POVERTY AND INCOME DISTRIBUTION IN BRAZIL[1]

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The article refutes the contention that Brazil's development has not benefited the poor and that rapid growth has had a polarizing effect on the distribution of income. It uses the National Household Expenditure Survey of 1974–75 to try to quantify the extent of poverty and concludes that the income levels of the poor have been underestimated in the past. The evidence suggests also that occupational and regional variables are powerful determinants of income stratification. Wage rate statistics convey information about long-term trends in income. The article notes considerable increases in rural wages during the 1970s as well as wage improvements in the urban informal sector. Shifts in the structure of employment have probably been the most powerful cause of economic improvement in Brazil. The enormous absorption of rural–urban migrants occurred without a flooding of the lower income urban categories. Social indicators and statistics referring to ownership of household durable consumer goods corroborate income and labor market evidence to the effect that there has been considerable progress for the poor during the 1970s. The article reviews statistical evidence bearing on distribution. There is little doubt that the distribution of income in Brazil is very skewed. It is not possible, however, to come to conclusions about changes that might have occurred in the degree of inequality over time. Finally, the article includes data on the "distribution of education" and the "distribution of life expectancy" and notes improvement over time in both.

This article takes advantage of the Brazilian population census of 1980 to bring up to date some of the statistical material that bears on the issues of poverty and income distribution. First, the article describes the overall context of Brazilian development since 1960. The second part analyzes the extent of poverty in the mid-1970s. The third part deals with trends in wages, employment and selected welfare indicators. The last section briefly summarizes the information relating to income distribution: what is the extent of skewedness and how has it evolved over time?

I. THE OVERALL CONTEXT

Since the issue of income distribution in Brazil is most often posed as a case of "rapid growth with growing concentration" it is useful to establish some facts on growth. These are first that growth rates have been very variable, ranging from 3 consecutive years (1963–65) when *per capita* growth was negative to 3 consecutive years (1971–73) when it surpassed 8.5 percent per year. At the same time this variability in real growth was accompanied by high and also variable rates of inflation. Second, annual per capita growth in GDP was relatively slow for over half the intercensal period. Between 1962 and 1967 it averaged only 0.7 percent; for the intercensal period as a whole it averaged about 3 percent. The intercensal decade (1960–1970), therefore, is not a convenient period for posing questions about distribution during rapid growth. Starting in 1968, *per capita* output grew by close to 8 percent per year until 1974. Since then, this moderated to about 5 percent. Much of the debate about distribution in Brazil took place in the early seventies and was based on data for the sixties, particularly the censuses. The present is therefore an opportune moment for reviewing the growth-distribution relationship under the very different growth contexts of pre-1968 and post-1968.

[1] The article reflects the views of the authors and not necessarily those of the World Bank.

A third feature of the growth record is the remarkable performance of agricultural crops which grew at 7.6 percent per year between 1955–1965 and 12.4 percent per year between 1966–1977. The substantial growth in agriculture satisfied a major necessary condition for improvement in rural incomes. Furthermore, with the help of massive rural-urban migration, which reduced the increase in farm families to at most 0.6 percent per year, and of favorable terms of trade, these output gains were translated into a considerable growth in real agricultural value added per household. This poses the question of how productivity gains were distributed within agriculture.

It is difficult to evaluate poverty and income distribution in Brazil without reference to the considerable degree of economic and social diversity. Some of this can be traced to the different origins of immigrants, but the most powerful factors are probably ecological differences, and the speed and uneven spread of technological change.

The failure to notice this diversity underlies many oversimplifications about income distribution and poverty in Brazil. The population is frequently reduced to a few categories that fit theories or paradigms, such as industrial labor, the Northeast landless, and senior executives. But factory workers and the Northeast landless *together* account for only 12 percent of the Brazilian labor force, while the total income of senior managers is also a relatively small proportion of total personal income. The great bulk of income and employment is left out in discussions that center on those categories. Within the Northeast, for example, there are as many owners and self-employed in nonfarm businesses as there are landless farm families; the former are growing much faster in number, and their average income is over three times that of the landless. There are almost as many domestic servants as factory workers. In 1974, family employment on small and medium farms in the South region alone (States of Parana, Santa Catarina, and Rio Grande do Sul) was as large as that in all factories with 50 or more workers in Brazil, and total income received by each group was similar. In 1976 there were twice as many workers in Government and welfare services as in factories. Market and institutional forces affecting employment and incomes in these other, generally neglected components of the economy are thus, by far, the biggest part of the story.

Finally, one cannot examine poverty and income distribution in Brazil without noting the highly dynamic and mobile character of the population and its economy. In such an environment, the traditional attention given to cross-section or static measures of inequality needs to be complemented with measures that reveal the income experience of individuals or groups over time. This mobility has several aspects, the most familiar being the high rate of net rural-urban migration. Between 1970 and 1980 Brazil's population increased by 28 percent. While the urban population increased by 55 percent the rural population *decreased* by 6 percent. Less familiar is the extent of movement *within* rural and urban areas, and the large urban-rural return migration. One measure of all this locational change is the 1970 Census statistic that 25 percent of all families had had less than two years' residence in their present home. Another is the extent of labor turnover: in 1970, 60 percent of all manufacturing employees in Sao Paulo State (the sample covers mostly medium and large firms)

had been employed less than two years in their current job. The extent of turnover is related to the youth of the labor force: 1 in 3 workers were less than 20 years old. A further aspect is that Brazil is still a frontier country: cultivated acreage expanded by 35 percent between 1960 and 1975. The urban counterpart is that around 1969–1970 about 15,000 manufacturing establishments of 5 or more workers were being created annually.[2] So much movement leads one to expect a great deal of individual income change with both upward and downward mobility. Extensive movement could also have high private costs, particularly to groups such as casual farm and construction workers who move frequently, and it may hamper the development of local and grassroots organization and thus the capacity for communal self-help.

II. THE EXTENT OF POVERTY

An approximate measure of the size and regional distribution of poverty is presented in Table 1 using a comprehensive household expenditure survey carried out in 1974 and 1975 known as ENDEF.[3] The main purpose of identifying the poorest group in the population is, of course, to orient the location and design of government efforts. The figures also provide a benchmark for measuring progress in the reduction of poverty. These purposes can be served by the arbitrarily defined poverty line used here. A further contribution could be made by estimating an absolute poverty line based on nutritional requirements, though more research is needed on the various dimensions of the relationship between income levels and basic needs.

The publication of partial results of the national household expenditure survey of 1974–75 (ENDEF) provides a more reliable basis for a measure of poverty than previously available statistics because it captures non-monetary as well as monetary income.

The poverty line chosen here—two Rio minimum wages per family or U.S. $260 per capita—identifies 27 percent of the population as poor. A crude adjustment for regional cost of living differences was carried out. The regional distribution of these families corresponds to common notions regarding Brazil: 61 percent of the poor are rural, and one-half are in the Northeast. A finding that is less generally known is that almost three quarters of the urban poor are in smaller cities and towns rather than in metropolitan areas. More precise measures would modify these findings. The most important improvement that is required is the estimation of more accurate regional cost of living differences.[4]

A major finding is that income levels of the poor have been underestimated in the past. Estimates based on the Pesquise Nacional por Amostra de Domicilios (PNAD) household survey of 1972 money income only data, for instance, place 62 percent of all households below the two minimum wage line. A recent

[2]*Censo Industrial* 1970, p. 270. The *net* increase in establishments of 5+ workers between 1960 and 1970 was only 28,000, implying considerable turnover of establishments.

[3]For a critical review of ENDEF and other statistical sources used in this article see Guy Pfeffermann and Richard Webb, The Distribution of Income in Brazil, World Bank Staff Working Paper No. 356, September 1979.

[4]For an analysis of regional differences in prices, see Vinod Thomas, Differences in Income, Nutrition and Poverty within Brazil, World Bank Staff Working Paper No. 505, February 1982.

