

M. Louise Fox

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# Income Distribution in Post-1964 Brazil

## New Results

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# *Income Distribution in Post-1964 Brazil: New Results*

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Brazil is often cited as a developing country that has exemplified the trade-off between economic growth and equity. The basis for the claim was the rising inequality in the income distribution between the 1960 and 1970 censuses, combined with an increase in per capita income over the decade. Numerous scholars have analyzed the period, yet there is little or no agreement in the literature regarding either the causes or the extent of this apparent increase in inequality. Using a recently released sample of the 1970 demographic census, the empirical basis for the claim of deteriorating income distribution over the decade is examined here. Applying poverty lines defined for both 1960 and 1970 data sets, the correlates of income variance and poverty are analyzed. The results show that under most reasonable assumptions regarding data deficiencies and appropriate deflators, the fraction of the population in absolute poverty declined only slightly over the decade. Although the poorest households were found among the small farmers and sharecroppers in the rural areas in both 1960 and 1970, a large increase in the incidence of poverty in urban areas occurred over the decade.

**T**HE economic development of Brazil since 1964 has been a controversial case study in the strategy of economic development for at least a decade. On one hand, Brazil has been hailed as the success story of Latin American economies for its seven years of accelerated, "miraculous" economic growth that followed a three-year period of stabilization in the middle sixties. At the same time critics of Brazilian economic policy have pointed to the rapid deterioration in the income distribution that accompanied the miraculous growth. The reported change in the income distribution is at least as impressive as the high rates of growth in per capita income because size distributions of income have been shown to be remarkably stable in most developing countries.<sup>1</sup> Some of the same critics of the effects of Brazilian economic policy on distribution have also been critics of the social and political policies of the military government in power since 1964. Brazil has frequently been cited as a case in point of the failure of the policies of

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<sup>1</sup> Kemal Dervis, Jaime de Melo, and Sherman Robinson, *General Equilibrium Models for Development Policy* (New York, 1982).

western economists and the multilateral development agencies to raise the living standards of the poorest members of developing countries.

The debate has been acrimonious at times, partly because of ideology, and partly because of the weaknesses of the data on which it has been conducted. Most studies have had to rely on published tabulations of household surveys, which have been imperfect measures of the distribution of income because of data omissions and underreporting.<sup>2</sup> Until recently the only income distributions available to researchers were on the economically active population, which contain the additional limitation of only providing information about the income flows of a minority of the population. The welfare of the individual earner is a function of the income earned in the labor market and of the number of people with whom it is shared. A better unit of analysis for the examination of changes in the welfare of the total population is the household. Because of these data limitations some proponents of the Brazilian economic strategy have challenged the empirical basis of the critics' position, denying that the magnitude of the change previously reported could possibly have taken place.<sup>3</sup>

Recently the Brazilian National Statistical Institute (IBGE) released for independent researchers a 1 percent public use sample of the 1970 Brazilian demographic census. The data contain much of the information needed to document fully the nature and extent of Brazilian income inequality and poverty in an improved empirical framework. The data, corrected for many of the deficiencies of the published tabulations, are used here to measure the degree of income inequality and poverty among households in Brazil in 1970. Using similarly adjusted data from the 1960 census (first published by Albert Fishlow in 1972), the nature and extent of poverty at the beginning and end of the decade is compared. Over the decade the percent of households in poverty in Brazil did not decline substantially, even under a number of different assumptions regarding the appropriate calculation of the poverty line in 1970. The conclusion of the critics regarding the income distribution impact of Brazilian economic policy is inescapable. Analyzing the characteristics of households in poverty at the beginning and end of the decade begins to reveal the socioeconomic groups in Brazil who were bypassed by the rapid economic growth of the last years of the decade, a step towards understanding the causes of the decline in living standards between 1960 and 1970.

<sup>2</sup> Some have estimated as much as 40 percent of Brazilian national income is not accounted for by the 1970 census. For a detailed discussion of the weaknesses of the census data, see Guy Pfeffermann and Richard Webb, "The Distribution of Income in Brazil," World Bank Staff Working Paper No. 356 (Washington, D.C., Sept. 1979).

