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## Analysis on the Change and Its Cause of Income Distribution before and after the Financial Crisis: Income Mobility Perspective

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## **ABSTRACT**

Income inequality in Korea has increased after the economic crisis, and the main reason for the widening of income distribution is due to the increase of the unemployed when analyzed using the Urban Household Report(UHR). However, income inequality has not decreased although the rate of unemployment decreased after 2000. Further data bases for income-related statistics are necessary to examine the exact causes of changing income inequality as a whole since the UHR covers only statistics on urban employees' wage and salary in Korea.

## I. Introduction

It has been generally reported that the income distribution structure in Korea has worsened after the recent financial crisis of 1997. According to the official statistics published by the Korea National Statistical Office (KNSO), the Gini Coefficient (incomes of urban workers), which measures the inequality of income distribution within a country, was measured at approximately 0.28 for the three years before the crisis and 0.32 for the three years following the crisis. However, the cause of widening income inequality was presumed to be the side effect from “the rich get richer and the poor get poorer” phenomenon resulting from various restructuring measures implemented during the crisis. The underlying cause and the course of income inequality has not been precisely understood, thus far.

In addition, the samples of urban household report, which are the basis for the official statistics published by KNSO, were completely discontinued<sup>1</sup> during the financial crisis (between 1997 and 1998) thus, we cannot ignore the possibility that the rise in Gini Coefficient during these periods, immediately before and after the crisis, may be due to partially changing the samples.

This paper was written to identify the underlying cause of worsening income distribution trends before and after the financial crisis. Due to unavailability of data, this paper limits its analysis to the incomes of urban worker households published by KNSO’s Urban Household Reports. To indirectly calculate the income statistics during the period when the data was completely discontinued the KDI Income Panel (Urban Workers) was used to analyze the income mobility for three years before and after the crisis. Thus, the widening of income inequality was measured indirectly.

In fact, due to the discontinuation of data before 1997 and after 1998, a direct comparison between these two periods was impossible. Hence in our paper the period between 1995 and 1997, right before the crisis, which did not show substantial changes in income inequality or income distribution structure and 1998 to present, which showed definite increases in income inequality, was compared and the cause of income inequality was analyzed.

The following is the outline of this paper. In Chapter II, the methodology used to compile the “KDI Income Distribution Panel(Urban

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<sup>1</sup> In 1998, the Korea National Statistical Office (KNSO) changed the samples of the Economically Active Population and the Urban Household Reports by 100%.

Workers)” and its characteristics are explained. In Chapter III, the changing trends of income distribution is analyzed and in Chapter IV, various analyses on income mobility for 3 years before and after the crisis of 1997 using the materials from the income panel are presented. In Chapter V, using the discussions from Chapter III and IV, the causes that increase income inequality before and after the crisis are analyzed. Finally, in Chapter VI, some future tasks are identified in order to improve the income distribution.

## **II. Compositions of the KDI Income Panel (Urban Workers)**

### **1. The subject of the panel analysis**

The types of households analyzed on KNSO’s Urban Household report,<sup>2</sup> depending on the status of household head’s economic participation, were largely divided into two categories such as income-earning households and other households (includes no-occupation households). Although it is compiled annually, the statistics for other households are unreliable therefore this paper only considered income-earning households as the subject of analysis. As shown in <Table 1> below, no-occupation households, which include self-employed and unemployed households, are excluded from the components of the panel. For that reason, only 60% of the sample of urban households is used for formulating the panel.

As shown in <Table 1>, the ratio of urban households starting 1995 displayed a steady falling trend, in particular, at the start of the crisis (1998) the ratio of no-occupation households (including unemployed) rapidly increased compared to 1997. Although the reports are discontinued around the crisis period, when considering the relative recovery in the ratio of income earning households in 2000, it can be speculated that it has a close relationship with the increase rate of unemployment. Namely, considering the unemployment rate of 2.6% in 1997, 6.8% in 1998, 6.3% in 1999, and 4.1% in 2000, the increased number of no-occupation households closely resembles the rate of unemployment except for 1999.

Given this circumstance, a serious consideration should be taken

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<sup>2</sup> KNSO only publishes incomes of urban-dwelling, income-earning households with 2 or more persons. Hence, incomes of unemployed, single person, and non-urban dwelling households are excluded. On that ground, only 63.8% of all households are included in the sample. The statistics used are limited since incomes of only 60% of the households are officially published, therefore it is safe to assume that only 38.3% of all households are being represented in this income report.

**<Table 1> Type of Households included in the Annual Urban Household Report**

(Unit: %)

Years		1995	1996	1997	1998	1999	2000
Income-earning Households		63.5	63.0	62.1	58.5	56.6	57.3
Other Households	Self-employed	29.3	29.4	29.6	29.4	29.8	30.1
	No-occupation	7.2	7.6	8.4	12.2	13.6	12.7

*Note:* Self-employed category includes merchant, self-employed, law-practice, freelance; no-occupation denotes households without a stable income but relies on pension, allowance from other members of the family, income from interest, etc.

*Source:* The initial data of urban households excluding imputation households were used in the calculation.

when dealing with no-occupation households, which include unemployed households when trying to grasp the distribution structure changes. However, this task is not so simple since the incomes of no-occupation households are not published in KNSO's data. For example, when distribution structure is analyzed with no-occupation or unemployed households included the respondent households are presumed to have other incomes such as employment benefits—transfer income, miscellaneous incomes, etc. other than earned income but in the analysis all incomes start at zero therefore the possibility of overestimating the worsening effect of distribution structure may occur. On the other hand, if no-occupation and unemployed households are omitted from the analysis, the income-earning households convert to no-occupation or unemployed households eliminating the downward income aspect from the analysis thus leading to the possibility of underestimating the worsening effect of distribution structure.

The no-occupation household in the panel composition were omitted from the analysis under a strong assumption that the ratio of households that are included in the sample every year and those excluded are similar, depending on the change of household type. Moreover, households that were income earning before the crisis but converted to unemployed households after the crisis were omitted from the analysis since their incomes are considered as zero leading to either overestimated or underestimated income distribution. Consequently, there is a possibility that the extent of income inequality<sup>3</sup> of households used in the panel data of this study may be underestimated.

In order to solve the underestimation problem, reviewing the characteristics of households that are left out from the sample of KNSO's initial data and appropriately adjusting the weight of these

<sup>3</sup> The same problem arises when calculating the rate of income inequality using KNSO's initial data of urban household report. For this reason when calculating the rate of income inequality the KNSO also excludes no-occupation households (including unemployed households).

households may be one of the methods in compiling the panel. However, due to the difficulty in setting a standard value in the above-mentioned adjustment method, since incomes of no-occupation or unemployed households are not published, this paper leaves this problem as a future research task in the field of income distribution.

In income tax burden distribution study of Sung (2000), unemployed households were included in the income-earning households in the analysis. His study, in order to reflect that the unemployed household ratio was overly exaggerated compared to the real unemployment rate randomly eliminated portions of unemployed household and then adjusted their ratio when reorganizing his sample. Still, even with the adjustment it is difficult to wholly understand the changes of distribution structure.

## 2. Handling imputation and households that are excluded

The survey rate of KNSO's income (household) report are around 82% level for the period between 1995~2000 and in place of those households omitted from the survey, the income and expenditure data of households selectively chosen under KNSO's standard were used. These same households were not surveyed every year on a regular basis and their substitution each year is difficult to trace hence, in the KDI Income Panel, households denoted as 'Imputation' were deleted<sup>4</sup> from the initial data provided by KNSO.

The imputation households are those households not included in the report because they did not respond to the survey. If substituted households on the report show remarkable difference in characteristics from the omitted imputation households then this will create sample selection bias ultimately causing error on the analysis. Moreover, without any information on characteristic differences between the imputation households and all households, the problems arising from sample selection cannot be solved.

<Table 2> The Annual Ratio of Imputation Households

(Unit: %)

Year	1995	1996	1997	1998	1999	2000
Ratio	19.2	17.7	18.4	22.5	19.5	18.9

<sup>4</sup> The quarterly and yearly statistics published in KNSO's Annual Report include all imputation data.

Therefore, households that were included in the reference year but excluded in the following year or the one after were excluded when compiling the KDI Income Panel (Urban Workers).

The most probable method in solving this discrepancy, is to compare the characteristic difference between the households excluded from the sample (starting after the reference year) and the households that were kept and then inserting households that are most similar in characteristics to the households in the sample.<sup>5</sup> The method above and previously mentioned problems relating to unreleased income status of unemployed households are dealt in the section that discusses future research tasks.

The households that fall under the two above-mentioned groups are excluded from the KDI Income Panel (Urban Workers). The households included in the KDI Income panel are those that maintained the status of income-earning household for three consecutive years and were surveyed at least once a year. The ratio of these households is approximately less than 50% compared to the reference year. Due to households that did not respond to the survey, or cannot locate, etc., and households that convert to other household status (including no-occupation) from employed household are excluded from the sample, the second year showed 30% drop rate in the households that are included and 20% in the third year.

**<Table 3> Number of Sample Households and their Annual Representation Rate (When Matching)**

Year \ Period	First Year	Second Year		Third Year
1995	4,032	2,818 (69.9%)		1,947 (48.3%)
1996	3,935		2,759 (70.1%)	
1997	3,576			
1998	3,731		2,560 (68.6%)	1,776 (48.1%)
1999	3,590	2,539 (70.7%)		
2000	3,467			

<sup>5</sup> Refer to Kang (2000) for detailed explanation.

### 3. Compiling method of KDI Income Panel (Urban Workers)

When annual data are used as a part of the panel, the household ID provided by KNSO was used for the matching key. For the ten deciles, the households were aligned according to their average monthly income then the aggregate of monthly average ratio was divided by ten.

Also, in determining the average monthly income level, the quarterly Consumer Price Index (1995=100) was used in order to eliminate the effects of income changes due to inflation.

In a strict sense, KNSO's initial data of urban households is not based on a household standard. This is because although the data consists of monthly information on similar households however, their annual data ignores the status of the households whether they are same households or not, and simply adds the monthly data to produce overall statistics.

Taking this into consideration, in the annual initial data when same households are observe in different month in the annual initial data, they were considered as one household and their mean value was used in compiling the panel. Accordingly, when preparing the annual index on income distribution using this data, each household is considered as a separate entity although similar households overlap yearly. Hence, to a certain extent there will be some differences from the "Annual Urban Household Report" published by KNSO, which measures the Gini Coefficient of Korea.

