oriented basic needs approach

i. Measuring poverty alleviation in terms of welfare indicators other than income opens a new set of policy considerations. Not only per capita income is unequally distributed, but calorie consumption, life expectancy and infant mortality. They reflect inequality in the consumption of particular services, such as housing, sewerage, water, education, and health. Policies to increase their consumption above levels resulting from private demand and supply of these services define what by now has become known as a "basic needs" strategy. It implies interfering with resource allocation to reach these critical consumption levels at early stages of development, despite strategies to accelerate the growth in income of the poor. This strategy becomes more important the smaller the trickle down effect of high growth rate policies on the income of the poor, the fewer

the possibilities of increasing the earning capacity of the poor by high yielding investments in their assets, the smaller the marginal propensity by the poor to spend on basic needs, and the lesser the possibility of the private sector supplying them, particularly when the supply of these services is characterized by strong complementarities and economies of scale.

Two sets of issues are central in evaluating these policies. First, at the macro-level, they involve some trade-off with growth to the extent these services may have a more limited effect on the productivity of the poor. What becomes important is to calibrate this trade-off at the present (high) level of per capita income in these countries; this trade-off appears different today at per capita incomes of \$1,000 than it did 25 years ago when these countries had only half this income level. The second set of issues is microeconomic: (a) how can these services be delivered without major leakages to other income groups, (b) without inducing an effect simply equivalent to an income transfer, and (c) how can children be reached when intrafamily leakages also occur?

ii. Nutrition and child care, consumption of health services, shelter with water and sewerage, and basic education are typical services that determine "quality of life." The specific policy choice and mix are clearly country and regional specific, and involve a high degree of value judgment. Even objective judgments from the medical field, such as "optimal calorie requirement," are still highly controversial.

The choice of a specific basic needs strategy depends on the initial deficit, the age composition of the poor, the effect of rural-urban

migration in redefining basic needs over time, and the income elasticity of the poor for different basic needs, namely, the rate at which the deficit will be closed by income growth in the poverty group.

iii. Several factors point toward a children-oriented approach to basic needs. First, basic needs deficits are associated with the distribution of income, and poor families have more children; the incidence of children with basic needs deficits is larger than adults. Second, life expectancy at birth--basically determined by infant mortality--is perhaps the prime basic need. Infant nutrition, lowering of infectious diseases due to better shelter, and childcare are crucial inputs in this process. Third, evidence shows that the marginal propensity to spend on children (by defining a broad concept of such spending such as mothers' time, quality of parents-children interaction) is low. Additional rural-urban migration, a distinctive feature of the future, will compound the problem. All these propensities are lower in urban areas. In sum, normal income growth will not solve the basic needs deficits of children.

2. The calorie deficit

2a. Aggregate magnitude: its cost

Countrywide survey data on the present distribution of calories in the population is extremely scanty. An alternative is to allocate known aggregate (or country mean) consumption across income groups by using available income distribution data and assumptions about the relationship between consumption and income.^{1/}

^{1/} This follows the technique used in Malnutrition and Poverty, *op. cit.* A semi-log calorie income relationship is specified with an elasticity equal to 0.15 at a level of consumption equal to requirements.

Consumption by income groups was derived for the two alternative income distributions discussed above (distributions I and II)^{1/} and for several ranges of country-mean consumption, 0.9, 1.0, and 1.1 times the mean calorie requirement. These values encompass most of the range of the Latin American countries in question and, for a given country, allow a sensitivity analysis.^{2/} The resulting calorie deficit was priced using the "cost per calorie" implicit in the cost of the food basket used by ECLA in defining poverty lines. As mentioned above, this basket includes an "efficiency correction" but also maintains consumer preferences.

Table 22 shows the cost of the calorie deficit as a percentage of GNP under the worst distribution of income (Distribution I). The results are shown for countries of different GNP per capita and different mean calorie availability over mean requirement. Under the worst of circumstances, this cost is between 1.5 and 2 percent of GNP for countries of US\$600-800 per capita income and about 1 percent for the countries above US\$1,000.

2b. Calorie deficits in young children: interventions

The nature of the calorie deficit in Latin America illustrates children's dimensions of basic needs: 111 million individuals, belonging to the poorest income groups, experience calorie deficits; of them, 51.6 million are young children, 55.4 percent of all young children in the region. The mean incidence of malnutrition in the population, 35.8 percent, results from the fact that 27.4 percent of adults are malnourished and

^{1/} For the fifth quintile a share of income of 4 and 5 percent is used for distributions I and II, respectively.

^{2/} See Table A-4 in the Appendix.

Table 22: COST OF THE CALORIE DEFICIT AS A FRACTION OF GNP (%)

GNP per capita, dollars	Mean Calorie Availability Over Mean Calorie Requirement		
	0.9	1.0	1.1
600	1.95	0.70	0.0034
800	1.46	0.52	0.0025
1000	1.17	0.42	0.0020
1100	1.06	0.38	0.0018

Source: Table A-11.

55.4 percent of children. The distributive dimension of malnutrition--the strong association between malnutrition and poverty--gives origin to a larger incidence of malnutrition among children.

Table 23: LATIN AMERICA: THE DIFFERENTIAL INCIDENCE OF CALORIE MALNUTRITION AMONG YOUNG CHILDREN, 1975

	Number of people (millions)	Percentage that are malnourished
Young children (below age 10)	51.6	55.4
Rest of the population	<u>60.4</u>	<u>27.4</u>
Total	111.0	35.8

Source: Marcelo Selowsky, "The Economic Dimensions of Malnutrition in Young Children," World Bank Working Paper #294, October 1978.

Projections for the representative child in the poorest income groups are more disturbing than for the representative adult. First, the scattered empirical evidence does not show significantly higher calorie-income elasticities for children than for adults. Second, to the extent that development in general (and urbanization in particular) increases women's participation in the labor force, infant nutrition could deteriorate because of further declines in breastfeeding. If additional purchased food for the infant (from additional earnings of women now participating in the labor force) does not compensate for losses in breast-milk consumption, the net effect may be a deterioration in the infant's nutritional status. Thus, higher household incomes due to women's participation in the labor force could be consistent with a deterioration in the level of nutrition of children.

Other factors associated with urbanization--and urbanization will be a distinctive feature of the future--will also tend to adversely affect young children. Competing expenditures such as transportation, clothing, and housing are more important in urban than rural areas, and affect the share of income spent on food. Relative prices of food also tend to be higher in cities. In addition, new commodities become available to be consumed basically by adults, such as entertainment and fashion. As a result, the share of income spent on children's food may decline because expenditures other than food become necessary and new commodities for adults become available. These considerations suggest that the future will not solve the problem with the desired speed. Therefore, the need for specific nutrition interventions becomes imperative.

2c. The effectiveness of target oriented food programs for children ^{1/}

i. Interventions to increase calorie consumption in malnourished children range from general food subsidies (for example, subsidies on the import of cereals) to specific programs for poor children, such as school breakfasts. To reach children in the poorest group, the first kind of program subsidizes all consumers, rich and poor, adults and children. The program has what might be called a large "leakage." The second has less leakage, only to the extent that some food is diverted to the adults in the family. These considerations do not always make target programs more cost effective. Target oriented programs can be very expensive administratively; on the other hand, the leakage of general food subsidies can become smaller if the subsidy is concentrated on a single food consumed basically by poor households or poor children.

The above becomes clearer if the cost of a program whose objective is to increase children's food consumption by one dollar is divided into: (a) the cost of the intrafamily leakage, equivalent to the subsidy on adults' consumption in poor families that is necessary to achieve the objective, (b) the income-group leakage, or the subsidy received by nontarget families, and (c) the administrative costs of the program.

General programs are those where (b) becomes an important part of the fiscal cost of the program; nontarget groups must then be subsidized to reach target families. Examples are general food production subsidies or subsidies on food imports, and ration shop schemes for the entire population. Target-oriented programs are those where this component of the cost is relatively smaller: food stamps or ration-shop programs for specified families,

^{1/} For a more thorough discussion of this issue, see Marcelo Selowsky, "The Economic Dimensions of Malnutrition in Young Children," World Bank Staff Working Paper #294, October 1978.

take-home and on-site feeding programs in specific schools and health centers.

ii. Target-oriented food programs are presently being implemented in several developing countries. Ration-shops with free or subsidized rations for preselected families, take-home and on-site feeding programs for children in specific schools, and health centers are some examples.^{1/} Other countries are considering and experimenting with interventions such as food stamps for specified populations.

What is the effectiveness of these programs in increasing children's food consumption? How much of a program's food simply replaces old consumption? How much of the food intended for children is diverted to adults? What are the magnitudes of these replacements and diversions that make these programs more or less effective than income transfers equivalent to the subsidy embodied in the program?

Any transfer of a food commodity in excess of what the household is voluntarily willing to consume will be sold to households with different food preferences or to households not reached by the program. The program will be equivalent to an income transfer, and its effectiveness will be proportional to the marginal propensity to spend on children's food. The effect on calories will depend on the calorie content of that additional food. A parameter capturing both elements is the calorie-income elasticity of children's consumption; if that elasticity is 0.5, any food program embodying a subsidy equivalent to a per capita income transfer of 10 percent will increase the calorie intake of children by 5 percent.

