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Education and the Urban Labor Market in Colombia

A Comparison Between the Modern and Non-Modern Sectors

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INTRODUCTION

With this new monograph the Socio-Economic Area of the Regional Population Center, (CCRP) presents, for the readers' consideration, the principle results of a pilot study carried out in Colombia and whose basic objective was the measurement of the effects of education on the country's economic development; special emphasis is given to the differences between the modern and non-modern sectors.

The importance of this theme in evaluating the possibilities of socio-economic advancement of the population does not escape the attention of the CCRP, nor does its relevance for the analysis of the dynamics of human resources in the future. In fact, this monograph is part of a larger group of studies on the relationship between the population and the human capital incorporated in it, and its impact on development. These studies are presently being carried out by the Socio-Economic Division.

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EDUCATION AND THE URBAN LABOR MARKET IN COLOMBIA
A COMPARISON BETWEEN MODERN AND NON-MODERN SECTORS

This work presents some of the results for Colombia, which originated from the Pilot Study on Education and Development, funded by the Program for Joint Studies of Economic Integration for Latin America (ECIEL) and conducted by the Regional Populatio Center, Incorporated (CCRP), of Bogota, Colombia.

Its purpose is the analysis of the role of education in economic development. In particular, it studies the effects of schooling on those workers who at one time had been involved in the urban sectors which could be called non-modern, because of their technological characteristics and the degree of social division of labor.

The effects mentioned in the study primarily refer to the impact of education on the distribution of income from labor and on occupational and sectorial mobility.

The literature of the social sciences related to economic development themes, makes frequent allusions to relatively importa strata of the labor force which have little participation in the process of economic interchange. To these strata, names are given such as marginal, informal backwards, traditional, low productivit precapitalist, etc. When we examine that which the different groups studied have in common, we find some concept of poverty, although defined in a manner which can be more or less arbitrary. To find other points in common is more difficult, but at least the are allusions to the labor market which state that these groups are part of a labor force with little access to the means of production.

In this study, the possible existence of "dualisms" in the urban labor markets in Colombia is explored. Directed to possible

cases in which there is little access to the means of production, and therefore, low average levels of work productivity, the analysis of the following concepts is proposed:

i) The possible existence of technological dualism.

ii) The way in which this would be reflected in the remuneration of work and the effects of schooling on it.

With the general focus of the theory of human capital(Becker, Mincer), we analyzed: (i) Earnings functions for different segments of the urban labor market in Colombia. (ii) Mobility functions between different sectors of the economy, attempting to establish the extent to which occupational and sectorial mobility of the labor force has been sufficient, inadequate, or excessive for the attainment of the equalization of salaries and productivity in the economy, and to what degree differentials in earnings between the sectors continue, which cannot be expalined by the individual characteristics which determine the potential productivity of the worker, on the supply side. In particular, we considered the amount of formal schooling and work experience accumulated on the part of the individual.

THEORETICAL CONSIDERATIONS

The impact of education on economic development has usually been measured using either the rate of return method or the manpower requisites approach. The first method assumes that wages are equal to the marginal productivities and that the different work categories, classified by years of schooling, can be substitute in production. The second technique assumes that there are fixed coefficients of production between different types of work and therefore, there is no substitution between them. Both assume perfect mobility of manpower, in order to locate itself in the sector in which its productivity is greatest, and supposes perfect competition in the labor markets.

The specific objective of determining the effects of education on the labor force in the non-modern sectors required the analysis of the functioning of the labor markets and the other ways in which people use their labor power in the production of goods and services. The analysis of human capital, as we have already indicated, explains differentials in productivity and earnings through the worker's characteristics. It is also necessary to take into account the demand for labor, be it exercised directly through the markets, or implicitly as in the case of independent workers. With a theoretical framework which takes into account both the personal characteristics of those who use their manpower, as well as the technological and productive characteristics of those who require a labor force to produce, it is then possible to better explain the functioning of these processes, pointing out the sort of interaction which takes place and in particular the effects of education on the productivity and the earnings of the labor force.

It must be recognized that in a market economy, such as Colombia, labor markets exists where supply and demand interact to determine quantity of labor and earnings. Even in the cases where there is no explicit demand for labor, as is the case of independent workers from whom goods and services are demanded directly, the analytic expedient of a derived demand for labor which depends on the demand for goods and services and equals the observable supply of labor, can be utilized.

By making explicit this type of analytic system, we may distinguish possible differentials in productivity rates, salary differentials, and even differentials between marginal and average productivity; it is also possible to determine the causes of each of these differentials.

The distinctions made here and the possibility of identifying them empirically has important implications from the point of view of evaluating the potential of different socioeconomic policies, among them the educational development policies in

effect in the country since the last decade, and those more recently directed towards the "marginal" sectors. Certain types of policies could yield adequate results when a dualism is recognized in which the two sectors of the economy suffer an almost total absence of channels which connect them, but would be ineffective if it were ascertained that there are various sectors which differ amongst themselves in some fashion, but which also have important elements which link them.

Along this line of analysis, the role of education as an instrument of improving productivity of the labor force has frequently been stated, as well as questioned, in the sense that the differentials observed are said to be due to circumstances which are different from education properly speaking, but which are covariant with it. It is therefore important to "filter" the effects of education , for example, on earnings or on the selection of the individual's occupation, from the effects on these same variables that can be attributed to other circumstances related to socio-economic background, or special conditions which confront the diverse labor markets.

If we wish to speak about the impact of education on development, it is necessary to clarify the relationship between education and the productivity of the labor force. However, to begin quantifying productivities entails functional problems which at times are insurmountable. Therefore, it is necessary to seek approximations to measurements of productivity through concepts which can be observed more readily. In this sense, in a sectorial analysis, where the sectors present an order in terms of the productivity of work, intersectorial mobility provides some information about changes in productivity. It is useful to keep in mind, moreover, certain aspects of occupational mobility because an adequate classification of occupations can illustrate differential contents of productivity. In general, the more advanced productive activities exhibit an occupational content representative of a certain division of labor which does not take place in relatively backward sectors.

On the other hand, even when there are divergences between earnings and the marginal productivity of labor, certain types of relations always persist between these concepts. By analyzing the former, light is shed on the latter. This is particularly true when knowledge is added regarding the possible distortions between earnings and work productivity, both of which presumably vary between sectors.

In referring to education as an element which affects the productive capacity of the labor force, it is understood that education is part of the "training" that people receive in order to fulfill their productive roles in society. There are other types of instruction which must be taken into account in this context, since forms of education other than the classical system are increasingly being institutionalized and these can bear greater similarity to processes of on-the-job training or apprenticeship than to processes of formal education. All of these methods of training capacitate the individual for his or her productive activity and cannot always be differentiated explicitly. However, to the extent that they may be considered as being distinct from each other, it is possible to evaluate more concisely their respective effects and compare them to each other.

To obtain information which would permit the analysis of the themes mentioned above, a survey representative of the urban labor force in Colombia with some employment history was conducted (See Appendix I). This was done to compile data on the occupational and educational histories of the labor force residing in the country's urban areas (cities with more than 30.000 inhabitants). The sample excluded persons who were seeking their first job because they lacked an occupational history, and working people whose primary activity was study, not having completed their formal education, the effects of which we sought to measure.

SECTORIZATION IN THIS STUDY

Existing simultaneously, in urban areas are modern (capitalist) sectors and non-modern sectors, the latter based on wage-earning work with low productivity, or on workers who hire themselves out temporarily, and domestic help. This is on the one hand, a situation inherited from the past and, on the other, a result of development to the extent that this process brings with it an increase in the supply of urban labor which cannot find employment in the modern sectors of the economy.

In order to subsist, this excess population depends on transfers from other family members or on marginal activities with low social productivity. However, these activities can generate sufficient income for a good number of people in handicrafts, domestic or personal service, and in the small-scale commercialization of consumer goods, especially foodstuffs. These are defined, in the context of this study, as the non-modern (urban) sectors.

It is our intention to relate the sectors defined here with the productivity of labor, which increases as labor is utilized together with larger quantities of other basic factors. Thus, we can distinguish a stratum of the labor force which will be called: the Marginal Sector, because it utilizes minimal or almost non-existent quantities of other factors in its productive activites. In this group, there is virtually no division of labor and the activity is notably uniform for each individual. One would think that in a society which is progressing and expanding its level of technological and economic development, this type of activity would tend to disappear But in these intermediate stages of development, the opposite phenomenon is temporarily present, if the expectations of location of the supply of labor exceed the capacity for transmission and expanding technological development. The members of the labor force who are involved in these activities, do not do so because such has been their expectation, but because circumstances generated within the system lead them to do so. Those who confront this situation have low incomes and cannot attain placement within

the more productive sectors of society. The economic activities which have flourished are domestic service, other personal services, small-scale commerce relating to the sale of food and other consumer goods in the large cities, often in open air markets or by ambulatory vendors.