### 4. Data comparison of Initial statistics

First, when comparing the initial data of urban households to the total data on household standard, the yearly mean value of various monthly income of the total data on household standard showed lower average income as well as lower total income ratio in 1997 and 2000 for households selected from the initial data of urban households. In general, relatively high income-earning households are regularly included in the monthly sample whereas relatively low income-earning households are either omitted from the survey or have the high tendency to convert to self-employed or unemployed households and thus having high frequency in being left out from the survey. Therefore, it is presumed that in the initial data the high income-earning households are repeatedly calculated as independent households displaying higher average income level than the total data on household standard. Moreover, the backings of higher results shown in 1997 and 2000 cannot be explained.

The KDI Income Panel was compiled using the household standard



<Table 4> Various Data Comparison of Initial Statistics

(Unit: thousand won, %)

	Urban Household Initial Data						Household Standard Data						KDI Income Panel					
	1997			2000			1997			2000			1997			2000		
	Ave.	Ratio		Ave.	Ratio		Ave.	Ratio		Ave.	Ratio		Ave.	Ratio		Ave.	Ratio	
Total Income	3,713.2	100.0		3,705.4	100.0		3,725.3	100.0		3,592.8	100.0		4,056.0	100.0		3,982.9	100.0	
Income	2,087.0	56.2		1,964.5	53.0		1,993.9	53.5		1,831.2	51.0		2,129.1	52.5		2,015.7	50.6	
Current Income	1,953.1	52.6		1,822.4	49.2		1,865.7	50.1		1,703.5	47.4		1,997.0	49.2		1,853.6	46.5	
Earned Income	1,769.0	47.6		1,653.1	44.6		1,686.7	45.3		1,529.4	42.6		1,802.4	44.4		1,673.3	42.0	
Household Heads	1,407.8	37.9		1,349.3	36.4		1,352.4	36.3		1,254.1	34.9		1,436.8	35.4		1,363.7	34.2	
Spouse	194.9	5.2		166.1	4.5		189.0	5.1		149.3	4.2		191.2	4.7		158.8	4.0	
Others	166.2	4.5		137.6	3.7		145.3	3.9		126.0	3.5		174.4	4.3		150.8	3.8	
Self-employed and Subsidiary Jobs	72.0	1.9		77.6	2.1		69.4	1.9		75.2	2.1		75.5	1.9		79.9	2.0	
Property Income	48.9	1.3		37.1	1.0		43.5	1.2		33.5	0.9		56.4	1.4		42.2	1.1	
Transfer Income	63.1	1.7		54.7	1.5		66.1	1.8		65.4	1.8		62.8	1.5		58.2	1.5	
Non-current Income	133.9	3.6		142.2	3.8		128.1	3.4		127.8	3.6		132.1	3.3		162.2	4.1	
Other Income	1,333.4	35.9		1,535.9	41.4		1,440.0	38.7		1,558.2	43.4		1,619.0	39.9		1,759.5	44.2	
Transfer from Last Month	292.9	7.9		205.0	5.5		291.4	7.8		203.3	5.7		307.9	7.6		207.6	5.2	
Number of Employed	1.6			1.5			1.5			1.5			1.6			1.5		
Ave. Age of Household Head	40.3			40.9			39.0			40.1			41.7			42.2		

Note: Total income = Income + Other incomes + Transfer from previous month

**<Table 5> The Ratio of Surveyed Households and their Average Income**

(Unit: thousand won, %)

	1995 ⇒ 1996		1996 ⇒ 1997		1998 ⇒ 1999		1999 ⇒ 2000	
	Ratio <sup>1)</sup>	Ave. Income <sup>2)</sup>	Ratio	Ave. Income	Ratio	Ave. Income	Ratio	Ave. Income
KDI Income Panel (Urban Workers) Households	69.4	1,895.9	69.8	2,009.1	68.8	1,716.6	70.5	1,752.1
Non-respondent	25.4	1,687.1	25.4	1,856.6	22.2	1,589.1	22.3	1,666.7
Household Type Change <sup>3)</sup>	5.2	1,737.1	4.8	1,846.8	9.1	1,640.8	7.2	1,666.3

Note: 1) The weight was considered hence, there is a slight difference between the panel maintenance rate of two periods in <Table 3>.

2) Income = Current Income + Non-current Income

3) Other households include households that converted their status to (self-employed and unemployed households)

**<Table 6> Trends of Gini Coefficient**

	Initial Data of Urban Households	Household Standard	
		Household Standard	KDI Income Panel
1995	0.284	0.255	0.247
1996	0.291	0.260	0.246
1997	0.283	0.254	0.249
1998	0.316	0.284	0.273
1999	0.320	0.287	0.267
2000	0.317	0.293	0.289

from the period three years immediately before and after the crisis only using the households that were included in every year with known income. Accordingly, for those households that changed their status, for instance, from earned-income household to self-employed, unemployed households or households due to address changes that were not included in the survey were eliminated from the panel. In general, since these households are assumed to have low-income level it is judged that the average income level in the KDI panel is slightly higher than the average income shown in other data as seen in Table 5.

### **III. Trends of Income Distribution Before and After the Financial Crisis**

#### **1. Trends of income inequality**

As shown in <Table 6>, the Gini Coefficient for urban worker households before the crisis was 0.28 and after the crisis 0.32, slightly higher after the crisis (same as data published by KNSO).

However, the Gini Coefficient of the total data on household standard, which was composed by reorganizing the same households on the initial data of urban households, was 0.26 before the crisis and 0.29 after the crisis. The Gini Coefficient of KDI Income Panel (Urban Workers), which compiled panels for three years before and after the crisis displayed 0.25 for before the crisis and 0.27 after the crisis.

It is believed that the fundamental reason for the difference in Gini Coefficient in each data is the methods used in compiling each statistic data, as explained in Chapter II of this study. KNSO's initial data and the total data of household standard had a difference of  $\pm 0.03$  Gini point. Theoretically, the difference in Gini point is difficult to explain. For instance, when monthly units of overlapping household data are integrated into yearly unit and its average is used, there is a possibility that the result can be higher or lower than the actual rate of income inequality.

Meanwhile, the difference observed in the Gini Coefficient of KDI Income Panel, which used data of closely followed households for three consecutive years, and the Gini Coefficient of KNSO's initial data is mainly caused by omission of relatively low-income households giving rise to more households that increase the extent of income inequality in the panel, as explained in <Table 4>.

There is one common point among these Gini Coefficients shown above. It is clear that all three coefficients did not show any substantial changes from 1995 to 1997 (before the crisis) but, during 1998 to 2000 (after the crisis) there was approximately 0.01 increase in Gini point in

2000, except for the initial data of urban households, indicating that the income inequality rate after the crisis did increase.

## 2. Trends of Income Distribution

In order to observe the changing trends of income distribution, some type of classification is needed. There are many classifications used to describe income levels however, in this study, we will use income classification system relative to OCED (1995).

In OECD (1995) and Yoo (1999), those earning 150% and above median will be classified as high-income class and those earning less than 50% of median will be called low-income class. From the existing middle-income class, those earning 70~ 150% of median will be considered as middle-income class and those earning 50~70% will be called modest-income class.

The analysis result from the above classification shows increasing trend for the ratio of low-income class after the crisis but then it became stagnant after 2000. But, when this rate was compared with the rate before the crisis, the rate after 2000 has somewhat increased. And, among the middle-income classes, the increasing ratio of modest-income class was very unique.

The ratio of middle-income class, which has been continually falling since before the crisis until 1999 however increased somewhat in 2000 defying the 'collapse of middle-income class' phenomenon that was raised frequently after the crisis. Hence, concluding that the middle-income class collapsed due to the financial crisis is too hasty when data shows the actual reduction began before the crisis and when the increasing trend is still observed three years after the crisis. The trends of middle-income class should be observed for longer time span.

Based on the 1997 income distribution, which used classification of the relative income levels of OECD standard, <Table 8>, analyzes the annual income distribution and changes with inflation rate in mind

Using 1997 as the reference year, the analysis result for the ratio of high-income class increased until immediately after the crisis and again in 2000, increasing trend was seen. The ratio of low-income class displayed symmetrical ratio to the high-income class. Following the symmetrical ratio of high-income and low-income classes, the ratio of middle-income class showed stable ratio however, the ratio of modest-income class showed increasing tendency after the crisis.

When considering the income distribution changes of 1997, we can fairly reason that the increases in both low-income and modest-income classes are one of the factors that worsened the whole income distribution structure after the crisis. However, more research must be done in order for this static analysis result to support the existing argument,

**<Table 7> Trends of Income Class (Relative Changes)**

		1995	1996	1997	1998	1999	2000
High Income Class		22.1	22.8	21.8	22.9	23.3	22.0
	Middle Income	69.0	67.5	68.5	65.4	64.7	66.1
	Modest Income	69.0	67.5	68.5	65.4	64.7	66.1
Low Income Class	8.9	9.7	9.7	11.7	11.9	11.9	

(Unit: %)

Source: KNSO, from the initial data of urban households

**<Table 8> Income Level Changes (based on 1997)**

		1995	1996	1997	1998	1999	2000
High Income Class		16.6	20.8	21.8	14.3	15.9	17.4
	Middle Income	71.7	68.7	68.5	68.1	67.2	67.9
	Modest Income	71.7	68.7	68.5	68.1	67.2	67.9
Low Income Class	11.7	10.6	9.7	17.6	16.9	14.7	

(Unit: %)

Source: KNSO, from the initial data of urban households

which states that the income of low-income class compared to other income classes decreased substantially worsening the distribution structure after the crisis.

## IV. Income Mobility

### 1. Methodology used in determining income mobility

There are many ways to measure income mobility depending on what is being studied through income mobility. However, in general, the following methodology is used to conduct most of the studies. In Fields (2001) measuring method of income mobility study was divided into three categories. First, income changes of a given unit are observed throughout various set times. For example, when determining the income mobility changes of different income classes in a fixed period of time a panel data of the subject group is needed. Second, to solve the problems that arise due to the measuring unit, the subject group can be either an individual or a household. Third, to determine the different aspects of economic welfare then the subjects can be income, consumption, earned income, etc.

This study aims to analyze and compare the extent of income mobility during the two periods before and after the financial crisis. Period A designates time between 1995-1997 and Period B, between 1998 and 2000. Studies done in other countries usually analyze 5 year-period as one unit however, in this study the data are analyzed and compared around the time of the crisis between Period A and B due to the fact that this was a unique occurrence and also due to lack of data availability. In addition, this study's underlying source, the sample from KNSO's Urban Household Report had been reorganized completely around the crisis period thus it was impossible to compile the panel for 1997 and 1998. This is the main reason that this study observed only two given periods such as Period A and B. Accordingly, due to limited data availability this study aims to indirectly determine the changes in distribution structure before and after the financial crisis. The measuring unit is per household, and the subject of analysis is limited to household income. Measuring standard for consumption and earned income will be left to future studies in this field.