^{1/} For an excellent survey on present experiences in supplementary feeding in different countries, see Simon Maxwell, "Food Aid and Supplementary Feeding: Impact and Policy Implications," Institute of Development Studies, University of Sussex, November 1977.

Several food programs operate like an income transfer without households reselling the concessionary food: (a) Programs that transfer free or subsidized food in magnitudes smaller (or in infra-marginal amounts) than the amount previously consumed by the family, will replace initial levels of consumption and release purchasing power of a value equal to the subsidy (this characteristic holds for most of the ration-shops and take-home programs presently implemented in most countries) ^{1/}; (b) A site feeding program for children (breakfast and lunch in school) when the food consumed on site is smaller than the amount of that food previously consumed at home (here the site-food will, in part, replace the food eaten at home); (c) A Food-stamp program providing stamps of a smaller value than the initial (preprogram) food consumption level of the family. The income transfer is equal to the concessionary component of the stamps--the difference between the value of the stamps and the price charged for them. Programs more effective than equivalent income transfers are food stamp programs for which a sufficiently high price is charged and "full feeding" programs for children, distributing sufficient food to potentially replace all food previously eaten at home.

The programs described above do not induce substitutions between foods. But what happens if programs do change the composition of food consumption? How, then, can the change in calorie consumption be predicted? When substitution occurs, the increment in the consumption of a particular food (subsidized or provided by the program) can induce a decline in the consumption of other foods, that is, foods that are substitutes. If the

^{1/} This is the experience of the ration-shop schemes in India and Sri Lanka.

degree of substitution is strong and the foods being substituted account for an important share of the initial calorie consumption, the net effect on calorie intake could be negative.^{1/} Information on such substitution is extremely scanty, even at the level of aggregate household consumption, and for children it is nonexistent. Thus, one can speculate only about the effectiveness of programs that induce these substitutions. It will become clear that many of the current nutrition interventions fall into this category.

Milk price subsidies or free distribution of milk (as in take home programs) in amounts substantially above previous household consumption are typical cases. If resale is not possible, these policies will induce a substitution among food commodities. If children consume two basic foods, cereals and milk, these programs will increase children's consumption of milk and decrease children's consumption of cereals, if both foods are substitutes. (The decline in milk's implicit price decreases children's cereal consumption.) Moreover, total calorie consumption could decline if, as is usually the case, most of the calories are derived from cereals. It can be shown that, in this case, even a small degree of substitution between the two foods could induce a negative effect on calorie intake. Milk subsidies and free distribution of milk are currently popular programs, perhaps conceived to increase the consumption of high quality proteins. If calories are the major nutritional problem, however, a re-evaluation of milk programs along the lines described above becomes imperative.

^{1/} For a formal presentation of the relation between cross elasticities and calorie consumption, see Reutlinger and Selowsky, op. cit., pp. 44-45.

3. Options in the health sector: the change of present biases

3a. The "urban-curative" bias of present systems.
The importance of demand

i. Present public health systems are characterized by an expensive urban-curative orientation. Social security systems have become increasingly important in providing health services, but because their beneficiaries are mainly middle-income urban employees, belonging either to the public sector or to the modern private sector, they fail to reach nonaffiliated urban workers and individuals in rural areas.

Table 24 shows that in Colombia households in the poorest quintile living in large cities receive a subsidy from the public health sector 5 times larger than those in rural areas. Table 25 shows that in Brazil the percentage of public health expenditures devoted to preventive medicine declined from 87.1 to 29.7 from 1949 to 1975. The effect is that, in spite of an increase in total public expenditures in health as a percentage of GNP from 1.0 to 2.5, the amount spent on preventive medicine as a percentage of GNP has remained constant.

ii. The expansion in the supply of rural, preventive-oriented health care will not, per se, guarantee increases in the consumption of these services. Interventions increasing the utilization of health institutions and in those factors affecting the demand for health services must also be identified. It was found in urban Colombia that, controlling for the income of the household, the level of family education had an important impact on the number of visits to doctors. In fact, doubling the level of schooling of the household head increased per capita visits by 18 percent. Thus, any determinant of "health conscientiousness," schooling probably being one of them, becomes a point of intervention.

Table 24: SUBSIDIES PER HOUSEHOLD FROM THE PUBLIC HEALTH SYSTEM, 1974
(dollars per year)

Income Quintile	Large Cities <u>1/</u>	Intermediate Cities <u>2/</u>	Small Towns <u>3/</u>	Rural Areas <u>4/</u>	Total Country
1 (Poorest)	60	32	19	12	22
2	41	28	20	15	23
3	55	26	21	15	28
4	28	35	14	13	23
5 (Richest)	21	18	19	8	18
Total Country	35	27	19	14	23

1/ More ½ million.

2/ 30-50 thousand.

3/ 1.5-30 thousand.

Source: M. Selowsky: Who Benefits from Government Expenditure, op. cit.

Table 25: BRAZIL: COMPOSITION OF PUBLIC HEALTH EXPENDITURES
(Percentages)

	1949	1965	1969	1975
INDIVIDUAL-CURATIVE (Basically Social Security System)	12.9	35.8	59.2	70.2
COLLECTIVE-PREVENTIVE	87.1	64.1	40.8	29.7
Ministry of Health	(35.3)	(25.9)	(13.0)	(5.4)
States	(51.8)	(38.2)	(27.8)	(24.3)
Total	100.0	100.0	100.0	100.0

Source: P. Knight and D. Mahar: World Bank, "Brazil Human Resources Special Report: Annex III," October 25, 1978.

3b. The cost of expanding "preventive care oriented" health systems. Simulations

How expensive is a preventive care oriented health system aimed at a full coverage of the population? Preliminary estimates for Brazil show that such a system could be financed by maintaining the present 2.5 percent share of health expenditures in GNP. ^{1/}

These estimates are based on a strategy that would change the present "urban-based-individual-curative system" trend. The alternative is a stronger emphasis on primary and collective health care in rural areas and poor regions based on the PIASS plan (Program for Grass Roots Health and Sanitation Actions in the Northeast). The principle behind PIASS is that "a large variety of health problems may be successfully prevented and/or treated at the community level, without recourse to expensive hospitalization in urban areas, and that preventive and simple curative services should be integrated with more complex curative services through well-defined institutional channels." ^{2/}

This system is based on three levels of medical facilities of increasing complexity: first, rural health posts in communities of 500-2,000 inhabitants staffed by local auxiliaries, whose function is to prevent infectious diseases and detect more complex diseases. Second, health centers servicing three health posts and staffed by a nurse, a sanitation auxiliary, and a day-per-week visit by a doctor based in a larger health center. This larger health center is attached to a regional hospital, which represents the third level of health facilities and also serves the urban population.

^{1/} Peter Knight and Dennis Mahar, "Brazil Human Resources Special Report, Annex III: Health and Nutrition," World Bank, mimeo, October 25, 1978.

^{2/} Knight and Mahar, op. cit.

By costing out the expansion of such institutions (operating and capital costs) and by projecting population growth, two alternative projections are made and shown in Table 26. The first aims at full coverage by the year 2000 and assumes a 7 percent GDP growth rate in the period 1980-2000. The second involves a more moderate increase in coverage and assumes a GDP growth of 4 percent. In both cases the total health expenditure as a fraction of GDP remains in the 2-2.5 percent range.

Table 26: BRAZIL: COVERAGE AND COSTS OF EXPANDING A RESTRUCTURED HEALTH SYSTEM

	Percentage Coverage				Cost Percent of GDP	
	Urban		Rural	Northeast a/	Projec- tion I	Projec- tion II
	Projec- tion I	Projec- tion II	Projec- tion I	Projec- tion II		
1975	79.0	79.0	0(50)	0(50)	-	-
1980	100.0	92.8	30(60)	15(60)	2.3	2.2
1985	100.0	96.4	65(80)	30(65)	2.4	2.4
1990	100.0	100.0	85(100)	45(70)	2.3	2.5
2000	100.0	100.0	100(100)	70(80)	2.0	2.5

a/ This coverage reflects the expansion of the first level of health posts. Values in parentheses refer to the capacity of the second and third levels, which are highly influenced by the present structure of the system.

This exercise shows that 2.5 percent of GDP can finance a proper health system in a \$1,000 per capita income country with reasonably good growth, if the system is restructured to a less expensive primary care-oriented system. Most of the other countries discussed here spend between

1 and 1.5 percent of GNP on health; therefore, it is likely that an additional percentage point of spending, plus a restructuring of their systems along the lines described above, could have considerable impact on the health coverage of the population.^{1/}

4. Issues in delivering educational services

4a. The first priority: increasing enrollment and the quality of education in rural areas

The first priorities in expanding educational services are to expand rural enrollment rates by increasing incentives to attend school, and to increase the quality of teachers and teaching materials in rural areas. Neither goal can automatically be attained by simply expanding the physical supply of schools or school places.

Expansion of rural enrollment implies drawing an increasing number of children from families of lower socioeconomic status and less densely populated areas. Their low enrollment is the result of factors affecting the demand for schooling as well as of the availability of school places. Low educational levels of parents and the cost of schooling--foregone earnings and transportation costs--are crucial factors in influencing the demand for additional schooling.

