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DISCUSSION PAPER

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SEARCHING FOR THE DETERMINANTS OF THE LEVEL OF SOCIAL WELFARE IN LATIN AMERICA

Ricardo Barros
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Brasília, January 2015

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Ricardo Barros
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Federal Government of Brazil

Secretariat of Strategic Affairs of the Presidency of the Republic
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DISCUSSION PAPER

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SUMMARY

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REFERENCES

SEARCHING FOR THE DETERMINANTS OF THE LEVEL OF SOCIAL WELFARE IN LATIN AMERICA*

Ricardo Barros **
José Márcio Camargo ***

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** IPEA /Brazil and Yale University.

*** PUC-RJ/Brazil.

1. INTRODUCTION

In this paper we investigate the proximate determinants of the aggregated level of social welfare in Latin America. We seek both to identify the main factors that cause the level of welfare to be smaller in the region when compared to the industrial economies as well as the factors that cause the level of welfare to vary across countries within the region.

The study has two important limitations that should be made explicit at the outset. First, throughout the analysis it will be assumed that the level of welfare is completely determined by the distribution of per capita income among families, i.e., the society level of welfare becomes completely determined once the per capita income of each family in the society has been specified; no additional information is required. In other words, we abstract completely from the independent impact of the distribution of other resources, such as public services and health, on the level of welfare.

Secondly, we consider only the determinants of labor income. So, the results are more appropriate to describe the situation in urban areas than in rural areas. Moreover, it can not treat the specific welfare problems of the older segment of the population, such as the impact of alternative social security systems. The emphasis of the study is on the impact of demographic composition and labor market functioning (the quality of the labor force and the quantity and quality of jobs available) on the level of welfare.

To investigate the proximate determinants of the aggregate level of social welfare, we begin by writing, at the micro level, the per capita income of a family as the product of a series of six **factors**. The six factors are: (i) the dependency ratio, (ii) the proportion of adults in the family that are fully employed, (iii) the bargaining power of these workers in the labor market, (iv) the quality of the jobs they hold, (v) the potential quality of the labor services they can provide, and (vi) the extent to which this potential quality is actually provided.

Since the welfare of the society is a function of the **distribution** of income among families, it can be written as a function of the **joint-distribution** of the **factors** determining the level of per capita family income at the micro level. It is worth emphasizing that this entails that the society level of welfare depends not only on the average level of these factors, but also on how unequal they are distributed, as well as on

their correlation pattern. For instance, holding the average quality constant, greater variability in the quality of machines and workers tends to reduce welfare with this reduction being the greatest when the best workers are assigned to the best machines.

This paper is organized as follows: in the next two sections, we develop a framework to relate the aggregate level of welfare to the joint distribution of the factors affecting the level of per capita (adult-equivalent) family income. In Sections 4 to 8 we use this framework to investigate the impact of six major proximate determinants of the aggregate level of welfare. In each section we gather some preliminary empirical evidence for or against the importance of each factor in determining the level of welfare in the Latin American context. Finally, in Section 9 we summarize our main findings and discuss some policy implications.

2. SOCIAL WELFARE, INCOME LEVEL, AND INCOME INEQUALITY

Consider a society with n members $\{1,\ldots,n\}$ and denote by y_i the income of member i. The welfare level of this society, w, will be given by

$$w = W(y_1,\ldots,y_n)$$

where W is the society welfare function. We are going to assume that the principles of anonymity, absence of envy and preference for equity are satisfied [see Shorrocks (1983) for a detailed analysis of these principles]. Under these principles the level of welfare can be written as an increasing function of (a) the average level of income and (b) the degree of equality in the distribution of income, i.e.,

$$w = f(\mu, L)$$

where μ denotes the average level of income and L the Lorenz curve.[1] Since the degree of inequality declines as the Lorenz curve shifts up, the fact that f is

[1]As a matter of fact, Shorrocks (1983) demonstrates that when these three principles are satisfied the level of welfare is an increasing function of the product μF, i.e., there exists an increasing function g such that $w=g(\mu F)$. The product μF is known as the generalized Lorenz curve.

increasing in L indicates that the level of welfare declines as the level of inequality increases.

An important class of welfare functions is the Atkinson family. A typical member of the Atkinson family is given by

$$w = \left(\sum_{i=1}^{n} (y_i)^{\epsilon} \right)^{1/\epsilon}$$

for any $\epsilon<1$ but $\epsilon \neq 0$. When $\epsilon \to 0$ the level of welfare converges to

$$w = \sum_{i=1}^{n} \ln(y_i)$$

It can be shown that the preference for equity gets stronger as ϵ gets smaller. In fact, in the limit when $\epsilon=1$,

$$w = \sum_{i=1}^{n} y_i = n.\mu$$

indicating that the preference for equality disappears at this limit.

3. PROXIMATE DETERMINANTS

In the previous section we briefly review how the level of welfare relates to (a) the average level of income and (b) the degree of income inequality. We show that the level of welfare is (a) an increasing function of the average income level and (b) a decreasing function of the degree of income inequality. In this section we investigate how the level of welfare relates to characteristics of the joint-distribution of the proximate determinants of the level per capita income at the micro level.

We say that a set of factors $\{k_1, \ldots, k_n)$ are the proximate determinants of the level of income, y, when they are linked by the identity

$$y \equiv \prod_{i=1}^{m} k_i$$

Several examples of identities of this type are presented in the subsequent sections.

Since the level of welfare is completely determined by the distribution of income and the distribution of income is completely determined by the joint-distribution of the factors $\{k_1,\ldots,k_n\}$, it follows that the level of welfare is completely determined by the joint-distribution of the factors $\{k_1,\ldots,k_n\}$. In this section we aim to specify more precisely how the level of welfare depends on (a) the average level of each factor k_i, (b) the degree of inequality in the distribution of each of these factors, and (c) the coefficient of correlation among them.

Average level of factors: Without great loss of generality and to simplify the presentation we concentrate on the case in which there are only two proximate determinants. In this case, the average outcome can be written as

$$\mu = \mu_1 \cdot \mu_2 \cdot (1 + \rho \cdot v_1 \cdot v_2) \qquad (1)$$

where μ_i and v_i denote, respectively, the average and the coefficient of variation of factor k_i, i=1,2 and ρ is the coefficient of correlation between them. From this expression, it follows that higher average values for each of the factors lead to higher average income. Since proportional changes in the factors (which would affect the average value but not the inequality in the distribution) would have no effect on the degree of income inequality, we have established that the level of welfare is an increasing function of the average level of each factor, holding constant their degree of inequality and the degree of correlation among them.

Inequality: The impact of increments, on the level of welfare, in the degree of inequality in the distribution of each factor k_i, i=1,2, is ambiguous. This impact is particularly sensitive to the sign of the correlation between the two factors.

On the one hand, when the two factors are positive correlated ($\rho > 0$) an increase in the degree of inequality in the distribution of one of the factors will increase the average income level (see the expression (1) above) but will also increase the degree of income inequality. Therefore, the final impact on welfare will depend on how strong is the society preference for equity. For example, it can be shown that if the society has a welfare function in the Atkinson family with $\epsilon \leq 0$, increments in the inequality in the distribution of one of the factors would decrease welfare as long as $\rho > 0$. In fact, in the limit as $\epsilon \to 0$

$$w = \ln(\mu_1) + \ln(\mu_2) - L_1 - L_2$$

where L_1 and L_2 are the second Theil measure of inequality.[2] This expression indicates that increments in the inequality in a factor reduce the level of welfare for any value of the correlation. Since the preference for equity gets stronger as ϵ gets smaller, it follows that at least for all $\epsilon<0$ the level of welfare is a decreasing function of the degree of inequality in the distribution of each factor.

On the other hand, when the correlation is negative, increments in the degree of inequality in the distribution of a factor will cause the average level of income to decline, but may also diminish the degree of income inequality. Hence, the result can be an increase in welfare for societies with sufficiently strong taste for equality.

