

**ECONOMIC CRISIS AND INCOME
INEQUALITY IN KOREA**

by

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Abstract

Using quarterly data for urban worker-households in Korea, I investigate trends in income and consumption inequality since the eruption of the recent economic crisis. I find evidence of sharply increasing income inequality while consumption inequality does not show any apparent trend. There is also evidence that severe deterioration in between-(income-decile)group inequality has more than offset minor improvement in within-group inequality, resulting in deterioration of overall income inequality. It is, therefore, believed that the worker households in Korea are undergoing a distinct process of income stratification parallel with the concentration of income after the economic crisis.

Keywords: Income inequality, the Gini coefficient and Income distribution in Korea

JEL Codes: D31, D63 and O15.

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I. Introduction

Korea has been experiencing dramatic socio-economic changes since the onset of the recent economic crisis, and income inequality has quickly erupted as a major policy concern in the country. It is often asked whether the burden of the economic crisis is being shared in a fair way, and what will be the immediate and long-run effect on income distribution. Proper answers to these questions will not only provide better understanding of the socio-economic consequences of the crisis but also introduce guidelines for effectively directing relevant policies. Nevertheless, while the literature on the Korean economy is rapidly expanding, there are few studies focusing on the distributional aspect of the crisis.¹ There are, though, a few studies that deal with social impacts of the crisis, such as Kim (1999), Lee and Rhee (1998) and Moon, Lee and Yoo (1999); however, they discuss the effect on income distribution only briefly and lack formal analysis of trends in income inequality. Motivated by this observation, I intend to closely investigate the recent trend in income inequality in Korea and thereby suggest answers to the questions above and provide a useful road map for interested scholars and policy-makers.

Employing new methods of measuring and decomposing inequality and quarterly data on income and consumption expenditure of the urban worker-households in Korea, I find that income inequality has sharply worsened after the crisis while consumption inequality does not show any apparent trend. Interestingly, the results from decomposition analysis on income decile groups suggest that severe deterioration in between-group inequality has outweighed minor improvement in within-group inequality, resulting in deterioration of overall income inequality. Therefore, the worker households in Korea seem to be undergoing a distinct process of income stratification parallel with the concentration of income.

¹ See “Symposium on the Korean Financial Crisis” in the Winter 1998 issue of the *Journal of Asian Economics* (edited by Dutta and Kwack) for various treatments of other aspects of the economic crisis.

This paper is organized as follows. The next two sections discuss, respectively, the data and methodology used in this paper. Section IV summarizes the empirical findings and their implications, and the concluding comments are shared in the last section.

II. Data

Reliable data are an absolute prerequisite for a successful income study and, in a sense, an income study is only as reliable as the data used. I use the income and expenditure data from the Urban Household Income and Expenditure Survey (UHIES). The survey is conducted monthly by the National Statistical Office (NSO) in Korea, but only quarterly data are available publicly. Although the UHIES covers only urban households, there are no better data available for a nationwide income study in terms of survey frequency and reliability. As a matter of fact, the UHIES data have been used in many previous income studies, such as Ahn (1995), Cheong (1986) and Whang and Lee (1996).

The UHIES covers about five thousand representative households living in the seventy-two cities in Korea, excluding farmers' and fishermen's households and single person households. Presumably, it is the urban households that have been mostly affected by recent socio-economic changes and, therefore, using the UHIES data seems not problematic given the aim of this study. A serious problem lies in the fact that the UHIES collects income data only from worker households but not from self-employed and employer households. One immediate solution to this problem would be generating income data for the excluded households using the consumption function estimated from the worker households under the assumption that workers and non-worker households have identical consumption propensities, as done in several previous studies such as Whang and Lee (1996). However, estimation of the consumption function has its own difficulties and, moreover, there have been no studies empirically verifying such an assumption. For this reason, I focus on the data for worker households in this study, which implies the monthly sample size reduces

to about three thousand households. The data set compiled for this study covers thirteen quarters from the first of 1996 to the first of 1999.

III. Methodological Issues

1. Unit of Analysis

Unlike previous studies, I chose the distribution of disposable income instead of gross income since the former is believed to better approximate household welfare. I also used the distribution of consumption expenditure, which is preferred by many researchers to income distribution as a better proxy for household welfare.