<sup>3</sup> Pfeffermann and Webb (*ibid.*) hold this position. See Edmar Bacha and Lance Taylor, "Brazilian Income Distribution in the 1960's: Facts, Model Results and the Controversy," *Journal of Development Studies*, 14 (April 1978), for a discussion of mutations of this position and a critical assessment.

## THE DATA

By 1970 in Brazil the economic miracle was in full swing. Output growth in Brazil in that year was over 7 percent and the trend would continue for the next three years.<sup>4</sup> Although it can be argued that the full impact of the miracle growth had not fully been realized by the time of the census, the 1960–1970 comparison is useful because the economy was at about the same point in the business cycle in both periods. Thus, the analysis presented below allows a preliminary look at the impact of the policies of the stabilization period and the first half of the growth period.

The data sources for both periods are samples of the demographic census, and the unit of observation is the private household. For the 1970 census the data are a 1 in 1,000 sample, for the 1960 census a 1 in 1,400 sample. The tabulation of the 1960 sample was completed in 1972 by Albert Fishlow and Oey Astra Meesook.<sup>5</sup> I have performed the tabulation of the 1970 sample.<sup>6</sup> In both tabulations similar adjustments are made to the data to correct for the deficiencies of the published tabulations: missing income, truncation of the upper portion of the distribution, income in kind. The 1970 data differ from the 1960 data, however, in three important ways: First, the 1960 sample excludes the frontier area (7 percent of the population in 1960). Second, the definition of the household is different in the two analyses. In 1960 boarders, employees, and *agregados* are included as members of the income sharing unit; in 1970 they are excluded. This group represents 2.6 percent of the population in 1970.<sup>7</sup> Third, in 1960 income was recorded in nine class intervals, requiring Fishlow and Meesook to use the mean of the income range as the estimate of the income for each household in the sample. In 1970 actual income figures were recorded, allowing more accurate tabulations of the 1970 income distribution.

The differences in the two bases used for the intertemporal comparison suggest that the results presented below should be interpreted with some caution. Fortunately, in the two cases of nonoverlap between the

<sup>4</sup> Bacha and Taylor, "Brazilian Income Distribution in the 1960's."

<sup>5</sup> Results of this tabulation have been published in two places: in Albert Fishlow, "Brazilian Size Distribution of Income," *American Economic Review*, 70 (May 1972), and in Oey Astra Meesook, "Income Distribution in Brazil," (Ph.D. diss., University of California, 1972). The presentation differed somewhat in each work, but the underlying data base is the same—the adjusted 1960 census sample. I have used Fishlow's table of the distribution of income for my relative inequality comparison and Meesook's table of the characteristics of the poor for my poverty line tabulations, since Meesook provides a much clearer discussion of her methodology than does Fishlow. I refer to the joint methodology as the Fishlow-Meesook method.

<sup>6</sup> Results of this tabulation and extended documentation on the methodology used in the analyses described here are provided in M. Louise Fox, "Income Distribution in Brazil: Better Numbers and New Findings," (Ph.D. diss., Vanderbilt University, 1982).

<sup>7</sup> See *ibid.*, chap. 2 for a complete discussion of the issues that precipitated this difference in methodology.

TABLE 1  
DISTRIBUTION OF CORRECTED HOUSEHOLD INCOME, 1960 AND 1970  
(deciles of households)

Decile	1960		1970	
	Percent of Income	Cumulative Percent of Income	Percent of Income	Cumulative Percent of Income
10	1.4	1.4	1.2	1.2
10	2.4	3.8	2.4	3.6
10	3.6	7.4	3.2	6.8
10	4.6	12.0	4.1	10.9
10	5.6	17.6	4.9	15.8
10	7.2	24.8	6.0	21.8
10	8.1	32.9	7.7	29.5
10	13.1	46.0	10.8	40.3
10	14.6	60.6	16.6	56.9
10+	39.4	100.0	43.1	100.0
Gini Coefficient:		.50		.54

Sources: 1960: Fishlow, "Brazilian Size Distribution," Table 1, corrected family distribution. Distribution was obtained by interpolation. Each income class was assumed to be uniformly distributed about the mean.

1970: Tabulations of the 1970 Census from the Public Use Sample, adjusted (see text). Distribution obtained without interpolation from individual household data.

sample populations the groups concerned are quite small. The purpose of the time series comparison is to provide suggestive evidence for trends, not absolute evidence on exact numbers. Although the limitations of the data are important, data are certainly comparable enough to be suitable for our purposes.

