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Symposium on Income Distribution

The first two articles in this issue of the *Journal* are revised versions of two of the papers submitted to the Workshop on Analysis of Distributional Issues in Development Planning at Bellagio, Italy in May 1977. The next three papers were submitted independently, and, while not addressing themselves directly to problems of income distribution and planning, make interesting and useful contributions to cognate subjects—the flow of remittances between the urban and the rural sector, the estimation of underemployment in the rural sector and the transfer, within the Soviet Union, of commodities from its agricultural to its industrial sector. The remaining four papers were written in response to articles on income distribution which have already appeared in the *Journal of Development Studies*, or by way of comment on these responses.

The Editors

Brazilian Income Distribution in the 1960s: 'Facts', Model Results and the Controversy

*by Edmar L. Bacha and Lance Taylor**

This paper discusses a number of hypotheses that have been put forward to explain apparently unequalising changes in Brazilian income distribution in the 1960s. One of these argues that, if more relevant measures are used, the increase in distributional inequity is apparent only. This hypothesis is rejected after conceptual and statistical criticism.

Of the hypotheses which accept increased inequity in distribution in the 1960s, one emphasises the importance of changes in the composition of the income-earning population (by education, sex, sector, age and region). But it is shown here that these compositional effects were either in an equalising direction (regional; sectoral) or quantitatively small (sex, age and education).

*The authors are respectively at the University of Brasilia and the Massachusetts Institute of Technology. This is a revision of a paper originally presented at the World Bank-sponsored Workshop on Analysis of Distributional Issues in Development Planning, Bellagio, Italy, 1977. Comments of the conference participants (especially Michael Lipton) are gratefully acknowledged, as well as those of Rodolfo Hoffman, Frank Lysy, Roberto Macedo and Flavio Versiani.

The argument that the rise in distributional inequity was caused by growth-induced demand for skills forcing up the rewards for skill, is also rejected. The increase in the supply of skilled labour in the 1960s was very large, and with plausible elasticities of substitution and a competitive labour market, the rewards for skills must have fallen.

Detailed analysis of Brazilian wage-fixing institutions suggests that the government was able, despite some wage drift, to hold back increases in real wages by squeezing minimum money wages and allowing firms to pass on increased labour costs in output prices. This is consistent with a shift in the functional distribution in favour of profits. It is also consistent with a picture of the labour market as one of two non-competing groups, managers who are paid wage-spreading increases—their share in the income left over after the labourers are paid their wages. Mutual consistency of partial explanations does not, of course, guarantee their correctness.

1. INTRODUCTION

Attempts at explaining changes in the Brazilian income distribution during the 1960s can be grouped conveniently into six hypotheses. Five accept that there was deterioration in distributional equity, one denies that any such thing occurred.¹ The five positive explanations of increasing inequality further split into two groups, emphasising microeconomic market adjustments on the one hand, and institutional and macro phenomena on the other. The micro stories emphasise, first, certain statistical regularities of the development process, which we label *Kuznets effects*. Secondly, they stress the importance of unequalising Marshallian wage responses to sudden increases in excess demand for skilled labour, as growth accelerates—a *skilled differentials* hypothesis.

More historically oriented scholars point out the negative impact on the income distribution of the post-1964 *wage squeeze*, which forced labour payments down during the period 1964–7. When rapid output growth resumed after 1967, the wage compression at the bottom of the distribution allowed bigger profit margins and remunerations at the top (in both the public and private sectors) giving rise to *wage spreading*. Both these lines of analysis fit naturally with a number of neo-Keynesian interpretations of Brazilian growth, which have *income concentration with growth* as their likely outcome. Finally, recent papers by American economists try to dispose of the debate by denying that on relevant welfare scales income distribution did in fact deteriorate in the 1960s. This is the *wrong measurement* explanation.

In the remainder of this introductory section, we try to pass along some of the polemical flavour of these positions, as well as state their key assumptions more fully. Thereafter, we discuss the extent to which each is supported by economic reasoning and the 'facts', in so far as they are known. Our conclusions will be agnostic, but predisposed toward the wage squeeze, wage spreading and income concentration hypotheses. It is only fair to warn the reader in advance that we are counted among the authors of papers arguing these points of view.

1.1 *Kuznets Effects*

This hypothesis stresses that changes in the structure of employment accompanying the intermediate stages of modern economic growth can easily lead to increases in income inequality. It is favoured by Carlos Langoni [1973] in a book widely cited in the Brazilian debate, and Gary Fields [1977].

The original idea is from Simon Kuznets [1955] who conjectured that, as labour moved from rural to urban occupations, income distribution would deteriorate because income is less concentrated in rural communities. Kuznets also thought that this rise in inequality would be temporary, largely restricted to an intermediary phase of capitalist development when substantial intersectoral population movements take place. Afterwards, equalising factors would prevail, allowing for a decrease in inequality with further economic growth. This hypothesis of an inverse U-shaped relationship between income concentration and per capita income has been tested by a number of econometricians using cross-section international data. The cross-country evidence is broadly consistent with Kuznets' conjecture, although large deviations from the regression curve stand out [Ahluwalia, 1976; Bacha, 1978].

In his polemical chapters, Langoni [1973] emphasises general structural shifts of the Kuznets type, but his statistical work focuses mainly on the unequalising impact of the expansion of education between 1960 and 1970. Despite a substantial decline in illiteracy rates, the distribution of educational attainment became more unequal, largely because of a marked expansion in the numbers of university and high school graduates relative to grade school graduates. As shown below, income is more equally distributed among the less educated, so the overall distribution worsened. Perhaps more importantly, narrowing of income differentials by education levels—which could offset such an increase in inequality—was not observed in Brazil in the 1960s.

This restatement of Kuznets' ideas gained easy acceptance in Brazilian government circles. For example, Antonio Delfim Netto (serving as Minister of Finance but identifying himself as a university professor) wrote in a foreword to Langoni's book that:

Langoni proves that the observed increase in inequality is a direct consequence of market disequilibria accompanying the development process. Thus, the behavior of relative incomes reflects, mostly, the intense process of differentiation of the labor force caused by the rapid expansion of modern sectors. In these sectors, however, workers are very productive and, because of this, receive relatively high earnings even when the variance is larger. In this context, it makes no sense to use the increase in inequality as an index of welfare deterioration.

[Langoni, 1973: 14]

1.2 *Skill Differentials*

This explanation was proposed as part of Langoni's [1973] study, and maintains that short-run Marshallian adjustment processes in the labour market are responsible for the observed stretching of wage differentials in the 'sixties. The idea is that there is a structure of labour supply by (well-

defined) skill levels which is constantly changing as a result of the educational process. The wage structure is anchored at the bottom by elastic supply of the unskilled, but elasticities of substitution between skill groups are in effect assumed to be low and rapidly declining at higher rungs along the education ladder. Growth in labour demand is supposed to be biased toward higher skill types, because physical capital and advanced skill are complementary. The sectoral mix of aggregate demand is shifting toward skill-intensive industries and technical progress is skill-using.

According to this set of assumptions, GDP growth in Brazil during the 1960s could not help but drive up demand for skilled workers at a faster pace than they were being produced by the educational system. As a consequence, wage differentials by years of schooling (temporarily?) widened. This alleged market response partially explains the rising Gini coefficient over the decade.

The skill differentials hypothesis is clearly compatible with emphasis on Kuznets effects, and was also adopted by the government as part of the official interpretation of rising inequality. For example, at the height of the distribution debate in 1975, Minister of Finance Mario Simonsen baldly asserted that: 'In fact, the main reason for worsening income distribution seems to have been an inadequate profile of labor qualifications vis-a-vis the needs of the market' [*Simonsen, 1975: 18*]. The implicit technological assumption that the wage response to faster growth in the skilled labour supply would be highly equalising is taken up in detail below.

