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Changes in Wage Inequality and the Effect of Human Capital in Korea: 1972~89

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I. Introduction

In Korea between 1972 and 1989 the average real hourly wage of working men tripled. Workers at all points of the wage distribution gained over this period, even though the wage gains were not spread equally across workers. The gains of the least skilled and the most skilled are quite contrary to the case of the U.S.¹⁾ Wages for the least skilled, as measured by the 10th percentile of the wage distribution,

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1) In the U.S. the most skilled workers gained the most and the least skilled workers gained the least.

increased more than those for the most skilled, as measured by the 90th percentile of the wage distribution. Thus, wage inequality declined in Korea for those years. Associated with these phenomena is an improvement in human capital.²⁾ When the decreased wage inequality is decomposed into changes in observable dimensions of skill (i.e., education, age and tenure) and a decrease associated with unobservable components of skill, the contribution of the first is roughly the same as that of the second. Thus, even though the observed improvement of human capital has quite an effect on the changes in wage inequality in Korea, there are still factors that cannot be identified at this stage (for example, international trade, technological change, etc). Moreover, there is a timing difference between the decrease due to observable components and that due to unobservables. Until 1976 inequality due to observables increased, whereas inequality due to unobservables decreased since the early 1970s.

While it is well known that wage inequality for males has increased substantially in the U.S. over the 1970s and 1980s³⁾, the fact that wage inequality has decreased in Korea has been less studied until recently. Kim and Topel (1995) in their study on the Korean labor market showed that wage inequality narrowed during Korea's industrialization. They showed that most of the advances in average education were accomplished at lower schooling levels, which raised the average level of education in the workforce and reduced educational inequality. This in turn reduced overall wage inequality.

However, they relied on published cross-tabulations of the Occupational Wage Survey (OWS) data from 1971 to 1989 except the years of

2) Education level increased substantially in Korea. Percentage of the 20~24 age group enrolled in all post-secondary schools and universities increased from 6 percent in 1965 to 37 percent in 1988. For comparison, in the U.S. it increased from 40 to 60 percent. See Table 29, World Bank (1991).

3) See Juhn, Murphy and Pierce (1993), Katz and Kruger (1991), Davis and Haltiwanger (1991), Katz and Murphy (1992), Freeman (1993), Mincer (1993), and Borjas, Freeman and Katz (1993).

1971, 1983 and 1986 for which they utilized micro data. The lack of micro data set for those years kept them from further investigating the effects of the increasing human capital level on the decreasing wage inequality. At the end of the paper they posed a question of "How much of the overall narrowing of the wage distribution is caused by improvements in overall human capital and consequent substitution effects?"

This paper exploits a rich source of information on the wages and other characteristics of individual workers in Korea, OWS data in tapes for 10 years in about two decades. With this data set, this paper will ① document changing wage inequality in Korea, ② decompose decreasing wage inequality to examine the effects of the increasing human capital level on the decreasing wage inequality.

The rest of the paper consists of the following sections. The next section describes the OWS data in more detail. Section 3 shows how the wage inequality has changed over time in Korea. Section 4 decomposes the wage inequality into observable components and unobservable components. To see how much of the decreasing inequality is due to changes in the distribution of skill and skill price, the paper analyzes data employing the accounting scheme with a decomposition of the changing inequality developed by Juhn, Murphy and Pierce (1993) (JMP, hereafter). Section 5 concludes.

II. Data

Throughout the paper, I refer to the data set Occupational Wage Survey (OWS) reported annually by the Ministry of Labor, Korea. Data available at hand are from 1972 to 1988 in every other year and 1989, a total of 10 years of micro data with about 30,000 observations

a year randomly selected from the OWS tapes. This survey includes wage and demographic information of workers. The OWS is different from the Current Population Survey (CPS) in the U.S. in that the sampling units are firms rather than households. The survey includes only firms with at least 10 employees, by which fact manufacturing sector is over represented and retail trade industry is under represented in the sample⁴⁾.

Education is categorized into 5 groups. Elementary school graduates (6 years, dropouts of elementary school and dropouts of middle school), middle school graduates (9 years and dropouts of high school), high school graduates (12 years and dropouts of college), junior college, or, vocational college, graduates (14 years and less than 16 years), college graduates (16 years and more).⁵⁾

Wages are based on the monthly amount paid. There are regular payments and overtime payments.⁶⁾ Throughout the paper monthly payment is defined as the sum of regular payment and overtime payment and focus on the real hourly wages and log real hourly wages. I deflated monthly payment by the consumer price index (1985=100) and defined the real hourly wage as the deflated monthly payment divided by hours worked a month, where hours worked are the sum of regular work hours and overtime work hours. Then I

4) This survey also excludes such industries as agriculture, forestry, fishery, public administration, armed forces, police, public education, hospitals, libraries, and international and foreign institutions.