TABLE 1

THE EXTENT OF POVERTY: FAMILIES UNDER TWO MINIMUM WAGES:[1] 1974–75

Regions	Total Families ('000)	Percent Poor in Region	Number Poor ('000)	Regional Distribution of Poverty (Percentage)
Rio	*2,169*	*11*	*244*	*4*
Metropolitan	1,784	9	163	3
Other Urban	209	14	28	1
Rural	176	30	53	1
Sao Paulo	*4,168*	*9*	*385*	*7*
Metropolitan	2,078	5	103	2
Other Urban	1,413	11	156	3
Rural	677	19	126	2
South	*3,548*	*15*	*520*	*9*
Metropolitan	601	8	48	1
Other Urban	1,162	13	147	3
Rural	1,785	18	325	6
Minas G. & E. S.	*2,592*	*30*	*788*	*14*
Metropolitan	367	14	52	1
Other Urban	1,034	25	260	5
Rural	1,191	40	476	9
Northeast	*5,791*	*52*	*3,008*	*54*
Metropolitan	844	27	231	4
Other Urban	1,673	44	731	14
Rural	3,274	62	2,046	37
North & D. F.[2]	*2,032*	*30*	*619*	*11*
Metropolitan	156	4	6	—
Other Urban	918	25	230	4
Rural	958	40	383	7
Total	*20,300*	*27*	*5,566*	*100*
Metropolitan	5,830	10	603	11
Other Urban	6,409	24	1,554	28
Rural	8,061	42	3,409	61

[1]Adjusted for regional cost of living differences. Income concept is total family expenditure including nonmonetary and capital (real estate, vehicles, stocks) expenditures. (From ENDEF, Table 7.) Basis for poverty line was the highest regional minimum wage in August 1974, or Cr. $376.80 per month. Adjustment for regional cost of living differences is an arbitrary approximation. Differences were assumed to equal 30 percent between rural and Metropolitan and 20 percent between rural and other urban. The poverty line is Cr. $9,000 per year (U.S. $1,300) in Metropolitan areas, Cr. $7,500 in other urban areas and Cr. $6,923 in rural areas. Assuming an average family of 5, this amounts to a poverty line of U.S. $260 per capita in metropolitan areas.

[2]Data for North are approximations guided by PNAD 1972 data on families by income class and by regional unskilled wage differentials.

joint study of the UN Economic Commission for Latin America and the World Bank, using PNAD 1972 total income figures and an almost identical poverty line, estimates that 47 percent of Brazilian families were poor in 1972, a figure substantially higher than the 27 percent obtained from ENDEF.[5] Using a lower

[5]Oscar Altimir, The Extent of Poverty in Latin America, World Bank Staff Working Paper No. 522, March 1982. The poverty line was Cr. $890 per capita per year which, in August 1974 prices, amounts to Cr. $9,700 vs. Cr. $9,000 used here.

poverty line of U.S. $130 per capita, which is closer to figures normally used in other countries, would reduce the poverty group to less than 15 percent of the population.

The most thorough previous measurement of poverty levels and characteristics was carried out by Meesook and Fishlow for 1960, using Census data.[6] Their poverty line was equal to one Northeast urban minimum wage, or U.S. $130 in 1974 prices.[7] After adjusting for non-monetary income, they estimate that 31 percent of all families in 1960 fell below that level. If we apply the same real poverty line to the ENDEF data, the share of the poor is in the order of 15 percent, or half of the 1960 level.[8] Since there is a strong presumption that ENDEF figures are better approximations to true income than Census-based estimates, this inconsistency has only two possible explanations. One is that even the corrected Fishlow–Meesook income figures are severe underestimates. Another is that poverty has been reduced. Since it would require an implausibly large underestimation to explain the gap, it seems probable that the much lower poverty share in 1974–75 is the result, at least in part, of a real reduction in poverty.

The discovery of higher income levels at the bottom of the distribution is more a measure of the inaccuracy of earlier statistics than of the adequacy of those income levels. There is much direct evidence on the high levels of malnutrition, mortality rates and severely deficient services and living conditions that correspond to income levels in the vicinity of two minimum wages. In part this reflects high prices in Brazil by international standards. More important perhaps is the fact that some aspects of family welfare in Brazil have lagged behind the growth of money incomes. This is most obvious with respect to the lag in public services and relatively high levels of malnutrition, but it may also involve aspects of welfare that are difficult to quantify, such as low levels of communal support and resources, and the costs associated with high degrees of individual mobility.

The broad occupational-regional hierarchy is provided in Table 2 using ENDEF data. The occupations are those of heads of families only, while the incomes shown include the earnings of secondary workers and are therefore higher than the earnings of any individual in those categories. The table illustrates the power of both occupational and regional variables in creating stratification. One point to note is the big differential between farm and nonfarm manual labor ("Farm Laborer" and "Employee: Manual"). In all regions, the landless laborer doubles his income by moving to urban manual employment within his own region. Allowance for urban-rural cost of living differences would still leave increases of well over 50 percent since the landless buy much of their food, while at least half of nonfarm manual employment is in small cities and towns where cost of living differences with rural areas are not as large as in metropolitan areas. The rural-Northeast to urban-Rio move roughly triples income, while the

[6] Albert Fishlow, Brazilian Size Distribution of Income, *American Economic Review*, 1972.

[7] Applying the Guanabara Retail Price Index, plus an upward adjustment for the rate of inflation in 1973 which government spokesmen now admit to be closer to 22.5 percent than the official figure of 12.6 percent.

[8] Reflated to 1974 prices using the Guanabara Cost of Living Index.

TABLE 2
RANKING OF OCCUPATIONAL AND REGIONAL GROUPS BY INCOME LEVEL (HOUSEHOLD
HEADS AND HOUSEHOLD INCOME), 1974–75

Occupational Category	Non-Agriculture			Agriculture		
	Region	Mean Income ('000)	Number Families ('000)	Region	Mean Income ('000)	Number Families ('000)
Total			*9,219*			*6,263*
Manager	Rio	169.1	78			
	SP	167.2	82			
	MG	143.4	19			
	NE	137.9	37			
Employer or Professional	MG	136.3	62			
	SP	123.1	204			
	Rio	120.7	87			
Manager	South	120.4	34			
Employer or Professional	South	108.5	117			
Middle Management	SP	79.1	235			
Shopkeeper	SP	71.8	159			
Employer or Professional	NE	67.9	84			
Middle Management	Rio	67.7	139			
	South	57.6	116			
Farmer				SP	54.5	102
Middle Management	MG	54.0	68			
	NE	52.1	96			
Farmer				MG	45.2	150
				Rio	45.1	23
Shopkeeper	South	44.4	117			
Employee: Nonmanual	SP	43.3	405			
Shopkeeper	Rio	42.9	57			
Farmer				South	42.5	286
Self-employed	SP	38.2	261			
Workshop	SP	36.8	121			
Employee: Nonmanual	South	35.7	179			
Workshop	South	35.5	96			
Employee: Nonmanual	MG	34.4	123			
	Rio	34.2	254			
Shopkeeper	MG	34.0	96			
Workshop	Rio	31.0	49			
	MG	30.9	43			
Employee: Manual	SP	25.6	1,337			
Self-employed	Rio	24.9	169			
	South	24.5	195			
Small Farmer				SP	23.2	174
Employee: Nonmanual	NE	23.0	200			
Employee: Manual	Rio	21.0	685			
Small Farmer				South	20.2	930
Employee: Manual	South	19.2	714			
Self-employed	MG	17.8	180			
Shopkeeper	NE	17.3	343			
Employee: Manual	MG	16.3	526			
Small Farmer				MG	16.0	439
Farmer				NE	15.9	487
Small Farmer				Rio	14.8	41
Workshop	NE	14.4	147			
Farm Laborer				SP	12.6	400
Employee: Manual	NE	11.9	848			
Self-employed	NE	10.8	457			

TABLE 2 (cont.)

| | Non-Agriculture | | | Agriculture | | |
Occupational Category	Region	Mean Income ('000)	Number Families ('000)	Region	Mean Income ('000)	Number Families ('000)
Farm Laborer				South	9.9	329
				Rio	9.0	71
				MG	7.5	480
Small Farmer				NE	7.3	1,239
Farm Laborer				NE	5.5	1,112

Sources: ENDEF. Occupation is of head of household. Income is annual household income in August 1974 cruzeiros. Exchange rate = Cr. $/U.S. $.

