Discussion Paper

Central Bureau of Statistics, P.B. 8131 Dep, 0033 Oslo 1, Norway

No. 59 8. februar 1991

INEQUALITY IN DISTRIBUTIONS OF HOURS OF WORK AND CONSUMPTION IN PERU

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Acknowledgement

This project was supported by the World Bank.

* Tom Wennemo is responsible for the programming, Elisa Holm and Anne Skoglund have typed and edited the paper. We would like to thank José Goméz de Leon and Morton Stelcner for useful comments.

ABSTRACT

Firstly, this paper examines the relative differences in observed hours of work, consumption (income) and welfare among individuals and households in Peru in 1985-1986. For this purpose a Gini-related measure of inequality is employed.

Secondly, the paper reports the results of some basic policy simulations which are based on a structural micro-econometric model. The main purpose has been to examine the impact of changes in wage rates and in length of schooling, respectively, on distributions of hours of work, consumption and welfare.

CONTENTS

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INTRODUCTION

The evaluation of inequality in the distribution of income and other resources is of fundamental importance in order to make judgment of the welfare and the level of living in a society. This is of particular relevance for many developing countries since it is often believed that the inequality in the distribution of resources is large while there is sometimes a lack of empirical evidence to support these claims.

Most of the available empirical information on economic inequality in developing countries refers to the distribution of income among earners. This information constitutes an important part of a complete description of the labor market and the related distribution of income, but it is less helpful in the analysis of inequality as a welfare issue. A more relevant indicator of welfare is per capita (or per adult equivalent) household income or consumption. The present paper uses this indicator in an analysis of inequality based on data from the Peruvian Living Standards Survey (PLSS) in 1985-86. Our methodological approach is based on a summary measure of inequality which is closely related to the Gini coefficient. The essential difference is that our proposed measure of inequality gives more weight than the Gini coefficient to transfers that is related to the very poor.

Based on a structural micro-econometric model given in Dagsvik and Aaberge (1989), we have performed some basic policy simulations. The purpose has been to examine the impact of changes in the wage rates and in length of schooling, respectively, on production, consumption and time allocation, as well as on economic welfare.

The paper is organized as follows. Section 2 discusses in more detail the employed measure of inequality. Section 3 deals with the description of the labor market activity and the related distribution of income based on an inequality analysis of distributions of hours of work and consumption. In Section 4 we examine economic welfare based on per capita household consumption as an indicator of welfare. Sections 3 and 4 cover Lima, other urban areas and rural areas while Section 5 deals with policy simulations for Lima. Section 6 contains a brief summary and the conclusion.

2. MEASUREMENT AND DECOMPOSITION OF INEQUALITY

A common approach for measuring inequality in distributions of income is to employ the Gini coefficient, which satisfies the principles of scale invariance and transfers. The principle of scale invariance states that inequality should remain unaffected if each income is altered by the same proportion and it requires, therefore, the inequality measure to be independent of the scale of measurement. The principle of transfers implies that if a transfer of income takes place from a richer to a poorer person without changes in the relative positions, the level of inequality diminishes. The reader is referred to Sen (1972) for a more comprehensive discussion of the normative implications of different measures of inequality.

As is wellknown, the Gini coefficient (G) is related to the Lorenz curve (L) in the following way

$$(2.1) \qquad G = \int_0^1 [1-2L(u)]du.$$

The Gini coefficient offers a method for ranking distributions and quantifying the differences in inequality between distributions. This strategy, however, suffers from certain inconveniences. Evidently, no single measure can reflect all aspects of inequality of a distribution, only summarize it to a certain extent. Consequently, it is important to have alternatives to the Gini coefficient. As pointed out by Atkinson (1970), the Gini coefficient assigns more weight to transfers in the centre of an unimodal distribution that at the tails. As an alternative to the Gini coefficient, we will employ an inequality measure - the A-coefficient - that assigns more weight to transfers at the lower tail than at the centre and the upper tail.

The A-coefficient, see Aaberge (1986), has a similar geometric interpretation and relation to the inequality curve M defined by

$$(2.2) \qquad M(u) = \frac{E[X|X \le F^{-1}(u)]}{EX}, \qquad o \le u \le 1,$$

as the Gini coefficient has to the Lorenz curve. Here X has distribution function F. The A-coefficient is defined by

$$(2.3) \qquad A = \int_0^1 [1-M(u)]du.$$

If X is an income variable, then M(u) for a fixed u expresses the ratio of the mean income of the poorest 100u percent of the population to the mean income of the population. As is wellknown, the egalitarian line of the Lorenz curve is the straight line joining the points (0,0) and (1,1). The egalitarian line of the M-curve is the horizontal line joining the points (0,1) and (1,1). Thus, the universe of M-curves is bounded by a unit square, while the universe of Lorenz-curves is bounded by a triangle. Therefore, there is a sharper visual distinction between two different M-curves than between the two corresponding Lorenz curves. Note that the M-curve will be equal to the diagonal line (M(u)=u) if and only if the underlying distribution is uniform (0,a) for an arbritary a. The A-coefficient then take the value 0.5, while the maximum attainable value is 1 and the minimum attainable value is 0.

Note that M(u) = L(u)/u, which implies

$$(2.4) \qquad A = \int_0^1 [1-\frac{L(u)}{u}]du .$$

Alternative expressions for G and A are given by

$$(2.5) \qquad G = \frac{1}{EX} \int_0^\infty \int_0^y (y-x)dF(x)dF(y) = \frac{1}{EX} \int_0^\infty y(2F(y)-1)dF(y)$$

and

$$(2.6) \qquad A = \frac{1}{EX} \int_0^\infty \int_0^y \frac{(y-x)}{F(y)} dF(x)dF(y) = \frac{1}{EX} \int_0^\infty y(1+\log F(y))dF(y) ,$$

respectively.

Given the inequality in the distribution function F measured by A or G, the next step is to identify the sources that make substantial contribution to the inequality. Assume that the main variable X is the sum of s different factor components,

$$(2.7) \qquad X = \sum_{i=1}^{s} X_i .$$

According to Aaberge (1986), A and G satisfy the following decomposition rules

$$(2.8) \qquad A \quad = \quad \sum_{i=1}^{s} \frac{\mu_i}{\mu} \alpha_i$$

where μ_i/μ is the ratio between the means of X_i and X, respectively, and α_i is, loosely spoken, the conditional A-inequality of factor i given the units rank order in X. Analogously,

$$(2.9) \qquad G \quad = \quad \sum_{i=1}^{s} \frac{\mu_i}{\mu} \gamma_i$$

where γ_i related to G has a similar interpretation as α_i related to A.