5) For 1972 there is no category of vocational college. College graduates include junior college graduates in 1972.

6) Wage rate for overtime work is 50 percent higher than that of regular work hours. It is not controlled for here. In addition, there are bonus payments given last year. Bonus payments are in a range of about 5 percent to about 20 percent in 1989 out of total wage inclusive of bonus. Some experiments showed that the inclusion of bonus payments did not deviate from our results qualitatively. However, the exclusion may have overrepresented the changes in wage inequality because those paid high wages usually receive higher bonus payments than those paid low wages do.

defined log real hourly wage as the natural logarithm of real hourly wage.

Sample selection criterion for this paper is as follows. Male workers from 16 years old to 65 years old working between 80 and 450 hours a month should earn real hourly wage of at least 50 won in 1985 won. This criterion gives rise to the data each year as in <Table 1> and thus total 189,036 wage observations of working men.

<Table 1> Descriptive Statistics of OWS Data

| Year | Sample Obs # | Mean Age | Mean Tenure | Mean Wrkhrs | Normal Wrkhrs | Overtime Wrkhrs |
|------|-----------------|-------------|----------------|----------------|------------------|--------------------|
| 1972 | 19156 | 32.0 | 2.82 | 216.2 | a | a |
| 1974 | 18917 | 32.3 | 3.12 | 218.5 | a | a |
| 1976 | 18341 | 32.1 | 2.96 | 243.5 | a | a |
| 1978 | 18971 | 32.0 | 2.95 | 242.0 | 202.3 | 39.7 |
| 1980 | 17997 | 32.1 | 3.06 | 231.4 | 197.5 | 33.9 |
| 1982 | 18433 | 32.6 | 3.91 | 232.4 | 196.7 | 35.7 |
| 1984 | 19207 | 33.0 | 4.47 | 235.8 | 195.4 | 40.4 |
| 1986 | 19549 | 33.5 | 5.13 | 228.4 | 191.7 | 36.7 |
| 1988 | 19222 | 33.6 | 5.03 | 227.1 | 193.2 | 33.9 |
| 1989 | 19243 | 34.1 | 5.43 | 221.5 | 190.1 | 31.4 |

Source: Author's calculation from the OWS tapes.

Note: a = No information available.

III. Decreasing Wage Inequality

With the above data set, this section presents how the average real wage and wage inequality changed over the 1970s and 1980s in Korea.

<Table 2> shows real hourly wage for the average male worker who earned 712 won an hour in 1972 and 1,488 won in 1984, which is more than double the wage in 1972. By 1989 his wage became 2,127 won, about 3 times the wage in 1972. Average real hourly wages have

steadily increased since 1972 and in 1989 the wages are triple what they were in 1972. This increase in average real wage in Korea is an amazing phenomenon, especially compared to U.S. real weekly wages which decreased from 1973 to 1983 and then gained a little bit since 1983.

〈Table 2〉 Real Hourly Wages by Percentile (in 1985 won)

| Year | 90th | 50th | 10th | Mean | Var(lnW) |
|---------|---------|---------|---------|---------|----------|
| 1972 | 1288.89 | 582.32 | 246.15 | 712.48 | 0.43 |
| 1974 | 1541.80 | 695.53 | 305.24 | 861.16 | 0.42 |
| 1976 | 2107.14 | 813.69 | 375.46 | 1084.67 | 0.45 |
| 1978 | 2096.40 | 858.37 | 398.84 | 1110.47 | 0.41 |
| 1980 | 2118.38 | 977.85 | 492.20 | 1200.99 | 0.33 |
| 1982 | 2256.23 | 1080.98 | 532.31 | 1294.29 | 0.32 |
| 1984 | 2571.26 | 1257.33 | 649.18 | 1488.03 | 0.29 |
| 1986 | 2833.17 | 1387.29 | 738.06 | 1654.92 | 0.28 |
| 1988 | 3145.77 | 1611.82 | 911.43 | 1888.18 | 0.24 |
| 1989 | 3479.98 | 1846.65 | 1057.13 | 2127.24 | 0.22 |
| Avg %ch | 10.0% | 12.8% | 19.4% | 11.7% | |