The following example should help to clarify these possibilities: Suppose that the two factors are the quality of the machines and the quality of the workers; just to be concrete. Let us assume that wages are given by the product of the quality of the worker by the quality of the machine that has been assigned to him. There are two workers of quality levels 1 and 10 respectively. The machines initially have quality levels 2 and 3. The objective is to determine the impact on the level of welfare of increasing the inequality in the machine quality such that after the transformation the quality of the machines becomes 1 and 4 respectively. Note that the average quality is still the same, 2.5.

Consider first the case in which the correlation is positive, so that the best worker is assigned to the best machine. In this case, the wages will initially be 30=3x10 and 2=2x1. After the transformation the wages become 40=4x10 and 1=1x1. As a result, the average income and the degree of inequality increased leading the impact on welfare to depend on the society taste for equality. If $\epsilon=1/2$, w=47.5 initially and w=53.6 after the transformation, indicating that the society gave relatively greater weight to the increase in average income than to the increase in income inequality. If $\epsilon=-1$, w=1.9 initially and w=1.0 after the transformation, indicating that in this case the society gave greater weight to the increase in income inequality.

[2] $L(y_1,\ldots,y_n) = \ln\left(\frac{1}{n}\sum_{i=1}^{n} y_i\right) - \frac{1}{n}\sum_{i=1}^{n} \ln y_i$.

Next, consider the case in which the correlation is negative so that the best worker is assigned to the worst machine. In this case the wages will initially be 20=2x10 and 3=3x1. After the transformation the wages become 10=1x10 and 4=4x1. Hence, the average income and the degree of inequality both declined. The impact on welfare will again depend on the taste for equality. If $\epsilon=1/2$, $w=38.5$ initially and $w=26.6$ after the transformation, indicating that the society gave greater weight to the decline in average income than to the decline in income inequality. If $\epsilon=-1$, $w=2.6$ initially and $w=2.9$ after the transformation, indicating that in this case the society gave greater weight to the decline in income inequality.

In summary, the impact on the level of welfare of increments in the degree of inequality in the distribution of a given factor is ambiguous. The level of welfare may increase or decrease depending on the nature of correlation between the factors and the strength of the preference of the society for equity.

The factors we investigate in this paper are in general positively correlated. This fact associated to the hypothesis that the society has a strong enough preference for equity ($\epsilon<0$ if we are in the Atkinson family) imply that greater inequality in either factor leads to lower welfare. We maintain this hypothesis implicitly throughout the subsequent sections. Hence, welfare will always be thought as a decreasing function of the degree of inequality in each of the factors determining the level of income at the micro level.

Correlation: The impact of the degree of correlation on the level of welfare is also ambiguous. On the one hand, a higher degree of correlation between factors leads to greater average income. This is a consequence of factors being complements in the production of income. In such cases, matching the best (worst) of factor 1 with the best (worst) of factor 2 will maximize total income. On the other hand, a higher degree of correlation between the two factors also leads to greater inequality in income. So, the total impact on the level of welfare will depend on the strength of the society preference for equity.

To illustrate this ambiguity, let us reconsider our numerical example. As before, there are two workers of quality 1 and 10 and two machines of quality 2 and 3, respectively. On the one hand, if the correlation is positive, the best (worst) machine will be allocated to the best (worst) worker and the wages will be 2 and 30, respectively. On the other hand, if the correlation is negative, the best (worst) machine will be allocated to

the worst (best) worker and the wages will be 3 and 20. Therefore, the average income and the degree of income inequality will both be greater in the case of positive correlation. Hence, whether or not greater correlation leads to a greater level of welfare will depend on the strength of the society preference for equity. If $\epsilon=1/2$, $w=47.5$ when the correlation is positive and $w=38.5$ when the correlation is negative, indicating that, in this case, the society gave greater weight to the higher average income than to the lower degree of income inequality. If $\epsilon=-1$, $w=1.9$ when the correlation is positive and $w=2.6$ when the correlation is negative, indicating that in this case the society gave greater weight to the lower degree of income inequality.

More generically, it can be shown, for the Atkinson family of welfare functions, that increments in the degree of correlation decrease welfare if $\epsilon<0$ and increase welfare if $\epsilon>0$. If $\epsilon \to 0$, then the level of welfare is not influenced by the degree of correlation, since as we have shown above, in this case

$$w = \ln(\mu_1) + \ln(\mu_2) - L_1 - L_2$$

In summary, increments in the degree of correlation increase the average level of income but also increase the degree of income inequality, with the final result on welfare depending on the preferences of the society. In this study we assume that the society preference for equity is strong enough so that the negative impact of a greater correlation on the degree of income equality dominates its positive impact on the level of income. Hence, we assume that greater correlation among factors tends to decrease welfare. In the realm of the Atkinson family this assumption is equivalent to assume that $\epsilon<0$.

Summary: Overall we conclude that, as long as the factors determining the level of income are positive correlated and the preference of the society for equity is strong enough, the level of welfare will be (a) increasing with the average level of each factor, (b) decreasing with the degree of inequality associated to each factor, and (c) decreasing with the degree of correlation between factors. Throughout the following sections we implicitly assume that the relationship between the level of welfare and the joint-distribution of the factors determining income has these three properties.

4. THE DEPENDENCY RATIO

Is the low level of social welfare in Latin America the result of insufficient income or the result of large family sizes?

To investigate this question it is useful to express the per adult-equivalent family income (y) as the product of two factors: the average income per adult in the family (a) and the proportion of family members who are adults (r). To formally establish this identity, let n denote the number of persons (adult-equivalents) and m the number of adults in the family. The income levels of each of these adults are denoted by $z_1, \ldots, z_m$, respectively. To simplify, we assume that non-adult members do not receive any income. As a result,

$$y \equiv \frac{\sum_{i=1}^{m} z_i}{n} = \frac{\sum_{i=1}^{m} z_i}{m} \frac{m}{n} = a.r = \frac{a}{1+d},$$

where

$$a \equiv \frac{\sum_{i=1}^{m} z_i}{m}$$

is the average income of the adults in the family, r=m/n is the proportion of family members (in adult-equivalent) who are adults, and d=(n-m)/m is the dependency ratio. Hence, the aggregate level of welfare will depend on the joint-distribution of a and r (d). Notice that r=1/(1+d) implying that r and d are inversely related.

From the discussion in Section 3 it follows that the aggregate level of welfare will be (i) increasing with the average income per adult and the average proportion of adults among family members (decreasing with the average dependency ratio), (ii) decreasing with the degree of inequality in the distribution of both income per adult and proportion of adults (dependency ratio), and (iii) decreasing (increasing) with the degree of correlation between income per adult and proportion of adults (dependency ratio).

The connection between the level of welfare and the mean and inequality in income per adult is considered in the subsequent sections. Hence, in this section we concentrate on the role of the distribution of families according to the fraction of adults (dependency ratio)

as well as on the degree of correlation between the fraction of adults (dependency ratio) and the income per adult.

Average: The average level of the proportion of adults (dependency ratio) is still considerably higher (lower) in Latin America than in the industrial economies. Table 1 presents two pieces of information in this direction. First, the table reveals that the total fertility rate in Latin America is still of the order of 3.5, being almost twice the level observed in the industrial economies (1.9). Secondly, the table reveals that the population 15 to 64 years old in Latin America is 1.6 times the population 0 to 14 years old, this ratio being approximately one half of the respective ratio estimated for the industrial economies.

Table 1

Demographic Profile

Country	Fertility Rate	Age Structure[a]
Mexico	3.5	1.49
Guatemala	5.7	1.12
Honduras	5.5	1.13
El Salvador	4.8	1.15
Nicaragua	5.4	1.11
Costa Rica	3.2	1.64
Panama	3.1	1.65
Dominican Republic	3.7	1.50
Cuba	1.9	na
Venezuela	3.7	1.49
Colombia	3.1	1.67
Ecuador	4.2	1.37
Peru	4.0	1.46
Bolivia	6.0	1.21
Chile	2.7	2.05
Argentina	2.9	2.03
Paraguay	4.5	1.37
Uruguay	2.4	2.39
Brazil	3.4	1.68
Latin America	3.4	1.59
Industrial Economies	1.9	3.37
World	3.5	1.82

Note: [a]Ratio of the % of population age 15-64 years to the % of population age 0-14 years.

