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EDUCATION & INCOME DISTRIBUTION : A CASE STUDY OF KOREA

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I. INTRODUCTION

The 1960s saw a widespread flowering of interst in human resources as a basic element in the production of goods and services. Economists concentrated heavily on the human capital factor and its origin. Development specialists generally believed that education, i. e., one typical form of investment in human capital, constituted one of the key elements in economic growth. At the same time most economists were convinced that a more equal distribution of education would be a critical instrument in obtaining a more equal income distribution.

A general skepticism about the role of education also was observed. Boudon, for instance, found that in Western societies, "educational growth as such has the effect of increasing rather than decreasing social and economic inequality, even in the case of an educational system that becomes more egalitarian."[1]

Consistent with this assertion, Thurow has shown that in the United States, a country which is a prominent example of educational expansion, schooling has had only a negligible effect in reducing income inequality.[2]

Expansion and democratization of the educational system have not always gone hand in hand with an equalization of income, and problems of eduated unemployment and underemplopyment have been experienced in many countries.[3] This has seriously undermined the confidence in the role that the educational system plays in the process of economic development. Many writers have commented on the question 'Does education matter?'. Diametrically opposed schools of thought have developed, particularly the neoclassical human capital approach, the secreening hypothesis, the theory of labor market segmentation, and radical view.

The basic premise of the human capital approach is that variations in labor income are due to differences in labor quality in terms of the amount of human capital,

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1) See Raymond Boudon, *Education, Opportunity, and Social Inequality : Changing Prospects in Western Society* New York, John Wiley and Sons, 1974, pp. 187-188.

2) By stressing the concept of 'job competition' rather than 'wage competition', Thurow presumably claims that even if a more equal distribution of educational resources or opportunities occurs, it does not necessarily lead to a more euqal income distribution. See, for details, Lester C. Thurow, "Education and Economic Inequality", *Public Interest*, No. 28. Summer 1972, pp. 66-81.

3) These problems are frequently found in many LDCs, especially in Southeast Asia.

especially education, acquired by the workers. Therefore, if one wishes to reduce earnings inequality among individuals, one method to achieve this would be to reduce inequality in the investments people make in human capital, e. g., education.

On the other hand, the labor market segmentation theorists reject the basic relationship posited in human capital theory between investment in schooling and earnings, mediated by productivity differentials. They propose that institutional factors produce divisions within the labor market which are not eroded by the forces of competition.[4] Each separate segment is viewed as having a fundamentally different mechanism to explain the determination and distribution of earnings, and there is little intersegment mobility.

Segmentation theory, therefore, implies that the earnings distribution will not be affected primarily by changes in the distribution of education and other personal characteristics.

In addition to the segmantation theorists, disturbed by the difficulties with human capital models, many economists also have questioned such an approach and began to work on alternatives, such as 'screening hypothesis' or 'the radical view'.

The screening hypothesis is originally derived from the work of Michael Spence, surrounding a controversy of whether the level of education enhances productivity.[5]

It asserts that a primary role of education is to serve as a credential, since educational achievement may identify productive capacities without necessarily enhancing them. That is, education is merely a selection or signaling device, which identifies a person's true productivity, since persons selected for an educational program possess the kinds of attributes sought by employers. It is the 'sheepskin' rather than the education that is rewarded, since having the sheepskin does provide useful information to the employer about motivation, ability, etc.

A totally different explanation for earnings distribution is provided by proponents of the radical approach. The radical view à la Bowles tries to show how deeply the social class structure of society affects earnings distriburion. Earnings depend to a high degree on inherited capabilities, such as the socioeconomic status of parents, and the upper classes have a tendency to perpetuate themselves. Schools are merely an instrument of the ruling class to educate the masses so as to tame them and produce conformists. Bowles has argued repeatedly that the main explanatory factor of earnings inequality is family background, or 'social class'. In other words, the effect of education on earnings is, he argues, very small when 'social class' is appropriately taken into account.[6] From the standpoint of radical analysis, education is viewed as a vehicle by which the wealth or status of the upper classes is transmitted from generation to generation. Rather than serve as equalizer of opportunity, education trains the masses to act according to the wishes of the ruling class, and therefore cannot be considered as a medium of social and economic change.

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4) The question is then the extent of the effect equalization of education will have on the earnings distriubtion.

5) Michael Spence "Job Market Signalling", *Quarterly Journal of Economics*, Vol. LXXXVII, No. 3, August 1973, pp. 355-374.

Ⅱ. STATEMENT OF THE PROBLEM

This paper seeks to analyze the distribution of labor income in Korea, based initially on a human capital approach to education and employment. But it also analyzes the distribution of earnings from a different perspective so that potential inadequacies of the human capital approach can be investigated.

As mention above, the human capital approach suggests that an unequal distribution of labor income can be reduced by improving the distribution of education, while critics of human capital theory assert that education cannot improve earnings inequality unless other institutional factors, such as occupational earnings structures, are changed. By investigating which theory best explains the labor market situation in Korea, we can assess whether education can be used as a policy tool to improve the earnings distribution.

It is hypothesized that inequality in earnings is positively related to the distribution of investment in schooling, other things being equal. However, if the labor market is characterized by segments, and if there exist institutional factors which persistently interrupt the operation of competitive market forces in the labor market, then (i) education is expected to play substantially different roles across labor markets and affect individuals far differently insofar as earnings are concerned. and (ii) marked differences in employment, hence earnings, patterns may be anticipated to occur between the occupational strata. Thus, education alone may not have a major effect on altering earnings distribution.

In other words, even if greater equality in the distribution of formal education were to occer, it would not necessarily lead to greater earnings equality, unless changes in institutional factors such as wage or occupational structure go hand in hand. This means that if one wishes to reduce significantly inequality in earnings distribution, educational policy alone is not appropriate, since it may not affect the institutional barriers.

But this does not necessarily mean that education is not important. Education still might be useful for income equality if equalization of education is accompanied by changes in institutional factors,[6] even if we ignore the importance of education as a consumption good and its potential contribution to higher earnings capacity for each individual.

Korea is especially relevant for an analysis of this issue. It is said that korea has been one of the top performers in the sense that it ranks well in terms of inequality during the period of rapid economic growth. It also has been argued that improvement in educational attainment has been a major element contributing to income equality in addition to making a critical contribution to rapid economic growth. Evidence of an increases in educational attainment goes hand in hand with increases in equality and the growth rate in the 1960s.

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6) See Samuel Bowles, "Schooling and Inequality from Generation to Generation", *Journal of Political Economy*, Vo. 80, No. 3, Part Ⅱ, May/June 1972, pp. s219-251.

There was certainly a rapid rate of growth of both per capita GNP and total GNP during this period. As shown in Table 1, per capita GNP and total GNP have increased as much as 49 percent and 67 percent in real terms, respectively, between 1965 and 1970. Moreover, no serious deterioration in the distribution of income has occurred, as shown by Gini coefficients in Table 2.

This period also was marked by a rapid expansion of formal schooling at all levels in terms of number of students and school enrollment ratio.[7] As a result of these expansions, the average level of schooling of the total population increased from 5.03 years in 1966 to 5.74 years in 1970, as shown in Table 3.

Thus this period was characterized by an increase in educational attainment in terms of its mean level and distribution[8] and rapid economic growth which was accompanied by no serious deterioration of income distribution.

But despite a conjuncture of events favorable to the overall argument, more recent conditions give cause for concern. The rapid expansion of schooling seemed to be associated with greater inequality in the distribution of economic benefits to individuals in the more recent period of rapid economic growth between 1970 and 1980.

During this period, the economy has continued to experience a rapid rate of growth of both per capita GNP and total GNP, as shown in Tabel 1. Formal schooling has also continued to expand rapidly at all levels in terms of its number and enrollment ratio. Owing to this expansion, the average level of educational attainment of the total population increased from 5.74 years in 1970 to 7.61 years in 1980.

During this period, however, the Gini concentration ratio of the distribution of income has increased from 0.3550 to 0.3891, as shown in Tabel 2.[9] This may not be a significant deterioration of income distribution, and income inequality in Korea still compared very well with that found in other countries. At the very least, however, we have doubts about earlier works which claim that the Korean economy has performed exceptionally well in terms of advancing equity during the rapid economic growth period since the early sixties owing to the role of education.[10] Note that the

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7) The evidence of a rapid expansion of formal schooling can be found in various issues of *Statistical Yearbook of Education* published by Ministry of Education.

8) Even though we lack evidence of a decline in the variance of educational attainment, we can imagine that the distribution of education imporved as the mean level of educational attainment increased, since the proportion of people entering elementary and secondary school has increased much faster than the proportion entering college. In fact, this equalizing trend of educational attainment for the population as a whole is found between 1970 and 1980. We can calculate the variance of educational attainment in 1970, 1975, and 1980, using the following formula: $Var(S) = 1/(N-1) \sum (S_i - S) n_i$, where $Var(S)$=Variance of schooling, S_i=average level of schooling for i th age cohort, S=average level of schooling for population as a whole, n_i=number of population for i th age cohort, and N=total number of population=$\sum n_i$. The variances of educational attainment for the population aged 6 and over are 6.1047, 5.7164, and 4.9803, respectively for the same period. It appears that the distribution of educational attainment has equalized continuously between 1970 and 1980.

9) Note that one study observe the Gini coefficient in 1970 as 0.3322, although this difference does not change the deteriorating trend of income distribution between 1970 and 1980.

school system of this period was characterized as one in which primary schooling shows a perfect degree of the coverage, middle schooling widespread (over 90 per cent of the age cohorts), and high school enrollment widespread, while access to college-level education is still much less general.

When we compare these statistics with similar statistics for other countries, we see that Korea had a more accessible school system than most other developing countries at comparable levels of per capita income, or even compared to higher per capita income countries.

Thus, the claim that education is said to have generated considerable social mobility, favoring a more equitable society in Korea, merits examination for at least two reasons. First, the experience of Korea is likely to be of interest to other countries concerned with achieving an equitable distribution of income while underdoing rapid economic growth. Second, the Korean case has relevance for a more purely academic controversy around a growing chorus of critics who assert that an expansion of education not only fails to improve the distribution of income, but also tends to worsen an already inequitable system.

To evaluate the above claim, we focus upon the effects of schooling and other institutional variables as determinants of earnings (not necessarily income) of workers and their broader impact on earnings distribution in Korea. We distinguish between expansion of education with or without a more equal distribution of education.[11] The empirical framework is organized in two sections. The first section contains an analysis of the determination of earnings with special reference to the impact of education. This section is designed to examine the validity and interpretation of different theories and to derive some insights which can be applied to the distribution issue in relation to educational policy. The second section inquires whether or not equalizing education can be used as a policy tool for equalizing the earnings distribution, based on the insights obtained in the first section.