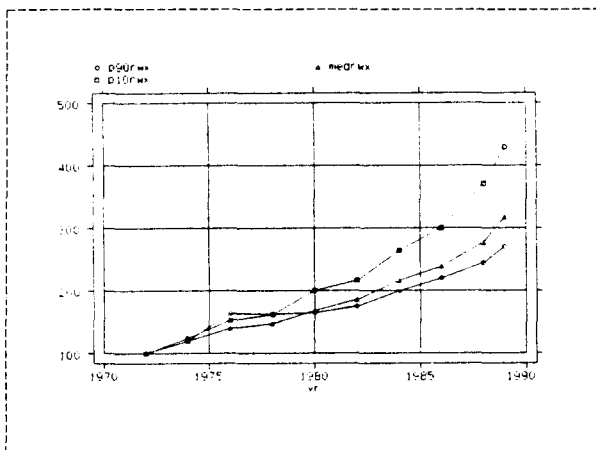
Source : Author's calculation from the OWS tapes.

Then, a question one might ask is if all workers gained equally. The following part of this section examines how the wage gains are spread across workers.

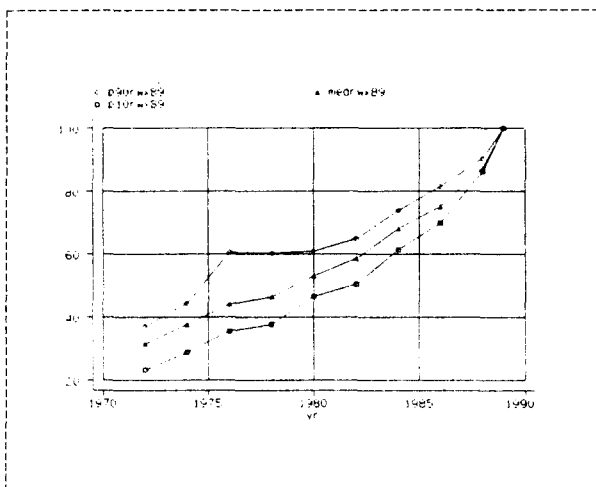
Real hourly wages for the 90th, 50th and 10th percentile are also presented in 〈Table 2〉. For a worker in the 90th percentile of wage distribution wage rate increased from 1,289 won in 1972 to 3,479.98 won a little less than 3 times by 1989, which amounts to an average increase of 10 percent a year. For a median worker wage increased more than 3 times from 582 won in 1972 to 1,847 won in 1989, with an average increase of 12.8 percent a year. For a worker in the 10th percentile wage increased more than 4 times in 17 years from 246 won in 1972 to 1,057 won in 1989, with an average increase of 19.4 percent

a year. The wages of the least skilled worker, proxied by the 10th percentile in the wage distribution, increased very rapidly relative to the wages of the more skilled. This says that wage inequality declined in Korea over the 1970s and 1980s.

(Fig. 1) Real Hourly Wages by Percentile: 1972=100



(Fig. 2) Real Hourly Wages by Percentile: 1989=100

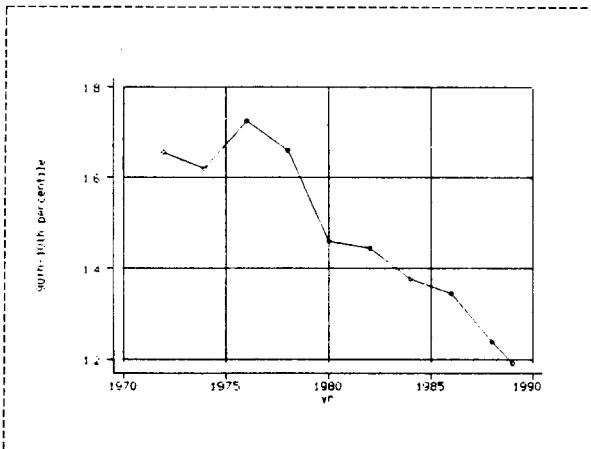


To show decreasing wage inequality more clearly, figure 1 graphs indexed real hourly wages. It graphs the 10th percentile, median, and 90th percentile of the real hourly wage distribution of men from 1972 to 1989. Wages for the three groups are indexed to 1972 values for each group. All three groups have gained over time. Median wages increased continuously to be more than three times the wage in 1972 by the end of sample period. For the least skilled (proxied here by the 10th percentile) wages rose even more sharply. From 1972 to 1980 in eight years wages doubled and in another six year they gained another

100 percent from 1980 to 1986 and finally they gained more than 100 percent in another 3 year from 1986 to 1989. For the most skilled (proxied by the 90th percentile) wages increased too, but by the least amount. From 1972 to 1976 wages increased, but from then until 1980

