The Income Inequality of Wage Earners
during 1993-98 in Korea

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이 논문은 1993년에서 1998년까지 임금 노동자들의 소득을 분석하였다. 한국의 경제와 그에 따른 노동자들의 소득은 1997년 말에 시작된 경제위기와 IMF 경제하에서 급격한 변화를 겪었다. 소득이 어떻게 변화하였는지 교육, 성, 연령을 중요한 변수로 여기는 인적 자본론을 바탕으로 분석하였다. 1993년에서 1998년까지 소득변화에 미치는 성 효과는 어떤 유형을 찾기 어렵지만 교육 효과는 점차 감소하고 있으며 연령 효과는 급격히 감소하고 있다. 소득변화에 미치는 세 변수의 누적 효과는 증가하다가 감소하고 다시 증가하다가 감소하는 파도와 같은 모양을 보이지만 전체적으로는 점차 감소하고 있다. 이 논문은 패널조사로 구성된 원자료를 사용하였기 때문에 조사가 어려운 저소득층이 점차 줄어드는 제한점이 있다.

핵심단어: 소득 불평등, 임금 노동자, 인적 자본론, 교육, 성, 연령

I. Introduction

Because of the rapid industrialization since 1960, Korea has achieved an excellent economic growth. Many Korean citizens have benefited from the growth of economy since their income has increased as well. Despite the economical growth, however, many are of the opinion that 'the poor are getting poorer and rich are getting richer.' Therefore, the issue of fair distribution of the increased benefits needs to be evaluated.

In order for people to survive, there must be a source of income of any kind. Generally, people can be divided into two large groups based on the type of income source: people who own an independent business and wage earners. There are various types of occupations and great disparities in

incomes among independent business owners: some are able to make high revenues while others only make enough to sustain their livelihoods. Compared to the independent business owners, however, the disparity in income is relatively low for wage earners. Most wage earners receive monthly pay checks from their companies and even incentives are of similar amount except for special circumstances.

In this thesis, the transition of the inequality of wage earners' income in the 1990s, especially from 1993 through 1998, will be the main point of analysis. During this period of time, the rapid economical growth had maintained itself for about 40 years since the 1960s and Korea understood its economical growth to be quite successful until around the end of 1997. The economical threat Korea has received at this time was, with a little exaggeration, the greatest national crisis since the beginning of Korea. Our country's economical growth had merely been a party of debt borrowed from other countries, which drove itself into near bankruptcy. This period of economical crisis where Korea received economical support through the International Monetary Fund (IMF) under the leadership of the United States of America is called the 'IMF economy' or the 'economy under the IMF system.' During this time, most citizens of Korea, except for the top upper class, experienced the worst economical depression and the greatest rate of unemployment.

In this thesis, the influence of IMF on wage earners 'has been studied. The subject of study includes the wage earners' income and the change in the inequality of income during the period from 1993 to 1998.

II. Theoretical Background

Among the many theories explaining the determination of income, the human capital theory will be the basis of this study in order to utilize variables that illustrate an individual's attribute. Comparable to materialistic capital such as equipments and facilities that build up over a long period of

time to increase productivity, human capital refers to all techniques, skills, and knowledge that have accumulated within an individual over a long period of time. Human capital includes not only the knowledge and skills accumulated through business but also through schooling. Furthermore, the health of a laborer and the information on the labor market are also considered as human capital(Cho, 2000). Out of the many theories that explain disparity of incomes, the 'human capital theory', which argues that an individual's income is determined by how much human capital he/she possesses, will be applied in order to explain the change of income.

According to the 'human capital theory', the bigger the disparity of income is between high school graduates and college graduates, the larger the college graduate's relative wage gets, therefore causing an increase in the number receiving college education. Also, the younger an individual is, the longer it takes to collect profit from the point of investment. According to Mincer(1974), this kind of investment is not a single-shot deal but rather a life long process that, as experience and age increase, requires continuous improvement in the human capital in order to collect its profit.