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10) All researchers do not emphasize the role of education in distributing the benefits of growth in Korea. However, what most analysts suggest in common is that one of the important factors in distributing the benefits of growth in Korea was the spread of education in the period before rapid industrial growth. They suggest that education in Korea is an extremely important means of access to high social positon and to relatively high earnings. Thus, the improvement in educational attainment has been one of the major and important elements in Korea's development process which contributes a lot to income equality. See Irma Adelman, "Redistribution with Growth : Some Country Experiences — South Korea", in Hollis Chenery, et. al., *Redistribution with Growth*, London : Oxford University Press, 1974, pp. 280-285; Irma Adelman and Sherman Robinson, *Income Distribution Policy In Developing Countries : A Case Study of Korea*, Stanford, CA : Stanford University Press, 1978; Hakchung Choo, "Economic Growth and Income Distribution", In Chong Kee Park, ed., *Human Resources and Social Development in Korea*, Seoul : Korea Development Institue, 1980, pp. 277-335, Note that the span of time covered by most studies is 1959-1970.

11) Although the critics are attacking both a more and a less equitable expansion of education, we will not address the issue of inequalities of educational distribution associated with the financing of educational expenditure, e. g., a less equitable expansion of education. This, of course, does not mean that it is not important. It may have a substantial effect on the earnings distribution in relation to the socioeconomic background of individuals. However, it is beyond the scope of this paper, even though we may derive some implications on such effect by investigating the relationship between individual levels of schooling and socioeconomic background.

Ⅲ. THE EMPIRICAL FRAMEWORK

In the first section, we specify a simultaneous equation system which seeks to explain the mechanism of earnings determination based on four different theories : the conventional human capital approach, the screening hypothesis, labor market segmentation, and the radical view. These theories, differ greatly in their explanations for the determination of individual earnings. Some of them emphasize the role of personal characterisics, while others focus on the effects of job characteristics or socioeconomic background on earnings capacity.

However, each theory seems incomplete in the sense that it emphasizes only one part of the earnings determination mechanism — either the individual choice side or the institutional side. These differences seem to come mainly from their different assumptions about the way that labor markets are structured and operated. For example, the first two theories retain the assumption that there are forces equilibrating the labor market, while the last two do not necessarily. Or the latter two actually might incorporate an alternative concept of equilibrium, whatever it might be.

However, if we assume labor income is determined by personal characteristics as well as the institutional conditions of the labor market, such as occupational structure and socioeconomic background, all the variables of these various theories can be nested together. The question then becomes which among the variables are most important in explaining individual earnings, and possibly which theory gives the most plausible explanation about the role of education in earings determination. But note that all the theories of earnings determination need not be viewed as mutually exclusive; interactions or feedbacks may exist between the explanations.

In the second section, we partition the four different wage determination theories into two basic groups : human capital explanations and institutional explanations. This dichotomy is surely problematic due to the above—mentioned interactions or feedbacks between explanations. However, this simplified partition can be justified for the investigation of the possibility of utilizing educational policy to obtain a more equal earnings distribution. In other words, we identify two oppsite views in the second section : the 'optimisic' view of human capital theory and the 'pessimistic' view of institutional labor market theory. [12]

The implications for earnings distribution of the human capital theory should be clear : if the distribution of schooling, one typical and important component of human capital investments, changes, then earnings distribution will change and if the distribution of schooling becomes more equal, the earnings distrubution also will become more equal.

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12) The human capital approach and screening hypothesis can be classified as the 'optimistic' view, while segmentation theory and radical view represent the 'pessimistic view. Of course, all of the segmentation and radical view are not necessarily 'pessimistic'. For example, the radical views under some interpretations may indicate that a more equal distribution of education may lead to a more equal distribution of earnings. However, considering that radicals typically admit that there are limits to this effect given a prevailing class structure, they can be classified as falling under the 'pessimistic' view. See Erik Olin Wright, *Class Structure and Income Determination*, New York : Academic Press, 1979, pp. 97-109.

The alternatives to the human capital model emphasize that in analyzing changes in earnings distribution, we should look for changes in the institutional factors which affect the structure of wages and occupations. Since a more equal education cannot automatically or directly lead to a more equal earnings distribution, the role of education in altering earnings distribution should not be overstated. If these alternative theories are correct descriptions of the labor market, the distribution of educational opportunities, at least, cannot be the only variable in determining earnings distribution.

The data used in the empirical investigation were collected by nationwide surveys. The Korean Educational Development Institute performed the survey in order to investigate policy implications in relation to the educational expenditure.

A sample of 6,000 individuals was selected from 322 establishments(firms), and the questionnaire was given to each individual by mail, or in some cases, by direct interview. The establishments selected were randomly chosen but restricted to those having more than 10 employees. The number of workers selected in each establishment was assigned proportionally according to the size of the establishment, and within the establishment the selection covered all the positions of employees.

Among 6,000 questionnaires, 1,152 cases were finally chosen and included in the data set.[13] The data, which contain information about 16 variables as of May 31, 1985, can be classified into two broad categories : data referring to personal characteristics and data referring to institutional circumstances of respondents.

The personal characteristics include sex, age, years of schooling, experience, years of employment with current firm, grades during graduate schooling years, father's education, father's occupation, and financial status of family during secondary schooling age, while the institutional circumstances include job characteristics such as job ranking, location, and occupational category, and hours worked.[14]

Ⅳ. EDUCATION AND DETERMINATION OF EARNINGS

1. The Model

We can present four different theories in extreme form as follows;[15]

13) The rest of the cases are either not returned or ones that do not seem to contain any meaningful information, though returened. Fortunately, personal communication form the survey performer of the Korean Educational Development Institue confirms that the cut is made fairly proportionately to each category so that we can keep the random selection process initally set up.

14) Of course, there are some serious shortcomings of these data. For example, the survey only includes full-time labor income earners who work in the establishments. Therefore, the data set does not contain any information concerning earnings determination in the rural sector as well as self-employed and family workers in the urban sector. Therefore, the study cannot claim to be a global analysis of the Korean income distribution. However, as long as we are concerned with earnings determination in the formal labor market, the data set may provide us with typical information about the mechanism of earnings determination, although we should keep in mind that great care must be exercised when the regression results are interpreted.

15) This specification, of couse, may be problematic, since it is very difficult to simply present the explanations of each theory as an explicit functional form due to the above-mentioned mutual inexclusiveness among the different theories. We just specify the core of the different theroies as a simple functional form. For example, the specification of the human captial approach

Human Capital Approach :

(1) $lnY = f_1(S, X)$

(2) $S = g_1(Y^e, X, W)$

Screening Hypothesis :

(3) $lnY = f_2(S', X)$

Segmentation Approach[16] :

(4) $lnY = f_3(S, X, Z)$

(5) $Z = h_3(S, X, W)$

Radical View :

(6) $lnY = f_4(S, X, W)$

(7) $S = g_4(X, W)$

where Y = earnings
Y^e = expected lifetime earnings
S = formal education
S' = educational diploma
X = a vector of personal characteristics
Z = a vector of job characteristics
W = a vector of socioeconomic variables

The model that nests all competing theories can be constructed as follows:

(8) $lnY = f(S, S', Z, X, W)$

(9) $S = g(Y^e, X, W)$

(10) $Z = h(S, X, W)$

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is based on typical Mincerian earnings function and schooling decision equation developed by Robert J. Willis and Sherwin Rosen, "Education and Self-Selection", *Journal of Political Economy*, Vol. 87, No. 5, Part 2, October 1979, pp. s7-36, and that of the screening argument follows the explanation of 'credentialism', while that of the radical view comes from the Bowles' formulation.

16) The segmentation approach has tended to emphasize differences among jobs, rather than among people, as a determination of the distribution of earnings. This claim is reflected in the specification (4) and (5), although it may not be an adequate presentation. In fact, two of the most important claims of segmentation approach are that there is a distinct low-wage (secondary) labor market in which there are almost no returns to schooling, and that there are noneconomic barriers that prevent at least some secondary workers from obtaining better (primary) jobs. Consequently, in order to study the validity of the segmentation approach, we need to test two hypotheses that the wage-setting mechanisms are different segment by segment, and that better (primary) jobs are rationed. There is, of course, no way to distinguish these hypotheses by estimating the equations (4) and (5). The significance of the coefficient Z only indicates the possibility of the segmentation in the labor market. To directly test two claims of the labor market segmentation approach, we need to construct a more sophisticated model. Unfortunately, the data set does not permit us to do that in the sense that it is very difficult to identify primary and secondary jobs among observations because the classification of occupational category is based on only one-digit Korean census occupational categories. See, for details concerning the test of segmentation theory, William T. Dickens and Kevin Lang, "A Test of Dual Labor Market Theory", *American Economic Review*, Vol. 75, No. 4, September 1985, pp. 792-805.

A difficulty in selecting the appropriate estimation technique for this system arises, because equation (8) is underidentified. Moreover, the variable Y^e in equation (9) is not observable. In order to obtain the consistent estimators needed to assess the different theories, the planned estimation proceeds as follows :

(1) To test the endogeneity of years of schooling, we will estimate equation (9) which utilizes an estimate of earnings of individuals with the same schooling, sex and age *YEX* for the expected lifetime earnings Y^e.[17] If this equation proves to be statistically significant in terms of its explanatory power and significance of the coefficients, we know that the treatment of schooling as an exogenous variable is inappropriate. Specifically, if all the coefficients in equation (9) are statistically significant, we can favor the specification of the human capital approach within the above specification (1) through (7). If only one or both of the coefficients X and W are statistically significant, we can partially or fully accept the radical views' treatment of schooling as an endogenous variable, or we may need to check the validity of average earnings of individuals with the same schooling, sex and age as an indicator of expected lifetime earnings. On the other hand, if equation (9) is not statistically significant, we can treat years of schooling as exogenous, or we may need to check a possible specification error. The estimation results of equation (9) are presented in section 2. A.

(2) To test the endogeneity of the job characteristics, we will estimate the equation (10) which includes an instrumental variable *SHAT* for years of schooling S. The instrumental variable *SHAT* can be obtained as the predicted value from the estimation of equation (9). If this equation (10) proves to be statistically significant, we find support for the specification of segmentation theories, entirely or partially, depending on whether or not all or some of the coefficients are statistically signficant. The discussion will be presented in section 2. B.

(3) To test the validity of specification of earnings function for different theories, we will estimate the earnings function (8) which includes instrumental variables *SHAT* and *ZHAT* for years of schooling S and job characteristics Z. By examining whether or not the earnings function for each theory, (1), (3), (4), and (6) is statistically different from equation (8) as one of the restricted forms of equation (8) by means of an F—test, we can test whether or not the specification of earnings function for each theory is statistically significant in relation to the above earnings equation (8). The estimation results are contained in section 2. C.