At the other extreme, using technologies which are intensive in factors other than pure labor, we find people engaged in relatively specialized activities. These activities are part of more or less complex processes in which large quantities of inputs are brought together to obtain the final product. There is great division of labor, with ascending hierarchical levels according to the role played in the organization of subordinates and the responsibility taken in decision-making. This type of organization results from processes which can only operate efficiently on a large scale.

In these organizations, significantly greater productivity is generated than in other cases. Companies, to operate at this level, must necessarily have easy access to the financial markets, and can offer more attractive positions among other things because, given their size, they are subject to all the labor legislation in effect in the country. These laws include a series of benefits such as vacations, bonuses, severance pay, medical services, retirement pensions, etc. Within this type of activity, the government and state-owned companies must be considered separately because they do not follow the criteria of profit maximization and the corresponding characteristics of the generation of employment: occupational structure, salary levels, etc. and, although they partially respond to the overall level of economic activity in the country, they are also influenced by a series of factors which can be differentiated from those which are important in private enterprise.

This whole sector, which can be called Modern, presents the most important perspectives in the nation's development. It is the sector which offers the greatest possibilities of high

productivity, since through it the expansion of the market can occur, and the greater benefits of the economies of scale inherent in these processes can be obtained. In between the two groups mentioned above, there is a series of intermediate activities. These are characterized by their execution using a certain type of equipment or machinery and by the fact that a certain level of skill is required to do so. In these cases, there are teams of people who perform differentiated jobs in a productive process, but who generally do not reach the levels of specialization nor the operational size which are present in the modern sector.

The size of this intermediate sector depends in part on the point at which one begins to define the modern and marginal sectors. In this respect, the possibility must be considered that certain activities - which in a country like Colombia must be classified as modern - in a more developed society could well be termed non-modern. This is because the feasibility of a certain technology in a society depends on the endowment of the factors of production in it. This group includes all those which are called traditional activities, but in a more restrictedsense than usual. That is to say, they are considered to be those activities which, although they demonstrate a relatively high level of development, are executed in groups or individually, but with some degree of skill. These activities, carried out at a small operational scale, can prove to be efficient, as currently observed.

This classification of the productive activities in the economy into three groups: Modern Sectors, Marginal, and Intermediate or Traditional Sectors, has as its objective the analysis of the impact of education on productivity and earnings in a way that will overcome some of the criticisms which have been made to the traditional methods of approaching the problem.

EARNINGS FUNCTIONS

In order to evaluate to what extent mobility in the labor market is sufficient to achieve the equality of wages between sectors of the economy which are differentiated by technology and the proportion of factors which they use, and its effect on increasi the impact of education on productivity and earnings, earnings functions have been estimated for men and women in different segments of the labor market, of the form[1]

$$\text{Log } y = a_1 + a_2 . Ed + a_3 . Exp + a_4 . Exp^2$$

where

y = Monthly earnings (in tens of pesos)
Ed = Years of formal schooling
Exp = Years of accumulated experience

The concept of earnings used was designed based on the information from the survey. Earnings were defined as the monthly balance received from the worker's principal job as a wage earner, plus additional earnings in secondary jobs, plus the income received from independent work, or from being self-employed. To this amount the monthly (1/12) of the bonuses and annual severance pay earned as a social benefit was added, along with transportation and family allowances, plus the pay received monthly in cash as part of wages, if the individual works as a wage earner.

Monthly earnings are used, and not by the hour, since the object is to evaluate the macro effects of schooling on the national product. This effect can be broken down into an increase in the productivity per hour and a reduction in the hours worked per month: monthly earnings covers both, while hourly wages excludes the

[1]For a discussion of the derivation of this function see Mincer. a_2 represents the average rate of return for education. a_3 and a_4 are coefficients which embody the returns of on-the-job training.

second factor. It must be remembered that under these circumstance the estimated return for schooling tends to be larger when earnings per hour are used, and the differentials between the modern and non-modern sectors would also be larger.

The concept of incomes used as applied to independent and self-employed workers, especially in the non-modern sectors of the economy, does not only represent income from labor. It also includes some components of rent and return on capital. However, given the low level of utilization of factors other than labor on the part of these workers, and the competitive nature of their activities, their incomes are basically remuneration for labor. As long as the proportion of income from labor to other income remains constant among workers, no bias is introduced in the coefficients; should this proportion vary, but not according to education or experience, bias is only introduced in the independent term.

Besides taking into consideration the years of schooling, whose coefficient represents the average rate of return for schooling when the direct costs are trivial, it is also worthwhile to consider the variations in the rates of return for different levels of schooling, since the evidence regarding it is not conclusive. While Schultz (1969) and Selowsky (1969) found decreasing social rates of return by level of schooling at the primary, secondary, and university levels, Kugler (1975) found the rate of return for primary education to be lower than that of secondary, but found no significant difference between secondary and university level. Although the differences in these studies can be explained by the fact that the first two consider social return, and the third looks at private return, another factor which could explain the differences is the high sensitivity of the rate of return for primary schooling to the opportunity costs of people with low levels of schooling and experience, costs which are very difficult to measure precisely.

As a measure of the years of experience, this study utilized

the aggregate of the continuous or discontinuous years of experience in all jobs. This permits a more precise measurement of the effect of experience, which is underestimated in other studies, especially for persons who do not remain regular members of the labor force during their productive years.

In the analysis of the statistical significance of the differences between coefficients or groups of coefficients for different segments of the labor force, the F-test (Chow) was applied.[2]

RESULTS

The results obtained show clear differences of average earnings at the intersectorial level (See Table No. 1). The average salaries and wages are larger in the modern sectors than the average earnings or income in the non-modern sectors. The overall differential of income between sectors is of the order of 47%. In the earnings functions, there are also significant differences; in the modern sectors the rates of return for schooling are larger than in the non-modern sectors. Upon attempting to explain these intersectorial differences it becomes apparent that by holding sex, schooling and experience constant, the difference in average earnings disappears and, in general, no significant differentials are observed. Not even the fact that social benefits are present with greater frequency in the modern sector than in the non-modern is noticeable when the

[2]The test of differences between groups of coefficients in two regressions is given by the statistic:

$$Fn_1n_2 = \frac{(SSr - SSp) / (Nr - Np)}{SSp / Np}$$

where SSr is the sum of the errors squared of the regression where the coefficients to be contrasted are restricted(i.e. take the same value for each group) and SSp is the sum of the errors squared of the unrestricted regression, that is, that in which the coefficients can differ between groups. The degrees of freedom are n_1=Nr.Np and n_2=Np where Nr and Np are the degrees of freedom in the restricted and unrestricted regressions, respectively. For more details regarding this test see Fisher.

average earnings of persons with equal levels of schooling and experience are compared.

It can be observed that a large part of the overall differentia between sectors is associated with differences in educational and age make-up in their respective labor forces. People with lower educational levels are prevalent in the non-modern sectors. Sixty percent of the labor force who have at best completed primary school are in the non-modern sectors while of those with some secondary schooling, or more, only 20% are to be found in these sections. The relation between years of education (modern/non-modern) is 1.45 for men and 1.92 for women.

Differences in composition by sex between sectors are also noticeable. While women represent 27.5% of the labor force in the modern sectors, the proportion of women reaches 37.8% in the non-modern sectors. This explains, thus, part of the differential by sex is such that, even in the modern sectors, where women have a higher average level of schooling than men (8.25 vs. 6.97), their average earnings are still lower.

EFFECTS OF EDUCATION AND EXPERIENCE

The principal results of the regressions of monthly earnings against education and experience by sectors, using the sample of 3,264 workers residing in cities with 30,000 or more inhabitants, appear in Table No. 2.

We can observe that the coefficients are very different from zero and show a certain variability between sectors. The explained variance ranges from .374 for the men in the modern sectors, to .087 for women in the non-modern. In the latter, other variables explain the disparity observed in earnings. From the regression, we can see that the earnings of persons without education and experience present a differential on the order of

25% for women, between the modern and non-modern sectors. This same differential has a variation rank of the order of 2% in the case of the men, which shows a relatively small differential of income for "pure" labor between sectors.

The coefficients of education and experience show an overall rate of return for education of 11.4% and a net impact of 6.75% for the first year of experience, and impact which decreases due to the effects of obsolescence and depreciation of human capital, at a rate of 0.2% per year on the average, taking the 3,264 cases of the urban sample in 1975.