Korea is considered to be one of the countries that show the highest enthusiasm for education in the world. The reason for this being the high rate of profit compared to the amount of investment. According to Chung(1996) who has calculated the rate of profit in educational investment, the rate of profit for maximum college education investment in Korea reached a high rate of 20.9% and 20.1% for men and women respectively in 1979. Because of this high profit rate, most households consider the investment for college education to be rational in spite of the high private educational fees. Even though the profit rate had declined to 13.5% and 13.8% for men and women respectively in 1994, Chung predicted a continuous investment for college education since the profit rate was still considerably high. According to her studies, the profit rate for middle school students waiting for advancement to high school is also very high. The profit rate is still considered to be high even though it had declined from 14.3% in 1979 to 9.1% in 1994 for men and from 18.7% to 14.6% for women. Park's study(2003) shows the decreasing effect of female's education and job. Kim(2003) studies the diverse

patterns of the economic sources of the elderly population.

III. Data and Method of Research

The subject of research was consisted of wage earners, excluding owners of independent businesses, workers engaged in agriculture, forestry, and fishery, workers of irregular occupations, the unemployed, non-salaried family members, and housewives.

The dependent variable used in this study consisted of all wage earners' one-month income including fixed income, variable income and bonuses. Fixed income included base salary and all stipends aside from the base salary. All incentives and over-time pays have been included in variable income along with fixed bonuses and variable bonuses received within a year.

The independent variable consisted of the individual's gender, educational background and age. Among the variables that may be included in the 'human capital theory', occupation and marital status have been excluded. Occupation has been excluded as a variable since only wage earners have been subjected to this study, excluding other occupations such as independent business owners, and agriculture, forestry, and fishery related workers. Marital status has been excluded since it is closely related to age and since most interviewees were married.

The data established by DaeWoo Economy Research Center, which conducted a nation-wide research on the economic activities of all households for 6 years from 1993 to 1998, was used. A distinctive feature of this research is that it has used a panel data where the same selected households were analyzed continuously for 6 years.

Having conducted the research on individuals and households, DaeWoo Economy Research Center could have used either individuals or households as the unit of calculation. However, due to the inappropriateness of using the gender, educational background and age of the representative of a household, individuals have become the unit of calculation.

IV. Research Results and Discussion

As seen in <Table 1> where individuals were set as calculating units, the number of samples has declined from 2,839 at the beginning of the research in 1993 to 1,911 in 1995 and finally to 1,286 at the end of the research in 1998. Gender-wise, there were 3 times as many men as women in 1993 counting 2,148 men and 691 women. This trend had continued till 1998 when the count went down to 903 men and 383 women. The number of middle school graduates, high school graduated, and college graduates were 485, 1,652, and 702, respectively in 1993 and 220, 550, 516 in 1998. The distribution of age for people in their 20's, 30's, 40's, 50's and over 60's in 1993 were 893, 1139, 480, 262, and 65 respectively and 354, 435, 303, 151, and 43 in 1998.

〈Table 1〉 Annual change of sample size and coefficient of variance

Year	Number of sample	Coefficient of Variance
1998	1286	.600
1997	1596	530
1996	1715	.558
1995	1911	.570
1994	2111	456
1993	2839	482

There are various methods for calculating the income inequality such as the coefficient of variance, the upper-lower ratio comparison, the Gini index, the Theil index, etc. In this research, the coefficient of variance and the upper-lower ratio comparison have been used. Though a specific part of the distribution of income is emphasized depending on the coefficient, the measured values of various coefficients are mostly similar. For example, Tolbert and Lyson (Tolbert and Lyson, 1992) have conducted a research on the change in the inequality of income in the United States from 1968 to 1989 using 3 different methods (Variance of Logarithms, the Theil Index and the Coefficient of Variance). The inequality of income over the period of 20 years has shown to be very similar in those 3 different graphs. In my study,

the coefficient of variance and the upper-lower ratio comparison have been used. The coefficient of variance, calculated by dividing the standard deviation of the distribution of income by the mean, was used in comparing inequalities of different sized communities.

As shown in <Table 1>, the coefficient of variance of the change in income inequality has been relatively low in 1993 and 1994 figuring 0.482 and 0.456 respectively. The coefficient of variance, one of the relative measure of dispersion shows the relative measure that will give us a feel for the magnitude of the deviation relative to the magnitude of the mean. This number is calculated when we divide the standard deviation by the mean. The figure went up to 0.570 and 0.558 in 1995 and 1996, respectively and fluctuated from 0.530 in 1997 to 0.600 in 1998. <Figure 1> may be used to visualize this change. The Since the researches for the year 1997 and 1998 were conducted in October of 1997 and February of 1999, respectively, the data from 1998 could be considered as an actual reflection of Korea's economy under the IMF. Moreover, the inequality of income among these wage earners has worsened in the years after the economy under the IMF.