As a measure of economic welfare, I also compute equivalent household income, which is household disposable income adjusted for household size using an equivalence scale (Υ) defined as

$$\Upsilon = (A + \alpha K)^\beta,$$

where A and K are, respectively, the numbers of adults and children in the household and α and β are parameters. The parameter α is the weight assigned to children, and it implements the idea that children do not require as much as adults. Setting α equal to zero means totally ignoring the presence of children and setting at one means children and adults are equally treated. The parameter β denotes economies of scale within the household, implementing the idea that a household's resource needs are less than proportional to the household size. Following Williams, Weiner and Sammartino (1998), I set both α and β equal to 0.5.²

2. Measure of Inequality

I measure the degree of inequality using a variation of the Gini coefficient. The Gini coefficient satisfies several desirable properties for an inequality measure: the Pigou-Dalton

² See, for example, Kakwani and Lambert (1998) as a study using equivalent income with different parameter values for α and β .

transfer principle, Dalton’s population principle and constant relative inequality aversion, and has been “generally accepted to be the best single measure of inequality.”³ In spite of its popularity, the Gini coefficient has few intuitive meanings. It has been interpreted as the degree of relative deprivation,⁴ the covariance between a household’s income and its income rank,⁵ and the weighted average of differences between a household’s importance as a member of a society and its importance as an income-receiving unit.⁶ Recently, Cheong (1999a) proved that the Gini coefficient is a linear transformation of the center of gravity of income distribution, that is, the relative income rank of the household on which the income distribution is centered. The exact relationship between the Gini coefficient (G) and the center of gravity (CoG) is given by

$$CoG = \frac{1}{2}(1 + G),$$

which shows that CoG ranges from 0.5 and 1 as G ranges from 0 to 1. For example, CoG being 0.67 (or equivalently, G being 0.34) means that the distribution of income is centered on the sixty seventh poorest household of the percentile. Thus, an increase in the Gini coefficient implies that the center of gravity of the income distribution has moved farther away from the middle-ranked household, so that we can conclude that income inequality has increased. The formula for the center of gravity of an ordered income distribution (with i denoting income ranks of households) is as simple as the following:

$$CoG = \sum_{i=1}^N \frac{i}{N} \frac{y_i}{Y},$$

where y_i denote the income of the i -th poorest household, N the total population, Y the total income (such that $Y = \sum_{i=1}^N y_i$). Due to its computational simplicity, I computed the center of gravity first and then derive the Gini coefficient from it.

³ Quoted from Thomas (1994), p.73.

⁴ See, for example, Yitzhaki (1979), Hey and Lambert (1980) and Berrebi and Silber (1985).

⁵ See, for example, Lerman and Yitzhaki (1984) and Shalit (1985).

⁶ See Milanovic (1994).

The Gini coefficient and center of gravity are also computed from the estimated Lorenz curves. Although the Lorenz curve can be directly constructed from income data, parametric estimation of the Lorenz curve remains useful and worthwhile in income studies ⁷ and many researchers have proposed functional forms for such estimation. In this study, I estimated the Lorenz curve using two functional forms: one proposed by Kakwani (1980) and the other proposed by Rasche, Gaffney, Koo and Obst (1980) (*RGKO*). These two forms are known to perform well in terms of the goodness of fit and the estimated income shares. ⁸ Their functional forms and corresponding formulae for the Gini coefficient are as follows:

$$Kakwani : p - L(p) = ap^\alpha(1 - p)^\beta,$$

where $a, \alpha, \beta > 0$, and $G = 2a B(\alpha + 1, \beta + 1)$, where B is the beta function.

$$RGKO : L(p) = \{1 - (1 - p)^\alpha\}^{\frac{1}{\beta}}$$

where $0 < \alpha, \beta \leq 1$, and $G = 1 - \frac{2}{\alpha} B(\frac{1}{\alpha}, \frac{1}{\beta} + 1)$.

In estimation, I first constructed percentile income data from the raw data by grouping all households into 100 income groups, so that each income group represents one percent of the sample population. This method not only allows for sufficiently many data points for proper estimation of the Lorenz curve but also generates fixed and equally spaced data points. ⁹

3. Decomposition of Inequality Changes

An additional advantage of using the center of gravity is that it allows for a useful decomposition of inequality changes into two parts: one due to within-group inequality

⁷ See, for example, chapter 4 in Ryu and Slottje (1998) for discussion of this point.

⁸ See, for example, Cheong (1999b) for a comparative investigation of existing functional forms.

⁹ In comparison, the Gini coefficient reported by National Statistical Office is computed on the basis of decile groups.

and the other due to between-group inequality.¹⁰ Suppose that an income distribution is partitioned into income groups (or strata) with equal group sizes, such as income deciles. The center of gravity can be computed for each group by re-ranking the households in the group, ignoring the income rank assigned in the total population.¹¹ Denoting the center of gravity within the j -th (poorest) group by CoG_j , the number of income groups by K , the total income within group j by Y_j , one can easily show that

$$CoG = \sum_{j=1}^K \frac{1}{K} \frac{Y_j}{Y} CoG_j + \sum_{j=1}^K \frac{j}{K} \frac{Y_j}{Y} - \frac{1}{K}.$$

The first term is weighted sum of COG_j 's with the weight for each group being the product of the group's population share ($\frac{1}{K}$) and income share ($\frac{Y_j}{Y}$), and it measures the contribution of within-group inequality to overall income inequality. The second term is simply the center of gravity of the distribution of group income, (Y_1, Y_2, \dots, Y_K) ; that is, it captures the contribution of the between-group inequality to overall income inequality. The last term is constant, depending upon only the number of income groups. Therefore, as long as the same number of income groups is maintained, one can precisely traced what fraction of inequality changes are attributed to inequality within groups or inequality between groups. I computed the percentage contribution of the between-group components from decile groups.