When the sample is broken down by sex, education and experience have less effect among the women. The differential in the rate of return for education between men and women is 2 percentage points and the differential in the net impact is initially (0 years of experience) 1.3 percentage points, and decreases more rapidly among the women. This leads to a situation in which, with 20 years of experience, the impact of an additional year in the case of men is 2.6% and for women, only 0.7%. The differentials between sexes in favor of men, can be associated with differentials in quality and orientation of the education received and with the type of positions filled by each sex within the labor market. Within the educational system, as well as within the labor market, these results can be explained by discriminatory social practices against women. However, it does not become clear how much of this is due to the quality of the education received and how much of it is due to the type of work experiences. In the latter case, the differentials can also be explained by the discontinuous and instable nature of the involvement of women in the labor force. Both cases reflect the fact that women are relegated to occupations with a lower learning content than equivalent male occupations for equal levels of

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[3]The marginal rate of return for education is equal to the coefficient of the years of schooling ($r_{educ} = a_2$) and the net impact of an additional year of experience, given the quadratic form of the function, $r_{exp} = a_3 + 2a_4.Exp.$, which depends on the accumulated experience.

schooling and experience (in years). This is also reflected in earnings.

By breaking down the survey by sectors, a variability in the rates of return for education and in the net impact of experience becomes apparent. The results obtained by the regression of the logarithms of income vs. education and experience, permit the testing of the hypothesis of equality of all the coefficients between sectors. The coefficients of determination were also included (R^2). This coefficient measures the fraction of the disparity of earnings (variance of log y) which can be attributed to disparities in human capital considered in the analysis (schooling and experience). The first step was the consideration of whether the disparity of the distribution of human capital, in the modern sectors, explained the same proportion of inequality in earnings as the disparity in the distribution of human capital in the non-modern sectors. The second step was the study of whether differences exist within these sectors, between the public and private subsectors and the modern sectors, and between the marginal and traditional subsectors of the non-modern sections. The results of this contrast of hypotheses shows that the disparities in human capital explain a larger proportion of the distribution of earnings in the modern sectors, for men as for women. The variance in earnings explained by the model, varies from .374 for the men in the modern sectors to .087 for the women, in the non-modern. This means that an improvement in the distribution of human capital, if the rates of return on this capital remained constant, would tend to have a greater impact on the distribution of earnings in the modern sectors than in the non-modern. In considering the differences explained by the model, within these two sectors in the case of the men, no significant differences are observed between the public and private subsectors of the modern sectors, although the explained variance of earnings tends to be greater in the private subsector. Significan differences are observed, however, between the traditional subsector (.311) and the marginal subsector (.130) in the non-modern category.

In the case of the women, there is very little difference in

this respect, between the marginal and traditional subsectors of the non-modern sectors. In the Modern Sectors, there tends to be a larger explained variance for the model in the public sector than in the private, a tendency contrary to that of the male case, such that when both sexes are considered together, there are no significant differences between the component parts of the modern sector.

In terms of the coefficients, when the earnings functions for different strata or segments of the labor market, identified by the degree of technological advancement (modern/non-modern) and by the level of social organization of labor (public-private, marginal-traditional) are estimated, the preliminary results show that there are significant differences in one or more of the coefficients between the modern and non-modern sectors, and within the latter between the Marginal and Traditional subsectors. (See Table No. 3) The next step, therefore, is to identify the differences in the effect of the different components of human capital between sectors, considering each separately, in particular, education as measured by years of schooling and the experience accumulated by an individual in his or her working life.

The contrast of the hypothesis of equality of the rate of return for education between sectors is the most important test in the evaluation the existence of a differential impact of education on earnings, for different sectors or segments of the labor market. This hypothesis is rejected in the male sample, comparing the modern and the non-modern sectors. For the men, the differential in the rate of return is of the order of 35%, in favor of the modern sector (.123 vs. .091). The hypothesis of equality, in the case of the women cannot be rejected, since in their case the average rate of return for education is, statistically speaking, significantly equal in the two sectors (.073 vs. .081).

Within these sectors, no significant differences are observed in the return on education, comparing the public and private subsectors or the modern sector (.105 vs. .11), nor between the

marginal and traditional subsectors of the non-modern sectors (.096 vs. .088), except for women. In their case, a large difference, but which is hardly statistically significant, is observed in favor of the marginal subsector (.10 vs. .042).

Regarding the differentials in the average rate of return for education, these results suggest that the breakdown of the labor market into modern and non-modern sectors makes a significant contribution in explaining the impact of education on earnings. The same does not occur when these sectors are broken down into public and private or marginal and traditional.

The total years of experience (whether continuous or discontinuous) in the labor market is another component of human capital incorporated to the individual and taken into account by the model. When we consider the hypothesis of the equality of the effect of experience between sectors, we find that this hypothesis cannot be rejected between the modern and non-modern sectors, nor within the modern sector, between the public and private subsectors. However, this hypothesis can be rejected within the non-modern sectors where, for men as for women, the effect of experience is significantly greater in the traditional subsector than in the marginal, which is associated with services which require relatively little training. Here, the breakdown of the non-modern sectors (marginal/traditional) is indeed relevant to the analysis.

The study of the causes of the differences in the impact of education by sector leads us to inquire as to the characteristics of the labor force, in the different segments of the market. For such it is useful to examine the levels of education and experience for each sector, since there are important differences in this respect. In terms of education, for example, beyond the fact that education in the modern sector is 35% more profitable than in the non-modern sectors, the average level of schooling is 45% higher (almost 7 years of schooling compared to 4.8 in the non-modern sectors). The differential between the public and private subsectors is much smaller (on the order of 10%) and the differential between

the traditional and marginal subsectors is on the order of 30%. These differentials in schooling are generally greater for women than for men. It is worth emphasizing that the women who work have the same educational level as working men, approximately 6 years of schooling, such that the observation that women have average earnings which are inferior to males because their educational levels are lower, is not valid.

This is not the case for experience. Working women have, on the average, less than half the average accumulated experience of working men: 8 years for women compared to 17.3 years for men. This differential is partially explained by the recent increases in the rates of participation of young women in the labor force, and by the intermittent nature of their connection to it. If to this we add the fact that the opportunities for on-the-job training are fewer in the female occupations than in the male, we find that in seeking an explanation as to why the average female salary is inferior to the male, the lesser experience of women is an explanation more in keeping with the facts than the supposedly lower level of education which, as we have seen, is false.

The results obtained in the empirical analysis indicate that until now, significant differences are only present in the effects of education in the case of men between the modern and non-modern sectors, in the case of women between the marginal and traditional subsectors and that there are only differences in the effects of experience in the case of women for the marginal and traditional subsectors.

The effect of experience which is considered by means of a quadratic function, permits us to take into account the effects of obsolescence and depreciation of human capital on earnings, while the specification of the effects of education only permits the measurement of the average rate of return for one additional year of schooling for the whole range of variation for these rates. However, the differentials obtained between sectors can depend on

the composition in terms of education and experience in each sector, if the rates of return vary with levels of schooling and experience and if there is some interaction between these two. This interaction is suggested by the theory, in that higher levels of schooling permit faster learning through experience.

To take this possibility into account, contrasting hypotheses were posited regarding the differential effects of the human capital incorporated in the individual on earnings, holding the level of schooling constant. By considering all the sectors together, and breaking the sample down by sex and level of schooling, significant differences in the effects of human capital on earnings were observed between primary and secondary school, for men as well as for women, but not between secondary and university level (See Table No. 4). The results suggest that the variability of education and experience partially explain the sectorial differentials in earnings, direct as well as indirect, through the rates of return for education and experience. These findings can be observed in Table No. 5.

There are interesting differences for the various levels of schooling. For example, the rate of return for education for women does not vary with the level of schooling (approximately .085), but for men, it is greater for higher levels of education (.82,.106, .183), although the differences between secondary and university level are not statistically significant. In the case of the effect of experience (by carrying out the joint test on the coefficients of Exp and Exp^2), for men as well as for women, is greater for secondary level than for primary. It is not significantly different between secondary school and university.

When level of schooling is held constant, these results acquire great significance, when joined to the previous findings, held constant by sector.

The sectorial differentials which have been noted, such as the different rates of return for education between the modern and

non-modern sectors, are explained in part by the differential in the rate of return by levels of schooling, given that: in the modern sectors 51.4% of the men and 88.7% of the women have some secondary school or more, while in the non-modern sectors, only 21.7% of the men and 10.9% of the women reach this level. The results obtained indicate that in the case of the women, the educational composition by sector does not affect the average rate of return for education, since it does not vary with the level of schooling. In the case of the men, this educational composition does affect the differential in the rate of return by sector, because the return on education is greater at higher levels of schooling. This tends to increase the average rate in the modern sectors, over the non-modern, due to the greater proportion of people with some secondary schooling or more in the first group. Significant differences exist, therefore, between sectors, for men, in which the educational composition is important because the rate of return for education is greater for higher levels of schooling. The differences are not significant among women, where the educational composition is not important, because the return on education does not vary with the level of schooling (See Tables Nos. 6 and 7).