#### 1-a. Measuring the income decile movement (income positional movement)

One of the methods used to determine the extent of income mobility

before and after the crisis is to first measure each household income to decile income and observe the mobility changes of the same household after given lapse of time whether there was change in its decile. Without observation, it is clear that the period after the crisis supported more mobility in decile of household income than the period before. It is predicted if the crisis did influence the economic structure of Korea then the households subject to the survey with minute changes before the crisis would have shown greater mobility in income decile after the crisis.

In order to measure the above statement, the immobility ratio (IR) index can be used. This index represents households with the same decile income at the beginning and at the end of a given period. If Period A: 1995~1997 showed less mobility in income decile for each household than the Period B: 1998~2000, the IR ratio of Period A will be higher than Period B.

Prepared by using the initial data of urban households and KDI Income Panel data, the IR ratio of <Table 9> and <Table 10>, using the transition matrix, is 0.314 during 1995~1997 and 0.297 during 1998~2000. For instance, 31.4% of total households showed no changes in their decile income for Period A and 29.7% for Period B. It is estimated that during Period B (after the crisis), the extent of decile income mobility was higher.<sup>6</sup>

During Period A, 36.6% of the total households displayed upward income decile movement while 31.9% displayed downward movement. During Period B, 43.2% showed upward movement and 27.1% showed downward movement, recording an increase of 6.6%p upward decile movement after the crisis.

<Table 11> compares the source of income for households that are classified by their income mobility (i.e. downward, unchanged, upward). After separating the two periods, 1997 (before the crisis) and 2000 (after the crisis), households with downward, unchanged, or upward income mobility was compared for particular characteristics however, non were found.

The Shorrocks' Index (SI) is another index that indicates the extent of decile income mobility, a very similar concept to IR Index. The fundamental concept of SI and IR is that only diagonal matrix is used to determine the decile income mobility when relating to transition matrix. SI is defined as  $[C - tr(M)/(C-1)]$ . Here,  $tr(M)$  denotes trace of M while C denotes decile. Hence, if the extent of decile income mobility decreases at the two point of comparison then  $tr(M)$  will increase while SI will decrease.

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<sup>6</sup> First, KNSO's initial data of urban households was used to determine the income decile from the reference year and the compared year and then the KDI Income Panel was used to calculate the extent of decile income mobility for households that were observed for three consecutive years.

**<Table 9> Income Decile Mobility before the Financial Crisis**

(Unit: %)

1997 1995	I	II	III	IV	V	VI	VII	VIII	IX	X
I	53.1	18.2	9.2	10.6	2.9	3.2	2.1	0.8	0.0	0.0
II	19.8	32.9	16.0	14.4	6.5	4.1	3.7	0.8	0.0	1.9
III	9.3	21.9	27.5	15.8	12.7	6.2	4.4	0.6	1.7	0.0
IV	8.9	8.0	9.2	19.3	21.4	12.6	10.8	6.9	1.3	1.5
V	2.0	8.3	14.3	13.0	12.9	20.6	13.3	12.3	1.9	1.5
VI	0.2	1.7	5.1	9.0	12.4	18.5	22.8	13.3	12.1	4.9
VII	2.4	2.5	2.7	5.7	5.9	22.7	20.9	18.7	12.4	6.3
VIII	0.4	1.6	2.6	4.1	6.4	11.0	18.4	25.9	19.0	10.7
IX	0.2	1.3	0.9	2.4	4.8	7.9	6.8	17.2	35.1	23.3
X	0.4	0.0	0.7	3.3	5.0	0.4	2.7	8.8	14.3	64.6

**<Table 10> Income Decile Mobility after the Financial Crisis**

(Unit: %)

2000 1998	I	II	III	IV	V	VI	VII	VIII	IX	X
I	45.7	20.2	17.9	7.7	5.2	3.1	0.2	0.0	0.0	0.0
II	18.9	23.6	20.6	13.0	12.1	8.0	2.3	1.1	0.5	0.0
III	14.6	12.4	22.5	20.5	6.8	10.2	5.0	6.0	1.1	1.0
IV	3.7	7.0	15.2	21.1	24.6	12.2	11.0	2.4	2.5	0.4
V	3.0	4.5	6.8	13.3	18.4	16.5	22.5	7.8	5.4	2.1
VI	0.4	3.8	5.2	6.0	14.7	21.9	20.4	18.2	5.8	3.7
VII	1.3	0.3	2.5	8.4	8.3	11.3	21.1	22.9	16.1	8.0
VIII	1.5	0.0	0.3	3.1	3.5	9.7	12.4	27.7	29.9	12.0
IX	0.8	1.1	1.2	2.1	2.8	4.6	4.2	16.3	32.8	34.2
X	1.7	0.0	0.0	0.7	2.0	3.7	3.7	6.1	20.3	61.8



<Table 11> Type of Income Mobility: Breakdown of Income Sources

(Unit: thousand won, %)

	1997 (1995→1997)						2000 (1998→2000)					
	Downward		Unchanged		Upward		Downward		Unchanged		Upward	
	Ave.	Ratio	Ave.	Ratio	Ave.	Ratio	Ave.	Ratio	Ave.	Ratio	Ave.	Ratio
Total Income	3,191.9	100	4,661.0	100	4,289.2	100	3,304.6	100	4,398.0	100	4,122.5	100
Income	1,675.4	52.5	2,364.1	50.7	2,322.5	54.1	1,473.9	44.6	2,232.9	50.8	2,205.8	53.5
Current Income	1,574.6	49.3	2,243.0	48.1	2,153.6	50.2	1,411.9	42.7	2,085.6	47.4	1,970.7	47.8
Earned Income	1,439.2	45.1	2,025.8	43.5	1,927.0	44.9	1,258.5	38.1	1,895.9	43.1	1,780.1	43.2
Household heads	1,210.5	37.9	1,622.2	34.8	1,474.7	34.4	1,052.7	31.9	1,531.6	34.8	1,443.1	35.0
Spouse	102.2	3.2	242.5	5.2	224.7	5.2	90.6	2.7	228.0	5.2	153.9	3.7
Others	126.5	4.0	161.1	3.5	227.6	5.3	115.2	3.5	136.4	3.1	183.1	4.4
Self-employed & Subsidiary jobs	58.6	1.8	81.6	1.8	84.8	2.0	56.8	1.7	94.8	2.2	84.1	2.0
Property Income	33.2	1.0	80.6	1.7	55.7	1.3	42.5	1.3	43.8	1.0	40.9	1.0
Transfer Income	43.6	1.4	55.0	1.2	86.0	2.0	54.2	1.6	51.1	1.2	65.6	1.6
Non-current Income	100.8	3.2	121.1	2.6	168.9	3.9	62.0	1.9	147.3	3.3	235.1	5.7
Other Incomes	1,226.6	38.4	1,983.1	42.5	1,648.1	38.4	1,630.0	49.3	1,954.9	44.4	1,706.3	41.4
Transfer from Previous Month	289.8	9.1	313.8	6.7	318.6	7.4	200.6	6.1	210.2	4.8	210.3	5.1
Number of Employed	1.5		1.5		1.6		1.4		1.5		1.6	
Ave. Age of Household	41.3		43.3		40.7		42.6		43.3		41.3	

In fact, after the actual calculation,  $SI(SI_a)$  of Period A was 0.766 and  $SI(SI_b)$  of Period B was 0.782 clearly displaying greater decile income mobility after the crisis than before, supporting the result of IR.

Kim (2001) used similar data as this study to analyze decile income mobility (V decile) of a period between 1988~1992 and period between 1993~1997. Kim reported the SI results of each period as 0.627 and 0.642, respectively. Although the results from Kim (2001) and this study cannot be compared directly due to differences such as the duration of analysis (5 years (Kim's) and 3 years (ours)) and the division of income deciles (5 deciles (Kim's) and 10 deciles (ours)) however, when looking at the overall results, it is safe to assume that the income mobility in Korea during the mid 1990s decreased compared to the beginning of 1990s but, the extent of income mobility is on the rising trend since the crisis.

Linking income equality to this result, the extent of income inequality in the 1990s continued its decreasing trend until mid 1990s and started to increase. Hence, in Korea, it is possible to hypothesize that income mobility and income inequality have a proportional relationship.

In order to prove the above hypothesis with more precision, a construction of statistical database with longer duration and detailed statistics work must precede, however, recalling Kuznets' (1955) *Inverse U Hypothesis* will help in understanding the above hypothesis. For example, the main point in his hypothesis states that income distribution worsens at the beginning of economic development however as economic development matures income distribution will improve. On the other hand, that same hypothesis can be interpreted as the extent of income mobility will increase at the beginning of economic development but in a stable environment after the economic growth the extent of income mobility will decrease. Of course, Kuznets' hypothesis is not popularly accepted due to various counter findings. However, unlike the past, a speedy technological progress in a new economic system (knowledge-based economy) is being established. And, if we perceive this as the beginning of a new economic development, it can be explained from the hypothesis that current increase in income mobility is a part of the economic development process.

### **1-b. Estimation and verification of decile income mobility**

The above presumed IR or SI simply helps us to understand the extent of income mobility of a household with no decile income mobility within a given period of time. Hence, the direction and degree of households with decile income mobility was not reflected. In other words, in view of decile income transition matrix, other than the diagonal matrix, the extent of household income was not reflected.

There is another measuring method that reflects the extent of household income mobility as well as decile income mobility other than the diagonal matrix. The Pearson Chi-squared Calculation first measures the household income mobility and then calculates whether there was also a change in the extent of decile mobility during the two given periods. The concept and estimation methods for the Pearson Chi-squared Calculation are as follows.

First, if there is no decile income mobility at the two given periods, the composition of decile income transition matrix is 1 for diagonal matrix and the rest is composed of identity matrix, which is zero. If this was reversed, for instance, reverse identity matrix, then the income distribution at the two given periods would be completely opposite. As such, it is safe to say that in both cases the income distribution at the compared period has *perfect time dependence* with the income distribution of the reference period.

On the other hand, hypothetically, if transition matrix at the reference period has perfect time independence, the households on the panel will have completely different income distribution at the compared period and the reference period.

Given this perspective, we can consider the hypothetical transition matrix where each factor has equal value. For example, if we use 10 decile distribution and the number of the sample is designated as N, we can assume all factors of transition matrix to be  $0.1N$  matrix. Using this matrix, we can determine whether income distribution at the compared period has *perfect time dependence* with income distribution of the reference period. Depending on the degree of difference between the two periods of the transition matrix and the above hypothetical matrix will indirectly determine whether the income distribution at the compared period and the reference period has a meaningful difference.  $\chi^2$  provides the evaluating standard.