¹⁰ The Gini coefficient can be decomposed too since it is merely a linear transformation of the center of gravity; however, the direct decomposition of the Gini coefficient is more complicated. See, for example, Lambert and Aronson (1993), Sastry and Kelkar (1994) and Wodon (1999), for different ways of decomposing the Gini coefficient.

¹¹ For example, the poorest household in each group is assigned the income rank 1 no matter which income group it belongs to.

IV. Results

1. Household Characteristics

It does not seem that the household structure has been noticeably affected by the economic crisis. Table 1 shows that the number of household members remained almost constant from the third quarter of 1997 until the first quarter of 1999, and I obtained basically the same result from the household size in equivalence scale.

However, it is suggested that households with old heads have suffered relatively severer income reduction. Table 2 presents the average ages of household heads in each income decile, and it is clear from the table that the average age of the poorest decile group increased between the third quarter of 1997 and the third quarter of 1998 while the average age of each of the other decile groups had decreased during the same period. Although some say that the old people have suffered less or have even gained from the appreciation of their financial assets during the crisis period, the numbers in Table 2 show that it is not true, at least for workers.

2. Income and Consumption Expenditure

Interestingly enough, income and consumption expenditure have been affected differently by the economic crisis. Tables 3 and 4 present, respectively, the average income and consumption expenditure for income decile groups, and it is easily seen in the tables that more than half of the income decile groups had recovered their pre-crisis (nominal) consumption level (that is, the consumption level in the third quarter of 1997) by the first quarter of 1999 while only the richest group had recovered its pre-crisis (nominal) income level. The tables also show that middle-income groups (the fourth to seventh decile groups) reduced their consumption most severely in percentage terms while the percentage reductions in income were negatively correlated with group income levels. In addition, it is found from the tables that the richest households (the top decile) became about 10.3

times as rich as the poorest households (the bottom decile) in the first quarter of 1999 while they were about 6.7 times as rich before the crisis; whereas the richest spent only about 3.5 times as much as the poorest both before the crisis and in the first quarter of 1999. These findings seem to substantiate what many people in Korea are saying, “the economic crisis is over — many people now spend as much as before; but income gaps have widened.” Figures 1 and 2 are the diagrammatic presentations of Tables 3 and 4, respectively.

The tendency of income inequality deterioration and income concentration hinted by Table 3 becomes evident in Table 5, which presents the relative income shares of decile income groups. The table shows that, in the third quarter of 1998, the top three decile groups saw their income shares higher than the pre-crisis shares but only the richest group continued to see the same phenomenon through the first quarter of 1999. Furthermore, the increase in the richest group’s share was as high as 3.5% in the third quarter of 1998 while the second highest increase was as low as 0.26% in the same period. In the first quarter of 1999, the increase in the richest group’s income share was even as high as 6.14%. In this sense, the numbers in Table 5 indicate the rapid increase in income concentration, which is clearly illustrated in the accompanying chart, Figure 3.

In contrast, the concentration trend is not obvious with consumption expenditure. The percentage consumption shares of income decile groups are presented in Table 6 and Figure 4. In general, the consumption shares of upper-income groups were over their pre-crisis shares both in the third quarter of 1998 and the first quarter of 1999, and the extent of their increases were relatively small. It is, however, notable that the consumption shares of the second and third richest income groups continued to increase in 1999 while their income shares took a turn downward.

Another interesting observation made from Tables 5 and 6 is that the distributions of income shares and consumption shares are remarkably different. The tables show that

lower-income groups consume more than proportionally to their income shares while the opposite is true for upper-income groups and thus the between-group income inequality is somewhat mitigated at the welfare level.

3. Inequality Trend and Decomposition

It was not at all surprising to find out that income inequality has sharply increased as a result of the economic crisis, and the obtained results are seamlessly consistent with each other. First, Table 7 presents the center of gravity scaled by 1000,¹² and it is clear in the table that the *CoG* for the first quarter of 1999 is higher than that for any quarter of 1998, which is in turn higher than that of any previous quarters, no matter whether it is computed directly from income or equivalence income, and whether indirectly from the Lorenz curve estimated using Kakwani's form or the RGKO form. The table also shows the center of gravity derived from the gross-income Gini coefficient computed by Moon, Lee and Yoo (1999), and the annual Gini coefficient officially reported by the National Statistical Office. All corresponding Gini coefficients are presented in Table 8 and Figure 5.