In summary, the rate of return for education which is larger at higher levels of schooling, which can be seen in the case of the men, but not women, would seem to indicate a situation of disequilibrium in which everyone would seek, for motives which are purely connected to personal profit, to obtain as much schooling as possible. This is conceivably the most important disequilibrium, in its effect on education and on the labor market.

The coefficients of education represent the rates of return, when the direct private cost of education is negligeable. These costs,even when low for the primary level, can reach an important magnitude when compared to the indirect cost components. If this is true, although in a lesser proportion, for other educational levels, the previous ranking would be re-inforced.

This order, which was found for the labor force in 1975, is different from that which was found for Colombia in the first studies on returns on schooling, done in the 60s', in which return was larger at the primary level than at the secondary, where profitability was in turn larger than in higher education. The results could be consistent if, over time, there were decreases in the rate of return for education which were larger for higher levels of schooling. In the occupational histories which were studied in the survey carried out for this project, there is evidence that would seem to confirm this tendency, as is discussed later.

According to earlier results, sector and level of schooling must be held constant simultaneously, in order to adequately measure the effects of human capital incorporated in individuals, in different sectors of the economy. The differentials between modern and non-modern sectors diminish and become less significant when levels of schooling are not significantly different between sectors, except for women with secondary education. Moreover, the effect of experience when educational level is held constant is statistically equal in modern and non-modern sectors.

ADDITIONAL CONSIDERATIONS ON EARNINGS FUNCTIONS

Besides the considerations which until now have been given to the type of elements which must be taken into account in earnings functions, it is reasonable to argue that other factors exist which must also be considered. Thus, we can view as determinants of earnings such factors as socio-economic background (Blau), the capital endowment of the independent workers (Chiswick), and the aspect of location, among others. The three mentioned above have been taken into account in this study and shortly we will discuss to what extent they are related to the central aspects of this work.

In an earlier work (Kugler, 1973), it was found that the

original specification of the model of human capital had maintained its validity even though it had taken into account the socioeconomic background of the person, since this, in the case of Colombia, was highly influential in determining earnings, but mostly through the level of schooling of the people, and to a much lesser extent, directly.

These results were confirmed here, after trying out various specifications of socioeconomic background. The largest additional explanation attained included binary variables for the education of both parents. In any event the remaining coefficients (educatio and experience) did not suffer significant alteration such that the results obtained previously remained in effect.

In considering the case of the independent workers (and the owners) it can be argued that the earnings which they report are not only the result of labor. They also contain return on their own capital, which is invested to allow them to carry out their labor activity. Due to the fact that in the non-modern sector 60% of the labor force is independent, while in the modern sector this proportion is less than 10%, the consideration of these sectors can play an important part in this analysis: it is possible that an intersectorial differential of earnings is confused with, or compensated by, a differential associated to the returns received by the independent laborers.

Some of the results which refer to the differences between wage and salary earning employees, and independents, appear in Annex No. 3. Firstly, considering the aggregate sample, there are no differentials which are statistically significant. When the sample is broken down by sex and sector we begin to find significant differences: the independent workers show greater incomes than the wage and salary-earners and in similar categories, the workers of the modern sector have higher incomes than do the workers in the non-modern sectors. The only exception is women in the modern sector, in which there are very few independents.

Most of the differential can be explained by possible

returns on capital. Assuming that salary and wage earners and independents compete in the same labor market, then the difference in the constants in a regression for education and experience, can be interpreted as part of the incomes of the independents which can be attributed to capital. The participation of capital is found to vary between 16 and 32%. It becomes larger in the modern sectors, since it is in these that most of the owners and executives who manage companies with a relatively high capital investment, compared to the quantity of labor and human capital incorporated, are to be found.

The effects of experience are different according to sector. With respect to the independent workers, there is a profound contrast between the relatively high amount of effect attributable to experience in the modern sector, and the low amount in the non-modern. In the first, the effect on the wage and salary earners was disregarded and the area of concentration was primarily the managerial skill acquired. In the non-modern sector, experience in the case of the regular employees plays a more important role than does experience among the independents, indicating that the independents are placed in services with low productivity where the learning opportunities are scarce.

On the other hand, the differences in the return for schooling are negligeable within the sectors, although for men a higher rate for the regular employees as compared with the independents was found overall. In the modern sector, the rates of return for education are higher, for salary and wage-earners as for independents, than in the non-modern. This is one of the most noticeable differentials which would seem to be explained, as was the case with other differentials found earlier, by the distinct educational composition of the groups.

Given that economic development and the process of modernizing the productive apparatus have regional disparity, this study contemplated determining whether there were differences in the effect of education and experience on earnings in different

cities in the country, grouped according to size or level of urbanization. If there were differences in the educational compositions, and by age and sex, in the labor force divided by city, then there would also be differences in the level and disparity of earnings. However, an attempt was made to see if the proportion of this dispersion of earnings varied from one location to another and if the effect of the components of human capital, taken into account, varied with the level of urbanization.

In considering the hypothesis that there were no significant differences in any of the coefficients for different levels of urbanization, the results obtained showed that the earnings explained by the model are significantly equal at all levels, for men as well as for women. They also showed that the effect of experience did not show significant differences between levels and that the rates of return for education among men tended to be slightly greater in large and intermediate cities than in smaller ones, although the differences were not statistically significant. Among women, there were no significant differences by level of urbanization.

The results tend to confirm that sufficient geographic mobility of factors, or flexibility in the prices of the products, exists to adieve equality in the price of the factors between regions or cities, in spite of the different educational composition of the supply of labor.

MOBILITY IN THE LABOR MARKET

In the previous chapter, we analyzed the extent to which the mobility of manpower has been sufficient to achieve the equality of earnings in different sectors of the economy, for equal amounts of work. Before drawing the final conclusions, it is worthwhile to describe the occupational and sectorial mobility observed in the sample.

The labor force covered in the study had been the result of the natural demographic growth of the cities and of the rural-urban migration which has generated a rapid process of urbanization in the country in the last 20 years.

In the "modern" sectors, the growth of the labor supply has been great. An excess labor force has thus been created, and has found employment in "marginal" or "traditional" occupations with average levels of productivity below those which predominate in the rest of the urban economy. The rural migrants, whose education and experiential levels are inferior to those of the workers who find jobs in the modern sectors of the economy, fill the "marginal" occupations which have lower levels of productivity and earnings.

Occupational mobility, through rural-urban migration, in inter generational and intragenerational terms is illustrated by the fact that, although 29.6% of those surveyed were the children of agricultural day laborers, only 11.9% had held their first job in this occupation and only 3.7% remained in it until 1975; and, although 11.9% were the offspring of independent farmers, only 0.6% were thus engaged in that year. More than 40% of the labor force active in 1975, in the macrocosm of the sample, were of rural origin and more than 13% had held their first job in agriculture. Under these conditions, the economy of these cities seems to have functioned with an unlimited supply of unqualified manpower.

On the other hand, the Colombian educational system generated graduates at the different levels of the system, in quantities which apparently were sufficient to meet the growth in demand. Thus, the conditions which predominated in the labor market suggest a high adaptive capacity of supply to the conditions of demand, directly related to the rate of growth in this supply and associated to the incorporation of the new job seekers in the labor force, migrants as well as non-migrants. Between 1964 and 1973, in the Colombian urban areas, the labor force without education grew at a rate of 7.8% of year and the groups with secondary and university level education, especially women, grew at rates which were substantially higher than the rates for groups with primary

schooling, which is the largest in the work force (See Table No.8).

Given that the principal source of mobility in the urban labor market which is being analyzed is associated with rural-urban migration and with the incorporation of ever more educated members of the work force, the occupational or sectorial mobility needed to equalize earnings in the whole system can be very small as long as the rates of return for education are flexible. The employment histories of those people surveyed for this study indicate that the proportion of the labor force of the two sectors (modern/non-modern) which have been recruited from other sectors including agriculture, by five-year periods from 1955 to 1975, has been small, although it has tended to grow. For example, in the modern sector, this proportion increased from 4.3% of the labor force associated with this sector during the period 1950-55, to 6.9% in the period from 1970 to 1975. The majority of the labor force had been recruited from within the same sector (65-75%), or from among the inactive members who have been incorporated to the work force in each five-year period (16-26%). (See Table No. 10)

With the intention of analyzing the flexibility of the rates of return, an analysis of the occupational histories of persons in the sample, from 1955 to 1975, was presented. Although the differences are not statistically significant, they do suggest several tendencies. In the results for men, two periods can be distinguished: an initial period (1955-61) where the rate of return for primary schooling is greater than that for secondary and another (1965-1975), with the exception of the year 72-73, in which the rate of return for secondary schooling is greater. In the case of women there are only significant differences by levels of schooling in the year 72-73. (See Table No. 9)

This change in the return for education in the male case, would seem to have taken place through a reduction in the return on primary schooling between 1955 and 1975, with the rates of return basically constant for education above the primary level.