Concisely, for hypothetical verification of the difference between the actual transition matrix and the hypothetical transition matrix the following null hypothesis was set and  $\chi^2$  was used to statistically verify the difference.

$H_0$ : denotes income mobility at perfect time independence

The value of  $\chi^2$  is as follows. When each factor value of hypothetical matrix is denoted as  $EXP_{ij}$  and the observed value of actual transition matrix as  $OBS_{ij}$ ,

$$\chi^2 = \sum_i \sum_j \frac{(OBS_{ij} - EXP_{ij})^2}{EXP_{ij}}$$

The equation provides information on the degree of independence of the actual transition matrix from the reference period. Also, through comparison of  $\chi^2$  value obtained from the two different transition matrix, information on which matrix showed more independent income mobility from the reference period can be provided.

For example, greater the value of  $\chi^2$ , occurrence of a higher degree of *perfect time dependence* at the reference period and accordingly, a less degree of income mobility.

In KDI Income Panel (Urban Workers), the  $\chi^2$  value of Period A was 2,351.2, and Period B was calculated as 2,019.4, rejecting the hypothesis which states that the transition matrix of both periods are independent from the reference period<sup>7</sup> and further showed the income mobility after the crisis was more prominent than immediately before the crisis.

The *Correlation Coefficient*, is another index, which determines the relationship between the change of income distribution at the compared period to the distribution structure of the reference period. The correlation coefficient between 1995 to 1997 was 0.777 while between 1998 and 2000 was 0.592, reconfirming the above  $\chi^2$  value and showing that the income mobility during Period B was much active than Period A.

### 1-c. Symmetric Income Movement

Up to now, the main discussion was focused on the direction of income mobility for the two periods. However, there are many other factors that can be evaluated when studying the income mobility. In this section, the quantitative views on income mobility before and after the crisis will be discussed. For this perspective, Fields and Ok (1996,1999a) Index, which was developed for this specific reason will be used. A brief outline of the index is as follows: First, the reference period income is denoted as  $x_i$ , the compared period income  $y_i$ , and the size of the sample as  $n$ . Then the total income mobility can be defined as follows.

$$d_n^{(1)}(x, y) = \sum_{i=1} |x_i - y_i| \quad (1)$$

When the above equation is divided by  $n$ , the income mobility per person can be expressed as below.

$$m_n^{(1)}(x, y) = \sum_{i=1} |x_i - y_i| / n \quad (2)$$

When the above equation is divided by the aggregated income of reference year, it is possible to calculate the average income mobility as shown below.

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<sup>7</sup> In statistical significance, when calculated  $\chi^2$  value is C\*C transition matrix, it is verified as freedom of C(C-1)

$$p_n^{(1)}(x, y) = \sum_{i=1} |x_i - y_i| / \sum_{i=1} x_i \tag{3}$$

Fields (2001) named the above indices, F-O 1 set of measures.

In KDI Income Panel (Urban Workers), when calculating the values of  $d$ ,  $m$ , and  $p$  for Period A (before the crisis) and Period B (after the crisis), the values for Period A were 933,955,486 won, 479,690 won, and 0.252, respectively and for Period B, 1,058,952,945 won, 589,617 won, and 0.336, respectively.

As seen above, it is clear even in the absolute quantity sense, the income mobility of Period B (after the crisis) is much greater compared to Period A (before the crisis). Even in the average income mobility ( $p^{(1)}$ ) per person shown for Period A, which is around 25% and Period B, around 34% also verify that more changes occurred after the crisis rather than before in terms of individual income.

In Fields (2001), F-O 2 measures are used as well as F-O 1 measures. Among these measures,  $m^{(2)}$  index takes individual income difference into consideration and determines the extent of income mobility by using the average of income difference rate, which is shown below.

$$m_n^{(2)}(x, y) = \sum_{i=1} |\log x_i - \log y_i| / n \tag{4}$$

The above measure emphasizes that the extent of individual's income mobility can differ depending on his/her income size. For example, a difference of additional ten million won to a person with an annual salary of thirty million won to a person with an annual salary of sixty million won, would result in significant income ratio difference.

The  $m^{(2)}$  for Period A was 0.26 and for Period B was 0.3.

In addition,  $d^{(1)}$  can be separated into growth component and transfer component using the method below.

$$d_n^{(1)}(x, y) = \sum_{i=1} |x_i - y_i| = g_n^{(1)}(x, y) + t_n^{(1)}(x, y) \tag{5}$$

Here,  $g_n^{(1)}(x, y) = \sum_{i=1} y_i - \sum_{i=1} x_i$  and  $t_n^{(1)}(x, y) = 2 (\sum_{i \in L_n(x,y)=0} (x_i - y_i))$ .

And,  $L_n(x, y)$  denotes total households that displayed income reduction during the analysis period.

Using the given materials to determine the above value, among the total income mobility during Period A, 41% was due to the growth component and 59% was due to the transfer component. For Period B, 50.6% due to growth component and 49.4% due to transfer component. For instance, after the crisis, half of the income mobility was caused by the economic growth. This phenomenon was believed to have been caused by the minus economic growth rate in 1998, which rebounded in 1999 and 2000.

### 1-d. Assessment on income mobility direction

In previous sections, mainly indices that determine the flow of income mobility were used in order to observe the income mobility before and after the financial crisis.

However, the assessment on the direction of income mobility between the two periods cannot be determined by indices used above. For indices that measure the directional income mobility before and after the crisis, the mobility direction for each period can be determined by comparisons such as ratio between income-gain and income-loss households and average income gain (between income-gain and income loss). But, for the two periods, a standard method to determine which period had better income mobility cannot be established.

A measure that allows standard assessment on income mobility was developed by Fields and Ok (1999a). One of the F-O 3 set of measure is shown below.

$$m_n^{(3)}(x, y) = \sum_{i=1}^n (\log y_i - \log x_i) / n \quad (6)$$

When using the real income, the income change rate using the log was designated as the standard index in order to keep the extent of income change from worsening. Then the income mobility direction of the two periods using the difference of income change rate at the average value was assessed. The result showed 0.095 for before the crisis and 0.135 for after the crisis. Hence, the income mobility during 1995~1997 and 1998~2000 both showed move in the positive direction, meaning income mobility after the crisis was more positive than before the crisis.

However, the positive result of  $m$  measure does not mean that the extent of income distribution of a society has improved, meaning an income distribution improvement of portions of income class in a society does not affect the whole society's income distribution. Furthermore, although  $m$  measure represents the directional income mobility of a whole society but it does not represent individual's income mobility direction or a particular group's income mobility direction.

Accordingly, in order to determine if the extent of income mobility for a particular group has improved for a given period of time, instead of using the total average, like  $m$  equation, first determining the extent of income mobility change of that particular group should be made. In the graph using the real income, the emphasis (accumulative weight) was on the households with the most income loss during the two periods and if the income mobility of one period compared to the other period is not positioned above (if at least one household falls below or in a same position) then it can be said that income distribution has im-

proved.<sup>8</sup>

In order to make a standard assessment on the income mobility direction before and after the crisis, [Figure 1] and [Figure 2] was prepared. [Figure 1] was prepared using the log income difference and [Figure 2] by using the real income difference.

As seen in [Figure 2], all income changes after the crisis showed downward direction compared to before the crisis, except for the lowest 3% income mobility and the uppermost class.<sup>9</sup> Except for the partial households with severe fluctuation in their income loss or gain, the income mobility direction after the crisis is more positive compared to before the crisis but, we cannot show that the whole income distribution structure has improved.

To explain the higher Gini Coefficient (which indicates worsening income inequality) shown in the KDI Income Panel (Urban Workers), using the income mobility results from the graph, it can be said that the amplitude of income mobility direction after the crisis was much greater than before the crisis. (Refer to <Table 6>) More explanations on this issue is discussed in Chapter V.

Putting all the results together and keeping in mind that the households indicated in the KDI Income Panel with increased income after the crisis fall under extremely small number, it can be said that the underlying cause of worsening distribution structure after the crisis is due to the greater degree of income loss gap after the crisis for those households that already experienced income loss before the crisis. In the following chapter, the cause of worsening distribution structure after the crisis was analyzed through households mentioned above.

The result of standard evaluation on the income mobility direction obtained by analyzing the difference of real income axiomatically agrees<sup>10</sup> when using the result from [Figure 1] as used in the equation (6), which uses the log value. Therefore, in the next chapter not only the results from [Figure 1] but also the results from [Figure 2] will be used simultaneously to closely examine the characteristics of households with absolutely or relatively great income mobility after the crisis as the subject in understanding the underlying cause of worsening distribution structure.

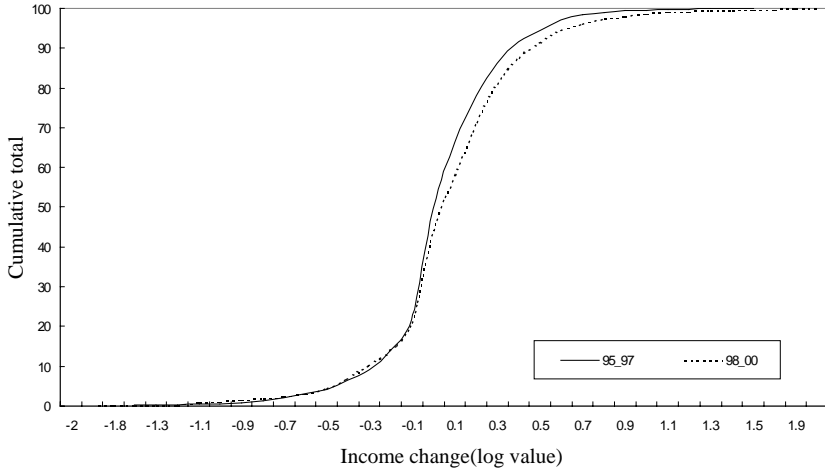
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<sup>8</sup> This concept is similar to comparing two Lorenze curves to determine the extent of income inequality and income equality levels. The value of horizontal axis of the graph denotes the degree of income changes from negative to positive arranging in order of biggest households. The vertical axis denotes aggregate composition ratio of those households. Here, we mean absolute value of income and not log income. The comparison between the absolute income value and log income will be dealt in the next section.