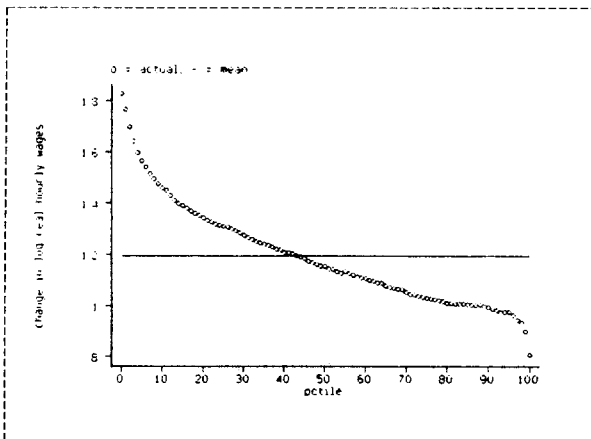
wages stagnated and then started to increase until 1989. After about 17 years later, workers in the top 10 percent of the wage distribution have gained over 250 percent, workers in the median have gained over 300 percent, while those in the bottom 10 percent have gained over 400 percent. These different growth rates of wage by percentile decreased wage inequality in Korea. To show the decreasing inequality more clearly, [fig.2] indexed wages for the three groups to 1989 values for each group.

[Fig.3] 90~10 Log Wage Differential



Decreasing wage inequality over time in terms of log wage differential between the 90th and the 10th percentile is also shown in figure 3⁷⁾. The differential increased a little until 1976, but since then has decreased by more than 5 log point or about 30 percent. The clear message is that wage inequality between the most and the least skilled has decreased.

[Fig.4] Wage Changes by Percentile: 1972~1989



Then, a question could arise about others, less skilled (not the least skilled) and more skilled (not the most skilled). Do workers in the other ranges than the 90th and 10th have exper-

7) The decline in wage inequality is also to be seen in the decreasing variance of log real hourly wages in table 2.

perienced the same thing? [Fig.4] and [Fig.5] answer this question.

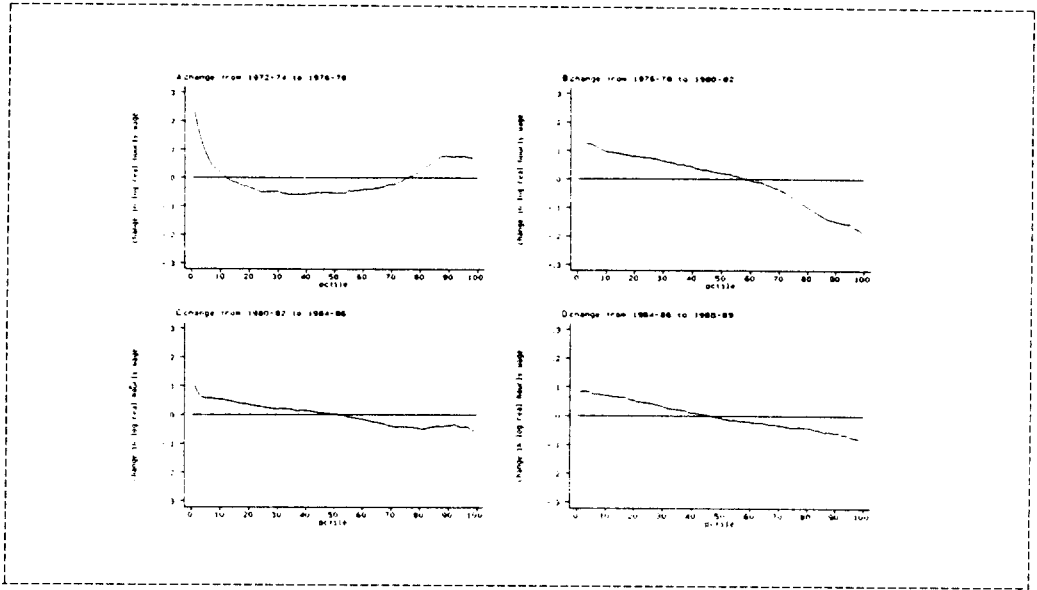
[Fig.4] shows that this decline in wage gap is not limited to those in the 90th and 10th percentile. The figure provides the change in log real hourly wages by percentile over the 1972~89 period. The dots are actual changes and the horizontal line represents the mean of the changes. The change in log real hourly wages from 1972 to 1989 is monotonically decreasing function of the percentile. Workers at the bottom percentile gained the most and workers at the top percentile gained the least. As the figure shows, the convergence in wages across percentiles is not limited to a specific part of the wage distribution, but it applies to all points in the wage distribution.