Notice that α_i and γ_i are measures of interaction between factor i, X_i, and the sum X. Assume for example that $\mu_i > 0$. Then, a negative value of α_i or γ_i expresses negative interaction and means that factor i has an equalizing effect on the inequality in the distribution F of X. A positive value expresses a disequalizing effect on the inequality in F. For $\mu_i < 0$, then positive values of α_i and γ_i express an equalizing effect on the inequality in F.

3. INEQUALITY IN OBSERVED DISTRIBUTIONS OF HOURS OF WORK AND CONSUMPTION IN PERU IN 1985-86

In this section we provide information on the labor market participation and income formation among households in Peru using the data gathered by PLSS. In particular, we focus on the distributions of hours of work among employed persons and households, respectively. The main goal is to estimate inequality in distributions of hours of work, i.e. relative differences in hours of work among persons and among households. In addition, we identify the contribution from wage work, agricultural selfemployment, non-agrigultural selfemployment and unpaid family work to the distribution of hours of work among employed females, males and children, respectively. More precisely, we decompose the inequality in the actual distributions of hours of work with respect to the above mentioned groups. A similar approach is taken to assess the contribution of wage work, farm activity, non-farm activity and unpaid family work for females, males and children, respectively, to the inequality in distributions of hours of work among households and the contribution of wage earnings from females, males and children, respectively, to the inequality in distributions of consumption (income) among households. In this way we obtain important information about the distribution of income and the functioning of the labor market. The implications for the economic welfare among households and individuals are examined in section 4 on the basis of household consumption relative to a certain equivalence scale.

3.1. Inequality in distributions of hours of work among persons

In this section individuals are classified as employed if they worked one hour or more during the seven days or twelve months prior to the survey. We examine the following populations,

- employed females between 15 and 70 years old,
- employed males between 15 and 70 years old,
- employed children between 7 and 14 years old.

Definition and measurement of annual hours of work are reported in Appendix 2 and correspond to the definition used in Dagsvik and Aaberge (1989).

In Table 1 we report the regional employment participation rates for children, males, married and unmarried females.

Table 1. Employment participation rates for children, males, married and unmarried females by region. Per cent

Population			Females (15-70)		
Region	Children (7-14)	Males (15-70)	All	Married	Unmarried
Peru	33	82	64	69	57
Lima	11	77	51	55	47
Other urban	17	76	56	62	49
Rural	54	91	79	81	75

Participation rates for both females, males and children are considerably greater in rural areas than in urban areas of Peru. Furthermore, participation rates for married females are higher than participation rates for unmarried females. For children, the participation rate for those living in rural areas is 400 per cent higher than for those living in Lima. When they do work, children in rural areas on the average work considerably longer than children in urban areas, see Table 2. Similar result holds for females, but not to same extent for males.

Table 2. Annual mean hours of work for employed children, males, married and unmarried females by region

Population Region	Children (7-14)	Males (15-70)	Females (15-70)		
			All	Married	Unmarried
Peru	911	2351	1746	1728	1775
Lima	565	2356	1594	1580	1611
Other urban	681	2286	1656	1613	1717
Rural	991	2388	1868	1844	1912

The mean figures in Table 2 may cover large individual differences in hours of work. By estimating the inequality in the corresponding distributions of hours of work, we obtain relevant information about the individual differences in hours of work. For this purpose we employ the A-coefficient. Corresponding results based on the Gini coefficient are given in Appendix 1.

Table 3. A-inequality*) in distributions of hours of work for employed children, males, married and unmarried females by region

Population / Region	Children (7-14)	Males (15-70)	Females (15-70) All	Females (15-70) Married	Females (15-70) Unmarried
Peru	.588	.396 (.004)	.521 (.004)	.521	.521
Lima	.691	.398 (.008)	.569 (.008)	.586	.547
Other urban	.627	.434 (.008)	.563 (.007)	.573	.546
Rural	.557	.370 (.006)	.467 (.005)	.455	.483

*) Standard deviations are given in parentheses.

The figures in Table 3 clearly demonstrate large individual variations in hours of work; particularly among children and females. For children and for females, except for those living in rural areas, the inequality in distributions of hours of work is significantly higher than if the observations were generated from a uniform (0,a) distribution for an arbritary a. There are, however, not significant discrepancies in inequality between the corresponding distributions of hours of work for married and unmarried females. Inequality is lowest in the rural area for both children, males and females.

The observed distributions of hours of work are the result of a process where the individuals make decisions on hours of work in each sector simultaneously. In this paper we define the sectors to be

(1) wage work,
(2) non-agricultural selfemployment,
(3) agricultural selfemployment

and

(4) unpaid family work.

By decomposing the overall inequality in the distribution of hours of work with respect to the four above mentioned sectors, we obtain information about the contribution of each sector to the overall inequality. (Here it is understood that the behavioral labor market adjustments are given).

By applying the decomposition (2.8) for the A-coefficient we obtain the results presented in Tables 4, 5 and 6. The first and second column display the relative contribution from the sectors to overall inequality and to total hours of work, respectively. The third column gives the interaction coefficients. The positive interaction coefficients demonstrate that each sector has a disequalizing influence on the distributions of hours of work for both children, males and females in each region. Note that the sectors contribution to overall inequality are equal to the products of the figures in columns two and three divided by 100. Consequently, the sum of the first four inequality contributions in Table 4 is equal to the overall inequality (0.521) in the distribution of hours of work for females in Peru.

Table 4. Decomposition of the A-inequality*) in distributions of hours of work with respect to wage work (1), non-agrigultural selfemployment (2), agricultural selfemployment (3) and unpaid family work (4) for females by region

Region (Level of inequality)	Employment sector	Fraction of overall inequality (per cent)	Fraction of total hours of work (per cent)	Interaction coefficient
Peru (0.521)	1	21.9	22.0	0.518
	2	28.5	24.1	0.618
	3	7.5	7.8	0.501
	4	42.1	46.1	0.476
Lima (0.569)	1	53.2	52.8	0.573
	2+3	37.8	33.0	0.653
	4	9.0	14.2	0.360
Other urban (0.563)	1	25.4	26.1	0.547
	2+3	53.8	45.8	0.661
	4	20.8	28.1	0.417
Rural (0.467)	1	8.6	7.5	0.536
	2	13.1	11.2	0.543
	3	13.2	13.6	0.455
	4	65.1	67.7	0.449

*) Fraction of overall inequality =

$$\left(\frac{\text{Fraction of total hours of work}) \cdot (\text{Interaction coefficient})}{\text{Overall inequality}} \right)$$

<u>Example</u>:

Wage sectors fraction of overall inequality in Peru = $\frac{22.0 \cdot 0.518}{0.521} = 21.9$

Table 5. Decomposition of the A-inequality in distributions of hours of work with respect to wage work (1), non-agricultural selfemployment (2), agricultural selfemployment (3) and unpaid family work (4) for males by region