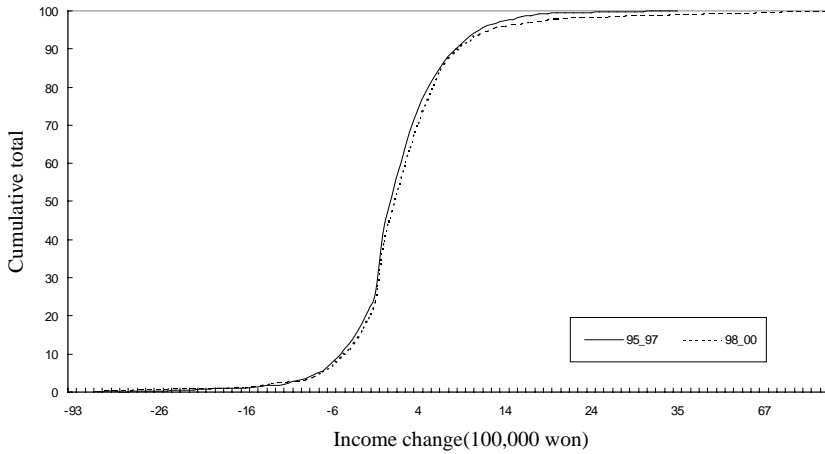
<sup>9</sup> Not shown in the graph but households with above 3.1 million won income gain during 1995~1997 did not show any income mobility change.

<sup>10</sup> Evidenced in Fields and Ok (1999a).

[Figure 1] Distribution of Income Mobility (log value)



[Figure 2] Distribution of Income Mobility (real income)





## **V. Analysis on the Cause of Worsening Income Inequality after the Financial Crisis**

### **1. Focused on households with great absolute income mobility**

#### **1-a. Analysis on the cause of worsening distribution structure**

Most of the previous studies conducted to understand the cause of distribution structure indicated that the cause of worsening distribution structure after the crisis mostly concentrated in the low-income or lower class (in this paper modest-income and low-income classes). [(Yoo 1999), (Jung, 2000), (Jung & Choi, 2001), Jung (2001)]

Such static analysis result coincides with the distribution changes of income classes shown in (<Table 7> and <Table 8>) in Chapter of this paper, which also used a static method in their analysis.

However, the analysis conducted in this paper, which is based on the dynamic analysis of income mobility by using the panel data, has following differences from the previous analysis results.

As shown in [Figure 2], which displays the results of the income mobility direction before and after the crisis, the causes of worsening distribution structure after the crisis among urban worker households are mainly due to a sharp increase rate of income gain (above 3.1 million won) before the crisis and a sudden decrease in household income after the crisis (above 1.1 million won based on 1997) fell even more after the crisis.<sup>11</sup>

As such, if majority of the households with great income-loss gap belongs to the low-income class and the same households moved to even lower class than it can be said this result is in accord with the results of previous static analysis. In <Table 12> and <Table 13>, the results are shown.

The income decile mobility of households that are presumed to have worsen the distribution structure due to substantial income-loss after the crisis all belong to the high-income class of the VII decile and above in 1998. These households, which experienced considerable income-loss in 2000, are also experiencing the change in their income class through various income deciles. For example, the households belonging to VII decile moved to I decile, households belonging to VIII decile to I and III deciles, and households belonging to IX decile to below VI

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<sup>11</sup> The standard value of 1.1 million won and 3.1 million won was derived from the two values that intersect on [Figure 1].

**<Table 12> 1999-2000 Income Decile Mobility of Households with Income-loss (more than 1.1 million won)**

(Unit: %)

2000 1998	I	II	III	IV	V	VI	VII	VIII	IX	X
VII	4.1 <sup>1)</sup> 100.0 <sup>2)</sup>	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
VIII	6.0 100.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
IX	3.2 15.9	4.2 23.5	5.2 26.1	6.9 34.5	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
X	6.8 9.7	0.0 0.0	0.0 0.0	2.8 3.9	8.0 11.4	14.7 21.0	9.8 14.1	8.8 12.5	8.9 12.7	10.3 14.8

Note: The ratio of households with more than 1.1 million won income-loss during 1998-2000 was 2.7% of the total household (46 households).

1) Ratio based on 46 households.

2) Ratio based on the number of households in each income decile 1998 (raw percent).

**<Table 13> 1995-1997 Income Decile Mobility of Households with Income-loss (more than 1.1 million won)**

(Unit: %)

1997 1995	I	II	III	IV	V	VI	VII	VIII	IX	X
VII	5.0 100.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
VIII	1.7 30.8	3.9 69.3	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
IX	1.1 6.7	5.8 36.1	4.0 24.7	3.0 18.9	2.2 13.6	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
X	1.5 2.1	0.0 0.0	3.0 4.2	14.5 19.8	22.0 30.0	1.7 2.3	8.0 11.0	13.8 18.9	6.1 8.3	2.6 3.6

Note: The ratio of household with more than 1.1 million income-loss during 1995-1997 was 2.7% of the total household (51 households)

1) Ratio based on 51 households.

2) Ratio based on the number of households in each income decile 1995 (raw percent).

decile, experiencing severe changes in income decile in 1998. In particular, the households that belonged to X decile in 1998 experienced income class mobility through various income deciles.

Accordingly, the argument supported by the static analysis, which states that the fundamental cause of worsening income distribution structure after the crisis is the collapse of lower-income class cannot be proved by the dynamic analysis.

In addition, the basis for questions raised and opposing arguments of the previous analysis relating to the collapse of middle class cannot be affirmed by neither the dynamic nor static analysis results, hence we

can conclude that it is not true.<sup>12</sup>

The conclusion of this study will be conducted by using a dynamic analysis to investigate the characteristics of households with great income-loss and the notable characteristics are as follows. The worsening income distribution of urban worker households before and after the crisis showed greater extent of income mobility after the crisis and accordingly, the households with considerable income-gain increased after the crisis. Moreover, households with substantial income-loss before the crisis experienced greater income-loss gap after the crisis eventually leading to worsened distribution structure.

### **1-b. Analysis on characteristics of households with income-loss**

In <Table 14> and <Table 15> households with considerable income-loss for 3 years before and after the crisis were analyzed on their income changes by household type.

In observing the characteristic differences between the two periods, first for those households that experienced income-loss after the crisis, 46.9% of the income-loss was due to the loss in non-current income. Comparing this to 12.7% recorded before the crisis, a notable difference can be seen. Non-current income includes incomes other than current income such as money received for special occasions, free giveaways and lottery, lump sum pension and retirement payment, and scholarship funds. It is presumed that the income loss seen after the crisis is mainly due to the income gain from retirement payment received immediately following the crisis in 1998 as part of a vigorous restructuring, that gradually reduced in 2000. If this assumption is correct then this is considered as a temporary decline and will not further worsen the distribution structure in the future.

On the other hand, the ratio of current income loss from the total income loss after the crisis was 53.1% and the ratio of earned income loss was 48.8%, which is approximately half of the total income loss. Looking at the breakdown of earned income loss after the crisis, 23% was due to income loss of household head, 11.6% spouse, and 14.1% due to others. In addition, during the period before the crisis the ratio of

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<sup>12</sup> The households with absolute income-loss of 1.1 million won are naturally the households with above VII deciles meaning high-income households accordingly, there are no low-income households with income-loss of 1.1 million won. Hence, the argument of this paper, which disagrees with the theory that states worsening income inequality, is due to the collapse of low-income class does not have any basis which can support its argument. But, in the next chapter, the relative income increase using the *log* income is identical to the findings in this study hence the results from this study is considered valid. In order to justify the existing theory that the collapse of the low-income truly is the reason for increase in income inequality, you cannot find an answer from static analysis, but a dynamic analysis must be conducted. The results gained from using the *log* income, which was used in this paper seem most effective.

<Table 14> Income Source of Households with Income Loss in 1995~ 1997 (more than 1.1 million won)

(Unit: 1,000 won, %)

	1995		1997		Income Difference (97-95)	Ratio of Income Difference		Increase Rate (97-95)
	Income Amount	Ratio	Income Amount	Ratio		Based on Total Income	Based on Income	
Total Income	5,482.9	100.0	3,854.6	100.0	-1,628.3	100.0	-	-29.7
Income	3,603.1	65.7	1,771.0	45.9	-1,832.2	112.5	100.0	-50.8
Current Income	3,236.7	59.0	1,637.0	42.5	-1,599.7	98.2	87.3	-49.4
Earned Income	2,894.8	52.8	1,492.2	38.7	-1,402.6	86.1	76.6	-48.5
Household Heads	1,714.5	31.3	1,184.7	30.7	-529.8	32.5	28.9	-30.9
Spouse	450.9	8.2	152.4	4.0	-298.5	18.3	16.3	-66.2
Others	729.4	13.3	155.1	4.0	-574.3	35.3	31.3	-78.7
Self-employed & Subsidiary Jobs	120.3	2.2	47.8	1.2	-72.5	4.5	4.0	-60.3
Property Income	58.7	1.1	50.4	1.3	-8.3	0.5	0.5	-14.1
Transfer Income	163.0	3.0	46.6	1.2	-116.4	7.1	6.4	-71.4
Non-current Income	366.5	6.7	134.0	3.5	-232.4	14.3	12.7	-63.4
Other Income	1,564.4	28.5	1,837.9	47.7	273.5	-16.8	-	17.5
Transfer from Last Month	315.3	5.8	245.7	6.4	-69.6	4.3	-	-22.1
Number of Employed	2.4		1.5			-		
Ave. Age of Household Heads	40.4		40.5			-		

<Table 15> Income Source of Households with Income Loss in 1998~2000 (more than 1.1 million won)

(Unit: 1,000 won, %)

	1998		2000		Income Difference (2000-1998)	Ratio of Income Difference		Increase Rate (2000-1998)
	Income Amount	Ratio	Income Amount	Ratio		Based on Total Income	Based on Income	
Total Income	7,051.2	100.0	4,235.1	100.0	-2,816.1	100.0	-	-39.9
Income	4,013.0	56.9	1,766.7	41.7	-2,246.3	79.8	100.0	-56.0
Account Income	2,859.3	40.6	1,666.8	39.4	-1,192.5	42.3	53.1	-41.7
Earned Income	2,383.4	33.8	1,286.6	30.4	-1,096.8	38.9	48.8	-46.0
Household Heads	1,619.2	23.0	1,101.8	26.0	-517.4	18.4	23.0	-32.0
Spouse	298.3	4.2	36.7	0.9	-261.6	9.3	11.6	-87.7
Other	465.9	6.6	148.1	3.5	-317.8	11.3	14.1	-68.2
Self-employed & Subsidiary Jobs	176.6	2.5	127.7	3.0	-48.9	1.7	2.2	-27.7
Property Income	166.0	2.4	150.4	3.6	-15.7	0.6	0.7	-9.4
Transfer Income	133.3	1.9	102.2	2.4	-31.1	1.1	1.4	-23.4
Non-current Income	1,153.6	16.4	99.8	2.4	-1,053.8	37.4	46.9	-91.3
Other Income	2,778.8	39.4	2,241.2	52.9	-537.6	19.1	-	-19.3
Transfer from Last Month	259.4	3.7	227.3	5.4	-32.2	1.1	-	-12.4
Number of Employed	2.1		1.5				-	
Ave. Age of Household Heads	47.3		46.5				-	

**<Table 16> Income Decile Mobility of Households with Income Gain in 1998~2000 (more than 3.1 million won)**

(Unit: %)

1998 2000	III	IV	V	VI	VII	VIII	IX	X
X	8.1	2.6	1.9	2.5	10.6	30.9	29.3	14.2

earned income decline among the income decline was 76.6% and by type, household heads was 28.9%, spouse 16.3%, and others 31.3%. Now, looking at the period before the crisis, the ratio of earned income loss from the total income loss was 76.6%, and the breaking down consists of 28.9% income loss of household heads, 16.3% spouse, and 31.3% others.