[Fig.5] decomposes the change in inequality from 1972 through 1989 into 4 sub-periods⁸⁾. The first panel compares wages by percentile for the period 1972~74 with wages for 1976~78. The pattern of changes in inequality between 1972~74 and 1976~78 was different from those in the other intervals. Over this period workers below the 10th and above the 75th gained on the mean and median worker. The first force reduced wage inequality while the second force increased it. This same effect can also be seen in figure 1 where indexed wages for both the 90th and 10th percentiles are above the median until 1978. Thus, inequality between the median and the lowest percentiles declined during the period, but inequality between the most skilled and the average worker increased during the first interval.

The next three panels show much clearer moves toward decreasing wage inequality. The most dramatic decrease in inequality occurred in the second period from 1976~78 to 1980~82. Workers at or below the 10th percentile of the wage distribution gained about 10 percent on the average (about 7 percent relative to the median) and workers in the upper quartile lost about 7 percent relative to the average worker

8) The wage changes are normalized by comparing the change at each percentile with the mean change in log wages over the interval.

[Fig. 5] Wage Changes by Percentile by Sub-Period



(about 10 percent relative to the median). Workers in the 90th percentile lost about 15 percent relative to the average worker. The changes from 1980~82 to 1984~86 are the smallest. Workers at the upper percentiles lost about 5 percent relative to the average, while workers at the lowest percentiles gained about 7~10 percent. The changes from 1984~86 to 1988~89 show almost a linearly decreasing function of the percentile, and the magnitude of the changes is greater than that in the immediate previous period. For this sub-period, especially in 1987 Korea experienced unprecedented labor union movements, which had a significant impact on decreasing wage inequality⁹⁾. The basic message of [Fig.4], [Fig.5] is that decreasing wage inequality is pervasive to all points in the wage distribution.

However, the timing of decreasing inequality is different between above median inequality and below median inequality. Wage differentials among the upper half increased until 1976~78 and then sharply

9) See Uh and Lee(1992) and Lee and Nam(1994) about the labor union effect on the wage distribution in Korea.

decreased during the 1980s. On the other hand, wage differentials among the lower half decreased since the early 1970s. This timing difference can be partly explained with the changes in demand for and supply of educated workers. Increasing differential among the upper half until 1976 is said to be demand-driven. Excess demand for high educated workers drove up rates of return to education¹⁰⁾. The decrease in inequality among the upper half during 1980s is related to a sharp increase in the supply of high educated workers. On the other hand, the decreasing differential among the lower half since the early 1970s is largely due to a decrease in the supply of the least educated workers.¹¹⁾

Thus, wage inequality in terms of the 90th and the 10th wage differential has decreased in Korea, which is contrary to the U.S. case. Associated with decreasing wage inequality has been an improvement in human capital in Korea. The next section decomposes decreased inequality into the contributions of observable components (education, age, and tenure) and of unobservable components to see how much can be accounted for by the improvement of the observed human capital and how much cannot be accounted for by the observables.

10) See the regression results in the appendix.

11) In 1978 there was a 28% increase of new students from 50,485 in 1977 to 64,587 in junior colleges, and in 1981, a 31% increase from 85,242 in 1980 to 111,836. The number of new students in colleges and universities increased by 55 percent from 115,755 in 1980 to 179,935 in 1981. See Korean Educational Development Institute(1991), pp.181~183. See also Kwark and Rhee(1993) and Kim and Topel(1995) for the supply and demand story.

IV. Decomposition of Wage Inequality

This section examines the forces behind the decreasing wage inequality. A useful framework for isolating these forces has been suggested by JMP(1993). This method basically estimates the effects of ① changes in the distribution of observables, ② changes in the observable prices, and ③ changes in the unobservables. To understand the methodology, consider the following earnings equation:

$$Y_{it} = X_{it}b_t + u_{it}, \dots\dots\dots(1)$$

where Y_{it} denotes the log wage for individual i in year t , X_{it} denotes a vector of individual characteristics and u_{it} is the component of wages not accounted for by the observables.¹²⁾ Following JMP, think of this residual as two components, an individual's percentile in the residual distribution, θ_{it} , and the distribution function of the wage equation residuals, $F_t(\cdot)$. The definition of the cumulative distribution function gives

$$u_{it} = F_t^{-1}(\theta_{it}|X_{it}), \dots\dots\dots(2)$$

12) The earnings equation considered for this exercise is

$$\ln W = a_0 + a_1EDUC1 + a_2EDUC2 + a_4EDUC4 + a_5EDUC5 + b_1AGE + b_2AGE^2 + b_3TENURE + b_4TENURE^2 + u.$$

where $\ln W$ represents log real hourly wages, AGE represents age, $TENURE$ stands for tenure, and $EDUCi$ is an education dummy for $i=1,2,4,5$ (1=elementary school, 2=middle school, 4=junior college, 5=college). The residual is denoted by u . The omitted dummy is one for high school graduates. The model explains more than half of the variation in log wage. The regression results for selected years are in the appendix.