Region (Level of inequality)	Employment sector	Fraction of overall inequality (per cent)	Fraction of total hours of work (per cent)	Interaction coefficient
Peru (0.396)	1	39.9	42.9	0.368
	2	27.2	20.3	0.531
	3	17.7	16.1	0.435
	4	15.2	20.7	0.292
Lima (0.398)	1	58.3	66.6	0.348
	2+3	40.4	29.8	0.539
	4	1.3	3.6	0.144
Other urban (0.434)	1	44.7	50.4	0.385
	2+3	50.7	39.4	0.558
	4	4.6	10.2	0.195
Rural (0.370)	1	26.8	24.4	0.403
	2	8.3	6.8	0.451
	3	35.2	31.9	0.409
	4	29.7	36.9	0.298

Table 6. Decomposition of the A-inequality in distributions of hours of work with respect to wage work (1), non-agricultural selfemployment (2), agricultural selfemployment (3) and unpaid family work (4) for children by region

Region (Level of inequality)	Employment sector	Fraction of overall inequality (per cent)	Fraction of total hours of work (per cent)	Interaction coefficient
	1	4.3	5.4	0.469
Peru	2	1.8	1.7	0.645
(0.588)	3	0.7	0.6	0.710
	4	93.2	92.4	0.593
	1	19.7	19.2	0.708
Lima	2+3	13.1	12.0	0.754
(0.691)	4	67.3	68.8	0.676
	1	15.5	14.5	0.667
Other urban	2+3	2.2	2.7	0.515
(0.627)	4	82.3	82.6	0.624
	1	2.3	3.3	0.376
Rural	2	1.5	0.9	0.866
(0.557)	3	0.9	0.7	0.661
	4	95.4	95.0	0.560

According to the results in Tables 4, 5 and 6 wage work plays a predominant role for females and males living in Lima and for males living in other urban areas. In rural areas, the majority of hours of work for both females and males is in the agricultural sector. The wage sector contributes, however, by almost 25 per cent of total hours of work for males living in the rural areas.

Unpaid family work is the predominant activity among the children who work. Still, almost 20 per cent of the children's total hours of work in Lima is wage work ativity. The large interaction coefficients in Table 6 suggest that children with long hours of work on average work longer hours in each sector than children with short total hours of work. To a certain extent this conclusion is also valid for both males and females.

There is, however, a weak interaction between hours worked as unpaid family worker and total hours of work among males. This means that males with short total hours of work on average do nearly as much unpaid family work as males with long total hours of work.

3.2. Inequality in distributions of hours of work among households

In this section we examine the distribution of hours of work for households, similarly to the results for individuals reported above.

Table 7 provides some basic statistics on household composition and hours of work. As one can see, the regional differences in household size is not very large. However, in spite of almost equal average household sizes, households in rural areas have both more children and more old people than households in urban areas. Still, the rural households have on average considerably larger mean annual hours of work than households living in urban areas.

To obtain information about the relative spread of the households distributions of hours of work we employ the A-coefficient, as we did when examining the distributions of hours of work among individuals.

Table 7. Household composition and annual mean hours of work for households by region

Region	Peru	Lima	Other urban	Rural
Number of observations	5106	1370	1460	2276
Household size	5.1	5.1	5.3	5.1
Number of children, 0-6 years old ...	0.95	0.71	0.90	1.12
Number of children, 7-14 years old ..	1.13	0.97	1.15	1.20
Number of females, 15-70 years old ..	1.5	1.7	1.6	1.3
Number of males, 15-70 years old	1.4	1.6	1.5	1.3
Number of people above 70 years old .	0.15	0.13	0.14	0.17
Total hours of work for household ...	5170	4533	4492	5976
Mean households hours of work per individual in agegroup 15-70 years	1874	1497	1574	2292
Relative number of employed females (15-70 years old) per household ...	0.61	0.49	0.55	0.72
Relative number of employed males (15-70 years old) per household	0.76	0.74	0.72	0.79

Table 8. A-inequality*) in distributions of hours of work among households by region

Peru	Lima	Other urban	Rural
0.487 (0.004)	0.497 (0.009)	0.492 (0.008)	0.458 (0.006)

*) Standard deviation in paranthesis.

Table 8 provides information on the relative variation in total hours of work among households in Peru and in regions of Peru. The figures for Lima and other urban areas are approximately equal to the inequality in a uniform(0,a) distribution. Similarly to the corresponding distribution of hours of work among individuals (reported in Table 3), the level of inequality is lowest in the rural area.

Next we examine the influence on the distribution of hours of work among households from the different types of employment activities for children (7-14), males (15-70) and females (15-70), respectively. The different categories we use to decompose the overall inequality in the distribution of hours of work among households are as follows:

(C1) - childrens hours of work in the wage sector,
(C2) - childrens hours of work in non-agricultural selfemployment,
(C3) - childrens hours of work in agricultural selfemployment,
(C4) - childrens hours of work in unpaid family work,
(M1) - males hours of work in the wage sector,
(M2) - males hours of work in non-agricultural selfemployment,
(M3) - males hours of work in agricultural selfemployment,
(M4) - males hours of work in unpaid family work,
(F1) - females hours of work in the wage sector,
(F2) - females hours of work in non-agricultural selfemployment,
(F3) - females hours of work in agricultural selfemployment
(F4) - females hours of work in unpaid family work.

The total hours of work (h) for each household is given by

$$(2.10) \quad h = \sum_{i=1}^{4} (Ci+Mi+Fi).$$

The results of the decomposition are given in Tables 9 to 12.

Table 9. Decomposition of the A-inequality in the distribution of hours of work among households living in Peru with respect to childrens, males and females hours of work in wage work, non-agricultural selfemployment, agricultural selfemployment and unpaid family work, respectively

Hours of work component	Fraction of overall inequality (per cent)	Fraction of total hours of work (per cent)	Interaction coefficient
C1	0.4	0.4	0.511
C2	0.1	0.1	0.438
C3	0.1	0.1	0.731
C4	10.6	7.0	0.737
M1	16.1	23.8	0.329
M2	9.7	11.7	0.402
M3	9.2	9.3	0.482
M4	16.4	12.1	0.659
F1	6.3	7.8	0.395
F2	8.2	8.5	0.471
F3	2.5	2.8	0.434
F4	20.5	16.5	0.606

Table 10. Decomposition of the A-inequality in the distribution of hours of work among households living in Lima with respect to childrens, males and females hours of work in wage work, selfemployment and unpaid family work, respectively

Hours of work component	Fraction of overall inequality (per cent)	Fraction of total hours of work (per cent)	Interaction coefficient
C1	0.6	0.4	0.735
C2+C3	0.1	0.2	0.363
C4	1.6	1.1	0.753
M1	36.1	42.8	0.420
M2+M3	21.0	20.0	0.521
M4	3.6	2.6	0.684
F1	18.4	17.4	0.526
F2+F3	12.4	10.9	0.565
F4	6.2	4.7	0.656

