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VIEWING SOCIAL PYRAMIDS:
INCOME DISTRIBUTION IN LATIN AMERICA

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VIEWING SOCIAL PYRAMIDS: INCOME DISTRIBUTION IN LATIN AMERICA *

by

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INTRODUCTION

Income distribution is the summary of a nation's social organization and the forces of social change. The study of income distribution yields a type of social score-card, showing the resolution of claims by competing groups for the economy's output. As an indication of social justice, the income distribution measures as well the extent to which different groups share in a nation's economic progress.

Empirical studies of income distribution typically attempt to reduce the complex economic landscape to a single number, for example, the Gini coefficient, or by means of a single graph such as the Lorenz curve. However important, the summary coefficient tells only that part of the story which has to do with the overall degree of concentration and the summary Lorenz curve at most gives the distance, in money terms, between the top and bottom deciles. If we are to return to social science, then the "money accounts" must be transformed back into "social accounts," and it must be known as well which social groups occupy the top and which the bottom of the income pyramid.

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One goal of our study is to review the work of a number of official and individual scholars who have attempted to estimate the current size distribution of income to families and individuals and to compare their findings, using several standard measures of distribution. Taking these different approaches, data bases, and assumptions into account, we shall attempt to draw generalizations about changes in the income distributions during a nation's growth. How do these distributions differ between countries?

In most of Latin America, economic development is primarily an urban phenomenon. While the countryside has served as the source of emigrating labor and as the supplier of food, handicrafts and raw materials, the cities remain as the major centers of transformation, as the poles of growth, and as recipients of the rural surplus. The cities are, in many countries, islands of relative prosperity floating on the poverty of rural seas. Perhaps it has been the reaction to the growing uninhabitability of the city, the attention to upper-class needs or a response to the requirements of industry and trade; nevertheless, the accumulated public and private investment has given rise to the impression that the city is a much better place to live than the countryside.

Our objective is not to comment on the mechanism by which people are propelled from the country to the city. Rather, it is our intention in the second section to survey the urban and rural situation seen through the recent empirical studies and thus lend substance to theoretical endeavors which might prove difficult, if not unrealistic, in the absence of these basic statistical observations.

We divide each economy in two ways: first according to residence of the family and then according to the producing sector which generates family income. Do the urban distributions, here compared for nine Latin American countries, reveal any common elements? As a group, do the distributions of the rural zones sustain

the hypothesis that the rural distribution is, for various reasons, less unequal than the burgeoning urban zone?

Many nations have become concerned with their urban poor. However, the nation's poor may not live in the city. Nor is it clear that any set of investment programs or redistribution policies for the city would help the poorest of any nation. Therefore, our interest lies in locating the relative position of the urban population within the entire income structure (Section II) and in dividing the economy between agricultural and non-agricultural sectors (Section III).

In Section III, we present a graphic array of "social pyramids" to illustrate the relative positions of different income levels. Tapering gracefully upwards, these income pyramids appear more like antennae reaching from their earthly (earthy) base into the sky. Firmly grounded on a massive number of poor families, the "social pyramids" rises slowly at first and then swiftly with the increasing wealth of fewer and fewer families. The "inverse pyramid" is an upright outstretched "umbrella" giving the shares of income received by each population decile. Thus the high share of income to the topmost decile forms the roof, narrowing to a very minor share, which is distributed to the poorest decile of the people.

In the fourth section, measures of income distribution are applied to fourteen Latin American cities. This study is, by its nature, preliminary. The concentration of income would, we suspect, vary with certain basic characteristics of a city, and not necessarily with the level of development or with per capita income. Bureaucratic cities or seats of national governments, such as Caracas, Bogotá, and Mexico may tend to greater homogeneity than primarily commercial cities such as Barranquilla and San Juan. Manufacturing cities such as Medellín, Monterrey

and Sao Paulo may tend to generate greater equality than, say, cities which depend on a major extractive industry, such as Maracaibo, or on the processing of agricultural products, such as Cali. None of these intriguing questions is explored here. Our objective is to collect the basic information, compare measurements, and prepare the groundwork for further examination of the linkages of the city with its hinterland and their impact on the distribution of income.

I. COUNTRYWIDE DISTRIBUTION

A. Techniques of Measuring Income Distribution:

The use of a variety of summary indices to measure the equality of income distributions often leads to contradictory results. Identical Gini coefficients may be calculated from differing distributions. Lorenz curves may intersect; one segment of a distribution may be more or less equal than the corresponding portion of another distribution. The coefficient of variation may suggest a narrowing distribution over time especially if the mean has been growing rapidly; however, the standard deviation of the logarithms of income may indicate a widening distribution for the same time period if changes in relative incomes have been significant. Even the presumption of log normality which would permit the comparison of the standard deviations of the logs of different distributions is not validated by the measurement of higher moments. In fact, the inclusion of skewness and kurtosis, the third and fourth moments, (neither is presented here), would be necessary to pinpoint precisely the changes occurring in relative incomes.[1]

One method of retaining the descriptive profile of the entire array of the distribution is to calculate the income shares received by standard ordinal groups

[1] For more complete description of the measures, their history and application, see R. Weisskoff (1970).

of recipients. Beginning with the frequency distributions for each country, linear interpolations for each decile of recipients were calculated by plotting the logarithms of cumulated incomes against the logs of the cumulative number of recipients.[2]

B. Countrywide Comparisons:

Summary measures for four Latin American countries (Table 1) indicate a general deterioration in overall equality in comparing the earliest year of each economy with the latest.[3] The Gini coefficient, coefficient of variation, and the standard deviation of the logs rose in all cases with the lone exception of the coefficient of variation for Mexico which fell between 1950 and 1963.

The rise in the Gini ratio can be consistent with many different changes in the income shares to quintiles of recipients. From the ordinal shares in columns 7 - 14 in Table 1, two patterns may be distinguished. The first reflects the gain of the top 5% or 10% and the relative loss by the lower 90%, as in the case of Argentina and Brazil. The second pattern reflects declining shares of the bottom 60% and top 5% and the growth in the shares of the middle-class (61 - 95th percentiles) as in Mexico and Puerto Rico. In all cases, however, the bottom 60% suffered losses in their relative positions.

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[2] Two important points must be noted. First, it is known that the departure from linearity at both extremes of the cumulated scale may be substantial. Therefore, the accuracy of the income shares received by the poorest 20% and by the top 5% depends on the proximity of these groups to the original income classes.

Second, the summary measures are sensitive to the number of groups in the data. Hence, the comparison of Gini ratios undertaken here has been calculated from distributions expressed in a standard number of groups resulting from the linear interpolations of the basic data of each country into ten decile shares (10, 20, ... , 90, and the 95th percentile shares). Estimation of the summary measures was undertaken for both the standardized interpolated data and the original data using all the original frequency groups, which range from 6 to 29 for some country samples. The drawback of the interpolation procedure is that income intervals are "created" when the original data are too few, or intervals are lost when the original data are too detailed. In this paper, we present only results from the interpolated data, although both are available upon request.

[3] In the case of Argentina, the observation for 1959 reflects the effects of a severe recession and major devaluation which resulted in an acute widening of the distribution. The partial "recovery" by 1961 still reveals a lower level of equality than in the initial year, 1953, of the data.