Observing the change of inequality through the comparison of the upper-lower ratio (top 20% of population's income divided by lowest 40% of populations income) as seen column (a)/(c) in <Table 2>, the relatively low rate of inequality (1.42) in 1993 increased to 1.69 in 1995, decreased in 1997 and increased again in 1998. As shown in the graphs of 'variances of coefficients' and 'upper-lower ratio comparison', Korea's inequality of income has oscillated from 1993 to 1998. As indicated by the increase in 1998, it can be said that the income inequality of wage earners' have worsened by the IMF economy.

〈Table 2〉 Average Income and Proportion of Income among the Total Population

(10,000 won, %)

	Upper 20% Population		Middle 40% Population		Lower 40% Population			Total Population	
	Average Income	Rate(a)	Average Income	Rate	Average Income	Rate(c)	(a)/(c)	Average Income	
1998	254	36.8	142	41.3	75	21.9	1.68	138	100.0%
1997	273	35.7	162	42.5	83	21.8	1.64	153	100.0%
1996	262	35.8	156	42.5	79	21.7	1.65	146	100.0%
1995	239	36.4	138	42.1	71	21.5	1.69	131	100.0%
1994	193	33.8	122	42.8	67	23.4	1.44	114	100.0%
1993	172	33.6	109	42.8	60	23.7	1.42	102	100.0%

Now that the general trend of the annual income inequality has been shown, the income ratio in relation to the population will be discussed. As shown in <Table 2> where the average income of the upper 20%, middle 40%, and lower 40% of the population is demonstrated, the average income increases each year. The absolute value of the average income has risen from 1,720,000 won in 1993 to 2,540,000 won in 1998 for the upper 20% of the population, 1,090,000 won to 1,420,000 won for the middle 40% of the population, and 1,020,000 won to 1,380,000 won for the lower 40% of the population. The growth of economy can be accounted for the increase in income. Furthermore, in terms of the ratio of increase, the upper 20% increased 1.48 (=254/172) times from 1993 to 1998, the middle 40%, 1.30 (=142/109) times, and the lower 40%, 1.35 (=138/102) times. From this, we can see that the income of the upper class has risen more than the others in the same period of time.

The next step of the research is to compare the relative value of income in order to find out how much of the income each class owns. Theoretically, in a society where the distribution of income is spread out evenly, the upper 20% of the population should own 20% of the income, the middle 40%, 40% of the income, and the lower 40%, 40% of the income. In this case, the Gini Index would be 0, which is an indication of the most equal distribution. In Korea's case, the upper 20% of the population owned 33.6% of the total

income in 1993 and 36.4% in 1995. In 1996 and 1997, there was a drop in the numbers but in 1998, the numbers increased to 36.8% again. The middle 40% of the population showed a relatively stable rate, marking 42.8% of the total income in 1993 and continuing in this manner till it slightly declined to 41.3% in 1998. The lower 40% marked 23.7% and 23.4% in 1993 and 1994, respectively, which declined to 21.8% and 21.9% in 1997 and 1998, respectively. In other words, the percentage of the total income continuously declined for the lower class.

As seen in the above data, from the year 1993 to 1998, the upper 20% of the population, which showed an increase of 1.48 times in the absolute value of income from 1,720,000 won to 2,540,000 won, has experienced a bigger increase than the lower 40% of the population, which showed an increase of 1.35 times from 1,020,000 won to 1,380,000 won. The relative comparison of income indicates that the percentage of the total income of the upper 20% increased from 33.6% to 36.8%, the middle 40% stayed the same, and the lower 40% decreased from 23.7% to 21.9%. It can be concluded that the situation for the upper 20% of the population improved in both situations (absolute and relative value) while situation for the lower 40% worsened in both cases.