One could have better idea about the distributional impact of the economic crisis if the inequality trend without the crisis were known. Unfortunately, there seems to be no existing studies of income trends in Korea for recent years.¹³ The only clue at present is the Gini coefficient and the center of gravity for the four quarters of 1996 presented in Tables 7 and 8. However, those numbers do not reveal any clear tendency and, moreover, Figure 5 suggests that inequality trends might include cyclical factors. Therefore, it seems

¹² For example, the *CoG* for income being 647 in the first quarter of 1996 implies that income distribution in that quarter centered on the 647th poorest household.

¹³ The literature provides the estimates of the Gini coefficient up to 1994. Although the debate on the trend in income inequality during 1980's is not resolved yet, there seems to be a general consensus that income inequality had been improving in the early 1990's. See, for example, Ahn (1995) and Whang and Lee (1996).

only fair to say that the exact extent to which the economic crisis has affected income inequality cannot be concluded in this study.

Yet the result from decomposition analysis is revealing. Table 9 presents changes in the between-group components ($CoG(K)$) of the center of gravity both in absolute and relative terms. First, the table shows that CoG and $CoG(K)$ move in the same direction for all quarters, implying that an increase (decrease) in overall income inequality always accompanies an increase (decrease) in between-group income inequality. The table also shows that that is not necessarily true for the within-group component of overall inequality. For example, the increase in $CoG(K)$ exceeds the increase in CoG between the first and second quarters of 1998, which means that there was a decrease in within-group inequality. In fact, such *overshooting* of between-group inequality almost forms a pattern after the onset of the crisis as it is found for four quarters out of a total of six quarters. The average contribution of between-group inequality during the six quarters is about 122% of the changes in overall inequality. Therefore, it is believed that severe deterioration in between-group inequality has more than offset minor improvement in within-group inequality, resulting in deterioration of overall income inequality. In other words, the results strongly suggest that the worker households in Korea are undergoing a distinct process of income stratification parallel with the concentration of income.

V. Concluding Remarks

Although anecdotal evidence suggests that income distribution in Korea has worsened since the onset of the recent economic crisis, there have been no serious studies on the distributional impact of the crisis. Employing high frequency data and newest techniques, this study rigorously investigates such impact and finds that income distribution has not only deteriorated but is also being stratified.

This study has two major limitations, which immediately call for future research

projects. One is the task of extending income data to include non-worker households. This has to draw on the comparative studies on consumption behavior of worker and non-worker households. The other is the task of estimating the baseline trends in income distribution for 1990s. This can be only done once the first task is completed; but simply extending the data periods in this study seems meaningful solution in the short run.

No one seems to have clear vision of how the income trends in Korea will be affected eventually. It could be the beginning of another inverted U-curve or a jump onto a new plateau. Despite this uncertainty, income studies have not drawn much attention from previous researchers. One might say it is due to the lack of widely acceptable, yet manageable, definition of equity or due to the limited availability of reliable data. However, income inequality is an aspect of economic system as important as efficiency or growth, and we should not turn a blind eye to it. After all, we are often more concerned about how the pie is cut than how big it is.

References

- Ahn, Kookshin, 1995, Economic development and income distribution in Korea (in Korean), *Economic Development Review* 1, 53-76.
- Berrebi, Z. M. and Jacques Silber, 1985, Income inequality indices and deprivation: a generalization, *Quarterly Journal of Economics*, 809-810.
- Cheong, Kwang Soo, 1999a, A note on the interpretation and derivation of the Gini coefficient, Department of Economics Working Paper Series No. 99-1, University of Hawaii at Manoa.
- Cheong, Kwang Soo, 1999b, A comparison of alternative functional forms for parametric estimations of the Lorenz Curve, Department of Economics Working Paper Series No.99-2, University of Hawaii at Manoa.
- Dutta, M and Sung Yeung Kwack, 1998, Symposium on the Korean financial crisis: causes and challenge, *Journal of Asian economics* 9, 609-670.
- Kakwani, N. C., 1980, On a class of poverty measures, *Econometrica* 48, 437-446.
- Kakwani, Nanak, and Peter J. Lambert, 1986, On measuring inequality in taxation: a new approach, *European Journal of Political Economy* 14, 369-380.
- Hey, John and Peter Lambert, 1980, Relative deprivation and the Gini coefficient: comment, *Quarterly Journal of Economics*, 566-573.
- Kim, Dae Il, 1999, The impact on labor market of the crisis in Korea, mimeo, Seoul National University.
- Lambert, Peter J. and J. Richard Aronson, 1993, Inequality decomposition analysis and the Gini coefficient revisited, *The Economic Journal* 103, 1221-1227.
- Lerman, Robert, and Shlomo Yitzhaki, 1984, A note on the calculation and interpretation of the Gini index, *Economics Letters* 15, 363-368.
- Lee, Jong-Wha, and Changyong Rhee, 1998, Social impacts of the Asian Crisis: policy challenges and lessons, manuscript prepared for the Korea Development Institute & United Nations Development Programme Conference.