We specify estimable equations as follows:

17) The variable *YEX* is thus a proxy for the gain in expected lifetime earnings. It can be calculated from the data set under the assumption that individuals with the same schooling, sex, and age are expected to earn the same amount of earnings throughout their whole life and that this expected lifetime earnings are proportionately related to the current average earnings of individuals. We admit that it may be a poor choice since it does not take into account the duration of schooling and lifetime employment. However, it is the only possible proxy for expected lifetime earnings due to the limited data. This proxy can be justfied in the sense that it's calculation is based on the rational expections of the human captial approach.

Human Capital Approach[18] :

(1′) $lnY = f_1(S, EXP, (EXP)^2, lnL)$

(2′) $S = g_1(Y^e, SEX, FOCC, FSCH, FWHL)$

Screening Hypothesis :

(3′) $lnY = f_2(ED, EXP, (EXP)^2, lnL)$

Segmentation Approach :

(4′) $lnY = f_3(S, EXP, (EXP)^2, lnL, OCP, LOC, JOB)$

(5′) $OCP = h_3(S, EXP, SEX, FOCC, FSCH, FWHL)$

Radical View[19] :

(6′) $lnY = f_4(S, EXP, (EXP)^2, lnL, SEX, FOCC, FSCH, FWHL)$

(7′) $S = g_4(SEX, FOCC, FSCH, FWHL)$

Based on the above specifications, we construct a simultaneous equation system of earnings determination as follows[20] :

(8′) $lnY = f(S, EXP, (EXP)^2, lnL, ED, SEX, AGE, OCP, LOC, JOB, FOCC, FSCH, FWHL)$

(9′) $S = g(Y^e, SEX, AGE, FOCC, FSCH, FWHL)$

(10′) $OCP = h(S, EXP, SEX, FOCC, FSCH, FWHL)$

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18) This is typical Mincerian earings function with adjustment for hours worked. We include L in the earings function to account for variations in earnings due to variations in employment. The effect of employment variability on earings may be adjusted by including the number of hours worked during the week as follows; $Y = Y(L)^e$, where Y is monthly earnings, Y is weekly earnings, L is the number of hours worked, and e is the elasticity of earnigns with respect to hours worked. Thus, we assume hours worked are exogenous, although it may not be an attractive assumption. This problem also may be avoided by using the hourly wage as a dependent variable. See Barry R. Chiswick, *Income Inequality; Regional Analysis within a Human Capital Framework*, New York : National Bureau of Economic reserch, 1974, chapters 1 and 3.

19) We only include the father's background and family financial status during the respondent's secondary schooling age as explanatory variables in equation (7′). This does not mean that the mother's background is unimportant. Nor does it mean that the parental variable is the only relevant one in a Korean context. It only means the data set never permits us to consider other elements of socioeconomic background.

20) There doubtlessly can be quarrels with details of this specification. However, the data set only permits us to identity the independent variables listed. And no one would wish to exclude any of the variables included in each structural equation. Rather, some may want to add variables to the above list. Note also that the variable *AGE* is included in euqations (8′) and (10′), while the exogenous variables *LOC* and *JOB* are in the euqation (8′), but for different purposes. The inclusion of *AGE* in the equation (9′) is designed to reflect the age cohort effects. There is certainly some trend in schooling attainment associated with age cohort; the younger generation is expected to receive more education than older one. The inclusion of the variable *AGE* in the equation (8′) is to capture the increase in earnings capacity with age. We believe that earnings capacity is increased with age in one way or another. It is designed to reflect some effects which are not related to the post-school experience. On the other hand, the variables *LOC* and *JOB* are incluede to adjust their effects on earnings capacity. The regional variable *LOC* may reflect the difference in the cost of living between regions, while the variable *JOB* is expected to show the typical earnings differences between job rankings. We may regard them as one of the exogenous personal and job characteristics variables, respectively.

2. Estimation Results

A. Educational Attainment of Individuals

In this section, we address the effects of various explanatory variables on the level of individual's education. The regression equation (9') has been estimated, at first, on a total sample of 1,069 respondents by assuming a linear relationship between dependent and independent variables. Then we run the regression separately according to the various variables which seem related to labor market segmentation. Definitions of variables are given in Table 4.

Table 5 presents estimated coefficients and t-statistics of the schooling equation (9'). Overall, equation (9') seems to explain well the schooling determination mechanism in term of explanatory power and statistical significance of coefficients. The value of R^2 shows us that the model explains more than half of the schooling determination mechanism, and the value of 'F-ratio' is statistically significant at the 99 per cent level. Further, all the coefficients are statistically significant, at least, at the 90 per cent confidence level.

As a whole, the estimation of the schooling equation indicates that schooling is an endogenous variable, and it appears to reject neither the human capital approach nor the radical view in the sense that expected lifetime earnings has a positive but small effect on the educational attainment. In other words, it favors radical views' treatment of schooling as an endogenous variable, based on the fact that the determination of educational attainment is quite different according to sex and socioeconomic backgrounds as shown in rows (2) through (9) of Table 5. But it does not necessarily reject the human capital approach concerning the determination of educational attainment in the sense that expected lifetime earnings gain may play a certain role, and that there may be problems in treating *YEX* as a proxy for the expected lifetime earnings.

B. Determination of Occupational Categories

In this section, we apply the multiple logit model to the prediction of occupation of individuals, based on four explanatory variables : educational attainment, sex, labor market experience and socioeconomic background. Using these explanatory variables, we predict individuals to be in one of six occupational groups : 'professional and technical workers', 'administrative and managerial workers', 'clerical and related workers', 'sales workers', 'service workers' and 'production and related workers'. These six categories are groupings of the major one-digit occupational categories, based on the Korean Census classification of the occupational categories.

We estimate functions of the form :

$$(11)\quad ln(P_1/P_6) = a_{11} + a_{12}SHAT + a_{13}EXP + a_{14}SEX + a_{15}FOCC + a_{16}FSCH + a_{17}FWHL$$

$$(12)\quad ln(P_2/P_6) = a_{21} + a_{22}SHAT + a_{23}EXP + a_{24}SEX + a_{25}FOCC + a_{26}FSCH + a_{27}FWHL$$

$$(13)\quad ln(P_3/P_6) = a_{31} + a_{32}SHAT + a_{33}EXP + a_{34}SEX + a_{35}FOCC + a_{36}FSCH + a_{37}FWHL$$

$$(14)\quad ln(P_4/P_6) = a_{41} + a_{42}SHAT + a_{43}EXP + a_{44}SEX + a_{45}FOCC + a_{46}FSCH + a_{47}FWHL$$

$$(15)\quad ln(P_5/P_6) = a_{51} + a_{52}SHAT + a_{53}EXP + a_{54}SEX + a_{55}FOCC + a_{56}FSCH + a_{57}FWHL$$

where P_i is the probability of being in occupation i, We also can derive from these equations the equations for other comparisons. For example, since

$$ln(P_3/P_4) = ln(P_3/P_6) - ln(P_4/P_6),$$

we have :

$$(16)\quad ln(P_3/P_4) = (a_{31}-a_{41}) + (a_{32}-a_{42})SHAT + (a_{33}-a_{43})EXP + (a_{34}a_{44})SEX + (a_{35}-a_{45})FOCC + (a_{36}-a_{46})FSCH + (a_{37}-a_{47})FWHL$$

The estimated coefficients and their 't—ratios' are given in Table 6.[21] The 't—ratios' are the ratios of the estimated coefficients to their estimated asymptotic standard errors, and are asymptotically distributed as N(0, 1) under the null hypothesis that the associated coefficients are zero.

As shown in the Chi—square statistics of Table 6, the model seems to explain the determination of occupation quite well. The estimated coefficients in Table 6 also seem to present the expected sign.

However, the interpretation of the effects of socioeconomic background on occupation is somewhat problematic, since the majority of coefficients is statistically insignificant. To examine the effects of socioeconomic background on the determination of occupation, therefore, we evaluate the probability of being in each of the six occupations. These probabilities were estimated at the sample means for education and experience, and for sixteen permutations of sex and socioeconomic backgrounds. The results are given in Table 7.

Based on these results we can tentatively draw a conclusion as follows. Education plays a very impotant role in the determination of one's occupation; the more education one receives, the higher the pribability of being found in more prestigious occupations. But sex and socioeconomic backgrounds also affect the determination of one's occupation ; the more favorable socioeconomic background one has, the more likely one is to be in more desirable occupations. Although the model used above is an admittedly simple one, the above results, at least, partially support the specification of segmentation theories concerning the determination of occupation. That is, among people of equal education and experience, sex and socioeconomic background still strongly influence what type of a job individuals obtain. It argues that existing patterns of employment cannot be explained by simple differences in education and experience.

C. Earnings Function Analysis [22]

21) To estimate equations (11) through (15), we have used the computer program 'MLOGIT', while the computer program 'PERMUTE' is used to estimate euqations like (16) for other comparisons, instead of calculating the equations. 'PERMUTE' is very convenient program for calculating the full set of coefficients and predicted outcome probabilities. It has been developed by the Carolina Population Center, University of North Carolina at Chapel Hill. For details, see John W. Molyneaux and Erika M. Stone, "SAS Macros to Calculate the Full Set of Coefficients and Predicted Outcome Probabilities for a Polytomous Logit Model", Paper presented at the SAS Users Group International Conference FEB9-12, 1986, Atlanta, Georgia.

22) This section does not deal with all aspects of earnings determination, but will hopefully contribute to the knowledge about the relationship between education and earnings in Korea as well as about the functioning of the Korean labor market. For example, we only consider the relative importance of institutional factors vis-a-vis the human capital factors in earnings determination.

In this section, a linear model is estimated having the logarithm of individual monthly earnings of workers as the dependent variable with various personal and job characteristics as explanatory variables. For education and occupation, the instrumental variables *SHAT* and *OP* which are derived from Sections A and B, respectively, are used to derive consistent estimators.

The estimated coefficients are given in Table 8. As shown in the values of R^2 and adjusted $-R^2$, the model seems to explain more than two-thirds of the earnings determination mechanism. The 'F-ratio' for the model is also statistically significant at the 99 per cent confidence level. Moreover, most of the estimated coefficients are statistically significant and present the expected signs. Personal and job characteristics as well as socioeconomic background contribute, in one way or another, to the individual's earnings capacity. The F-test confirms that the specification of the earnings function for each theory seems to be statistically different from that of equation (8'). Although there may be differnces in the importance of each variable to the contribution of the earnings capacity, most variables in the equation (8') play a role in the determination of the individual earnings.

Based on the empirical results, we can infer that i) human capital variables, espescially education, have positive effets on earnings, although they do not necessarily come from the ultimate accumulation of human capital investment *per se*, ii) there is some indication that location in some of the prestigious occupations is positively related to individual earnings, regardless of the individual's other characteristics, and iii) sex and socioeconomic backgrounds do not appear to be directly related to earnings, while their indirect effects on earnings through occupational status and educational attainment are substantial.

3. Summary and Discussion

Although we do not end up with sufficiently discriminating conclusions, probably due to the previously mentioned mutual inexclusiveness among the different theories and the limitations of the data set, we can derive a series of conclusions about which theory (or subset of theories) best explains income determination mechanism in Korea.

