Income Distribution in Brazil:
Long Terms Trends and Changes
in Inequality Since The Late
1970s

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INCOME DISTRIBUTION IN BRAZIL: LONG TERM TRENDS

AND CHANGES IN INEQUALITY SINCE THE LATE 1970s[1]

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Contents: 1. Introduction. 2. Long term trends. 3. Alternative explanations of changes in the size distribution of income. 4. Inequality and economic performance. 5. A decomposition of inequality since the late 1970s. 6. Concluding comments: economic policy, economic performance and the explanation of inequality.

1. INTRODUCTION.

The relationship between income inequality, economic growth and economic policy is admittedly a very complex one, as witnessed by the substantial amount of both theoretical and empirical work that has been devoted by economists and other social scientists to clarifying the issues at stake and identifying the most relevant economic mechanisms behind changes in income inequality.

Brazil represents, in this respect, a useful case study as it provides evidence of very pronounced changes over a short time

period. Before the early 1970s, however, lack of adequate quantitative data prevented the profession from fully meeting the challenges posed by the explanation of one of the more extreme profiles of income concentration in the contemporary world.

When the issue is looked at in historical perspective one observes surges of interest corresponding to points of time when new data become available, particularly Census data. More recently research on the distribution of income in Brazil has been enhanced by the use of new computing methods, more efficient equipment and readily available data from the household surveys conducted by IBGE. This last source of information has facilitated systematic analyses of changes in the size distribution of income on an annual basis, which emphasize the role played by a few crucial variables in explaining inequality[4]. Besides being preoccupied with the explanation of changes in inequality, many of these studies also share a concern with linking the observed changes with economic policy and performance[5].

The present paper is a modest contribution in the same direction. The objective here is to analyze changes in the income profile since the late 1970s, to identify relevant variables and actors and to explain - or, at least, infer on - how macroeconomic

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[4]Longitudinal analyses have not been pursued so far. See, however, Barros, Sedlacek and Varandas [1990]. On social mobility and income distribution in Brazil see Pastore [1986] and Barros, Reis and Ramos [1992].

[5]A very partial list would include: Bonelli and Sedlacek [1989], Ramos [1990] and Barros et allii [1992].

policies and performance contributed to the observed record. The remaining of the text is organized as follows. Section 2 presents, as a background, a brief descriptive survey of long term trends in inequality. Section 3 summarizes a few of the more interesting theories or ideas put forward to explain the observed results. Section 4 presents the record since the late 1970s and explores possible links between inequality and economic policies and performance. Section 5 contains the results of decomposition exercises devised to identify characteristics of the labor force that have influenced the observed pattern of income inequality through time. The final section closes the paper with a few concluding remarks.

2. LONG TERM TRENDS

As it is known, reasonably well-founded empirical research on income inequality in Brazil began only in the late 1960s[6], stimulated by the availability of data on individual incomes from the 1960 Demographic Census.

The comparison of the 1960 and 1970 Census results, broadened the debate by allowing the analysis to take into account

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[6]Fishlow AER study [1972] is the obvious first reference here. Previous pioneering studies based on the structure of earnings in the manufacturing sector had been motivated by the distributive effects of the so-called "corrective inflation" of 1964-65 upon wages given the wage legislation passed in the mid-1960s. The substitution of the original wage formula in 1968 was not sufficient to counter the fact that wage levels near the legal minimum lost purchasing power relatively to higher wages during the decade as a whole.

all incomes - i.e., not only wages - of a much larger sample of individuals. Eventual measurement differences that may have occurred at the time soon gave way to a much broader consensus on one essential fact: Brazil had experienced from 1960 to 1970 what could by any standards be considered an astonishing increase in income inequality.

The fact that all studies which dealt with the measurement of income inequality from 1960 to 1970 reached this same overall conclusion[7] made it possible to shift the focus to the causes and interpretation of the phenomena behind the figures. In particular, a heated debate on the factors related to the observed deterioration took place soon after the 1970 Census results became available.

The so-called Brazilian debate on the size distribution of income was actually an exchange of ideas[8] in the mid-1970 disputing the explanation of why all indices of income concentration increased between 1960 and 1970. The Gini coefficient, for instance, which had already reached very high levels in 1960, according to international comparisons (a value of nearly 0.50) increased full 7 points over the decade to 0.57 in 1970.

When the 1980 Census results became available researchers soon found out that, considering end-point data, the distribution

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[7]For instance, Hoffman and Duarte [1972], Hoffman [1973], Langoni [1973] and Fishlow [1973].

[8]An analytical survey of the controversy can be found in Bacha and Taylor [1978]. Many contributions are found in the volume edited by Tolipan and Tinelli [1975].

of income had become more concentrated between 1970 and 1980 as
well. Changes between 1970 and 1980 were, however, much less
pronounced than during the previous decade. Partial evidence from
the IBGE-PNAD surveys allowed for some qualifications to this
pattern within the 1970s, though. The thrust of the evidence,
however, was inescapable: when considered from its extremes, the
1970s witnessed an increase in income inequality levels.

As the 1991 Census results are not yet available, it is
not possible to compare the 1980s as a whole to the two previous
decade based on the same kind of information. The annual PNAD
surveys, however, allow us to develop a good understanding of the
trends in inequality during the 1980s. A summary of the evidence
over periods of approximately the same length combining Census and
Household Surveys results since 1960 is shown in Table 1.