1.3 *Wage Squeeze*

Economists not directly associated with the Brazilian government take other tacks. One was independently suggested by Albert Fishlow [1972] and R. Hoffman and Duarte [1972] and further developed by R. Hoffman [1973]. It stresses that the repressive wage policy that figured notably in the economic stabilisation programme following the 1964 military coup was a factor in producing the increase in income inequality. More precisely, the cited authors observe that unskilled and semi-skilled urban labourers' earnings place them in three intermediary deciles (5th to 7th) of the income distribution. These three deciles are the ones for which average real income grew least between 1960 and 1970. Minimum wage control and the lagging 'wage formula' for collective bargaining hit exactly these income strata the hardest, and are asserted to have caused their observed low real growth. Rural workers were only indirectly affected by urban minimum wage requirements, and upper income groups in the city escaped wage repression because their salaries were not determined by collective bargaining.

1.4 *Wage Spreading*

A related explanation was originally suggested in an unpublished paper by Maria Conceicao Tavares [1969] further explored by Bacha [1976: *Essay No. 2.4*], and favourably discussed by Wells [1974] and Fishlow [1973b]. It starts with the observation that in the modern sector, both production and government service activities are organised along hierarchical lines. The relative levels of wages parallel the structure of command and influence within organisations, with market processes guaranteeing rough

comparability of remunerations across management units. The average wage differential between 'managers' and 'workers' widens as gross profits increase, and is influenced by the level of payments received by upper level government technocrats. If the market at the top end of the wage spectrum tightens, vacancies are more likely to be filled by accelerated on-the-job training and downgrading of ascriptive job characteristics, than wiped out by wage adjustments.²

Applied to Brazil, these ideas suggest that broadening earnings differentials in the 'sixties will not be explained by skilled labour scarcities as maintained by the 'official' spokespersons. Rather, a conjugation of wage repression (after 1964) with demand boosting policies (after 1967) allowed firms to achieve much higher profit rates than before. These filtered down the organisational hierarchy, allowing increasing pay rates to administrative and professional positions. The wage squeeze at the bottom of the scale and rising government salaries for technocrats moving back and forth from the private sector helped keep the whole structure stable.

1.5 Income Concentration with Growth

For many years, Latin American economists of 'structuralist' persuasion have stressed that rapid economic growth is likely to be associated with increasing income inequality, for a variety of reasons. Much of their argument transcends economics as usually construed, and cannot easily be captured by mathematical or statistical reasoning. Some flavour of structuralist analysis shows up, however, in models stressing macroeconomic adjustments via 'forced saving'. For example, Eliana Cardoso [1978a], shows in a macroeconomic model without an important monetary sector that during the 1960s, savings adjusted to the current value of investment via shifts in the real values of private, foreign and government savings brought about by changes in the inflation rate. A subsequent analysis [Cardoso, 1978b] develops this line of thought to show that the observed decrease in the government budget deficit and the growth spurt after 1967 were consistent with an increase in wage repression, reducing the need to rely on inflationary finance. Such macroeconomic reasoning is consistent with micro wage squeeze and wage spreading, and the three hypotheses fit together as a consistent alternative to the government's rationalisations of increasing inequality.

1.6 Wrong Measurement

Finally, some analysts (on the whole not Brazilian) suggest that the whole inequality debate is pointless because of inadequate data and faulty methodology. Morley and Williamson [1975] observe that Langoni's data for the income-earning population yields a Lorenz curve for 1970 lying strictly below the corresponding curve for 1960. For income earners, the increase in inequality is unambiguous. However, if labour force participants with zero income are included, the Lorenz curve for 1960 crosses the 1970 curve from below, implying that the poorest groups became relatively better off in the latter year.

In a similar though independent analysis, Fields [1977] bases his comparison on equivalent real income intervals rather than on income

deciles to conclude that the Brazilian 'poor' (those earning up to Cr\$2.10 per month in 1960 and up to Cr\$99.00 in 1970) increased their average income by more than 60 per cent over the decade whereas the non-poor (all others in the labour force) raised their income by only 25–30 per cent during the same period.

Both the Morley–Williamson and Fields arguments can be criticised on methodological and statistical grounds. We take up this task in the following section, as a prelude to more quantitative discussion of the other hypotheses.

2. WRONG MEASUREMENT DISMISSED

The reliance of all analysts on the 1960 and 1970 Brazilian demographic censuses has forced them to adopt all kinds of extrapolation techniques to try to get at the 'true' income distribution. The census data gives information only about cash incomes received by samples of individuals in the economically active population, and must necessarily be supplemented by inferences about income in kind, under-reporting at the top of the distribution, closure of open ended income brackets, etc., before it can be useful.

The results of such manipulations presented by Langoni [1973] have received closest attention, since he had access to large samples from both censuses (as opposed to other economists such as Fishlow [1972] and R. Hoffman and Duarte [1972] who had to rely on summary 1970 census tabulations). Langoni's overall distribution estimates are reproduced in Table 1.³

Morley and Williamson [1975] take exception to Langoni's choice of income *earners* as the population of reference and insist on comparing the distributions for all individuals in the economically active population, including 'zero income recipients'. The latter, for the most part, are unpaid family workers in the rural sector [Fishlow and Meesook, 1972; Langoni, 1973]. Fishlow [1972] developed a technique to estimate how much of the money income of rural family heads was redistributed to these 'zero income recipients' in 1960. Langoni [1973] found Fishlow's procedures too subjective and did not do the same for 1970: his solution was to exclude these workers from the analysis. Morley and Williamson's proposal is to put them back in the picture with *zero* income levels and identify them as unemployed. The proportion of 'zero income recipients' falls from 14.7 to 9.6 per cent of the labour force between 1960 and 1970. As a consequence, the 1970 Lorenz curve of the distribution of cash incomes for the labour force crosses the corresponding curve for 1960 from above—unequivocal welfare judgments on the two distributions can be made no longer.⁴

Morley and Williamson's point is a reminder of the inadequacy of using cash incomes as a basis for welfare judgments. However, the problem is not solved by calling 'unemployed' the 'zero income recipients', for this they certainly are not.⁵ Rather, one should consider a broader income concept including payments in kind; or else compare family instead of individual incomes, because the proportion of zero-income families is minimal in both 1960 and 1970. Unfortunately, these alternatives are not available, hence the only practical solution is to restrict attention to the income-earning population.

TABLE 1
 BRAZIL: COMPARISON OF INCOME DISTRIBUTION
 BY INCOME DECILES, 1960-1970
 (INCOME EARNING POPULATION)

Population deciles	Percentage of income			Average income (in 1970 cruzeiros per month)		
	1960	1970	% change	1960	1970	% change
-10	1,17	1,11	- 5.1	25,	32,	+28.0
10	2,32	2,05	-11.6	48,	58,	+20.8
10	3,42	2,97	-13.2	71,	84,	+18.3
10	4,65	3,88	-16.6	96,	110,	+14.6
10	6,15	4,90	-20.3	127,	139,	+ 9.5
10	7,66	5,91	-22.8	158,	168,	+ 6.3
10	9,41	7,37	-21.7	195,	210,	+ 7.7
10	10,85	9,57	-11.8	225,	272,	+20.9
10	14,69	14,45	- 1.6	305,	411,	+34.8
+10	39,66	47,79	+20.5	815,	1,360,	+66.9
+5	27,69	34,86	+25.9	1,131,	1,984,	+75.4
+ 1	12,11	14,57	+20.3	2,389,	4,147,	+73.6
-40	11,57	10,00	-13.6	60,	71,	+18.3
40	34,08	27,80	-18.5	176,	197,	+11.9
+20	54,35	62,20	+14.5	560,	886,	+58.2
Total	100.00	100.00		206,	282,	+36.9

Source: Langoni, [1973: Table 3.5, p. 64].