Table 1

Time Series of Countrywide Size Distribution of Income

Country [Recipient Unit]*	Year (1)	Per Capita Income 1960 US$ Equivalents (2)	Gini Ratio (3)	Coefficient of Variation (4)	S.D. Logs (5)	INCOME SHARE TO PERCENTILE OF RECIPIENTS 0 - 20 (6)	21 - 40 (7)	41 - 60 (8)	0 - 60 (9)	61 - 80 (10)	81 - 90 (11)	91 - 95 (12)	96 - 100 (13)
1. Argentina [H]	1953	786	.41	1.09	.64	7.5	10.7	13.8	31.9	18.1	13.2	9.6	27.3
2. Argentina [H]	1959	832	.45	1.29	.70	6.9	9.5	12.2	28.6	16.8	12.8	10.1	31.8
3. Argentina [H]	1961	927	.42	1.18	.67	7.0	10.4	13.1	30.5	17.9	12.7	9.6	29.3
4. Brazil (F) [E]	1960	289	.52	1.24	1.17	2.5	7.9	12.4	22.7	20.4	16.4	11.6	28.9
5. Brazil (F) [E]	1970	383	.64	1.32	2.37	.1	4.0	12.5	16.5	16.9	15.0	13.0	38.6
6. Brazil (L) [E]	1960	289	.49	1.18	.94	3.5	8.1	13.8	25.4	20.3	14.7	11.8	27.9
7. Brazil (L) [E]	1970	383	.56	1.49	.99	3.2	6.9	10.8	20.8	16.9	14.4	13.0	34.9
8. Mexico (N) [H]	1950	397	.526	2.50	.72	6.1	8.2	10.3	24.6	15.6	10.8	9.0	40.0
9. Mexico (N) [H]	1957	488	.551	1.65	.88	4.4	6.9	9.9	21.2	17.4	14.7	9.7	37.0
10. Mexico (N) [H]	1963	542	.55	-	na	4.2	6.9	9.7	20.8	15.5	12.7	11.6	38.3
10. (b) Mexico (B) [H]	1963	-	.54	1.26	.97	3.5	6.6	11.1	21.2	19.4	17.4	13.4	28.7
11. Puerto Rico [H]	1953	502	.42	.97	.75	5.6	9.8	14.9	30.3	19.9	16.9	9.6	23.4
12. Puerto Rico [H]	1963	842	.46	.96	.84	4.5	9.2	14.1	27.9	21.5	17.0	11.7	22.0
13. USA [CU]	1955-7	2,397	.36	.78	.68	6.2	12.6	16.2	35.0	21.9	14.6	9.2	19.4
14. USA [CU]	1960-2	2,837	.36	.72	.70	5.9	12.1	16.5	34.5	22.4	15.1	12.0	16.1

*Column [Recipient Unit]

[H]= Households

[E]= Economically active population

[CU]= Consumer Unit

Sources: 1.1; 2.3; 2.5; 7.1; 7.2; 7.3; 9.1; 9.2

Some general observations may be hazarded in comparing the countrywide cross-section of income distributions, although caution should be exercised in contrasting a sample which refers to households, individuals and consumer units (Table 2). The general ranking of the economic level of each country may be related, however roughly, to the coefficients of concentration. Peru, Mexico, Colombia and Brazil demonstrate the lowest per capita income and also the highest Gini ratios. At the other extreme, Argentina and Puerto Rico are characterized by the highest income levels and lowest inequality. The high levels of inequality in Peru, Mexico, Colombia and Brazil reflect the greatest shares possessed by the top 5% in each country and the corresponding downward pressure on the lowest 60% of the people. The more equal distributions of Puerto Rico and Argentina reflect the greatest spread of income downward to the poorest 60% of the population.

How can the observation be explained that the income shares to the top groups are highest in the poorest countries? It follows from the algebra of national income that in order for the top 5% of a poor country to sustain an absolute standard of living set by the industrial countries, these groups must mobilize a proportionately larger share of their own country's output. If the upper stratum of the poor country attempts to achieve the standard of living established by the middle stratum of rich countries, then the poor country necessarily must demonstrate a higher degree of inequality. Many observers have noted the existence of an international consumption pattern "learned" or emulated by the upper classes in poor countries. Here we emphasize that the achievement of this pattern by the topmost groups requires substantial pressure on the rest of their societies.[4]

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[4] Kuznets (1963) points out that inequality in a poor country may be necessary to impede international mobility of professionals. But certainly this explains only a small fraction of the inequity.

Table 2

Cross Section of Countrywide Distributions

Country [Recipient Unit]	Year (1)	Per Capita Income 1960 US$ Equivalents (2)	Gini Ratio (3)	Coefficient of Variation (4)	S.D. Logs (5)	PERCENTILE OF RECIPIENTS 0 - 20 (6)	21 - 40 (7)	41 - 60 (8)	0 - 60 (9)	61 - 80 (10)	81 - 90 (11)	91 - 95 (12)	96 - 100 (13)
1. Argentina (3obs) [H]	53, 59, 61	848	0.43	1.1	0.69	7.1	10.2	13.0	30.3	17.6	12.9	9.8	29.5
2. Brazil (Fishlow) [E]	60, 70	336	.58	1.2	1.77	1.3	6.0	12.5	19.6	18.7	15.7	12.3	33.8
3. Brazil (Langone) [E]	60. 70	336	.53	1.3	.97	3.4	7.5	12.3	23.1	18.6	14.6	12.4	31.4
4. Chile [E]	1967	-	.50	1.09	0.91	3.9	7.7	12.4	24.0	19.5	16.3	18.1	22.7
5. Colombia (Urrutia [E]	1964	364	.58	1.5	1.09	2.6	6.2	10.3	19.1	17.9	15.3	12.2	35.6
6. Costa Rica [E]	1971	-	.37	0.8	0.64	7.0	12.3	13.8	33.1	21.5	14.9	10.3	20.1
7. Mexico (3 Obs) [H]	50, 58, 63	476	.54	1.4	.53	4.9	7.3	9.9	22.2	16.1	12.7	10.1	38.4
8. Peru [E]	1961	353	.62	1.7	1.1	2.3	5.6	9.4	17.0	16.6	14.0	12.0	40.1
9. Puerto Rico (2 obs) [H]	53, 63	672	.44	.97	.80	5.1	9.5	14.5	29.1	20.9	16.9	10.7	22.7
10. USA (2 Obs) [CU]	55-7, 60-2	2.617	.36	.75	.69	6.1	12.4	16.4	34.8	22.2	14.9	10.6	17.8
Average of Latin American sample (lines 1 - 9)		484	.51	1.2	.94	4.2	8.0	12.0	24.2	18.6	14.8	12.0	30.4

Sources: Same as Table 1 plus 3.1; 4.4; 5.1; 8.2

II. URBAN - RURAL COMPARISONS

A. Urban Zones:

Distributions between urban areas may be compared on the basis of data from nine countries. For the most part, these distributions represent the summation of all individuals living in towns greater than 2,500 inhabitants. Only in the cases of Colombia (four major cities), Guatemala (five major cities) and Venezuela (two major cities) do the distributions reflect only the largest urban areas.

An examination of Table 3 indicates that the urban distributions demonstrate two broad patterns of inequality. First, a "bi-polar" distribution is characterized by a less-than-average share for the lower 60% and a higher-than-average share for the top 5% of recipients, as in Colombia, Mexico, Ecuador and Peru. A second pattern which demonstrates the strength of the rising middle classes, here taken to be the 61 - 80th percentiles, is noted for Costa Rica, Puerto Rico, Venezuela and Guatemala.

B. Rural Zones:

Similar patterns are seen from the rural zones (Table 4). The rural distributions for two small economies, Costa Rica and Puerto Rico, reflect a relatively strong peasantry, as illustrated by the higher-than-average shares to the bottom 60%. In Colombia and Mexico, the top 5% receive the largest share, while the Peruvian distribution demonstrates high shares to the middle 61 - 80th percentiles. Further understanding of the observed inequalities in the rural zone require relating the generated distribution to land tenure, cropping patterns and economic institutions.