First, the level of years of schooling appears to be affected by the segmentation variables, such as sex and socioeconomic backgrounds. The expected lifetime earnings gain may play a partial role in the determination of the years of schooling, if any.

Second, the level of schooling substantially influences one's occupational location. But other factors such as labor market experience, sex, and socioeconomic backgrounds also seem to affect one's occupational location, which again is an indication that the labor market is in some sense segmented.

Finally, formal education in the form of the years of schooling is of importance in the determination of earnings, even though some of its contribution to individual earnings may be due to differences in ability. However, there is also a certain indication that individual earnings are quite different according to some types of job characteristics.

V. EDUCATION AND EARNINGS DISTRIBUTION

1. The Model

Based on the insights obtained from our hypotheses tests, we will address the distribution issue in relation to educational policy in this section.

The model used to analyze the distribution of earnings is a modified version of the human capital earnings function initially postulated by Becker and Chiswick [23] and later developed by Chiswick and Mincer. [24]

The 'relative earnings inequality function' is derived from the earnings function (8') which was specified in section Ⅳ. 1. and also can be expressed as following matrix form;

(17) $InY = c' D + u$

where c' = 1 × k row vector of coefficients
D = k × 1 column vector of regressors
u = disturbance term

By taking the variance of both sides of equation (17), we can obtain the 'relative earnings inequality function', if we assume that the regressors are random variables independent of their corresponding coefficients, and that there is no correlation between disturbance term and regressors.

(18) $Var(InY) = c' Cov(D) c + Var(u)$

where $Var(X)$ = variance of variable X
$Cov(D)$ = k × k covariance matrix of vector D

Once having estimated the earnings function (8') and the contribution of variation in each independent variable on earnings distribution based on the above 'relative earnings inequality function' (18), we can analyze the effects of changes in the explanatory variables and in the relevant parameters in a particular point in time to the earnings inequality function, in principle, by taking the partial derivative of (18) with respect to the variables of interest.

For example, if the sign of the partial derivative $\partial Var(lnY)/\partial SD(S)$ is positive, we can interpret it as a supporting argument that a more equal distribution of education can lead to a more equal distribution of earnings, other things being equal.

23) Gary S. Becker and Barry R. Chiswick, "Education and The Distribution of Earnings", *American Economic Review*, Vol. LVI, No. 2, May 1966, pp. 358-369.

24) Barry R. Chiswick and Jacob Mincer, "Time-Series Changes in Personal Income Inequality in the United States form 1939, with Projections to 1985", *Journal of Political Economy*, Vol. 80, No. 3, Part I I, May/June 1972, pp. s34-66. Note that the Backer-Chiswick-Mincer work is selected as a base line since these authors are strong advocates of the human capital approach on earnings distribution. However, our model is augmented to consider the market segmentation factors, ect., so that it is much more general than their model. Logically, one need not adhere to all the premises of human capital analysis - in particular the strong market orientation and marginal productivity assumptions - to accept the Becker-Chiswick-Mincer formulas as a point of departure for empirical research considering that there is substantial evidence, especially in LDCs that such institutional elements have a significant effect on personal earnings. Therefore, the institutional factors should be taken into account in an appropriate way.

Alternatively, if the variance of log of earnings increases when the variance of occupational dummies changes, we can interpret it as an counter-argument against the human capital approach. That is, only if the occupational structure is in some sense equally distributed, then education can be used as a policy tool to achieve equal earnings distribution.

However, this simple idea may not work due to the fact that all terms in the right hand side of the inequality function (18) are presumably positive. The negative sign can only be identified in the terms which contain the negative correlation. Moreover, since these negative terms, are not large enough in magnitude to offset the positive terms, the partial derivative of inequality function (18) with respect to the variables of interest cannot be negative.

In this case, an alternative method should be sought. Instead of introducing the dummy variables in the 'relative earnings inequality funtion', we will compare the separate 'earnings inequality functions' among the appropriately stratified samples.[25] By examining the systematically different effects of independent variables on the variance of earnings, we can derive some implications about the effects of changes in the explanatory variables and in the relevant parameters on the earnings inequality function among different occupational groups and sectors.

2. Estimation Results

The effects of the various explanatory variables on the distribution of earnings can be analyzed using the earnings inequality function (18), where we insert the relevant estimates for the coefficients of the independent variables as well as for the correlations, variances and standard deviations of these variables.

The estimates for the earnings inequality function are presented in Table 10. The coutributions of the components of independent variables as well as the joint contributions of these variables toward relative earnings inequality are also displayed in Table 10. These are required for a comparative analysis of earnings inequality below when we look at the differences between occupational groups;since the residual variance may differ across groups, changes in the absolute size of the contribution in different occupational groups do not necessarily reflect changes in the relative importance of each component.

A. Distribution of Earnings

As shown in Table 10, in addition to the human capital variables, the institutional conditions of the labor market, especially occupational structure, also appear to contribute greatly toward earnings inequality. Note that the combination of inequality of independent variables measured by their variance and their respective coefficient alone, however, seems to account for more than the exaplained earnings inequality. In other

25) Actually it is another way to introduce dummy variables into the regression analysis.

words, the joint effects of the explanatory variables which are related to the correlation coefficients between those variables turn out to be negative. Even though it may not pose any problems statistically, it is unrealistic in the sense that any one of the explanatory variables can explain more than 100 per cent of the explained inequality accounted for by the model. This somewhat unrealistic result may arise either from the presence of the statistically insignificant coefficients, a multicollinearity problem, or any interactions between some of independent and dependent variables.

To examine this problem below, we estimate the separate earnings inequality function for two groups of occupations. This practice seems successful in the sense that two separate inequality functions provide some implications concerning the relative effects of the various variables toward the earnings inequality. The estimation results are also contained in Table 10.

The sample is broken down into two groups of occupational categories : prestigious and non-prestigious occupations. Occupational categories 1 and 2 are classified as prestigious ones (Group 1), while occupational categories 3 through 6 are chosen as non-prestigious (Group 2). This division of the occupations into two groups may be problematic since a precise empirical cut-off is unclear. This grouping is, however, along the lines of segmented labor market theory in the sense that the prestigious occupations correspond roughly to primary jobs, while non-prestigious occupations roughly match secondary jobs.[26]

In summary, the evidence here suggests the probable existence of segmentation in the urban labor markets of Korea. Insofar as schooling is concerned, there appears to exist a separation in terms of its effect on the determination and distribution of earnings across groups, and this also is in accordance with the predictions of institutional segmentation theories. Moreover, schooling alone cannot explain the determination and distribuation of earnings across groups. Earnings inequality is larger in group 2 despite the smaller variance of years of schooling. This means that the difference in the concentration of earnings across groups may result from other factors.

B. Changes in Earnings Inequality

To predict changes in the earnings inequality in relation to changes in the explanatory variables, the partial derivatives of $Var(lnY)$ with respect to the variables of interest are evaluated using the estimated coefficients of independent variables as well as the observed values of the other variables for the aggregate, group 1 and 2 workers.

The results indicate that for an increase in dispersion of years of schooling, relative earnings inequality will increase. It is consistent both with the general prediction of the human capital approach and with our first hypothesis that a more equal distribution of schooling, *ceteris paribus*, leads to a more equal distribution of

26) This grouping is also justified since the analysis in the last section indicates that people with more favorable socioeconomic backgrounds tend to have prestigious occupations.

earnings. However, these changes in earnings inequality do not take into account the other factors which may have a counteracting effect. Moreover, change in other institutional factors also have substantial effects on the distribution of earnings. Actually, when we alter the variance of occupation, earnings inequality changes substantially.

To sum up, there is at best an ambiguous prediction regarding the relationships between changes in inequality of earnings and years of schooling without considering changes in other factors.

Actually, changes in distribution and level of rates of return may be more important than changes in the distribution of years of schooling, if the effects of schooling on the earnings inequality are related to the occupational structure.

Unfortunnately, effects of changes in the level and the distribution of the rate of return to schooling on changes in the distribution of earnings cannot be directiy estimated with the tools that we have been using so far, because projections of the behavior of rates of return to schooling and their variations are not made easily.

However, we have some evidence that changes in level and distribution of rates of return to schooling have contributed a lot to the deterioration of earnings distribution in the past decade in Korea. As pointed out in section Ⅱ, the income distribution in Korea has worsened at least from the late seventies, while the average level of years of schooling has equalized. The reason for the worsening income distribution, therefore, might be found in variations in rates of return to years of schooling.

The average rates of return to schooling appear to have undergone drastic changes in the past in Korea, as shown in Table 11. It is interesting to note that the rate of return to higher education has increased substantially, while that to lower-secondary schooling has decreased significantly. This is certainly inconsistent with diminishing returns to years of schooling.

Within a simple demand and supply framework, and under competitive assumptions, one could expect that if the supply of workers with higher levels of schooling increases faster than the demand, the rates of return for these levels of schooling would fall. The supply of graduates from upper secondary schooling in the 1966-1980 period has increased at a much faster rate than that of graduates from lower secondary and college levels of scooling in Korea. The consequence has been, however, not a fall in the rates of return to upper secondary levels of schooling relative to lower secondary and college levels. The rate of return to upper secondary schooling remains almost unchanged. But the rate of return to college level schooling increased, while that to lower secondary schooling decreased substantially. A simiar trend is also shown in Table 12 which presents the wage level by educational attainment between 1971 and 1983. It appears that the wage differentials between college level and upper secondary schooling has widened, while those between lower and upper secondary schooling has remained unchanged or slightly narrowed.

All of these suggest that other forces not included in the simple supply and demand framework have been operative. In other words, the above phenomena cannot be explained simply by ordinary demand and supply forces in the labor market.[27]

Institutional factors may lie at the bottom of these phenomena. Consequently, the entire variations in earnings may not necessarily be causally attributable to variations in schooling. If the structure of employment and earnings opportunities is essentially given independent of the supply of people with different levels of years of schooling, and the funtion of the school system is just to select people to fill these preexisting slots, then the operation of ordinary demand and supply forces in relation to the role of schooling on earnings distribution is likely to be overstated.

Rather, the effects of schooling on earnings distribution may be found in its relation to the occupational structure. The empirical results in the last section indicates that people with higher levels of schooling tend to concentrate in the prestigious occupations. As shown in Table 13, substantial wage differentials have existed between prestigious and non—prestigious occupations throughout the last decade. All of these indicate that the increase in the earnings of those with higher education is much greater than those with relatively less education, thereby worsening the distribution of earnings.

The key point is there may exist a large contribution to a more unequal earnings distribution from changes in the structure of earnings than from changes in the distribution of labor characteristics, especially years of shooling. Therefore, identifying the shift in earnings structure is all-important in determining changes in earnings distribution in Korea, And the evidences show that there are demand patterns inherent in the earnings structure in Korea which substantially favor workers with more schooling over those with less schooling.