Definitions
 1. Manager: senior managers, generally with professional qualifications.
 2. Employer or professional: includes self-employed professionals.
 3. Middle management: includes supervisory positions requiring high school level.
 4. Shopkeeper: includes owners of service establishments.
 5. Farmer: middle and large farmer who employs wage-labor.
 6. Employee: nonmanual: low level office workers, store and service employees.
 7. Workshop: artisan, repair shop and other manual activities.
 8. Self-employed: owner of unregistered, nonfarm establishment.
 9. Small farmer: doesn't hire labor.
10. Farm laborer: main source of income is wages.
11. Regions: SP: Sao Paulo; MG: Minas Gerais; NE: Northeast.

family income of a Sao Paulo manual worker is 4.7 times that of a Northeast farm laborer.[9]

The data in Table 2 also indicate the size and composition of middle income groups; 34 percent of all families, for instance, have family incomes on the order of 5 to 20 minimum wages (Cr. $22,500 to 90,000). These include a sizeable contingent of farmers who achieve incomes well above those of agricultural laborers and who comprise a rural middle class. Much larger, however, is the size of the urban middle-income groups made up of skilled workers and a large number of small business owners.

Within agriculture, there is a strong relationship between regional average productivity and the incomes of both small farmers and farm laborer households.[10] These relationships are shown in Table 4. The comparison in that table is crude, owing chiefly to the lack of regional value added data for 1974–75, but it serves to establish the relationships between productivity and incomes.

[9]A recent study by Vinod Thomas, *op. cit.*, attempts to quantify price differences between regions, and within regions between metropolitan, other urban, and rural areas, for the poorer population of Brazil. Rural prices are lower, by and large, than urban prices, and metropolitan prices are higher still, owing largely to higher rents. Compared to an average price index of 100 (for 1974–75) the following are some area indices: Metropolitan Sao Paulo (179), Belo Horizonte (127), Curitiba (125), rural Sao Paulo (90), rural Minas Gerais and Espirito Santo (78) and rural South (80). There are no data for the rural Northeast, a major source of migration. Source: *op. cit.*, Table 5, p. 73. The Thomas estimates cited above concern the lowest 4 deciles in the income distribution scale. They are not inconsistent with the analysis in this article.

[10]For a review of agricultural policies and performance since World War II see Fred D. Levy *et al.*, Brazil—A Review of Agricultural Policies, World Bank, 1982.

First, small farmer incomes are strongly correlated with average regional productivity: the high productivity of the South and Southeast is not limited to large farmers. Second, the farm laborers also benefit substantially from higher regional productivity: the elasticity of their household incomes to regional productivity is between one-third and one-half. That elasticity is about twice that of the rural wage *rate*. The Sao Paulo farm wage-earner's household income is higher than in the Northeast only partly because the regional wage rate is higher. Over half the higher family income of the Sao Paulo farm laborers must be explained in other ways. One possibility is more days worked per year, which may in turn be related to more developed labor markets (better information, quicker transport, and more efficient intermediation). Another is more and better paid work opportunities outside agriculture—in towns and cities during agricultural slack seasons. These greater employment opportunities apply as well to secondary earners. Finally, since many wage-earners have access to some land, they may enjoy higher productivity on those plots than their counterparts in the Northeast.

What is most interesting about the cross-section relationship between small farmer and wage-earner incomes and regional productivity is that it suggests that the gains from productivity growth and improved terms of trade have been widely shared within the agricultural sector.

III. Trend in Wage Rates, Employment and Selected Welfare Variables

Wage Rate Trends

The limited direct evidence on trends in the income of specific occupational categories are the wage series summarized in Table 3. The broad conclusions that are suggested by those data are first that most wages have been rising though at very variable rates. The general picture is clearly not one of wage stagnation. A second conclusion is that most wages grew faster during the period of accelerated economic growth which began in 1968, though the pre-1970 data is scant. The single most striking and important feature of those series is the marked increase after 1970 of real wage rates for casual rural farm laborers. These wage rates went up by 75 percent in real terms between 1970 and 1980. Excluding the most advanced state of Sao Paulo, the average wage rate for casual rural laborers went up by 76 percent for the rest of Brazil. For comparison, per capita income went up by 77 percent during the period 1970–1980. Thus an important group of workers who are among the poorest in the country experienced a substantial absolute improvement in their daily earnings.[11] The convergence of rural and urban wages for unskilled labor as well as the convergence between wages in different parts of Brazil suggest the emergence of an increasingly homogeneous national labor market. Convergence has meant progress, especially for the poorest groups.

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[11]The rural wage series refer to cash only. After the extension of labor legislation to the rural areas in the mid-1960s the income in kind of many rural workers was reduced; this reduction is unlikely to have had much if any bearing on rural income trends in the 1970s.

TABLE 3

INCOME AND WAGE TRENDS: INDICES

	Base Year =100	1970	1971	1972	1973	1974	1975	1976	1977
1. Sao Paulo: Casual Rural Wage	1960	112	121	128	145	180	184	193	210
2. All Brazil: Casual Rural Wage	1968	97	103	109	130	157	165	159	156
3. Construction: Unskilled	1968	92	95	99	100	111	117	117	116
4. Construction: Skilled	1968	89	91	97	103	94	99	97	94
5. Construction: Foremen	1968	88	105	127	134	154	165	174	178
6. Urban Employees (SEPT)	1965	121	121		144				
7. Manufacturing Mean Wage (Central Bank)	1971		100	108	119	119	131	140	
8. Manufacturing Mean Wage (FIBGE/DEICOM)	1959	132	136	149	149	152	161		
9. Manufacturing Mean Wage (Sao Paulo: 2/3 Law)	1972			100			128		
10. Manufacturing Mean Wage (Sao Paulo: DIESSE)	1961		92					97	
11. Manufacturing Mean Wage (Sao Paulo: DIESSE) (with FGV deflator)	1961		104					121	
12. Car Industry	1966	114	113	124	129	127	130		
13. Basic Industries (ABDIB)	1971		100	108	119	119	131	140	

Note: All series deflated by Rio Cost of Living Index (adjusted upwards in 1973) unless otherwise indicated.

Line
1-5: FGV (rural wages); FIBGE (construction wages).
  6: Law of 2/3, SEPT, Ministry of Labor.
  7: *Boletín do Banco Central do Brasil.*
  8: Mean remuneration of plant workers in manufacturing (includes plant supervisors and foremen) obtained from industrial surveys.
  9: A weighted average of mean industry wages obtained from R. Macedo, *Emprego e Salario No Ciclo Economico* 1972-75, Programa de Estudos, Secretaria de Emprego e Salario do MTG, FIPE.
 10: DIESSE. Deflated by DIESSE cost of living index.
 12: ANFAVEA. Deflated by FIPE/USP cost of living index.
 13: *Conjuntura Economica.*

The trend in rural wages is made plausible by the relationship between regional farm incomes and agricultural productivity (Table 4). As suggested by these data, the trend in wages may not capture the full extent of income growth generated by rising productivity, since incomes may have been affected also by increased opportunities for work during the year, and for primary and secondary earners in both rural and urban areas. The close association between the trends in rural wage rate and farm productivity may be seen in the following figures. An index of agricultural value added in Brazil, deflated by the cost of living index to reflect consumer purchasing power, moves as follows: 1959 = 100, 1970 = 97, 1975 = 172, 1977 = 223. The rural casual wage shown in Table 2 follows the same pattern closely: little change during the sixties; sharp increase between 1970-75. The levelling off in the rural wage since 1975 suggests that

TABLE 4

FARM HOUSEHOLD INCOMES AND REGIONAL AGRICULTURAL PRODUCTIVITY

		Indices of		
		Household Income		
	Regional Agricultural Value Added per Worker 1970–72	Small Farmer 1974–75	Farm Laborer 1974–75	Rural Casual Wage 1974
Sao Paulo	452	318	229	149
South	306	277	180	146
Rio	257	203	164	107
Minas Gerais	174	219	136	121
Northeast	100	100	100	100

Source: ENDEF for household incomes. National accounts for 1970 value added. J. F. Graziano da Silva, coordinator, *Estrutura Agraria e Produçâo de Subsistencia na Agricultura Brasileira* (Sao Paulo: Editora Hucitec. 1978), Table 51 for 1970 regional productivity per worker. For 1972 we used average of productivity per permanent and per maximum (peak season) annual employment. 1970–72 figure shown here is average of those two years. Vargas Foundation for rural casual wage.

it was the exceptional *combination* of an urban boom with sharp growth in agricultural value added that generated so strong a response in wages, and that the slowing down of urban growth has reduced pressure on the supply of rural labor.