Table 3

Measures of Income Distribution: Urban Zones

Country	Year (1)	Gini (2)	Coefficient of Variation (3)	S.D. Logs (4)	INCOME SHARE PERCENTILES OF RECIPIENTS 0 - 20 (5)	21 - 40 (6)	41 - 60 (7)	0 - 60 (8)	61 - 80 (9)	81 - 90 (10)	91 - 95 (11)	96 - 100 (12)
Chile	1967	48	1.04	59	4.04	8.43	12.98	25.45	20.04	16.11	17.39	21.02
Colombia (U)	1964	55	1.32	1.20	1.63	7.53	12.54	21.70	19.35	15.60	12.85	30.50
Colombia (4 Cities)	1967	47	1.05	83	4.92	8.49	12.56	25.97	19.20	16.05	17.47	21.32
Costa Rica	1971	37	76	66	7.16	9.83	15.09	32.08	24.48	14.42	11.32	17.70
Ecuador	1968	51	1.26	95	3.53	8.07	12.91	24.52	18.04	14.62	13.57	29.25
Guatemala (5 Cities)	1971	42	90	13	5.82	9.73	14.35	29.90	21.30	16.36	111.57	20.84
Mexico	1963	52	1.2	96	3.43	7.25	11.98	22.67	20.49	17.26	13.27	26.30
Peru	1961	49	1.1	89	4.05	8.25	12.31	24.61	20.75	15.62	12.96	26.06
Puerto Rico	1953	45	1.0	83	4.67	9.51	13.55	27.73	21.79	14.92	11.53	24.02
Puerto Rico	1963	43	90	85	4.37	9.66	14.53	28.56	23.03	16.54	11.45	20.42
Venezuela (2 Cities)	1970	44	89	82	4.80	8.94	13.55	27.29	22.13	17.95	14.96	17.68
Average:		47	1.04	85	4.4	8.7	13.3	26.4	20.9	15.9	13.4	23.1

Sources: 3.1; 4.4; 11.1; 5.1; 4.3; 6.3; 7.1; 8.2; 9.1; 9.2

Table 4

Measures of Income Distribution: Rural Zones

Country	Year (1)	Gini (2)	Coefficient of Variation (3)	S.D. Logs (4)	INCOME SHARE PERCENTILES OF RECIPIENTS 0 - 20 (5)	21 - 40 (6)	41 - 60 (7)	0 - 60 (8)	61 - 80 (9)	81 - 90 (10)	91 - 95 (11)	96 - 100 (12)
Chile	1967	.47	.09	.81	5.19	8.74	12.52	26.45	18.71	14.17	18.23	22.44
Colombia	1964	.56	.68	.91	4.22	8.04	9.64	21.90	14.11	13.03	10.84	40.13
Costa Rica	1971	.30	.53	.57	7.83	14.13	17.96	39.92	19.02	14.90	11.12	15.04
Mexico	1963	.47	1.10	.61	5.09	8.52	12.76	26.38	19.51	15.40	12.89	25.63
Peru	1961	.48	1.00	.92	3.82	8.46	13.22	25.50	21.57	17.42	14.07	21.45
Puerto Rico	1953	.33	.65	.60	7.23	12.14	17.25	36.63	22.87	14.31	11.26	14.93
Puerto Rico	1963	.41	.86	.86	3.59	11.89	16.21	31.69	21.88	15.50	10.83	20.11
Average		.43	.70	.75	5.26	10.3	14.21	29.78	19.63	14.96	12.74	22.84

Sources: 3.1; 4.4; 5.1; 7.1; 8.2; 9.1; 9.2

Table 5

Comparison of Urban - Rural Distributions

	Year (1)	Mean Income (2)	Gini Coefficient (3)	URBAN SHARES Percentages of People (4)	URBAN SHARES Percentages of Income (5)	INCOME SHARES RECEIVED By Lowest 60% (6)	INCOME SHARES RECEIVED By Top 5% (7)	S.D. Logs (8)	Coefficient of Variation (9)
		Urban/Rural	Urban/Rural			Urban/Rural	Urban/Rural	Urban/Rural	Urban/Rural
Chile	1967	1.944	1.019	60.77	71.43	.96	.93	1.03	.96
Colombia (U)	1964	1.714	.981	48.35	61.60	.99	.76	1.32	.79
Colombia (Dane)	1970	2.313	1.276	61.63	78.79	.88	1.26	1.29	1.27
Costa Rica	1971	2.145	1.221	41.72	60.56	.57	1.17	1.16	1.20
Mexico	1963	2.311	1.094	55.76	74.44	.86	1.02	1.18	.84
Peru	1961	2.673	1.031	42.81	66.68	.96	1.21	.96	1.13
Puerto Rico	1953	1.809	1.369	49.52	63.97	.75	1.60	1.37	1.57
Puerto Rico	1963	1.899	1.059	48.59	64.22	.90	1.01	.98	1.04
Average		2.101	1.131	51.14	67.71	.86	1.12	1.16	1.10

Sources: Same at Tables 3 & 4.

C. Urban - Rural Comparisons:

The greater range and heterogenity of urban activities, we hypothesize, lead to greater inequality within the urban zone as compared to the more homogenous activity characteristic of rural areas. However, significant dualities exist in the rural zone as well, especially in the form of enclave mining and large-scale plantations, considerable inequality may persist.

Several conclusions may be drawn on the basis of the urban-rural comparisons in Table 5. The mean income of the urban zone ranges from nearly two to three times the rural mean (column 2).[5] The ratio of Gini coefficients (column 3) indicates greater inequality within the urban zone for all cases except Colombia, 1964. However, this ratio for most countries may not be significantly different from unity, except in the cases of Costa Rica and Puerto Rico. Comparison of the other measures (columns 8 and 9), suggests even less unanimity on the question of urban-rural inequality.

In considering the income and population shares of the urban-rural zones, we note that in all cases, the urban population receives a correspondingly greater income share than does the rural, indicating greater relative pressure on the rural populace. For the sample average, slightly more than half of the people are urban and claim two-thirds of the national income (columns 4 and 5). The most extreme case is Peru in which two-thirds of national income is held by only 43% of urban individuals.

Comparison of corresponding shares for urban and rural zones (columns 6 and 7) suggests that the income share to the bottom 60% in the urban zone is, on average, 86% of the corresponding rural share. Finally, the income share for the top 5% of

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[5] The comparison of monetary income alone between the urban and rural areas may exaggerate the differences in real income unless some adjustment for differences in cost of living are made. However, the fact that manufactures--an urban product--are more expensive in the rural areas indicates that this adjustment is complex and that there may exist offsetting effects. Unfortunately, no statistical work exists on this question for the countries studied here.

urban individuals is 12% higher on the average than the corresponding rural share. However, the observation that the bottom 60% in the rural zones receive a slightly higher income share is little consolation in view of the considerable smaller size of the pie available to them.

Where do the urban and rural groups lie with respect to each other? Who are the poor and rich in the nation? What is the division of each nation-wide quartile between urban and rural zones?

In the most extreme of dualities, all the poor would reside in the hinterland and the rich in the city. Alternatively, we might expect the rural area itself to be a mixture of modern, export-oriented plantations and subsistence farms and the city to be a mixture of modern and traditional as well. If poverty were evenly distributed throughout the urban and rural areas, we would expect both the urban and rural share in the total countrywide population. In all cases, however, rural people dominate the bottom half of the distribution, while urban people dominate the top half (Table 6).

The overlapping nature of the two distributions cannot be emphasized too highly. Characterization of the poor as completely rural is inaccurate, although the overwhelming dominance of rural poverty is striking in all countries. Despite the visibility of the poor in urban areas, only a fraction of each nation's poor is urban.