Specifically, it is well-known that active wage controls for export competitiveness, especially against low-paid workers, has been set in Korea. Wage control policy increasingly has favored highly schooled labor over less schooled workers.

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27) The recent research by Stweart indicates that the simple demand and supply framework does not work in Korean labor market. He argues that the intergenerational occupational distribution and mobility which follow the structural change during the period of economic growth do not respond well to the supply of workers with the appropriate skill requirements imparted by the higher education. While demand for modern skills, hence, prestigious occupations, increases sharply but at a decreasing rate once the major shift is accomplished during the period of rapid economic growth, the supply of educated workers supposed to fill these occupations is very long-lived, thereby reducing occupational opportunities for succeeding cohorts. The consequence is the social and political frustrations of the new generations entering the labor force. Even though his research does not explicitly mention the effects of this time lag between demand and supply in relation to the earnings distribution, the changes in the intergenerational occupational distribution are certainly related to the worsening earnings distribution. And it may be one form of the frustrations among the new generation. See Charles T. Stewart, Jr., "Structural Change and Intergenerational Occupational Mobility", *Journal of Developing Areas*, Vol. 21, No. 2, January 1987, pp. 141-158.

Moreover, in cirumstnaces where the right to strike was almost abolished, there is reason to believe that wages of lower income workers fell behind, while those of the more politically favored professional occupations remained constant or increased.

In short, the evidence appears to be rather overwhelming regarding the effects of the government policy and other istitutional factors on changes in the level of wages and in the distribution of earnings. The government policy of wage controls and the weakness of labor orgainzations have played an important role in the fall of the real wage for low-paid workers and in the deterioration of the earnings distribution. In spite of an equalization in years of schooling in the population, individuals with relatively lower levels of schooling have experienced a relative devaluation in the labor market, which worked against an equalization of earnings.

3. Summary and Discussion

We have looked at the earnings distribution mechanism by examining the effects of various variables, especially years of schooling, on earnings inequality. Needless to say, the ideal situation to study the earnings distribution in relation to educational policy is to have time-series data available for the level of education and earnings. Unfortunately, this is not the case. Thus, we attack the issue indirectly by investigating how schooling plays a different role across sectors and occupations in relation to the existing institutional factors.

The analysis indicates that a more equal distribution of years of schooling leads to, other things being equal, a more euqal distribution of earnings, although it has different effects across occupations. It also appears that the other factors, rather than the effects of schooling alone, have substantial effects on the earnings inequality across occupations in the sense that the dispersion of years of schooling does not explain the different degrees of the earnings inequality across occupations. We can infer from these results that possible clues about the worsening income distribution in the past decade in Korea should be found from other sources, rather than the effects of schooling alone. In fact, the worsening income distribution in Korea goes against the grain of the changed distribution of schooling.

VI. SUMMARY AND CONCLUSTION

Although we could not derive direct evidence from our empirical results concerning the worseing income distribution in Korea due to the limitations of the data set, the discussion indicated that the interactions of the role of years of schooling with the institutional, occupational, or wage structure were important forces which had helped cause the deterioration of earnings equality. In other words, in spite of an euqalization of years of schooling in the population as a whole, it appeared that those persons with lower levels of schooling experienced a relative devaluation in the labor market, a trend which worked against the euqlization of earnings.

As long as equalization of the distribution of years of schooling and the rise of the average level of schooling have not led to a more equal distribution of earnings in the past decade in Korea, there might have been an offsetting indirect effect of schooling through a more unequal distribution of pay to differenct kinds of occupations, although the distribution of schooling in the labor force has had an equalizing effect on earnings.

Consequently, under this circumstance a more equal distribution of years of schooling cannot be regarded in unqualified fashion as the key policy variable to bring about changes in the distribution of earnings.

The study does not show that the institutional model is a 'better' approach to labor markets than the human capital theory. The available evidence does not have sufficiently discriminating evidence to allow us to favor one of the four approaches as the correct description of the labor market in Korea. But the analyses do indicate that the change in the distribution of schooling in the labor force in Korea has much less influence on earnings distribution than changes in the value of different amounts of schooling over time and changes in the values of other variables, especially the occupational segment variables. These letter changes are the result of institutional factors on the demand side of the labor market that are affected by government policies. Consequently, they indicate that income distribution policies based on the equalization of supply side characteristics alone are bound to fail.

We conclude, then, that there is an apparent paradox in income distribution policy : schooling apparently plays a very important role in determining individual earnings in Korea, but the distribution of education in the labor force is not very important in influencing earnings distribution. Because government incomes policy affecting the reward to different levels of schooling, the structure of occupations appears to be a more important factor in understanding changes in income distribution. Educational policy can only contribute to a more equal distribution of earnings when it is carried out in concert with a government policy which attempts to reduce earnings differentials between workers with higher levels of schooling and those with lower levels, and between higher paying occupations in the labor force and lower paying ones. [28)]

Despite the above conclusion and suggestions based on the probable presence of labor market segmentation in Korea, a number of aspects need to be studied in more depth in order to throw additional light on the issue involving the competing paradigms of human capital and institutional labor market segmentation theories. First, it is possible to improve the criteria used to draw a dividing line between prestigious (primary) and non-prestigious (secondary) occupations. This could be done by giving special attention to the nature of the tasks performed in the job. Or the

28) The question of what governs who gets assigned to low and high pay occupation, if the educational distribution becomes more equal, still remains controversial.

methodology developed by Dickens and Lang could be adopted,[29] if imporved data collection permits. Second, an analysis of the issue of worker mobility across occupations is necessary to determine if conditions of market segmentation actually prevail in the Korean economy. For this a more detailed data source is required.

At any rate, the analyisis in this paper brings us one step further toward explaining the distribution of labor incomes in Korea in the sense that it is performed with a more general model than the one associated with the conventional human capital approach tradition. And it is successful in uncovering some clues to explain the worsening income distribution of the recent period in Korea. It is hoped this investigation will encourage additional research efforts in this direction. In order to gain a better understanding of changes in income distribution, especially in the development process of LDCs, the analysis suggests that more research be carried out in the direction of understanding institutional and political economy foactors in future economic research.

29) Dickens and Lang construct the three equation system composed of wage equation for each sector (primary and secondary), and an equation determining 'tendency to be in the primary sector', Their estimation methodology is one type of the switching regression model. The key euqation is the third one which employs the limited dependent variable estimation technique. We could not use this switching equation in examining the existence of labor market segmentation in Korea, due to the data limitation. See, for details, William T. Dickens and Kevin Lang, *op. cit.*, especially Appendix.

[Table 1] GNP and Per Capita GNP in Korea

	GNP 1980 constant market prices (billion Won)	Per Capita GNP 1980 constant market prices (thousand Won)
1965	10, 352. 89	360. 67
1970	17, 284. 28	536. 10
1975	26, 113. 49	740. 16
1980	37, 204. 98	975. 89

Source : Bank of Korea, *National Income Accounts*, various issues.

[Table 2] Distribution of Income in Korea
(by Income Decile and Index of Concentration)

		1965		1970		1976	1980
		(1)	(2)	(1)	(2)	(2)	(3)
Lowest	1st	3. 27	1. 32	2. 85	2. 78	1. 84	1. 57
〃	2nd	3. 53	4. 43	4. 56	4. 56	3. 86	3. 52
〃	3rd	5. 99	6. 47	5. 42	5. 81	4. 93	4. 86
〃	4th	6. 46	7. 12	6. 14	6. 48	6. 22	6. 11
〃	5th	7. 03	7. 21	7. 17	7. 63	7. 07	7. 33
〃	6th	7. 82	8. 32	8. 21	8. 71	8. 34	8. 63
〃	7th	10. 80	11. 32	9. 49	10. 24	9. 91	10. 21
〃	8th	12. 28	12. 00	11. 43	12. 17	12. 49	12. 38
〃	9th	15. 14	16. 03	14. 85	16. 21	17. 84	15. 93
〃	10th	27. 68	25. 78	29. 88	25. 41	27. 50	29. 46
Gini		0. 3428	0. 3439	0. 3550	0. 3322	0. 3808	0. 3891

Source : (1) Toshiyuki Mizoguchi, Do Hyung Kim, and Young Il Chung, "Overtime Changes of the Size Distribution of Household Income in Korea, 1963-1971", *Developing Economies*, vol. XIV, No. 3, September 1978.
(2) Hakchung Choo, "Economic Growth and Income Distribution in Korea", Working Paper 7810, Seoul : Korea Development Institute, September 1978.
(3) Economic Planning Board, *Social Statistics Survey, 1981*

[Table 3] Average Years of Educational Attainment
(by Age Groups, in Korea)

Age	1966	1970	1975	1980
Average	5.03	5.74	6.62	7.61
6-19	4.98	5.33	6.16	6.53
20-29	7.44	8.32	8.83	9.88
30-39	6.15	7.15	8.12	9.17
40-49	3.90	4.83	6.26	7.52
50 and Over	1.52	1.98	2.74	4.16

Source : Economic Planning Board, *Population and Housing Census*, various issues.

Note : Average Years of Educational Attainment = (Cumulative Years of Education Received by Total Population)/(Population 6 Years Old and Over - Total Students)

[Table 4] Definition of Variables

lnY	Log of monthly earnings, in 1985 prices (won)
YEX	Proxy for expected lifetime earnings
S	Years of schooling
SHAT	Instrumental variable for *S*
EXP	Years of post-school experience
EXP^2	Square of *EXP*
EMP	Years of employment with current firm
lnL	Log of hours worked per week
SEX	Dummy variable; 1 if male
AGE	Respondent's age
Educational diploma	
ED1	Dummy variable; 1 if received primary school diploma
ED2	Dummy variable; 1 if received middle school diploma
ED3	Dummy variable; 1 if received high school diploma
ED4	Dummy variable; 1 if received junior college diploma
ED5	Dummy variable; 1 if received college diploma
ED6	Dummy variable; 1 if received graduate school diploma
Grade (in final graduating class)	
GDE1	Dummy variable; 1 if top 20 per cent
GDE2	Dummy variable; 1 if between 20 and 40 per cent
GDE3	Dummy variable; 1 if between 40 and 60 per cent

GDE4 Dummy variable; 1 if between 60 and 80 per cent
GDE5 Dummy variable; 1 if bottom 20 per cent
Q Dummy variable; 1 if graduated form top quality university or graduate school

Occupation

OCP1 Dummy variable; 1 if professional or technical workers
OCP2 Dummy variable; 1 if administrative or managerial workers
OCP3 Dummy variable; 1 if clerical and related workers
OCP4 Dummy variable; 1 if sales workers
OCP5 Dummy variable; 1 if service workers
OCP6 Dummy variable; 1 if production and related workers
OP Instrumental variable for OCP (occupation)
FOCC Dummy variable; 1 if father had a prestigous occupation ('professional, technical workers' or 'administrative, managerial workers' position)
FSCH Dummy variable; 1 if father received higher education
FWHL Dummy variable; 1 if family was rich (upper 33 per cent) during secondary schooling age)