#### THE DISTRIBUTION OF INCOME AND THE INCIDENCE OF POVERTY

Table 1 shows the distribution of adjusted household income by deciles of the population in 1960 and 1970. The numbers confirm what most participants in the Brazilian income distribution debate believed: increasing inequality of income occurred in the 1960s. The income share of the top decile increased by 10 percent in this period, and the share of the bottom four deciles fell by as much. The share of every decile fell except for the top two, with the highest gains occurring in the uppermost decile. This represents quite a change in an income profile in ten years. It is not difficult to understand why these numbers are controversial.

Changes in relative inequality are only part of the story of the impact of a decade of economic policy. What about changes in absolute levels of poverty? Did the welfare of the poor increase despite deterioration in relative living standards? To answer, we compare the population in

poverty in both years, using the poverty line which Meesook defined for the 1960 population.<sup>8</sup>

The Meesook poverty line for the 1960 census sample was based on the Northeast minimum wage in that year. This amounted to about \$65 per month in 1970 dollars, purchasing power adjusted, for the average family in the Northeast of Brazil. Using separate minimum wages for rural and urban Northeast, Meesook adjusted the line upwards to reflect spatial price differences. The type of spatial price indices that have been used elsewhere for this type of analysis was not available to Meesook in 1972.<sup>9</sup> Therefore, she simply assumed based on some limited data that the spatial difference in Northeast minimum wages (28 percent) reflected the rural-urban differential throughout the country and that prices in the east and south were 15 percent higher than in the Northeast. As an approximation this regional price index is not bad, judging by the expenditure-based index found in Williamson.<sup>10</sup> The major difference between the two indices is the estimate of urban east and south, which is much higher in the Meesook approximation than in the Williamson index. This will contribute to a higher estimation of the population in poverty in urban areas in 1970 than previously found using other indices.<sup>11</sup> The Meesook poverty line was applied to households standardized for differences in size and composition.

In order to apply the Meesook poverty line in the 1970 sample, the 1960 poverty threshold has to be translated into 1970 NCR\$. This involves choosing a national price index for the time period. Estimates of the change in nominal price level over the decade vary by up to 9 percent, and, as Beckerman and Coes have shown, the estimate of the population in poverty in 1970 will be sensitive to the price index chosen.<sup>12</sup> The price inflator used here is the São Paulo cost of living index used by Beckerman and Coes as the upper bound estimate of the change in nominal prices over the period. The sensitivity of my estimate of the size of the poverty population to the choice of deflator was tested by applying a lower price inflator to the Fishlow-Meesook 1960 poverty line and reestimating the proportion of the population in poverty.<sup>13</sup>

<sup>8</sup> Meesook, "Income Distribution in Brazil."

<sup>9</sup> Fox, "Income Distribution in Brazil: Better Numbers and New Findings," for other poverty line calculations using price indices derived from the 1974 expenditure survey (or ENDEF).

<sup>10</sup> Denise Williamson, "Food Prices and Consumption Comparisons—Brazil 1975," mimeo (April 1981).

<sup>11</sup> Fox, "Income Distribution in Brazil: Better Numbers and New Findings," chap. 3.

<sup>12</sup> Paul Beckerman and Donald Coes, "Who Benefits from Economic Development?: Comment," *American Economic Review*, 70 (March 1980).

<sup>13</sup> The ideal price index for my use would be one that measured the changes in the price of a basket of commodities consumed by the poor. This index is not available. Estimates using the Guanabara Cost of Living Index, which is disaggregated in seven separate indices, and a commodity basket (computed using the ENDEF data) that represented the distribution of purchases of goods and services by the poorest quintile, suggest that the use of São Paulo Cost of

The Meesook poverty line is applied to the 1970 data set to compare the number and characteristics of households in poverty in the two periods. The comparison is shown in Table 2. The first two lines show that the percent of households and people in poverty did not change substantially over the period. Given the limitations of the data in both periods, the extent that the incidence of poverty has fallen remains ambiguous, but it has not increased and probably decreased slightly. Despite rapid economic growth in the later years of the decades, a minority of the population was still quite poor by any standards. The rising tide seems to have left about 30 percent of the population behind in 1970.