A graphic presentation dramatically highlights the rural location at the base of the overall income pyramid. In Figure A the rural masses dominate the lowest income intervals and are excluded almost completely from the higher ranges. Few rural individuals reach the top of the national antenna. The "inverse pyramid" (Figure B) demonstrates the split in income shares between urban and rural zones for each decile of recipients. The top decile of the umbrella-shaped form which

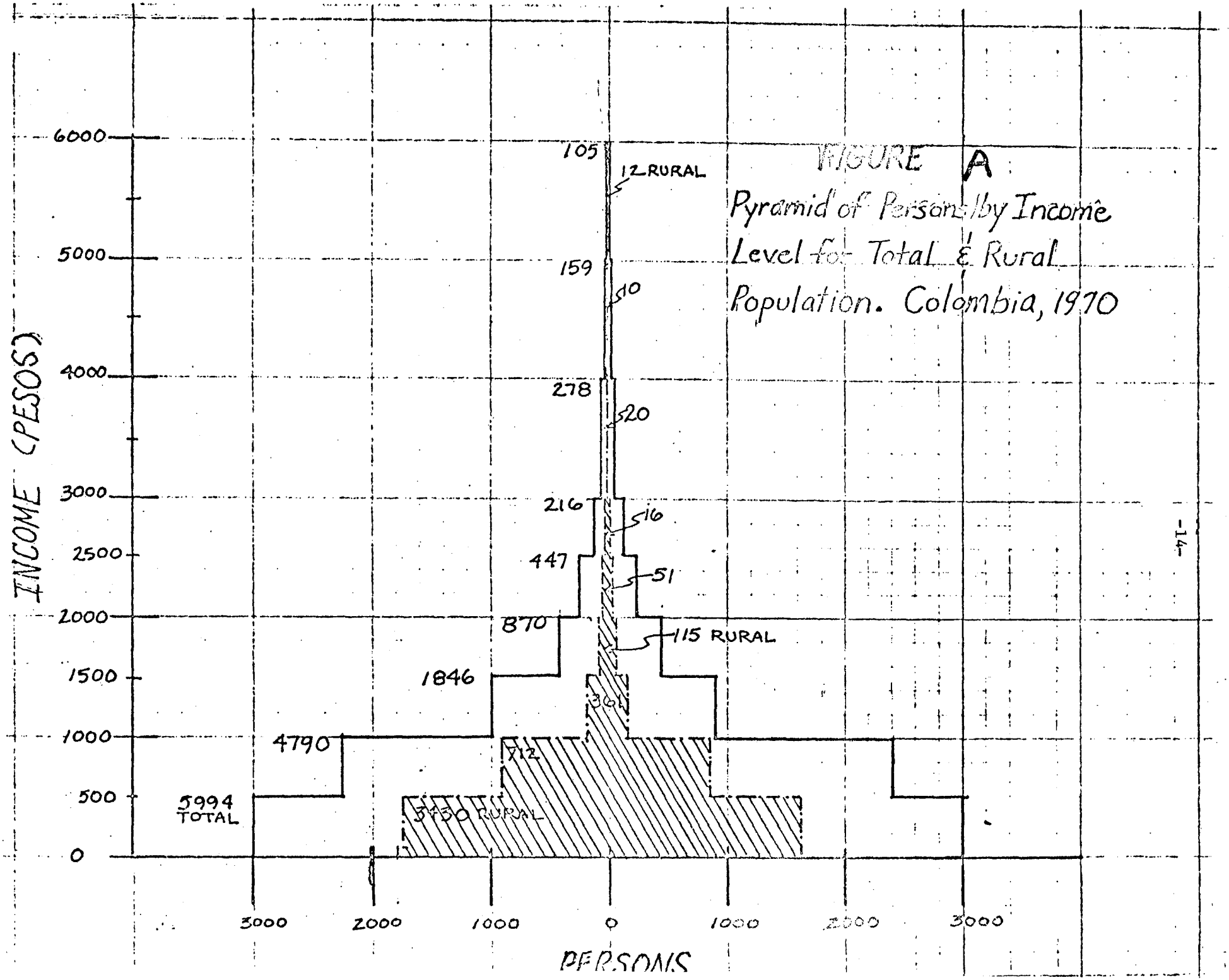
FIGURE A
Pyramid of Persons by Income Level for Total & Rural Population. Colombia, 1970
INCOME (PESOS)
PERSONS
6000
5000
4000
3000
2500
2000
1500
1000
500
0
3000
2000
1000
0
1000
2000
3000
105
12 RURAL
159
40
278
20
216
16
447
51
870
115 RURAL
1846
361
4790
712
5994
TOTAL
5430 RURAL

FIGURE B

Inverse Pyramid of Income Shares Received by Deciles of Total & Rural Populations Colombia, 1970

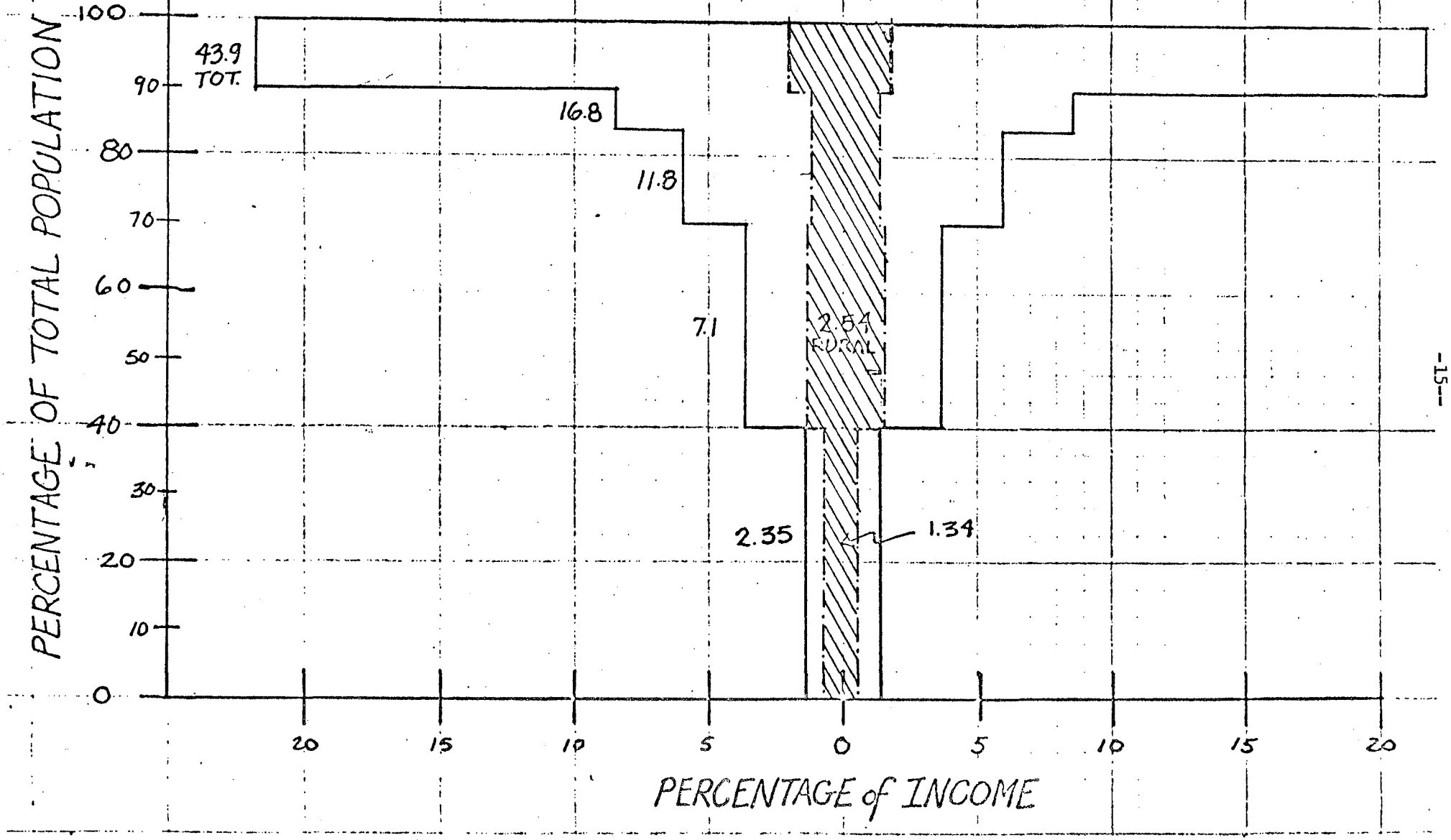

Table 6

Countrywide Quartiles Divided into Rural and Urban Sectors

Country and Year	INCOME SHARE RECEIVED BY EACH I (1)	II (2)	III (3)	IV (4)	POPULATION SHARE (5)
Rural					
Colombia (Urrutia) 1964:	52	92	34	29	52
Colombia (DANE) 1970:	57	49	34	14	38
Costa Rica 1971:	83	69	52	28	58
Mexico 1963:	67	54	36	21	44
Peru 1961:	89	69	43	28	57
Puerto Rico 1953:	63	59	51	29	51
Puerto Rico 1963:	69	61	47	29	52
AVERAGE	69	65	42	25	51
Urban					
Colombia (Urrutia) 1964:	48	8	66	71	48
Colombia (DANE) 1964:	43	51	66	86	62
Costa Rica 1971:	17	31	48	72	42
Mexico 1963:	33	46	64	79	56
Peru 1961:	11	31	57	72	43
Puerto Rico 1953:	37	41	49	71	49
Puerto Rico 1963:	31	39	53	71	48
AVERAGE	31	35	58	75	50