Inequality: The proportion of adults (dependency ratio) is not only lower (higher) in Latin America, but also very unequally distributed within and between countries. As far as the inequality between countries is concerned, Table 1 reveals that while the fertility rate in the Southern Cone (Uruguay, Argentina and Chile) is only 50% higher than in the industrial

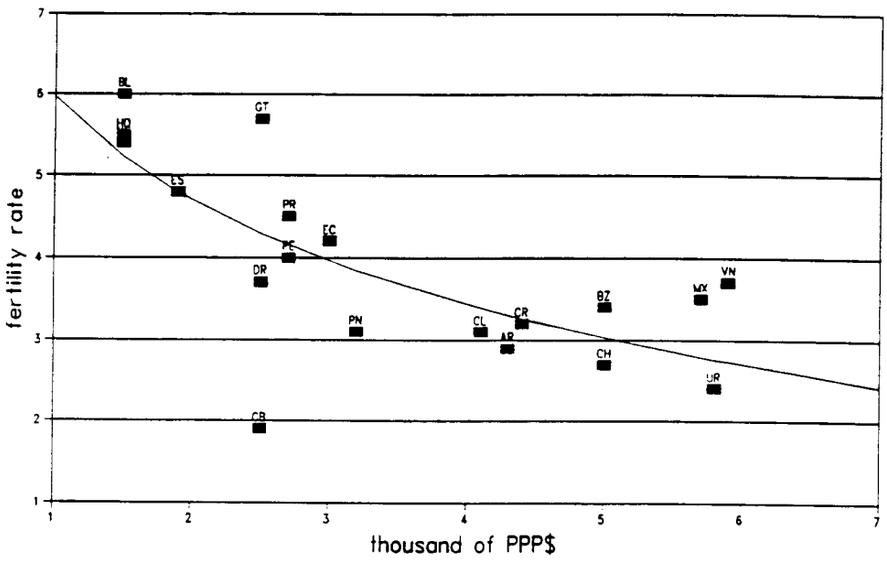
economies, in Bolivia and Central America (Costa Rica and Panama excluded) the fertility rate is more than 250% higher than in the industrial economies. For instance, the difference between Argentina and Bolivia (just to take two neighboring countries) is three times greater than the difference between Argentina and the industrial economies. The evidence in Table 1 using the age structure of the population leads to similar results.

As far as the inequality in the proportion of adults (dependency ratio) within countries is concerned, evidence from Brazil indicates that it can be quite substantial. For instance, Merrick (1986) shows that the fertility rate varies in Brazil from 5.7 in the Northeast (a value very close to the one estimated in Table 1 for Bolivia) to 2.7 in the State of Rio de Janeiro (a value lower than the estimate for Argentina in Table 1). Moreover, he shows that the total fertility rate varies from 3.0 for high income families in urban areas to 6.7 for poor families in rural areas [see Merrick (1986:46)].

Correlation: The evidence available indicates not only that the proportion of adults (dependency ratio) is quite variable, but also that most of its variability is positively (negatively) correlated with income. As it has been shown in Section 3, this fact tends to reduce the level of welfare. With respect to the correlation between countries, Figure 1 indicates that the fertility rate tends to be larger in the poorest countries in Latin America and smaller in the countries with higher income, with the exception of Mexico and Venezuela. In fact, Mexico and Venezuela have relatively high levels of income for the region, but medium levels of fertility rate.

With respect to the correlation within countries, a strong and positive correlation between adult earnings (or education) and fertility rates has been found in several studies[see, for example, Merrick (1986)]. This correlation, however, is expected to decline very fast, as the reduction in fertility begins to reach the poor strata of the population. However, is is still true that low income parents tend to have more children, leading to higher dependency ratios among the poor.

Figure 1
Relationship between Total Fertility Rate and Real GDP Per Capita



CH	Chile	MX	Mexico
PE	Peru	VN	Venezuela
NC	Nicaragua	ES	El Salvador
BL	Bolivia	DR	Dominican Republic
HD	Honduras	CB	Cuba
GT	Guatemala	AR	Argentina
CR	Costa Rica		
BZ	Brazil		
UR	Uruguay		
PR	Paraguay		
EC	Ecuador		
PN	Panama		
CL	Colombia		

5. CAPACITY UTILIZATION

Is the low level of social welfare in Latin America the result of low wages or a consequence of the fact that a large fraction of the adult population is not occupied, being either out of the labor force or unemployed?

To address this question we express the family income per adult, a, as the product of two factors: the family income per working adult, w, and the fraction of adults who are working, u. Formally, if l denotes the number of working adults and only working adults have positive income, then

$$a \equiv \frac{\sum_{i=1}^{m} z_i}{m} = \frac{\sum_{i=1}^{l} z_i}{l} \frac{l}{m} = w.u,$$

where

$$u \equiv l/m$$

and

$$w \equiv \frac{\sum_{i=1}^{l} z_i}{l}.$$

For simplicity, we refer to w as the family earnings capacity. In this case, u is the degree to which the family is actually using its earnings capacity, so it will be referred to as capacity utilization.

Since a=w.u, the average level and the degree of inequality in family income per adult, which partially determine the level of welfare in Latin America, are themselves a function of the joint-distribution of the earnings capacity, w, and the degree of capacity utilization, u.

As we have shown in Section 3, the greater the mean and the smaller the degree of inequality in each of these two factors, the higher will be the level of social welfare. Moreover, any increase in the degree of correlation between these two factors will tend to reduce welfare.

Since the determinants of the level and inequality in earnings capacity will be investigated in the following section, this section considers the distribution of capacity utilization and its degree of correlation with earnings capacity.

Average: With respect to the average level for capacity utilization, it has been repeatedly argued that this is not an important factor to explain low levels of income in Latin America. It has been argued that the poor in Latin America are employed, instead of unemployed or out of the labor force. To shed some light on this question, Table 2 presents three pieces of information related to the degree of utilization of the adult population in the labor market: the unemployment rate, the proportion of the adult population in the labor force, and the gender composition of the labor force.

Table 2

Measures of Utilization of the Adult Population in Market Activities

Country	Urban Rate of Unemployment	Labor Force Participation	Women in the Labor Force
Mexico	4	64	31
Guatemala	13	65	26
Honduras	13	59	18
El Salvador	na	81	45
Nicaragua	24	67	34
Costa Rica	6	64	29
Panama	14	60	27
Dominican Republic	na	52	15
Cuba	na	na	32
Venezuela	10	62	22
Colombia	12	72	41
Ecuador	14	61	30
Peru	5	73	33
Bolivia	20	59	24
Chile	12	58	31
Argentina	6	62	21
Paraguay	6	81	41
Uruguay	9	62	31
Brazil	4	72	35
Latin America	6	68	32
Industrial Economies	6	72	42
World	na	74	35

Average: This table reveals that although the unemployment rate is very low in the two most populated countries in the region (Brazil and Mexico, which together account for more than 50% of the population in the region), on average, the unemployment rate in Latin America is about the same as in the OECD economies. This table also reveals that the labor force participation rate in the region is four percentage points below the level for the industrial economies. As the last column in the table indicates, this lower participation rate for the adult population is a consequence of the lower participation of women in the labor force. Therefore, policies devoted to facilitate the participation of women in the labor force remain important in improving welfare in Latin America. Nevertheless, we conclude that overall there is no evidence that high unemployment rates and lower labor