Table 1: Selected Indicators of Income Distribution of the
Economically Active Population (with non-zero incomes)

Deciles	1960* %Y	1970* %Y	1980* %Y	1979** %Y	1990** %Y
Low 20%	3.9	3.2	3.0	4.2	3.3
Next 20%	7.4	6.8	5.8	7.3	6.6
Next 20%	13.6	11.2	9.0	11.1	10.9
Next 20%	20.3	17.2	16.1	18.5	18.5
Upper20%	54.8	61.6	66.1	58.9	60.7
Top 10%	39.7	47.8	51.0	42.6	44.5
Top 5%	27.7	34.9	34.9	29.5	30.9
Top 1%	12.1	14.6	18.2	11.0	11.7
Gini	0.499	0.568	0.590	0.530	0.558
Theil-T	0.470	0.644		0.560	0.620
R1/40 ***	1.048	1.460	2.068	0.957	1.186

* Demographic Census (1960 and 1970 from Langoni [1973] tables 3.5
and 3.6). ** IBGE Household Surveys (PNAD). Note that these are
not directly comparable with Census results. Estimates refer to a
sample composed of 18-65 year old males living in urban areas.
*** R1/40 is the ratio of the income share of the top 1% to that
of the lowest 40% of the population.

Despite methodological differences in the definition of incomes among demographic censuses and between censuses and yearly household surveys, the overall evidence on the evolution of the income distribution in Brazil in the time span under analysis points unequivocally to a worsening of inequality. Combining evidence from Census and PNAD data leads to the conclusion that the worsening in the 1980s seems to have been as important as in the 1970s. Note that the sample used for the 1980s understates the overall degree of inequality, but there is no a priori bias regarding inequality changes. The Gini coefficient estimated for the whole PNAD population with non-zero incomes is 0.58 in 1979[9] (to be compared to a Gini coefficient of 0.53 for the sample). The overall trend, however, is very much the same whether we use the total or the sample[10].

What is puzzling from this evidence is the fact that inequality increased almost independently from macroeconomic conditions and economic policies. As it is well known, both the 1960s and the 1970s can be characterized, as a whole, as years of growth and high employment. Compared to them, the dismal

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[9]A comparable figure for 1989 is 0.635, according to Bonelli and Sedlacek [1991], Post-Scriptum.

[10]It should be stressed that the increase in inequality between 1970 and 1980 reflected in a Gini coefficient that goes from 0.57 to 0.59 almost disappears when members of the EAP with zero incomes are included. In fact, since the proportion of this group relative to the total decreased between 1970 and 1980, the Gini coefficient in this case increases only slightly from 0.607 to 0.612 (Denslow Jr. and Tyler [1983], Table 4, p.15).

experience of the 1980s stands in sharp contrast. Changes in inequality, however, have been of approximately the same magnitude in the 1970s and in the 1980s - at least as far as end-point data are concerned.

The influence of the minimum wage in explaining the pattern of inequality over time has also been disputed in the literature[11]. The importance of the minimum wage in the debate is that it can be seen either as a determinant of the wage structure (the so-called "efeito farol") or as a crucial instrument in defending lower income earners. In this respect, one would expect that the acceleration of inflation in the 1980s, particularly in its last half, would result in lower levels of income for those near the minimum and for unprotected earnings than for higher income social groups. The evidence to be presented below is not incompatible with such a view.

Finally, it is worth pointing out that the observed long term deterioration in the income distribution took place in an environment of educational expansion. The question that naturally comes to mind is how to reconcile this long term evidence regarding inequality changes with the substantive schooling upgrade of the labor force. The explanation offered, for instance, by Langoni [1973] for the 1960s - that economic and technological

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[11]For the debate on the importance of minimum legal wages in influencing the structure of wages see Macedo [1980] and [1981], Souza and Baltar [1979] and [1980], Wells and Drobny [1982], Velloso [1988] and Reis [1989].

development shifted the demand for skilled labor upwards - does not seem to apply to the 1980s when the country barely grew at all.

3. ALTERNATIVE EXPLANATIONS OF CHANGES IN THE SIZE DISTRIBUTION OF INCOME

There are, on theoretical grounds, two main groups of explanations that have been used to analyze the size distribution of income[12]. On the one hand one finds the set of ideas that relates individual incomes to characteristics which reflect individual "abilities" of agents following rational choices. The theory of human capital with its emphasis on the role of educational variables in explaining inequality is the most widely accepted one in this group. Based on individual preferences and returns associated with different educational levels attained, agents allocate their time to education so as to maximize the present value of their well being over the life cycle. Therefore, in a society characterized by equal opportunities of access to education and perfect information, income inequality essentially reflects individual choices and preferences of economic agents as well as the stage in their life cycle[13]. Recognizing the existence

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[12]See Ramos and Reis [1991] for a comprehensive survey. We neglect here the stochastic theories of income distribution.

[13]Important qualifications emphasized by the theory but neglected in empirical applications are variables related to family background and innate abilities of individuals. Most empirical studies also neglect the role of family wealth and do not consider the direction of causality between income and education.

of imperfections that may prevent individuals from following their market oriented rational choices, economic policy could and should promote equal access to education as a way of ameliorating the gap between the desired and actual distribution of education and, indirectly, of income. Moreover, expanding education may contribute to reduce inequality as eventual unbalances between supply and demand are eliminated and quasi-rents associated with previous scarcity of qualified labor disappear[14].

The applicability of these theories to the experience of developing and underdeveloped countries is handicapped by the fact that these countries lack many institutions and environments found in the developed world. Thus, for instance, the norm in a LDC is the persistence/existence of imperfect or incomplete markets, difficulties of access to information, high degree of monopoly or oligopolist behavior in many markets, precarious communication among economic agents, sectors and regions, differences in the mechanisms of price formation among sectors and restrictions on the freedom of choice. The non-restrict applicability of models based on optimizing behavior by rational profit-seeking agents operating in competitive product and labor markets results, therefore, in a piece of fiction in many countries.