Sources: 3.1; 4.3; 4.4; 5.1; 7.1; 8.2; 9.1; 9.2.

represents the Colombian distribution receives 43.9% of total income. However, rural members of that decile consist of but a small "core" fraction (about 4% of that income). The rural umbrella (shown by the shaded region) is more constricted in all of its ranges.

III. AGRICULTURAL - NON-AGRICULTURAL DISTRIBUTION

For seven countries, the size distribution of income may be distinguished according to two broad sectors of origin--agriculture and non-agriculture. Our interest in isolating agriculture stems from its size as the sector whose profile dominates the countrywide distribution. The distinction between the "A" and "non-A" distributions, on the one hand, and the rural-urban distributions, on the other, are analogous to the differences between country GNP and geographic GDP. Should we expect greater overall equality with the decline of agriculture? Our expectation depends on the growth of the more unequal sector and the spread in the averages. Even if the dynamic sector (non-A) itself is more equal, the countrywide economy may be growing less equal due to the increasing divergence in productivities of the two sectors.

Conventional wisdom holds the characteristic distribution generated by agriculture to be more equal; the spread of poverty is more even and the range of incomes relatively narrow. However, in economies where large-scale mechanized plantations co-exist with small-scale peasant agriculture, these heterogeneous forces may tend to create a society in which agriculture is a greater source of inequality than manufacturing or commerce.

The summary measures of the distributions shed some light on the expectation of the relative equality of agriculture (Table 7). The average for each of the three summary measures (line 13, columns 4-6) indicate greater equality

Table 7

Measures of Income Inequality: Agricultural & Non-Agricultural Sectors

Country, Sector & Year	Percent of Families (1)	Percent of Income (2)	Average Income Relative to A (3)	Gini Coefficient (4)	Coefficient of Variation (5)	S.D. of logs (6)
1 - Argentina - 1953						
a) Agriculture	21	19	100	.4916(*)	1.3464(*)	.7615(*)
b) Non-agriculture	79	81	112	.3785(*)	1.0253(*)	.5936(*)
2 - Argentina - 1961						
a) Agriculture	16	13	100	.4802(+)	1.3718(+)	.7353(*)
b) Non-agriculture	84	87	131	.4125(+)	1.1461(+)	.6419(*)
3 - Brazil (Langone) - 1960						
a) Agriculture	54	39	100	.4254(+)	.9606(+)	.7690(+)
b) Non-agriculture	46	61	182	.4737	1.1172	.9626
4 - Brazil (Langone) - 1970						
a) Agriculture	40	20	100	.4323(+)	.9932(+)	.7557(+)
b) Non-agriculture	60	80	273	.5421	1.4165	.9866
5 - Brazil (Fishlow) - 1970						
a) Agriculture	44	18	100	.6156(+)	1.2158(*)	2.5418(+)
b) Non-agriculture	56	82	351	.5851(+)	1.5339	2.1659(+)
6 - Chile - 1967						
a) Agriculture	24	15	100	.4067(+)	1.3806(+)	.6653(+)
b) Non-agriculture	16	85	189	.4936	1.1392(+)	.8855
7 - Colombia						
a) Agriculture	34	20	100	.4358(+)	1.1596(+)	.7521(+)
b) Non-agriculture	66	80	210	.5239	1.3085	.9454
8 - Mexico - 1963						
a) Agriculture	43	27	100	.5099(+)	1.2696(+)	.8833(+)
b) Non-agriculture	57	73	198	.5206	1.1759(+)	.9313
9 - Puerto Rico - 1953						
a) Agriculture	31	22	100	.3318(+)	.7303(+)	.5806(+)
b) Non-agriculture	69	78	157	.4313	.9822	.7821
10 - Puerto Rico - 1963						
a) Agriculture	17	11	100	.4152(+)	1.0058(+)	.6826(+)
b) Non-agriculture	83	89	170	.4407	.9345(+)	.8424
11 - U. S. A. - 1957-59						
a) Farm	11	7	100	.4129(+)	.8869(+)	.7314(+)
b) Non-farm	89	93	165	.3582(+)	.7569(+)	.6313(+)
12 - U. S. A. - 1960-62						
a) Farm	10	6	100	.4136(+)	.8743(+)	.7453(+)
b) Non-farm	90	94	172	.3469(+)	.6916(+)	.6617(+)
13 - Average (lines 1-10)						
a) Agriculture	32	20	100	.4544(+)	1.143(+)	.9127(+)
b) Non-agriculture	68	80	197 (180)[a]	.4898	1.178	.9737

(*) Indicates sector of greater equality

(a) Indicates average, excluding line 5

Sources: 1.1; 2.3; 2.5; 3.1; 4.3; 7.1; 9.1; 9.2

for agricultural than for non-agricultural populations. The only country exceptions in which the agricultural sector is the less equal as measured by the Gini ratio and the standard deviation of the logs is Argentina in both years, Brazil 1970 (line 5) and the U.S.A. Comparing countries, we note that the agricultural sector is the least equal in Brazil (1970) and Mexico, and the most equal in Chile and Puerto Rico.[6] The results of the coefficient of variation are less uniform: five observations suggest greater equality in the non-agricultural sector, and five other cases suggest greater equality for the agricultural sector.

Examination of the averages of the standard quintile shares (Table 8) indicates that on the average the bottom 80% of recipients in agriculture receive a greater share of that sector's income than does the bottom 80% in non-agriculture. The uppermost deciles in non-A receive correspondingly greater shares (see lines 14a and b). The notable exceptions to the average are Argentina and the USA which both distribute larger shares of income to the poorest and smaller shares to the richer non-agricultural quintiles.

We suspect that relative sectoral equality, is determined by the pervasiveness of the mechanized farms, and, especially in Argentina government policy toward that sector. The influences which create inequality outside agriculture, we hypothesize, concern the degree of migration, the range of productive activities within the city, public policy toward unemployment and welfare, and the institutional arrangements which sustain the laboring class's share of the rising product.

If we consider each country as a whole, is it true that the poorest individuals are engaged in agriculture? From the division of quartiles arranged in Table 9 we note that on the average about half of the individuals in the poorest quartile

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[6] The imputations to agricultural incomes in the non-monetarized areas are generally inadequate, therefore exaggerating comparative poverty.