An illustrative case is Brazil. In 1974, enrollment rates of children ages 7-14 were 72.5, 55.3, and 44.4 percent for the total country, total rural areas, and rural Northeast, respectively.^{2/} Table 27 shows the pyramid ratio (the percentage of children in each grade as a fraction of the enrollment in the first grade) for the first 6 years of primary schooling.

^{1/} Based on a Bank study mission visit to Cuba, I estimate that Cuba spends roughly 4 percent of the GNP on health. Its health system is highly rural and primary-care-oriented.

^{2/} Yves Tencalla, World Bank, Brazil Education Sector Memorandum, mimeo.

Table 27: BRAZIL: PYRAMID RATIO
(Percentages)

Grade	Country	Rural Areas
1	100.0	100.0
2	55.2	38.3
3	44.4	24.8
4	36.9	15.7
5	32.1	2.6
6	25.2	1.0

Source: Tencalla, op. cit.

The constraint here is due, not to a lack of school places, but to insufficient incentives to remain in school. Subsidies to school attendance, such as school breakfasts and lunches, free provision of textbooks and clothing, and transportation, are relevant policy options. In the state of Goias, for example, experiments with school meal programs increased effective school attendance from 67-80 percent to 84-95 percent.^{1/}

Another constraint is that teachers in rural primary schools, particularly in the more backward regions, have extremely low levels of pedagogical training. Ninety percent of the teachers in Northeast Brazil lack pedagogical training altogether and most have little primary schooling. In 1972, 31 percent of the Northeast teaching force had not completed primary education, and in 1974, 77 percent of these teachers were reported to have had only primary schooling.^{2/}

^{1/} Federal University of Goias-INEP-SEC-CNAE Project, 1976.

^{2/} Tencalla, op. cit.

The inability to attract better teachers results from the low salaries paid by the rural municipalities in Northeast Brazil. Teachers with complete primary education receive between US\$10-51 a month, compared with the legal minimum salary of US\$57. They usually work without contracts, and their salaries fluctuate according to the budget of the rural municipio.^{1/}

From the above data it is clear that a larger fraction of a country's primary education budget must be used, first, to increase incentives to attend rural schools, basically school meals (this is quite related to the nutrition objectives discussed earlier), and second, to improve the working conditions and increase the salaries of teachers in rural areas.

4b. Financing priorities: transferring fiscal subsidies from higher education: toward the self-financing of higher education

Preliminary estimates show that, for Latin America, providing six years of schooling to the overall population would increase the educational budget by 6 to 17 percent.^{2/} Because the share of expenditures in education in GNP is approximately 3-4 percent, this increase amounts to 1/5 - 2/3 of one percent of GNP. This is the cost of expanding the supply of primary school places; an additional fiscal effort is required if better teacher salaries and school meals in rural areas becomes also part of this package. What additional sources of finance can be conceived within the educational sector?

^{1/} Tencalla, op. cit.

^{2/} Sebastian Piñera, Preliminary Estimates from the Critical Poverty in Latin America Project, ECLA.

The most obvious way to finance these measures is to gradually eliminate the subsidy to higher education and transfer these funds to primary rural education. In most countries, public expenditure for higher education represents half the expenditure for primary education. A substantial amount of public funds could be released, therefore, if higher education became self-financed.

Subsidies to higher education are perhaps one of the most regressive transfers in the economy, clearly more unequally distributed than personal income, as shown in Figure 1 for Colombia. Equity and efficiency point to a clear solution: the replacement of free higher education with a system where tuition covering the cost of education is charged and students are given loans to be repaid after graduation.

In Appendix II, a model exploring this option is presented.^{1/} In the model, a fraction of students (the poorer ones) are entitled to a yearly loan equal to their tuition plus their foregone earnings while in school. The loan must be repaid in 10 yearly installments after graduation, at an interest rate of 10 percent. Assuming that 50 to 70 percent of enrolled students receive loans, the system would become self-financed within 12 to 15 years.

5. Housing and associated services in urban areas: a cost simulation exercise

Location and typical dwelling standards limit the access of the poor to new housing and a lack of capital markets compounds the problem. Table 28 shows that, in Bogota and Mexico City, the cheapest housing unit

^{1/} See Appendix II.

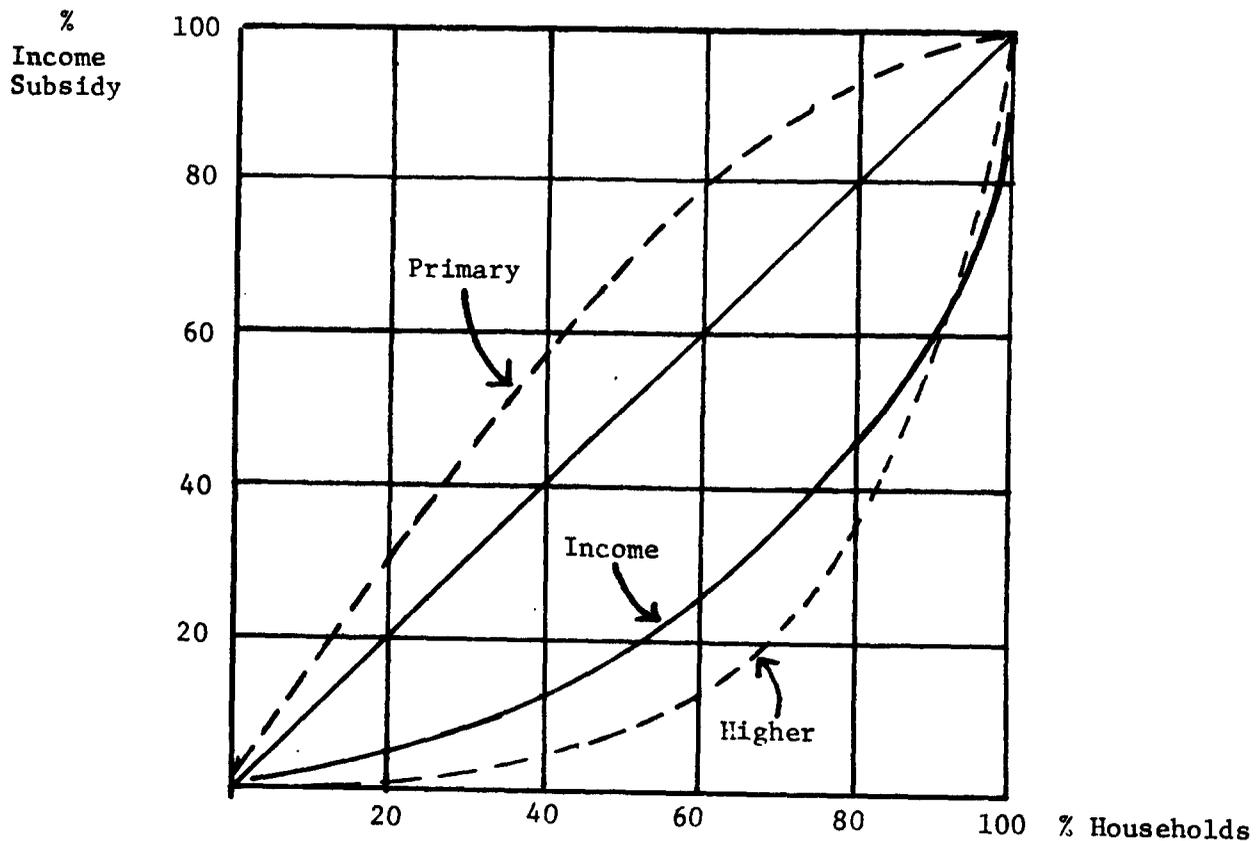


FIGURE 1
DISTRIBUTION OF THE SUBSIDY TO EDUCATION AND OF PERSONAL INCOME

currently available cannot be afforded by 47 and 55 percent of the inhabitants of these cities, respectively. Alternative housing standards and locations are identified to analyze the sensitivity of costs and the subsidy required to finance the difference between mortgage payments and household expenditures for rents. Practically all households in Mexico City could afford multi-family dwellings with basic services located on the periphery of the city. In Bogota, only 15 percent of households would be unable to finance these types of housing; to afford these dwellings, a subsidy of only 12.9 percent on the required mortgage would be required. The issue is how to implement these new standards of housing.

Table 28: COST OF HOUSING UNITS OF VARIOUS STANDARD AND LOCATION, PERCENTAGE OF HOUSEHOLDS UNABLE TO AFFORD THEM AND REQUIRED SUBSIDY ON THEIR RENTS /a
(in 1976 US\$)

Location	Bogota			Mexico City		
	Cost	Households (%)	Subsidy (%)	Cost	Households (%)	Subsidy (%)
<u>Periphery</u>						
Single family, individual services	1256	17	21.7	2063	14	9.2
Multi-family, " "	1809	36	21.9	1960	12	3.4
" " basic services	1134	15	12.9	1274	4	-
<u>Intermediate zones</u>						
Single family, individual services	4787	73	71.1	31184	95+	92.6
Multi-family, " "	2509	50	44.1	7777	72	70.1
" " basic services	1837	36	23.5	7096	69	67.1
<u>Present cheapest housing unit</u>	2477	47	-	4988	55	-
Per capita income country:	US\$635			US\$1090		

/a Subsidy is defined as the percentage by which monthly income available for housing falls short of required monthly payment. Based on repayment period of 25 years, 10% interest rate and a share of income devoted to income equal to 15 percent.