Although the absolute numbers in poverty changed little, the shape of poverty in 1970 was different from the shape in 1960 in very important ways (Table 2). Comparing the third and sixth columns shows how the relative incidence of poverty changed with respect to various characteristics of the population. When this number equals 1 the incidence of the characteristics among poor people is the same as in the whole population. If the number is greater than 1 a disproportionate number of poor people have the characteristic. How these numbers changed over time tells us how the poverty population changed relative to the population as a whole.

The greatest change in the poor was the major increase in urban poverty. In 1960, 64.3 percent of poor households were located in urban areas, but by 1970 poor households were evenly divided between rural and urban areas. The relative incidence of poverty in the rural areas in 1960 was 1.26; by 1970 it had fallen to 1.18. This suggests that over the decade poverty was becoming equally well distributed in rural and urban areas.<sup>14</sup> The decade was characterized by a large rural-urban migration, and it appears that poverty followed the migrants into the city and that the migration may have depressed the wage of urban residents as well. In 1970 the relative incidence of poverty among nonmigrants was less than 1, a change from the previous period suggesting that some migrants suffered or did not improve their fortunes in their move.<sup>15</sup> Regionally, poverty remained concentrated in the Northeast.

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Living understates slightly the changes in the national price level as they affected the poorest segment of the population.

<sup>14</sup> Using a lower poverty line in Fox, "Income Distribution in Brazil: Better Numbers and New Findings," chap. 3, I found a much higher relative incidence of poverty in rural areas. As noted above, the Fishlow-Meesook method of adjusting the data and drawing the poverty line has an urban bias, and therefore I find lower relative incidence of poverty in rural areas using their method.

<sup>15</sup> This observation ignores the large increase in access to public services that occurs for all income groups with increasing urbanization. Given a choice, many migrants might rather be poor in the city than in rural areas, but my data do not allow this measurement. For evidence on service delivery, see Peter Knight and Ricardo Moran, "Brazil: Human Resources Special Report, Summary Report," World Bank Report No. 2604-BR (July 1979).



Female-headed households continued to have a much higher probability of being poor in 1970, as did nonworkers. The poor for the most part remained a working poor, not a group of unemployed or disabled. Poor families were still larger and the age of the head of household slightly younger, although this difference may simply reflect shorter life spans among the poor rather than a life cycle income effect. Heads, who were principal earners for most households in 1970, were more educated in 1970 than in 1960.<sup>16</sup> Although over half of the heads of poor households in 1970 reported having no education, the relative incidence of poor heads of households in poverty with some education rose over the decade. Even though education drastically reduced the probability of being in poverty in 1970 it did not guarantee a good income.

With the increasing incidence of poverty among the urban population by the end of the decade the distribution of sector of activity of the heads in poverty changed as well. Although the proportion of heads of poor households engaged in agriculture fell by 20 percent over the decade, the relative incidence increased slightly because of the declining share of the population in agriculture over the decade. Commerce was the major urban occupation that attracted poor households; selling anything, including street vending, was a major informal sector activity. Service, another urban informal sector activity, decreased in relative incidence of poverty at the same time. Industry also increased as a primary activity of poor households, suggesting some truth to the hypothesis of Fishlow and others that the fall in minimum wage hurt the poor at the expense of the rich.<sup>17</sup> Other suggestive evidence for the position is the increase in relative incidence of poverty among households where the heads were private sector employees. Note, however, that the categories of "industry" and "private sector" include a portion of the so-called informal sector as well (in the form of small handicraft firms, for example).

Although family size and number of children among the poor remained roughly constant over the decade, the number of extra family workers in the poor decreased slightly. At the same time the number of children in school in poor families increased. This is the one bright spot in our generally dismal picture of the effects of a decade of economic policy. It appears—perhaps an effect of increased urbanization—that increasing numbers of poor children were in school instead of working.

While the number of households in poverty appears to have declined only slightly, the mean income of the households in poverty could have improved, implying a reduction in the intensity of poverty not measured by Table 2. Unfortunately, the data for 1960 do not exist to calculate a

<sup>16</sup> For quantitative estimates of the contribution of the head to total household income, see Fox, "Income Distribution in Brazil: Better Numbers and New Findings."

<sup>17</sup> Fishlow, "Brazilian Size Distribution of Income."