This leads to Fields' [1977] first point, that in absolute scale the Brazilian poor were better off in 1970 than in 1960. The effective basis for this conclusion is the 18.3 per cent gain in average incomes of the poorest 40 per cent of the income-earning population shown in Table 1. However, this result might not be maintained if comparisons included income in kind, because market-related processes became increasingly important in Brazilian agriculture between 1960 and 1970. The proportion of unpaid family workers, resident labourers and sharecroppers fell, while that of wage earners soared. Under changing agricultural labour market conditions such as these, cash income comparisons alone clearly overstate the real income growth of the rural poor. Proper evaluation of Fields' contention would require data on changes in income in kind, which do not exist.

Fields also stresses absolute income changes, although most of the debate has been about relative income shifts. However, he oversteps the bounds of the data when he asserts that 'average real incomes among families defined as poor by Brazilian standards increased by as much as 60 per cent while the comparable figure for nonpoor families is around 25 per cent' [Fields, 1977: 570]. Fields compares the average incomes in equivalent real income intervals in the two census years, say between 0 and 2.1 or 2.1 and 3.3 1960 cruzeiros (as well as other pairs of end points). The average income in each such interval will of course change with both the number of income recipients it contains, and the income per head they receive.

Population movements among intervals are at least as important as income growth itself in changing the distribution by size, and Fields' procedure of scaling up average incomes within fixed intervals leaves them out completely.

In addition, Fields' estimates of the real income growth of the poor are vitiated by faulty statistical procedures. He defines 'the poor' as those earning up to 2.1 1960 cruzeiros per month both in 1960 and 1970. In his equation (4) [Fields, 1977: 575], he imputes to this group an income share equal to 6 per cent in 1970, up from 5.2 per cent in 1960. Since the proportion of 'the poor' in the labour force declined from 37 per cent in 1960 to 35.5 per cent in 1970, he concludes that 'the poor' experienced a much higher growth rate of income than the 'non-poor'. Using Langoni's data [Langoni, 1973: Table 3.2, 61] we can draw a Lorenz curve for the income distribution data of 1970. From this curve, we estimate that the income share of the lowest 35.5 per cent of the population in fact was 4.35 per cent rather than the 6.0 per cent described by Fields. Hence, in proportion to the total population, 'the poor' were 4.1 per cent fewer than in 1960, but their income share in 1970 was 16.3 per cent lower. In relative terms, in 1970 'the poor' were worse off than in 1960. The picture is bleaker if we exclude from 'the poor' the zero income earners (which is what we should do, since we do not know what happened to the real income of these people between 1960 and 1970). In this case, the proportion of 'the poor' increases from 22.3 to 23.8 per cent of the population between 1960 and 1970. But their income share drops as before, from 5.2 to 4.5 per cent of the total.

The way not to fall into Fields' trap is quite traditional—one simply compares distributional changes by looking at time-invariant population percentiles, ordered according to income level. Using this yardstick, we verify in Table 1 that the cash income of the poor (say, the lowest 40 per cent of the distribution) proportionately increased by much less than the cash income of the rich (say, the highest 20 per cent of the distribution) between 1960 and 1970.

In summary, both Morley and Williamson and Fields substitute computation for common sense in asserting that the Brazilian size distribution became more egalitarian over the 1960s. Both approaches amount to misinterpretation of the available data, and are best dismissed as red herrings.

3. *Kuznets Effects*

The income distribution study by Langoni [1973] apparently was undertaken with both polemic and scholarly intent. Happily for the author, he could make his two objectives compatible by focusing on structural changes of the type discussed by Kuznets: 'a substantial fraction of the increase in inequality observed in the period is associated with the educational improvement of the labor force, the transfer of workers from the primary sector to the urban sector, and a larger participation of youth and women in the labor market' [Langoni, 1973: 15].

These assertions are based on decompositions of the shifts in the variance of logarithms of payments received by members of the income-

earning population between 1960 and 1970. Suppose that income recipients are stratified into G groups according to some relevant characteristic, such as sector of activity or educational level. Take the variance of logs of income as the measure of income inequality and consider the changes in this measure between two points in time. Apart from interaction effects, movements in the variance of log incomes can be decomposed into three terms. The first, which we will denote by 'composition changes' (or 'Kuznets effects'), represents the variations due to people shifting from one group to another—as long as log variances differ between groups, this will affect the overall log variance. The second component, which we will name 'relative income changes', captures variations in the relative incomes of the different groups (for example, the overall variance goes up when the average income of college graduates increases more than the average income of illiterates). Finally, the third component, 'within group variance changes', takes into account the impact on the overall variance of changes in the variances within groups. In symbols, let:

- V = overall variance of log income;
- x^i = proportion of total population in group i ; $i = 1, \dots, G$;
- w^i = the ratio between the geometric mean of incomes in group i and the overall geometric means of incomes;⁶
- v^i = variance of logs of income in group i .

Then, as shown by Theil [1967: 123–4], we can write the overall variance as:

$$(1) \quad V = \sum_{i=1}^G x^i (\log^2 w^i + v^i)$$

Let Δ stand for changes in the variables between two periods (say, between 1960 and 1970). Then we can write:

$$\Delta V = \Delta V^* + \text{higher-order terms.}$$

where,

$$(2) \quad \Delta V^* = \sum_{i=1}^G (\log^2 w^i + v^i) \Delta x^i + x^i \Delta \log^2 w^i + x^i \Delta v^i$$

ΔV is the 'estimated change in the variance of logs' and its first order approximation, ΔV^* , the 'explained change in the variance of logs'. The terms within brackets in (2) are, respectively, the 'composition change', the 'relative income change', and the 'within variance' components.

ΔV , ΔV^* , and their components can be estimated from Langoni's computations of the structural characteristics of the income-earning population for the 1960 and 1970 Census data; these are reproduced in Table 2. The decomposition results are summarised in Table 3, with alternative 1960 and 1970 weightings on the Δx^i , $\Delta \log^2 w^i$ and Δv^i terms appearing in (2).

Both our findings and parallel results reported by Fishlow [1977] are rather surprising in views of Langoni's insistence upon the importance of compositional changes in explaining the increase in the variance of log income in the period. In the first place, population movements between regions and between sectors of activity had an *equalising* influence on the overall variance, in spite of the fact that migrations from the rural sector to urban activities and from poorer to richer regions were substantial between 1960 and 1970. This result seems to contradict the original version of Kuznets' hypothesis for the Brazilian case. On two other population dimensions, sex and age, the compositional changes contributed to increase the overall variance, but only slightly so. No more than 1.2 to 3.1 per cent of

TABLE 2

BRAZIL, STRUCTURAL CHARACTERISTICS OF THE INCOME EARNING POPULATION, 1960 AND 1970

<i>Classification and Groups</i>	x_{70}^i	x_{60}^i	w_{70}^i	w_{60}^i	v_{70}^i	v_{60}^i
Education						
Illiterates	.2975	.3905	.3972	.5415	.5304	.4755
Grade School	.5447	.5171	.8511	1.0293	.7282	.6262
Junior High	.0803	.0516	1.7092	2.1463	.8525	.6084
Senior High	.0524	.0265	2.4397	2.6145	.7405	.5167
College	.0251	.0140	6.0496	5.4780	.8572	.5916
Sex						
Male	.7925	.8322	1.0851	1.0728	.9273	.7429
Female	.2048	.1687	.6595	.6504	1.0493	.7035
Sector						
Primary	.4005	.4656	.4894	.5874	.5474	.5110
Secondary	.1974	.1524	1.2730	1.2427	.7411	.5580
Tertiary	.4021	.3820	1.3723	1.3592	1.1725	.8852
Age						
10/19	.1425	.1245	.3481	.4412	.5468	.4374
20/24	.1581	.1489	.7021	.7864	.6746	.5899
25/29	.1371	.1421	.9894	1.0048	.8324	.6756
30/39	.2303	.2422	1.2092	1.1796	.9405	.7704
40/49	.1718	.1736	1.3652	1.2184	1.0606	.8180
50/59	.1005	.1029	1.2589	1.2087	1.0968	.8527
60/69	.0449	.0492	1.0638	1.0534	1.1087	.8458
70+	.0130	.0166	.8085	.8398	.9948	.7518
Region						
Rio	.1058	.1036	1.5887	1.6214	.8423	.7027
Sao Paulo	.2278	.2086	1.5107	1.3738	.8663	.6346
South	.1677	.1472	.9610	1.1068	.7329	.5304
M. Gerais & E. Santo	.1351	.1595	.7270	.8204	.8962	.7484
Northeast	.2763	.3066	.5568	.5680	.8128	.5296
North & Centre-West	.0872	.0744	.8440	1.0486	.6385	.5887

Notes: x^i = share of individuals of group i in total income earning population; w^i = ratio between the mean of income of group i and the mean of incomes of all individuals; v^i = variance of logs of incomes of individuals in group i . The subscripts 60 or 70 denote the year of reference for the above variables.