Region

LOC1 Dummy variable; 1 if living in Seoul
LOC2 Dummy variable; 1 if living in five big cities
LOC3 Dummy variable; 1 if living in samll cities
LOC4 Dummy variable; 1 if living elsewhere

Job ranking

JOB1 Dummy variable; 1 if janitor, security, typist, etc.
JOB2 dummy variable; 1 if mere clerk level
JOB3 Dummy variable; 1 if chief clerk level
JOB4 Dummy variable; 1 if section chief level
JOB5 Dummy variable; 1 if department manager level
JOB6 Dummy variable; 1 if executives level

[Table 5] Determination of Years of Schooling
(Coefficients and 't-ratios')

Dependent variable = *S* (Years of schooling)

*	constant	*YEX*	*AGE*	*SEX*	*FOCC*	*FSCH*	*FWHL*
(1)	13. 52259	0. 00001	-0. 16199	0. 69475	0. 78464	0. 71830	0. 30026
	(64. 57)	(28. 41)	(-18. 27)	(4. 57)	(4. 77)	(4. 44)	(1. 61)
(2)	14, 33660	0. 00001	-0. 16624	-	-0. 83443	0. 67508	0. 22371
	(48. 05)	(26. 36)	(-16. 45)	-	(4. 34)	(3. 43)	(1. 05)
(3)	12. 77288	0. 00001	-0. 13991	-	0. 62060	0. 71343	0. 74107
	(24. 51)	(3. 95)	(-6. 41)	-	(1. 95)	(2. 61)	(1. 81)
(4)	13. 89727	0. 00001	-0. 13559	0. 90698	-	0. 42083	-0. 57692
	(22. 99)	(10. 46)	(-5. 43)	(2. 13)	-	(1. 56)	(-1. 93)
(5)	13. 58395	0. 00001	-0. 16561	0. 69558	-	0. 87057	0. 68605
	(61. 08)	(26. 29)	(-17. 52)	(4. 28)	-	(4. 46)	(3. 02)
(6)	16. 50028	0. 00001	-0. 27612	0. 61000	0. 20874	-	0. 02231
	(26. 49)	(13. 34)	(-9. 50)	(1. 94)	(0. 89)	-	(0. 08)
(7)	13. 40391	0. 00001	-0. 15579	0. 68142	0. 99632	-	0. 44494
	(60. 53)	(25. 85)	(-16. 53)	(4. 04)	(4. 89)	-	(1. 93)
(8)	15. 44685	0. 00001	-0. 19469	0. 60148	-0. 20584	0. 39217	-
	(21. 68)	(12. 10)	(-8. 06)	(1. 25)	(-0. 67)	(1. 27)	-
(9)	13. 42365	0. 00001	-0. 15977	0. 68725	1. 02737	0. 76551	-
	(60. 80)	(26. 20)	(-16. 94)	(4. 29)	(5. 52)	(4. 20)	-

*	Case	R^2	Adj R^2	'F-ratio'	N
(1)	total sample	0. 5103	0. 5076	184. 463	1, 069
(2)	*SEX* = 1	0. 5077	0. 5046	162. 951	796
(3)	*SEX* = 0	0. 1955	0. 1805	12. 979	273
(4)	*FOCC* = 1	0. 4928	0. 4755	28. 561	153
(5)	*FOCC* = 0	0. 4880	0. 4852	173. 493	916
(6)	*FSCH* = 1	0. 6055	0. 5926	46. 968	159
(7)	*FSCH* = 0	0. 4838	0. 4810	169. 473	910
(8)	*FWHL* = 1	0. 6216	0. 6032	33. 834	109
(9)	*FWHL* = 0	0. 4929	0. 4902	185. 444	960

[Table 6] Determination of Occupation
(Coefficients and 't-ratios')

	Constant	*SHAT*	*EXP*	*SEX*	*FOCC*	*FSCH*	*FWHL*
$ln(P_1/P_6)$	-4.841	0.323	-0.034	1.639	-0.195	1.245	0.051
	(-4.44)	(3.64)	(-1.64)	(4.57)	(-0.48)	(2.39)	(0.11)
$ln(P_2/P_6)$	-6.330	0.424	0.043	1.108	0.297	0.738	0.023
	(-6.13)	(5.09)	(2.28)	(3.07)	(0.76)	(1.39)	(0.05)
$ln(P_3/P_6)$	-2.111	0.290	-0.016	-0.347	-0.441	1.276	-0.106
	(-2.16)	(3.59)	(-0.89)	(-1.34)	(-1.16)	(2.58)	(-0.25)
$ln(P_4/P_6)$	-4.261	0.179	-0.010	1.217	0.269	1.036	0.696
	(-2.840	(1.47)	(-0.37)	(2.32)	(0.51)	(1.61)	(1.26)
$ln(P_5/P_6)$	-3.638	0.205	0.000	0.550	-0.354	1.306	0.087
	(-2.73)	(1.88)	(0.00)	(1.37)	(-0.66)	(2.19)	(0.15)
$ln(P_1/P_5)$	-1.203	0.117	-0.034	1.089	0.159	-0.061	-0.036
	(-0.99)	(1.19)	(-1.44)	(2.52)	(0.34)	(-0.15)	(-0.07)
$ln(P_2/P_5)$	-2.692	0.219	0.043	0.557	0.651	-0.568	-0.064
	(-2.33)	(2.35)	(1.93)	(1.28)	(1.43)	(-1.32)	(-0.13)
$ln(P_3/P_5)$	1.527	0.085	-0.016	-0.897	-0.087	-0.030	-0.193
	(1.36)	(0.91)	(-0.75)	(-2.53)	(-0.20)	(-0.08)	(-0.42)
$ln(P_4/P_5)$	-0.623	-0.027	-0.010	0.667	0.623	-0.271	0.610
	(-0.39)	(-0.21)	(-0.34)	(1.15)	(1.08)	(-0.48)	(1.06)
$ln(P_1/P_4)$	-0.580	0.144	-0.023	0.422	-0.464	0.209	-0.645
	(-0.42)	(1.29)	(-0.88)	(0.77)	(-1.01)	(0.44)	(-1.39)
$ln(P_2/P_4)$	-2.069	0.246	0.053	-0.110	0.028	-0.298	-0.673
	(-1.54)	(2.29)	(2.08)	(-0.20)	(0.06)	(-0.61)	(-1.48)
$ln(P_3/P_4)$	(2.150	0.112	-0.006	-1.564	-0.710	0.241	-0.800
	(1.63)	(1.04)	(-0.24)	(-3.20)	(-1.61)	(0.52)	(-1.81)
$ln(P_1/P_3)$	-2.730	0.033	-0.017	1.986	0.246	-0.031	0.157
	(-3.45)	(0.51)	(-1.09)	(6.57)	(0.87)	(-0.12)	(0.51)
$ln(P_2/P_3)$	-4.219	0.134	0.059	1.455	0.738	-0.538	0.120
	(-6.08)	(2.44)	(4.23)	(4.77)	(2.77)	(-1.92)	(0.43)
$ln(P_1/P_2)$	1.489	-0.101	-0.076	0.532	-0.492	0.507	0.028
	(1.81)	(-1.59)	(-4.65)	(1.35)	(-1.68)	(1.65)	(0.09)

Log-likelihood	-1,548.4
Restricted Log-likelihood	-1,667.9
Chi-Squared	239.01
Degrees of Freedom	30

* Occupational groups are defined in Table 4.

[Table 7] Probabilities of Being in Each Occupation
Given Average Education and Experience

SEX	*FOCD*	*FSCH*	*FWHL*	1	2	3	4	5	6
1	1	1	1	0. 251	0. 221	0. 275	0. 135	0. 076	0. 041
1	1	1	0	0. 254	0. 230	0. 325	0. 072	0. 074	0. 044
1	1	0	1	0. 198	0. 290	0. 210	0. 132	0. 057	0. 114
1	1	0	0	0. 201	0. 302	0. 250	0. 070	0. 055	0. 121
1	0	1	1	0. 265	0. 143	0. 371	0. 090	0. 094	0. 036
1	0	1	0	0. 259	0. 144	0. 425	0. 046	0. 089	0. 037
1	0	0	1	0. 223	0. 200	0. 303	0. 093	0. 075	0. 105
1	0	0	0	0. 220	0. 202	0. 349	0. 048	0. 071	0. 109
0	1	1	1	0. 077	0. 115	0. 611	0. 063	0. 069	0. 065
0	1	1	0	0. 071	0. 110	0. 663	0. 031	0. 062	0. 064
0	1	0	1	0. 062	0. 155	0. 482	0. 063	0. 053	0. 184
0	1	0	0	0. 059	0. 150	0. 530	0. 031	0. 048	0. 182
0	0	1	1	0. 069	0. 064	0. 709	0. 036	0. 074	0. 049
0	0	1	0	0. 063	0. 059	0. 750	0. 017	0. 064	0. 046
0	0	0	1	0. 061	0. 092	0. 600	0. 039	0. 060	0. 148
0	0	0	0	0. 056	0. 087	0. 643	0. 019	0. 053	0. 142
Average				0. 179	0. 177	0. 427	0. 046	0. 072	0. 109

Average *SHAT* = 12. 935454; average *EXP* = 8. 2082051;
Average *SEX* = 0. 74462114; average *FOCC* = 0. 14312442;
Average *FSCH* = 0. 14873714; average *FWHL* = 0. 10196445;

[Table 8] Earnings Function
(Coefficients and 't-ratios')

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	8. 04883	8. 31689	8. 13004	8. 40762	7. 93829	8. 22337	8. 16362
	(15. 48)	(15. 87)	(15. 71)	(16. 11)	(15. 25)	(15. 68)	(15. 66)
SHAT	0. 11331	0. 10011	0. 11940	0. 10646	0. 11111	0. 09754	0. 10176
	(3. 34)	(2. 93)	(3. 53)	(3. 13)	(3. 29)	(2. 87)	(3. 02)
EXP	0. 06717	0. 05969	0. 06048	0. 05250	0. 06631	0. 05879	0. 05961
	(6. 290	(5. 46)	(5. 60)	(4. 76)	(6. 25)	(5. 42)	(5. 53)
EXP^2	-0. 00052	-0. 00059	-0. 00042	-0. 00049	-0. 00053	-0. 00060	-0. 00062
	(-2. 97)	(-3. 35)	(-2. 38)	(-2. 74)	(-3. 01)	(-3. 41)	(-3. 56)
lnL	0. 14706	0. 12796	0. 13157	0. 11111	0. 14809	0. 12562	0. 13621
	(2. 54)	(2. 20)	(2. 27)	(1. 91)	(2. 57)	(2. 18)	(2. 38)
AGE	0. 02496	0. 02054	0. 02402	0. 01946	0. 02544	0. 02107	0. 02171
	(9. 19)	(6. 84)	(8. 85)	(6. 49)	(9. 40)	(7. 06)	(7. 35)
SEX	0. 11008	-0. 23804	0. 25924	-0. 09654	0. 16614	-0. 18575	-0. 24064