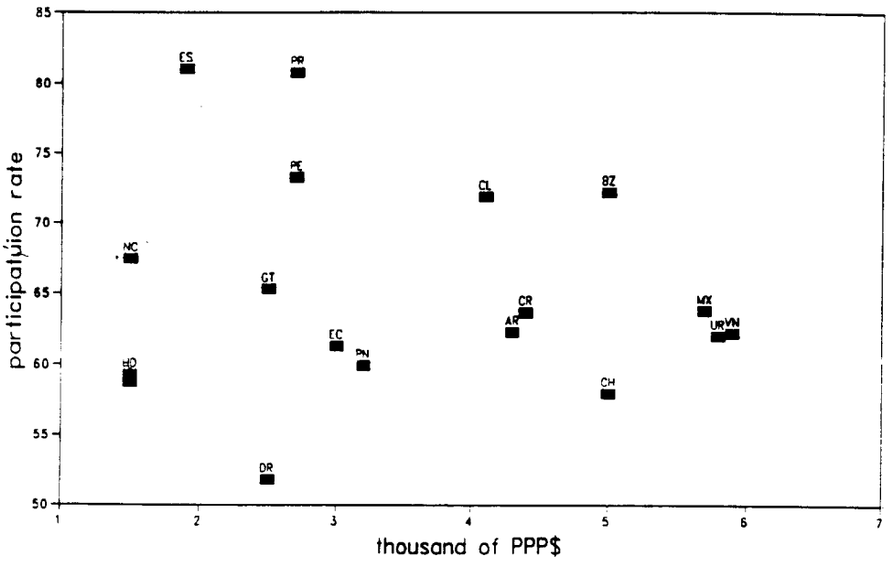
force participation rates can explain any significant portion of the income gap between Latin America and the industrial economies.

Inequality: With respect to the variability of the unemployment and labor force participation rates, Table 2 indicates that there exists large differences among countries: while a few countries such as Brazil, Mexico, Argentina, Costa Rica, and Paraguay have very low unemployment rates, in several other countries in the region, like Guatemala, Honduras, Panama, Venezuela, Colombia, Ecuador, and Chile, the unemployment rate is between 10 and 15%. Moreover, in two poor countries, Bolivia and Nicaragua, unemployment has recently become a serious problem. The evidence available within countries also indicates large variations in adult employment rate across families.

Correlation: The large variability of unemployment and labor force participation rates across countries may have their effects on the level of welfare attenuated by the fact that they does not seen to be strongly related to earnings capacity. For instance, Figure 2 indicates that among countries there exists no clear relation between per capita income and labor force participation rate. Figure 3 reveals a weak but negative relationship between unemployment rate and per capita income. However, the estimated line is strongly influenced by the high unemployment rates in Bolivia and Nicaragua. If these two countries are removed from the regression, the negative association vanishes.

With respect to the correlation between capacity utilization (unemployment and labor force participation rates) and earnings capacity within countries, there is also little evidence of a strong positive correlation. Actually, the evidence indicates that families with lower earnings capacity are usually over-employed not under-employed [see, for example, Pastore, Zylberstajn e Pagotto (1983)]. Moreover, there is clear evidence indicating that, following an economic downturn, household heads with low levels of educational attainment are not the ones who are affected first or the most by unemployment. The evidence suggests that secondary members (primarily youths) and household heads with intermediate levels of education (5-11 years) are those who suffer the most from cyclical unemployment [see Amadeo et alii. (1993)].

Figure 2
Relationship between Labor-Force Participation and Real GDP Per Capita



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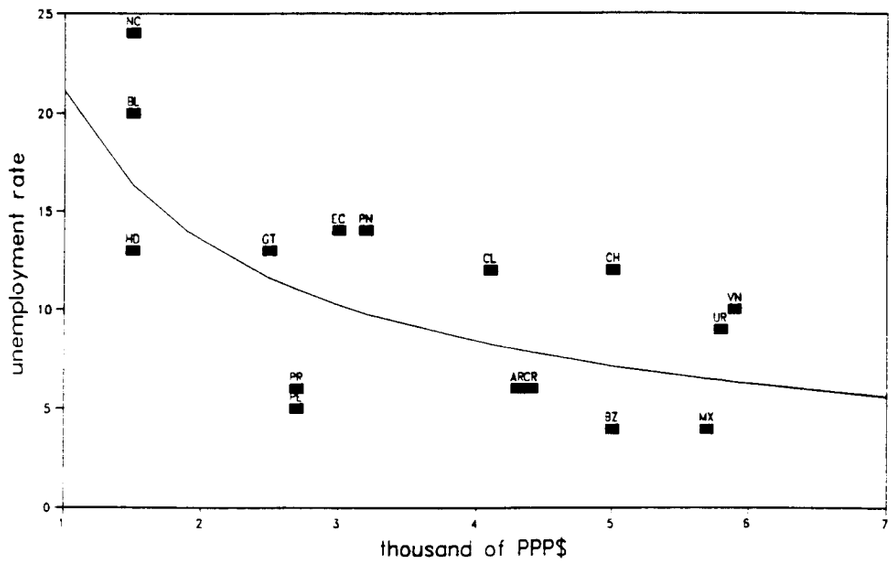
BZ	Brazil		
UR	Uruguay		
PR	Paraguay		
EC	Ecuador		
PN	Panama		
CL	Colombia		

Figure 3
Relationship between Unemployment Rate and Real GDP Per Capita



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CL	Colombia		

6. BARGAINING POWER

Is the low level of social welfare in Latin America the result of lower marginal productivity of labor or a consequence of wages being considerably below the value of workers' marginal productivity? In other words, are Latin American workers not generating much value added, or are they not receiving the value they add?

To investigate this question we define the bargaining power of workers in a given family, b, as the ratio between the average earnings of the working adults in the family, w, and the value of their marginal productivity, v. Formally, let V_j denote the value of the marginal productivity of the working adult j in the family. Therefore, the average value of the marginal productivity among working adults, v, is given by

$$v \equiv \frac{\sum_{j=1}^{l} V_j}{l}$$

and

$$b \equiv \frac{w}{v}$$

Hence, w=b.v. Consequently, at the aggregate level welfare will depend on the joint-distribution of bargaining power, b, and the value of marginal productivity, v. Increases in the average level of bargaining power or in the value of the marginal productivity will increase social welfare, whereas increases in the inequality among families with respect to either bargaining power or the value of marginal productivity will decrease social welfare. Moreover, the more positively correlated these factors are -- i.e., the extent to which families with working members with greater bargaining power are those whose members have greater marginal productivity -- the lower will be the society level of welfare.

In the next section, we investigate the determinants of the value of the marginal productivity and their joint-distribution. Therefore, in this section we concentrate our attention on the level and inequality in bargaining power as well as on the correlation between bargaining power and the value of marginal productivity.

Average: We begin considering the question of the level of the bargaining power of workers in Latin America: Overall, is the bargaining power of Latin American workers weaker than the power of workers in industrial

economies? Since the marginal productivity of workers is not usually observed, very few indicators are available to give any indication in this direction. One possibility would be to investigate whether the degree of union activity, the degree to which labor legislation protects workers, and the proportion of the labor force covered by unions or the labor legislation are smaller in Latin America than in the industrial economies. Casual evidence seems to indicate that workers do not seem to be less organized, nor the labor legislation less protective in Latin America than in Europe or North-America. There seems to exist no evidence that, overall, workers in Latin America are being exploited by receiving wages well below the value of their marginal productivity. That is, of course, not to say that in certain isolated areas and specific sectors this phenomenon is not occurring. In summary, it is hard to believe that overall lack of bargaining power of the labor class could be an important factor in explaining the lower level of welfare in Latin America.

Inequality: If, on the one hand, an overall lack of bargaining power does not seem to be a problem, on the other hand, the distribution of power among workers' sub-categories is likely to be a significant factor influencing the level of welfare. Workers' bargaining power varies widely from country to country, as well as over time. Within countries large and persistent wage differences between workers with equal observable characteristics but working in different sectors indicate that bargaining power may be quite unevenly distributed. This is a particularly useful argument to explain wage differences between public servants, workers in state enterprises, workers in the private formal sector, and workers in the informal sector. In particular, it is still unresolved whether the lower wages of workers in the informal sector results from their weak bargaining power, which permits firms operating in this market to pay workers below the value of their marginal product, or simply because workers and jobs in this sector have lower productivity, or both.