Table 11. Decomposition of the A-inequality in the distribution of hours of work among households living in other urban areas with respect to childrens, males and females hours of work in wage work, selfemployment and unpaid family work, respectively

Hours of work component	Fraction of overall inequality (per cent)	Fraction of total hours of work (per cent)	Interaction coefficient
C1	0.4	0.5	0.453
C2+C3	0.1	0.1	0.284
C4	4.1	2.8	0.737
M1	23.4	30.2	0.381
M2+M3	24.9	24.3	0.504
M4	8.6	6.7	0.633
F1	7.9	9.2	0.423
F2+F3	18.5	16.3	0.557
F4	12.2	10.1	0.593

Table 12. Decomposition of the A-inequality in the distribution of hours of work among households living in rural areas with respect to childrens, males and females hours of work in wage work, non-agricultural selfemployment, agricultural selfemployment and unpaid family work, respectively

Hours of work component	Fraction of overall inequality (per cent)	Fraction of total hours of work (per cent)	Interaction coefficient
C1	0.4	0.4	0.403
C2	0.1	0.1	0.599
C3	0.1	0.1	0.621
C4	16.7	11.7	0.652
M1	8.7	12.0	0.320
M2	2.2	3.5	0.286
M3	11.9	16.4	0.331
M4	23.8	19.0	0.573
F1	2.3	2.8	0.380
F2	3.3	4.1	0.376
F3	3.0	4.9	0.281
F4	27.5	24.9	0.506

The results in Tables 9-12 can be summarized as follows:

- males wage work plays a predominant role for the households labor supply both in Lima and other urban areas with a fraction of hours of work of 42.8 per cent and 30.2 per cent, respectively

- females and males unpaid family work and males work in agricultural selfemployment contribute by 24.9 percent, 19 per cent and 16.4 per cent, respectively, of the household total market activities in rural areas

- childrens labor supply is considerably higher in rural areas than in urban areas. In rural areas childrens unpaid family work constitute almost 12 per cent of the households total hours of work

- the positive interaction coefficients demonstrate that females, males and childrens activities in each sector contribute to produce the large relative variation in households total hours of work

- the large interaction coefficients of childrens unpaid family work mean that children in households with high labor supply work considerably longer hours in unpaid family work than children in households with low or moderate labor supply

- the large interaction coefficients of females and males unpaid family work show that there is a strong correlation between females and males hours of work in unpaid family work, respectively, and the households total hours of work

- the interaction coefficients of males wage work are relatively small and lead to a lower relative contribution of males wage work to overall inequality than to total hours of work. The explanation is that males living in households with lower hours of work on average contribute more to males total hours of work in wage work than the related households contribute to total hours of work for households.

3.3. Inequality in distributions of consumption among households

This section and Section 4 deal with the measurement of economic inequality in Peru. Evidently, any study of economic inequality require decisions about:

i) the definition of income,

ii) the unit of observation,

iii) the period of time over which the chosen income variable is measured

and

iv) a summary measure of inequality.

The basic income variable used in this paper is consumption defined as follows:

$$\begin{aligned} \text{consumption} &= \Sigma \text{ wage earnings} \\ &+ \Sigma \text{ net entrepreneurial income} \\ &+ \Sigma \text{ other income.} \end{aligned}$$

Note that this definition is consistent with the one used by Dagsvik and Aaberge (1989), see also Appendix 2.

A consequence of this definition is that savings become included in consumption. Note also that consumption of home-grown food and other in-kind income is given a monetary value so that net entrepreneurial income include consumption of these items. The basic unit of observation is the household and the reference period is one year. With this concepts the "Σ" in the definition of consumption means sum over all persons who where living in the household during the year in question.

In Section 2 we discussed the basic properties that a summary measure of inequality ought to fulfil. Since the Gini-coefficient is relatively insensitive to changes in the incomes of the very poor, we argued that comparisons of inequality could alternatively be done in terms of the A-coefficient (defined by (2.3)).

In Sections 3.1 and 3.2 we examined the inequality in distributions of hours of work among persons and households, respectively. In spite of the large inequalities in distributions of hours of work we can not, however, automatically infer from them immediate implications regarding the inequalities in the corresponding distributions of household consumption. The distribution of consumption is the result of the preferred hours in combination with offered wage rates and product prices and will therefore depend on the wage rate, the returns to selfemployment activities, hours of work in wage work and in selfemployment and non-labor income and the association between these variables. For example if households with high returns to their selfemployment activities work longer hours than households with low returns to their selfemployment activities and if in addition there exists a positive association between wage rates and the households hours of work in the wage sector, then we must expect larger inequality in the distribution of consumption than in the distribution of hours of work.

Table 13 provides information about the mean, the median and the inequality in the distributions of household consumption by region. Note that the estimates given in Sections 3.3 and 4 are based on fewer observations than the estimates given in Sections 3.1 and 3.2. The reason is that we have excluded households with observed negative net entrepreneurial income from the sample when dealing with consumption distributions. The large figures of the A-coefficient in Table 13 reveal extreme inequalities in the observed distributions of consumption. The mean consumption of the richest 5 per cent of the households in Peru is for example 128 times the mean consumption of the poorest 50 per cent of the households and 1355 times the mean consumption of the poorest 10 per cent of the households.

Table 13. Mean*), median and A-inequality in distributions of consumption among households by region

	Peru	Lima	Other urban	Rural
Number of observations	4622	1287	1316	2019
Mean	42500 (10066)	40120 (2250)	71104 (32912)	25373 (8273)
Median	11433	22344	15660	4423
A-inequality	0.864 (0.033)	0.680 (0.016)	0.892 (0.049)	0.895 (0.034)

*) Intis figures are at June 1985 prices. Standard deviations are given in the parantheses.

By comparing Tables 8 and 13 we find that the inequality in the distribution of consumption is considerably higher in rural areas than in Lima even though the households hours of work were more equally distributed in rural areas than in Lima.

In addition to characterizing the regional inequalities in the distributions of consumption in Peru it is important to disentangle why inequality vary across regions. To do so, we gauge the contribution of different income sources to overall inequality by decomposing the inequality in the actual distributions of consumption with respect to females, males and childrens wage earnings, respectively, and also with respect to the households net entrepreneurial income and other income. By applying the decomposition (2.8) of the A-coefficient we obtain the results presented in Table

15. (The interpretation of the terms in Table 15 is outlined in Sections 2 and 3.1.) To give the reader an impression of the variations behind the coefficients for Peru in Table 15, we have decomposed in Table 14 the deciles of consumption for households in Peru with respect to earnings for females, males and children, and with respect to the households entrepreneurial income and other income. Since the decile specific mean wage earnings in the column for females is strongly increasing with increasing decile, the corresponding interaction coefficient takes a large positive value, in accordance with the estimate (0.842) given in Table 15. However, if the decile specific means were equal, the corresponding interaction coefficient would have been zero, or approximately zero.