where $F_{t-1}^{-1}(\cdot|X_{it})$ is the inverse cumulative residual distribution for workers with characteristics X_{it} in year t .

Then the level of inequality can be decomposed into the corresponding components as

$$Y_{it} = X_{it}\underline{b} + X_{it}(b_t - \underline{b}) + F_t^{-1}(\theta_{it}|X_{it}) + (F_t^{-1}(\theta_{it}|X_{it}) - F_{t-1}^{-1}(\theta_{it}|X_{it})), \dots\dots\dots(3)$$

where \underline{b} is the average prices for observables over the whole period and $F(\cdot|X_{it})$ is the average cumulative distribution. The first term captures the contribution of a changing education and experience distribution at fixed prices. The second term captures the contribution of changing skill prices for observables at fixed X 's and the final term captures the contribution of changes in the distribution of wage residuals.

To isolate the contribution of changes in each component, we estimated the following wage equations and calculated the distribution of Y_{it}^1 , Y_{it}^2 and Y_{it}^3 for each year.

$$Y_{it}^1 = X_{it}\underline{b} + \underline{F}_t^{-1}(\theta_{it}|X_{it}), \dots\dots\dots(4)$$

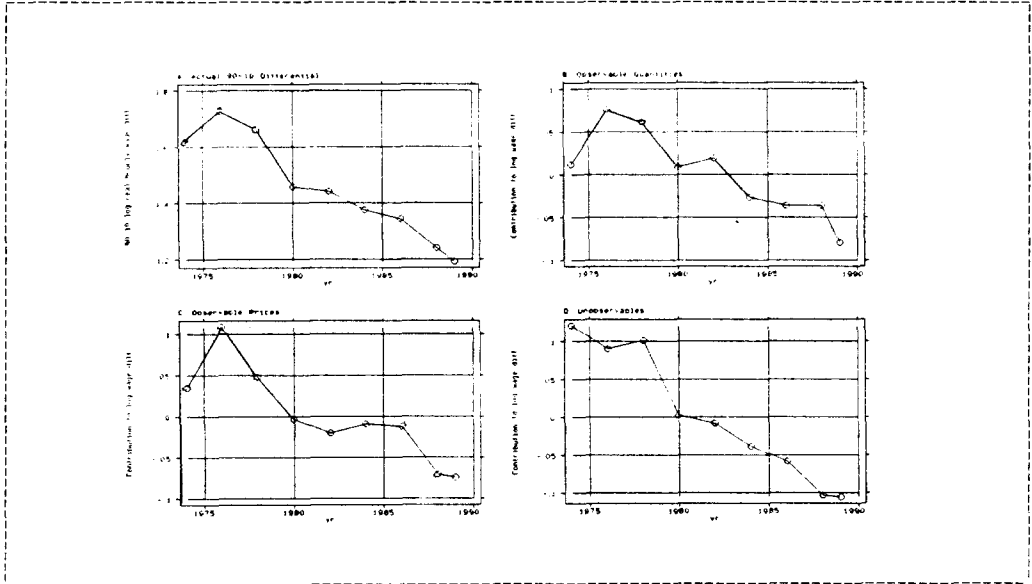
$$Y_{it}^2 = X_{it}b_t + \underline{F}_t^{-1}(\theta_{it}|X_{it}), \dots\dots\dots(5)$$

$$Y_{it}^3 = X_{it}b_t + F_t^{-1}(\theta_{it}|X_{it}) = X_{it}b_t + u_{it} = Y_{it}, \dots\dots\dots(6)$$

Then, we attributed the change over time in inequality in the Y_{it}^1 distribution to changes in observable quantities and attributed any additional change in inequality in Y_{it}^2 beyond those found for Y_{it}^1 to changes in observable prices. Finally, we attributed any additional changes in inequality for Y_{it}^3 beyond those found for Y_{it}^2 to changes in the distribution of unobservables.