TABLE 8

INCOME SHARES BY ORDINAL GROUPS FOR AGRICULTURAL AND NON-AGRICULTURAL SECTORS

COUNTRY	YEAR	PERCENTILES OF RECIPIENTS							
		0-20	21-40	41-60	0-60	61-80	81-90	91-95	96
01. ARGENTINA	1953								
a. Agricultural		6.48	8.23	10.44	25.15	16.44	15.04	10.98	32.
b. Non-Agricultural		8.43	11.36	14.19	33.98	18.06	12.72	9.25	26.
02. ARGENTINA	1961								
a. Agricultural		6.43	8.82	11.71	26.96	15.84	13.63	10.16	33.
b. Non-Agricultural		7.59	10.64	13.23	31.46	18.02	12.26	9.61	28.
03. BRAZIL (LANGONE)	1960								
a. Agricultural		5.13	9.78	14.59	29.50	22.26	14.92	10.12	23
b. Non-Agricultural		3.28	9.54	14.21	27.03	20.62	14.72	10.98	26.
04. BRAZIL (LANGONE)	1970								
a. Agricultural		5.35	10.05	14.15	29.55	20.19	13.92	13.17	23
b. Non-Agricultural		3.21	7.59	11.27	22.07	18.05	15.20	11.02	33
05. BRAZIL (FISHLOW)	1970								
a. Agricultural		-	-	10.58	10.89	32.44	15.32	11.12	30
b. Non-Agricultural		0.88	7.90	10.14	18.91	18.28	15.32	11.40	36
06. CHILE	1967								
a. Agricultural		-	-	-	31.47	11.61	12.61	10.52	33
b. Non-Agricultural		5.25	5.36	13.75	24.36	20.67	15.69	13.19	26
07. COLOMBIA	1970								
a. Agricultural		-	-	-	24.68	22.61	14.51	10.27	27
b. Non-Agricultural		4.16	6.20	12.59	22.94	19.26	15.01	11.94	30
08. GUATEMALA									
a. Agricultural	1966	8.97	13.00	16.66	38.63	22.18	15.05	9.65	14
b. Cities Only	1971	5.82	9.73	14.35	29.90	21.30	16.38	11.57	20
09. MEXICO	1963								
a. Agricultural		4.44	7.53	10.85	22.82	17.58	16.68	13.78	29
b. Non-Agricultural		3.71	7.64	11.87	23.22	19.90	17.21	12.72	28
10. PUERTO RICO	1953								
a. Agricultural		7.84	12.28	16.27	36.38	22.60	12.90	9.63	18
b. Non-Agricultural		5.03	9.94	14.48	29.45	21.47	15.55	9.87	23
11. PUERTO RICO	1963								
a. Agricultural		6.66	10.43	13.62	30.70	19.47	14.09	11.29	24
b. Non-Agricultural		4.36	9.57	14.28	28.21	21.94	16.88	11.54	21
12. USA	1957-59								
a. Farm		6.15	8.80	15.09	30.04	22.45	15.91	10.69	20
b. Non-farm		6.97	12.62	16.52	36.11	21.46	14.37	6.94	19
13. USA	1960-62								
a. Farm		5.37	9.47	15.28	30.11	22.55	16.05	10.82	20
b. Non-farm		6.45	12.40	16.58	35.42	22.26	14.64	12.22	15
14. Average (lines 1-11)[c]									
a. Agricultural		7.85[a]	10.02[a]	13.21[b]	27.88	20.29	14.52	10.97	26
b. Non-Agricultural		4.70[c]	8.68	13.12	26.50	19.78	19.78	11.19	27

Notes: [a] excludes lines 5-7

[b] excludes lines 6-7

[c] Quintile shares excluded when original data is insufficient to justify logarithmic interpolation.

Sources: Same as Table 7

work in agriculture (Col. 1, line 8). At the other end of the spectrum, an average of 12% of the highest quartile are supported in agriculture (Col. 4, line 8). If the agricultural population were distributed evenly, 27% of each quartile would be engaged in agrarian pursuits (Col. 5, line 8). Brazil and Mexico show great similarity; both are characterized by almost 44% of the population in agriculture (Col. 5). Three-quarters of the agricultural workers in Brazil and 70% in Mexico fall in the lowest half of the income pyramid. At the other extreme, 7% of agricultural workers in Brazil reach the top quartile compared to 15% in Mexico. Puerto Rico and Argentina have the lowest percentage of population in agriculture, 16-17% in the 1960's. In both countries, almost 75% of the population engaged in agriculture belong to the bottom half of the incomes pyramid, while 12% are in the top quartile in Argentina and 9% in Puerto Rico.

We conclude that although population shares in agriculture vary among groups of countries, the relative position of each agricultural sector in its income pyramid is comparatively uniform: 67-75% of individuals belong to the bottom half and 9-15% reach the top quartile.

IV. COMPARISONS BETWEEN CITIES

In Latin America intense and rapid urbanization has emerged with industrialization and economic growth. The city, as a location of modern production and as the residence of a wide range of life styles, lies on the fault-line of acute social conflict. By bringing people of varied backgrounds and roles geographically close together, the city may accentuate social differences and intensify social friction. Awareness of these social differences may be expressed in a wide range of phenomena, from petty theft to mass political mobilization. One indicator as well as root of conflict within the city may be the degree of income equality; one route to reducing conflict may be through the redistributive mechanisms of social change.

Table 9

Division Between Agriculture and Non-Agricultural Sector of Country-wide Quartiles

Country and Year	INCOME SHARE OF EACH QUARTILE I (1)	II (2)	III (3)	IV (4)	POPULATION SHARE (5)
Agriculture					
1. Argentina - 1953	45	11	10	18	21
- 1961	36	11	8	9	16
2. Brazil (Fishlow)-1970	70	62	33	11	44
3. Chile - 1967	40	35	13	8	24
4. Colombia (DANE)-1970	51	44	30	12	34
5. Mexico - 1963	68	49	31	23	43
6. Puerto Rico - 1953	49	30	30	13	30
- 1963	30	21	10	6	17
7. U.S.A. - 1957-59	33	7	3	3	11
- 1960-62	26	6	3	3	10
8. Average of (lines 1 to 6	49	33	21	12	27
Non-Agriculture					
9. Argentina - 1953	55	89	90	82	79
- 1961	64	89	92	91	84
10. Brazil (F)- 1970	30	38	67	89	56
11. Chile - 1967	60	65	87	92	76
12. Colombia(D)-1970	49	56	70	88	66
13. Mexico - 1963	32	51	69	77	57
14. Puerto Rico-1953	51	70	70	87	70
-1963	70	79	90	94	83
15. U.S.A. - 1957-59	67	93	97	97	89
1960-62	74	94	97	97	90
16. Average of lines 9-14 1-6	51	67	74	88	71

Sources: 1.1; 2.3; 3.1; 4.3; 7.1; 9.2.

How do income distributions compare among Latin American cities? The ranking of the fourteen cities surveyed reveals a cursory inverse relationship between the level of per capita income of the city and the concentration indices(Table 10). As measured by the Gini ratio, the most unequal cities are Asunción and Monterry; the most equal are Caracas and San Juan.

The profiles of urban distributions suggested in the quintile shares (Table 10, Col. 6-13) may prove a useful first approximation for distinguishing two broad types of cities. The "bourgeois" city is defined by higher-than-average income shares to the 41st to 80th percentiles, and lower-than-average income shares to the uppermost 5%, as in Guatemala, San Juan and Caracas. The "bi-polar" city is characterized by a lower-than-average share to the bottom 60% and a higher-than-average share for the top 5%, as in Cali, Medellín, Monterrey and Asunción.[8]

CONCLUSIONS

A. Findings

We have observed two patterns of redistribution among the countries studied: first, the increase in the income share of the top 10% and a loss to the bottom 90%; second, the "twisting of the distribution away from the bottom-most 60% and top-most 5% toward a greater share for the middle 81-95th percentiles.

Comparing countries, we found a wide range in income concentration: Peru, Mexico, Brazil and Colombia demonstrate the highest inequality and Costa Rica, Argentina and Puerto Rico reveal the lowest inequality. The top ordinal groups of the poorest countries command larger income shares than the corresponding groups of the richer nations.

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[8] It is possible to place the city's population within the national pyramid, as in the distribution of a city's population across the national quartiles. In the case of Peru (see Webb, 1961) Lima accounts for almost 20% of the country's population, but only 17% of Lima falls into the bottom half of the country's income distribution. 83% of the city falls in the top half of the countrywide distribution and 54% of the city's population in the upper quartile of the nation.