Regional and Sectoral Income Differentials

Table 5 shows evidence that challenges the common presumption that per capita income growth was concentrated in urban areas and in the Southeast.

Between 1960 and 1976 per capita income in the Northeast kept pace with Sao Paulo (Line 2) and Brazil as a whole (Line 6).[12] This overall performance shows up in both urban and rural areas. The Sao Paulo–Northeast urban differential is remarkably constant over the five different years (and sources) shown (Line 3). As might be expected, the rural differential is more variable: Northeast rural income lags behind rural income in Sao Paulo (Line 4) but grows faster than the South (Line 5). Independent support for these results is provided by trends in regional wage differentials: both agricultural and skilled construction wage rates (Lines 10 and 13) rise more rapidly in the Northeast than in the South and Southeast, between 1968 and 1980, though unskilled construction wages lag (Line 12). Finally, the trend in agricultural land rents is consistent with the income and wage data: the price of both rented cropland (Line 18) and pasture (Line 19) rose at almost the same rates in the Northeast and South.[13]

[12]The small changes in the ratios—a lag of 5 percent by the Northeast relative to Brazil as a whole, a gain of 5 percent relative to Sao Paulo—are not statistically significant, in view of the deficiencies of census and survey income data and in relation to the *doubling* of income per capita over the period.

[13]In real terms the rental price of land in the Northeast rose 87 percent for crops and 18 percent for pasture.

TABLE 5

TRENDS IN REGIONAL AND SECTORAL INCOME DIFFERENTIALS

	1959	1960	1966	1968	1970	1972	1974	1976	1977
Regional per Capita Incomes									
1. Urban ÷ Rural: Brazil		2.17			2.74	2.32	(2.93)	2.33	
2. S. Paulo ÷ Northeast		2.11			1.98	2.64	(2.53)	2.00	
3. S. Paulo ÷ Northeast (Urban)		2.00			1.93	1.96	(2.22)	1.96	
4. S. Paulo ÷ Northeast (Rural)		1.86			2.15	2.83	(2.55)	2.17	
5. South ÷ Northeast (Rural)		2.11			1.98	2.64	(2.53)	2.00	
6. Brazil ÷ Northeast		1.76			1.80	1.93	(2.02)	1.84	
Regional-Sectoral Wages									
7. Construction: Unskilled ÷ Rural Casual				1.56	1.49	1.43	1.10	1.15	1.16
8. *Idem*: Sao Paulo				1.30	1.20	1.12	1.03	0.88	0.81
9. Urban Minimum ÷ Rural Casual				1.72	1.72	1.64	0.96	1.03	1.09
10. Rural Casual: S.P. and South ÷ NE				1.71	1.81	1.81	1.52	1.58	1.57
11. Minimum: Southeast ÷ NE		1.65	1.65	1.64	1.50	1.47	1.41	1.41	1.41
12. Construction: Unskilled: Rio and S.P. ÷ NE				1.59					1.74
13. Construction: Skilled: *idem*					1.59				1.55
Occupational-Sectoral Wages									
13. Construction: Skilled ÷ Unskilled				1.97	1.91	1.92	1.68	1.64	1.60
14. Manufacturing: (20+): Non-plant ÷ Plant	2.37				2.69	2.46	2.59		
15. Manufacturing: Large (20+) ÷ Small (5–19)	1.40				1.79	1.72	1.41		
16. Manufacturing: Plant (20+) ÷ Small (5–19)	1.16				1.47	1.35	1.10		
17. Government ÷ Private (Nonag. Employees)		1.64			1.64			1.41	
Land Rent									
18. Cropland: NE ÷ Rio and South			1.00					0.96	
19. Pasture: NE			1.00					1.11	
Value Added per Household									
20. Nonagriculture ÷ Agriculture	5.38				7.70			5.11	

Line

1–6: Sources: Langoni (1973) for 1960 and 1970; PNAD 1972, Table 6.1; ENDEF; PNAD 1976 (Table 26). See Notes to Table 9 and Annex Table for coverage. All data are for individual recipients except ENDEF (bracketed) which are for households.

   5: South equals Region III Sul (Parana, Sta. Catarina and Rio Grande do Sul).

7–13: See Table 3.

14–16: Censo Industrial 1960; Censo Industrial 1970; Pesquisa Industrial 1972; Pesquisa Industrial 1974. All by FIGBE. Plant workers are "Pessoal ligado à Produção": covers plant engineers and supervisors, skilled and unskilled plant workers. Non-plant includes administrative and service workers. This breakdown was calculated here for firms with 20 or more workers only because of suspected poor quality of this statistical distinction in smaller firms.

   17: 1960 Census, 1970 Census and 1976 PNAD.

18–20: *Conjuntura Economica*, June 1977, p. 101. States weighted by agricultural labor force.

The overall urban-rural income ratio rises between 1960–70, but then falls between 1970–76 to a level only 7 percent higher than in 1960 (Line 1). Some improvement in the reporting of farm income in kind in the 1972 and 1976 surveys may contribute to this result, but coverage of urban cash income also rose and there is no basis for knowing whether coverage improved more in rural or urban areas. Wage statistics support the Census and PNAD income data: the gap between urban and rural unskilled wages falls from 56 percent in 1968 to 16 percent in 1977 (Line 7).[14] Additional evidence is provided by national accounts and demographic data. These show a net *decline*, between 1959 and 1976–77, of the ratio between nonagricultural and agricultural productivity (Line 20). The ratio rose substantially between 1959 and 1970, but the increase was more than offset after 1970 by a combination of real output growth, improved farm terms of trade, and continuing rapid rural outmigration.

One measure of sectoral inequality is provided by the differential between the average wage in factories (20 or more workers) and workshops (5–19 workers) (Line 15). This ratio, which can be interpreted as a differential between protected and unprotected sectors, grows between 1960 and 1970, but then declines to its original level in 1959. This pattern matches evidence from educational and occupational differentials that some widening did occur between 1960 and 1970, but that this trend slowed or was reversed after 1970. Another statistic that fits this pattern is the wage ratio between non-plant and plant workers in factories (Line 14), which follows a similar cycle between 1959 and 1974.

A related sectoral measure is the income ratio between government and private nonagricultural employees (Line 17). Between 1960 and 1976, government workers *lose* relative to private. Factories and government together account for the bulk of what is usually considered the "modern sector"; they are also the categories of employment most subject to direct policy influence on wages. In both, wages are higher than in informal or small-scale establishments, but that premium shows no net increase between 1959 and 1976. In fact, the average wage in the modern sector as a whole appears to fall relative to that in the urban informal sector.

Employment

The two main features of the change in employment patterns between 1960 and 1976 are a substantial move out of agriculture, and an upgrading of the urban employment structure (Table 6). The absolute number of farm households increased by only 11 percent over 16 years, and the rate of increase appears to have been slowing.[15] Thus, 4 out of every 5 farm households that would have

[14]The absolute size of this premium is not known exactly since reported farm wage rates are on a daily basis, and reported construction rates are hourly: the measured premium will turn on the assumption made regarding average hours and days worked. Also, payments in both these markets more often than not include pay in kind, piece rates, and other incentive pay. The published rates are reportedly for "pure" cash contracts but the frequency of "impure" contracts allows considerable room for unmeasured differences in the average levels of these two key wage rates, as well as in their trends.

[15]A comparison of 1970 Census and 1976 PNAD data shows a minimal change between 1970 and 1976 (an absolute growth of only 2 percent), but the margin of error is larger than between Censuses.