TABLE 2  
 CHARACTERISTICS OF POOR, NONPOOR HOUSEHOLDS IN 1960, 1970  
 (percent of households)

Characteristic	1960			1970		
	Poor Households	Nonpoor Households	Relative Incidence of Poverty <sup>a</sup>	Poor Households	Nonpoor Households	Relative Incidence of Poverty <sup>a</sup>
Percent of Households	27	73		23.7	76.3	
Percent of Population	34	66		30.5	69.5	
Average Family Size	6.1	4.5		6.4	4.6	
Region:						
Northeast	40.8	17.1	1.73	48.1	23.1	1.65
East	41.1	37.8	1.06	21.4	24.8	.89
South	18.2	45.1	.48	20.9	43.2	.54
Frontier <sup>b</sup>				9.6	8.9	1.05
Location:						
Urban and Suburban	35.7	54.3	.78	49.4	61.2	.85
Rural	64.3	45.7	1.26	50.6	38.8	1.18
Economic Activity of Head:						
Working or Looking for Work	82.2	91.6	.92	79.7	87.0	.93
Not Working	17.8	8.4	1.62	20.3	13.0	1.37
Sex of Head:						
Male	82.9	91.5	.93	82.0	89.4	.94
Female	17.1	8.5	1.57	18.0	10.6	1.45
Age of Head:						
Under 30	14.0	21.3	.73	12.2	19.8	.67
30-39	28.2	28.2	1.01	29.6	26.0	1.10
40-49	27.4	21.4	1.19	22.7	22.7	1.16
50-59	15.4	15.6	.99	16.8	17.0	.99
60+	14.4	13.5	1.04	13.6	14.5	.95
Education of Head:						
None	65.0	36.0	1.48	67.8	34.1	1.53
Some Primary	34.2	54.3	.70	33.4	43.9	.81
Some Lower Secondary	0.6	5.2	.16	3.3	11.0	.35
Some Upper Secondary	0.1	2.3	.06	0.5	7.7	.08
Some University	0.1	2.1	.05	0.1	3.3	.02

Migratory Status of Head:							
Migrant from Rural Areas	13.4	14.6	.94	6.0	5.5	1.14	
Migrant from Urban Areas	19.2	35.9	.61	66.4	55.6	1.06	
Nonmigrant	67.4	49.5	1.24	27.6	38.9	.76	
Sector of Employment of Head:							
Agriculture and Extraction	72.9	48.7	1.22	66.4	41.6	1.38	
Industry	8.4	15.7	.56	14.4	21.4	.70	
Services	8.3	8.4	.91	5.5	11.5	.52	
Commerce	4.3	11.4	.41	6.5	6.1	1.03	
Transport and Communications	4.2	7.9	.55	3.1	6.8	.51	
Government, Liberal Arts, Others	2.0	7.9	.29	4.1	12.6	.37	
Position in Occupation of Head:							
Public Sector Employee	2.4	9.2	.30	4.8	11.3	.45	
Private Sector Employee	35.9	38.5	.88	35.9	40.8	.84	
Self-Employed	52.4	44.6	1.04	45.2	38.9	1.05	
Sharecropper or Family Worker	8.6	3.6	1.66	13.6	5.6	1.72	
Employer	.6	4.1	.17	0.5	3.4	.18	
Number of Economically Active:							
0	11.4	3.0	2.16	13.7	5.1	1.92	
1	54.9	62.2	.91	56.9	58.4	.98	
2	16.5	20.6	.85	15.8	21.7	.78	
3 or more	17.2	14.3	1.14	3.2	14.8	.94	
Number of Children under 14:							
0	15.0	33.4	.53	19.8	37.2	.59	
1-2	28.7	37.7	.81	19.5	36.0	.61	
3-4	26.5	19.6	1.23	27.7	18.6	1.34	
5 or more	29.7	9.4	1.99	33.0	8.3	2.33	
Number of Children Under 14 in School:							
0	65.6	67.3	.98	43.8	47.1	1.13	
1-2	23.0	25.4	.93	34.9	39.5	1.09	
3 or more	11.4	7.3	1.36	21.3	13.4	1.63	

<sup>a</sup> Incidence of poor in category as a multiple of the overall incidence of poverty (26.6 percent).

<sup>b</sup> Fishlow's 1960 sample excluded from the Frontier area.