TABLE 10

MEASURES OF INEQUALITY IN 14 LATIN AMERICAN CITIES

Country/City	Year (1)	Per Capita Income 1960 US$ Equivalents (2)	Gini (3)	Coefficient of Variation (4)	S.D. Logs (5)	Percentiles of Family Recipients: 0 - 20% (6)	21 - 40% (7)	41 - 60% (8)	0 - 60% (9)	61 - 80% (10)	91 - 95% (11)	91-95% (12)	96-100% (13)
A. Brazil	1960-1968												
1. Recife	(Average)	.356(1)	.4542(7)	.9745(7)	.8475(11)	4.62	8.42	13.51	27.04	21.28	17.22	12.50	21.95
2. São Paulo	1971	.839(13)	.4306(4)	.9082(4)	.7541(4)	5.85	8.91	13.28	28.04	21.87	17.29	12.49	20.31
B. Colombia													
3. Barranquilla	1967	.463(3)	.4548(8)	1.0081(9)	.7698(5)	5.74	8.98	12.33	27.05	18.87	16.61	16.44	21.03
4. Bogotá	1967	.575(5)	.4563(9)	.9789(8)	.8196(9)	4.85	8.98	13.24	27.07	20.01	16.40	16.68	19.84
5. Cali	1967	.461(2)	.4710(10)	1.0546(11)	.8033(8)	5.15	8.31	12.41	25.87	19.65	16.43	14.81	23.24
6. Medellín	1967	.494(4)	.4897(12)	1.1314(13)	.8325(10)	4.82	8.30	11.92	25.04	17.98	15.20	18.63	23.15
C. Guatemala													
7. Guatemala City	1969	.583(6)	.4211(3)	.8895(3)	.7499(2)	5.62	9.50	14.15	29.27	21.98	16.46	11.96	20.32
D. Mexico													
8. Mexico D.F.	1963	.730(10)	.4987(13)	1.0631(12)	.9151(14)	4.09	7.38	12.06	23.54	19.97	19.29	14.81	22.39
9. Monterrey	1965	.603(8)	.5214(14)	1.2844(14)	.8959(13)	4.06	7.31	11.49	22.86	18.72	15.85	12.55	30.02
E. Paraguay													
10. Asunción	1970-1971	.789(12)	.5630(15)	1.3028(15)	1.0582(15)	2.82	6.20	10.41	19.43	18.61	15.64	19.59	26.73
F. Peru													
11. Lima	1968	.607(9)	.4759(11)	1.0189(10)	.8789(12)	4.25	8.32	13.04	25.62	20.20	16.61	17.08	20.50
G. Puerto Rico													
12.a. San Juan	1953	.743(11)	.4332(6)	.9422(5)	.8013(7)	4.90	9.62	14.39	28.91	21.82	15.51	11.82	21.54
12.b. San Juan	1963	1.242(15)	.4096(1)	.8566(2)	.7514(3)	5.52	9.92	14.75	30.19	22.59	16.20	11.17	19.85
H. Venezuela													
13. Caracas	1966	.914(14)	.4177(2)	.8157(1)	.7784(6)	5.25	9.36	14.22	28.83	23.00	18.13	14.08	15.97
14. Maracaibo	1967	.587(7)	.4314(5)	.9546(6)	.7458(1)	5.46	9.63	13.89	28.98	20.58	16.06	12.24	22.14
All Cities Average (14)						5.21	9.22	13.94	28.41	22.01	17.78	15.49	23.53

Sources: 2.1; 2.2; 6.3; 7.1; 7.4; 8.2; 9.1; 9.2; 11.1

With regard to urban and rural zones, the average income in the urban zone is more than twice the rural mean, uncorrected for cost of living differences. Thus, the income share commanded by the urban sector always exceeds population share. The measures of inequality are inconclusive with regard to relative dispersion in the urban and rural zones. Do the nation's poor populate the

Do the nation's poor populate the urban zones? On the average, the composition of the poorest quartile is 69% rural, while the richest quartile is formed by 25% rural. If we consider the agricultural and non-agricultural bifurcation, the mean income of A is one half the non-A average, and relative intra-sectoral inequality varies among countries. On the average, the A sector comprises 27% of the economically active population, forms 49% of the bottom quartile and 12% of the top quartile. Although the population share in agriculture varies among countries, the relative position of each agricultural sector in its income pyramid follows a more uniform pattern: 67-75% of individuals belong to the bottom half, while only 9-15% reach the top quartile.

We have observed, at first glance, two types of city distributions: "bourgeois", characterized by an emerging middle-class, and the "bi-polar" city with higher concentration of income in the top 5% and a lower share to the lower income groups. Income pyramids, constructed from ECIEL data for eight cities, show that education and occupation are the major characteristics--which clearly identify the poor from the rich. Other characteristics examined include family size, number of earners, main source of income, and age and sectoral activity of the head.

B. A Redistributive Excercise

The dramatic effect of income redistribution to the lower classes can be demonstrated simply by a mental experiment of transferring income directly from the top 5%. By how much would the standard of living of the top 5% fall in order

to double the income share of the bottom 40%? In the case of Peru, 1961, the lower 40% receives 7% of income while the top receives 41%. Doubling the lower class's share to 14% of income would reduce the top by 17%. Similar magnitudes hold for Colombia (1964) and Brazil (1970). Such a path towards increasing the standard of living of the lower class may not be feasible, but this type of calculation does indicate the degree to which the topmost group is likely to resist the necessary steps to directly raise the standard of living of poorest groups.[9]

Thus our position stands opposed to the conventional belief that prompt redistribution of current incomes would help no one because the consequence, it is said, would only "redistribute poverty" among the poor, an empty statement contradicted by the empirical evidence.[10]

C. Concluding Remark

We reject the notion that our findings of trends or tendencies of the past imply a necessary path for other nations seeking to traverse similar terrain. A country may seek to reduce the great disparity between rural and urban areas and refuse to tolerate the historical poverty of agriculture.

The persistence of low rural incomes in the face of rising urban fortunes stems from rural neglect, high levels of urban investment and the state's attention to infrastructure, energy, and industry. Conventional policies such as subsidies and public works which try to reverse these practices may not sustain rural incomes, and even the gains from direct redistribution, such as land reform, may be undermined by other ongoing market policies. Equalization within the rural sector, may

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[9] The assumption that the increase in share to the bottom would come exclusively from the top is here made purely for illustrative purposes. If this were to occur, as a penalty to the upper class for having enjoyed such a disproportionate share of income, then the resulting redistribution in some cases would leave the topmost 5% with less income than the income accruing to the 90-95% percentiles.

[10] See Mario Simonsen, Brasil 2002 (Rio de Janeiro: Ed. APEC, 1972), page 64.

prove meaningless in the face of widening sectoral averages. Even the political appeal of continued rural attention and reform may prove weak due to the fragmentation and geographical dispersion compared to the consolidated urban groups. To conclude, we maintain that the only effective way of raising rural standards may be by directly changing the rules by which society rewards its members and validates, rather than erodes, an equal distribution.

DATA USED IN THIS STUDY

1. Argentina

   A. Countrywide: (1.1), 1953 from T. IV-1, p.5; 1961 from T. IV-223, p.253, calculated from 22 intervals.

      1. Agriculture: 1953, T. from pp. 7 & 15; 1961, T. from pp. 225 and 263.

      2. Non-agriculture: 1953, T. from pp 8-13, 16-22; 1961, T. from pp. 131 and 139.

2. Brazil

   A. Countrywide (Fishlow): (2.3) 1960 from T. 1. p. 392; economically active population from (2.4), T. VI; p. XXIX. 1970 from T. 5, p 339, and e.a.p. from (2.4), T. 8, p.6. Nine intervals for 1960 and 1970.

      1. Agriculture and Non-agriculture, 1970, both from TV, p.399.

   B. Countrywide (Langoni): (2.5), 1960 & 1970, Decile shares from T.4, p.14; 1960 e.a.p. from (2.4), T. VI, p. XXIX; 1970 e.a.p. from (2.5), T.8, p. 19; mean incomes from p. 14. Twelve intervals used for all data in bothe years.