- Milanovic, Branko, 1994, The Gini-type functions: an alternative derivation, *Bulletin of Economic Research* 46, 81-90.
- Moon, Hyungpyo, Hyehoon Lee and Gyeongjoon Yoo, 1999, Social impact of the financial crisis in Korea, mimeo, Korea Development Institute.
- National Statistical Office, 1998, Annual report on the family income and expenditure survey 1997.
- Shalit, Haim, 1985, Calculating the Gini index of inequality for individual data, *Oxford Bulletin of Economics and Statistics* 47, 185-189.
- Rasche, R. H., J. Gaffney, A. Y. C. Koo, and N. Obst, 1980, Functional forms for estimating the Lorenz curve, *Econometrica* 48, 1061-1064.
- Ryu and Slottje, 1998, Measuring trends in U.S. income inequality (Springer-Verlag, Berlin).
- D. V. S. Sastry and Ujwala R. Kelkar, 1994, Note on the decomposition of Gini inequality, *The Review of Economics and Statistics*, 584-586.
- Thomas, Desmond R., 1994, Estimation of Gini coefficients in selected (OECS) countries, *Social and Economic Studies* 43, 71-93.
- Whang, Seong-Hyeon and Jung-Woo Lee, 1996, The problems of distribution and policy issues in Korea, mimeo, Korea Development Institute.
- Williams, Roberton, and David Weiner and Frank Sammartino, 1998, Equivalence scales, the income distribution and federal taxes, Congressional Budget Office Technical Paper Series 1992-2.
- Wodon, Quentin, 1999, Between group inequality and targeted transfers, *Review of Income and Wealth* 45, 21-39.
- Yitzhaki, Shlomo, 1979, Relative deprivation and the Gini coefficient, *Quarterly Journal of Economics*, 321-324.