Correlation: Even though, overall lack of bargaining power does not seem to be an important factor in Latin America, the fact that this bargaining power is heavily concentrated among skilled workers in high-paying sectors including, in some countries, public servants, may have important consequences on the level of welfare, since it implies that the bargaining power of workers and the value of their marginal product are positively correlated.

7. CAPITAL STOCK

Is the lower level of welfare in Latin America related to the scarcity of physical capital and natural resources on due to the scarcity of human resources?

To address this question, assume that firms combine capital and labor to produce goods and services. To simplify, assume that all firms have the same production function **f** but differ with respect to the amount of physical capital, K, they possess. Workers are heterogeneous but perfect substitutes, so the amount of labor services provided by worker i can be measured as a multiple, q_i , of the amount of labor services provided by a standard worker that is assumed, without loss of generality, to be equal to one. So, a firm with a stock of physical capital K and a labor force of n workers of quality $\{q_1,\ldots,q_n\}$ will produce **f**(K,L) where

$$L \equiv \sum_{i=1}^{n} q_i$$

Therefore, the marginal productivity of worker i, v_i is given by

$$v_i = \frac{\partial f(K,L)}{\partial L} q_i$$

To simplify, we assume that there are constant returns to scale in production. In this case,

$$\frac{\partial f(K,L)}{\partial L} = g(K/L) = g(k)$$

where

$$k \equiv K/L$$

and

$$v_i = g(k)q_i \qquad (2)$$

Moreover, the hypothesis of constant returns to scale also implies that the average productivity, t, is given by

$$t = \frac{f(K,L)}{L} = h(k)$$

Hence, $k = h^{-1}(t)$ and as a result

$$v_i = e(t)q_i \qquad (3)$$

where

$$e(t) \equiv g\left(h^{-1}(t)\right)$$

Expressions (2) and (3) show that the marginal productivity of a worker is the product of the marginal productivity of the standard worker multiplied by his/her quality level (amount of human capital). Given the assumption of constant returns to scale, the marginal productivity of the standard worker in a given firm is an increasing function of the capital-labor ratio of the firm. Alternatively, the marginal productivity of the standard worker can be written as an increasing function of the average productivity. This is a useful property since estimates of average productivity are commonly available, whereas estimates of the capital-labor ratio are more difficult to obtain.

Hence, the income of the family is increasing with both the marginal productivity of labor in the jobs held by family members and the quality of the labor supplied by family members. Since the marginal productivity of labor depends on the capital-labor ratio, the family income will increase as the capital-labor ratio in the jobs held by family members increases. In other words, the family income will depend on both the quality of the labor services provided by the family members and the quality of the jobs in which they are employed.

At the aggregated level, welfare will depend on the joint-distribution of the quality of labor and the quality of jobs. The greater the average quality of labor and the average quality of jobs, the higher will be the level of welfare. In addition, the level of welfare will also increase as the degree of inequality in the distribution of both labor and job quality is reduced. Finally, the level of welfare will decrease as the correlation between labor and job quality increases. In other words, for given marginal distributions of quality among workers and jobs,

welfare will be minimized if better workers are allocated to better jobs.

The marginal distributions of the quality of labor services and of some of its determinants are investigated in the next section. In this section we concentrate on the distribution of job quality and on the correlation between job quality and labor quality.

The first column in Table 3 presents estimates of GDP per worker for Latin American countries and for the industrial economies as a whole. These differences, however, encompass differences in both job and workers quality. To evaluate the level of quality of jobs, we need to estimate the level of productivity of labor standardized for labor quality, i.e., to remove differences in labor quality. To accomplish this, we have first to construct a measure of labor quality. To construct this measure we assume that the quality of workers, q, increases exponentially with their number of completed years of schooling, s, i.e.,

$$q = A \cdot e^{\lambda s}$$

where A and λ are constants. Since several estimates of the relationship between wages and education indicate that wages increase exponentially with years of education, such that an extra year of education increases wages approximately 10%, we use λ =0.10. Based on this expression, and assuming that q has a log-normal distribution, we obtain that the average quality of workers, $\mu(q)$, is given by

$$\mu(q) = A \cdot e^{\lambda\mu(s)+(\lambda\sigma(s))^2/2}$$

Given the average, $\mu(s)$, and the standard deviation, $\sigma(s)$, of the number of completed years of schooling for each country and region, we compute measures of the average quality of workers for each of them. These estimates are presented in the third column of Table 3. To obtain these estimates we obtain the constant A by normalizing the quality of workers such that the average quality for Latin America as a whole is equal to one. Given these estimates of the average quality of workers, we obtain the average productivity per standard worker by dividing the average productivity per worker (first column) by the average quality of the labor force (third column). The results are presented in the second column of Table 3.

Table 3
Measures of Average Productivity, Job Quality and Worker Quality

Country	GDP (PPP) per Worker	GDP (PPP) per Standard Worker	Workers' Quality
Mexico	15.5	16.4	1.75
Guatemala	7.5	8.5	1.63
Honduras	5.0	5.8	1.59
El Salvador	4.5	5.1	1.63
Nicaragua	4.4	4.8	1.67
Costa Rica	11.6	10.9	1.96
Panama	9.0	7.7	2.17
Dominican Republic	8.3	9.3	1.67
Cuba	5.7	4.5	2.37
Venezuela	16.4	14.6	2.09
Colombia	9.5	7.8	2.26
Ecuador	8.8	8.5	1.94
Peru	6.4	5.7	2.11
Bolivia	4.8	5.6	1.61
Chile	13.7	7.8	2.35
Argentina	11.3	8.0	2.68
Paraguay	6.0	6.2	1.79
Uruguay	14.9	11.4	2.61
Brazil	11.6	13.6	1.59
Latin America	11.3	11.3	32
Industrial Economies	30.7	19.6	42
World	10.3	10.5	35

Average: The second column of Table 3 reveals that the average productivity of a standard worker is 75% greater in the industrialized economies than in Latin America.[3] So, Table 3 presents evidence that lower job quality is probably the most important explanation for the lower level of welfare in Latin America as compared to the industrial economies.

Notice that the quality of jobs, as defined above, captures not only the fact that jobs in the industrial economies are more intensive in capital, but also that production in these economies is likely to be conducted more efficiently and with improved technology. Moreover, the **value** of the average productivity of Latin American workers may be simply the result of goods and services produced in Latin America being undervalued or taxed more than those produced in the industrial economies. This may be due to either discriminatory trade policies or segmentation of the international markets or even due to inferior bargaining power of the Latin American countries in the international market. In principle, the value of the average productivity could also be lower due to lack of natural resources, but there is clear evidence that the availability of per capita arable land and energy resources are not lower in Latin America than in the industrial economies.

[3]However, if we compare Latin America with all economies we obtain that the average quality of jobs is similar, being actually slightly greater in Latin America.

Furthermore, continuous migration pressure of low-skilled workers from Latin American countries to industrial economies indicates that the lower quality of jobs in Latin America is certainly an important factor explaining the lower level of welfare in the region.

Inequality: The level of welfare is a function not only of the average productivity but also of its variability. The greater the variability in productivity, the lower will be the level of welfare. Table 3 (column 3) reveals that labor productivity varies substantially across Latin American countries. Actually, the range of variation among Latin American countries is greater than between the average for the region and the average for the industrial economies. In fact, the average productivity in Mexico, Brazil and Venezuela is 2.5 times greater than in the poor Central American countries, Bolivia, Paraguay, Peru and Cuba. There are also sharp differences among Latin American countries with respect to their natural resources; while some are members of OPEC, others have to import a substantial fraction of their consumption of energy.

Inequality in job quality within countries also tends to be very large. In fact, several sources indicate that labor markets are severely segmented in most Latin American countries. Particular attention has been given to the urban-rural gap with several studies showing that observably equal workers tend to be more productive and receive higher wages in urban areas than in rural areas. Within rural areas the productivity of labor may also vary substantially as the distribution of land in some countries as Brazil remains extremely concentrated. The concentration of land in the absence of well-functioning market for credit leads small farmers to use inefficient technologies, inadequate combination of inputs and inadequate choice of outputs. In this case the value of the marginal productivity of labor, land and other inputs will vary considerably according to the size of farms.