In order to analyze how the change in income inequality occurs, variance has been used. In other words, it can be explained that if an individual's income's value of variance is large (in terms of the unit of analysis), each individual's income is distributed widely, therefore creating great inequality whereas if the value of variance is small, the incomes are concentrated, therefore decreasing the inequality. Here, the three independent variables (gender, educational background, and age) stated by the 'human capital theory' were used. <Table 3> is the result of completing the 'one way analysis of variance' which has 3 separate parts in order to calculate the percentage that each variable (gender, level of education, and age) holds out of the total variance from 1993 to 1998. In order to help visualize this, <Figure 2>, <Figure 3>, <Figure 4> have been drawn, and <Figure 5> has been drawn to show the accumulative effect of the three variables.

⟨Table 3⟩ Percentage of Gender, Education, and Age
out of the Total Variance of Income

Year	Gender	Education	Age	Accumulation
1998	17.5	10.4	7.7	35.6
1997	20.4	11.4	10.3	42.1
1996	17.4	10.0	9.5	36.9
1995	16.5	10.1	11.3	37.9
1994	20.6	11.5	15.2	47.3
1993	18.8	12.8	10.9	42.5

When the absolute value of the three independent variables are considered, persuasive ability is in the order of gender, education, and age. As indicated in <Table 3>, <Figure 2>, <Figure 3>, <Figure 4>, out of the three independent variables, the effect of gender has started at 18.8% in 1993 and fluctuated up and down till it reached 17.5% in 1998. The effect of education started at 12.8% in 1993, continuously declined till it increased to 11.4% in 1997, and dropped down to 10.4% in 1998. In the case of age, the number suddenly increased to 15.2% in 1994 then declined steadily to 7.7% in 1998. During this period, the effect of gender continued fluctuating from 16% to 20%, the effect of education was at a steady decline, and the effect of age declined at a relatively rapid pace. It can be concluded from the results that gender discrimination is practiced most severely in terms of income, and then discrimination against educational back ground and age.
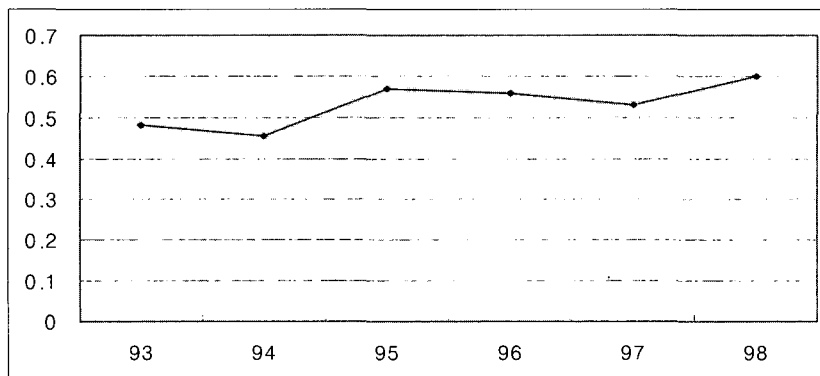
V. Conclusion

In this thesis, the income of wage earners and the transition of the inequality of their income from 1993 through 1998 have been analyzed. Since the income of Korea's wage earners is easily exposed, it has been a favorable subject of analysis. In this analysis, independent business owners whose method of making money is different have been excluded. Korea's economy went through an epochal change since the beginning of the IMF economy and the inequality of income, which is part of the change incurred by this
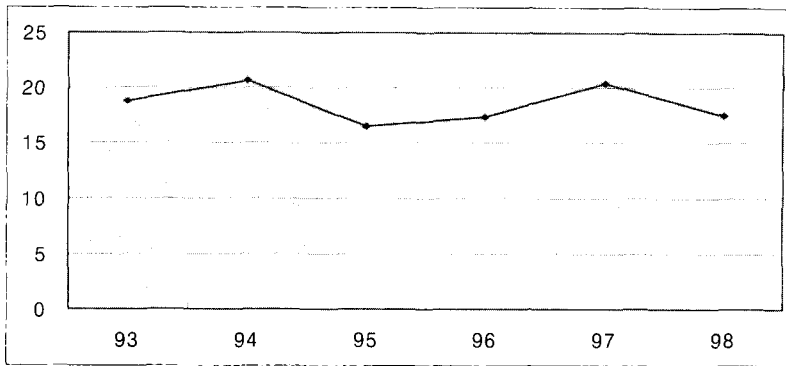
situation, has been studied in this thesis.