The results for women in the year 72-73 indicated that the return on secondary or higher education tends to be very low when compared with the rates for men. This finding is consistent with the norms of growth of the urban labor force in Colombia between 1964 and 1973, by levels of schooling and by sex, since it has been observed that the female labor force, especially that part of it with secondary and university education, has grown at rates which are substantially greater than those for men.

The behavior of the rates of return for education, by sex and levels of education, which is indicated by the analysis of the occupational histories, shows that the incorporation of new persons to the labor force with increasing levels of schooling, over time will lead to changes in the rates of return for schooling. It also indicates the presence of a relatively important elasticity of substitution, between types of labor with different educational levels.

To evaluate the impact of education on mobility, the occupational histories of the individuals surveyed for this study have been analyzed. They point to the existence of an essentially stable equilibrium in the growth of employment, in the modern and non-modern sectors, in the cities included in the sample. A few have grown at the expense of the agricultural sector through the process of rural-urban migration.

The modern sector, which represented 48.8% of the individuals surveyed in 1955, grew to represent 52.7% of all active persons in 1975. The non-modern sector, which comprised 44.4% of all the workers in 1955, fell to 47.2% of the active members in 1975. The relationship between the two tended to remain constant. In analyzing the origin of the recruitment of the labor force in each sector, between 1955 and 1975, with respect to its placement five years earlier, it can be observed that the intersectorial mobility is also very small, and that the sources of recruiting are the same sector, and the group of inactive people who are incorporated in the economically productive population in each period. However,

the charts of intersectorial mobility are interesting.

Between 1955 and 1965, the mobility of the laborers in the non-modern sector to the modern sector increased more in proportion to mobility in the opposite direction. Between 1965 and 1975, however, the mobility of the workers in the modern sectors to the non-modern is proportionally greater than the inverse (See Table No. 10)

These tendencies can be associated with the relative aging of the individuals in the survey and with changes in the factors which determine this flow over the course of the development process.

To analyze the role of education in the workers' mobility, between the modern and non-modern sectors, several mobility functions of the type:

$$M_{ij}^{t} = a_0 + a_1 . \text{Educ} + a_2 . \text{Exp}$$

where:

M_{ij}^{t} = 1 if the person moves from i to j during the period t
0 if not

Educ= Years of schooling accumulated

Exp = Years of experience accumulated

In estimating equations of this sort, by ordinary least squares,[4] the results obtained indicate that the predictive power of the equation is significantly different from zero, in almost all cases and the variables included contribute to decrease the probability of movement from the modern sector to the non-modern

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[4] In this specification, the mean value of M_{ij}^{t} gives the rate of mobility between i and j; to interpret it as a conditional probability it is necessary to estimate it by methods which guarantee a value in the interval (0,1). The estimates by ordinary least squares are a first approach to the problem.

sector, and to increase the probability of movement in the opposite direction. Moreover, an additional year of education has a greater effect, in absolute terms, on the mobility of the workers in the non-modern sectors towards the modern, than on mobility in the reverse sense.

Comparing mobility in the period 1955-65, with mobility from 1965 to 1975, we see that the effect of education does not increase in the case of the men, but in that of the women there is a structural change in the channels of mobility to which the effect of education is incremented, especially in the downward mobility from the modern sector to the non-modern. Experience, although in general not statistically significant, tends to have a negative effect on mobility. (See Table No. 11).

Although the differences in the earnings functions between 1955 and 1975 are not very significant, we can see that the rates of return for education have tended to be larger in the modern sectors, for the men, and in the non-modern sectors, for the women. Accordingly, holding other factors constant, it has been advantageous for women with more education to move from the modern sectors to the non-modern, and for the men to change from the modern to the non-modern.

This tends to confirm the figures for average mobility, for women, it is larger from the modern to the non-modern sectors, than the other way around, in 1955-65, as in 1965-75. In turn, the mobility for men is greater from the non-modern sectors to the modern, than vice-versa, as much in 1955-65 as in 1965-75.

The mobility towards the non-modern sectors increased more in proportion to mobility in the opposite direction, in the decades between 1955 and 1965, and 1965-75, for men as well as for women. It is interesting to note that, in support of the results already noted for the period from 1965 to 1975, the effect of education on female mobility from the modern sectors to the non-modern tripled with respect to the magnitude of the effect in the previous decade, while this effect relative to male mobility suffered changes of lesser magnitude during the two decades in question

SUMMARY AND CONCLUSIONS

This investigation has studied the role of education in economic development, with special consideration of whether differences exist in the effects of schooling on earnings and on mobility in the urban areas of Colombia, between workers connected to the modern and workers connected to the non-modern sectors.

The analytical model is derived from the theories of human capital, which maintains that formal and non-formal education, work experience, and other activities which improve the individual's skills are the factors which determine potential productivity. The hypothesis tested in this study are more closely related to the premises of the theories of human capital with respect to the functioning of the labor markets, than to the demand for education and other forms of human capital, which together with the supply of labor constitute the core of the theory.

The criticism which has been directed at the use of the theory of human capital provided part of the motivation for this investigation. Some of this criticism has arisen, in that the theory of human capital analyzes the effect of the characteristics of the supply of labor without taking into account the demand for manpower. One of the most persistent attacks, in particular, has referred to the possible existence of dualisms, segmentations or barriers to the mobility of labor between sectors, which could limit the results obtained based on the theory of human capital, when it is applied indiscriminately to the labor market as a whole.

To confront some of the critiques which have been formulated regarding this theory, this study took the step of analyzing the impact of education on various sectors which were identified according to technological level and the degree of social organizatic of labor. The analysis allows us to inquire, whether these factors, associated to the demand for labor, add any additional explanation

to the predictions of the theory of human capital concerning the characteristics of the mechanisms for the absorption of labor in the productive process, by levels of schooling and forecasts regarding the earnings which are obtained. The principal results of this inquiry indicate that by breaking down the demand for labor between modern and non-modern according to the size of the firm, whether it is privately or state-owned, and other characteristi of the involvement and occupation of the individual, there are differentials in earnings between sectors. The average earnings in the modern sectors are greater than the average salaries or wages in the non-modern sectors. Significant variations are noticeable in the earnings functions: the rates of return for schooling are generally larger in the modern sectors than in the non-modern.

By holding sex, schooling and experience constant the difference in earnings disappears. Generally speaking, no significan differentials are observed. Not even the fact that in the modern sector there are more benefits than in the non-modern makes a differe when we compare the average earnings of people with equal levels of schooling and experience.

It has been noted that a large part of the overall differentia between sectors is due to the educational composition of the labor force of their respective labor force of their respective labor forces. Persons with lower educational levels prevail in the non-modern sectors. Sixty percent of the labor force with only primary school completed, or less, is engaged in the non-modern sectors, while only 20% of the labor force with at least some secondary schooling is employed in that area.

By comparing the earnings functions between sectors at each educational level the differences which initially appeared are eliminated or minimized. These functions show that people with primary schooling present similar performances, no matter which sector they work in. Something analogous occurs with those who have some secondary education.

By observing the earnings functions, we find that, besides the differences by sex, there are significant differences by educational level. Thus, for the men, the schooling coefficients increase from primary to secondary school, as well as for higher education. If these coefficients effectively represent the rate of return for schooling, this would indicate a situation of disequilibrium, in which everyone would seek the maximum amount of schooling possible. Among women, this is possibly the case and the enormous relative growth of women with secondary and university-level education in the labor force in the last ten years seems to have accompanied these rates of return.

The ordering of the rates of return found in 1975 for the labor force is different from those which were found for Colombia in the first studies of return on schooling, in which the benefits from primary education were larger than secondary, in turn larger than higher education. In this respect, the analysis of the occupatic histories indicates that there seems to have been a decrease in the rates of return for secondary and primary schooling, with the larger reductions occuring in the latter. This indicates the presence of a redistributional process which has reduced the differentials in income attributable to education.

These results are within the lines of classical economics in the sense that the functioning of the market leads to the equality of prices, in this case the income from labor and the return on schooling in the different sectors. The theory of market segmentation at the level of modern and non-modern sectors, as has been posited, becomes questionable, or at least can only be accepted to the extent that the segments are identified with differences in educational level rather than technological differences between the sectors.

On the other hand, even when occupational and intersectorial mobility over the individual's work career seem relatively low, the general composition of the labor force shows substitution and interrelation between different sectors due to the relatively high

number of people who enter the labor force each year.

GENERAL CONCLUSIONS WHICH CAN BE DRAWN ARE:

- In terms of the earnings of the workers and the effects of schooling on these earnings, the intersectorial technological differences do not have any direct implication.