Source: Langoni [1973], Tables 4.1 (p. 81) and 4.2 (p. 86).

TABLE 3

BRAZIL: DECOMPOSITION OF THE CHANGE IN THE VARIANCE OF LOGS OF INCOMES BETWEEN 1960 AND 1970

Classification (Number of Groups)	Estimated Change in Variance of Logs (ΔV)	Explained Change in Variance of Logs (ΔV^*)	Proportional Contributions, to Explained Change, of		
			Composition Changes	Relative Income Changes	Within Groups Variance Changes
Education (5)					
1960-weights	·2916	·3296	14·6	56·2	29·2
1970-weights	·2916	·2534	3·9	52·7	43·4
Sex (2)					
1960-weights	·2218	·2162	2·4	—·2	97·8
1970-weights	·2218	·2270	4·7	—·4	95·7
Sector (3)					
1960-weights	·2573	·2596	—1·8	42·3	59·5
1970-weights	·2573	·2547	—2·9	37·6	62·3
Age (8)					
1960-weights	·2642	·2592	1·2	31·8	67·0
1970-weights	·2642	·2704	3·1	33·7	63·2
Region (6)					
1960-weights	·2232	·2269	—4·5	13·4	91·1
1970-weights	·2232	·2199	—6·2	13·4	92·8

Notes:

$$\Delta V = \sum_i x_{70}^i (\log^2 w_{70}^i + v_{70}^i) - \sum_i x_{60}^i (\log^2 w_{60}^i + v_{60}^i)$$

$$\Delta V^*(1960\text{-weights}) = \sum_i [(\log^2 w_{60}^i + v_{60}^i)$$

$$(x_{70}^i - x_{60}^i) + x_{60}^i (\log^2 w_{70}^i -$$

$$\log^2 w_{60}^i) + x_{60}^i (v_{70}^i - v_{60}^i)]$$

$$\Delta V^*(1970\text{-weights}) = \sum_i [(\log^2 w_{70}^i + v_{70}^i)$$

$$(x_{70}^i - x_{60}^i) + x_{70}^i (\log^2 w_{70}^i - \log^2 w_{60}^i)$$

$$+ x_{70}^i (v_{70}^i - v_{60}^i)].$$

The terms between the brackets are, respectively, the composition change, the relative income change, and the within group variance change. See Table 2 for the meaning of the symbols. Source: Estimated from Tables 4.1 (p. 81) and 4.2 (p. 86) of Lanogni [1973].

the total change in variance is explained by shifts in age composition of the population, and only 2·4 to 4·7 per cent by changing sex composition.⁷

The results in Table 3 also indicate that changes in the educational composition of the labour force account for at most 14·6 per cent of the increase in the variance of log incomes (with 1960 weights), but also that this contribution could be as little as 3·9 per cent, with 1970 weights. This finding clashes with Lanogni's contention, apparently based upon the same data and methodology, that 'the changes in relative incomes explain 23 per cent of the total increase observed in the period, whereas changes in

composition explain 35 per cent, and the increase in inequality within groups represents 42 per cent [Langoni, 1973: 93, *emphasis added*]. According to the results reported in Table 3, relative income changes were responsible for no less than 52.7 of the explained change in variance, with within group variance accounting for from 29.2 (with 1960 weights) to 43.4 per cent (with 1970 weights) of the total. We convinced ourselves that our results were consistent with Langoni's basic data (except as noted in note 6) but could not find the reasons why our final results differ from his. Similar scepticism by Malan and Wells [1973] and Fishlow [1973b, 1977] leads us to the conclusion that Kuznets effects did not importantly shape trends in the Brazilian size distribution in the 1960s.

4. SKILL DIFFERENTIALS

This hypothesis is summarised by Simonsen as follows:

Only 10.34 per cent of the economically active population had at least a high school diploma [in 1960], and college graduates represented only 1.6 per cent of the labor force. Hence, vis-a-vis the needs of the market, unskilled laborers were overabundant, meanwhile skilled labor types were rather scarce.

[Simonsen, 1975: 19]

Though the polemic intent of this Ministerial observation is clear, its static analysis rather misses the point. In looking at *changes* in the income distribution by skill types over 1960-70, one would have to look at shifts in labour force composition over the period. Table 4 shows that the population share of college graduates increased by 80 per cent, while their per capita income increase (51.9 per cent) was greater than any other educational group. Contrariwise, the population share of illiterates fell by a quarter, and their per capita income stayed constant. Any sort of competitive labour market theory would suggest that average payments to the college educated should have fallen under this sort of shift while those of the increasingly scarce illiterates should have gone up. Widening skill differentials in the face of increasing numbers of the skilled during the 1960s make up the real puzzle in Table 4. It is not resolved by observations about labour force composition in 1960.

To delve deeper and test whether the results in Table 4 can be explained by some sort of bias favouring the highly educated in growth of Brazilian labour demand, one would have to construct a model of the economy during the 1960s, with producing sectors demanding different labour skill types. Four groups of authors have in fact undertaken exercises of this nature—Morley and Williamson [1975], Fishlow [1973b], Cardoso [1978a] and Lysy and Taylor [1978]. We review their results *seriatim*.

Morley and Williamson construct a demand-determined dynamic input-output model so calibrated that sectoral output levels track historical growth paths closely (see their Table 1B). Total employment growth in each sector is related to output growth by an elasticity set to the observed ratio of these respective growth rates (their equation (7)). Employment of each type of labour by sector is determined from a set of coefficients reflecting 1960 skill composition—'skills' being identified with eight income fractiles from the 1960 Demographic Census. A previous paper [Morley and Williamson, 1974: Table 2] indicated that this apparatus could

TABLE 4

BRAZIL: COMPARISONS OF INCOME DISTRIBUTION BY EDUCATIONAL LEVELS,
1960/1970
(INCOME-EARNING POPULATION)

Educational Level	Population Share		Average Income (in 1970 cruzeiros per month)		Proportional Changes 1970/1960	
	1960 (%)	1970 (%)	1960	1970	Income (%)	Population (%)
Illiterates	39.05	29.75	111	112	00.0	2.2
Grade School	51.71	54.47	211	240	13.7	41.3
Junior High	5.16	8.03	440	482	9.5	108.9
Senior High	2.67	5.24	536	688	28.4	163.4
College	1.40	2.51	1,123	1,706	51.9	140.8
Total	100.00	100.00	206	282	36.9	34.2

Source: Langoni [1973: Table 4.2, p. 86], except for the income-earning population in 1960 which is calculated from data in Fishlow and Meesook [1972].

be used to track *total* employment growth in the period 1949-62 rather accurately. However, no verification of how well the model performs with respect to employment growth during the 1960s is presented.

From their simulations, Morley and Williamson [1975] conclude that estimated demand (*not* known supply) for their highest skill group grew by 4.8 per cent annually between 1960 and 1970, whereas the growth rate in demand for the lowest skill group was 3.2 per cent. In effect, they are asserting that the composition of demand shifted in favour of industries intensive in the employment of high income workers in 1960.

