

## **RELATIVE PRICE CHANGES AND THE REAL DISTRIBUTION OF INCOME The Case of Brazil**

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The relative increase in the price of food in Brazil is found to significantly deteriorate the real distribution of income.

### **1. Introduction**

Studies of changes in income distribution [e.g., Fishlow (1972)] have paid little attention to the effect of relative price movements. It is implicitly assumed that all individuals consume different quantities of the same basket of goods. So relative price changes will be neutral in their income distribution effects. But in reality the consumption bundles differ significantly across income classes. A migrant worker spends most of his income on food while a wealthy landowner will spend a larger share of his income on luxury goods. An increase in the price of food relative to that of luxury goods will hurt the migrant worker relatively more than the landowner. Thus there is a need to differentiate between their consumption bundles, and thus between changes in nominal and real distributions of income.

### **2. The Brazilian case**

The relative price of food rose significantly in Brazil during the 1960's and 1970's. Brazilian development policy during this period primarily emphasized industrialization, and the manufacturing sectors realized much higher productivity gains than the agricultural sectors. The difference in productivity gains is reflected by changing relative prices for agricultural and manufactured goods.

According to Evenson (1982), most agricultural prices rose faster than the general (*FGV2*) price deflator during the period 1966–1980. Productivity in some agricultural commodities like tomatoes, eggs, soybeans, chickens and wheat appear to have kept up with the non-agricultural sectors. But manioc, beans, cacao, bananas, tobacco and cotton have done quite poorly by this measure (see table 1). The relative price of manioc increased by more than 7% a year from 1966 to 1980 while the price of beans increased by about 8.5% a year. Moreover, the sharp rise in the relative prices of manioc and beans have serious implications for the welfare of the poorest in Brasil who traditionally consume these as staple foods.

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Table 1  
Price changes in Brazilian agriculture. <sup>a</sup>

	Estimated annual rate of real price change 1966–1980
<i>Crops</i>	
Rice	0.01905
Coffee	0.1373
Soybeans	–0.0000192 <sup>b</sup>
Corn	0.02924
Manioc	0.07150
Sugarcane	0.03012
Beans	0.08469
Cotton	0.04654
Wheat	–0.01678
Oranges	0.01618
Cacao	0.08585
Bananas	0.05576
Tomatoes	–0.02059
Potatoes	0.02121
Tobacco	0.04781
Groundnut	0.03245
<i>Animal products</i>	
Steer – Heifers	0.04397
Fat cattle	0.04128
Swine	0.03492
Chickens	0.00796
Milk	0.03589
Eggs	–0.00198

<sup>a</sup> Source: Evenson (1982).

<sup>b</sup> Not statistically significant.

### 3. The data and analysis

In 1974/75 a nationwide household expenditure study was undertaken called Estudo Nacional da Despesa Familiar (ENDEF). This study surveyed annual family expenditures on highly disaggregated consumption categories, including expenditures on some 120 food items. It divided the country into seven major geographical regions and into 22 smaller metropolitan, non-metropolitan urban and rural areas.

Analysis of ENDEF data suggests that beans and manioc are inferior goods over the entire income spectrum. In the poorest families, with annual incomes of less than 4500 cruzeiros, over 8% of total expenditures go toward purchases of beans and manioc. Families in the highest income class (over 134799 cruzeiros) have less than 0.15% of their expenditures going toward purchases of beans and manioc. Indeed, even actual expenditures on beans and manioc per family are higher in the lower income classes than in the higher income classes.

Thus increases in the prices of these staple foods hurt the poor much more than the rich. Since the consumption patterns of rich and poor are very different, a single index of inflation is inappropriate across the full range of the income spectrum. Higher prices for these basic commodities results not

only in a real income loss for the entire population, but also a further relative income loss for the poor.