Source: Orville Grimes, Housing for Low-Income Urban Families, Johns Hopkins University Press, 1976.

Because these examples are quite specific to a particular metropolis (for example, the results are very sensitive to location in the case of Mexico City), a sensitivity analysis is presented for a typical country of US\$800 dollars per capita income under the two alternative income distributions discussed above, I and II. The objective is to compute the subsidy that would allow urban households in the poorest 40 percent (of total households) to afford (a) a dwelling equal to twice the per capita GNP, \$1,600, (b) a dwelling five times the per capita GNP, \$4,000.

Table 29 shows the required yearly subsidy assuming households in the bottom 40 percent devote 15 percent of their incomes to housing. It is assumed that 45 percent of the total households in the bottom 40 percent are urban. Table 30 shows that under the worst circumstances, with the more unequal distribution of income (I) and the dwelling to be financed amounting to five times per capita GNP, the cost of the subsidy is 1.28 percent of GNP per year. The subsidy will benefit urban households in the bottom 40 percent of the income distribution, accounting for 30 percent of all urban households.

Table 29: REQUIRED SUBSIDY TO FINANCE A HOUSING MORTGAGE UNDER DIFFERENT DISTRIBUTION OF INCOME (I, II) AND VALUES OF DWELLING. TYPICAL COUNTRY OF US\$800 PER CAPITA INCOME (VALUES IN DOLLARS)

Deciles	Annual household income (family size equal to 6)		Yearly rent expenditure (15% income)		Yearly mortgage payment for a dwelling equal in value, to:		Required yearly subsidy per household				Assumed fraction in urban areas
	I	II	I	II	V		1600		4000		
					Twice GNP per capita 1600	Five times GNP p.c. 4000	I	II	I	II	
1	324	720	49	108	176	440	127	68	391	332	0.3
2	636	960	95	144	176	440	81	32	345	296	0.4
3	960	1440	144	216	176	440	32	-	296	224	0.5
4	1440	1920	216	288	176	440	-	-	224	152	0.6

/a At 25 years and at 10% interest.

Table 30: FISCAL COST OF THE SUBSIDY TO URBAN HOUSEHOLDS

	<u>Income Distribution I</u>		<u>Income distribution II</u>	
	V=1600	V=4000	V=1600	V=4000
Mean yearly subsidy per household (dollars):	80	314	50	251
Urban households with subsidies as a fraction of:				
- all households	0.12	0.18	0.07	0.18
- all urban households ^{/a}	0.20	0.30	0.12	0.30
Cost as a fraction of GNP (%) ^{/b}	0.21	1.28	0.13	1.02

/a It is assumed 60 percent of households are urban.

/b A country average family size of 5.5 is assumed.

IV. BALANCING THE OPTIONS: TRADE-OFFS
BETWEEN BASIC NEEDS AND GROWTH

A. FINANCING THE BASIC NEEDS PACKAGE

Based on the above considerations, our recommendation is to increase public subsidies to basic needs oriented sectors, from their present levels of 5-7 percent of GNP to a new level of 10 percent of GNP (Table 31). This must be accompanied by changing the nature of delivery systems in each sector and transferring regressive segments of subsidies within each sector. Without this qualitative change, those additional resources will lose a large part of their poverty oriented objective. The share of GNP spent on higher education must be kept constant or decline as a consequence of a policy of self financing. In health, the share of urban based curative medicine must be kept constant, and all increments devoted to primary-preventive rural health care.

Table 31: RESOURCE REQUIREMENTS

Sectors	<u>Resources per sector</u> (as % of GNP)		<u>Reallocations within Sectors</u>
	Actual	Target	
Education	3-4	5	Toward self financing of higher education: food programs and teacher's quality in rural areas
Health	1-2.5	2.5	Pro collective-preventive rural health care systems
Nutrition	< 1	1.0	Target oriented instead of general food subsidies
Housing	< 1	1.5	Eliminating subsidies to middle class housing. New standards for lower income groups
Total	5-7	10.0	

For countries like Brazil, which have already reached 2.5 percent public spending in health, additional funds amount to only 3 percent of GNP. For other countries the increment reaches 5 percent, a doubling of public spending in these sectors.

Table 32 presents some options for financing such a program. In the oil producing countries--Colombia, Mexico, and Ecuador--domestic oil prices are kept substantially below world prices. It is estimated that lifting them to world price levels would increase government revenues by 3, 2.5, and 4 percent of GNP in these countries, respectively. Half of this increase could be devoted to finance the basic needs package, the other half to finance investment in the oil sector. In the case of Mexico, additional oil production will increase government saving, even by maintaining low domestic prices, by an additional 4.3 percent of GNP (from 2.2 to 6.5) by the year 1982.^{1/} Half of this increase, 2.15 percent of GNP, is another source of finance.

If lifting the price of oil (row 1 in Table 32) is considered politically unfeasible or having a regressive impact (which we doubt, an important issue to be researched), additional taxation would be the alternative option.

Not a single report fails to emphasize that there is still room for additional fiscal revenues by increasing (effective) direct taxation at the top of the income distribution and also by increasing the tax base. In several oil producing countries, additional oil revenues have been accompanied by declines in the tax ratio (taxes over GNP) in the rest of the

^{1/} World Bank economic mission estimate.

Table 32: SOURCES OF FINANCE
(Percentages of GNP)

	Brazil	Peru	Colombia	Mexico	Ecuador
<u>Half</u> the increase in net revenues out of increasing the price of domestically sold (and produced) oil to world prices./a			1.5	1.25	2
<u>Half</u> the additional savings out of increased oil production (at present domestic prices)				2.15	
Additional taxation (in parenthesis, taxation from eliminating exemption on imputed rent on owner occupied dwelling)	3 (1.2)	4 (1.2)	1.2 (1.2)	2 (1.2)	4.8 (1.2)
Eliminating the subsidy to the electricity sector			1		
Additional government royalties from coal and uranium exploitation			1		
TOTAL	3	4	4.7	5.4	6.8

/a The additional oil revenues obtained by charging domestic consumers the world price is, as a fraction of GNP, 3%, 2.5% and 4% for Colombia, Mexico, and Ecuador. If only 0.5% of GNP can be raised by manipulating this option, the difference will have to be obtained by additional taxation.

economy. In the case of Ecuador, this ratio declined from .186 to .138 between 1972 and 1977^{1/}. Maintaining the 1972 figure yields the additional share of .048 used in Table 32.

It is estimated that eliminating tax exemptions on imputed rent on owner-occupied dwellings--one of the most regressive subsidies--could yield a tax equal to 1.2 percent of GNP. If the upper 10 percent of the population receives a share of GNP equal to 0.4 and their imputed rent is 0.2 of their income, their tax base will increase in 0.08 of GNP. If their income tax is 15 percent it yields an additional 1.2 percent of GNP. In several countries, particularly Mexico and Brazil, either inflation or high levels of deductions erode the tax base. In Brazil tax deductions exempt families with gross incomes up to four or five times the per capita GNP. In Colombia, adjusting property prices at commercial values could yield an additional 1 percent of GNP, and tax reforms now being contemplated in Peru could yield additional taxation equal to 4 percent of GNP.

Sources of finance from reallocating subsidies presently given to other sectors have not been contemplated here, except for Colombia, where 1 percent of GNP could be made available by eliminating the subsidy to the electricity sector. Defense represents at least one-fourth of the fiscal budget in several countries. In Peru, several of the present subsidies to electricity and consumer goods--benefitting consumers of all income groups--are not considered here a source of finance because their elimination is part of their present anti-inflationary program. In the case of Brazil, the investment budget of the government is held constant in this exercise.

^{1/} World Bank economic mission estimates.

B. TRADE-OFFS WITH GROWTH: KEEPING UNCERTAINTY DOWN

What is the maximum loss to the long term growth rate induced by this additional 5 percent of GNP devoted to basic needs? Let us assume the worse scenario: (a) This additional basic needs package has zero productive or asset creation effect on the poor. We conceive of it as a pure consumption transfer (though this would not be the case, particularly in the case of education). (b) Oil revenues are not feasible sources of financing; therefore, the 5 percent is financed entirely by an additional 12.5 percent income tax, levied on the income of the richest 10 of the population accounting for 0.4 percent of GNP. In terms of investment incentives, this tax, which affects the income of new investment, is clearly worse than the tax options discussed above, such as the elimination of deductions and exemptions on imputed rent and increases in property taxes (which tend to tax a larger share of inframarginal income).

What is the maximum effect of this tax on the investment behavior of the richest 10 percent and its impact on the overall country investment rate? Two capital market scenarios are presented to estimate this effect.^{1/} Within each, extreme parameter values and assumptions are used to derive an upper bound for the decline in investment.

One scenario is a closed economy capital market, that is, no capital flight takes place. The decline in investment results from both a smaller supply of savings (a function of the marginal propensity to save by this income group) and a decline in the net yield of new investment

1/ See Appendix III for calculations under different scenarios.

opportunities. The decline is largest by assuming a perfectly elastic demand for investment, that is, the new equilibrium net yield goes down by the amount of the additional tax.