Now, was this differential in *simulated* hiring patterns sufficient to explain the observed stretching of wages? Naturally, the answer depends on the elasticities, and the actual growth rates of supply. Having pre-empted the obvious candidates for supply growth, namely 4.8 per cent per year for high-skilled and 3.2 per cent for low-skilled, they pull a number out of the hat (in a footnote to their Table 4) and set supply growth equal to 2.6 per cent per year for *both* labour types. This number has nothing to do with actual employment growth by skill type (compare Langoni's estimates of changes in the shares of the economically active population by education level in Table 4). Nonetheless, Morley and Williamson use it together with arbitrary supply and demand elasticities estimates by *each* skill to conclude that observed wage changes can be 'explained' by demand and supply considerations alone. Given their assumptions, the conclusion looks like a *non sequitur*.

Despite their unrealistic model, Morley and Williamson *do* have hold of a real problem in economic analysis; they just go at it from the wrong angle. Fishlow [1973b] adopts a more realistic, though partial equilibrium, point of view. His question is, how biased would demand growth for higher skill levels have to be to achieve consistency with observed trends in payments, given that relative supply growth rates were working in the opposite

direction? This bias in supply growth is of course extreme—according to Table 4 the number of college graduates grew by 141 per cent over the decade whereas the combined supply of illiterates and grade school graduates went up by only 25 per cent. Distinguishing three educational classes, Fishlow writes labour demand functions of the form:

$$(3) \quad \Delta \log L_{it}/L_{ot} = \sigma_i \Delta \log w_{it}/w_{ot} + r_i \Delta t$$

where L_{it} = demand for skill i ; L_{ot} = demand for unskilled labour; σ_i = elasticity of substitution between labour types i and 0 ; w_{it} = wage of skill i ; w_{ot} = wage of unskilled labour; r_i = *difference* between the rates of labour-using technical progress for skill class i and unskilled workers; Δ = difference operator; i = medium-skilled or high-skilled; t = time.

Assuming changes in demand equal to observed changes in supply, Fishlow estimates the r_i 's which would be consistent with the observed wage variations between 1960 and 1970, with elasticities of substitution in the range between 1 and 4. His conclusion is that the r_i 's would have to be between 6.1 and 11.9 per cent per year for higher skills and between 4.0 and 5.2 per cent per year for medium skills. These numbers Fishlow finds exceedingly high in view of the fact that the rate of growth of per capita GDP in the period was in the order of three per cent per year. He concludes that 'supply and demand' alone cannot explain the widening earnings differential observed over the period.

A partial explanation for Fishlow's paradox is provided by Cardoso [1978a]. She observes that the Morley-Williamson model is not closed with respect to the savings-investment identity, i.e., they have no assurance that their estimated money (= real) wage changes are consistent with the observed growth in personal saving. On the basis of actual growth rates in money wages and real investment, her simulations in a closed macro model show that there must have been a substantial shift in the functional distribution during the 1960s, as profits rose to sustain savings. A large part of the income distribution shift toward richer Brazilians (many of whom are college educated) resulted from this savings-investment interaction, which both Morley-Williamson and Fishlow ignore.

Similar conclusions are provided by Lysy and Taylor [1978] from simulations with a multisectoral, multi-skill general equilibrium model calibrated to Brazilian 1960-70 data. Without inclusion of skill-biased technical progress as in (3), their model predicts *narrowing* wage differentials but a rise in the profit share parallel to Cardoso's. Also, their results track observed employment growth by sector reasonably well.

The Lysy-Taylor results on narrowing wage differentials derive from the competitive labour market structure they assume. With elasticities of substitution among skill types of less than infinity (their values hover around five), any supply increase as great as that for the college educated in Table 4 will inevitably lead to a decrease in its relative remuneration in competitive hiring. If the substitution elasticity between the skilled and the rest of the labour force is low, simple calculations show that the wage reduction needed to accommodate Table 4's 80 per cent increase in college-trained workers would have to be even larger. But low substitution

elasticities, or the 'essential' nature of skilled workers, is precisely what proponents of the skill differentials hypothesis assert. To make their case under labour competition (which they also presuppose) they finally have to rely on unreasonably high rates of biased technical change, as pointed out by Fishlow. Such assumptions are best shaved away by Occam's Razor, and for that reason we conclude that the skill differentials hypothesis is not a useful explanation of Brazilian distributional change.

5. THE WAGE SQUEEZE

The gist of this argument has already been sketched in section 1.3—the restriction on money wage increases imposed as part of the post-1964 stabilisation programme sharply reduced real income growth rates in the middle deciles of the size distribution, and produced the rise in inequality documented in Table 1. To analyse this hypothesis fully requires familiarity with the institutional character of the Brazilian labour market, and numerical inference based on scattered and inadequate data. We first discuss institutions and numbers, and then go on to somewhat more formalised hypothesis testing.

5.1 *Patterns of Wage Settlements*

Since 1940 Brazil has had a system of regional minimum wages which are periodically readjusted, as of lately on 1 May of each year. Collective wage negotiations involving the labour union for a given regional industrial grouping, on the one hand, and the corresponding firms on the other hand, are also conducted regularly, under the supervision of government bodies and Labour Courts, since the early 1930s when the so-called Consolidation of Labour Laws was put into effect. The right to strike under prescribed conditions was also legally guaranteed.

After the military take-over in 1964, the right-to-strike law became a dead letter, with the most important labour unions in the country subject to police intervention. New rules for collective wage negotiations were also drawn: the bilateral negotiation system was maintained but mandatory wage guidelines were specified. A complicated 'wage readjustment formula' conceived by Mario Simonsen was put forward; periodically, the government specified the values of each of the variables entering the formula. The wage readjustment itself, however, had to be ratified for each labour negotiation by the Labour Ministry Wage Department either directly (in cases of undisputed agreements between unions and managers) or through the Regional Labour Courts (in cases of Court settlements). Given the bureaucratic red tape, some margin of variation in wage negotiations always prevailed, despite the government's attempt to enforce homogeneity in wage increases. Starting in 1974, the government came up with a new simplified formula allowing it to decree monthly the yearly rate of wage readjustments to be followed in on-going negotiations.

From data in DIEESE [1975], a real wage index for unionised workers in the state of San Paulo can be constructed. There are a few interesting contrasts between the minimum wage index and this unions' index: both rise in value from 1957 through 1961; in this year, the minimum wage index loses momentum. However, the Unions' index continues to increase until

1963, the last year of the 'populist' Goulart government. Also, over the 'sixties as a whole there is very little change in the Unions' index: the 1970 value is five per cent below that of 1960 but the 1969 value is the same as in 1959. By contrast, real minimum wages in 1970 are 30 per cent lower than in 1960.

In view of this evidence, two questions emerge: First, how effective are the government wage guidelines in constraining the determination of market wage rates? Second, if effective, what are the likely impacts of government wage policy on the level and structure of employment? These questions are at the heart of the polemics on income distribution in Brazil. Much of the critical literature has been directed at exploring the negative impact of wage policy on the distribution on income and welfare of the poor.⁸ On the other side, economists associated with the government and a few others contend that wage restraint either did not influence the income distribution, or else acted to improve it through beneficial employment effects.⁹

5.2 *The Impacts of Minimum Wage Policy*

Arguments regarding wage policy are critically surveyed by Macedo [1977]. With respect to minimum wages (the series cited most frequently by all participants in the debate) he makes three key points:

(i) Minimum wages apply only in the formal market, and for example do not cover urban and rural workers without regular jobs, the poor self-employed and domestic servants. And even in the parts of the labour market they cover, minimum wage requirements are in some cases known to be evaded. As we have already noted, the minimum wage does not affect people in the lower deciles of the size distribution and in no way represents an income floor. Macedo cites survey evidence to the effect that over a quarter of Brazilian income recipients gained less than *half* the minimum wage in 1972. Over one-half of income recipients had earnings below the legal minimum.

(ii) While the level of real minimum wages has decreased since 1964, the proportion of workers receiving minimum wages in the urban formal market has also apparently decreased. . . The fact that the minimum wage has been losing importance is due both to the decline in its real value over time and to the diminished importance of institutional wages in a tightening labor market. [Macedo, 1977: 119-20].