Figure 3. Relative Income Share of Income Deciles

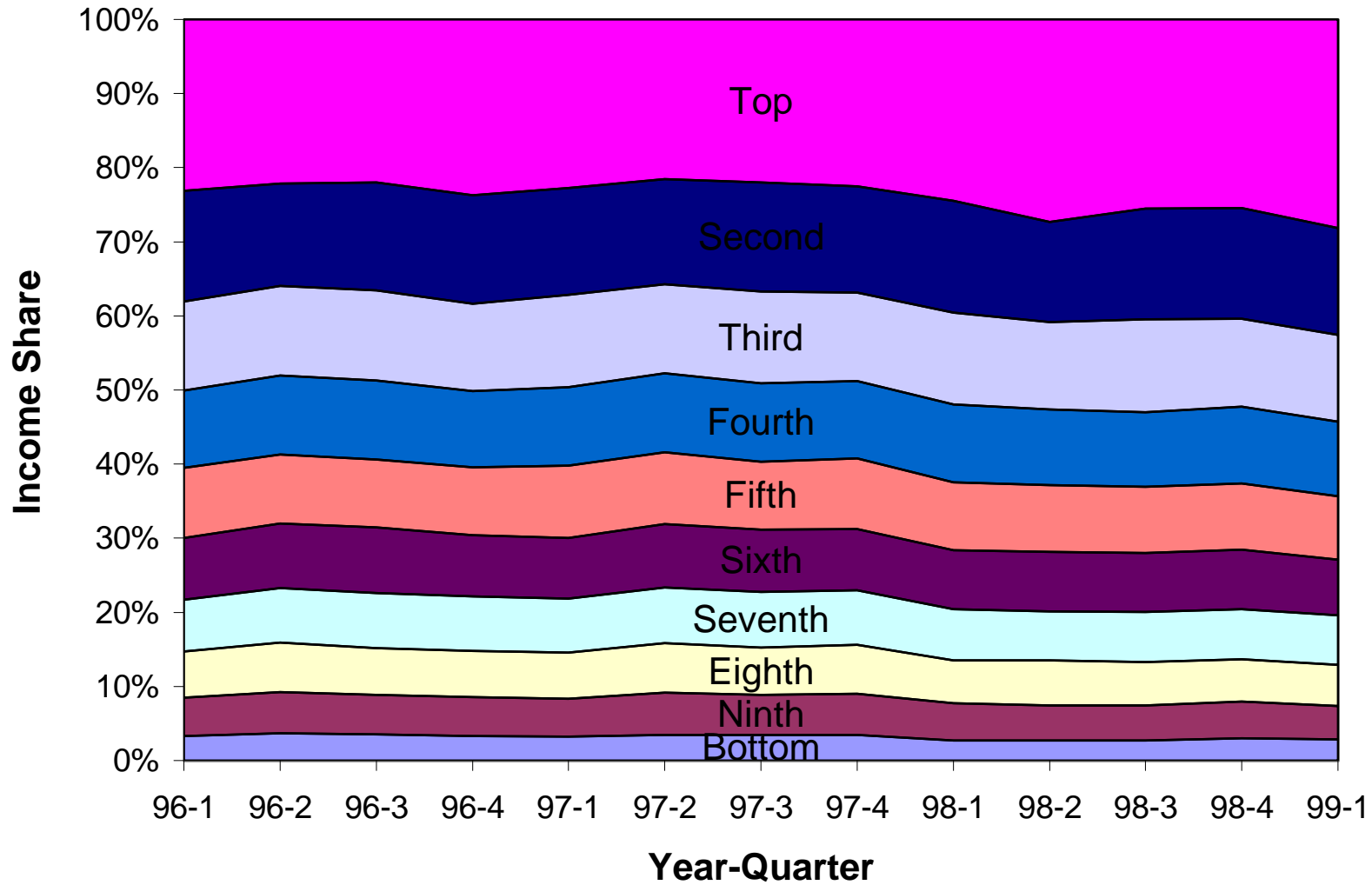


Figure 4. Consumption Shares of Income Deciles