On the other hand there is a class of models that aims at explaining the size distribution of income by exploring the ideas of:

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[14]The objections to these arguments raised by the "credentialist" explanation are not enough to dismiss them. One needs to add more hypotheses to explore the major shortcoming of human capital theories: an exaggerated emphasis upon supply and demand in labor markets.

(i) segmentation and other market imperfections (theories of the "internal labor markets", dualism in the labor market and the models of job competition). In the former case, sector specific and regional variables have a say in explaining inequality - besides education itself - as the costs of labor turnover and the bargaining power of organized labor tend to influence the functional progression of workers. In the latter, wages are determined by the characteristics of jobs: the marginal product of labor is not only determined by the degree of human capital previously attained but also by other factors specific to the occupations themselves.

(ii) institutional factors, such as the approaches which emphasize the role of the minimum wage and economic policies in determining the wage structure.

Many of the ideas in this second group are difficult to formalize and integrate in an analytical framework that could be used to model changes in the income profile. The fact that the analyses here have an ad hoc character does not imply that they are less relevant, though.

In a sense, the so-called Brazilian debate on income distribution reproduced these competing sets of ideas in trying to explain the observed increase in inequality between 1960 and 1970. On the one hand we find variants of a human capital interpretation which attributed the change to two basic sets of factors[15]:

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[15]See Langoni [1973], Senna [1976], Castello Branco [1979].

(i) classic changes in the distribution of income related to any process of economic development in a capitalist setting such as the one experienced in Brazil, a Kuznets-type explanation based on compositional changes in the labor force;

(ii) temporary labor market disequilibria associated with a differentiated expansion of qualified labor demands facing short term inelastic supplies.

The analysis pointed to the conclusion that the observed increase of inequality was not only temporary but also inevitable and self-correcting in a growing economy, as the appropriate expansion of the educational system and growth of supply of qualified labor (educated) would eventually eliminate the quasi-rents appropriated by the workers with more years of formal schooling, which constituted the basic source of the increase in inequality.

Thus, for instance, Langoni [1973] using the variance of logs as a measure of inequality showed that 35% of the variation in inequality between 1960 and 1970 was due to changes in the educational composition of the labor force, 23% was due to changes in mean incomes of educational groups, and the remaining 42% to increased inequality within each educational group.

Seeing from the vantage point of the early 1990s, the hypothesis of labor market disequilibria due to differentiated labor demands according to education does not seem sufficient to explain why inequality did not decrease - i.e., why the education effect was not transitory as predicted by the human capital theory. Of particular interest is the issue of how to reconcile

this long term evidence on inequality with the huge increase of school enrollment at the university level observed since the late 1960s: given the reduction of growth rates experienced by the Brazilian economy, it is difficult to explain the increase in the rates of return to education in more recent years (Barros and Reis [1991], Ramos e Trindade [1991], Leal and Werlang [1991], Barros and Ramos [1992])[16].

Competing views disputed the conclusions reached by the proponents of the human capital model and emphasized the effects of economic policies. In particular, the role played by wage policies under inflationary conditions, non-neutrality of other economic policies adopted in the mid-1960s, importance of managerial wages and profits of firms, factors related to the cyclical evolution of manufacturing output and variables associated with the functioning of imperfect markets. As an alternative explanation, the critics identified as central variables the distribution between wages and profits (or non-wages) and the segmentation of labor markets[17].

Since an individual's income is the outcome of a complex process largely determined by his/her initial endowment of wealth, preferences and investment decisions taken over his/her life cycle as well as societal characteristics, a theory that fails to take

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[16]See, however, the works by Lam and Levinson [1990.a] and [1990.b], who identified in cross section analyses a decrease in the returns to education for the younger cohorts.

[17]See, among others, Hoffman and Duarte [1972], Fishlow [1972,1973], Malan and Wells [1973] and Bacha and Taylor [1978].

into account any of these can provide at most a partial explanation of inequality levels and changes. In particular, by neglecting the importance of intergenerational transmissions of wealth the many existing theories leave unexplained one of the major sources of changes in income inequality.

Despite the wide variety of alternative explanations and qualifications, however, the role of specific characteristics of the labor force kept being recognized as of extreme importance. Given the strong empirical evidence which emphasizes the role of education, the theory of human capital continued to be adopted at least as an organizing device upon which subsequent researchers would build their models. Before turning to a more detailed exploration of these issues, however, we present some evidence on the relationship between inequality and economic growth in Brazil since the late 1970s.

4. INEQUALITY AND ECONOMIC PERFORMANCE: THE RECORD SINCE THE LATE 1970s.

Annual movements in the profile of income distribution in Brazil have been documented with the use of PNAD (IBGE household surveys) data. The next table shows a set of inequality measures derived from such a source since 1976 for a sample of 18-65 year old males with non-zero incomes living in urban areas. The table also shows, for selected years, Gini coefficients for the whole sample.

Table 2: The Evolution of Inequality (various indices) 1976-1989

Year	Gini	G (total)	Theil T	Theil L	R 1/40
1976	0.564	0.607	0.709	0.556	1.394
1977	0.543		0.607	0.511	1.054
1978	0.531		0.571	0.488	0.966
1979	0.530	0.580	0.560	0.486	0.957
1981	0.514	0.568	0.513	0.457	0.817
1982	0.520		0.527	0.465	0.832
1983	0.534	0.592	0.565	0.496	1.000
1984	0.536	0.587	0.558	0.498	0.967
1985	0.545	0.599	0.584	0.521	1.047
1986		0.588			
1987		0.595			
1988		0.612			
1989		0.635			

Sources: Gini, Theil T and Theil L from Ramos [1990]; Gini (total) from Bonelli and Sedlacek [1989],[1991]; R 1/40 is the ratio of income accrued by the top 1% divided by the share of the lowest 40%.