Sources: 1960: Meesook, "Income Distribution," pp. 127-29.

1970: See text. Upper bound estimate of poverty line for 1970 is used.

TABLE 3  
DISTRIBUTION OF HOUSEHOLD INCOMES ON THE POVERTY SCALE,  
HOUSEHOLDS BELOW POVERTY LINE

<i>Multiple of Poverty Income</i>	1960	1970	1970/60
0	1.8	0.4	.22
.01-.25	.8	1.3	1.62
.26-.50	5.3	4.7	.89
.51-.75	8.7	7.6	.87
.76-1.00	<u>10.6</u>	<u>9.9</u>	<u>.93</u>
Total	27.2	23.9	.88
Mean income (multiple of poverty line)	.627	.634	1.01

Sources: 1960: Meesook, "Income Distribution," p. 136.

1970: Author's estimate. Upper bound estimate of poverty line for 1970 is used.

"poverty gap" or other such measure. The only measure which can be made with the two data sets of the intensity of poverty is shown in Table 3, the distribution of household incomes on the poverty scale for the time series. By multiplying the percent of the poverty households by the midpoint of the interval, the mean poverty income can be calculated. Although Table 3 shows a sharp decline in the number of households reporting zero income, the average income of the households in poverty did not change over the decade.<sup>18</sup> Those households not lifted out of poverty by the end of the decade do not appear to have decreased the intensity of their deprivation.

How sensitive are the results in Tables 2 and 3 to the assumptions made in constructing the 1970 poverty line? In a longer version of this work, a sensitivity analysis was conducted.<sup>19</sup> The results can be summarized as follows.

1. The estimate of the size of the population in poverty is very sensitive to the price inflator chosen. An 8 percent reduction in the poverty line results in a 15 percent reduction in the size of the poverty population.

2. The rural-urban distribution of poverty is sensitive to the type of income-in-kind imputation. If income in kind is imputed in the urban areas, the rural-urban distribution of poverty shifts toward the rural areas.

The analysis suggests a large number of households in both rural and urban areas on the border of poverty, scraping out a living however possible.

The profile of poverty presented includes no information about access

<sup>18</sup> This decline in the portion of zero income earners could simply represent the better calibration of the 1970 census instrument, since the 1960 census only includes nine income classes. It should be noted that the figures in Table 3 for 1960 are very rough estimates.

<sup>19</sup> Fox, "Income Distribution in Brazil: Better Numbers and New Findings," chap. 5.

to public services over the decade. Other than observing some increase in enrollment among poor children, I can offer no conclusions about changes in nonincome indicators of welfare. My *a priori* expectation is that these improved for the fraction of the families called poor, as a result of increasing urbanization.<sup>20</sup> This limitation of the data, however, should be kept in mind when evaluating the welfare of the poorest segments in the two time periods.

#### CONCLUSIONS

This look at Brazilian income distribution and poverty in historical perspective, using data on the distribution of income and poverty among household units, is the first using adjusted, corrected data. Although the results are consistent with what most participants and observers of the Brazil income distribution debate expected, there are some surprises. The largest surprise was the growth in urban poverty over the decade.

The adjusted household distribution presented here confirms what most scholars of the period suspected: the bottom portion of the household income spectrum lost ground, relatively, over the decade. The change in shares is dramatic for such a short time period. Only the Brazilians themselves will be able to evaluate the relative costs and benefits of such a shift, within the larger picture of an economic development strategy.

It is possible for measured inequality to increase and at the same time for absolute incomes at the bottom to increase due to a sectoral transfer effect, but my data suggest that this did not occur in Brazil. While some sectoral transfer must have occurred over the decade (as indicated by the increased urbanization and the shift of the population out of agriculture) the estimates show that the proportion of households in poverty over the decade did not change substantially. This suggests that explanations for the relative inequality increase (and the *ex post* justifications for it) must go beyond simply Kuznets effects to look at structure of economic policy and economic development over the decade. It appears that the economic policies of the decade scarcely raised the absolute incomes of the poor by 1960 standards above the poverty level. The initial effect was simply to shift the incidence of the poverty to urban areas. The policies did, however, raise the incomes of the nonpoor, and thus increase the inequality of income.

<sup>20</sup> Knight and Moran ("Brazil: Human Resources") provide data that suggest this to be true.

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