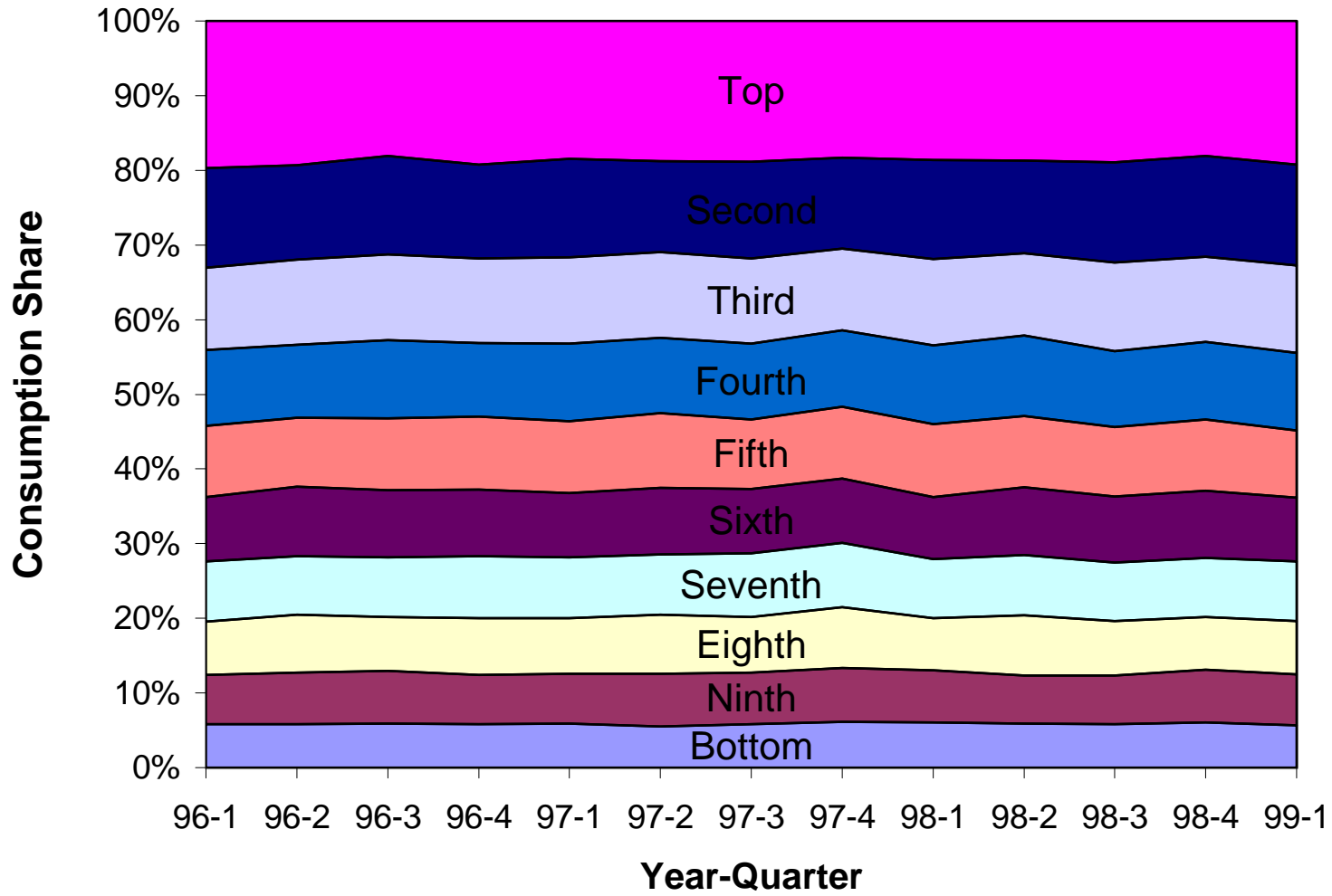


Figure 1. Average Income of Income Deciles

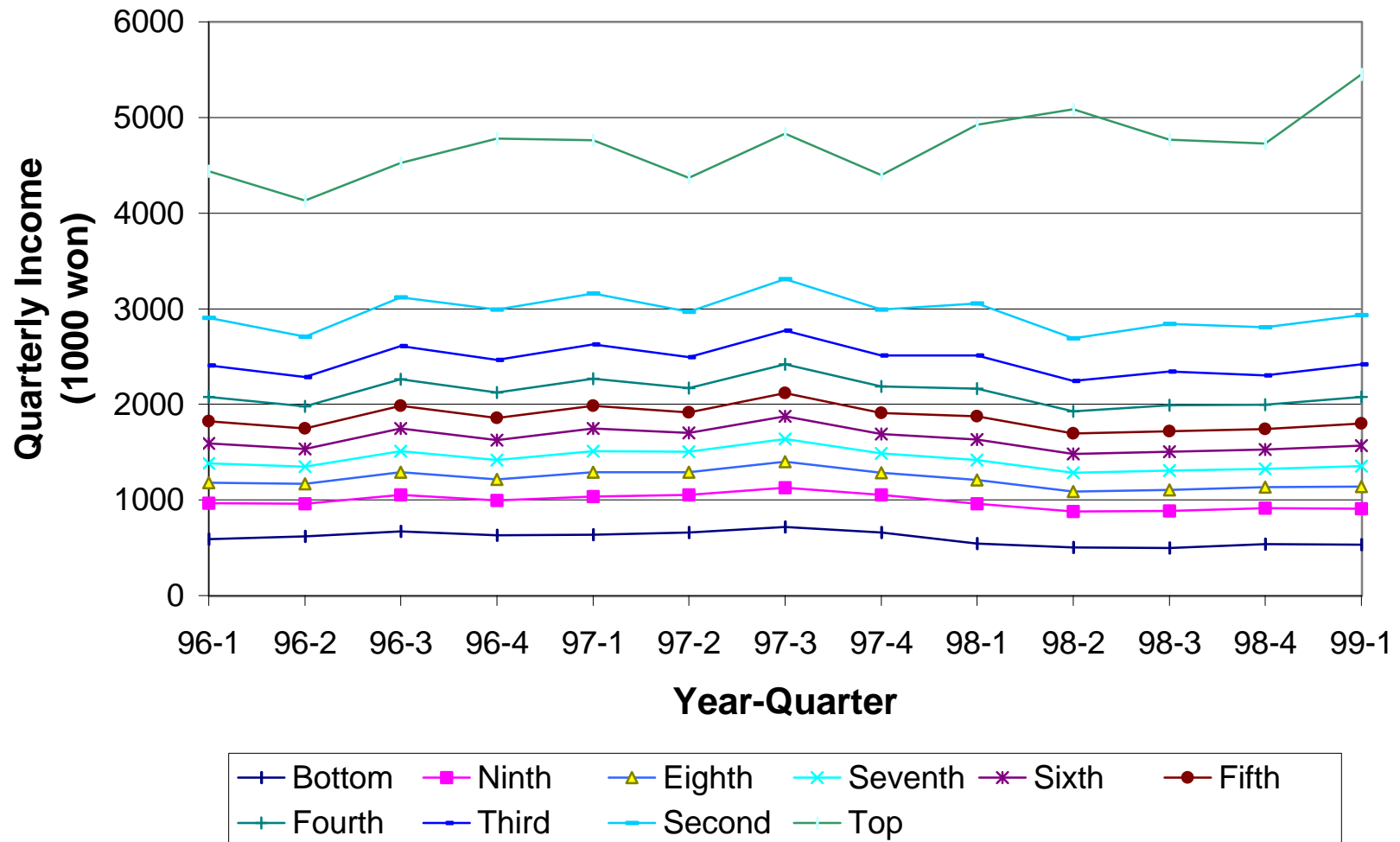


Figure 2. Average Consumption of Income Deciles