- Sufficient mobility and interaction of markets is encountered such that intersectorial differentials do not arise.

- The fact that the rates of return for schooling decrease over time, indicates the existence of substitutionality between different types of work.

Within the context of economic and social development, the implications of these results must be seen in light of the modus operandi of the different sectors within the economy. The access to subsidized credit on the part of the modern sectors would seem to be the principal factor in the intersectorial differentials. This accessibility facilitates the utilization of complex technologies for production in large volume, with eventual economies of scale in the modern sectors, which entails a certain monopolistic (or oligopolistic) power to the companies in this sector, with a corresponding appropriation of income.

In these circumstances, given two workers with equal qualifications and receiving equal pay, the worker in the modern sector would tend to have a larger marginal productivity, but the productivity differential is not appropriated by the laborer, possibly because of the conditions in effect in the labor and capital markets.

If the increment which has taken place in the educational level of the labor force in the modern sector is considered , it can

be concluded that part of the increase in the productivity of labor accrues to the labor force in terms of an average salary which increases with the higher average level of schooling. However, the potential increases in the productivity of labor resulting from a higher degree of schooling are not fully obtained due to the limited expansion of the modern sectors.

The overall effects of educational policies which have as their goal the encouragement of development therefore appear to be intimately related with the capacity to generate jobs in the modern sectors. It is these positions which can most productively absorb the more educated labor force.

The same impact on average earnings can occur when we look at the absorption of the educated labor force by the non-modern sector, as when we consider the modern sectors. However, in the first case, this also has the role of repressing wage pressures on the modern sectors and in preserving certain incomes in these, through the conservation of a reserve army for the modern sectors. It must be kept in mind, however, that this can impede the accomplishment of the increases in production which more educated manpower can generate, if employed in the sectors with higher productivity.

A P P E N D I X I

THE SURVEY

As a primary source of information for the investigation, a survey was carried out to obtain data concerning occupational, migrational and educational histories of members of the labor force residing in the urban areas of Colombia (cities with more than 30.000 inhabitants). People who were looking for their first job, since they lacked a history of employment, were

excluded from the survey, as were people who worked but whose principal activity was studying, in that they had not yet completed their formal education, whose effect we wished to measure.

Three domains were selected for the sample, differentiated by the level of urbanization. Although there is no systematic data to prove it, circumstantially it can be observed that the type of productive activity and the occupational composition of the labor force is different in large cities (more than a half million inhabitants) as opposed to medium-sized (between 100.000 and 500.000residents) and small cities (between 30.000 and 100.000 inhabitants). In the final sample, the four large cities in the country were included, as were six of the twelve intermediate cities and eight of the twenty-three considered small. The designed size of the sample (3.200 effective inquiries) was selected such that the composition of the population by levels of income, educational level and sex could be adequately estimated for each domain. Of the 3.200 inquiries, 1.200 were projected for the large cities, 1.200 for the medium sized, and 800 for the small ones.

The questionnaire was composed of nine parts, including: i) Geographical distribution of the questionnaire. ii) Selection of the informant; this was done by a system of weighted probabilities according to the relation with the master plan; iii) Personal characteristics of the informant, such as age, sex and place of birth; iv) Informant's employment data. Questions designed to identify occupational characteristics and characteristics of the firms where the respondent had been employed were included; information on the means of payment for work and on the possibilities of training within the company was considered, and furthermore, an adequate measurement of earnings was sought, differentiating the questions for salaried employees and those workers who were not on salary, including investment in privately-owned businesses. There was also data on periods of unemployment. v) The dynamics of small businesses. Working under the assumption that these are an important component of the non-modern sectors, questions were

addressed to those persons who in their working lives had owned a business, asking about its history. vi) History of formal education; including the different forms of the same and its duration; location of the institution where it took place, the public or private nature of the establishment, the schedule and reasons for suspending the educational process. vii) History of "out of school" education, including other courses, type, duration and location of these courses. viii) Data on the informant's parents, which contains information on the occupation and education of the parents and data on inheritances. ix) Data on housing, principally financial, since this represents the primary form of savings for most people.

SOME CHARACTERISTICS OF THE SAMPLE

The distribution by age (See Table No. I-1 - Appendix) show a relatively young labor force, although not as young as might be expected given the population structure; only approximately 8% are older than 20, and around 62% are less than 40 years old. This can be explained in part by the fact that people looking for their first job were excluded from the sample, as were students who held jobs, who most probably in their totality had fewer than 25 years of age. The representation of the sample by sex corresponds to that observed in other samples, since it includes 70% of men and 30% of women. The occupation of the father shows that more than 41% of the sample is of rural origin in spite of residing in cities with 30.000 inhabitants or more. The levels of schooling are relatively low, although there are few illiterates (7.1%). At the intermediate level, the classic high school diploma is predominant, with a very low frequency of technical diplomas (1.3% of the sample).

There was some course of informal education in 19.5% of the cases; these courses corresponded to technical courses taken outside of the school system, the average duration of which was between 3 and 6 months, and the same individual could have taken several such courses. Of these courses, 5% of the individuals

surveyed had taken them at the SENA (National Apprenticeship Service), which corresponds to a quarter of all the individuals who had taken informal courses overall. Lastly, in terms of duration, some 8.7% of the total had taken informal courses either continuously or discontinuously for more than one year. Some 61.6% of the sample were salaried or wage-earning workers, the majority of whom were located in the modern sectors of the economy; the same happened with the 21.8% of the survey who worked in the public sector at all levels. On the other hand, 38% of the survey worked in firms with less than 5 workers, of which a high proportion could be found in the non-modern sectors. Twenty four percent of the sample was employed by private firms with 25 people or more which represented more than 30% of the private sector, and as will be seen later, all these companies belonged to the modern sectors. The results would seem to indicate a more egalitarian distribution of income and lower levels of unemployment than usually presented by sources regarding the subject. Only 12.5% had been unemployed at some time during the last year; the exclusion of newcomers to the labor market explains this divergence in part.

Very little mobility is observed in terms of the number of jobs a person has during his or her working life. About 40% of the people surveyed have only had one job in their lives and 70% have had less than 3, while at the other extreme only 4.4% of the sample has had more than four jobs.

In terms of income, 27% of the individuals questioned received monthly income under the legal minimal salary which was 1.200 pesos (US$ 450 annually). On the other hand, 56% of the sample had monthly income of under 2.500 pesos (US$ 937 per annum) which is a rather low level of absolute poverty. Lastly, in terms of duration of employment, 31% of the survey has held their present job for more than 10 years, almost 48% had spent more than 5 years, in their current position and 22% have done so for one year or less.

In general, these results, which appear synthesized in Table

No. I-1, show that the quality of the data is adequate and that the distributions are quite similar to those found in other urban samples in Colombia when differences in coverage are taken into account.

A P P E N D I X II

THE SECTORS

Given that one of the objectives of this study was the analysis of the role of education in different sectors of the economy and in particular to examine whether significant differences exist between the modern and non-modern sectors, all the jobs observed in the occupational histories were classified into four sectors, based on the information collected in the Survey: two modern, one public and the other marginal. For this classification, the concept of modernization was defined in terms of the size of the company, the extent of the social division of labor, and other technological considerations associated with the individual's occupation.

All the government workers at all levels were immediately classified as belonging to the public sector, which was part of the modern sector of the economy. Some 22.4% of the total sample was included in this category. The second step was the inclusion of all persons who worked in companies with more than 25 employees within the modern private sector. This concept covered 18.8% of the sample. Thirdly, all the self-employed workers who did not have a professional or technical occupation were classified at the other extreme, along with domestic help and family help, as belonging to the non-modern sectors of the economy, trying to place in the traditional subsector manufacturing or artisanal activities, and in the marginal sectors

such service activities as personal services and small scale commercialization. Finally, the remaining occupations were classified by[a] direct study of the questionnaire with those sectors wich presented the closest average characteristics. Thus, 52.9% of the sample, according to their last job, was classified in the modern sectors, 21.3% in the public sector and 31.6% in the private; 21.9% was classified in the traditional or intermediate sector and 25.2% in the marginal category.