(iii) Since there is evidence [Macedo, 1974; Barbosa, Morley and Souza 1976] showing the importance of internal labour markets and occupational ladders in the Brazilian manufacturing sector:

it is difficult to believe that in the formal sector covered by the minimum wage law the people receiving minimum wages in 1970 are the same as those who received minimum wages in 1960. Moreover, there is no guarantee that those employed at the minimum wage levels of 1970 would be employed if the minimum wages were higher. Therefore, the loss caused by the drop in the real value of the minimum wage cannot be unambiguously determined. . . [Macedo, 1977: 120-1].

Let us consider these three observations in reverse order. Macedo's third point is another version of our criticisms of Gary Fields' work in section 2

above—it makes no sense in discussing relative inequality to consider changes in real income of either ‘the poor’ or ‘those receiving the minimum wage’. We can add structure to the discussion if we assume that manufacturing workers tend to enter internal labour markets at the minimum wage and progress steadily up a real wage ladder with stable income increments between the rungs. If these assumptions hold, then the drop in real minimum wages between 1960 and 1970 is equivalent to a downward shift in the whole wage ladder, and workers on all rungs lost absolutely. A repressed wage ladder may be a pretty good description of the outcome of the confrontation between labour and the military after 1964, but Macedo is right in asserting that it provides little direct evidence about what happened to relative inequality in the size distribution.

Macedo’s second observation about wage drift requires more careful scrutiny. The phenomenon certainly occurred, at least as far as minimum wages are concerned. The clearest evidence comes from Bacha, Mata and Modensi [1971]. For Brazil as a whole, they show that as the index of the real value of the minimum wage declines by 9.7 per cent from April 1965 to April 1968, the number of workers receiving up to 1.05/1.07 minimum wages falls from 43.2 to 36.1 per cent of the manufacturing labour force (for both Sao Paulo and Rio the fall is much more pronounced). Between April 1968 and April 1969, when the minimum wage held constant in nominal terms and fell 19.7 per cent in real terms, the proportion of all Brazilian workers near the minimum wage fell from 36.1 per cent to 28.4 per cent. The trend reversed subsequently, with the share rising to 29.7 per cent in 1971. Wage drift away from the minimum is suggested by these figures, though possibly in exaggerated form since they are not corrected for a probable increase in hours of work as the growth rate accelerated in the late 1960s. On the other hand, the rise in the proportion in 1969-71 may be due to low skill people entering the labour force at or below the minimum wage during the boom.

Other evidence for wage drift is also available. Bacha [1977] compiled data for a few Brazilian firms showing the real wages of assistants and helpers falling by 8 per cent between April 1966 and April 1972, as compared to a 16 per cent decline in the peak minimum wage over the same period. Similarly, data for Sao Paulo shows an increasing ratio between rural wages and the minimum urban wage.

In so far as wage drift occurred, it demonstrates that the government could not completely control market wages through its minimum wage guidelines. But this does not mean that one should jump from the position that the short-run elasticity of the money market wage with respect to the official minimum is equal to one (a position apparently taken by the critical literature) to its opposite extreme, that this elasticity is equal to zero. In fact, *median* wages in the manufacturing sector do seem to respond to the minimum wage, as the regressions of Table 5 illustrate.

These regressions use as dependent variables transforms of the median wage in the manufacturing sector of Rio de Janeiro city from 1952 through 1975, and as independent variables transforms of the minimum wage in Rio, the cost of living index for this city, and the GDP per capita for the country as a whole. The results show the significance of the minimum wage

as a determinant of the median wage after taking into account the independent effects of inflation and GDP growth on market wages. In fact, according to regressions (2) and (4), the elasticity of the median wage with respect to the minimum wage is approximately one half, which is a very sizeable ratio, taking into account that, at least since 1965, the workers earning *up to* the minimum wage comprise less than 40 per cent of the labour force in the manufacturing sector of Rio. According to regressions (1) and (3), subtracting one cruzeiro from the minimum wage means subtracting between 48 and 66 centavos from the median wage.

TABLE 5

RIO DE JANEIRO CITY MANUFACTURING SECTOR: RESULTS OF REGRESSIONS OF MEDIAN WAGES¹ ON VARIABLES SHOWN, 1952-1973 (26 observations)

Characterisation of regression	Minimum Wage	Cost of Living	Coefficients of independent variables (with t-ratios in parentheses)			R ²	DW
			GDP per capita	Constant			
	(ii)	(iii)	(iv)				
All variables deflated by a time index* (1)	·390 (2·683)	5,705 (3,735)	325·6 (4·351)	5·375 (·686)	·99	2·7	
All variables in natural logs deflated (2)	·476 (6·874)	·288 (1,855)	·280 (3·133)	1·589 (8·737)	·99	1·8	
All variables deflated by a price index** (3)	·662 (9·180)	—	3·164 (2·850)	3·724 (2·815)	·80	1·7	
All variables in natural logs deflated by a price index** (4)	·519 (8·604)	—	·218 (2·941)	1·424 (11·630)	·78	1·6	

Notes: *Time index: number of months elapsing since first observation, in March 1952;
**Price index: cost of living in Rio, with 1965/67 = 10,000. Deflation is used to counteract heteroscedasticity in the monetary series:

(i) Median wages: for Rio manufacturing sector, in centavos of cruzeiros. Observations for 3/52, 6/54, 3/55, 6/55, 3/56, 12/56, 4/57, 11/57, 4/58, 11/58, 4/59, 11/59, 4/61, 4/62, 11/62, and 4/63 from Bacha, Mata and Modenesi [1971: 97]. Original sources: *Conjuntura Economica*, 1958(1), and *Anuario Estatístico do Brasil*, 1965. Observations for 4/65, 4/66, 4/67, 4/68 and 4/69, calculated from Bacha, Mata and Modenesi [1971: 69]. Original source: Ministerio do Trabalho, 2/3 Law. Observations for 4/71, 4/72, and 4/73 calculated from Ministerio do Trabalho, 2/3 Law, 1972(26), 1973(32), and 1974(38).

(ii) Minimum wages for Rio, in centavos of cruzeiros. Source: *Anuario Estatístico do Brasil*, 1974.

(iii) Cost of living: Rio index with 1965/67 = 100. Source: *Conjuntura Economica*, 1975.

(iv) GDP per capita: in current ten centavos of cruzeiros. Sources: Interpolated from series in *Conjuntura Economica*, 1971(9) and Vargas Foundation, *Sistema de Contas Nacionais*, 1974. The new GDP series was scaled down to be made compatible with the old series, using as a deflator the ratio of the respective GDP estimates for 1970.

The wage drift is indicated by the statistical significance of the coefficients of nominal GDP per capita and the cost of living by equations (1) and (2), and of deflated GDP per capita, in equations (3) and (4). According to equation (2), for each ten per cent rise in the cost of living index (with constant minimum wages and nominal GDP per capita) the median wage increases by only 2.3 per cent. This suggests that workers *are* hurt by inflation if the legal minimum wages are not properly readjusted. From equation (4), a 10 per cent increase in deflated GDP, with constant real minimum wages, results in an increase of only 2.2 per cent in median wages. This result is consistent with the idea that, under Brazilian conditions, workers will *not* get their fair share of productivity gains if minimum wages are not adequately raised.

This leads us to an inference often drawn about wage floors, that 'higher minimum wage levels could have caused adverse employment effects for those at the bottom of the income distribution' [Macedo, 1977: 119]. Macedo himself remains uncommitted on the issue of whether or not higher minimum wages would protect only workers in formal urban markets, actually harming the working poor in the informal sector and the countryside by closing off modern sector jobs openings. However, government-related economists have made the assertion strongly, and their argument should be analysed.

Begin by observing that the anti-minimum wage argument really has separate micro and macroeconomic strands. The micro variant emphasises the negative effect of increases in (sectoral) real labour costs on (sectoral) employment levels. The macro argument asserts that high wages are likely to reduce aggregate saving, and therefore investment and output growth in the long run. We consider these assertions in turn.