In the open economy case we assume that domestic investors can invest abroad and that the return abroad is not affected by the new tax. This assumes that either the proceeds of this investment can only be consumed abroad or the proceeds can be brought back into the country in a way such that the new tax can be evaded.

To derive maximum values we assume that initially (a) this income group investment accounts for 10 percent of GNP, a rather high figure; (b) this group pays a 20 percent (t_1) income tax; the additional 12.5 percent tax (t_2) is equivalent, therefore, to a decline of 15.6 percent in the yield of new investment ($t_2/1-t_1$). In the closed economy case, the results are a function of the marginal propensity to save and the interest elasticity of the supply of savings, ϵ . We assume a rather high figure of 0.25 for the propensity and 0.5 and 1.0 for the elasticity. In the open economy case only the interest elasticity of the demand for investment, η , is relevant; a range between 0.5 and 1.5 is used in the analysis.

Table 33 shows the results. In the worst of circumstances, the decline in the country's investment rate is 2.5 percentage points; that is, if the rate was initially 20 percent, the new rate will be 17.5 percent. If the social return to capital in the economy is 0.2 (gross of taxes, depreciation, and excess market wage over the opportunity cost of labor), the decline in the growth rate will be at most one half of 1 percent (0.2×0.025). If a country's historical growth rate was 6 percent per year, the maximum

effect will be to reduce that rate to 5.5 percent: At the most "the trade-off ratio" between redistribution and growth is 10:1; in other words, a 5 percent transfer of GNP toward "consumption" results in a half a percent lower GNP growth.

Table 33: DECLINES IN THE COUNTRY'S INVESTMENT RATE ^{1/}

Closed Economy Case				Open Economy Case	
Interest elasticity of savings	Marginal propensity effect	Interest rate effect	Total effect	Interest elasticity of demand for investment	Total effect
$\epsilon = 0.5$	0.01	0.007	0.017	$\eta = 0.5$	0.0078
$\epsilon = 1.0$	0.01	0.014	0.024	$\eta = 1.0$	0.0156
				$\eta = 1.5$	0.0234

^{1/} Appendix III.

Crucial in the implementation of such a policy is to keep uncertainty down. Investment behavior is much more sensitive to uncertainty than to net yields; if the tax reform takes place in a milieu where other "rules of the game"--concerning other property incomes or property rights--are being questioned, the negative effects on investment could be substantially larger.

APPENDIX I

ADDITIONAL TABLES

Table A-1: FRACTION (f) OF CHILDREN (BELOW AGE 10) IN DIFFERENT GROUPS OF THE POPULATION ORDERED ACCORDING TO HOUSEHOLD PER CAPITA INCOME

	Colombia		Bogota		Quito		Lima	
	Population (%)	Children (f)						
Poorest	20.0	0.43	14.8	0.43	17.8	0.48	9.2	0.43
Next	20.0	0.37	8.3	0.43	14.9	0.43	12.4	0.34
Next	20.0	0.31	7.1	0.39	13.5	0.37	9.4	0.32
Total Population	100.0	0.32	100.0	0.33	100.0	0.35	100	0.29

Sources: Colombia--M. Selowsky: Who Benefits from Government Expenditure: A Case Study in Colombia Cities----Special Tabulation from ECIEL Study: P. Musgrove, op. cit.

**Table A-2: ESTIMATES OF LIFE EXPECTANCY BY HOUSEHOLD INCOME LEVEL,
BY STATE GROUPS, 1970**

Sub-region	Average Monthly Income in Cruzeiros			
	1-150 (1)	151-300 (2)	301-500 (3)	501+ (4)
1. Amazonia ^{a/}	53.4	53.9	54.8	58.2
2. Maranhao-Piaui	50.0	50.8	52.7	55.7
3. Central Northeast ^{b/}	42.8	46.1	50.3	54.4
4. Bahia-Sergipe	48.9	50.3	51.9	54.9
5. Minas Gerais-Espirito Santo	53.8	55.4	55.6	62.3
6. Rio de J. Guanaba	54.1	54.8	57.6	62.1
7. Sao Paulo	54.7	56.1	58.7	63.9
8. Parana	54.8	56.5	59.3	63.7
9. S. Catarina-R.G. Sul	60.5	61.2	63.4	66.9
10. Central-West ^{c/}	56.5	57.1	58.2	63.3
Brazil	49.9	54.5	57.6	62.0

Source: Carvalho and Wood (1977:11). Reported in Merrick T. and Moran, R.,
"World Bank Brazil Human Resources Report."

Table A-3: INFANT MORTALITY RATES BY PROVINCES
(per thousand live births)

Mexico, Central Region, 1971		Ecuador, Sierra Region, 1974	
Guanajuato	83.8	Azuay	84.6
Queretaro	64.1	Bolivar	71.7
Hidalgo	60.6	Canar	64.5
Mexico	105.0	Carchi	98.8
Distrito Federal	73.2	Chimborazo	105.7
Morelos	39.2	Cotopaxi	122.1
Puebla	79.7	Imbabura	100.4
Tlaxcala	105.9	Loja	45.4
		Pichincha	75.0
		Tungurahua	98.4
National Total	63.3		70.2

Source: Mexico -- Anuario Estadístico, 1971.
Ecuador - Country Economic Report.

Table A-4: MEAN PER CAPITA DAILY CALORIE CONSUMPTION
(1974-76 PERIOD) AND REQUIREMENTS

Country	Mean per capita calorie consumption, \bar{C} (per day) (1)	Per capita requirements, C_R (per day) (2)	\bar{C} / C_R
Mexico	2721	2330	1.17
Colombia	2181	2320	.94
Brazil	2513	2390	1.05
Ecuador	2120	2290	.92
Peru	2352	2350	1.00
Turkey ^{/a}	2836	2520	1.12

^{/a} 1974 data.

Source: Provisional FAO Food Balance Sheets.

Table A-5: MEXICO: FREQUENCY OF PROTEIN/CALORIE MALNUTRITION
IN PRESCHOOL-AGED CHILDREN IN RURAL ZONES

Zone	Percent of Cases Based on Degree of Malnutrition ^{/a}				Total
	Normal ^{/b}	Grade I ^{/c}	Grade II ^{/d}	Grade III ^{/e}	
North	30.4	50.4	18.8	0.4	100.0
Center-West	25.1	42.7	28.0	4.2	100.0
Gulf of Mexico	27.5	44.1	25.5	2.9	100.0
South	19.6	44.2	30.8	5.4	100.0
Southeast	10.8	50.5	34.5	4.2	100.0

^{/a} Based on Gomez classification: % theoretical weight for age.

^{/b} 90% - 100% of average weight; ^{/c} 75% - 90%; ^{/d} 60% - 75%; ^{/e} Less than 60%.

Table A-6: DISTRIBUTION OF HEADS OF HOUSEHOLD IN THE POOREST INCOME QUINTILE ACCORDING TO /a LOCATION, SECTOR, AND OCCUPATION, 1974

(percent)

URBAN AREAS:

Self-employed

a. Manufacturing

5.2

16.0

b. Services

10.8

Wage Labor

a. Manufacturing

4.9

b. Construction

5.5

c. Services

8.2

34.6

RURAL AREAS

a. Landowners

25.6

b. Sharecroppers

6.6

c. Tenants and colonos

3.9

d. Agricultural labor living on farms

8.1

18.6

58.2

e. Households not living on farms

14.0

Ill-defined occupations

7.2

TOTAL

100.0

/a Quintiles according to household per capita income.

Source: M. Selowsky, Who Benefits from Government: A Case Study in Colombia (forthcoming).

Table A-7: DISTRIBUTION OF FAMILIES IN THE POVERTY GROUPS
(Families below two minimum wages or 1/3 of the families), 1974-75 (Percentages)

Regions	Metropolitan	Other Urban	Rural	Total
Sao Paulo & Rio	4	4	4	12
South	2	2	8	11
Minas Gerais & E.S.	1	3	8	12
Northeast	3	12	37	52
North & D.F.		4	9	13
TOTAL	9	25	66	100

Source: World Bank Document on Income Distribution in Brazil.

Table A-8: COMPOSITION OF HOUSEHOLDS IN THE POVERTY GROUP,
ACCORDING TO OCCUPATION OF HEAD (Percentages)

	Peru (poorest 25%)		Turkey (poorest 20%)
Sierra Rural	82.7	Farmers	67.4
Coast & jungle farmers	1.1	Rural labor	4.8
Wage earners	7.1	Artisans	9.7
Urban self-employed	<u>9.1</u>	Unskilled labor	13.6
		Other	<u>4.5</u>
	100.0		100.0

Sources: Peru: R. Webb
Turkey: K. Dervis and S. Robinson.