Table 14. Mean consumption for households living in Peru by deciles decomposed with respect to females, males and childrens wage earnings and with respect to the households net entrepreneurial income and other income

Decile	Mean household consumption	Decile specific mean wage earnings for			Decile specific mean net entrepreneurial income	Decile specific mean of other income
		females (15-70)	males (15-70)	children (7-14)	for households	
1	397	13	40	2	324	18
2	1700	80	222	15	1296	87
3	3443	192	793	27	2268	163
4	6077	387	1984	42	3270	394
5	9478	884	3634	29	4203	718
6	13643	1367	6086	63	5244	883
7	19082	1741	8220	35	7630	1456
8	27073	3310	10902	214	10723	1924
9	41140	4718	15592	53	16970	3807
10	302982	20460	31874	326	242670	7651
All	42500	3315	7948	85	29461	1691

Note that the means in the first column are equal to the sum of the related five means in the remaining columns.

Table 15. Decomposition of the A-inequality in the distribution of consumption with respect to females, males and childrens wage earnings, respectively, and with respect to the households net entrepreneurial income and other income by region

Region (Level of inequality)	Income (consumption) factor	Fraction of overall inequality (percent)	Fraction of consumption (percent)	Interaction coefficient
PERU (0.864)	Females (15-70) wage earnings	7.6	7.8	0.842
	Males (15-70) wage earnings	16.0	18.7	0.742
	Childrens (7-14) wage earnings	0.1	0.2	0.635
	Households net entrepreneurial income	72.7	69.3	0.906
	Other income	3.6	4.0	0.767
LIMA (0.680)	Females (15-70) wage earnings	18.5	17.0	0.741
	Males (15-70) wage earnings	35.9	39.5	0.618
	Childrens (7-14) wage earnings	0	0.1	-0.076
	Households net entrepreneurial income	38.2	34.9	0.744
	Other income	7.4	8.5	0.596
OTHER URBAN (0.892)	Females (15-70) wage earnings	5.1	5.6	0.805
	Males (15-70) wage earnings	8.1	11.5	0.629
	Childrens (7-14) wage earnings	0.1	0.1	0.741
	Households net entrepreneurial income	84.8	80.2	0.943
	Other income	1.9	2.6	0.665
RURAL (0.895)	Females (15-70) wage earnings	2.2	2.4	0.829
	Males (15-70) wage earnings	9.7	10.9	0.795
	Childrens (7-14) wage earnings	0.3	0.4	0.774
	Households net entrepreneurial income ...	85.7	84.1	0.911
	Other income	2.1	2.2	0.866

The predominant contribution to households consumption played by males wage earnings in Lima reflects the predominant contribution to households hours of work played by males wage work (see Tables 10 and 15). Males wage earnings contribute by almost 40 per cent of the household consumption which is very close to the contribution of males wage work hours to households total hours of work. For females, the corresponding fractions are both about 17 per cent. However, despite that this particular structure in the distribution of hours of work among households is maintained in the distribution of consumption among households, consumption is considerably more unequal distributed than hours of work. The explanation is that the interaction coefficients referring to the consumption distribution for Lima, given in Table 15, are considerably larger than the corresponding interaction coefficients related to the distribution of hours of work, given in Table 10. This is due to skew distributed wage rates and a positive association between wage rates and hours of work. By applying a particular non-linear decomposition method (not reported here) we also found that the wage rate has a stronger disequalizing effect on the distribution of household consumption than hours of work in the wage sector. These effects are stronger for females than for males. Note that the interaction coefficient for childrens wage earnings in Lima is weakly negative, which means that childrens wage earnings have a modest equalizing effect on the distribution of consumption among households. This effect is in contrast to the effect of childrens wage work on the inequality of the distribution of hours of work. Altogether, the childrens contribution to overall inequality are in both cases of less importance as shown in the first column of Tables 10 and 15.

In contrast to the results for Lima, wage earnings in other urban areas show a modest contribution to the households total consumption compared to the contribution of households hours in wage work to the households total hours of work. The fractions are 17.1 per cent and 39.9 per cent, respectively. For the same reason as for Lima the interaction coefficients related to the distribution of consumption are considerably larger than the corresponding interaction coefficients for the distribution of hours of work. Similar results hold for the rural areas.

4. INEQUALITY IN DISTRIBUTIONS OF PER CAPITA HOUSEHOLD CONSUMPTION

The descriptive analysis of Sections 3.1-3.3 provides essential information about labor supply and distributions of income, but it must be interpreted with caution when used as basis for an analysis of welfare. This is mainly due to the large variations in household size. To allow for the fact that for some households the total consumption (income) may be shared by several persons while for others it may be enjoyed by just one or a few persons, we need an alternative to household consumption as an indicator of welfare. Clearly, an index of welfare constructed using the information on household size and composition is required. In the PLSS data an equivalence scale is constructed which accounts for the heterogeneity in demographic composition of the households. Specifically, the costs for children are specified in terms of fractions of one adult. The weights given are 0.2 for children less than 7 years old, 0.3 for children between 7 and 12 years old, 0.5 for children between 13 and 17 and 1 for persons above 17. The sum of these weights for each household is used as the scale. Consumption per capita is defined as household consumption relative to the equivalence scale and it is used as an indicator of household welfare. Note that these weights are consistent with similar weights estimated for Sri Lanka and Indonesia by Deaton and Mullbauer (1986) and have previously been applied by Glewwe (1987) in a descriptive analysis of the distribution of welfare in Peru in 1985-86. Glewwe's analysis is based on expenditure data and not on income data, as we do here.

Lack of sufficient data makes it impossible to distinguish consumption levels among members of the household. Therefore, we have to assume that the welfare level of an individual is equal to per capita household consumption of the household within which he/she actually lives. Comparisons will be made both between persons and between households, since it is of particular interest to examine the relationship between the per capita household consumption distribution among households and the per capita household consumption distribution among persons.

Table 16 displays average welfare levels for females, males and children living in Lima, other urban areas and rural areas, respectively. The reported figures demonstrate considerable differences in average levels of welfare between adults and children and between individuals living in urban and rural areas. The large differences between corresponding medians and means indicate extremely skew distributions, which is fully confirmed by the estimates of the A-coefficient reported in Table 17.