From the above data we conclude that: first, there is a clear downward trend from the beginning of the series to 1981; second, the movement is upward from 1981 to 1985, with the exception of 1984; third, the trend after that date is less clear, but certainly increasing after 1987; fourth, inequality unambiguously increased since the beginning of the 1980s as the accumulated Lorenz curve in 1989 is dominated by the 1981 curve[18].

Note that the R 1/40 index, a very sensitive indicator of income inequality, conforms to the pattern of both the Gini and Theil indices, but makes movements much more visible. Its interpretation is very simple: a R 1/40 equal to one means that

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[18]See Bonelli and Sedlacek [1991].

the average income of the individuals in the top 1% of the income profile is 40 times the average income of those located in the bottom 40%[19]. The fact that the R 1/40 index varies so much is additional evidence of the significant changes that characterize the Brazilian income profile.

These movements seem to be related to the effects of the business cycles. A central question here is whether or not short run output expansion contributes to reduce inequality. The literature on "labor hoarding" suggests that more skilled workers are more difficult to replace as a result of increasingly specific needs of firms, which leads to higher training costs. These expenditures act like quasi-fixed costs driving a wedge between wages and marginal product values - the higher the skills, the higher the quasi-fixed costs. This approach indicates that the lowest paid unqualified workers experience the largest wage cuts and unemployment in the downturn of economic activity, contributing to deteriorate the distribution of earnings. As economic activity recovers inequality should go down[20].

To what extent do the pronounced changes in economic performance observed in Brazil since the late 1970s conform to

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[19]A value of 1.5, for instance, indicates a multiple of 60. In other words, the individuals in the bottom 40% of the distribution would have to wait five years before accumulating an average income equal to the monthly average income of individuals in the top 1%.

[20]See Ramos [1990] for a discussion and references. An important qualification is that this hypothesis only applies to slowdowns that are not regarded as permanent: the rationale for not firing workers during down swings rests on the expectation that economic activity will soon pick up again.

such a pattern ? Or, in other words, is there a conflict between growth and distributive targets in the time interval here considered ? To what extent can the macroeconomic policies adopted in Brazil during most of the 1980s be blamed for the observed deterioration of the income profile ? Obviously, we do not intend to provide definite and complete answers to these questions in the context of this work. However, the evidence at hand is suggestive of positive answers to the first and third questions above - and a negative one for the second.

In order to explore the issues at hand, the following table and the accompanying figure shows an indicator of economic performance (the index of per capita GDP) and the sign of yearly variations in the Gini coefficient[21] and per capita GDP. It is apparent from the inspection of both the table and the figure that changes are inversely related for most of the period. The exceptions here are the years 1985, 1987 and 1989.

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[21]The change in the G series used in the Table comes from the second column in Table 2 complemented, when necessary due to lack of data, with variations from the first column.

Table 3: Direction of Changes in the Inequality Indices and per capita GDP   1976-1989

Year	GDP per capita [Y]	dG	dY
1976	85.4	n.a.	+
1977	87.5	−	+
1978	89.7	−	+
1979	93.6	−	+
1981	93.5	n.a.	−
1982	91.9	+	−
1983	86.8	+	−
1984	89.4	−	+
1985	94.4	+	+
1986	99.4	−	+
1987	100.9	+	+
1988	98.7	+	−
1989	99.9	+	+

Sources: see text; [Y] from IBGE - National Accounts (index number 1980 = 100).

FIGURE 1

Inequality and Per Capita Income

Gini (total)   Gini (sample)   Ypc
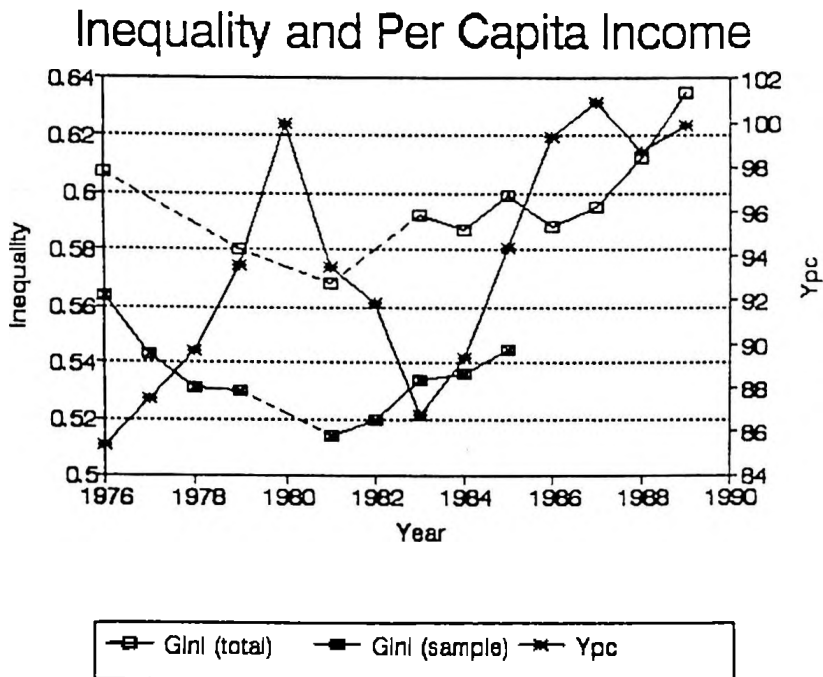
The results for 1989 - increased inequality coupled with growth, albeit small - are surprising in the sense that one of the features of data on income from this PNAD is a (still unexplained) substantial increase in the average incomes for all income groups[22] - a surprising result if one takes into account that monthly inflation rates were reaching all-time record highs at the time, under conditions of nearly perfect indexation of wages and, particularly, other incomes. The fact that inequality increased so much in 1989 indicates only what is common knowledge in Brazil: that individuals at the top of the income profile have been more capable of defending their earnings through indexation than those at the bottom.