Table A-9: DISTRIBUTION OF THE POOREST 45 PERCENT OF FAMILIES, 1975 /a

(According to household income)

Sector and type of worker	Percentage of total families		
	Total	Urban	Rural
<u>No Occupation</u>	<u>11.9</u>	<u>4.1</u>	<u>7.8</u>
<u>Agriculture</u>	<u>52.4</u>	<u>1.7</u>	<u>50.7</u>
Owner	0.6	0.1	0.5
Self-employed	33.0	0.6	32.4
Non-salaried in family business	0.3	-	0.3
Salaried employee	18.5	1.0	17.5
<u>Mining</u>	<u>0.5</u>	<u>0.3</u>	<u>0.2</u>
Owner	-	-	-
Self-employed	-	-	-
Salaried employee	0.5	0.3	0.2
<u>Petroleum and Electricity</u>	<u>0.2</u>	<u>0.2</u>	<u>-</u>
Owner	-	-	-
Self-employed	-	-	-
Salaried Employee	0.2	0.2	-
<u>Manufacturing</u>	<u>10.7</u>	<u>4.5</u>	<u>6.2</u>
Owner	0.3	0.1	0.2
Self-employed	4.6	1.0	3.6
Salaried employee	5.8	3.4	2.4
<u>Construction</u>	<u>3.0</u>	<u>1.9</u>	<u>1.1</u>
Owner	-	-	-
Self-employed	0.9	0.5	0.4
Salaried employee	2.1	1.4	0.7
<u>Commerce, Services, Transport</u>	<u>20.0</u>	<u>10.6</u>	<u>9.4</u>
Owner	0.3	0.1	0.2
Self-employed	8.1	3.9	4.2
Salaried employee	11.6	6.6	5.0
<u>Government</u>	<u>1.1</u>	<u>0.9</u>	<u>0.2</u>
Owner	-	-	-
Self-employed	-	-	-
Salaried employee	1.1	0.9	0.2
<u>Insufficient Information</u>	<u>0.2</u>	<u>0.2</u>	<u>-</u>
<u>Total</u>	<u>100.0</u>	<u>24.4</u>	<u>75.6</u>
Unemployed	11.9	4.1	7.8
Owner	1.2	0.4	0.8
Self-employed	46.8	6.2	40.6
Non-salaried in family business	0.3	-	0.3
Salaried employee	39.8	13.7	26.1

/a Defined as families whose monthly income was less than 1,621 pesos.

Source: World Bank Mission estimates from CENIET survey data.

Table A-10: LOCATION OF THE URBAN POOR IN THE POOREST
30 PERCENT OF THE POPULATION

City Size (thousands)	Peru	Colombia
+ 500	25.9	30.5
100 - 500	18.5	23.4 ^{/1}
2,000 - 10,000	55.5	45.9 ^{/2}

Sources: Peru: Richard Webb, On the Statistical Mapping of Urban Poverty and Employment, World Bank Staff Working Paper No. 227.

Colombia: Marcelo Selowsky, Who Benefits from Government Expenditures, Oxford University Press, (forthcoming).

/1 Refers to city size between 30 and 500 thousand.

/b Towns with less than 1,500 inhabitants.

Table A-11: ESTIMATED DAILY PER CAPITA CALORIE CONSUMPTION BY DECILES:
SENSITIVITY TO AGGREGATE CALORIE CONSUMPTION (\bar{C}/C_R) ^{1/}
AND THE DISTRIBUTION OF INCOME

Decile	Distribution of Income I			Distribution of Income II		
	\bar{C}/C_R			\bar{C}/C_R		
	0.9	1.0	1.1	0.9	1.0	1.1
1	1356	1597	1834	1587	1826	2065
2	1604	1843	2082	1691	1930	2169
3	1752	1991	2230	1837	2076	2315
4	1898	2137	2376	1939	2178	2417
5	2000	2239	2428	2019	2258	2496
<u>Daily Per Capita Calorie Deficit in Each Decile</u>						
1	794	553	307	563	324	85
2	546	307	68	459	220	-
3	398	159	-	313	74	-
4	252	13	-	211	-	-
5	150	-	-	131	-	-
Mean	428	258	187	335	206	85
<hr/>						
Yearly cost of the deficit per person (dollars) ^{2/}	23.4	14.1	10.2	18.3	11.3	4.6
Fraction of Mal- nourished Indi- viduals	0.5	0.3	0.2	0.5	0.3	0.2

^{1/} \bar{C}/C_R = Mean calorie availability over mean calorie requirement.

^{2/} A cost of 1.5 cents per 100 calories is used; corresponds to the value of a food basket equals to \$125 dollars per year yielding 2300 calories per day. (See Table 2.)

APPENDIX II

THE SELF-FINANCING OF HIGHER EDUCATION:
A MODEL OF FULL TUITION AND LOANS

How many years would it take the higher education system to become self supporting under this scheme of full tuition plus loans. We have constructed a hypothetical example to illustrate some orders of magnitude.

For expository purposes we will distinguish between the institutions providing higher education (universities) from the government (or the Ministry of Education). We define the present system as one that does not charge any tuition and where universities are completely financed by the government.

Suppose the cost to the budget per student year is equal to a . The public cost of higher education under the existing scheme will be, for any future year t , equal to $C_t = aS_t$ where S_t is the stock of students in the system in that year. Next figure shows the future path of C_t for Latin America (and where year 0 is the base year) assuming S grows at 11% per year and equal to the (compounded) rate of the period 1960-71. Given that we are interested in trends and not in the scale of the variables we simply assume $a=1$.

In year 0 the new scheme starts: a yearly tuition equal to \underline{a} is being charged for each of the 5 years of higher education. At the same time loans to finance that tuition \underline{a} plus the yearly foregone \underline{b} (where $b=\beta a$) are offered to "low income" students being accepted. These loans have to be repaid (after graduation) in 10 equal yearly installments at an interest rate of 10% per year.

The effect of the program is that now a fraction γ of the entering students will be "poor" students. After the 5th year the fraction of "poor" students in the stock will be equal to the fraction of "poor" students entering the system (in the flow of admittance) under the new program. $(1-\gamma)$ becomes the fraction of rich students in the stock.

Under this scheme the cost to the government in any year t (after the 5th year) will be equal to the yearly loan program:

$$(23) \quad C'_t = (a+b)\gamma S_t$$

$$\text{if } b = \beta a$$

$$(24) \quad C'_t = aS_t (1+\beta)$$

$$(25) \quad C'_t = \gamma(1+\beta)C_t$$

The new cost to the government, C'_t will be higher or lower than the earlier one, C_t , depending on the values of β and γ .

We will use $\beta = 0.6$, a figure based on Psacharopoulos' data, and two alternative values of γ ; $\gamma = .5$ and $\gamma = .7$. With those figures we get two alternative values for C'_t :

$$\gamma = .5 \quad C' = .80C_t$$

$$\gamma = .7 \quad C' = 1.12C_t$$

For $\gamma = .7$ the new cost is higher. The reason is that a "high" γ means more "poor" students--to which loans have to be given--in relation to "rich" student from whom tuition is now being collected.

After five years the government begins receiving a repayment flow (RF) out of the graduating students to whom loans were granted. $\frac{1}{\gamma}$ The larger the value of γ the larger this repayment flow.

Footnote 1 of previous page

1/ A student that receives for 5 years a yearly loan of (a+b) will have at graduation, a debt equal to:

$$(1) \quad D = (a+b) \sum_{i=1}^5 (1+r)^i = (a+b) \frac{1}{r} (1+r) [(1+r)^5 - 1]$$

where r is the opportunity cost of capital. He is allowed to repay that debt in 10 equal yearly installments at an interest rate r . Define as $\delta(a+b)$ that (constant) yearly repayment; the present value of that flow is therefore:

$$(2) \quad \delta(a+b) \sum_{i=1}^{10} \frac{1}{(1+r)^i} = \delta(a+b) \frac{1}{r} \left[1 - \frac{1}{(1+r)^{10}} \right]$$

Equalizing (1) and (2) we solve for :

$$(3) \quad \delta = \frac{(1+r) [(1+r)^5 - 1]}{\left[1 - \frac{1}{(1+r)^{10}} \right]}$$

for $r = 0.10$, δ becomes equal to 1.093.