TABLE 6

THE STRUCTURE OF EMPLOYMENT 1960–76

	Labor Force (in Millions)						Annual Percentage Growth 1960–76	
	Household Heads				Total Labor Force[c]			
	1960	1976[a]	1960	1976	1960	1976	Heads	Total
	(Millions)		(%)					
Total	*12.06*	*19.28*	*100*	*100*	*22.75*	*39.72*	*3.0*	
Agriculture	*6.77*	*7.49*	*56.1*	*38.8*			*0.6*	
Nonagriculture	*5.29*	*11.79*	*43.9*	*61.2*			*5.3*	*5.7[c]*
Manufacture and Construction	1.50	4.67	12.4	24.2			7.4	
Transport and Commerce	1.67	2.91	13.8	15.1			3.5	
Personal Services	1.04	1.73	8.6	9.0			3.2	
Government and Social Services	0.67	1.65	5.6	8.6			5.8	
Others	0.41	0.83	3.4	4.3			4.5	
Selected Subgroups								
Activity								
Construction					0.78	2.69		8.0
Factories (50+ workers)					(1.23)[b]	(2.95)[b]		5.5
Women in Personal Services					1.48	3.29		5.1
Occupation								
Administrative and Technical					2.53	7.61		7.1
Manual (nonagriculture)					8.15	17.59		4.9
Status (Nonagriculture)								
Self-employed and Family					2.97	5.29		3.7
Employees					7.91	19.38		5.8
Participation Rates[d]	*1960*	*1970*	*1972[c]*	*1976*				
Population (10+)	46.6	44.9	52.7	50.8				
Women (10+)	16.6	18.5	29.9	29.6				
Men (10+)	77.2	71.8	76.1	73.6				
Men (10–19)	45.2	38.8	48.4	45.9				

Sources: *PNAD 1976. Censo Demografico 1960. Censo Industrial 1960. Pesquisa Industrial 1974. PNAD 1972.*

Notes

[a] Adjusted upwards to include rural areas of North region using 1970 Census share of rural North in total population (3.6%). Nonagriculture figures are slightly underestimated due to omission of nonagricultural workers in rural areas of North.

[b] Estimated from 1959 and 1974 figures using the 5.5 percent annual growth rate recorded between 1959–1974.

[c] As argued in the text, the comparison of total labor force structure between 1960 and 1976 is biased by definitional changes which lead to higher participation rates in 1976. The change is especially large in agriculture so only heads are compared in that sector.

[d] The purpose of showing these data is to *demonstrate* the incomparability between Censuses (1960 and 1970) and surveys (1972 and 1976), particularly by showing the jump between 1970 and 1972 in the rates for women and young men.

been created through natural population growth emigrated. As a result, the number of nonagricultural households more than doubled, growing at 5.3 percent yearly over the whole period and at a slightly faster rate since 1970. The contribution to income growth of that movement is measured by the differential between agricultural and non-agricultural mean household incomes. The most reliable measure is provided by ENDEF: for Brazil as a whole it was 2.5 times in 1974–75, and the size of the differential appears to have remained roughly constant since 1960.[16] An approximate adjustment for urban-rural cost of living differences would still leave a differential on the order of 2 times.

The constancy of the differential itself suggests that this enormous absorption by urban areas occurred without a flooding of the lower income categories. But more direct evidence is provided by the favorable trends in the composition of non-agricultural employment. As may be seen in Table 5, administrative and technical occupations gained relative to manual; secondary activities gained related to tertiary; within tertiary, government and social services (mostly teachers and nurses) gained relative to other services, and wage employment gained relative to self-employment and unpaid family workers. Amongst heads, the slowest growth was in personal services. One unfavorable trend appears to be a loss in the share of factories relative to workshops or small-scale manufacturing but factory employment grows almost as fast (5.5 percent) as total nonagricultural employment (5.7 percent).[17] Also, because the personal services sector has a particularly large share of secondary earners, its growth is much understated by the household head figures, but even the figure for all women in personal services, most of whom are in domestic service, shows a slower rate of growth (5.1 percent) than that for all non-agricultural workers (5.7 percent).

Those trends in some cases refer to household heads, and in others to the total labor force. The more reliable comparison is that for heads, because the post-1970 data are obtained from surveys which use different questions and definitions to define activity and, as a result, yield higher levels of labor force participation than do censuses (Table 6). The rate for women, for instance, jumps from 18.5 percent in 1970 to 29.9 percent in 1972. None of the trends cited above, however, are significantly affected by this potential bias.

Our estimate that the rate of employment growth in agriculture was only 0.6 percent per year is based on the notion that households are a preferable basis for defining employment trends in agriculture than individuals. This approach has some obvious shortcomings: it will miss changes in the extent of wage-work performed by women and children, or in the tendency for secondary earners in farm households to work in construction or other nonagricultural

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[16]Table 4, Lines 1 and 19. The *urban-rural* differential was 2.9 times in 1974–75.

[17]This statistic may be affected by changes in coverage. Factory employment (establishments with 50+ workers) is taken from Industrial Censuses of 1960 and 1970 and Industrial Survey of 1974. The 5.5 percent growth rate shown in Table 11 is that recorded between 1959 (1960 Census) and 1974. In principle, all these sources cover all employment in firms of only 5 or more workers, so coverage of 50+ firms should not vary. As a test of the Industrial Census data, the Census for 1972 yields 2.5 million employees, vs. 2.7 million in SEPT data, and 3.7 million employees for all size establishments according to PNAD 1972. The Census-PNAD residual implies that about 30 percent of manufacturing employment was missed by the Census, but the omission may all occur in firms of under 50 workers.

activity. This could be important, for instance, where access to land is declining, or where school enrollment is increasing. On the other hand, the usual definitions of labor force participation, where multiple and overlapping forms of activity are the rule, and where much activity is directed at production for own-consumption, can lead to large biases in estimates of the volume of employment. In the context of rural households in Brazil, standard definitions require highly arbitrary statistical allocations, and the resulting estimates are especially sensitive to changes in definitions or procedures. Thus, the growth rate of total agricultural employment obtained from a comparison of 1960 census and 1976 survey figures—1.3 percent per year—is much higher than that of heads of households in agriculture, but the difference is largely attributable to the different treatment of female activity. Thus, the difference arises only between censuses and surveys: between 1960 and 1970 the census data record a growth rate of total agricultural employment of only 0.5 percent per year, whereas, a comparison of the 1970 census and 1976 survey yields a growth of 2.5 percent per year. If women and male unpaid family workers are excluded, the growth of total agricultural employment between 1960 and 1976 is only 0.7 percent, similar to that for household heads.

One aspect of employment change with negative implications for income is an apparent reduction in access to land and parallel increases in dependence on wage work and in the urbanization of the agricultural labor force. Numerous studies claim the existence of such trends.[18] Some data for the State of Sao Paulo show an increase in the category of *volantes* (temporary day workers), from around 17 percent in 1964 to 26 percent of total agricultural employment in 1975,[19] but this phenomenon is particularly pronounced in Sao Paulo. There are no available estimates for all Brazil.

Changes in the proportion of landless agricultural households are difficult to estimate. The main approximation to landlessness is the category of agricultural wage-earners. In practice, there is enormous overlap between work on one's own land and wage-employment. The frequency and variety of share-cropping arrangements increase the difficulty of classification.

A proxy for the number of landless households is the number of men aged 24 and over classified as wage-earners. These grew only slightly between 1960 and 1970, from 23.5 percent to 26.0 percent of all farm households, though it is during this period, following the extension of protective labor legislation to rural areas in 1963, that much of the increase should have occurred.[20] Figures for years after 1970 are not comparable owing to a different treatment of share-croppers (*parceiros*) who in 1960 and 1970 were listed separately, but in 1976 were allocated between the categories of employees and independents according to the nature of their relationship with the landowner. In 1976, the

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[18]E.g. *O Trabalho Volante na Agricultura Paulista*, Ministerio do Trabalho, Secretaria de Emprego e Salario, Convenio SINE/SEMO, 1978. This was one of a series of state-level studies. The literature generally refers to *boias-frias* or *volantes*, terms applied to temporary wage workers.

[19]Data from Instituto de Economia Agricola, Secretaria de Agricultura, State of Sao Paulo.

[20]The Estatuto do Trabalhador Rural. However, changing crops and technologies may be a greater part of the explanation for the observed increase in casual wage-employment in many areas.

proportion of heads in agriculture defined as employees was 37 percent—a substantial jump over the 1970 figure of 26 percent—but the definitional component of the change is not known.

This review of statistical evidence on wage differentials, changing employment structure, and wage trends has found evidence of widespread income growth resulting from *both* movement to better jobs and rising incomes within categories of employment. The data are stronger on the shift component of income growth than on wage rates. Shifts in employment have clearly contributed to income growth at many levels, including the poorest. The wage trends also support the hypothesis suggested by other data reviewed above, that income growth amongst poorer groups accelerated after 1970. A proper statistical disaggregation of the sources of income growth would perhaps find that mobility and employment change contributed more to income growth during the intercensal decade than did rising wages, but that the independent contribution of wage increases to income growth rose after 1970.