Whatever the reasons for these results the evidence is suggestive of the fact that economic growth and economic policy may occasionally have worked in the short run towards reducing inequality. Perhaps more important, it implies that growth can be a weapon both against inequality and poverty: not only it results in overall gains via higher incomes but it may be associated with increases in the share of income held by the poorest strata of the population.

A non-parametric test was used next to test for the existence of association between the direction of changes in inequality and income per capita[23]. A sign test was applied to the

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[22]See, for instance, Bonelli and Sedlacek [1991], Post-scriptum.
[23]The analysis replicates the work of Ramos [1990] on this point.

series on dG and dY in Table 3 for the direction of changes in the period 1976-1988. The results show a negative association between the series at the 5 % level of significance (total of 10 observations, 8 "right" ones). When 1989 is included the p-value goes up to 9 %. Therefore, considering the whole 1976-89 period we found out some support for the idea that earnings inequality is inversely related to economic performance. A more difficult task is to identify the most important underlying economic forces and variables - a task to which we now turn.

5. THE EXPLANATION OF INEQUALITY CHANGE: EVOLUTION FROM THE LATE 1970s AND A DECOMPOSITION EXERCISE FOR SELECTED SUB-PERIODS.

To what extent can changes in the labor force associated with macroeconomic performance be responsible for the observed changes in inequality? An useful tool for understanding the roots of inequality as well as effects of socio-economic transformations upon the distribution of income distribution is a decomposition model. This section considers the role of four variables (education, age, sector of activity and position in occupation)[24] in the explanation of inequality at a point in time (sub-section 4.1, static decomposition) and in the explanation of inequality changes over time (4.2, dynamic decomposition)[25].

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[24]See the Appendix 2 for the definition and description of level of aggregation for each of them.

[25]See the Appendix. Basic data refer to the PNADs of 1977, 1981, 1985 and 1989 and refer to a sample of 18 to 65 year old males, working 20 or more hours/week in urban areas. Only individuals with positive labor income have been included.

4.1. The Static Decomposition

The Theil measures are particularly suitable for the proposed exercise as they allow for the decomposition of total inequality in two parts: the inequality between the socioeconomic groups of interest and the inequality within them[26]. Results for the static decomposition using the Theil T[27] for 1977, 1981, 1985 and 1989 are shown in Table 4, where both univariate (i.e., based on partitions of the population according to the groups of a single variable) and some multi variate (i.e., based on partitions according to the combination of two or more variables) decompositions have been performed.

Education stands out, by far, as the single variable which explains most of the inequality in each year. It explains between 29% and 36% of total inequality, depending on the year considered. Position in occupation (the division of the labor force in employers, employees and self-employers) comes next (9 to 13%), followed closely by age. The variable "sector of activity" presents the lowest contributions, around 5%. The picture does not change when the marginal contribution of each variable to the

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[26]The weights for the within inequalities are the group shares in total income and in the population for the Theil T and the Theil L respectively.

[27]$T = Sum [1,n](a[i]b[i]\log a[i]) = Sum [1,G](a[g]b[g]\log a[g]) + Sum [1,G](a[g]b[g]T[g])$ where $T[g]$ is the Theil T calculated for group g, $a[g]$ is the ratio between the average income of the g-th group and the mean income and $b[g]$ is the share of the population in group g. See Ramos [1990].

overall inequality is considered, except by the fact that now age and position in occupation are at nearly the same level.

Note that, when taken together, the four variables considered in the analysis explain over 50 % of the overall labor earnings inequality, as measured by the Theil-T index.

Table 4: Explanatory Power in the Static Decomposition (% of T)

Variable	S77	M77	S81	M81	S85	M85	S89	M89
EDUC	31.6	27.0	36.2	19.5	34.2	27.2	29.4	23.7
AGE	8.2	8.6	8.8	8.8	9.3	9.0	8.3	7.5
POS	11.2	8.6	8.7	6.2	10.5	7.2	13.2	9.5
SET	5.0	4.3	7.4	5.1	6.3	3.9	4.9	4.5
EDUC+AGE	42.4		47.0		45.3		38.2	
EDUC+POS	42.2		42.6		42.7		40.3	
AGE+POS	17.0		16.3		18.2		19.4	
EDUC+AGE+POS	49.8		51.5		51.3		46.6	
EDUC+AGE+SET	45.4		50.4		48.0		41.6	
EDUC+POS+SET	45.5		46.6		46.2		43.6	
AGE+POS+SET	27.1		26.9		28.0		27.4	
EDUC+AGE+POS+SET	54.1		56.4		55.2		51.1	

EDUC: education; POS: position in occupation; SET: sector of activity.
St: gross explanatory power for year t.
Mt: marginal explanatory power for year t.

Table 5 compares these results with the results from other studies. It also shows estimates for the contributions of gender and geographical regions. Even though the periods are different, all estimates are very similar with respect to the following variables: education, age and sector of activity. Regional differences seem to be as important as age and position in occupation. Gender, in turn, has little explanatory power.

Whatever the methodology used, or the period analyzed, a common feature of all studies is the importance of educational attainment in explaining the observed pattern of income distribution. Inequality would be substantially reduced (up to one third to one half) if the educational differentials were narrowed, or eliminated. This is a peculiarity of Brazilian labor markets, as pointed by other studies. It also provides a clear evidence of the potential role of policies focused on the improvement of educational profile towards reducing income inequality in Brazil.