Likewise, in urban areas several studies indicate that observably equal workers in formal activities tend to be more productive and earn more than workers in informal activities or self-employed. Nevertheless, labor market segmentation is not restricted to the formal-informal dichotomy. As Branco (1979) showed, the urban formal sector in Brazil is considerably segmented. Table 4 constructed from information in Branco (1979) indicates that the value of the average productivity and the wages of workers with standard characteristics vary considerably across sectors. In fact, Table 4 reveals that wages for the standard

worker in the high-paying sectors are more than 60% greater than wages in the low-paying sectors.

Table 4
Measures of Average Productivity, Job Quality and Worker Quality
Brazil: Manufacturing

Sector	Product per Std. Worker[a]	Wage per Std. Worker[b]	Quality[c]	Years of School
Chemicals (CH)	1.5	26	1.2	5.6
Paper Products (PA)	0.9	-3	1.0	4.2
Rubber Products (RU)	0.2	-6	1.0	4.5
Textiles (TX)	0.6	4	1.0	4.2
Food (FO)	1.0	-13	1.0	3.9
Non-Metallic Pros (NM)	1.0	-8	0.9	3.5
Clothing and Footwear(CF)	0.6	-31	1.0	4.5
Beverages (BV)	1.0	-7	1.0	4.2
Printing & Publishing (PP)	1.1	8	1.1	5.2
Wood Products (WO)	0.6	-32	0.9	3.4
Furniture (FU)	0.7	-23	1.0	4.0
Leather and Hides (LH)	0.6	-3	0.9	3.7
Tobacco (TO)	1.1	32	1.1	5.3
Transportation Equip. (TR)	1.1	35	1.1	5.0
Metals Products (MT)	2.1	18	1.0	4.6

Source: Branco (1979).
Notes: [a]Product share divided by the product of the employment share and the quality of workers (column 3).
[b]Percentage deviations from the average wage in manufacturing.
[c]See note 3 in Table 5 . A is now defined such that the average quality is equal to one.

In summary, there is plenty of evidence that the quality of jobs or occupations varies considerably between countries, between urban and rural areas, between farms of different size, and between sectors in

the urban areas. This variability leads to a lower level of social welfare than what would prevail in case of greater homogeneity.

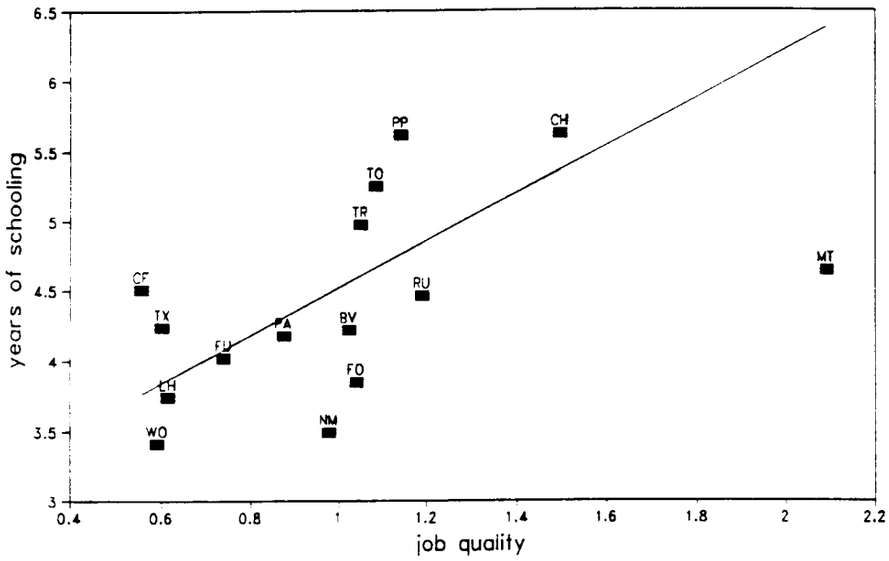
Correlation: The reduction in welfare caused by the inequality in job quality will be greater, the greater is the correlation between the quality of jobs and the quality of workers. Hence, we next investigate the extent to which countries, regions and sectors offering better jobs also tend to employ better educated workers.

Table 3 indicated that there is no association across countries between job quality and worker quality. In fact, among countries with above-average job quality there is a group, including Uruguay and Venezuela, with above-average educational levels whereas other countries with above-average job quality, like Mexico and Brazil, have below-average educational levels. Similarly, some countries with lower job quality, like Cuba and Peru, have above-average educational levels while others, like Nicaragua, El Salvador and Bolivia, have below-average educational levels. Overall the correlation between job quality (column 2 of Table 3) and worker quality (column 3 of Table 3) is almost zero, 0.05.

Within countries, however, there is strong evidence of positive correlation between job quality and worker quality. Workers in urban areas tend to have better jobs and be better educated; public servants tend to have better jobs and also be better educated. Finally, Figure 4 reveals that manufacturing sectors with greater job quality tend also to employ workers with greater educational level.

Summary: The quality of jobs in Latin America tends to be lower than in the industrial economies. Moreover the quality of jobs is heterogeneous with high quality workers being matched to high quality jobs within each country. All these characteristics help to explain the lower level of welfare prevailing in the region. However, we also showed that countries with greater job quality are not necessarily those with better educated labor force. If the association between job quality and worker quality across countries were greater and positive, the level of welfare in Latin America would be even smaller.

Figure 4
Relationship between Job Quality and Education of Workers



CH	Chemicals	WO	Wood Products
PA	Paper Products	FU	Furniture
RU	Rubber Products	LH	Leather and Hides
TX	Textiles	TO	Tobacco
FO	Food	TR	Transportation Equipment
NM	Non-Metallic Products	MT	Metal Products
CF	Clothing and Footwear		
BV	Beverages		
PP	Printing and Publishing		

8. INCENTIVES AND LABOR QUALITY

Is the lower level of welfare in Latin America the result of insufficient human capital or due to the inefficient or under-utilization of the available human resources?

To address this question, notice that the quality of labor services actually provided by workers, q, will generally be lower than their potential quality. If fact, when the supply of greater quality is costly to workers, lack of appropriate incentives or supervision may induce workers to supply labor services of quality below their potential. Accordingly, let p denote the potential quality of workers and define the extent to which this capacity is realized by workers, f, by the ratio q/p, i.e.,

$$f \equiv \frac{q}{p}$$

Therefore, q = f.p and at the aggregate level, welfare will depend on the joint-distribution of these two factors, f and p. Social welfare will increase as both the average potential quality and the average fraction of this potential quality which is actually realized increase. Moreover, welfare will decrease as the inequality in either the potential quality or the degree of utilization of this capacity increase. Finally, welfare will decrease as the correlation, between workers' potential quality and the extent to which this capacity is realized, increases.

Average: Several characteristics of the Latin American economies are prone to generate lack of appropriate incentives. For instance, although a great direct participation of government in production could, in principle, be accomplished without generating lack of appropriate incentives, it is doubtful that the Latin American governments pursued this goal with enough tenacity. Therefore, the large size of government and the large degree of protectionism against foreign competition probably generated an environment in which workers were less likely to realize their potential than they would in a more competitive economy. Moreover, to the extent that the large degree of social inequality, prevailing in most Latin American countries, is perceived as the result of unequal access to both education and high-quality jobs, it is natural to expect that workers' incentives to supply their potential capacity may be diminished. In summary, although it is difficult to measure the extent to which Latin American workers are under-utilizing their

capacity, it seems that the same labor force working in the same occupations could produce more if a more appropriate set of incentives and meritocratic rules were available.

Although it is difficult to measure the extent to which the capacity of Latin American workers is being under-utilized, the same is not true about the level of the capacity itself. Several indicators of investment in human capital clearly demonstrate that Latin American workers are less educated and less healthy than workers in the industrial economies. Table 5 presents three indicators of investment in human capital: illiteracy rates, average years of completed schooling, and life expectancy. In addition, the third column of Table 3 show how differences in the distribution of years of completed schooling translate into differences in productivity.