The major piece of evidence supporting the hypothesis that labour cost increases may have had negative effects on employment in Brazil is from Bacha, Mata and Modenesi [1971]. They show that the elasticity of employment with respect to labour costs in the manufacturing sector is about 0.43 for the period 1949-69. This is the average value of the elasticities in regressions for two-digit manufacturing sectors; weighted by their 1959 employment levels. However, in his Ph.D. thesis, Macedo [1974] argues convincingly that these results are not robust. He relies on the observation that average wages (measured as the yearly wage bill divided by average monthly employment) can be expected to move cyclically opposite to employment. Such would be the case if both hires and fires are concentrated at the low end of the pay scale, as predicted by the Doeringer and Piore [1971] internal labour market hypothesis, and verified for Brazilian manufacturing by Macedo. In addition, the existence of internal labour markets suggests that the relevant variables to analyse are the minimum (or entrance) wage and employment of the unskilled, as opposed to the averages Bacha *et al.* used.

Because of the opposite cyclical movements of wages and employment, Macedo's argument suggests that an elasticity of employment with respect to wage costs of 0.43 overestimates the 'true' capital-labour substitution response, if it even exists. Hence, the negative employment effect of minimum wages is not likely to be severe. Moreover, there are macro

considerations suggesting that it may be further attenuated or even reversed. We now turn to these.

5.3 Macro Impacts of Nominal Wage Changes

We take it as proven from Table 5 that government control of minimum wages (and other policy instruments) substantially influences the nominal level of wages received by different classes of workers. Our question is what are the distributional and employment effects of government manipulation of the money wage.

This kind of question is most naturally answered in terms of shifts in the functional income distribution. After 1964, two plausible generalisations about the operation of the 'modern' part of the Brazilian economy are (i) money labour cost increases could be passed along quite easily by firms into increased output prices; and (ii) profit or mark-up rates rose in response to greater pressure on available savings to satisfy rapidly growing investment demand.

Observation (i) means that employment responses to lagging money wages must have been quite weak, even if capital-labour substitution possibilities existed. What matters for substitution are changing *real* labour costs (the growth rate of money wages less the growth rate of output prices). Though real wages fell, Cardoso [1978a] shows at the macro level that the change was not enough to generate much new employment, even if an improbably strong substitution response is assumed. Conversely, more rapidly growing money wages might have led to higher real wages and a higher labour share, if the overall growth pattern of the 1960s had not been disturbed.

But is putting the rest of the post-1964 growth story in *ceteris paribus* really an admissible thing to do? Probably not, for observation (ii) means that the functional distribution must have shifted toward capitalists during the growth spurt after 1965, given modest growth in the balance of payments deficit and the fiscal cash surplus as alternative sources of saving. Here, the money wage lag *permitted* less reliance on deficit government finance and forced saving as an engine of growth, and allowed capitalists' saving to come to the fore [Cardoso, 1978b]. Wage repression and a declining labour share were inevitable counterparts to the military government's success in slowing inflation and stepping up the rate of output growth. The implications of the functional distribution changes for the income distribution by size are taken up in section 6 below.

Many of these same results reappear in more disaggregated form in the general equilibrium model developed by Lysy and Taylor [1978]. They assume that certain payments flows are fixed in nominal terms, and that money wage increases are largely passed along in price increases relative to these payments.¹⁰ Under these circumstances, the elasticities of employment of different skill groups with respect to labour costs are both small and of uncertain sign. A related point is that precisely *because* they do not strongly affect employment patterns, shifts in relative payments to labour and capital induced by government policy (minimum wages, social security levies, profits taxes) can substantially affect the income distribution, as shown in detailed simulations by Lysy and Taylor.

All these macro arguments point to clear conflicts between the classes over wage policy. To put the issue bluntly, why should workers have to pay through lagging nominal wages for the investment of the rich or of the State, rather than the middle classes or the rich themselves? In the models just described, different savings patterns among classes may explain *why* workers pay under current government policy, but scarcely justify the existing arrangements. In fact, under other socioeconomic policies, ranging from a more humane tax structure up through outright expropriation, growth could be maintained or accelerated without making the workers worse off.¹¹

6. PROFITS AND WAGE SPREADING

Labour surplus conditions and repressive labour policy together help explain why Brazilian workers near the median of the size distribution benefited little if any from economic growth in the 1960s. However, we are still lacking an explanation for the substantial real income increments enjoyed by those at the top of the income distribution.

The macroeconomic work by Cardoso we have just described suggests that rising profit shares are consistent with the character of the Brazilian growth process beginning after 1964. However, she *derives* her profit numbers from models which otherwise fit available Brazilian data well. Unfortunately, information based on primary sources about changes in the functional income distribution is extremely limited. Vargas Foundation has recently published estimates of the labour share in urban income for 1949, 1959 and 1970/1975 [*Conjuntura Economica*, 1977 (8)]. These figures suggest that factoral income distribution was unchanged between 1949 and 1959 (with the wage share in both years equal to 0.56), and that it shifted towards profit earners in the following decade (with the wage share roughly constant at 0.51 between 1970 and 1975). Data on profits in the manufacturing sector in Bacha, Mata and Modenesi [1971] suggest an increase in the share of profits in value added, especially since 1968. Some of this profit increase may have spilled over into the personal income estimates of the 1970 Demographic Census, which unfortunately are not disaggregated by income types. However, profits tend to be reinvested during cyclical upturns and non-earned incomes are not captured effectively by simple census questionnaires. Profit-related gains may account for only a small part of the income changes observed between the two Census years.

What then does explain the substantial earnings increases at the top of the Census-based income distributions? In section 4, we concluded that supply and demand for labour skill types alone would not explain the wage spreading observed in the 1960s. An alternative, non-neoclassical interpretation emphasises the explanatory power of widening hierarchy-related income differentials. The idea is that the labour market is segmented into two non-competing groups, 'managers' and 'labourers', with the former group sharing in the residual income left over after workers are paid their wages. In this case, it is hierarchical position rather than qualification, or span of influence rather than marginal productivity, that determines a person's earnings. This statement is obviously extreme, since

the empirical evidence reviewed below indicates that both qualification (as measured by years of education, age and experience) and hierarchy (as measured by an index of functional importance of positions) are important determinants of individuals' earnings.

Bacha [1976: *Essay no. 2.3*] produced evidence that the earnings of managers (at the level of division and department heads) in a group of large Brazilian manufacturing firms increased on the average by 7.2 per cent from 1966 to 1972, whereas the wages of semi-skilled and skilled workers grew at 2.9 per cent, and the wages of unskilled occupations declined by 1.3 per cent per year in the same period. Skills proved to be important determinants of workers' wage increases, but even so these lagged the growth in payments to those occupying positions higher in the firms' hierarchy. A difficulty with Bacha's data is that in it all occupations requiring college education are labelled as 'managerial', hence qualification is not really given a fair test. Langoni [1973] includes a set of 'occupational' dummies in regressions explaining income levels in 1970. However, he only distinguishes between 'employer', 'employee' and 'self-employed'. If non-contractual incomes were adequately recorded, which certainly is not the case in Langoni's Census figures, these dummies might provide a reasonable test of naive 'marxist' theories of income determination. Even then, they would fail to do justice to the hierarchy hypothesis. In any case, Langoni finds the coefficients of the occupational dummies statistically significant but with marginal contributions to the explanation of income inequality much smaller than education, age, sector or region. Fishlow [1973b], working with 1960 Census data, partially reverses Langoni's findings by allocating a fraction of the money income of rural family heads to the working members of the family who do not receive cash payments. In this case, occupation has the highest marginal contribution to the explanation of income followed by education, age, sector and region. Fishlow's findings are a reminder of the pervasive importance of ownership patterns as a determinant of income distribution in rural settings, when sensible data corrections are made.¹²

Relevant results for the hierarchy hypothesis are reported in Pastore, Haller and Gomez [1975], who investigated a sample of over twenty-two thousand specialised workers in nearly seven hundred private industrial firms in Sao Paulo in 1907-71. They run standardised multiple regressions of wages on variables representing occupational influence levels (in rank-order scores), job experience (in years-equivalents) and seniority (years with the firm). The two most important explanatory variables for wages are occupational influence level and education, the partial correlations of which with wages are, respectively, 0.33 and 0.32. However, even in such a large sample, these two independent variables display a correlation coefficient as high as 0.40, hence their separate effects on wages are hardly distinguishable. This is borne out by the fact that the hierarchy variable alone explains 23 per cent of the variance in wages, whereas all five explanatory variables together manage to explain no more than 36 per cent. The unexplained portion of wage dispersion remains large even after including all reasonable socioeconomic variables in the analysis, as much as Langoni's Census-based regressions as in Pastore's sample survey results.