TABLE No. I-1

SOME DISTRIBUTIONS OF THE STUDY SAMPLE[1]

CHARACTERISTIC	No.	%
Size of sample	3240	100.0
Women	978	30.2
Under 20 years old	254	7.8
Under 40 years old	2022	62.4
Inhabitants of cities with more than 500.000 inhabitants	1240	38.2
Inhabitants of cities with 30.000 to 100.000 inhabitants	1094	33.8
Father with no education	623	19.2
Father with 1 to 5 years of primary	1953	60.3
Of rural origin (father)	1339	41.3
Having no education	229	7.1
1 to 5 years of primary	1611	49.9
1 to 6 years of classical high school course	907	28.0
1 to 6 years of teacher training high school	72	2.2
1 to 7 years of commercial high school course	144	4.4
1 to 7 years of technical high school course	42	1.3
With some course of informal education	632	19.5
With courses at the National Apprenticeship Service	163	5.0
With more than one year of informal education	281	8.7
Salaried and wage earners	1995	61.6
Independents	890	27.4
Owners or directors	132	4.1
Domestic service	128	3.9
In Public sector	709	21.8
In Private firms with under 5 workers	1228	37.9
In Private firms with 5 to 24 workers	528	16.3
Held only one job in lifetime	1303	40.2
Held two jobs in lifetime	1000	30.8
With monthly income under 1.200 pesos (minimum wage)	882	27.2
With monthly income under 2.500 pesos (US$77)	1829	56.4
With more than 10 years in present job	1006	31.0
With more than 5 years in present job	1546	47.7
One year or less in present job	708	21.8
Unemployed at some time during year	405	12.5

[1]Representative of the labor force with some working experience, residing in cities of 30.000 or more inhabitants in 1975.

TABLE No. 1

AVERAGE MONTHLY EARNINGS OF THE MODERN AND NON-MODERN SECTORS BY YEARS OF EDUCATION AND EXPERIENCE, ACCORDING TO SEX

Years of Education	Years of Experience	Men		Women	
		Modern Sector	Non-Modern Sector	Modern Sector	Non-Modern Sector
Total		5324	3887	3044	2106
0 - 4		3060	3210	1706	1541
	1 - 4	1453	1658	1418	1255
	5 - 8	1913	2133	1480	1360
	9 - 15	4247	2740	1566	1591
	16 - +	3105	3740	2309	2166
5 - 6		4560	3782	2402	2526
	1 - 4	2509	1465	2315	1670
	5 - 8	2904	2601	2155	1473
	9 - 15	4524	4269	2629	6526
	16 - +	5274	4810	2780	2149
7 - 8		5356	4242	2786	2024
	1 - 4	2516	1443	2163	1173
	5 - 8	3319	3126	2605	2150
	9 - 15	3739	3473	4597	4753
	16 - +	7963	5836	4657	1666
9 - 10		5118	4161	3211	3985
	1 - 4	2385	2185	2357	2777
	5 - 8	3605	2605	3385	1804
	9 - 15	5813	5992	4633	5962
	16 - +	7518	5601	4242	9000
11 - +		8835	8417	3837	3720

Note: The earnings differential is only significant in the examples with the asterisk, at the 1% level (**) or at the 5% level (*) based on the test of differences of averages.

Source: Survey

EARNINGS FUNCTIONS BY SECTOR AND SEX

SECTOR	SEX	COEFFICIENTS / t - TEST				R^2. F-Test	No.of[1] cases (thousands)
		Educ.	Exper.	Exper.^{2}	Const		
All	Total	.114 (32.7)	.067 (21.7)	-.0010 (14.5)	4.23	.323 518.	3.264
	Men	.119 (28.9)	.068 (18.5)	-.0010 (13.4)	4.26	.329 362.	2.216
	Women	.099 (15.8)	.055 (7.6)	-.0012 (5.5)	4.29	.229 103.	1.047
Modern	Total	.110 (26.2)	.066 (10.6)	-.0010 (16.6)	4.33	.335 304.	1.815
	Men	.123 (25.9)	.064 (13.6)	-.0009 (9.2)	4.31	.374 518.	1.315
	Women	.073 (8.31)	.064 (13.62)	-.0010 (4.74)	4.56	.210 44.	500
Non-modern	Total	.095 (9.14)	.066 (13.48)	-.0009 (9.15)	4.24	.224 139.	1.449
	Men	.091 (10.20)	.072 (12.14)	-.0011 (9.29)	4.29	.222 85.	901
	Women	.81 (6.10)	.045 (4.16)	-.0009 (3.02)	4.33	.0868 17.	547
Marginal	Total	.096 (8.70)	.052 (7.81)	-.0007 (5.12)	4.29	.178 58.	808
	Men	..071 (4.79)	.058 (6.35)	-.0009 (5.11)	4.45	.130 21.	421
	Women	.100 (1.38)	.027 (2.13)	-.0005 (1.39)	4.33	.0874 12.	387
Traditional	Total	.088 (8.47)	.079 (11.01)	-.0010 (7.53)	4.23	.258 73.	641
	Men	.100 (9.14)	.083 (10.64)	-.0013 (7.66)	4.19	.311 71.	481
	Women	.042 (1.59)	.086 (3.40)	-.0020 (2.67)	4.41	.086 5.	160

[1]The number of cases corresponds to the expanded sample for cities at 30 thousand inhabitants or more in Colombia.

T A B L E No. 3

DIFFERENCES BY SECTOR IN THE EFFECT OF HUMAN CAPITAL ON THE DISTRIBUTION OF EARNINGS ACCORDING TO SEX

	COEFFICIENTS OF DETERMINATION (R^2)		TEST OF THE DIFFERENCE OF COEFFICIENTS[1]			
	Modern	Non-Modern	All	Education	Exper.	Independent Term -
Total	.335	.224	10.1(**)	3.35(**)	.16(no)	36.4(**)
Men	.374	.222	7.0(**)	10.6 (**)	.56(no)	-
Women	.210	.086	6.4(**)	.31(no)	1.1 (no)	-
MODERN SECTOR						
	Public	Private				
Total	.274	.364	2.2(no)	-	-	-
Men	.310	.405	.6(no)	-	-	-
Women	.200	.162	2.5(**)	.19(no)	.3 (no)	-
NON-MODERN SECTOR						
	Marginal	Traditional				
Total	.178	.258	5.4(**)	.26(no)	4.93(**)	10,7(**)
Men	.130	.311	3.4(**)	1.48(no)	2.29(*)	-
Women	.087	.859	3.2(**)	3.52(**)	2,32(*)	-

[1]Significant at the 5% level (*), at the 1% level (**), or not significant

Source: Survey

DIFFERENCE BY EDUCATIONAL LEVELS IN THE EFFECT OF HUMAN CAPITAL (EDUCATION, EXPERIENCE) ON THE DISTRIBUTION OF EARNINGS

	VAPIANCE EXPLAINED BY THE MODEL (R^2)[1]			
	PRIMARY	SECONDARY	UNIVERSITY	F-TEST OF DIFFERENCES[2]
Total	.178	.248		4.78(**)
		.248	.341	1.92(no)
Men	.161	.259		6.96(**)
		.259	.330	
Women	.056	.164		2.52(*)
		.164	.129	.70(no)
	NUMBER OF CASES			
Total	1886	1152	243	
Men	1333	713	186	
Women	553	438	57	

[1] In $y = a_0 + a_1$ EDUC + a_2 EXP + a_3 EXP^2

[2] Significant at the 5% level(*), at the 1% level (**), or not significant (no).

Source: Survey

TABLE No. 5

DIFFERENCES IN THE EFFECT OF EDUCATION AND OF EXPERIENCE ON EARNINGS BETWEEN EDUCATIONAL LEVELS (PRIMARY, SECONDARY)

1 9 7 5

EDUCATIONAL LEVEL	VARIABLE	Coeficientes[2]		
		Total	Men	Women
Primary	Education	.082	.067	.083
	Experience	.061	.064	.039
	Experience^2	-.0009	-.0010	-.0008
Secondary	Education	.106	.136	.073
	Experience	.073	.069	.076
	Experience^2	-.0010	-.0009	-.0016
T-test of differences[1]	Education	2.32(*)	12.8(**)	.09(no)
	Experience	5.85(**)	5.30(**)	4.85(**)
Number of cases		3.037	2.045	990

[1] Refers to the difference in the effect of education or of experience between primary and secondary.

[2] The differences are significant at the 1% level (**), at the 5% level(*) on not significant (no).