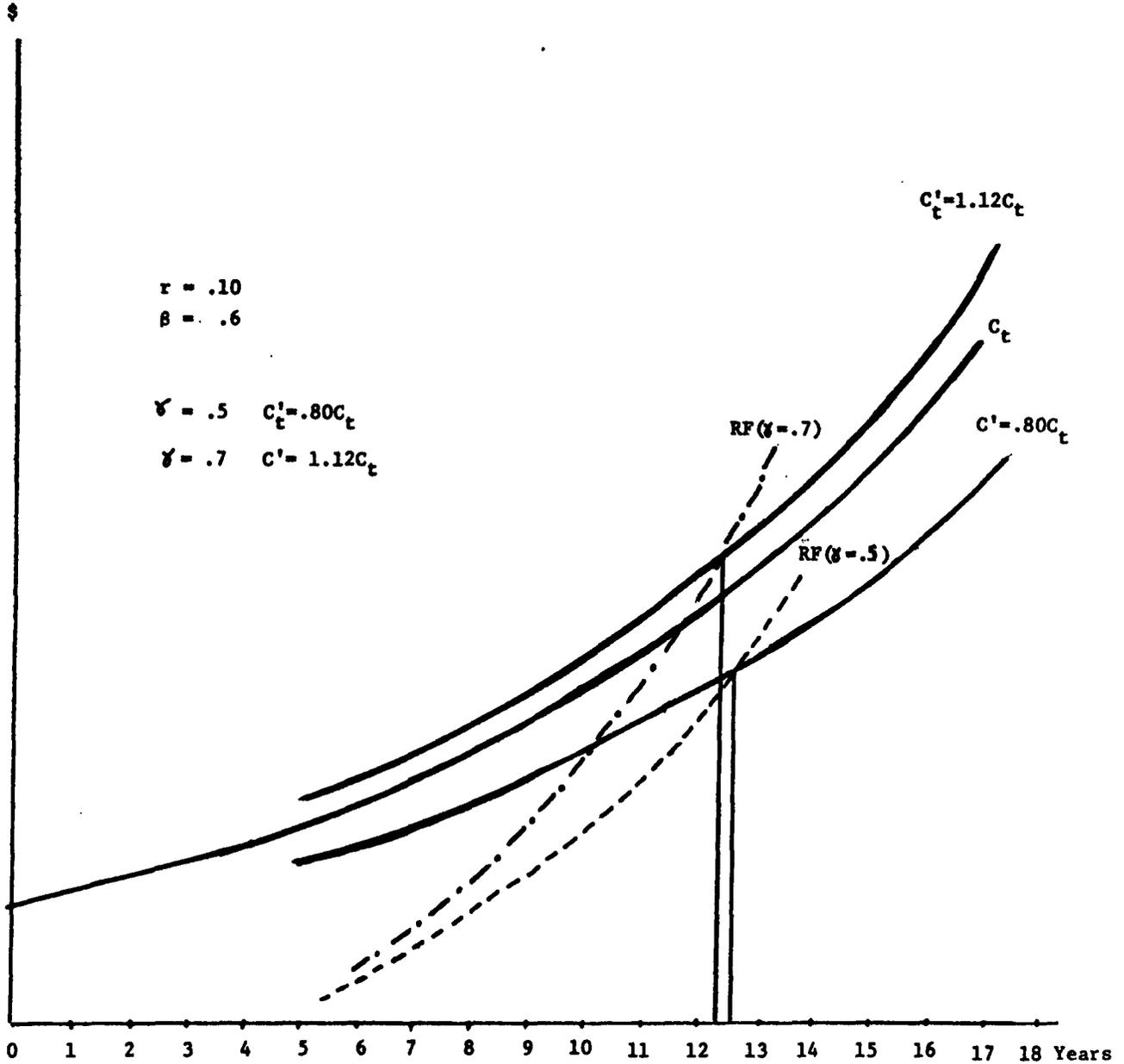
Of the A_t newly admitted students in any year t , a fraction γ will be entitled to receive loans. If the loan program begins in year 0 the repayment flow will begin in year 5. The expression for that flow for any year T (where $T \geq 5$) is:

$$(4) \quad RF = \gamma(a+b)\delta A \left[\sum_{t=0}^{T-5} (1+\lambda)^t \right] \quad \begin{array}{l} \text{where } t = 0, \text{ if } T \leq 14 \\ t = T-14, \text{ if } T \geq 14 \end{array}$$

where λ is the annual growth rate of new admittance and A are new admissions when the program begins.

Recalling that $b = \beta a$ we can express (4) as a fraction of C_t or C'_t by just knowing λ and the fraction $\frac{A_0}{S_0}$, the ratio of new admittance to the stock of students in the base year. For Latin America the value of λ is 17% for the period 1960-71; for $\frac{A_0}{S_0}$ the value for 1971 was used.

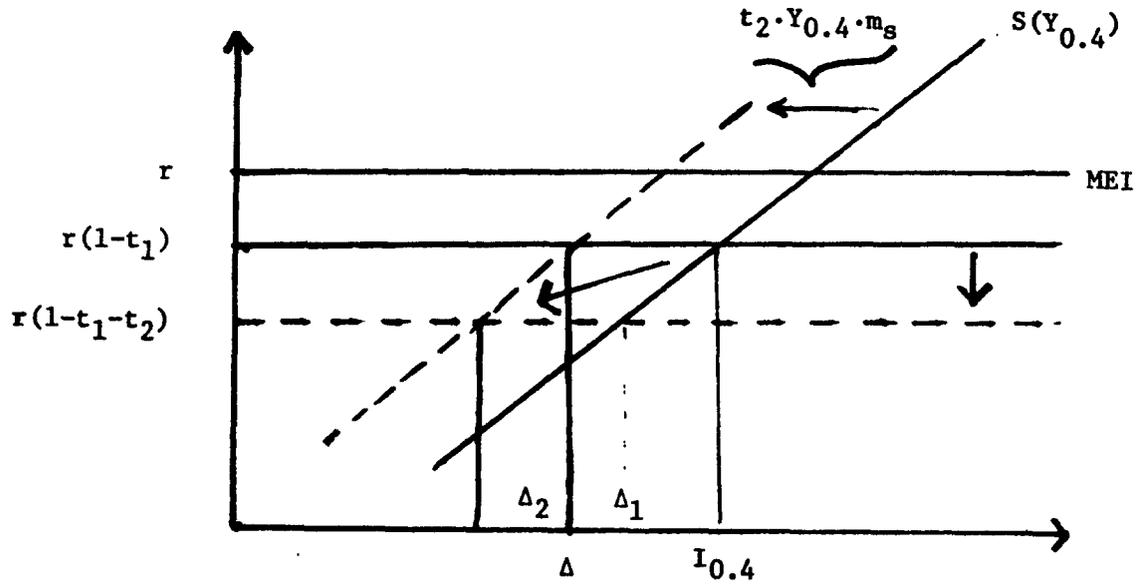
From the attached figure we can see that the system becomes self supported between the 12th and 13th year after the program begins. This result seems to be relatively insensitive to the value of δ .



APPENDIX III

ESTIMATES OF DECLINES IN INVESTMENT AS A RESULT
OF AN INCOME TAX ON THE RICHEST 10 PERCENT OF HOUSEHOLDS

CLOSED ECONOMY CASE: MAXIMUM EFFECT
(Perfectly elastic investment function)



$$\Delta = \Delta_1 + \Delta_2$$

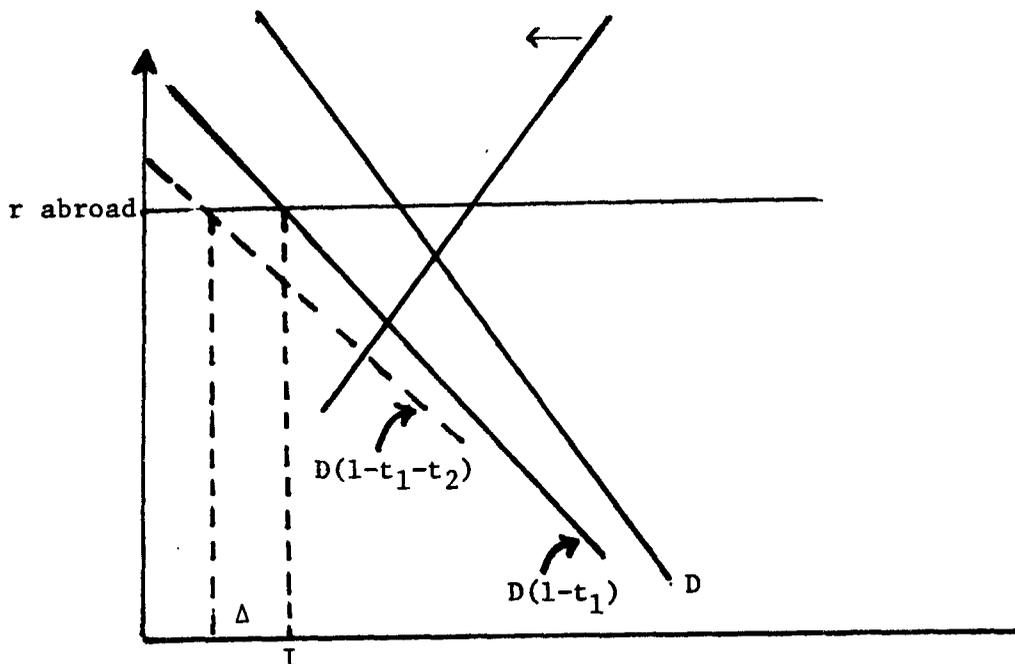
$$\Delta = (t_2) (0.4) (\text{GNP}) (m_s) + (I - \Delta_1) \cdot \epsilon \frac{t_2}{(1-t_1)}$$

$$\frac{\Delta}{\text{GNP}} = \{(0.4)t_2 \cdot m_s\} + \left\{ \frac{I}{\text{GNP}} - (0.4)t_2 \cdot m \right\} \epsilon \frac{t_2}{1-t_1}$$

$$t_1 = 0.2; t_2 = 0.125; m_s = 0.2; \frac{I}{\text{GNP}} = 0.1$$

CHANGE INVESTMENT RATIO			
<u>Propensity to save effect</u>	<u>Lower interest rate effect</u>		<u>Total Effect</u>
0.01	($\epsilon = 0.5$)	0.007	0.017
0.01	($\epsilon = 1.0$)	0.014	0.024

OPEN ECONOMY CAPITAL MARKET: MAXIMUM EFFECT
 (return abroad not affected by taxation) 1/



$$\begin{aligned} \frac{\Delta}{\text{GNP}} &= n \cdot \frac{t_2}{1-t_1} \cdot \frac{I}{\text{GNP}} \\ &= (0.1) (0.156) \cdot n \\ &= (0.0156) \cdot n \end{aligned}$$

CHANGE INVESTMENT RATIO			
$\frac{\Delta}{\text{GNP}}$	=	0.0078	if $n = 0.5$
	=	0.0156	if $n = 1.0$
	=	0.0234	if $n = 1.5$

1/ Returns on capital invested abroad can only be consumed abroad. Otherwise investment alternatives abroad must also be taxed, the negative effect on domestic investment becoming smaller.