Table 5: Explanatory Power of Variables (%), Results from Other Studies

Variable	Period	Explanatory Power[%]
Education		
Langoni (1973)	1960/70	35-43
Reis e Barros (1989)	1976/86	35-50
Ramos (1990)	1977/85	32-36
Age		
Langoni (1973)	1960/70	7-10
Wajnman (1989)	1970/80	
Ramos (1990)	1977/85	5-7
Sector of Activity		
Langoni (1973)	1960/70	13-15
Ramos (1990)	1977/85	8-9
Gender		
Langoni (1973)	1960/70	2-3
Region		
Langoni (1973)	1960/70	13-14
Position in Occupation		
Ramos (1990)	1977/85	8-11

Results for Langoni's study (Theil T) are from his figures in Tables 4.1 and 4.2. Cf. Langoni [1973].

4.2. The Dynamic Decomposition

The idea behind the dynamic decomposition is to identify changes in the composition and income profiles related to

socioeconomic variables that can be associated with observed changes the level of inequality. It is possible, for a group of indices that includes the Theil T, to break down the change in inequality between two points of time according to whether it can be attributed to modifications in the socioeconomic groups relative incomes, relative group sizes or in the internal dispersions.

Referring to the general index I in expression (1) in the Appendix 1, the composition or allocation effect corresponds to the variation induced in the inequality index I by modifications in the allocation of the population among groups (i.e., changes in the b's), with no direct changes in the group relative incomes (a's) . The income effect corresponds to the change in I induced by changes in group incomes (a's) without changing the group population shares (b's); the internal effect is the change in the inequality index caused only by changes in the group-level dispersions (the I's)[28].

The exercise of decomposition was carried out for three time periods selected with the objective of taking into account both the overall economic performance and the behavior of inequality: the first one, from 1977 to 1981, is characterized by a substantial reduction of inequality and high annual growth rates of income during most of the period[29]; the second period (1981-

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[28]The precise derivation of this decomposition for the Theil-T index can be found in Ramos [1990].

[29]Income per capita grew 6.9% between 1977 and 1981. Since 1981 was a year of domestic recession, a better choice of period would be 1976-80. Comparable data, however, is not available for this period.

1985) is marked by increasing income inequality and a recessive economic environment during most of the time (income per capita grew a meager 1% using end-point data, concentrated in 1984-85); the third period, from 1985 to 1989, witnessed a further deterioration of the distribution under a somewhat chaotic economic scenario, marked by the alternance of threats of hyperinflation and price freezes that affected the normal working conditions of the economy (income per capita, however, grew 5.8%).

Table 6: Results of the Dynamic Decomposition   (% of variation in T)

Period and Variable	Alloc Effect	Income Effect	Gross Contrib.	M4
1977-81				
EDUC	-7.0	13.2	6.2	18.6
AGE	1.2	6.0	7.2	7.4
POS	-4.4	28.6	24.2	17.8
SET	8.2	-7.1	1.1	1.7
All Variables	-0.3	48.5	48.2	-
1981-85				
EDUC	3.9	16.6	20.5	13.4
AGE	-2.9	20.0	17.1	0.3
POS	-0.3	21.8	21.5	16.2
SET	3.4	2.0	5.4	-1.7
All Variables	-1.5	53.8	52.3	-
1985-89				
EDUC	-0.7	10.0	9.3	12.9
AGE	1.2	8.3	9.5	1.3
POS	9.6	13.4	23.0	18.8
SET	-1.4	4.2	2.8	6.3
All Variables	8.0	34.2	42.2	-

M4: Marginal contribution of each variable in four-variable model.

Two observations clearly stand out when the complete model (with the four variables) is considered. First, nearly half (ranging from 42% to 52%) of the observed variation in the distribution of labor earnings can be traced back to changes in the composition of the urban male labor force according to education, age, sector of activity and position in occupation, together with changes in the groups income differentials (see Appendix 2). Second, the allocation effect is irrelevant for the first two time periods, and of little importance from 1985 to 1989. In all periods it is completely dominated by the income effect.

The importance of the second point raised above is related to a possible Kuznetian characterization of changes in the distribution of earnings in Brazil - a relevant aspect in the debate on the distribution of income in the mid-1970s. According to the Kuznets-type models the allocation effect should be of considerable magnitude and at least more important than the income effect. This is clearly not the case since the late 1970s.

The evidence against an explanation à la Kuznets is reinforced by the analysis at sectoral level (see Appendix 2). The sector composition of the labor force is very stable over the time span of 12 years. Thus, it comes as no surprise that the allocation effect associated with sector-specific activity shown in Table 6 is very small. Moreover, its overall explanatory power is barely positive either in gross or in marginal terms.

In his seminal work for the 1960s Langoni [1973] put considerable emphasis on the role of education in the explanation

of inequality changes from 1960 to 1970. He observed that, despite
an increase in the average level of schooling, the distribution of
education became less egalitarian due to the marked expansion of
universities relative to primary and intermediate schools. As this
was not followed by narrowing income differentials, there was a
natural deterioration of the distribution of earnings. According
to his interpretation the increased concentration should be viewed
as a "self-correcting problem": further increases in per capita
income would eventually move the country away from the ascending
part of the Kuznets curve and additional educational upgrade would
eventually result in an improvement of the distribution.