Source: Survey

T A B L E No. 6

DIFFERENCES BY SECTOR OF THE EFFECT OF HUMAN CAPITAL (EDUCATION, EXPERIENCE) ON THE DISTRIBUTION OF EARNINGS BY EDUCATIONAL LEVEL 1975-76

EDUCATIONAL LEVEL	GROUP	VARIANCE EXPLAINED BY THE MODEL (R^2)[1]		F-TEST[2]	No. OF CASES[3]	
		MODERN	NON-MODERN		MODERN	NON-MODERN
Primary	Total	.167	.160	6.625(**)	782	1093
	Men	.153	.162	2.400(*)	658	664
	Women	.066	.435	2.008(no)	124	429
Secondary	Total	.214	.305	5.167(**)	810	336
	Men	.248	.282	1.930(no)	491	217
	Women	.151	.177	5.028(**)	319	119
University	Total	.338	.291	1.781(no)	223	20
	Men	.310	.290	2.408(*)	166	20
	Women	.127	-	-	57	-

[1] $\ln y = a_0 + a_1 EDUC + a_2 EXP + a_3 EXP^2$

[2] Significant at the 1% level (**) at the 5% level (*) and not significant (no)

[3] Thousands

Source: Survey

DIFFERENCES BY SECTOR IN THE EFFECT OF EDUCATION AND OF EXPERIENCE ON EARNINGS BY EDUCATIONAL LEVEL (PRIMARY, SECONDARY) 1 9 7 5

EDUCATIONAL LEVEL (No. OF CASES)	SEX	SECTOR	COEFFICIENTS		
			EDUCATION	EXPERIENCE	EXPER^2
Primary (1322)	Men	Modern	.077	.057	-.00092
		Non-Modern	.053	.068	-.00107
		Test of Difference[1]	.95(no)	1.29(no)	
Secondary (438)	Women	Modern	.006	.075	-.0015
		Non-Modern	.140	.067	-.00114
		Test of Difference[1]	4.63(**)	.47(no)	

[1]The F-test of differences refers to the difference of the effect of education or experience between the modern and then non-modern sector within the corresponding educational level.

[2]The differences are significant at the 1% level(**), at the 5% level (*), or not significant (no).

Source: Survey

TABLE NO. 8

URBAN LABOR FORCE BY SEX AND EDUCATIONAL LEVEL (THOUSANDS) 1964 -1973

EDUCATIONAL LEVEL	1964	1973	ANNUAL GROWTH RATES (%)
1.Men	1871	2828	5.1
No Education	214	422	7.8
Primary	1212	1604	3.2
Secondary	360	740	8.3
University	85	162	7.4
2.Women	758	1378	6.9
No Education	118	230	7.7
Primary	462	686	4.5
Secondary	173	417	10.3
University	5	44	25.1

Source: Colombian Population Census, 1964, 1973.

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TABLE No. 9

DIFFERENCES BY EDUCATIONAL LEVEL OF THE EDUCATION EFFECT ON THE DISTRIBUTION OF EARNINGS IN THE OCCUPATIONAL HISTORIES ACCORDING TO SEX

Year	RATES OF RETURN FOR EDUCATION			No. of cases	F-test[1]
	All Levels	Primary	Secondary or more		
	M E N				
1955-56	.147	.232	.092	64	.657(no)
1960-61	.134	.179	.167	83	.010(no)
1965-66	.128	.074	.140	98	.415(no)
1968-69	.135	.121	.151	124	.137(no)
1970-71	.158	.141	.184	177	.439(no)
1972-73	.109	.167	.123	238	.490(no)
1975-76	.120	.067	.133	2232	22.2 (**)
	W O M E N				
1970-71	.110	.097	.056	53	.069(no)
1972-73	.190	.326	-.002	73	9.13 (**)
1975-76	.099	.083	.087	1048	.04 (no)

[1]Significant at the 5% level (*) at the 1% level (**) or not significant (no)

Source: Survey

T A B L E No. 10

ORIGIN (RECRUITMENT) OF THE LABOR FORCE IN THE SAMPLE BY SECTOR 1950 - 75

(PERCENTUAL DISTRIBUTION)

SECTOR OF ORIGIN	SECTOR OF DESTINATION									
	M O D E R N					N O M O D E R N				
	50-55	55-60	60-65	65-70	70-75	50-55	55-60	60-65	65-70	70-75
Urb. Modern	73.4	75.0	77.9	74.1	66.7	1.0	3.7	3.8	5.1	8.7
Urb. Non-Modern	2.8	4.5	4.8	4.8	6.3	77.5	78.7	76.1	74.1	63.5
Agricultural	1.3	1.3	1.2	1.1	0.6	1.1	1.0	1.5	1.5	.9
Inactive	22.4	19.1	16.1	20.0	26.4	20.4	16.6	18.5	19.2	26.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Participation in the economically active population in the sample	48.8	51.3	52.6	53.9	52.7	44.4	43.9	44.8	45.1	47.2

Source: Survey

T A B L E No. 11

REGRESSIONS OF SECTORIAL MOBILITY

MOBILITY (Mean)	GROUP	PERIOD	COEFFICIENTS (t)[1]			R^2	F-test(GL)[1]
			Educ.	Exp.	Const.		
			A.Modern - No-Modern				
(.082)	Men	1955-65	-.0077(**) (-2.59)	.0001(no) (.15)	.131	.013	3.56(*) (2.557)
(.158)	Men	1965-75	-.0085(**) (2.58)	.0007 (1.02)	.205	.011	4.41 (2.776)
(.065)	Women	1955-65	-.121(no) (-1.46)	.0037(no) (1.73)	.164	.057	2.71(no) (2.89)
(.189)	Women	1965-75	-.0399(**)	-.0016(**)	.508	.147	12.08 (2.140)
			B.Non-Modern - Modern				
(.159)	Men	1955-65	.0198(**) (3.91)	-.0006(no) (.66)	.075	.029	8.32(*) (2.563)
(.181)	Men	1965-75	.0132(**) (2.55)	-.0035(**) (4.16)	.176	.040	13.24(*) (2.638)
(.033)	Women	1955-65	.0157 (2.79)	.0019(no) (1.32)	-.037	.070	4.57(*) (2.120)
(.060)	Women	1965-75	.191 (**) (3.20)	-.0012(**) (..69)	-.006	.052	5.42(*) (2.197)

[1]The coefficient is significant at the 5% level (**), at the 1% level(*) or not significant (no).

Source: Survey

APPENDIX III

Comparative Tables on the Effect of Human Capital Among Salaried and Independent Workers, by Sector

T A B L E No. III-1

SECTOR	WAGE EARNERS	MEN	WOMEN
Modern	Wage-earners	3352	2450
	Independents	5705	2236
Non-Modern	Wage-earners	1800	1253
	Independents	3090	1577

Source: Survey

T A B L E No. III-2

DIFFERENCES BY OCCUPATIONAL CATEGORY (SALARY/WAGE EARNERS AND INDEPENDENTS) IN THE EFFECT OF HUMAN CAPITAL (EDUCATION AND EXPERIENCE) ON THE DISTRIBUTION OF EARNINGS BY SECTOR, 1975

SECTOR	GROUP	VARIANCE EXPLAINED BY THE MODEL (R^2)		F-TEST[2]	No. DE CASOS[3]	
		REGULAR	INDEPENDENTS		TOTAL	REGULAR
Total	Total	.331	.184	2.00(no)	2607	1849
	Men	.332	.181	4.88(**)	1898	1337
	Women	.294	.074	2.11(no)	709	504
Modern	Total	.289	.400	35.7 (**)	1527	1421
	Men	.307	.420	5.98(**)	1139	1046
	Women	.233	.067	9.99(**)	388	375
Non-Modern	Total	.227	.115	7.01(**)	1080	420
	Men	.228	.092	7.66(**)	759	291
	Women	.110	.085	1.91(no)	321	129

[1] $\ln y = a_o + a_1 \text{Educ} + a_2 \text{Exp} + a_3 \text{Exp}^2$

[2] Significant at the 5% level (*), at the 1% level (**), and not significant (no).

[3] Thousand

Source: Survey

DIFFERENCES BY OCCUPATIONAL CATEGORY (WAGE/SALARY EARNERS AND INDEPENDENTS) IN THE EFFECT OF EDUCATION AND EXPERIENCE ON EARNINGS BY SECTOR 1975

SECTOR	VARIABLE	VARIABLE	COEFICIENTES			
			MEN		WOMEN	
			Regular	Independents	Regular	Independents
Total		Education	.118	.095	.095	.104
		Experience	.065	.059	.058	.021
		Experience[2]	-.0011	-.0008	-.0011	-.0004
		(No. of cases)[2]	(1337)	(471)	(504)	(205)
	Test of Differences[1]	Education	5.00(**)		.16(no)	
		Experience	.88(no)		3.36(**)	
Modern		Education	.114	.110	.083	.054
		Experience	.055	.111	.055	.096
		Experience[2]	-.0008	-.0017	-.0011	-.0028
		(No. of cases)[2]	(1046)	(93)	(375)	(13)
	Test of Differences[1]	Education	.04(no)		37.40(**)	
		Experience	5.43(**)		19.17(**)	
		Education	.075	.069	.062	.109
		Experience	.078	.047	.049	.019
		Experience[2]	-.0014	-.0007	-.0006	-.0004
		(No. of cases)[2]	(291)	(468)	(129)	(192)
	Test of Differences[1]	Education	.07(no)		1.70(no)	
		Experience	2.56(*)		1.53(no)	

[1]Significant at the 5% level(*) at the 1% level,(**) and not significant (no)

[2]Thousands

Source: Survey