Social Indicators

The trend in social indicators is consistent with the picture of steady deepening of welfare through income strata. Table 7 shows changes between 1960 and the late 1970s.

TABLE 7

SOCIAL INDICATORS

	1960	Late 1970s
Crude Birth Rate (per 1,000)	42.5	29.4
Crude Death Rate (per 1,000)	12.9	8.7
Child (ages 1–4), Mortality Rate (per 1,000)	17.3	8.3
Access to Safe Water (% of population)	56.3	77.1
Urban	77.7	88.8
Rural	29.0	56.8
Population per Physician	2,561	1,700

Source: World Bank Social Indicators.

Ownership of Household Assets

Brazil is one of the few developing countries in which time series statistics are available on the penetration of consumer durables. The trend in these indicators provides corroboratory evidence for the hypothesis that economic growth has benefited increasingly even the lower strata of the population. Table 8 shows the degree of penetration of refrigerators, television receivers, connection to an electricity source and radio ownership from 1960 to 1980. Progress is striking not only for Brazil as a whole but also for the poorest region, the Northeast.

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TABLE 8

PROPORTION OF HOUSEHOLDS OWNING DURABLES

	1960	1970	1972	1974–75	1976	1980
Brazil						
Refrigerator	12	26	31	36	42	50
TV	5	24	32	39	47	54
Electric Light	39	48	N.A.	N.A.	63	67
Radio	35	59	73	69	76	76
Northeast						
Refrigerator	3	9	11	13	17	24
TV	0.3	8	10	13	18	27
Electric Light	16	23	N.A.	N.A.	34	42
Radio	12	35	45	51	59	62

Sources: 1960 and 1970 Censuses; 1972–76 PNAD; ENDEF; Preliminary tabulations of the 1980 Census.
    N.A.: Not available.

IV. DISTRIBUTION

While the statistical base for judgements on the degree of inequality is fairly good in Brazil the surveys and censuses from which this information is drawn suffer from differences in coverage which vitiate comparisons in time.

The Degree of Inequality

There is little doubt that the distribution of income is very skewed in Brazil. Table 9 shows estimates of the income shares of the poorest 40 percent among families as well as of the top 10 percent. "Our estimate" is the mid-point of the range in each year and should be read as no more than an order of magnitude.

Changes in Distribution over Time[21]

To the extent that any weight is placed on the estimates in Table 9 they support the view that inequality has probably increased. The margin for error in these data is very large and there is no basis for a definite trend estimate.[22] Nevertheless it should be noted that these estimates imply less deterioration than is usually alleged, and allow for substantial growth in the absolute incomes of the poor.

A comparison of *unadjusted* figures in Table 9 (Lines 1 and 6, or 1 and 10) shows some increase in unequality: between 1960 and 1976 the poor lose 21 percent of their 1960 share and the rich gain 13 percent. Adjustment, however, is necessary, because there appears to be a great deal of unreported income in the original sources. The two main adjustments that are required have offsetting effects: an imputation for nonmonetary income raises the share of the poor, while an imputation for unreported money income probably increases concentration. Though these imputations are largely arbitrary, explicit adjustments are

[21]See Annex Table.
[22]See Guy Pfeffermann and Richard Webb, *op. cit.*, pages 7–37.

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TABLE 9

ESTIMATED FAMILY INCOME SHARES
(Percentages of Total Family Income)

	Source	Percentile	
		Poorest 40	Top 10
1. 1960	Census	9.4	44.5
2.	Meesook–Fishlow adjustment	11.5	41.0
3.	Our estimate	9.8	50.0
	(Range)	(8.0–11.5)	(41.0–59.0)
4. 1970	Census	8.1	46.2
5.	Our estimate	8.4	51.5
	(Range)	(6.8–9.9)	(43.0–60.0)
6. 1972	PNAD: money income only	7.4	50.5
7.	Our estimate	8.9	53.6
	(Range)	(8.5–9.3)	(51.4–55.8)
8. 1974–75	ENDEF: Expenditures and gross saving	9.4	46.0
9.	Our estimate	8.5	51.9
	(Range)	(7.6–9.4)	(46.0–57.7)
10. 1976	PNAD	7.5	N.A.
11.	Our estimate	7.8	N.A.
	(Range)	(6.8–8.8)	

Line
1. Albert Fishlow and Astra Meesook, *Technical Appendix, Brazilian Size Distribution of Income, 1960*, May 1972, Table B.5.1, p. 54. Based on one in 1,400 sample of Census, excluding North and Central-West regions (about 7 percent of population). Principally money income, including transfers. Original data were already grouped by size classes so shares of bottom 40 and top 10 are sensitive to assumed mean incomes for the bottom and the open-ended top size classes. Fishlow–Meesook use a Pareto fit to estimate the mean for the top open-ended size class (N.Cr. $50.0+) for *individual recipients*. Their estimate is N.Cr. $108.7, (slightly higher than Langoni's N.Cr. $87.9). After combining individuals into families, however, the resultant open-ended class mean falls to N.Cr. $88.3 [Implicit in Table B.5.1, p. 54, *op. cit.*] This estimate appears to be low if compared with the relationship between mean family income in the open-ended class and the class limit, in ENDEF and PNAD 1972, both of which publish the actual means in the open-ended class. In both surveys, the ratio is about 2.1 vs. Fishlow–Meesook's 1.75 (87.6 ÷ 50.0). If the 1960 shares are reestimated using the ratio of 2.1, the Meesook–Fishlow share for the top 10 rises by 3.6 percentage points, from 41.0 to 44.6, and that of the bottom 40 falls from 11.5 to 11.0. The estimates in Line 3 would change in the same proportion.

2. *Idem.* Principal adjustment is imputation of value of direct consumption of product by agricultural families. The imputation is a decreasing proportion of money income and, on average, adds 39 percent to total farm incomes. Other adjustments are imputations for owner-occupied homes, and food and lodging received by domestic servants.

3. Obtained by allocation of difference between Census income total (after Meesook–Fishlow imputation of nonmonetary income) and national accounts total personal income. Range results from two extreme assumptions regarding allocation by percentile: high figure assumes equal proportional underreporting in each percentile; low figure allocates entire difference to top decile.

4. Based on size distribution in Carlos Geraldo Langoni, *Distribuiçaõ da Renda e Desenvolvimento Economico do Brasil*, (Rio de Janeiro, Editora Expressaõ e Cultura, 1973), Table 1.2, p. 26. Langoni's figures exclude zero-income families (3.7 percent of total) but we re-included them for greater comparability with 1960. Exclusion of zero-income families raises share of bottom 40 to 9.5 percent. Presumably only monetary income is recorded since Census questionnaire and coding procedures have no instructions for imputation of nonmonetary income. Also, income at the top is underestimated by a coding limitation: All incomes above Cr. 9997 were coded as equal to Cr. 9998 (Costa 1977, p. 52).

5. Includes three adjustments: (a) addition of nonmonetary income using ENDEF ratio of nonmonetary to monetary by percentile; (b) use of a Pareto estimated mean income for open-ended

income class, i.e., Cr. $4251 instead of Langoni's Cr. $3245; and (c) allocation of difference between Census income total (after adjustments (a) and (b)) and national accounts disposable income as in Line 3.

6. From Table 3.8 of *PNAD-2, 1972 4° Trimestre, Todas Regioes*, FIGBE, p. 54. This table shows *total income* by income class and thus eliminates the open-ended class problem. Includes monetary remuneration only (Rendimento Monetario). A more comprehensive income concept (Renda Global), including transfers and income in kind, is used in Table 6.1, but distributed by individuals, not families. Renda Global is 34% larger than Rendimento Monetario. PNAD 1972 excludes Regions VI and VII (Federal District and North). Only 0.1% of all families are reported with zero income, suggesting an element of incomparability with the 1960 and 1970 censuses.

7. Adjusted for nonmonetary income and for the shortfall of survey incomes relative to national accounts as in Line 3 above.

8. Based on the Estudo Nacional da Despesa Familiar (ENDEF), Table 7, for Regions I–V (excludes Distrito Federal & North). Covers current expenditures (including taxes) *plus* capital expenditures (principally purchases of real estate) *plus* net increases in financial assets, including retained earnings, *plus* debt payments. The financial items, however, are *not* net of sales of assets or of borrowing, and therefore exaggerate net saving.