The results presented in the Appendix 2 and Table 6 are
somewhat surprising in the sense that they reveal that schooling
looses a good deal of its explanatory power both when compared to
the static decomposition and Langoni's results for the 1960s. When
education was considered alone, changes related to allocation and
differentials were responsible for 6.2% of the variation in total
inequality between 1977 and 1981, 20.5% between 1981 and 1985, and
9.3% from 1985 to 1989. Alternatively, in the four-variable model
education had a marginal explanatory power ranging from 12.9% in
the last period to 18.6 % in the first one.

Looking at the results for 1977-81 the conclusion seems to
be in line with Langoni's predictions. The conjunction of
educational upgrade (Table A2.1 indicates a decrease in the
proportion of illiterates coupled with an increase in the share of
workers with college education) and economic growth resulted in
declining inequality.

Things start to get less clear in the 1980s - i.e., after 1981. The first half of this decade witnessed further improvements in the level of educational attainment of the labor force - but now in a context of virtual economic stagnation (accumulated GDP growth reached 1% between 1981 and 1985). In 1981-85 there was a widening of the income differentials related to education that heavily contributed to a deterioration in the degree of earnings inequality[30].

Finally, in the second half of the 1980s one finds a further widening of the income differentials in the presence of educational expansion, rising inequality, inflationary pressures and spasmodic income growth. It seems safe to conclude that, under these circumstances, the contribution of education to the distribution of income was mainly through offering a better access to mechanisms of protection against inflation.

To sum up, the level, distribution, and returns to education have changed continuously since the late seventies. These changes seem to be related to the evolution of earnings inequality in the period. There is no indication, however, of a consistent and systematic way by which education has affected the dynamics of income distribution.

Finally, despite not being important for the explanation of the degree of static inequality, the variable "position in

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[30]There is some evidence (Ramos [1990]) that the labor hoarding hypotheses may provide a plausible explanation for this behavior.

occupation" is correlated with changes in inequality over time.
Its gross contribution for these changes ranges from 21.5% to
24.2%, whereas its marginal contribution lies between 16.2% and
18.8%. Movements related to position in occupation both in terms
of its distribution and relative incomes outweighted changes
related to education. This provides an important indication that
the changes in the economic structure of the Brazilian society
since the late 1970s played a decisive role in influencing
inequality and deserve further attention.

6. FINAL COMMENTS: ECONOMIC POLICY, ECONOMIC PERFORMANCE AND THE
EXPLANATION OF INCOME INEQUALITY.

The paper aimed at analyzing changes in the size
distribution of income since the late 1970s. Whenever possible, we
tried to identify relevant variables that might explain how
macroeconomic policies and performance contributed to the observed
record. A summary of the main conclusions identifies the following
ones:

1. The first, and perhaps more important finding, is the
evidence of an almost continuous deterioration of the income
distribution in the three decades for which data is available.
Changes over the 1980s seem to have been on the same order of
magnitude than changes in the 1970s. Nothing compares to changes
observed in the 1960s, though. It is worth noting that this long
term trend does not seem to be affected by changes in economic
performance in the three decades analyzed.

2. Short term trends, on the other hand, seem to be associated with economic performance - at least, as far as the evidence from yearly household surveys indicates. There is evidence, based on such data, pointing to a negative relationship between changes in inequality and economic growth as measured by variations in per capita GDP. Therefore, there seems to be no conflict in the short run between the objectives of growth and equity.

3. The importance of the educational variable is highlighted in all decompositions performed - but particularly so in the so-called static decomposition. When interpreting changes in inequality over time the role of education looses a lot of its explanatory power. In particular, the evidence from 1977 to 1989 points to the fact that the variable position in occupation (a proxy for capital deepening or labor market economic structure) is at lest as important than education itself in accounting for changes in inequality.

4. The income effect is by far more relevant than the allocation effect for all variables considered in the dynamic decomposition: this means that changes in the income profiles are the driving mechanism behind inequality changes in all sub-periods examined. Reallocation of the labor force among the socio-economic groups - a factor of considerable importance in explaining income inequality changes in the 1960s by Langoni [1973] - looses nearly all its explanatory power when the experience of the more recent years is analyzed. Therefore, a Kuznetsian characterization to the dynamics of income distribution in Brazil is not confirmed by data since the late 1970s.

5. The evidence against an explanation à la Kuznets is reinforced by the analysis at sectoral level, which shows that the sector composition of the labor force is very stable over the time span of 12 years since 1977. This explains why the allocation effect associated with sector-specific activity is small. In addition, its overall explanatory power is barely positive either in gross or in marginal terms. Notice that the income profile did not change as well.

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APPENDIX 1: A Note on the Methodology of decomposition

Assuming a partition of the population in G groups, a measure of inequality I is said to be decomposable when it can be written as:

I = a[g],b[g],I[g]) = IB(a[g],b[g]) + Sum w(a[g],b[g])*I[g]   (1)

where a[g] is the ratio between average income of the g-th group and the overall average income, b[g] is the proportion of the population in group g, and I[g] is its internal dispersion as measured by I. In the right side term, IB is the between groups inequality (i.e., the one that would prevail after a redistribution in the interior of each group, in such a way that all of its individuals would end up with the same income, with no change in the group average income), and the sum corresponds to IW, the within groups inequality (i.e., the remaining level of inequality after a redistribution that would equalize the average incomes of all G groups without changing their internal dispersion).

Thus, if the population is classified according to, for instance, educational groups, the contribution of this stratification to the "explanation" of inequality can be measured by I , as this would be the reduction in inequality in the case the income differentials associated with education were eliminated (I , accordingly, reflects the inequality that is not related to education in this case).

APPENDIX 2: Data Basis, Sample Selection and Aggregation.