This paper attempts to measure the extent of this relative income loss for the poor by examining the implied change in the consumption Gini coefficient resulting from the actual change in food prices. It is assumed that all individuals have Cobb–Douglas utility functions, or more specifically that budget shares for all goods remains constant within an income class. Since we know the budget shares for goods in 1974/75 for each income class from ENDEF data, we can determine the consumption basket for 1966 and 1980 assuming that the only real price changes were those of the food items presented in table 1. We evaluate the value of these two consumption baskets at 1974/75

Table 2  
Estimated change in consumption Gini due to price changes. <sup>a</sup>

Region	1966	1980	Change
Brazil	0.4423	0.4750	0.0327
(I) Rio de Janeiro	0.4017	0.4222	0.0205
(II) Sao Paulo	0.3714	0.3969	0.0254
(III) South	0.3605	0.3818	0.0213
(IV) Minas Gerais, Esp Santo	0.4126	0.4487	0.0361
(V) Northeast	0.3761	0.4193	0.0431
(VI) Federal District	0.3804	0.3994	0.0190
(VII) North	0.3708	0.3949	0.0241
(1) Metropolitan Rio	0.4043	0.4243	0.0200
(2) Urban, non-metropolitan	0.3199	0.3408	0.0209
(3) Rural RJ	–	–	–
(4) Metropolitan Sao Paulo	0.3742	0.3926	0.0185
(5) Urban, non-metropolitan	0.3074	0.3298	0.0224
(6) Rural SP	0.2805	0.3121	0.0316
(7) Curitiba	0.3969	0.4198	0.0229
(8) Porto Alegre	0.3459	0.3663	0.0204
(9) Urban, non-metropolitan	0.3492	0.3701	0.0209
(10) Rural South	–	–	–
(11) Belo Horizonte	0.4409	0.4601	0.0192
(12) Urban, non-metropolitan	0.3737	0.3995	0.0258
(13) Rural MG, ES	0.3217	0.3509	0.0291
(14) Fortaleza	0.3927	0.4173	0.0246
(15) Recife	0.3852	0.4042	0.0190
(16) Salvador	0.3992	0.4171	0.0179
(17) Urban, non-metropolitan	0.3518	0.3784	0.0266
(18) Rural Northeast	0.2229	0.2462	0.0233
(19) Federal District	0.3804	0.3994	0.0190
(20) Belem	0.3576	0.3780	0.0204
(21) Urban, non-metropolitan	0.3699	0.3883	0.0183
(22) Rural North	0.3704	0.3984	0.0280

<sup>a</sup> Data for regions (3) and (10) were incomplete. These regions were excluded from the calculations. A straightforward estimation procedure was used with the implicit assumption that all income within each ENDEF income class is equal. This may pose problems in cases like region (18) where there are 640,986 families, all in income class 8.

prices, and determine the implied change in consumption inequality resulting from the food price increases.

#### **4. Results**

The results are presented in table 2. The estimated change in the consumption Gini coefficient for Brazil resulting from the food price changes alone is 0.033, going from 0.442 in 1966 to 0.475 in 1980. Since Gini coefficients are known to be remarkably stable, this change is quite significant. It suggests that even if the nominal distribution of income has not changed, relative price changes may have resulted in a dramatic change in consumption inequality. The change for Brazil as a whole is larger than for most regions because of strong regional income inequality.

These figures may tend to underestimate the decline in the welfare of the poor for one reason. If food prices tended to increase faster than the general price deflator, other goods such as manufactured goods must have had falling real prices. Since the wealthy have a larger budget share for the consumption of manufactured goods, they would have benefited more than the poor. This was not explicitly considered in these calculations.

On the other hand, it should be noted that most of the poor in Brazil work in the agricultural sector. A higher price for agricultural goods may have been transformed into higher incomes for the poor. In this case the poor of the agricultural sector could have gained relative to the rich of the manufacturing sector.

A more complete analysis would consider not only the relative price changes for food commodities, but also for durable goods, housing, health care, etc. One would develop a price index for each income class in each of the 22 regions since the cost of living varies substantially between regions.

#### **5. Conclusion**

During the last few decades inequality has been a very serious problem in Brazil. Nominal income inequality increased dramatically during the 1960's. Relative income shares became much more unequal as the income Gini coefficient increased from about 0.50 to 0.58. Despite very rapid growth in the later years of the decade, the incidence of poverty did not change substantially. During the 1970's changes in the overall inequality in income distribution were not clearly discernible, although there were more disaggregated changes for the most part offsetting each other. The results of this paper suggest that the serious inequality in Brazil may be an even more significant malaise.

Development policy must always be concerned about raising the incomes of the very poor relative to the price of basic needs such as food, clothing and shelter. Even if the nominal distribution of income is stable, relative price changes may be causing a dramatic increase in consumption inequality. Much more data and careful analysis is necessary to determine the actual effect of food price increases on the welfare of the poor in Brazil. But in this paper we have empirically shown that the potential magnitude of the problem is quite high and deserves serious attention.

#### **References**

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