Table 16. Mean*) and median per capita household consumption among persons by sex, age and region

Population	Peru		Lima		Other urban areas		Rural areas	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All	11692	3332	10668	5983	19139	4190	7454	1404
	(24126)		(6541)		(6952)		(10633)	
Females ... (above 15 years old)	13282	3508	10406	6036	25154	4143	6654	1332
	(7376)		(2256)		(2185)		(2935)	
Males ...... (above 15 years old)	12207	3820	11529	6418	20013	4425	7097	1516
	(7004)		(2090)		(2054)		(2860)	
Children .... (below 15 years old)	10118	2965	10118	5404	13630	3945	8150	1380
	(9746)		(2195)		(2713)		(4838)	

*) Intis figures are at June 1985 prices. Number of observations are given in the parantheses.

Table 17. A-inequality in distributions of per capita household consumption among households and persons, respectively, by region

Among \ Region	Peru	Lima	Other urban	Rural
Households	.857	.676	.881	.895
	(.029)	(.017)	(.048)	(.032)
Persons	.856	.662	.883	.888
	(.014)	(.008)	(.021)	(.016)

As can be seen in Table 17, there is only insignificant differences in inequality between corresponding distributions of per capita household consumption among households and persons, respectively. This result is in accordance with the results for various less developed countries reported in Berry (1988). More surprisingly is the fact that the inequality in different distributions of per capita household consumption among households differs little from inequality in the corresponding distributions of household consumption among households, see Tables 13 and 17. This result is mainly due to an extremely unequal distribution of consumption (income) in Peru in 1985-86. As reported by Glewwe (1987) this was also the case in

1966 when the per capita income inequality among persons was measured equal to 0.666 by the Gini-coefficient. Our estimate for the Gini-coefficient of the distribution of per capita household consumption among persons in Peru in 1985-86 is 0.789, see Appendix 1.

5. POLICY SIMULATION RESULTS FOR LIMA

The estimated econometric model reported in Dagsvik and Aaberge (1989) allows us to perform rather complex simulation experiments where we take into account observed heterogeneity that stem from age, schooling, household size and composition. In addition, we account for unobserved heterogeneity that in the model is represented by random error terms associated with the wage, the conditional profit and the utility function. After the model has been estimated it is possible to perform simulations since we then "know" the parameters of the structural part of the utility, the wage and the profit function, and the probability distributions of the related random terms. For more details we refer to Dagsvik and Aaberge (1989).

In this section we confine the analysis to households with at least one female and one male adult where the households consumption per capita does not exceed 20 000 Intis. Recall that this selection has not been made in Sections 3 and 4. Therefore it does not make sense to make direct comparisons between tables in Sections 3 and 4 and tables in Section 5.

The simulation experiments that are undertaken here relate to the effect from changes in wage rates and education on labor supply, wage earnings, profit from selfemployment, consumption and on the distribution of economic welfare. The effect from changes in wage rates and in education on the mean levels of hours of work, wage earnings and consumption are reported in Dagsvik and Aaberge (1989), but for the sake of completeness we have included the results here as well.

5.1. Wage effects

In Table 18 we report the effect of wage changes on participation probabilities and on mean hours worked in each sector. The table shows that a 20 per cent wage increase has only a small effect on labor supply. A 20 per cent wage increase for the females implies that their mean hours of work and participation rate in the wage sector increase by 5.8 and 3.2 per cent, respectively. The effect on females mean hours and participation rate in selfemployment is almost negligible. Also the cross effect on males participation rates and mean hours of work in each sector is negligible.

Recall that the sum of the participation rates across sectors may be greater than one because many individuals work in both sectors. When the males wage rates are increased by 20 per cent, participation and mean hours of work for males in the wage sector increase by 1.6 and 2.7 per cent, respectively.

For the selfemployment sector, male participation and mean hours of work decrease by 1.2 and 2 per cent, respectively. Female participation and mean hours of work are reduced by 1.9 and 2.2 per cent in the selfemployment sectors. The reason why female labor supply decreases is due to the income effect that stem from the increase in male wage earnings. When both male and female wage rates are increased by 20 per cent, the impact is similar but weaker.

The largest effect is obtained when the females wage rates are increased by 20 per cent of the mean wage rate. Then participation and mean hours in wage work increase by 3.8 and 8.0 per cent, respectively. By using the results of Table 12 we obtain that the mean hours, given participation in the wage work sector, increases by 4.0 per cent. However, the decrease in participation and mean hours in the selfemployment sector is small. So is also the change in male labor supply from this policy measure.

When males wage rates are increased by 20 per cent of the mean wage rate then males participation and hours of work in the wage sector increase by 2.1 and 3.8 per cent, respectively. In the selfemployment sector male participation and mean hours decrease by 2.3 and 3.5 per cent. The corresponding income effect implies that female participation and mean hours in the wage sector decrease by 2.9 and 3.6 per cent, respectively, while there is almost no change in female participation and mean hours in the selfemployment sector.

Table 18. Changes in participation rates, annual hours of work, wage earnings and consumption as a result of wage increments. Percentage changes from base case

	Sectorspecific participation rates				Sectorspecific annual hours of work (unconditional)				Wage earnings (unconditional)		Wage earnings	Consumption
	Wage work		Selfemployment		Wage work		Selfemployment					
	F	M	F	M	F	M	F	M	F	M	Households	
Base case	0.32	0.62	0.34	0.35	414	1165	414	492	2300	8100	17900	27800
20 per cent increase in females wages	3.2	-0.6	-0.9	-1.2	5.8	-0.7	-0.5	-0.4	30.0	-1.2	6.3	5.0
20 per cent increase in males wages	-1.9	1.6	-2.0	-1.2	-2.2	2.7	-2.4	-2.0	-4.6	22.3	17.1	11.9
20 per cent increase in both females and males wages	0.6	0.6	-1.8	-1.4	1.9	1.9	-1.5	-2.4	19.8	20.5	21.2	11.5
Female wage rates increased by 20 per cent of the mean wage	3.8	-1.4	-0.9	0	8.0	-1.4	-1.5	0	25.0	-0.8	5.0	4.7
Male wage rates increased by 20 per cent of the mean wage	-2.9	2.1	-0.9	-2.3	-3.6	3.8	-0.5	-3.5	-4.5	17.6	14.0	7.0
Female and male wage rates increased by 20 per cent of the mean wage	1.6	1.0	-2.3	-2.9	3.4	2.0	-2.7	-4.3	19.7	15.1	16.2	8.6

Table 19. Changes in mean level and inequality in the distribution of consumption per capita among households as a result of wage increments. Percentage changes from base case

	Mean level	A-coefficient	Gini-coefficient
Base case	7600	0.566	0.438
20 per cent increase in females wages	5.3	2.1	3.2
20 per cent increase in males wages	11.9	0.6	0,7
20 per cent increase in both females and males wages	11.6	-1.3	-1.6
Female wage rates increased by 20 per cent of the mean wage	4.9	0	0.7
Male wage rates increased by 20 per cent of the mean wage	6.4	-3.0	-3.4
Female and male wage rates increased by 20 per cent of the mean wage	8.6	-3.0	-3.4