In contrast to Pastore's large sample procedures, da Silva and Perez' [1975] is a detailed study of a single firm in the manufacturing sector of Sao Paulo. For each employee, they obtained data on wages, sex, age, education (eight levels), seniority and hierarchical position (unskilled worker, skilled worker, supervisor, white-collar employee, head of department, manager-director). They conclude that wage levels can be explained either by education or hierarchy. When both variables are included in the regression, hierarchy fares better than education. However, multicollinearity is a serious problem and the construction of the hierarchy variable is questionable. Consequently, the empirical results are difficult to interpret.

The sociological and organisational considerations underlying the hierarchy hypotheses can be given more economic content by centering attention on public sector behaviour. Hard data are not available, but perhaps 15 per cent is a reasonably good guess for the proportion of the Brazilian labour force working for the government (including public enterprises). This figure doubles once we ignore the primary sector. Within the non-primary sectors, the public sector probably absorbs over 50 per cent of total white-collar employment, a proportion of which may have increased moderately between 1960 and 1970.

Macedo [1974] argues that the post-1964 wage crunch hit particularly hard on public functionaries in general government service (but not necessarily employees in public enterprises, for which he had no data). According to the national accounts, expenditures for wages and salaries in general government activities (again not public enterprises) remained roughly constant as a share of GDP. This gives credence to casual empirical observation that salaries paid to high government, 'supergrade' public employees rose substantially after 1964.

Similar evidence regarding remunerations to managers in public enterprise is provided by Bacha [1976: *Essay no. 2.3*], where it is shown that between 1966 and 1973, managers' salaries grew much faster in a sample of firms heavily weighted with public enterprises than in a second sample, where private firms prevailed. According to Mata and Bacha [1973], in 1966-9 white-collar salaries in the manufacturing sector grew fastest in the group of industries where public enterprises are dominant. These bits and pieces of evidence suggest that the public sector may have been the leading agent of wage spreading since 1964. At least in part the higher salaries at the top were made possible by increases in taxes, public enterprise prices and public utility rates. These could take place without reducing private profit rates because, at the same time, the wage policy was squeezing the remunerations of lower paid occupations both in the public and private sectors.

Finally, it should be noted that the hierarchy hypothesis dovetails neatly with the Keynesian orientation of many of the ideas advanced previously about Brazilian income distribution. By providing a natural explanation of wage scales, it complements analyses of distributional responses to shifts in 'the' money wage (as in Cardoso's models), or changes in employment patterns (as in Lysy and Taylor [1978]).

Mutual consistency of a set of partial explanations for something as

complex as the size distribution of income does not guarantee they are correct, but at least it does indicate that they have to be met with something better. Non-critical analysts of income distribution in Brazil have so far not met this challenge.

NOTES

1. Most of the discussion about Brazilian inequality is focused on the 1960–70 period, because demographic censuses taken at the beginning and end of the decade are by far the most important sources of information about distributional trends. We will see as we proceed that differing interpretations of the census data underlie many polemical positions.

2. See Doeringer and Piore [1971] for an initial statement of 'dual labour market' theories, and Cain [1976] for a review of the burgeoning literature. The analysis of manpower and wage policies of Sao Paulo firms by Barbosa, Morley and da Souza [1976] is consistent with the job-rationing process sketched in the text.

3. Langoni's data manipulations have at least one important drawback: he continuously emphasises the fact that he did not need to guess the mean income of the upper open-ended income interval for 1970 because he had access to individual census data. However, it is now known that the Census bureau tabulated all individuals with incomes higher than Cr\$9,997.00 (approximately US\$2,150) per month as earning exactly Cr\$9,998.00 [Costa, 1975]. In a footnote to Table 4.5, appearing in the preliminary version of his book, Langoni [1972] seems to be aware of this fact, which, however, is not mentioned in the published version of his work [Langoni, 1973]. By treating the upper open-ended income class as if it were closed, Langoni underestimates the degree of income concentration by at least 2.7 per cent in the very insensitive Gini scale [Costa, 1975].

4. Morley and Williamson attempt to estimate the value for Atkinson's inequality aversion coefficient beyond which the 1970 distribution is 'better' than the 1960 one. As shown by R. Hoffmann [1976] this cannot be done with zero income earners in the sample, for the simple reason that Atkinson's measure requires the existence of the logarithm of all income levels.

5. The openly unemployed represented only 1.3 per cent of the labour force in 1970. A comparable figure is not available for 1960, but indirect evidence suggests that it would not be much larger. See Wells [1976].

6. In the computations, we use the ratio of arithmetic means as a proxy for the w^i since the geometric means are not published by Langoni. We have not been able to determine if this substitution introduces a systematic bias in our results. It should also be noted that, as a matter of arithmetic, estimated changes in the variance of log incomes should be identical for all classifications. For reasons we do not understand, this principle of accounting is *not* satisfied by the numbers in Langoni's summary tables. Hence, we cannot explain the differences in estimated variances appearing in the first column of Table 3.

7. Of course these decompositions are conditional on our (and Langoni's) choice of the variance of log incomes as a measure of inequality. Note in (2) that since population changes Δx^i (which must sum to zero) are weighted by a term in the *square* of ratio incomes ($\log^2 w^i$), movements in and out of groups at the extremes of the size distribution are weighted highly. Even so, the composition changes in Table 3 are not large and might indeed have their signs reversed under other decompositions of overall inequality, such as the entropy measure proposed by Theil [1967]. In mathematical terms, Table 3 shows small composition changes because in (2) the v^i will be more or less equal across groups, and despite their over-weighting the extremes of the distribution, the $\log^2 w^i$ terms will not differ greatly from one. An essentially similar point is made by Fishlow [1977].

8. The critical literature is scattered, often not formally published. A partial sampling would include Fishlow [1972, 1973a, 1973b], R. Hoffman and Duarte [1972], Malan and Wells [1973], Carvalho [1973], Wells [1974], Suplicy [1974], Serra [1975], Singer [1975], DIEESE [1975], and H. Hoffman [1976].

9. See, for example, Langoni [1973], Simonsen [1975], Velloso [1975] and Morley and Williamson [1975].

10. That such price movements are at the heart of Keynes' view of capitalist macroeconomics is amply verified in chapters Two and Nineteen of the *General Theory*. His ideas are interpreted in terms of planning models by Taylor and Lysy [1977].

11. These 'explosive' social issues may help explain why economists linked to the Brazilian government have refrained from using forced saving arguments to analyse the growth pattern of the 1960s. In fact, discussion of whether or not income concentration has furthered growth, which we will not summarise in detail here, has been restricted to economists adopting a critical attitude toward the economic policies of the military regime. See for example, Furtado [1968, 1972], Serra [1972], Oliviera [1972], Fishlow [1973a, 1973b], Tavares and Serra [1973], Wells [1974, 1976a], Tavares [1974] and Bacha [1976: *Essay no. 1.3*].

12. Recently, Sayad [1977] has called attention to the income concentration effect of subsidised credit programmes, especially in the rural areas. Farms with over 200 hectares accounting for 60 per cent of total crop area received 70 per cent of total rural credit in 1970, with implicit subsidies estimated as equal to 12 per cent of total federal government fiscal revenues.

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