Table 5

Indicators of Quality of Human Resources

Country	Illiteracy	Years of Schooling		Life
	Rate[a]	Mean[b]	Coef.Variation	Expectancy[c]
Mexico	12.7	4.7	0.89	69.7
Guatemala	44.9	4.1	0.95	63.4
Honduras	26.9	3.9	0.97	64.9
El Salvador	27.0	4.1	0.95	64.4
Nicaragua	19.0	4.3	0.93	64.8
Costa Rica	7.2	5.7	0.79	74.9
Panama	11.9	6.7	0.69	72.4
Dominican Republic	16.7	4.3	0.93	66.7
Cuba	6.0	7.6	0.60	75.4
Venezuela	11.9	6.3	0.73	70.0
Colombia	13.3	7.1	0.65	68.8
Ecuador	14.5	5.6	0.80	66.0
Peru	14.9	6.4	0.72	63.0
Bolivia	22.5	4.0	0.96	54.5
Chile	6.6	7.5	0.61	71.8
Argentina	4.7	8.7	0.49	71.0
Paraguay	9.9	4.9	0.87	67.1
Uruguay	3.8	7.8	0.58	72.2
Brazil	18.9	3.9	0.97	65.6
Latin America	16.0	5.2	0.84	67.4
Industrial Economies	2.0	10.0	0.36	74.5
World	na	5.0	0.86	64.7

Sources: United Nations (1992) and Ram (1990).

Notes: [a]Persons aged 15 and over (1990).

[b]Persons aged 25 and over (1990).

[c]Number of years a newborn infant would live if prevailing patterns of of mortality at the time of its birth were to stay the same throughout its life.

Table 5 reveals that while 15% of the population 15 years old and older are still illiterate in Latin América, the corresponding proportion for the industrial economies is insignificant. With respect to the average number of years of schooling, the value for the Latin America countries, 5.2 years, is approximately one half of the corresponding value for the industrial countries. Assuming that an extra year of education increases productivity in 10%, Table 3

suggests that the educational gap between Latin America and the industrial economies implies that the average productivity in the industrial economies is approximately 60% greater than in Latin America. Finally, life expectancy in Latin America is approximately seven years shorter than in the industrial economies indicating lower levels of investment in health.[4] In summary, lower labor quality is certainly among one of the main reasons why the level of welfare is lower in Latin America than in the industrial economies.

Inequality: The quality of the human resources in Latin America is not only low on average, but also very unequally distributed both between and within countries. In fact, as Table 5 reveals, the difference between Brazil and Argentina in terms of either illiteracy rates or mean years of schooling is considerably greater than between Argentina and the United States. In fact, the mean years of schooling in Argentina is 4.8 years greater than in Brazil, but only 3.6 years smaller than in the United States. Similar results hold for the illiteracy rate which is 14 percentage points lower in Argentina than in Brazil, but only four percentage points greater in Argentina than in the United States.

The inequality in education and health indicators are also very large within Latin American countries. As Ram (1990) has shown, the inequality in education tends to be greater in countries with average schooling level between four and seven years, which is precisely the range occupied by most Latin American countries. A comparison between Brazil and the United States made by Lam and Levison (1992) shows that the inequality in education in Brazil measured by the coefficient of variation of the number of years of schooling is close to four times the corresponding value for the United States. Table 5 presents estimates for the coefficient of variation of the number of years of schooling for the Latin American countries. The evidence in this table clearly indicates that inequality in education within most of Latin America is considerably greater than in the industrial economies.

Inequality in health indicators in Latin America is not less impressive than the inequality in education. For instance, Cuba has essentially the same life expectancy

[4]When compared to the average for the entire world, Latin American indicators are slightly above-average: life expectancy is three years longer; mean years of education 0.2 years greater; and labor quality (productivity) 2% greater (see Table 3).

as the United States while the life expectancy in Bolivia is 20 years shorter. The inequality in life expectancy within countries can also be substantial. For instance, Wood and Carvalho (1988) estimated that the life expectancy for the poor in the Northeast of Brazil is 25 years shorter than for the middle class in the South of Brazil.

In summary, all indicators of inequality in the quality of human resources between and within Latin American countries indicate a very large degree of inequality. This large inequality is another important cause of the lower level of welfare in Latin American when compared to the industrial economies.

Correlation: Finally, it should be emphasized that the impact of this extremely large degree of inequality in the quality of labor services would have an even greater negative impact on the level of welfare if potential quality were positively correlated with the intensity with which this capacity is actually realized by workers. In fact, to the extent to which the lack of appropriate incentives and motivation reach mainly workers with lower potential quality -- perhaps because they are discriminated or do not have fair access to opportunities to social progress --, the effect of inequality in potential quality on the level of welfare will be the greater.

9. CONCLUSIONS AND POLICY IMPLICATIONS

In this study we investigate the main determinants of aggregate level of welfare in Latin America. In the first part of the study, Sections 1 through 3, we show that the level of welfare is an increasing function of the level of average per capita income and a decreasing function of the degree of income inequality, provided society dislike inequality.

We also show that average income and the degree of inequality are directly associated to the joint-distribution of the factors determining the level of income. Thus the level of welfare in a society is a function of both the level and the inequality in the distribution of the factors determining income, as well as, a function of the degree of correlation among them. The level of welfare is increasing with the average level of each factor and generally decreasing with the degree of inequality in the distribution of each factor.

The relationship between the level of welfare and the degree of correlation among the factors is intrinsically more complex. The level of welfare and

the degree of correlation can be directly or indirectly related, depending on the strength of society preference for equity. To understand why, notice that when the best workers are allocated to the best machines, both average income and income inequality will be higher than when the best workers are allocated to the worst machine. Therefore, increments in the degree of correlation among the income determinant factors can increase or reduce welfare, depending on whether the society judges the positive effect on the average income as greater than the negative effect on the degree of inequality.

On the basis of these results, we develop a simple procedure, based on a sequence of identities, which links the per adult-equivalent family income to its various factor determinants. The entire exercise can be summarized by the following sequence of identities:

$$y = a/(1 + d)$$

$$= [1/(1 + d)].u.w$$

$$= [1/(1 + d)].u.b.v$$

$$= [1/(1 + d)].u.b.g(k).q$$

$$= [1/(1 + d)].u.b.g(k).p.f$$

where:

y = per adult-equivalent family income

a = average income of adults

d = family dependency ratio

u = family earnings capacity utilization

w = family earnings capacity

b = bargaining power of workers in a given family

v = value of marginal productivity

k = capital-labor ratio

q = quality of labor services

f = fraction of the potential quality actually

p = potential quality of workers

g = marginal productivity function

This last expression states that the income level of a given family increases with the family dependency ratio and increases with (1) the degree of utilization of the earnings capacity of the family, (2) the bargaining power of their working members, (3) the quality of the jobs they hold, (4) the quality of the labor services they can provide, and (5) the extend to which they actually supply the quality of services they are capable of.

Some of these factors, as the bargaining power of workers and the extent to which they are actually supplying the potential quality of services they are capable of doing, are difficult to quantify. Other factors, however, as the dependency ratio and quality of labor, are easier to quantify.

In Sections 4 to 8 we analyze to which extent each of these determinants of income can explain disparities in welfare among Latin American countries and between these countries and the industrial economies. To accomplish this goal we investigate the average level, and the degree of inequality in each factor as well as their correlation patterns. The degree of inequality in the distribution of each factor and the correlation among them were investigated both within countries and across countries. The main results are summarized next.

First of all, there is a wide range of variation of the income determinant factors within each country and between Latin American countries. Fertility rates, for example, vary from 6.0 in Bolivia to 1.9 in Cuba, with the average level for the region being 3.4. The open unemployment rate was 24% of the labor force in Nicaragua as compared to 4% in Brazil and Mexico, with the average open unemployment rate for the region being as low as 6%. The index of Gross Domestic Product (PPP) per standard worker, which is a measure of the quality of the jobs offered in each country, varies from 4.5 in Cuba to 16.4 in Mexico, with 11.3 being the average for Latin America. The index of workers quality varies from 0.86 in Brazil and Honduras to 1.41 in Argentina, with the average for the region being by construction 1.00.