{Fig.6} presents actual 90th-10th log wage differential and components of the differential from 1974 to 1989.¹³ Panel A plots the time series of overall log wage inequality as measured by the

(Fig. 6) 90-10 Log Wage Differential and Components: 1974~89



difference between the 90th and 10th percentiles of the wage distribution. As the figure illustrates, overall inequality decreased relatively steadily since 1976. The wage differential has decreased by about 43 log points since 1974. This fall in wage differential applies to both observable dimensions of skill (i.e., education, age and tenure) as well as unobserved dimensions of skill (the residual).

The other three panels in [Fig. 6] give the part of the 90-10 log wage differential accounted for by each of the three components. Each component is measured as a deviation from its overall mean. Panel B gives the effects of changes in the distribution of observables. The figure shows that changes in observable characteristics (i.e., changes in the age and education composition of the employment), contrary to the U.S. case, have had a significant impact on overall decrease in inequality. This factor accounts for about 25 percent (about 10 percent

13) The year 1972 is excluded from the following discussion due to the absence of the category of vocational college.

of 40 percent decrease) of overall decreasing inequality. Panel C shows the component of changes in inequality due to changes in observable prices (i.e., changes in the returns to education, age and tenure). As the figure illustrates, changes in observable prices had a big effect on inequality from 1976 to about 1980. Since 1980, however, because of the slowdown of decrease in education differentials, this factor did not have a big effect on the 90-10 log wage differential until 1986. Since then it decreased by more than 5 percent.

Panel D examines the component due to changes in unobservables. As is clear from the figure, this is by far the most important component for the decrease in inequality (accounting for about half of the decrease). Moreover, unlike the decrease in observable quantities and observable skill prices, the decrease in inequality based on unobservables has been operating from 1974 through 1980s. Note that the timing of this change is different from that of observable quantities and observable skill price change. The fall in within group inequality (measured by the residual) preceded the fall in overall inequality and the observable components.

⟨Table 3⟩ quantifies the contribution of observed quantities and prices and the unobservables to the increase in the 90-10 differential. The table shows how different parts of the wage distribution have been affected by the various components. The top panel in ⟨Table 3⟩ refers to the change over the full 1974~89 period. The first column refers to actual changes in inequality: $\ln W_{89} - \ln W_{74}$. The second column refers to effect of changes in observed quantities calculated as: $\underline{b}(X_{89}-X_{74})$. The third column refers to the effect of changes in observed prices calculated as: $X_{89}(\underline{b}_{89}-\underline{b}) - X_{74}(\underline{b}_{74}-\underline{b})$. The last column refers to changes in unobservables obtained as: $u_{89} - u_{74}$.

Inequality in terms of 90-10th log wage differential declined by about 43 percent during this period. Changes in observed quantities (education, age and tenure) contributed 22 percent ($.092/.427$) of total

decline and changes in observed prices (returns to education, age and tenure) contributed about 25 percent (.107/.427). The rest, more than half (about 53 percent), are unexplained by the observables¹⁴⁾. Now, look at inequality above and below the median, which is not to be seen in [Fig.6] The decrease in inequality above the median account for 38 percent and that below the median accounts for 62 percent of total decrease. While observables combine to account for more than half of the 90-50th differential, they account for only 43 percent of the 50-10th differential. The importance of unobservables is the same in here as in the U.S. case, even though in the U.S. wage inequality has risen.

〈Table 3〉 Observable and Unobservable Components of Decreasing Inequality:
Korean Men

| | Period | Total Diff | Total Change | Observed Quantities | Observed Prices | Unobserved P and Q |
|-----------|--------|---------------|-----------------|------------------------|--------------------|-----------------------|
| 1974~1989 | 90-10 | -.427 | -.092 | -.107 | -.228 | |
| | 90-50 | -.162 | -.034 | -.051 | -.077 | |
| | 50-10 | -.265 | -.058 | -.056 | -.151 | |
| 1974~1980 | 90-10 | -.159 | -.003 | -.037 | -.119 | |
| | 90-50 | -.023 | -.003 | .015 | -.035 | |
| | 50-10 | -.136 | .000 | -.052 | -.084 | |
| 1980~1989 | 90-10 | -.268 | -.089 | -.070 | -.109 | |
| | 90-50 | -.139 | -.031 | -.066 | -.042 | |
| | 50-10 | -.129 | -.058 | -.004 | -.067 | |

Source: Author's calculation from the OWS tapes.

The bottom two panels perform the same decomposition for the periods before and after 1980. As is clear from the 〈Table 3〉 and

14) The inclusion in the regression of such variables as industry, occupation, region, and firm size could lessen the importance of the unobservables in explaining the changes in inequality.