	(0.31)	(-0.65)	(0.72)	(-0.26)	(0.47)	(-0.510	(-0.66)
OP1	4.71275	4.49143	4.18968	3.93840	4.60173	4.41732	4.30263
	(4.21)	(3.84)	(3.73)	(3.36)	(4.12)	(3.80)	(3.80)
OP2	-0.62634	0.38635	-0.91648	0.10537	-0.61161	0.43415	0.34636
	(-0.82)	(0.48)	(-1.20)	(0.13)	(-0.80)	(0.55)	(0.44)
OP3	2.42821	2.01081	2.43219	1.98666	2.51530	2.12924	1.96396
	(3.37)	(2.66)	(3.39)	(2.64)	(3.51)	(2.83)	(2.65)
OP4	-0.60994	2.08420	-0.81056	1.92248	-0.69783	2.05883	2.47009
	(-0.29)	(0.95)	(-0.39)	(0.88)	(-0.33)	(0.94)	(1.13)
OP5	-7.11762	-1.07882	-7.63617	-1.40869	-7.42479	-1.13520	-0.75298
	(-1.48)	(-0.21)	(-1.59)	(-0.28)	(-1.55)	(-0.27)	(-0.15)
FOCC	0.21138	0.11432	0.23181	0.13256	0.21351	0.11510	0.11322
	(2.29)	(1.19)	(2.52)	(1.39)	(2.33)	(1.21)	(1.19)
FSCH	-0.38873	-0.35226	-0.38144	-0.34358	-0.38839	-0.35414	-0.35648
	(-5.53)	(-4.85)	(-5.46)	(-4.76)	(-5.56)	(-4.92)	(-5.00)
FWHL	0.9809	-0.03666	0.11436	-0.02371	0.10355	-0.03310	-0.0525
	(0.95)	(-0.34)	(1.12)	(-0.22)	(1.01)	(-0.31)	(-0.49)
LOC1	0.17904	0.20598	0.16666	0.19269	0.16900	0.19611	0.18940
LOC2	0.02657	0.05809	0.01915	0.04981	0.03091	0.06318	0.06051
	(0.79)	(1.68)	(0.57)	(1.44)	(0.92)	(1.83)	(1.80)
LOC3	-0.01530	0.01184	-0.02005	0.00643	-0.01678	0.01050	0.0176
	(-0.48)	(0.37)	(-0.63)	(0.20)	(-0.53)	(0.32)	(0.45)
JOB2	0.05410	0.04377	0.05900	0.04787	0.05213	0.03835	0.05045
	(1.81)	(1.46)	(1.98)	(1.60)	(1.75)	(1.28)	(1.71)
JOB3	0.20709	0.19415	0.19650	0.18256	0.20533	0.19033	0.19732
	(5.20)	(4.88)	(4.95)	(4.60)	(5.18)	(4.81)	(5.01)
JOB4	0.22760	0.22042	0.22325	0.21526	0.21704	0.20831	0.21815
	(4.88)	(4.74)	(4.82)	(4.66)	(4.68)	(4.50)	(4.74)
JOB5	0.28528	0.29836	0.28393	0.29693	0.28201	0.29293	0.29077
	(5.09)	(5.32)	(5.09)	(5.33)	(5.05)	(5.25)	(5.25)
JOB6	0.38732	0.38339	0.38633	0.38142	0.38362	0.37800	0.34569
	(6.13)	(6.08)	(6.15)	(6.09)	(6.10)	(6.03)	(5.51)
ED2	-	-0.04924	-	-0.03943	-	-0.04420	-
		(-0.74)		(-0.60)		(-0.67)	
ED3	-	-0.10035	-	-0.09537	-	-0.11192	-
		(-1.59)		(-1.52)		(-1.78)	
ED4	-	-0.08302	-	-0.07303	-	-0.08880	-
		(-1.19)		(-1.05)		(-1.28)	
ED5	-	-0.01979	-	-0.03018	-	-0.01082	0.07982
		(0.27)		(0.41)		(0.15)	(2.11)
ED6	-	-0.20345	-	-0.20936	-	-0.19959	0.25306
		(0.27)		(2.14)		(2.05)	(3.38)

Q	-	-	-	-	-	-	0. 16727
							(4. 17)
EMP	-	-	0. 01051	0. 01075	-	-	-
			(3. 52)	(3. 63)			
GDE1	-	-	-	-	0. 16006	0. 14938	-
					(2. 05)	(1. 93)	
GDE2	-	-	-	-	0. 06687	0. 05117	-
					(0. 87)	(0. 67)	
GDE3	-	-	-	-	0. 08856	0. 06472	-
					(1. 13)	(0. 83)	
GDE4	-	-	-	-	0. 04416	0. 00915	-
					(0. 41)	(0. 09)	
R^2	0. 7446	0. 7499	0. 7476	0. 7530	0. 7491	0. 7549	0. 7531
Adj. R^2	0. 7393	0. 7434	0. 7421	0. 7464	0. 7429	0. 7476	0. 7472
'F-ratio'	138. 639	115. 596	134. 596	113. 239	119. 672	103. 031	127. 252

[Table 9] Earnings Function by Occupational Group
(Coefficients and 't-ratios')

	Total		Group1		Group2	
	(1)	(2)	(1)	(2)	(1)	(2)
Constant	8. 04883	8. 31689	9. 94284	10. 75878	9. 11828	9. 61199
	(15. 48)	(15. 87)	(24. 84)	(25. 21)	(26. 30)	(24. 51)
SHAT	0. 11331	0. 10011	0. 13859	0. 10025	0. 14675	0. 12348
	(3. 34)	(2. 93)	(14. 90)	(8. 46)	(12. 38)	(7. 62)
EXP	0. 06717	0. 05969	0. 01790	0. 03678	0. 02610	0. 03200
	(6. 29)	(5. 46)	(2. 38)	(4. 53)	(3. 86)	(4. 30)
EXP^2	-0. 00052	-0. 00059	-0. 00018	-0. 00056	-0. 00062	-0. 00076
	(-2. 97)	(-3. 35)	(-0. 81)	(-2. 41)	(-2. 76)	(-3. 26)
lnL	0. 14706	0. 12796	0. 10089	0. 06107	0. 15002	0. 12723
	(2. 54)	(2. 20)	(1. 14)	(0. 70)	(1. 93)	(1. 62)
AGE	0. 02496	0. 02054	0. 01271	0. 00545	0. 02258	0. 01805
	(9. 19)	(6. 84)	(3. 26)	(1. 36)	(7. 19)	(4. 99)
SEX	0. 11008	-0. 23804	0. 17354	0. 18390	0. 10616	0. 13129
	(0. 31)	(-0. 65)	(2. 81)	(3. 06)	(2. 65)	(3. 20)
OP1	4. 71275	4. 49143	-	-	-	-
	(4. 21)	(3. 84)				
OP2	-0. 62634	0. 38635	-	-	-	-
	(-0. 82)	(0. 48)				
OP3	2. 42821	2. 01081	-	-	-	-
	(3. 37)	(2. 66)				

OP4	-0. 60994	2. 08420	-	-	-	-
	(-0. 29)	(0. 96)				
OP5	-7. 11762	-1. 07882	-	-	-	-
	(-1. 48)	(-0. 21)				
FOCC	0. 21138	0. 11432	-0. 06692	-0. 05400	-0. 02787	-0. 01133
	(2. 29)	(1. 19)	(-1. 67)	(-1. 40)	(-0. 64)	(-0. 27)
FSCH	-0. 38873	-0. 35226	-0. 01825	-0. 01914	-0. 08756	-0. 08536
	(-5. 53)	(-4. 85)	(-0. 43)	(-0. 47)	(-2. 20)	(2. 14)
FWHL	0. 09809	-0. 03666	0. 01815	0. 03684	-0. 08651	-0. 07245
	(0. 95)	(-0. 34)	(0. 40)	(0. 85)	(-1. 84)	(1. 53)
LOC1	0. 17904	0. 20598	0. 11743	0. 13053	0. 26887	0. 27241
	(5. 29)	(5. 89)	(2. 32)	(2. 57)	(5. 59)	(5. 44)
LOC2	0. 02657	0. 05809	-0. 01548	0. 00803	0. 08352	0. 10070
	(0. 79)	(1. 68)	(-0. 32)	(0. 16)	(1. 76)	(2. 04)
LOC3	-0. 01530	0. 01184	-0. 10385	-0. 07996	0. 07292	0. 08452
	(-0. 48)	(0. 37)	(-2. 20)	(-1. 69)	(1. 62)	(1. 83)
JOB2	0. 05410	0. 04377	-0. 07086	-0. 10002	0. 09686	0. 08994
	(1. 81)	(1. 46)	(-1. 18)	(-1. 69)	(2. 71)	(2. 49)
JOB3	0. 20709	0. 19415	0. 09915	0. 03451	0. 28404	0. 27667
	(5. 20)	(4. 88)	(1. 51)	(0. 53)	(5. 50)	(5. 33)
JOB4	0. 22760	0. 22042	0. 24321	0. 18160	0. 2168	0. 22883
	(4. 88)	(4. 74)	(3. 50)	(2. 64)	(3. 38)	(3. 48)
JOB5	0. 28528	0. 29836	0. 17998	0. 16593	0. 35216	0. 38881
	(5. 09)	(5. 32)	(3. 23)	(2. 10)	(4. 42)	(4. 83)
JOB6	0. 38732	0. 38339	0. 30669	0. 25038	0. 43151	0. 45208
	(6. 13)	(6. 08)	(3. 79)	(3. 12)	(3. 95)	(4. 12)
ED2	-	-0. 04924	-	-0. 12961	-	-0. 02403
		(-0. 74)		(-1. 16)		(-0. 29)
ED3	-	-0. 10035	-	-0. 14284	-	-0. 05920
		(-1. 59)		(-1. 37)		(-0. 74)
ED4	-	-0. 08302	-	0. 00501	-	-0. 10951
		(-1. 19)		(0. 05)		(-1. 20)
ED5	-	0. 01979	-	0. 08357	-	0. 05774
		(0. 27)		(0. 75)		(0. 60)
ED6	-	0. 20345	-	0. 25396	-	0. 08561
		(2. 07)		(1. 98)		(0. 42)
R^2	0. 7446	0. 7499	0. 7572	0. 7781	0. 7060	0. 7103
Adh R^2	0. 7393	0. 7434	0. 7462	0. 7650	0. 6984	0. 7005
'F-ratio'	138. 639	115. 598	69. 152	15. 303	92. 672	72. 589
N	1, 069		395		674	