In conclusion, the main cause of income loss before and after the crisis is due to a decrease in the number of employed persons per household (both periods showed approximately 2.1~2.4 average employed persons per household dropping to 1.5 persons). For instance, the households with considerable income loss experienced unemployment within the household with decreased shares of members in employment both before and after the crisis leading to a decrease in earned income which is the main cause of overall income loss.

Although the same households with substantial income loss were observed on the Panel data, considering that there was no significant change in the average age of household heads both before and after the crisis, we can infer that there was notable number of households with the change in their household heads. Directly validating the change will be difficult however we can assume that number of households experienced split in the family or death of household heads, which both decreased the shares of family members in employment.

### **1-c. Analysis on characteristics of households with income gain after the crisis**

As one of the causes for worsening income distribution after the crisis, observing the income decile mobility of households with more than 3.1 million won income gain for 3 years after the crisis are as follows.

Although the number of sample is small and maybe insignificant, looking at the income decile mobility among the households dispersed between the deciles III to X in 1998, these households moved upward to the X decile, highest income class, in 2000. Among the households that were in the deciles VIII and IX in 1998, 60% have moved upward to the X decile in 2000.

Moreover, looking at the characteristic changes in the income type of these households, 77% of upward income decile movement was due to

non-current income gain and 22.7% was due to current income gain, although only 20 households are analyzed casting a shadow on the credibility.

Noting that for the past two years the average age of household head was the same affirms that the same households are being sampled. Moreover, the number of employed persons per household which was 1.3 in 1998 slightly increased to 1.5 persons in 2000. However, as explain in the previous sections the majority of upward movement in income decile for 3 years after the crisis was due to a non-current income gain hence the greater shares of members in employment per household does not play a crucial role in income gain.

Also, considering the fact that the average age of household heads is in their late 30's and the non-current income gain, we can presume the income gain of these households, similar to those households with income loss, is due to increased retirement payment, etc.<sup>13</sup> On the other hand, the "Venture Boom" dividends and shares from stock investment maybe be one of the reasons for income gain however, due to KNSO's insufficient data on property income a direct evidence cannot be obtained.<sup>14</sup>

## **2. Centered on households with relatively large income mobility**

### **2-a. Analysis on the cause of worsening distribution structure**

The income mobility direction before and after the crisis as analyzed in [Figure 1], the main cause of worsening distribution structure of the urban worker households is due to a sharp income gain ratio before the crisis and a rapid income loss ratio after the crisis have become greater after the financial crisis.

Reviewing the income decile mobility of households with great drop in the log income after the crisis, which is thought to have worsen the distribution structure after the crisis even more than before the crisis as shown in <Table 18>, 12.2% of these households occurred below II decile (low-income and modest-income class), 52.8% between III and VIII deciles, 35.1% in IX and X deciles. And further, figures for before the crisis as shown in <Table 19>, are 8.1%, 53.8%, and 38.2%, respectively.

The occurrence rate of households with substantial drop in log income after the crisis in the low-income and modest-income classes increased by 4%p after the crisis and the rest of the households at around

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<sup>13</sup> In 2000, mid-settlement of retirement payment was widely enforced. Hence, the number of employed may not decrease but, retirement payment can greatly increase.

<sup>14</sup> It is presumed that the majority of respondents for the survey is housewives hence, precise reflection on the change in financial income will be difficult.

**<Table 17> Income Source of Households with Income Gain In 1998-2000(more than 3.1 million won)**

(Unit: 1,000 Won. %)

	1998		2000		Income Difference (2000-1998)	Ratio of Income Difference		Increase Rate (2000-1998)
	Income Amount	Ratio	Income Amount	Ratio		Based on Total Income	Based on Income	
Total Income	4,103.7	100.0	13,453.6	100	9,349.9	100	-	227.8
Income	2,267.4	55.3	8,218.6	61.1	5,951.2	63.6	100.0	262.5
Current Income	2,175.5	53.0	3,525.0	26.2	1,349.5	14.4	22.7	62.0
Earned Income	2,077.2	50.6	3,127.0	23.2	1,049.8	11.2	17.6	50.5
Household Heads	1,835.3	44.7	2,739.9	20.4	904.5	9.7	15.2	49.3
Spouse	237.9	5.8	259.6	1.9	21.6	0.2	0.4	9.1
Other	3.9	0.1	127.5	0.9	123.6	1.3	2.1	3,146.4
Self-employed & Subsidiary Jobs	39.0	1.0	143.9	1.1	104.9	1.1	1.8	269.1
Property Income	29.8	0.7	16.4	0.1	-13.4	-0.1	-0.2	-45.1
Transfer Income	29.6	0.7	237.8	1.8	208.2	2.2	3.5	704.3
Non-current Income	91.9	2.2	4,693.6	34.9	4,601.7	49.2	77.3	5,007.0
Other Income	1,628.7	39.7	5,021.8	37.3	3,393.0	36.3	-	208.3
Transfer from Last Month	207.5	5.1	213.2	1.6	5.7	0.1	-	2.7
Number of Employed	1.3		1.5				-	
Ave. Age of Household Heads	37.7		39.7				-	

Note: Taking into consideration the ratio of households with income gain of above 3.1 million won during 1998-2000, which equaled 20 households. (1% of the total households).



<Table 18> 1998~2000 Distribution of Households with Considerable Drop in Log Income

	I	II	III	IV	V	VI	VII	VIII	IX	X
	6.1 <sup>1)</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	100.0 <sup>2)</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
II	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	9.9	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	86.4	13.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	2.6	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	48.1	51.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
V	2.5	3.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	33.9	50.8	15.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VI	0.3	3.2	3.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	4.1	42.8	48.5	4.6	0.0	0.0	0.0	0.0	0.0	0.0
VII	1.2	0.2	2.3	7.7	2.2	0.0	0.0	0.0	0.0	0.0
	8.6	1.8	16.7	56.8	16.1	0.0	0.0	0.0	0.0	0.0
VIII	1.3	0.0	0.2	2.6	2.4	1.1	0.0	0.0	0.0	0.0
	17.2	0.0	3.0	34.4	30.7	14.7	0.0	0.0	0.0	0.0
IX	0.7	1.0	1.1	2.0	2.6	3.5	2.0	0.0	0.0	0.0
	5.4	8.0	8.9	15.3	19.9	27.3	15.2	0.0	0.0	0.0
X	1.5	0.0	0.0	0.6	1.7	3.2	3.3	4.0	4.1	3.8
	6.7	0.0	0.0	2.7	7.9	14.5	14.8	18.0	18.3	17.3

Note: 211 households showed more than 0.24 drop in their log income in 1998~2000 (12.3% of total households).

1) The ratio based on 211 households.

2) The ratio based on the number of households belonging to each income decile in 1998 (raw percent).

(Unit: %)

**<Table 19> 1995~97 Distribution of Households with Considerable Drop in Log Income**

(Unit : %)

	1997	I	II	III	IV	V	VI	VII	VIII	IX	X
1995											
I		3.3 <sup>1)</sup> 100.0 <sup>2)</sup>	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
II		4.8 100.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
III		7.0 95.2	0.4 4.8	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
IV		6.7 78.3	1.9 21.8	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
V		1.4 14.3	6.0 59.8	2.6 25.9	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
VI		0.1 2.4	1.4 26.3	3.9 71.4	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
VII		2.1 21.5	2.2 22.8	2.4 24.4	3.1 31.4	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
VIII		0.4 3.0	1.4 11.2	2.2 17.6	3.5 27.8	3.9 30.5	1.3 9.9	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
IX		0.2 1.3	1.3 7.2	0.9 4.9	2.3 13.0	4.7 26.0	6.9 38.7	1.6 9.0	0.0 0.0	0.0 0.0	0.0 0.0
X		0.3 1.7	0.0 0.0	0.7 3.3	3.2 15.9	4.9 24.1	0.4 1.8	2.7 13.1	4.6 22.7	2.6 13.0	0.9 4.4

Note: 231 households showed more than 0.24 drop in their log income in 1995~1997 (12.3% of the total households).

1) The ratio based on 231 households.

2) The ratio based on the number of households belonging to each income decile in 1995 (raw percent).

**<Table 20> Analysis on the Degree of Income Mobility of Each Income Class**

(Unit: won)

Income Class	Period	Index		
		d <sup>(1)</sup>	g <sup>(1)</sup>	t <sup>(1)</sup>
Low Income (I, II Decile)	1995 ~ 1997	131,757,997 (100.0%)	106,254,711 (80.6%)	25,503,286 (19.4%)
	1997 ~ 2000	112,351,820 (100.0%)	92,771,642 (82.6%)	19,580,178 (17.4%)
Middle Income (III ~ VIII Decile)	1995 ~ 1997	503,801,459 (100.0%)	264,088,384 (52.4%)	239,713,076 (47.6%)
	1997 ~ 2000	554,617,078 (100.0%)	369,850,190 (66.7%)	184,766,888 (33.3%)
High Income (IX, X Decile)	1995 ~ 1997	298,396,030 (100.0%)	10,954,458 (3.7%)	287,441,572 (96.3%)
	1997 ~ 2000	391,984,046 (100.0%)	73,223,506 (18.7%)	318,760,540 (81.3%)

90% ratio. Hence, the static analysis presented in the introduction of this paper, which argues that the worsening distribution after the crisis mainly occurred in the low-income class cannot be supported.

<Table 20> analyzes various indices on income mobility according to each income class shown in Chapter .

First, using the equation (5) in Chapter 4, income mobility of each income class ( $d^{(i)}$ ) is separated into growth component and transfer component. Looking at the income mobility of low-income class before the crisis, 81% was due to the growth component and 19% due to the transfer component and after the crisis 83% due to the growth component and 17% due to the transfer component.