Although information is much more difficult to get, we also try to present evidence on the degree of variation of some these factors within each of Latin American countries. In all cases that evidence was available,

the degree of inequality was shown to be very high (see Table 5, for example).

Another important finding is that the degree of correlation among some of these factors is not very high. Just to take one example, Brazil and Mexico are among those countries with the highest index of job quality in the region, but their indexes of labor quality are well below-average. Argentina, on the other hand, has the more qualified labor force and relatively low job quality. The relatively low correlation among job quality and labor quality reduces both the average per capita income for the region and the degree of income inequality. The first effect reduces welfare, while the second increases welfare, with the second effect dominating when the society preference for equity is strong enough.

There is still considerable research to be done to determine the relative importance of these factors in determining the level of inequality, poverty and welfare. The main objective of this study was to identify these factors and to provide some very preliminary indications of their relative importance.

Next, we use a simplification of the analysis to summarize some of its main findings and to identify which set of factors is of greatest importance in explaining the differences in welfare among Latin American countries and between Latin America and the industrial economies. To do so, it is convenient to assume the production function is of the Cobb-Douglas type. In this case, the above equation becomes:

$$y = (1 - \alpha).r.u.\delta.q$$

where α is the parameter of the Cobb-Douglas production function and $\sigma \equiv f(k).b$ is the value of the average productivity.

Moreover, in this simplified analysis we will ignore the level of inequality in each of the factors. This means that the comparisons that follow take into account only the average level of the above factors, not the distribution and the correlation of these factors, which, as we have showed, are also of great importance in determining the level of welfare and poverty.

Given these simplifying hypothesis and the above expression for y, we can write the ratio of the average

GDP per capita, γ, for two regions or countries (i and j) which are being compared as

$$\gamma = (1 + \beta_r).(1 + \beta_u).(1 + \beta_\delta).(1 + \beta_q)$$

where $\gamma \equiv y_i/y_j$

and $1 + \beta_f \equiv f_i/f_j$

for $f=r, u, \delta, q.$

Large values of β_f indicate that the factor f is important in explaining differences in welfare. Table 6 presents the average values of the factors r, u, δ, and q for the Latin American countries, the industrialized economies, all economies in the world, and for the poorest (Bolivia) and the richest (Uruguay) Latin American countries. The second panel of Table 6 presents the values of $\{\beta_f : f=r,u,\delta,q\}$ for several comparisons between regions and countries.

Table 6

Proximate Determinants of Poverty:
a Simplified Approach

	d	u	p	q
Latin America	59	68	11.3	1.0
Uruguay	63	62	11.4	1.3
Bolivia	53	59	5.6	0.9
Industrial Economies	67	73	19.6	1.6
World	61	74	10.5	1.0
Industrial Economies versus Latin America	1.1	1.1	1.7	1.6
World versus Latin America	1.0	1.1	0.9	1.0
Uruguay versus Bolivia	1.2	1.1	2.0	1.4

The most important result which appears on this table is that labor quality and job quality are the two most important factors in explaining differences between Latin American countries and industrial economies, as well as between rich and poor countries within Latin America. The other two factors considered, the

proportion of adults in the population and the capacity utilization (labor force as a fraction of the adult population), are much less important in explaining these differences. They also penalize the poor countries and regions, but to a much lesser extent.

The proportion of adults in Latin America is equal to the average for all countries, but 10% lower than in the industrial economies. The poorest country in Latin America, Bolivia, has a proportion of adults 20% lower than the richest country, Uruguay. Similar results are obtained for capacity utilization. On the other hand, labor quality is 60% higher in the industrial economies than in Latin America. The difference between Uruguay and Bolivia is also substantial, 40%. Job quality is also much higher in the industrial economies than in Latin America (70% higher) and in Uruguay as compared to Bolivia (100%). Note that this index includes not only the quality jobs but also the capacity of workers to earn its marginal product (or more), their bargaining power.

On the basis of these results, some policy implications can be analyzed. First of all, although policies to reduce the rate of growth of population can not be considered non important, they alone will not be sufficient to improve significantly the level of welfare in the region. Unemployment is also an important factor which reduces welfare in Latin America as compared to the developed world, but, again, except for specific countries, this is not the main generator of poverty and low welfare in the region. Thus, employment creation as well as birth control policies should be considered auxiliary policies to reduce poverty and increase welfare in Latin America. For them to have important effects over poverty and welfare, they should be accompanied by other instruments, which will increase the quality of the labor force and the quality of jobs in the region.

Policies which improve the quality of the labor force and/or the extent to which the labor force is capable of supplying its potential labor power are of great importance. Policies which increase human capital investment are certainly one of them. Thus, to improve the quality of the educational system and to reduce the opportunity costs for the children of poor families to stay in school should be considered an important instrument to reduce poverty and increase welfare. Note, however, that, as emphasized by Mendonça (1993), some policies (like those which increase the time families and children have to dedicate to education) improve the quality of the education but also increase the cost of being in school leading possibly to

reductions in school attendance among poor children. As a result, these policies can increase the inequality in the distribution of human capital in the country, affecting negatively poverty and welfare. Thus, educational policies devoted to increase the quality of the labor force should be designed to reduce the total costs and increase the total benefit of children being in school [see Mendonça (1993) for an extensive discussion of this question]. Examples of policies with these characteristics are: free and better transportation, free and better school books and materials, better prepared teachers etc.

The distribution of human capital is as important or perhaps even more important than the level of human capital in reducing poverty and increasing welfare in Latin America. If that is so, as poor children are mainly concentrated in the primary education level and seldom reach higher levels of education (secondary and university), to concentrate public resources to improve the quality of the primary level of education can be a very effective instrument to reduce the inequality in the distribution of human capital and so to reduce poverty and increase welfare.

On the other hand, to reduce the cost of being in school can be a powerful instrument to increase human capital accumulation by the poor. When the family is very poor, so that the income they lose by keeping their children in school is very important. Therefore, the result can be an early dropping out from school. In this case, income transfer to very poor families to compensate for this cost, while their children are attending school, can be an effective way to increase human capital accumulation by the poor and improve the average quality of the labor force at the same time that inequality is being reduced.

The second set of policies which is of importance to improve the quality of the labor force is related to the incentives provided by the institutional framework which determines the structure of labor contracts. This affect directly both, the extent to which firms and workers invest in human capital accumulation and thus in the quality of the labor force, and the extent to which workers will provide their full potential labor power. There are three sets of institutions which are of great importance in this context. First, institutions which provide incentives for workers and firms to have short run labor relations. These institutions tend to reduce investment in training by firms and so the quality of the labor force, since investments in training (except very specific human capital investments) are embodied in the workers and

can not be appropriated by firms unless the worker stays in the firm.

Second, institutions, which are unable to generate a peaceful relation between capital and labor, also tend to reduce the quality of the labor force.

Finally, institutions which create incentives for the workers to increase effort and productivity, as payment schemes based on productivity, cooperative capital-labor relations, are also very important instruments to improve labor force quality, and thus reduce poverty and increase welfare.

Policies aimed to increase job quality are also of great importance to improve welfare of workers. These are policies directed to increase the quality of the jobs, per se, as well as the bargaining power of workers. Quality of jobs is directly related to the amount of physical capital available in the job. For this reason, policies which induce increases in the rate of investment are important instruments to reduce poverty and to increase welfare.

The second set of policies which can increase welfare and reduce poverty contains those aimed to increase workers' bargaining power. Also in this case, it is important to avoid those institutional frameworks which increase the average bargaining power of workers, but also increase inequality. Centralization of some aspects of the collective bargaining process is one example. However, a rigid centralization of collective bargaining can also generate rigidities in the labor market which can increase unemployment, and therefore should be carefully implemented.

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