Brazilian data on personal and family incomes are of unusually good quality. Household surveys conducted by IBGE, the Pesquisas Nacionais de Amostra de Domicílios (PNADs), have been applied yearly since the late sixties, with the exception of the Census years. The PNADs were initially implemented upon request of the United States Agency for International Development (USAID), in order to create a system of population statistics comparable to the ones existing in other countries as well as to provide information similar to that made available by the censuses in a more frequent basis.

The survey has passed through several changes since its inception, both in terms of geographical and informational range, but has essentially kept its present form since 1976. Some work aiming at "conformation" has to be done at times since then, but it can safely be stated that the data allows for consistent and comparable analyses of the Brazilian income distribution.

The surveys are rich in information on individual and family profiles and are aimed at making it feasible to trace back the social-economic development of the country. They have information on labor and total income, education, age distribution, gender, sectoral and regional allocation, activities, position in occupation, hours of work, unemployment, and many other variables of economic interest.

Sample Selection: In order to minimize problems involving self selection, temporal heterogeneity of the survey coverage and

peculiarities in the process of earnings formation, the universe of analysis of the present study was limited to individuals: (i) participating of the labor force; (ii) not unemployed;(iii) males; (iv) between 18 and 65 years old; (v) working more than 20 hours per week; (vi) living in urban areas; (vii) having the attributes of interest clearly identified.

Aggregation: The evolution of the sample size is presented in Table A.1, where it can be seen that it reaches its minimum in 1976 (56145) and its maximum in 1985 (84570), staying above the 70000 mark all years but 1976 and 1979. The individuals in the sample were aggregated according to their educational level in the following categories: (1) illiterates - less than one year of schooling; (2) elementary school - 1 to 4 years of schooling; (3) intermediate school - 5 to 8 years of schooling; (4) high school - 9 to 11 years of schooling; (5) college education - 12 or more years of schooling. Concerning age the labor force was grouped according to five categories: (1) 18 to 24 years old; (2) 25 to 34 years old; (3) 35 to 44 years old; (4) 45 to 54 years old; (5) 55 to 65 years old. The classification according to sector of activity led to nine categories: (1) heavy industry, (2) light industry, (3) civil construction, (4) trade, (5) credit, (6) transports, (7) services, (8) public administration and (9) agriculture. Concerning position in occupation, an individual can be classified as an (1) employee, (2) self employer or (3) employer. Finally, there are five geographical regions: south, southeast, north, northeast and center.

Table A.1.1:   Sample Size by Year

Year	Sample Size
1976	56145
1977	70671
1978	77687
1979	64020
1981	74622
1982	80227
1983	79806
1984	80773
1985	84570
1986	43309
1987	45253
1988	44792
1989	46365
1990	47023

APPENDIX 2 : GENERAL STATISTICS
Table A2.1: Basic Statistics By Variable

Var	Cat	77			81			85			89		
		a	b	T	a	b	T	a	b	T	a	b	
	1	0.41	0.13	0.35	0.43	0.12	0.30	0.39	0.11	0.30	0.36	0.10	0.
	2	0.71	0.46	0.43	0.69	0.42	0.31	0.66	0.37	0.40	0.63	0.34	0.
EDUC	3	0.91	0.23	0.44	0.86	0.23	0.36	0.80	0.26	0.43	0.74	0.27	0.
	4	1.48	0.11	0.48	1.33	0.14	0.39	1.27	0.16	0.42	1.23	0.18	0.
	5	3.36	0.08	0.35	3.15	0.09	0.29	3.08	0.10	0.33	3.08	0.11	0.
	1	0.51	0.25	0.31	0.52	0.24	0.28	0.48	0.23	0.32	0.46	0.23	0.
	2	1.06	0.31	0.52	1.05	0.32	0.40	1.01	0.33	0.45	0.97	0.32	0.
AGE	3	1.21	0.22	0.55	1.25	0.23	0.50	1.33	0.23	0.57	1.31	0.24	0.
	4	1.30	0.15	0.69	1.25	0.15	0.58	1.25	0.14	0.64	1.36	0.15	0.
	5	1.15	0.07	0.79	1.04	0.07	0.68	1.05	0.07	0.77	1.08	0.07	0.
	1	0.86	0.75	0.53	0.94	0.74	0.49	0.90	0.74	0.54	0.83	0.74	0.
POS	2	1.04	0.20	0.54	0.85	0.21	0.42	0.91	0.20	0.52	0.95	0.20	0.
	3	2.96	0.05	0.56	2.45	0.05	0.41	2.78	0.05	0.45	2.95	0.07	0.
	1	1.11	0.14	0.49	1.28	0.14	0.40	1.19	0.13	0.50	1.09	0.14	0.
	2	0.81	0.09	0.56	0.83	0.09	0.46	0.79	0.09	0.51	0.76	0.09	0.
	3	0.67	0.15	0.46	0.61	0.15	0.40	0.55	0.12	0.49	0.57	0.12	0.
	4	1.05	0.14	0.56	0.91	0.14	0.45	0.97	0.17	0.60	1.08	0.16	0.
SET	5	1.89	0.03	0.45	2.02	0.03	0.40	1.89	0.04	0.42	2.14	0.03	0.
	6	0.96	0.80	0.47	0.98	0.08	0.38	1.02	0.08	0.39	0.99	0.07	0.
	7	1.13	0.16	0.56	1.12	0.18	0.56	1.06	0.19	0.63	1.12	0.21	0.
	8	1.28	0.11	0.59	1.18	0.11	0.48	1.25	0.12	0.55	1.06	0.11	0.
	9	0.74	0.10	1.14	0.73	0.08	0.78	0.76	0.09	0.83	0.79	0.07	1.

a: relative average income; b: population share; T: internal inequality.
*: all the categories are defined either in the text or the Appendix 2.