Table 19 demonstrates that percentage wage increments have a modest effect on the inequality in the distribution of consumption per capita among households. For 20 per cent relative wage changes the distributional impact is very small while inequality is reduced by 3 per cent (A-coefficient) when the males wage rates are increased by 20 per cent of the mean wage rate. This reduction in inequality corresponds to introducing a proportional tax of 3 per cent and then increase each households per capita consumption by an equal share of the total tax revenue. In other words, the transfer to each household is equal to 3 per cent of the mean consumption per capita (before taxation). A similar increase of the females wage rates increases the mean level of the households per capita consumption by 4.9 per cent, while the level of inequality is not influenced. This result corresponds to increasing each households per capita consumption by 4.9 per cent. Note that the relative changes in equality are larger when inequality is measured by the Gini-coefficient than by the A-coefficient, particular in the case where the female wage rates are increased by 20 per cent. This means that the central part of the distribution of per capita consumption is more strongly influenced by the wage rate changes than the lower part of the distribution.

In order to evaluate the impact of behavioral labor market adjustments when wage rates are changed, we have decomposed the total effects reported in Table 19 into a direct and an indirect effect. The results are displayed in Table 20. Recall that the indirect effect measures the contribution from behavioral responses.

Table 20. Direct and indirect effects on the mean level and on the inequality in the distribution of per capita consumption by wage increments. Percentage changes from base case

	Mean		A-coefficient		G-coefficient	
	Direct effect	Indirect effect	Direct effect	Indirect effect	Direct effect	Indirect effect
20 per cent increase in female wage rates	5.3	0	0.7	1.4	1.4	1.8
20 per cent increase in male wage rates	11.8	0.1	0.7	-0.1	1.1	-0.4
20 per cent increase in both female and male wage rates	15.8	-4.2	0.5	-1.8	0.9	-2.7
Female wage rates increased by 20 per cent of the mean wage rate	5.3	-0.4	-0.5	0.5	-0.2	0.9
Male wage rates increased by 20 per cent of the mean wage rate	10.5	-4.1	-2.5	-0.5	-3.0	-0.4
Both male and female wage rates increased by 20 per cent of the mean wage rate	14.5	-5.9	-3.9	0.9	-4.6	1.2

According to the results in Table 20 the direct and indirect effects have in most cases different signs, which means that the direct effects of the wage increments are counteracted by changes in labor market behavior. When the females wage rates are increased changes in labor market behavior increase the inequality in the distribution of per capita consumption, while the indirect effect of increases in male wage rates have a positive redistributive effect.

Note that we only report aggregate effects here. In Dagsvik and Aaberge (1989) we have carried out wage change simulations for a two-person family for the particular case in which all the random terms are equal to zero and without any choice constraints. These simulations demonstrate that the elasticities of hours are highly dependent on wage rate levels. The reason why the corresponding aggregate effects are much smaller is the large heterogeneity in preferences and in wage rates and the fact that in many families one or several persons are "stuck" in corner solutions i.e., they participate at most in one sector. Such families are therefore less responsive to wage changes compared to families where all members work in both sectors. In addition, as we shall see below, the restrictions on choice opportunities are very important for the occurence of a large number of corner solutions.

5.2. Education effects

In Table 21 we report the impact of schooling through the opportunity probabilities. Here the wage rates and the education variable (Maxed, the length of schooling of the most educated family member) in the conditional profit function are kept unchanged. Thus we study the pure "opportunity" effect. Contrary to the wage simulations above we obtain a large effect from increased education. If female education is increased by one year, female participation increases by 9.2 per cent in the wage sector. The change in the participation rate for the selfemployment sector is however within the simulation error margin. If male education is increased by one year participation in wage work increases by 3.4 per cent and remains unchanged for the selfemployment sector. If the minimum education for females is increased to 9 years, female participation increases by 19 per cent. When the males level of schooling is increased analogously male participation in the wage sector increases by 3.9 per cent. The cross effects appear to be negligible.

Table 21. Changes in sectorspecific participation rates as a result of additional schooling when the wage rates are kept fixed. Percentage changes from base case

	Sectorspecific participation rates			
	Wage work		Selfemployment	
	F	M	F	M
Base case	0.32	0.62	0.34	0.35
One year of additional schooling for females	9.2	-1.4	0	0
One year of additional schooling for males	-1.3	3.4	0	-0.6
One year of additional schooling for both females and males	7.6	2.4	0	-0.9
Nine years of schooling as a lower limit for females	19.0	-1.0	0	-0.3
Nine years of schooling as a lower limit for males	-1.3	3.9	0	-0.9
Nine years of schooling as a lower limit for both females and males	18.0	3.5	0	-1.2

In Table 22 we also report the impact on labor supply from increased education. Here only Maxed is kept unchanged. In other words, the increase in schooling has an effect both through increased wage levels as well as through expanded choice sets of wage work positions. The first line demonstrates that the wage effect seems to be small compared to the impact through the opportunity probabilities. In Table 21 we found that the corresponding female participation rate increased by 19 per cent which is only 2.5 percentage points less than what we obtained by increasing minimum level of schooling up to nine years for the females without keeping the wage rate fixed. The subsequent effect on mean hours of work in the wage sector is a 25.6 per cent increase for the females and a 2.7 per cent decrease for the males. The corresponding increase in the conditional mean hours given participation in the wage work sector for females is 3.3 per cent. The other income and cross effects on hours are small. The mean wage earnings for females increases dramatically, up to 42.6 per cent.

Table 22. Changes in participation rates, annual hours of work, earnings and consumption as a result of additional schooling and subsequent increase in wage rates. Percentage changes from base case

	Sectorspecific participation rates				Sectorspecific annual hours of work (unconditional)				Wage earnings (unconditional)		Wage earnings	Consumption
	Wage work		Selfemployment		Wage work		Selfemployment					
	F	M	F	M	F	M	F	M	F	M	Households	
Base case	0.32	0.62	0.34	0.35	414	1165	414	492	2300	8100	17900	27800
Nine years of schooling as lower limit for females	21.5	-1.8	1.2	-0.6	25.6	-2.7	-1.5	0	42.6	-2.0	8.4	6.5
Nine years of schooling as lower limit for males	-3.5	5.6	0	-1.7	-4.4	6.7	0	-3.5	-5.0	14.8	11.2	7.6
Nine years of schooling as lower limit for both females and males	19.0	3.7	0.9	-1.4	20.5	3.0	-1.2	-2.4	33.9	11.1	17.3	11.2

If the minimum level of schooling for males is increased up to 9 years the impact on labor supply is much less. In this case participation in the wage work sector increases by 5.6 per cent for males and reduces by 3.5 per cent for females. Mean hours of work in the wage work sector increases by 6.7 per cent for the males and reduces by 4.4 per cent for the females. Other income and cross effects on labor supply are small. Concerning wage earnings, they increase in this case by 14.8 per cent for males and decrease by 5.0 per cent for females. However, the total effect on household income is larger in this case than in the former case where minimum education for females was 9 years.