9. Adjusted to approximate current income by the arbitrary assumption that net saving is 75 percent of gross saving in each income class, i.e., that sales of assets plus borrowing amount to 25 percent of gross savings in each income class as recorded by ENDEF. Actual dissaving (borrowing plus sales of assets) is probably higher but (i) the value of increases in bank accounts is already a net figure; and (ii) not all dissaving needs to be included—only that which is reflected in ENDEF's expenditure figures. Since ENDEF expenditure on durables and real estate is *understated* by recording only the value of payments during the reporting year, and not the full cost, there is no corresponding need to deduct the value of consumer and mortgage debt incurred for those purchases. Also adjusted for shortfall relative to national acounts as in Line 3 above. All references in the text to ENDEF "income" refer to this *estimate* of income based on reported expenditures and savings *plus* our downward adjustment for unreported dissaving *plus* our upward adjustment for unreported expenditures and/or savings.

10. Table 3 (p. 74) of the 1976 Pesquisa Nacional por Amostra de Domicilios (PNAD). Excludes rural areas of Region VII (North) or about 1 percent of national income according to national accounts Table XVIII. Share of top 10 percent could not be estimated because the top open-ended class is far too large: it contains 24 percent of all families. Includes nonmonetary and transfer incomes. Only 1.0 percent of families recorded with zero income. Income in the open-ended class derived as a residual from total income calculated from Table 14 of PNAD 1976. That table covers all individual recipients and provides a more detailed set of income categories in which the open-ended class comprises only 1.4 percent of all recipients. Mean income for that class is based on a Pareto function fitted to the last two income categories.

11. Same adjustment as Line 7.

preferable to the implicit assumptions that are involved in using unadjusted figures: *any comparison* requires strong assumptions regarding the extent and distribution of unreported income. The purpose of Table 9 is to set out what we consider to be the most plausible statistical message provided by the available data.

Distribution of Education

It is evident that the distribution of education is highly unequal but that there is a trend towards equalization. The proportion without schooling fell from 51 percent in 1960 to about 35 percent in 1980, even though the absolute number of persons without schooling actually rose.

To translate these figures into a single measure of equity in the distribution of education one must first make a subjective judgement regarding the consumption value of each level of schooling, and then choose some measure of the productive value of schooling at each level. As a first approximation, we have

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TABLE 10

POPULATION ACCORDING TO GRADE LEVEL

(Persons 5 or more years old)

	Number (Millions)				Percent				Cumulative Percent		
	1960	1970	1976	1980	1960	1970	1976	1980	1960	1976	1980
No formal schooling	30.1	34.5	32.1	35.9	51.0	43.6	34.9	35.1	100	100	100
Primary: Grades 1–3	16.6	22.1	24.2	n.a.	28.1	27.9	26.3	n.a.	49.0	65.0	n.a.
4–5	8.6	13.3	19.6	n.a.	14.6	16.8	21.3	n.a.	20.9	38.7	n.a.
High School	3.3	8.3	13.6	n.a.	5.6	10.5	14.8	n.a.	6.3	17.4	n.a.
College	0.4	0.9	2.4	3.2	0.7	1.1	2.6	3.2	0.7	2.6	3.2
Total	*59.0*	*79.1*	*91.9*	*102.4*							

Sources: *Censo 1960*, Table 15. *Censo 1970*, Table 15. *PNAD 1976*, Table 11. College level ("*Superior*") is defined in the 1960 and 1970 Censuses as grades 13–17 but after the 1971 reform of the educational system, College level is defined as grades 12–17.

Note: The 1976 figures exclude the rural areas of Region VII (North) or about 3.7 percent of the total population. The 1980 figure for persons without formal schooling include those with less thàn one year school.

applied the simplest weighting system, which is self-weighting: each grade is weighted according to its cardinal value (e.g. 0 for those who never went to school, 8 for those who reached eighth grade). These values are roughly parallel to the income differentials which should be considered a maximum range since they do not allow for consumption value and are not net of private costs of attendance. The Gini coefficients so calculated for the total population are 0.69 in 1960, 0.65 in 1970 and 0.58 in 1976.[23]

Distribution of Life Expectancy

Another set of data that bears on the regional distribution of income and welfare consists of life expectancy rates. These rates are to some extent an indicator of economic improvement. But the achievement of longer life expectancy is of course a fundamental objective of development in itself. Table 11 analyzes the trend over time and the *distribution of life expectancy* at birth by regions of Brazil in 1950 and 1970.

TABLE 11

LIFE EXPECTANCY BY REGIONS
(1950, 1970)

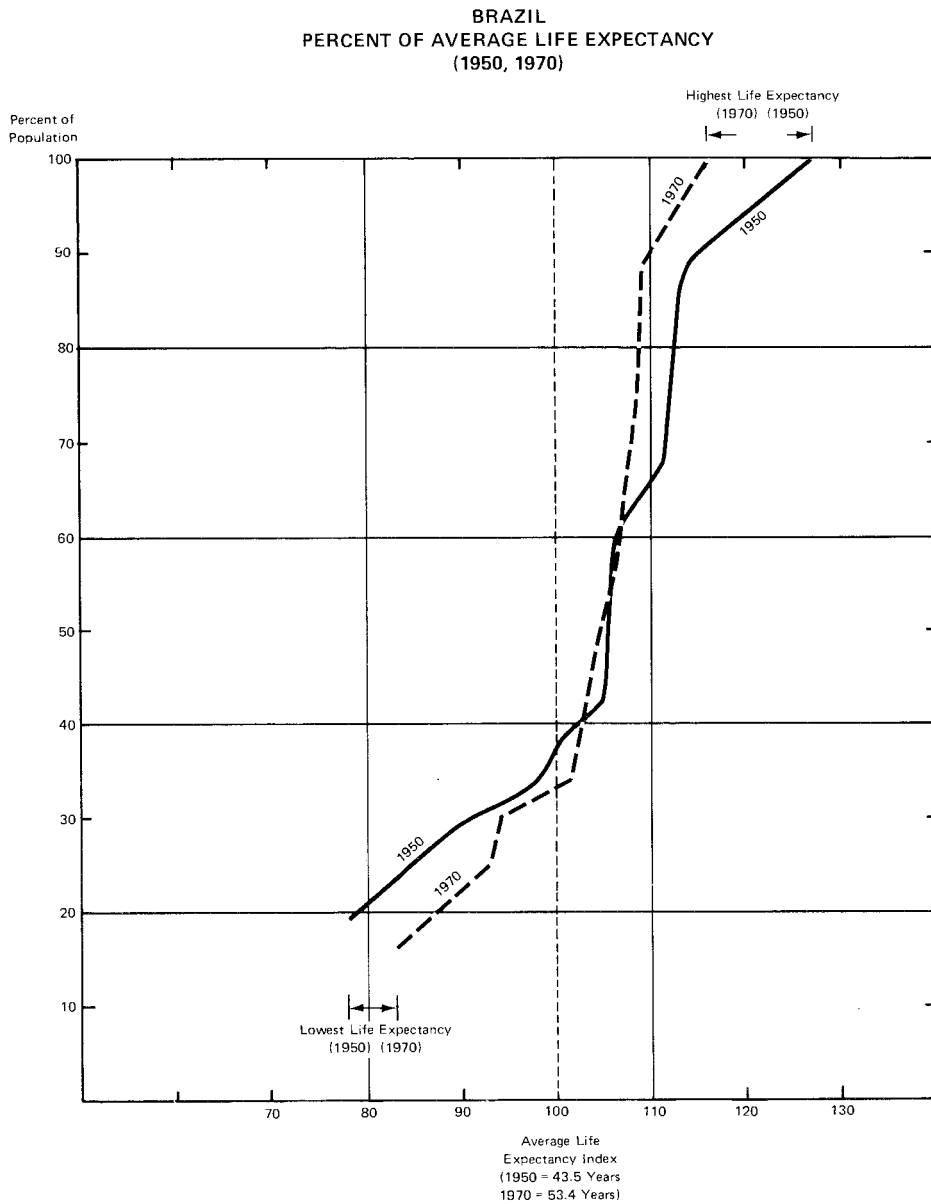| Region	1950 Population (1,000)	Life Expectancy (Years)	1970 Population (1,000)	Life Expectancy (Years)
Amazonia	1,845	42.7	3,604	54.2
North	2,629	43.7	4,673	50.4
Northeast	9,866	34.0	15,035	44.2
Bahia	5,479	39.2	8,394	49.7
Minas Gerais	8,739	46.1	13,087	55.4
Rio-Guanabara	4,675	48.7	8,995	57.0
Sao Paulo	9,134	49.4	17,781	58.2
Parana	2,116	45.9	6,930	56.6
South	5,725	55.3	9,567	61.9
Central-West	1,737	49.8	5,073	57.5
Brazil	51,945	43.6	93,139	53.4

Source: Census, in Thomas W. Merrick: Interregional Differences in Fertility in Brazil, 1950–1970 in *Demography*, August, 1974; and Jose Alberto Magno de Carvalho and C. H. Wood: Renda e Concentraçao da Mortalidade no Brazil, IPEA, Rio de Janeiro.