(Fig. 6), from 1974 to 1980 observables did not have much contribution. The decreased 90-10 differential mainly is due to changes in unobservables both above and (mainly) below the median. During the 1980s the story is different. Now, decreasing inequality above the median is more responsible for the overall decrease, and now observables account for more of the 90-10 and 90-50 differentials. Especially for the 90-50 differential changes in observable prices alone contribute more than unobservables.

In sum, the 1970s were characterized by a rapid decline in the returns to skills within education, age and tenure categories but no significant decline in the returns to skills across these categories. In contrast, the 1980s were characterized by a fall in returns to both observed and unobserved skill. Overall, the increase in observed human capital contributed about 47 percent of total decreasing inequality from 1974 to 1989.

V. Conclusion

This paper documented the changed wage inequality among Korean men. There are several important findings. Average wages increased sharply over the 1970s and 1980s, and workers at all levels of the wage distribution gained over the period. However, the least skilled gained the most and the most skilled gained the least, resulting in decreased wage inequality over this period. Moreover, this decreased inequality is not limited to the gap between extreme points of the wage distribution, but is pervasive throughout. Inequality below the median fell more than that above the median. When the whole period is divided into before and after 1980, decreasing inequality above the median becomes more important after 1980.

In order to see how much of the decreased wage inequality can be accounted for by changes in human capital, I decomposed wage inequality into the effects of observables and unobservables, where the observables are education, age and tenure. The contribution of increased human capital was about 47 percent of the total change in inequality from 1974 to 1989. The unobservable component is the most significant factor in accounting for overall inequality change from 1972 to 1989. However, during the 1980s observables contributed more than unobservables. Thus, as in the U.S. case, there are timing differences between inequality due to observables and that due to unobservables.

Note that even after education, age and tenure are controlled for, wage inequality in Korea declined. I do not know what is the underlying force of the decreasing inequality for the unobservables. That could be increasing international trade, technological change or something else. Studies on the impacts of these factors would be good topics for our future research.

Remember that the 1980s saw a big trade deficit in the U.S., while Korea had a first time trade surplus during the 1980s. More interestingly, the timings of the contributions of observables and unobservables are almost the same as in the U.S. case. The findings in this paper when considered with the above international trade deficit and surplus story are very suggestive of the links between international trade and what happened in the labor market in each country.

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APPENDIX

OLS Regression Estimates of Earnings Equation Selected Years,
Dependent Variable: lnw

| Indep Vars | 1974 | 1976 | 1980 | 1984 | 1988 | 1989 |
|------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| INTCEP | 4.2594 (105.8) | 4.9261 (127.2) | 5.1126 (143.6) | 5.2354 (135.7) | 5.7230 (154.3) | 5.9737 (159.7) |
| EDUC1 | -.2947 (-31.4) | -.3417 (-36.2) | -.2378 (-26.5) | -.2339 (-23.8) | -.1740 (-16.5) | -.1716 (-15.6) |
| EDUC2 | -.2083 (-24.2) | -.2747 (-34.2) | -.1917 (-26.9) | -.1753 (-27.1) | -.1374 (-21.9) | -.1250 (-19.8) |
| EDUC4 | .2096 (10.5) | .2577 (12.3) | .2930 (17.7) | .2142 (16.5) | .1603 (14.8) | .1681 (16.4) |
| EDUC5 | .5235 (49.2) | .6692 (64.8) | .6103 (66.4) | .5895 (77.2) | .5107 (76.1) | .4911 (76.2) |
| AGE | .1106 (46.0) | .0867 (37.4) | .0847 (39.7) | .0833 (36.4) | .0713 (33.1) | .0641 (29.7) |
| AGESQ | -.0012 (-35.4) | -.0009 (-28.8) | -.0009 (-30.7) | -.0009 (-28.6) | -.0008 (-27.8) | -.0007 (-25.7) |
| TENURE | .0461 (21.1) | .0538 (27.0) | .0362 (19.2) | .0448 (28.9) | .0446 (33.1) | .0492 (36.2) |
| TENURESQ | -.0011 (-8.7) | -.0012 (-10.0) | -.0006 (-5.2) | -.0010 (-11.9) | -.0006 (-8.7) | -.0008 (-12.0) |
| Adj R-sq | .5057 | .5638 | .5455 | .5532 | .5357 | .5136 |
| N | 18917 | 18341 | 17997 | 19207 | 19222 | 19243 |

Source: Author's calculation from the OWS tapes.

Notes: t-values are in parentheses. All coefficients are significant at 5% level.