Accordingly, the income gain of low-income class after the crisis due to the economic growth component showed slightly higher absolute value compared to before the crisis but the ratio was relatively high. Again it would be unjustifiable to state that the growth component ratio of low-income class was greater than the growth component ratio of middle and high-income classes hence, the worsening income distribution concentrated in the low-income class after the crisis.

## **2-b. Analysis on characteristics of households with log income loss by income type**

<Table 21> and <Table 22> analyzed households with considerable loss in log income by their household type for 3 years before and after the crisis.

Here, as indicated in the previous pages, a temporary cause such as a decrease in non-current income (reduction in retirement payment) after the crisis and decrease in the number of employed persons are seen both before and after the crisis.<sup>15</sup>

## **2-c. Characteristic analysis on households with log income gain after the crisis**

The characteristics of households with log income gain after the crisis do not show any particular difference from the households with absolute income gain therefore it is omitted.

## **3. Conclusion of Chapter V**

As pointed out in this paper, the causes that worsened the extent of income inequality after the crisis for both periods are the decrease in

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<sup>15</sup> The basis for 0.24 log income in <Table 21> and <Table 22>, is the log income value taken at the intersecting point of two graphs in [Figure 2].

<Table 21> 1995~1997 Income Source of Households with Log Income Loss (above 0.24)

(Unit: 1,000 won, %)

	1995		1997		Income Difference (97~95)	Ratio of Income Difference	
	Income Amount	Ratio	Income Amount	Ratio		Based on Total Income	Based on Income
Total Income	3,465.9	100.0	2,656.8	100.0	-809.1	100.0	-
Income	2,281.0	65.8	1,401.9	52.8	-879.0	108.6	100.0
Current Income	2,093.9	60.4	1,313.0	49.4	-780.9	96.5	88.8
Earned Income	1,862.3	53.7	1,188.6	44.7	-673.7	83.3	76.6
Household Heads	1,238.1	35.7	984.6	37.1	-253.5	31.3	28.8
Spouse	243.6	7.0	89.0	3.4	-154.6	19.1	17.6
Others	380.6	11.0	114.9	4.3	-265.6	32.8	30.2
Self-employed & Subsidiary jobs	94.2	2.7	38.6	1.5	-55.5	6.9	6.3
Property Income	45.1	1.3	34.5	1.3	-10.5	1.3	1.2
Transfer Income	92.4	2.7	51.3	1.9	-41.1	5.1	4.7
Non-current Income	187.1	5.4	88.9	3.3	-98.1	12.1	11.2
Other Income	877.4	25.3	1,000.8	37.7	123.3	-15.2	-
Transfer from Last Month	307.5	8.9	254.1	9.6	-53.4	6.6	-
Number of Employed		1.9		1.4			
Ave. Age of Household Heads		41.7		42.2			

<Table 22> 1998~2000 Income Source of Households with Log Income Loss (above 0.24)

(Unit: 1,000 won, %)

	1998		2000		Income Difference (2000-98)	Ratio of Income Difference	
	Income Amount	Ratio	Income Amount	Ratio		Based on Total Income	Based on Income
Total Income	3,637.0	100.0	2,745.1	100.0	-891.9	100.0	-
Income	2,179.7	59.9	1,261.4	46.0	-918.3	103.0	100.0
Current Income	1,841.8	50.6	1,195.7	43.6	-646.0	72.4	70.4
Earned Income	1,630.4	44.8	992.4	36.2	-638.0	71.5	69.5
Household Heads	1,151.0	31.6	847.1	30.9	-303.9	34.1	33.1
Spouse	190.6	5.2	63.8	2.3	-126.8	14.2	13.8
Others	288.7	7.9	81.4	3.0	-207.3	23.2	22.6
Self-employed & Subsidiary Jobs	73.7	2.0	55.4	2.0	-18.3	2.0	2.0
Property Income	72.5	2.0	68.8	2.5	-3.7	0.4	0.4
Transfer Income	65.2	1.8	79.1	2.9	14.0	-1.6	-1.5
Non-current Income	337.9	9.3	65.7	2.4	-272.2	30.5	29.6
Other Income	1,213.3	33.4	1,286.3	46.9	73.0	-8.2	-
Transfer from Last Month	244.0	6.7	197.3	7.2	-46.7	5.2	-
Number of Employed	1.8		1.4				
Ave. Age of Household Heads	44.3		45.2				

absolute income and log income. In this section, the previous findings on households with considerable decline in absolute and log incomes are re-examined.

Reasons that income distribution structure worsened after the crisis compared to the period before the crisis are first, reduction in non-current income (mainly a decrease in retirement payment) among households with income loss, second, reduction in earned income led by reduction in the number of employed persons among households with income loss, and third, although not proven, increase in financial income due to an increase in non-current income (again mainly retirement payment) among households with income gain.

The first reason is believed to be a temporary factor resulting from a massive restructuring process during the financial crisis and will not leave lasting effect on the distribution structure in the future however, the third reason, the increased financial income due to development in the IT industry and its structural factors will surely continue to play an antagonizing role on the worsening income distribution in the future.<sup>16</sup>

Furthermore, the asymmetric characteristic shown by both increase and decrease in income mobility due to an increase in the number of employed persons is common. In the case of households with considerable income loss after the crisis, the decrease in the number of employed persons per household is an influential factor however, for the households with considerable income gain, the increase in the number of employed persons per household does not affect the outcome.

## **VI. Tasks to Improve Income Distribution**

### **1. Constructing a statistical data basis to accurately determine income inequality**

As explained in the beginning of this paper, the research aim of this study was to analyze the cause of fluctuating income distribution and worsening income inequality after the crisis focusing on the earned incomes of urban worker households. Hence, incomes of wage-earning households in non-urban regions, self-employed, and no-occupation households are not included in this research.

Moreover, keep in mind that the analyses on the trends and distribution structure is conducted under certain limitations and in order to draw more in-depth analyses and policy measures more thorough analysis on income related statistics other than urban household report is urgently needed. Although it is believed that the expanded number

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<sup>16</sup> Indicated as Digital Divide

of membership to the four major social insurances and the extension of social safety net following the Minimum Living Standard Act of October 2000 have made an positive impact on the parts of distribution structure however, it is unfortunate that with the existing analyses it is not possible to validate the effects of income redistribution policy.

In particular, immediately after the crisis, the income loss experienced by the unemployed households following a sharp increase in the unemployment rate most likely have greatly affected the income distribution structure but as mentioned in Chapter , when the incomes of these households are set at zero in the analysis due to data unavailability, the problem of overestimating the extent of income inequality may occur while leaving them out would lead to underestimation. At the current stage, there are no other appropriate methods to handle this situation hence the method used by KNSO in which these households are excluded from the analysis of income inequality is used. Due to this discrepancy, it is possible that the extent of worsening income inequality after the crisis is somewhat underestimated. It will be an extra effort on KNSO's part however, if the income levels excluding the earned income of no-occupation or unemployed households are surveyed and published then this will be a crucial data in formulating the future policy measures as well as understanding the trends of income distribution.

Meanwhile, although the property income and financial income are included in the statistics of urban worker household data but there is a high possibility that the respondents will under-report these incomes. Therefore, the distribution structure changes reflected by either property or financial income are not reliable. Lee & Lee (2001) using the Daewoo Panel data, which closely examines both property and financial incomes showed that the Gini Coefficient before the crisis (1997) was 0.363 and immediately after the crisis (1998) was 0.396. Lee & Lee showed notably increased inequality in household income after the crisis in their report.<sup>17</sup>

Looking at these facts, if property or financial incomes are correctly estimated the current situation may be worse than the results shown by the existing data on income inequality after the crisis. In Chapter , this same problem was identified as one of the causes of worsening distribution structure.

No one will deny that fully understanding not only the earned income but also the property and financial incomes will be the most prioritized task in improving distribution structure. Unless the actual conditions are understood in all respects any efforts to improve distribution structure and establish policy measures will be illogical. Also, it is a serious problem when solution measures that have been recom-

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<sup>17</sup> Dawoo Panel data was discontinued after 1999 and hence additional analysis was impossible.



mended over several decades are not effective.

In order to thoroughly investigate income, it must be connected to the tax system hence compiling materials centered on the National Tax Service (NTS) and publishing them is a must. It goes same for the problems concerning the self-employed households. Problems with health insurance fee collection and the assertion that salaried households are disadvantaged in the National Pension system all arise due to the fact that incomes of self-employed households are not fully investigated first. NTS should first consolidate materials from national pension or national health insurance and use this information as the foundation for collecting tax and insurance premiums. Then publish this information making sure that no personal information will be exposed. For those against publicizing the information though anonymity is guaranteed appropriate measures must be taken under the Freedom of Information Act.

Keep in mind that without a firm foundation of distribution data introducing measures to improve distribution structure is like building a castle on the sand.

Accordingly, in order to compile statistics relating to distribution, conduct cause analysis, and establish solution measures for the distribution problems, operating so called 'Income Statistics Improvement Committee' composed of experts on income distribution affiliated with the 「Committee of Economic and Social Affairs」 at all times is essential.

## **2. Thesis on distribution philosophy**

There are two basic types of policy framework concerning distribution structure in other countries, the Northern European framework, and the UK and US framework. Under the Northern European type, the prime objective of the policies is to reduce the income gap because under their income inequality perspective, the worsening income distribution structure will damage social cohesion. Completely opposite from the former, under the UK and US framework, problems relating to absolute poverty are mainly administered by the government and the rest is left up to the due course of market competition.

The underlying basis for both of these policy frameworks originate from the past experience in wholly understanding the nature of distribution policy to make trade-off between growth or distribution, choosing one or the other.

Currently, our interest lies with improving the income distribution by finding a mutual solution between redistribution and continuing stable growth. Citing Yoo (1999), the following are the evaluation on the above opinion.

The argument stating 'redistribution policy reduces growth,' is a basis for Kaldor's theory. The precondition for growth is high savings rate and in general, the high-income class has the high marginal propensity to save hence, the theory that argues redistribution policy will reduce savings and to the end reduce growth and distort economic incentives are based on this traditional theory. But, the spreading theory on growth and distribution eliminates the mutual relationship between capital market failure and income distribution. For example, the aspect that the low-income class lacks collateral to secure loans in the capital market losing opportunities to invest in human capital and lead to growth reduction will be eliminated. According to this theory, if the capital market fails there is a possibility that income redistribution policy will stimulate growth through human capital accumulation of the low-income class. Moreover, redistribution policy through tax and transfer system may hamper accumulation of human capital throughout the whole society however it may help formation of human capital in the low-income class therefore it is difficult to identify uniformed net effect on growth. Moreover, under an extreme condition of distribution structure, limited redistribution policy, and capital market failure, a redistribution policy through tax and transfer system is judged to stimulate growth. Furthermore, instead of using indirect channels to help formation of human capital accumulation in low-income class, by selecting specific groups within the low-income class to give direct assistance such as education subsidy, financing education, etc. will stimulate growth through redistribution policy.