World Bank Publications of Related Interest

The Determinants of Labor Earnings in Developing Metropolises: Estimates from Bogota and Cali, Colombia Rakesh Mohan

Staff Working Paper No. 498. 1981. 135 pages (including 2 appendixes, bibliography).

Stock No. WP 0498. \$5.

Differences in Income, Nutrition, and Poverty within Brazil Vinod Thomas

Staff Working Paper No. 505. 1982. 91 pages (including references, map).

Stock No. WP 0505. \$3.

The Distribution of Income in Brazil

Guy P. Pfeffermann and Richard C. Webb

Staff Working Paper No. 356. 1979. 116 pages (including 2 appendixes).

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Economic Growth and Employment in China

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Examines how China's agricultural sector has made significant strides toward full employment for a labor force of nearly half a billion persons.

Oxford University Press, 1979. 208 pages (including maps, bibliography, index).

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Stock Nos. OX 520151, \$18.95 hardcover; OX 520152, \$7.95 paperback.

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Spanish: *Crecimiento economico y empleo en China. Editorial Tecnos*, 1980. ISBN 84-309-0871-4, Stock No. IB 0530, \$7.95.

Employment Patterns and Income Growth

Joseph J. Stern and Jeffrey D. Lewis

Staff Working Paper No. 419. 1980. 70 pages (including bibliography, 2 appendixes).

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Employment Policy in Developing Countries: A Survey of Issues and Evidence Lyn Squire

Low rates of growth in industrial employment, high rates of unemployment among new entrants to the urban labor market, and low levels of labor productivity and remuneration are the three issues addressed in this study. The author identifies the important determinants of labor demand and supply and the extent to which the growth of labor demand has been constrained—and labor supply advanced—by inappropriate policies. On the demand side, industrial trade policy, agricultural growth, and the operation of capital markets are discussed; on the supply side, attention is focused on population and education policy.

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Growth and Equity in Semi- Industrialized Countries

Joel Bergsman

Staff Working Paper No. 351. 1979. 115 pages (including references).

Stock No. WP 0351. \$5.

Growth with Equity: The Taiwan Case

John C. H. Fei, Gustav Ranis, and Shirley W.Y. Kuo

Introduces a method for tracing the inequality of family income to the inequality of various kinds of factor income and the shares of factor income in family income.

Oxford University Press, 1980. 444 pages (including index).

LC 79-23354. ISBN 0-19-520115-9, hardcover; ISBN 0-19-520116-7, paperback. Stock Nos. OX 520115, \$27.50 hardcover; OX 520116, \$12.95 paperback.

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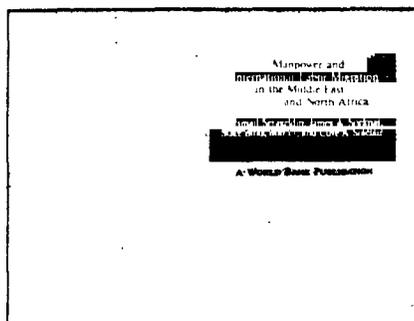
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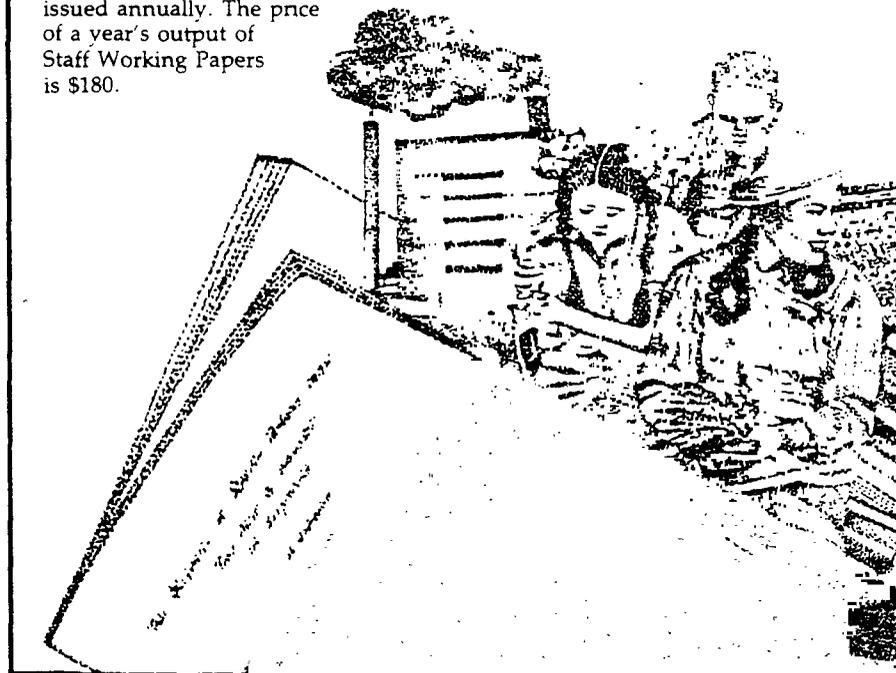
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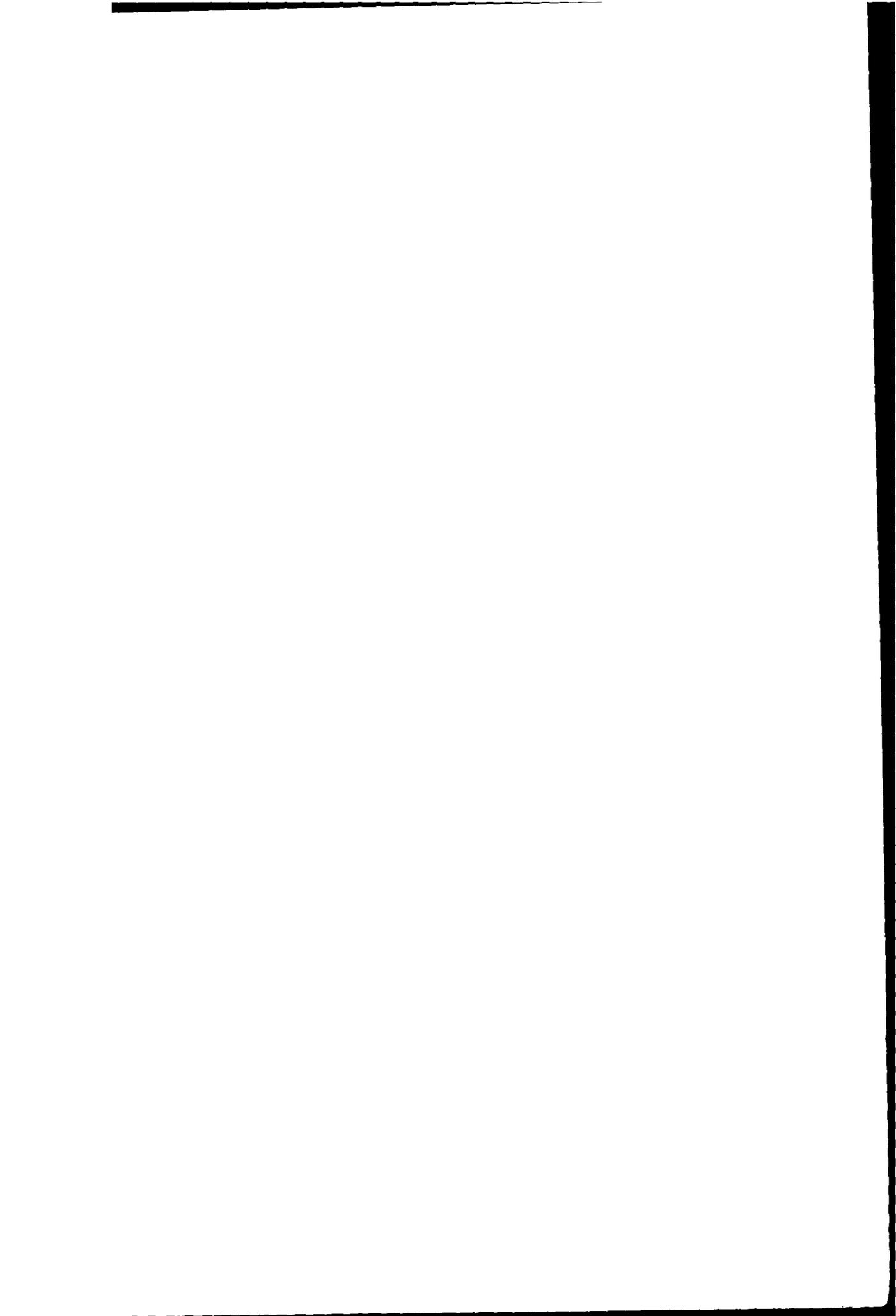
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