      1. Agriculture (Primario), 1960, Decile shares from T. 6, p. 17, 1970 from T on p. 14; 1960 e.a.p. from (2.4), T. VI, P XXIX, 1970 e.a.p. from T.8, p. 19.

      2. Non-agriculture (called "urbano" in 2.5), 1960 & 1970 decile shares from T6, p. 17.

   C. Recife (all years): (2.2), number of families from T. 1 p. 86, average family income from T. 2 p. 88, frequency distributions from T. 4, p. 99; quartiles (no interpolation procedure given) appear in T. 5, p. 100. We used his 6 intervals for 1960, nine for 1961, seven for 1967, and eleven for 1968.

   D. São Paulo: (2.1), all data from Tables on p. 6. Thirteen intervals used. (2.6), p. 46, gives only 4 classes, and therefore could not be used. (2.6) p. 46, gives only 4 classes, and therefore could not be used.

3. Chile

   A. Countrywide: Decile shares from (3.1), T. 1, p. 6; mean income from p. 11; e.a.p. from (3.3), T. 7, p. 48.

      1. Urban and Rural: decile shares from (3.1), T. 1, p. 6; number of recipients from geographic zones from T. 4, p. 8; mean incomes from T. 11, p. 27.

      2. Agriculture and Non-agriculture: income shares for seven intervals for A and eight intervals for I & S sectors in (3.1) T. 9, p. 21. Weighted averages for each interval to obtain

income and recipient share for combined "Non-agriculture." Number of recipients from shares in T. 2, p. 8; mean income from T. 11, p. 27; e.a.p. from (3.3), T. 1, p. 6. Seven intervals used for Agriculture; eight intervals for Non-Agriculture.

4. Colombia.

A. Countrywide (Urrutia, 1964): (4.4) accumulated shares, population total income from T. A-6, p. 1003.

1. Rural from T. A-5, p. 1002; total income from p. 993. Urban from T. A-3, p. 1001. Twenty-three intervals used for countrywide and rural, 25 intervals for urban.

B. Countrywide (DANE, 1970): (4.3) from T. 20, p. 70.

1. Agriculture: from 15 income groups in T. 8, p. 135.

2. Non-agriculture: number of people, for each interval was found by subtracting agricultural from total, then applying standard interval means to obtain income shares. Total number of e.a.p. from T 4, p. 129; Total income from T. 5, p. 130.

3. Urban-Rural from T. 21, p. 71, and T. 22, p. 72.

4. Bogotá-Non-Bogotá (Heads of Families): Thirteen intervals for Bogotá from T. 19, p. 149; Number of People from T. 28, p. 157. Income Share for Regions given in T. 16, p. 145. Non-Bogotá is calculated by summing Atlántica, Oriental, Central and Pacífico regions, Recipient and Income shares are given on T. 19, p. 149. Distribution of Recipients by Region from T. 28, p. 157; Distribution of Income by Region in T. 16 p. 145.

C. Medellín, Manizales (1967): from (4.4), Tables A-10, A-11, p. 1005. Twenty-five intervals for Medellin, and 22 for Manizales

5. Costa Rica

A. Countrywide: from (5.1), Appendix T. 4, p. 81, gives shares of persons, families, and income for eleven intervals, from which countrywide interval means are calculated. These means were then applied to the frequency distribution of urban and rural families given in T. 8, p. 40, to obtain income shares for each shares of recipients. The difference from the given total income and the aggregated income by interval was distributed across all income classes. The eleven intervals for the U-R distribution in T. 8, p. 40, were reconciled by linear interpolation with the twelve quite different intervals for the countrywide distributions given in T. 4, p. 81.

6. Ecuador

A. Urban only: from (4.3) - accumulated shares from T. 23, p. 73.

7. Guatemala

A. Agriculture only: from (6.2) number of families and mean income is given for 22 intervals for all agriculture in T. 31, p. 143, as well as for eight major cultivations.

B. Five Cities only: from (6.3), number of families and total income for each of ten intervals is given in T. 4.0-1, p. 93, for five cities, and in T. 40-2, p. 93, for Guatemala City.

8. México

A. Countrywide (1963), Agriculture and Non-agriculture: uncorrected results of budget survey distributions are given in (7.1), Series 38, p. 432, for sixteen original income intervals. Income shares to each interval are calculated for Agriculture and Non-agriculture from Series 36, p. 428, and the number of families in each interval from Series 35, p. 420

B. Countrywide (1963), from Ifigenia Navarrette, "La Distribucion del Ingreso en México: Tendencias y Perspectivas" en El Perfil de Mexico en 1980 (Mexico, 1970, Siglo Veintiuno), p. 37, Cuadro 2.

Urban-Rural (1963), calculated from fourteen intervals in (7.1), Series 38, p. 429, for rural localities under 2,500, and p. 432, for all México.

C. México D.F. (1963), calculated from nine intervals given in (7.1), Series 19.1, p. 244.

D. Monterrey (1965), calculated from 22 intervals in (7.4), Appendix T. 1, p. 82, accumulated shares of income families before taxes. Universe number is given in text on p. 95, and mean family per month in Appendix T. 2, p. 85.

9. Perú

A. Countrywide: total labor force and income in millions of U.S. dollars appears in (8.3), T. 2, p. 6. The fourteen intervals appeared earlier in (8.2), T. 3, p. 7, in millions of Peruvian soles. Quartiles for Urban and Rural sectors, and shares to the 90th, 95th 99th percentiles with average income in U.S. dollars follows in (8.3) T. 3, p. 7. However, these two components do not precisely exhaust the total country income. The Rural distributions have been calculated on the basis of six intervals, and urban with seven intervals.

10. Puerto Rico

A. Countrywide: 1953 is based on (9.2), T. 20, p. 110, with nine original income intervals. Data from 1963 are from T. 6, p. 15, based on thirteen intervals.

B. Urban-Rural: from (9.2), urban zone includes families in places

of 2,500 inhabitants and over; also those that are located in densely populated urban fringes for 1963 as well. Original shares of numbers of families and shares of income are from T. 6, p. 6, columns 7-10, 9 intervals in 1963, and T. 20, p.110, columns 7-10, for the thirteen intervals in 1953.

C. Agriculture - Non-Agriculture

1. For 1953, from (9.2), T. 6, p. 15. Agriculture includes forestry and fisheries. Non-agriculture is aggregate of construction, manufactring, utilities; trade, finance, services, public administration and others. Shares of number of families in each sector is given in T. 6. Average incomes were calculated by dividing the income received by each income interval by the number of families in that interval for the country-wide distributions constructed from Report A-1, Tables 1 and 3. Income shares were obtained by multiplying the number of families in each interval for each industry by the average income for that iterval. Finally, the income shares for the nine intervals were interpolated.

2. For 1963, from (9.2). Sectors are composed of the same industries as the 1953 data. Shares of the number of families in each income interval for each sector are given in T.15-A1, p. 78. Average incomes were calculated first for each of the 13 intervals for the urban and rural zones from the information in Column 1 of Tables 15-D1 and 15-E1. Then, these average incomes for each interval were applied to the number of families within each sector residing in the rural or urban zone to yield the actual income of rural and urban families for each interval within each industry. The rural and urban distributions were then aggregated and income shares formed for each income interval within each industry. These income shares were then interpolated to obtain the shares for standard ordinal groups.

11. U.S.A.

A. Countrywide, Farm and Non-farm for 1957-1959, and 1960-1962, are based on Jeannette FitzWilliams, "Size Distribution of Income in 1963," in Survey of Current Business, XLIV, 4 (April 1964), Tables 7 and 8, p. 7. We averaged the percentage shares in numbers of families and incomes for each three year period and the interpolated the twelve original income intervals. Data for 1960-1962 include Hawaii and Alaska.

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