This indicates that distribution should be considered after growth. When distribution is first considered, this will be accompanied by both uncertainties and reduction in 'incentive to work' for the specific groups. Hence the problem of absolute poverty should be dealt on a minimum level while through activating market competition protect workers and assert limited government intervention in case of market failure. However, there are numerous distribution philosophies and policy directions other than the ones mentioned in this paper hence further research into this area is necessary.

The above-mentioned views share mutual connection with theory presented below, which states that creation of jobs and distribution have inverse relationship.

### **3. Creation of jobs**

When considering the facts such as the data used above underestimates the worsening effect of income distribution due to exclusion of no-occupation and unemployed households, and the decrease in number of employed persons per household are the major causes of worsen-

ing distribution structure, it is clear that increasing employment should take precedence in order to improve distribution structure in the future. This is in accordance with the findings of Yoo (1999). Having based on the following theory, his study indicates that the start of distribution structure improvement is expansion of employment.

According to Yoo (1999), in the case of advanced countries, the reduction of unemployment through restructuring of labor market and the worsening income distribution have positive correlation. In addition, though weak, the increase in employment and the worsening income distribution also have positive correlation (OECD [1996]). Although restructuring the overall labor market may worsen the income distribution, depending on the relative relationship between the employment effect, which improves the extent of inequality by having jobs, and the income effect, which worsens the extent of inequality as income gap expands the direction of income distribution may change. This emphasizes that the extent of income inequality varies depending on the subject under consideration.

By using <Table 23> derived from OECD (1996) research, the extent of income inequality was measured using full-time workers. The U.S. showed higher extent of inequality among full-time workers compared to the European countries however when considering the purchasing power parity, the average income level of low-income class was much higher in the U.S. than the European countries except for the Netherlands. What is more, the extent of inequality in working age population of the U.S. is much lower than the European countries hence, it can be said that the employment effect exceeds the income effect when considering income inequality. Moreover, providing jobs is the most important alleviating factor for the degree of inequality among low-income class hence, there is a possibility that trade-off between the extent of income inequality and increase in employment may not occur.

Accordingly, in order to improve the distribution structure in the future through a continuous economic growth cultivate job absorption and at the same time introduce various systems to advocate incentives to work rather than offering welfare measures that give free support.<sup>18</sup>

#### **4. Supplementing the Minimum Living Standard Law**

The current Minimum Living Standard Act, which was established to protect the low-income class, is an appropriate system in terms of protecting the livelihood of income classes under absolute poverty level. As previously mentioned, the income redistribution policy (expanding membership to the 4 major social insurances, executing the Minimum

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<sup>18</sup> Detailed methodology on creating jobs is dealt in Yoo (2000).

<Table 23> Comparative Study on Individual and Household Labor Income: Country and Period

	1980 (MLD Level)	1990 (MLD Level)	Change Rate (1980-90)	1990 Rating
<b>Individual Income (annual): Full-time Workers</b>				
US (1979~1991)	0.14	0.17	+17.6	1
Germany (1984~1992)	0.15	0.12	-18.1	3
Canada (1981~1991)	0.15	0.16	+5.9	2
Netherlands (1983~1991)	-	0.09	-	5
Sweden (1981~1992)	0.08	0.11	+34.9	4
<b>Individual Income: All workers</b>				
US (1979~1991)	0.47	0.47	-1.0	1
Germany (1984~1991)	0.27	0.27	-1.8	3
Canada (1981~1991)	0.45	0.46	+2.1	2
Netherlands (1983~1991)	0.16	0.25	+62.1	4
Sweden (1981~1992)	0.16	0.22	+38.5	5
<b>Individual Income: Working Age Population</b>				
US (1979~1991)	1.41	1.25	-11.0	3
Germany (1984~1991)	1.50	1.38	-8.1	2
Canada (1981~1991)	1.26	1.19	+5.5	4
Netherlands (1983~1991)	2.15	1.67	-22.1	1
Sweden (1981~1992)	0.61	0.77	+27.5	5
<b>Household Income: Working Age Population</b>				
US (1979~1991)	0.59	0.66	+13.3	3
Canada (1981~1991)	0.88	0.68	-22.8	2
Netherlands (1983~1991)	1.21	0.97	-19.8	1
Sweden (1981~1992)	0.35	0.54	+54.8	4

Note: MLD (mean log deviation) index denotes the difference between log income and average log income. Compared to Gini Coefficient and other indices, income distribution of low-income class is carefully reflected.  
Source: OECD (1996), [quoted from Yoo (1999)]

Living Standard Act, etc.) of the government after the crisis is presumed to have provided positive influence on the changing distribution structure. However, the effectiveness of government policies is not being measured due to data unavailability. Therefore, in depth discussions on the extent of direction of income redistribution policy is not being established.

As with all policies, there is a critical need for improvement on problems that arise before and after the implementation of a policy.

The two problems that were pointed out before initiating the Minimum Living Standard Act was one, insufficient information on incomes of the low-income class can lead to the possibility of excluding or including wrong households and second, the decline in 'incentive to work' for recipients and income-class immediately above the beneficiary class due to government subsidies that are given out according to the difference (minimum living expense minus personal income).

It is believed these two problems still exist at the enforcement stage. Although a great manpower (experts on social welfare) was added to gather information so that an accurate determination can be made on the incomes of low-income class but, due to various circumstances there are still numbers of households that should be included as recipients<sup>19</sup> and problems with unjust payments occur frequently. It is estimated that these problems will gradually be solved however, without a thorough understanding of the incomes of low-income class there will be limitations.

Second, the problems with advocating 'incentive to work' should be more seriously and cautiously dealt with. The Minimum Living Standard Act was put in place in order to counter the rapidly growing unemployment rate and to protect the livelihood of the low-income class. The primary goal of this Law is to provide support to those households earning less than absolute income, regardless of household head's ability to work or age. Accordingly, although a household may have earned income if it earns less than the minimum cost of living the government provides the difference. If earned income increases in a household the government subsidy (benefit amount) will decrease correspondingly to the household income, additionally reducing 'incentive to work.' This will work to reduce the market participation by unemployed as well as their spouses inducing so called 'poverty trap' among the low-income class. As such, measures that exempt portions of earned income and other incomes from the fixed income amount is incorporated into this Law. But, the scope of this measure is small and this will not go into effect until 2002, hence at this point, it is not in ef-

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<sup>19</sup> Households listed as having dependent family but have a run-a-way or missing family members; or low-income person with high financial income but in reality someone else has borrowed his/her identity.

fect. In other countries, such measures generally led to 'welfare trap' hence they were either discontinued or converted to new income deduction measures that advocated 'incentive to work.'<sup>20</sup>

In order to promote 'incentive to work,' limit benefit period or set a specific time limit to receive government subsidy and then after cutback on the subsidy amount for those households with ability to work. In addition, the income deduction system must be put in place by 2002, and the deduction rate must be adjusted upward from the current 10~15%, since this rate is insufficient.

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<sup>20</sup> AFDC or TANF of the U.S. are two most representative cases.

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## Appendix

### Annual 10 Income Deciles on Average Monthly Income of Households(Applied quarterly Consumer Price Index (95=100))

#### 1) Total Data based on Households

(Unit: 1,000 won)

	1995	1996	1997	1998	1999	2000
I	664.7	713.1	723.1	542.9	551.3	601.0
II	1,014.8	1,064.0	1,081.0	847.4	848.4	900.3
III	1,221.0	1,278.2	1,321.2	1,035.4	1,057.4	1,108.3
IV	1,401.4	1,473.9	1,525.9	1,213.9	1,253.0	1,296.9
V	1,583.5	1,672.8	1,721.1	1,396.8	1,427.7	1,484.0
VI	1,766.6	1,888.3	1,933.2	1,597.7	1,638.8	1,708.6
VII	1,992.4	2,139.8	2,192.1	1,813.6	1,873.1	1,948.7
VIII	2,247.9	2,444.6	2,502.8	2,095.5	2,185.7	2,268.7
IX	2,650.4	2,862.1	2,926.5	2,523.4	2,597.8	2,757.9
X	3,799.2	4,082.3	4,004.9	3,732.2	3,830.7	4,225.1

#### 2) KDI Income Panel (Using income decile of Total Data based on Household Standard)

(Unit: 1,000 won)

	1995	1996	1997	1998	1999	2000
I	681.7	725.4	741.4	573.1	571.3	609.4
II	1,011.7	1,067.7	1,082.5	852.6	839.6	907.2
III	1,217.7	1,281.5	1,321.8	1,033.0	1,062.8	1,110.0
IV	1,399.5	1,481.4	1,527.5	1,214.7	1,255.8	1,298.2
V	1,587.2	1,676.6	1,720.7	1,396.2	1,427.0	1,484.9
VI	1,764.5	1,891.1	1,933.8	1,594.2	1,636.5	1,710.8
VII	1,988.7	2,146.9	2,187.3	1,815.1	1,873.5	1,951.4
VIII	2,258.4	2,447.5	2,504.3	2,089.6	2,183.3	2,267.3
IX	2,647.2	2,872.9	2,934.2	2,509.8	2,610.6	2,755.1
X	3,726.6	4,007.5	3,974.0	3,694.2	3,736.5	4,242.6

### 3) KDI Income Panel (After composition re-tiered as 10 Income Deciles)

(UNit: 1,000won)

	1995	1996	1997	1998	1999	2000
I	727.4	796.3	784.5	601.0	634.1	647.6
II	1,091.3	1,163.9	1,157.7	897.2	952.3	1,009.9
III	1,288.4	1,388.7	1,424.3	1,084.7	1,171.3	1,239.4
IV	1,487.0	1,596.1	1,644.1	1,290.0	1,360.0	1,439.3
V	1,683.7	1,811.7	1,858.7	1,478.3	1,561.4	1,664.2
VI	1,878.2	2,046.9	2,083.3	1,675.9	1,777.5	1,892.6
VII	2,106.2	2,300.5	2,352.8	1,886.0	2,028.1	2,162.1
VIII	2,381.4	2,587.2	2,662.6	2,160.7	2,311.1	2,491.1
IX	2,789.9	2,994.9	3,130.4	2,574.5	2,708.9	3,002.6
X	3,863.9	4,127.2	4,182.8	3,752.7	3,834.0	4,595.8