In order to explain the inequality of income, the 'human capital theory' has been chosen as the basis. Also, gender, educational background and age, which are the key variables of the' human capital theory', have been set as independent variables in order to comprehend each variable's influence in the distribution of income. From 1993 to 1998, the effect of gender has shown a fluctuating pattern whereas the effect of education declined slowly and the effect of age rapidly. The accumulative effect of the three variables show a fluctuating pattern, but at a declining mode. Though discrimination against gender, educational background and age, in terms of income, is at a declining mode, it is apparent that it still exists. Especially, discrimination against gender is continuing at a fluctuating pattern.
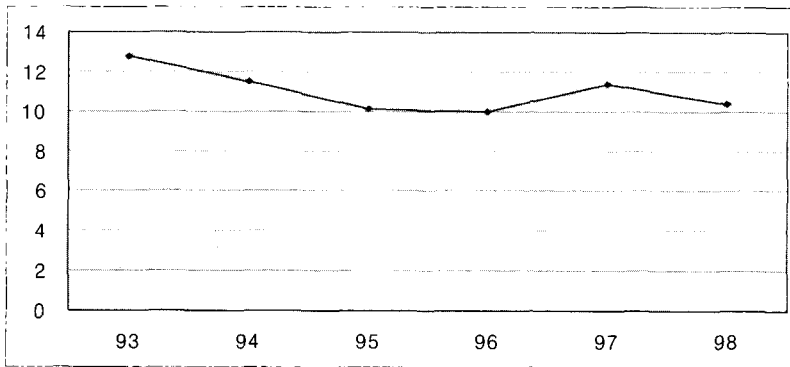
As for the limitations of the research, the drawbacks of panel data can be listed. Generally, subjects who drop out of the panel are of low-income class where frequent relocating is unavoidable, and most of the time, tracking them is difficult. Therefore, the middle- and high-class population, whose likelihood of remaining in the panel is higher, might have been relatively over represented and the data of the lower-class under represented.
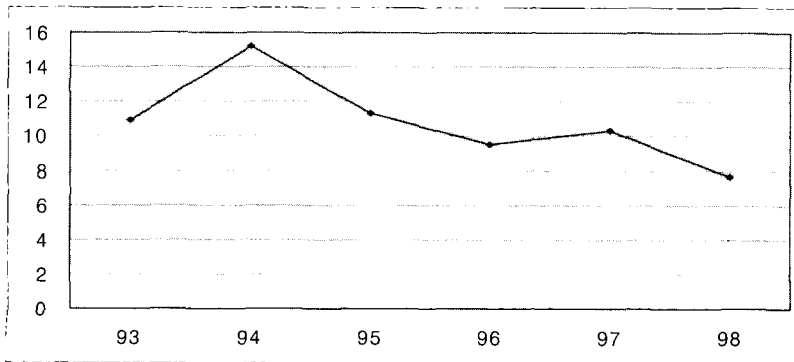

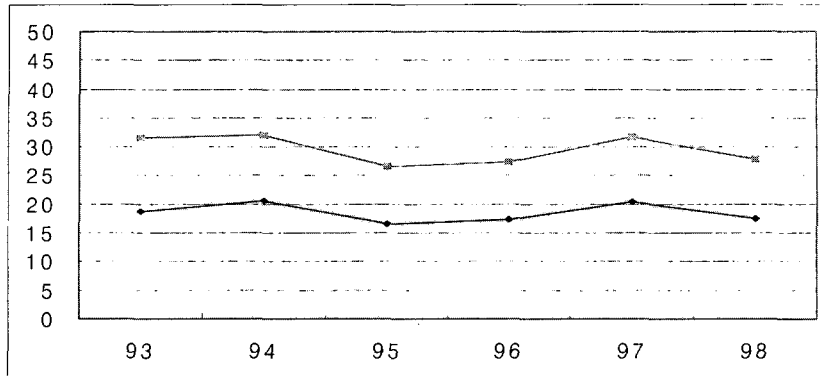〈Figure 1〉 Changes of the Variance of Coefficient

〈Figure 2〉 The Effect of Gender Among Total Variance

〈Figure 3〉 The Effect of Education Among Total Variance

〈Figure 4〉 The Effect of Age Among Total Variance

〈Figure 5〉 The Cumulative Effect of Age, Education, and Gender

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