* Group1 : *OCP*=1 or *OCP*=2
Group2 : *OCP*=3 or *OCP*=4 or *OCP*=5 or *OCP*=6

[Table 10] Contributions of Components Toward Earnings Inequality

	Total (N=1, 069)		Group1 (N=395)		Group2 (N=674)	
	Effects	%	Effects	%	Effects	%
S	0. 0322	12. 29	0. 0412	16. 77	0. 0366	15. 62
EXP	0. 1636	62. 42	0. 0745	30. 33	0. 0398	16. 99
EXP^2	0. 0114	4. 35	0. 0134	5. 46	0. 0150	6. 40
AGE	0. 0335	12. 78	0. 0022	0. 90	0. 0248	10. 58
lnL	0. 0003	0. 11	0. 0001	0. 04	0. 0004	0. 17
SEX	0. 0108	4. 12	0. 0025	1. 02	0. 0040	1. 74
OCP	0. 2293	87. 49	-	-	-	-
FOCC	0. 0016	0. 61	0. 0005	20. 36	0. 0000	0. 00
FSCH	0. 0157	5. 99	0. 0001	0. 04	0. 0009	0. 38
FWHL	0. 0001	0. 04	0. 0002	0. 08	0. 0004	0. 17
LOC	0. 0089	3. 40	0. 0046	1. 87	0. 0050	2. 13
JOB	0. 0222	8. 47	0. 0145	5. 90	0. 0266	11. 35
ED	0. 0044	1. 68	0. 0110	4. 48	0. 0029	1. 24
Joint Effects	-0. 2720	-103. 70	0. 0810	32. 98	0. 0781	33. 33
Explained Inequality	0. 2621	100. 00	0. 2456	100. 00	0. 2343	100. 00
Observed Inequality	0. 3503		0. 3161		0. 3340	
R^2	0. 7482		0. 7770		0. 7015	

[Table 11] Estimated Rates of Return to Educational Attainment (in per cent)

	Middle School	High School	College
1967[1]	12. 0	9. 0	5. 0
1969[2]	20. 0	11. 0	9. 5
1971[3]	8. 2	14. 6	9. 3
1977[4]	2. 8	9. 9	13. 8
1980[5]	2. 9	8. 1	11. 7

Source : 1. Kwang Suk Kim, *Rates of Return in Education in Korea*, USAID/Korea, September 1968.

2. Robert M. Morgan, ed., *Systems Analysis for Educational Change : The Republic of Korea*, Florida State University, 1971, p. 194.

3. Chang-Young Jeong, "Rates of Return on Investment in Education : The Case of Korea" (in Korean), Korea Development Institute, Working Paper 7408, September 1974, p. 36.

4. Chong-Keun Pae, *The Economic Effects and the Optimum Educational Investment* (in Korean), Seoul, 1979, p. 68.
5. Se-Il Park, "Social and Private Rate of Return to Education in Korea" (in Korean), *Korea Development Review*, Vol. 4, No. 3, September 1982, p. 116.

[Table 12] Wage Levels by Educational Attainment
(in won and per cent)

	Middle School Graduates	High School Graduates	Junior College Graduates	College Graduates
1971	16, 444	27, 004	-	47, 309
	(60. 9)	(100. 0)		(175. 2)
1972	17, 009	27, 939	-	50, 947
	(60. 9)	(100. 0)		(182. 4)
1973	19, 566	32, 583	-	60, 647
	(60. 0)	(100. 0)		(186. 1)
1974	26, 273	41, 069	-	81, 439
	(64. 0)	(100. 0)		(198. 3)
1975	32, 109	55, 982	76, 248	120, 021
	(57. 2)	(100. 0)	(136. 2)	(214. 4)
1976	43, 226	73, 144	106, 256	167, 982
	(59. 1)	(100. 0)	(145. 3)	(229. 7)
1977	53, 889	88, 939	131, 112	204, 955
	(60. 6)	(100. 0)	(147. 4)	(230. 4)
1978	72, 947	116, 898	174, 469	269, 998
	(62. 4)	(100. 0)	(149. 2)	(231. 0)
1979	104, 034	157, 790	232, 884	364, 010
	(65. 9)	(100. 0)	(147. 6)	(230. 7)
1980	(68. 8)	(100. 0)	(146. 3)	(228. 5)
	(68. 8)	(100. 0)	(146. 3)	(228. 5)
1981	105, 775	218, 502	313, 087	491, 546
	(69. 0)	(100. 0)	(143. 3)	(225. 0)
1982	174, 191	249, 169	325, 678	552, 191
	(69. 9)	(100. 0)	(130. 7)	(221. 6)
1983	193, 855	267, 442	372, 638	604, 662
	(72. 5)	(100. 0)	(139. 3)	(226. 1)

Source : Ministry of Labor, *Occupational Wage Survey*, Various Issues.

[Table 13] Wage Levels by Occupation
(in won and per cent)

	Average	*OCP1*	*OCP2*	*OCP3*	*SD*	*COV*	*INDEX*
1972	23, 819	43, 748	72, 322	34, 710	9, 511	0. 399	28. 1
	(100. 0)	(183. 7)	(303. 6)	(145. 7)			
1973	28, 861	54, 594	87, 722	44, 443	12, 900	0. 447	29. 0
	(100. 0)	(189. 2)	(303. 9)	(154. 0)			
1974	38, 779	64, 403	107, 812	60, 195	15, 112	0. 390	36. 1
	(100. 0)	(166. 1)	(278. 0)	(155. 2)			
1975	46, 654	92, 400	159, 399	74, 679	23, 385	0. 503	45. 2
	(100. 0)	(198. 1)	(341. 7)	(160. 1)			
1976	64, 308	136, 004	220, 958	103, 668	33, 213	0. 516	52. 1
	(100. 0)	(211. 5)	(343. 6)	(161. 2)			
1977	77, 375	157, 230	254, 301	119, 312	36, 576	0. 473	57. 4
	(100. 0)	(203. 2)	(328. 7)	(154. 2)			
1978	104, 132	211, 487	333, 227	142, 219	53, 896	0. 518	65. 7
	(100. 0)	(203. 1)	(324. 8)	(136. 6)			
1979	146, 442	285, 504	485, 826	196, 199	71, 724	0. 487	77. 0
	(100. 0)	(195. 0)	(331. 8)	(134. 0)			
1980	173, 150	321, 530	517, 432	211, 678	84, 297	0. 487	100. 0
	(100. 0)	(185. 7)	(298. 8)	(122. 3)			
1981	209, 641	368, 032	587, 027	260, 034	95, 916	0. 458	121. 3
	(100. 0)	(175. 6)	(280. 0)	(124. 0)			
1982	244, 819	446, 499	635, 631	291, 225	109, 696	0. 448	130. 1
	(100. 0)	(182. 4)	(259. 6)	(119. 0)			
1983	271, 178	486, 811	693, 165	312, 963	121, 149	0. 447	134. 5
	(100. 0)	(179. 5)	(255. 6)	(115. 4)			

	OCP4	*OCP5*	*OCP6*	*OCP7*	*SD*	*COV*	*INDEX*
1972	25, 208	17, 187	17, 127	18, 956	9, 511	0. 399	28. 1
	(105. 8)	(72. 2)	(71. 9)	(79. 6)			
1973	32, 687	21. 514	19, 196	21, 605	12, 900	0. 447	29. 0
	(113. 3)	(74. 5)	(66. 5)	(74. 9)			
1974	39, 637	28, 048	24, 171	30, 493	15, 112	0. 390	36. 1
	(102. 2)	(72. 3)	(62. 3)	(78. 6)			
1975	42, 964	36, 502	30, 332	34, 820	23, 385	0. 503	45. 2
	(92. 1)	(77. 3)	(65. 0)	(74. 6)			
1976	52, 319	47, 865	40, 123	46, 639	33, 213	0. 516	52. 1
	(81. 4)	(74. 4)	(62. 4)	(72. 5)			
1977	75, 774	57, 890	71, 792	57, 979	36, 576	0. 473	57. 4
	(97. 9)	(74. 8)	(92. 8)	(74. 9)			

1978	98, 375	77, 259	81, 972	78, 434	53, 896	0. 518	65. 7
	(94. 5)	(74. 2)	(78. 7)	(75. 3)			
1979	119, 560	108, 425	121, 304	111, 476	71, 274	0. 487	77. 0
	(81. 6)	(74. 0)	(82. 8)	(76. 1)			
1980	116, 815	131, 381	144, 426	130, 848	84, 297	0. 487	100. 0
	(67. 5)	(75. 9)	(83. 4)	(75. 6)			
1981	153, 543	159, 915	188, 324	159, 755	95, 916	0. 458	121. 3
	(73. 2)	(76. 3)	(89. 8)	(76. 2)			
1982	246, 002	188, 254	260, 530	184, 183	109. 696	0. 448	130. 1
	(100. 5)	(76. 9)	(106. 4)	(75. 2)			
1983	261, 708	204, 372	-	201, 998	121, 149	0. 447	134. 5
	(96. 5)	(75. 4)		(74. 5)			

Note : *OCP1* =Professionals and Technical Workers
OCP2 =Administrative and Managerial Workers
OCP3 =Clerical and Related Workers
OCP4 =Sales Workers
OCP5 =Service Workers
OCP6 =Agriculture, Forestry, Hunting, Fishing, and Related Workers
OCP7 =Production and Related Workers
SD =Standard Deviation
COV =Coefficient of Variation
Index =Consumer Price Index

Source : Ministry of Labor, *Occupational Wage Survey*, Various Issues.

ERRATA

THE FOLLOWING CORRECTIONS should be made in the paper by SI-WOOK KIM, "Micro-based Estimates of Demand Functions for Local Public Goods Incorporating Productivity and Benefit Differences", *The Korean Economic Review*, vol. 3, December 1987, pp. 141-167 : on page 146, O_i, $O_i(\cdot)$, Y_A, Y_B and $\bar{Y}_i$ in Figure 2 should be $\tilde{O}_i$, $\tilde{O}_i(\cdot)$, $\bar{Y}_A$, $\bar{Y}_B$ and Y_i respectively; on page 152, $O_i^2 c$ in the 16th line should be O_i^2 and $\log Y$ in equation (14b) should be $\log \bar{Y}$; on page 153, E_i^2 in the 29th line should be E_i^* and EE_i^* in the 34th line should be E_i^*; on page 154, E_i^2 in equation (15) should be E_i^*, Y'_i / Y in equation (16c) should be $Y_i / \bar{Y}$, and ϕ^{-1} in equation (16e) should be $\phi^{-1}\delta_i^{-1} D_i$; on page 155, E_i^* in equation (19) and in the 33th line should be $\tilde{E}_i^*$ and O_i^2 in the 32th line should be σ_i^2; on page 157, $L(\theta)$; in equation (22) should be $\tilde{L}(\theta)$; and on page 165, T_i in footnote (6) should be τ_i and $E(\varepsilon_i | X_i, \tilde{A}_i) \neq 0$ in footnate (10) should be $E(\varepsilon_i | X_i, \tilde{A}_i) \neq 0$.