The last line reports the effect from letting both males and females have minimum education equal to 9 years. The results show that female participation and mean hours in wage work increase by almost the same amount as in the "marginal" case reported in the first line. Male participation and mean hours in the wage work sector increase by 3.7 and 3 per cent, respectively, which is much less than the response in the "marginal" case of the second line.

Table 23. Changes in mean level and inequality in the distribution of consumption per capita among households as a result of additional schooling and subsequent increase in wage rates. Percentage changes from base case.

	Mean level	A-coefficient	Gini-coefficient
Base case	7600	0.566	0.438
Nine years of schooling as lower limit for females	5.3	0	0
Nine years of schooling as lower limit for males	6.6	-1.8	-1.8
Nine years of schooling as lower limit for both females and males	10.5	-3.0	-3.2

In Section 5.1 we concluded that the impact from wage changes on the inequality in the distribution of households per capita consumption are modest. Table 23 demonstrates that this is also the case when schooling is increased. In spite of a considerable increase in mean per capita consumption, the reduction of inequality in the distribution of per capita consumption is surprisingly small. One reason for this result may be the large heterogeneity in wage rates and selfemployment opportunities. Since the changes in inequality are the same whether it is measured by the Gini-coefficient or the A-coefficient, we can conclude that changes in schooling have the same impact on the lower part of the distribution of per capita consumption as on the central part of this distribution.

6. CONCLUSION

The present chapter consists of both a descriptive and a structural analysis. The descriptive part discusses labor market participation and income inequality in Lima, other urban areas and rural areas, respectively. This part also discusses decomposition of income inequality with respect to entrepreneurial and wage earnings of household members (females, males and children). The main results are that males wage earnings play a predominant role of households consumption in Lima, while entrepreneurial income is the dominating income source in both other urban areas and in rural areas. In Lima males wage work earnings contribute by almost 40 per cent of household consumption which seems to be a reflection of the males contribution of hours of wage work to households total hours of work. For females the corresponding fractions are both about 17 per cent. The same relationship also holds for rural areas. However, despite this similarity between the distribution of hours of work and the distribution of consumption among households, consumption is considerably more unequally distributed than hours of work. This is also the case when we examine inequality in the distribution of welfare. As indicator of welfare we apply household consumption relative to an equivalence scale. This indicator accounts for some of the heterogeneity in demographic composition of the households.

The structural part departs from the assumption that the members of a household behave so as to maximize a household utility function given the available resources, work and production opportunities. The corresponding econometric model is developed by Dagsvik and Aaberge (1989). It has been estimated for Lima and rural areas. However, we only report policy simulation results for Lima.

The simulation results for Lima demonstrate that proportional wage changes have only a small effect on behavior (indirect effect). It is also remarkable that the direct effect through wage earnings affect the inequality in the distribution of per capita consumption very little. Even when the wage rates are increased by the same amount the indirect effect is small. In this case, however, the inequality in the distribution of per capita consumption is moderately reduced.

These simulation exercises demonstrate that it is a very demanding task to obtain a reduction of the inequality in the distribution of per capita consumption by means of policy measures related to schooling and wage rates.

APPENDIX 1

Estimates of inequality based on the Gini coefficient

In the tables below we have used a numbering which will facilitate comparisons with the corresponding tables for the A-coefficient. Table G3 corresponds to table 3, table G8 corresponds to table 8 and table G17 to table 17.

Table G3. Gini-inequality in distributions of hours of work for employed children, males and married and unmarried females by region

Population / Region	Children (7-14)	Males (15-70)	Females (15-70) All	Married	Unmarried
Peru	.448	.249	.362	.364	.359
Lima	.557	.251	.404	.426	.379
Other urban	.627	.275	.404	.415	.387
Rural	.424	.231	.318	.312	.328

Table G8. Gini-inequality*) in distributions of hours of work among households by region

Peru	Lima	Other urban	Rural
0.344 (0.003)	0.349 (0.007)	0.351 (0.007)	0.320 (0.005)

*) Standard deviation in paranthesis.

Table G17. Gini-inequality in distributions of per capita household consumption among households and persons, respectively, by region

Among \ Region	Peru	Lima	Other urban	Rural
Households	.787 (.043)	.567 (.021)	.830 (.068)	.843 (.048)
Persons	.789 (.020)	.553 (.010)	.835 (.030)	.835 (.023)

APPENDIX 2

Definitions of main variables

The Peruvian Living Standards Survey records information on the two most important jobs held by each individual in the last 7 days and in the last 12 months prior to the survey, respectively. Accordingly, this survey provides information about cases where the individual held one main job in the last 7 days and another main job in the last 12 months and similar information for second jobs. Therefore annual hours of work and wage earnings is defined by (A.1) and (A.2).

Table 1A. Measures of annual hours of work and wage earnings

	Last 7 days			Last 12 months		
	Weekly hours of work	Weekly wage earnings	Number of weeks	Weekly hours of work	Weekly wage earnings	Number of weeks
Main job	h_1	k_1	r_1	h_2	k_2	r_2
Second job	h_3	k_3	r_3	h_4	k_4	r_4

(A.1) Annual hours of work $= \sum_{i=1}^{4} r_i h_i$

and

(A.2) annual wage earnings $= \sum_{i=1}^{4} r_i k_i$.

As an illustration we give examples of three possible outcomes of h_1, h_2, r_1 and r_2 in table 2A.

Table 2A. Three examples of observations of main job activities in the course of 12 months

Outcome	Last 7 days		Last 12 months	
	Weekly hours of work	Number of weeks	Weekly hours of work	Number of weeks
1	40	50	0	0
2	0	0	40	50
3	40	28	30	24

Based on the measurements of wage earnings and annual hours of work wage rate is given by

$$\text{wage rate} = \frac{\text{Annual earnings}}{\text{Annual hours of work in wage sector}} .$$

Table 3A gives details of how profits from farm and non-farm production are measured.

Table 3A. Measure of profits from farm and non-farm production

	FARM	NON-FARM
Revenue	TOTREV	REVCONS
Expenses	EXPFARM = (TOTINP+ TOTLIVST)	EXPENSES = (TOTAL MTHLY EXPENSES*NO. MTHS ENTERPRISE OPER IN LAST YEAR)
Value added	PROFARM = TOTREV - EXPFARM	PROFITS = REVCONS - EXPENSES

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