The poorest areas in 1970 have the same life expectancy as the country's average in 1950 (about 44 years). In turn, life expectancy in the Northeast in 1950 was only 34 years. Thus there is a 10-year span between the poorest and the average just as there is a 10-year improvement between the national average for 1950 and that for 1970.

Ranking the ten regions in the table according to the life expectancy of their populations and weighing the latter by the size of each region's population, one arrives at the Chart which shows the *distribution* of life expectancy in 1950 and 1970. If all persons had had the same (average) life expectancy, the distribution curve would be a vertical line rising at the 100 index mark. Conversely,

[23]Experiments with different weighting systems changed the level but not the trend in the Gini's.

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perfect inequality would be represented on the Chart by a horizontal line. Thus, movement toward the vertical between two observations reflects greater equality. This is in fact what can be seen on the Chart. Perhaps partly because of migration from poor to more affluent areas and the gradual assimilation of migrants with the resident population, not only has life expectancy increased substantially, but its distribution is more equal in 1970 than in 1950. Moreover the absolute improvement at the top (61.9 minus 55.3 = 6.6 years), is smaller than that at

BRAZIL
PERCENT OF AVERAGE LIFE EXPECTANCY
(1950, 1970)

Percent of
Population

Highest Life Expectancy
(1970) (1950)

Lowest Life Expectancy
(1950) (1970)

Average Life
Expectancy Index
(1950 = 43.5 Years
1970 = 53.4 Years)

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the bottom (44.2 minus 34.0 = 10.2 years) reflecting "diminishing returns" to life-extending efforts as life expectancy and income increase.

In conclusion the data on distribution all convey a picture of skewedness. They do not, however, lend themselves to comparisons of the degree of skewedness in time. No strong conclusions on "improving" or "worsening" of inequality can be drawn from the available data.

ANNEX TABLE

COMPARISON OF ESTIMATES OF ANNUAL PERSONAL INCOME AND CONSUMPTION
(in billions of current Cr. $)

		Survey/Census[a]	National Accounts[b]	% Discrepancy
1. 1960	Census	1.46	2.50	42
2.	(plus nonmonetary)	1.73	2.50	31
3. 1970	Census	93.2	166	44
4. 1972	PNAD (money factor income)	164	290	43
5.	(plus nonmonetary and transfer income)	221	290	24
6. 1974–75	ENDEF (expenditures plus saving)	483	600	20
7.	(Consumption)	395	480	18
8. 1976	PNAD	916	1,279	28

[a]Total personal income figures of survey/censuses were adjusted (i) to include Regions VI & VII (Federal District and North) when coverage was incomplete, using their share in NNP according to Table XVIII of *Contas Nacionais*; (ii) to represent the calendar year, using Rio cost of living index and real growth trend during the year: PNAD were in fourth quarter, censuses in August (1960) and September (1970), ENDEF was August 1974–August 1975 but all ENDEF values are expressed in August 1974 prices; and (iii) to deduct intra-family sector transfers, estimated to equal 5% of total family income in all surveys, and 3 percent in the Censuses (since less transfer income is reported in Censuses). Figures are approximations based on 1972 PNAD figure of 12 percent for *all* transfer income, less social security transfers from *Sinopse Estatistico do Brasil* 1977, pp. 511–518.

[b]National accounts Personal Income estimated here as equal to National Income *plus* Transfers and Subsidies, *less* Retained Earnings assumed to equal 10 percent of National Income. No estimates of corporate retained earnings are published, but the national accounts provides a ceiling in the figure for private sector saving *less* depreciation, if one assumes positive household sector saving. The latter assumption is strongly supported by ENDEF, which shows household savings to be 16 percent of total income (*after* downward adjustment for unreported dissaving explained in Table 9, Line 9). Private sector saving less depreciation as a proportion of national income was 6.2 percent in 1959, 8.3 percent in 1970, 9.7 percent in 1972, 11.5 percent in 1974 and 6.5 percent in 1976. These figures imply retained earnings well below 10 percent, but they are subject to much error. Figures for other LDCs range between 5 and 10 percent. Thus, the 10 percent used here is probably an upper bound for the seventies, and too high for 1960 given the rapid growth of the corporate sector.

Source: *Contas Nacionais, Revisaõ e Atualizaçaõ*, July 1977. This publication contains revised estimates for earlier years, including the benchmark years 1949 and 1959. The revision implies a higher GNP in 1960 than earlier estimates. Since Table VI does not contain an estimate for 1960, the 1960 figure used here is a projection of 1959 using the implicit GDP deflator and real growth rate.

Line 1. From Fishlow and Meesook, *Technical Appendix*, p. 54. Census reference month for income was August, but if August had not been a typical month, a monthly average for the entire prior year was solicited. It seems likely that a majority reported current (August) receipts.

Line 2. Same source as Line 1. Includes estimated nonmonetary income (imputed rent, pay in kind of domestics, and own-consumption of agricultural output). The Fishlow–Meesook original reconciliation with the national accounts obtained a maximum discrepancy of 10 percent. Their comparison is with an earlier estimate of Personal Income published in the *Revista Brasileira de Economia*. The figure for Disposable Income used here is based on the recently revised *Contas Nacionais, op. cit.* which revised 1959 NNP upwards by 28 percent. About half of the increase is due to the revision of value added in Manufacturing and Commerce. The 1960 Economic Censuses, which provide the benchmarks for value added in those sectors, appear to have classified several

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components of value added as forms of intermediate purchases under the item "Other Expenditures." This became apparent from a comparison of input-output ratios in the 1950 and 1960 censuses and 1966–1970 annual establishment surveys by DEICOM/FIGBE. Thus, the ratio of value added to total output in Manufacturing ranges between 39 and 40 percent in all those years *except* 1960, when it was reported as only 30 percent.

The 1960 discrepancies shown here are probably *minimum* estimates.

Line 3. From Langoni, Carlos Geraldo, *Distribuiçaõ da Renda e Desenvolvimento Economico do Brasil* (Rio: Editora Expressaõ e Cultura, 1973), p. 64. Langoni's mean income, however, was adjusted upwards by re-estimating the upper open-class mean income with a Pareto fit to correct for the ceiling income of Cr. 9998 imposed on his data.

Line 4. Table 3.7, PNAD-2, 1972, FIGBE. Defined as monetary remuneration, including cash rents and other property income.

Line 5. Table 6.1, PNAD-2, 1972. Defined as "global income" includes non-monetary remuneration and transfer income from government (pensions, disability payments), from corporate sector (insurance payments, pensions) and from other families (remittances to students, gifts, etc.). Nonmonetary remuneration is 11.3 percent and transfers 13.4 percent of "global income." Rural nonmonetary income, however, appears to be underestimated. Unfortunately this table is a distribution by *individual recipients*; there is no table which distributes "global income" by *household* income classes. Thus the full and relative high coverage achieved by PNAD-1972 is not available for comparison with household distributions in other years.

Line 6. *Estudo Nacional da Despesa Familiar* 1974–75, FIGBE, Table 7. Corresponds to our *estimate* of family income based on reported expenditure and savings *plus* adjustment for unreported dissaving.

Line 7. *Idem.* Consumption equals Current Expenditures plus purchases of vehicles classified under Increase in Assets.

Line 8. PNAD, FIGBE, Table 14. Pareto fit on upper two income categories used to estimate mean income of top open-ended class, which comprises 1.4 percent of recipients. Includes imputed value of income in kind, property income, and transfers.