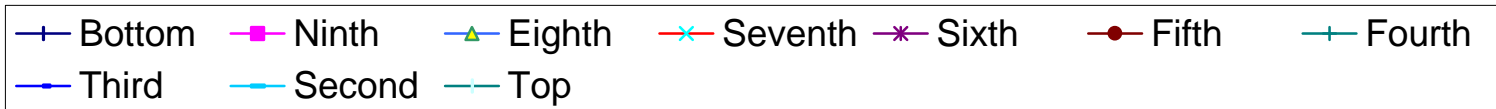
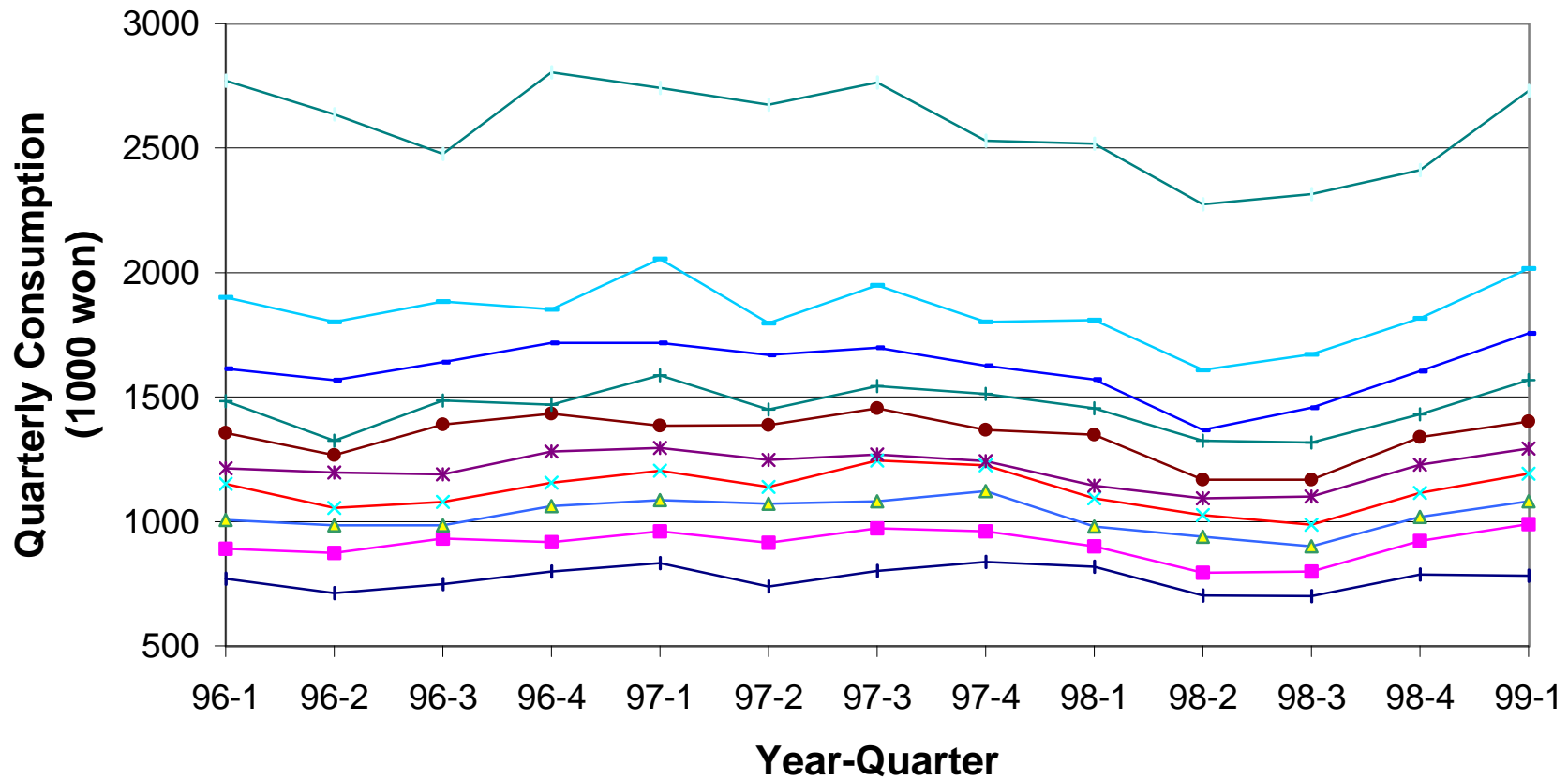


Figure 5. Inequality Trends

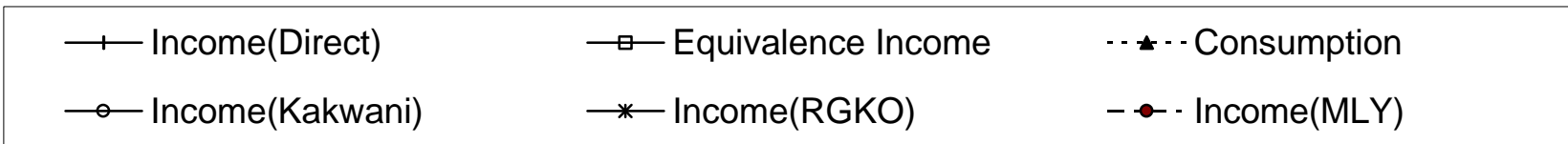
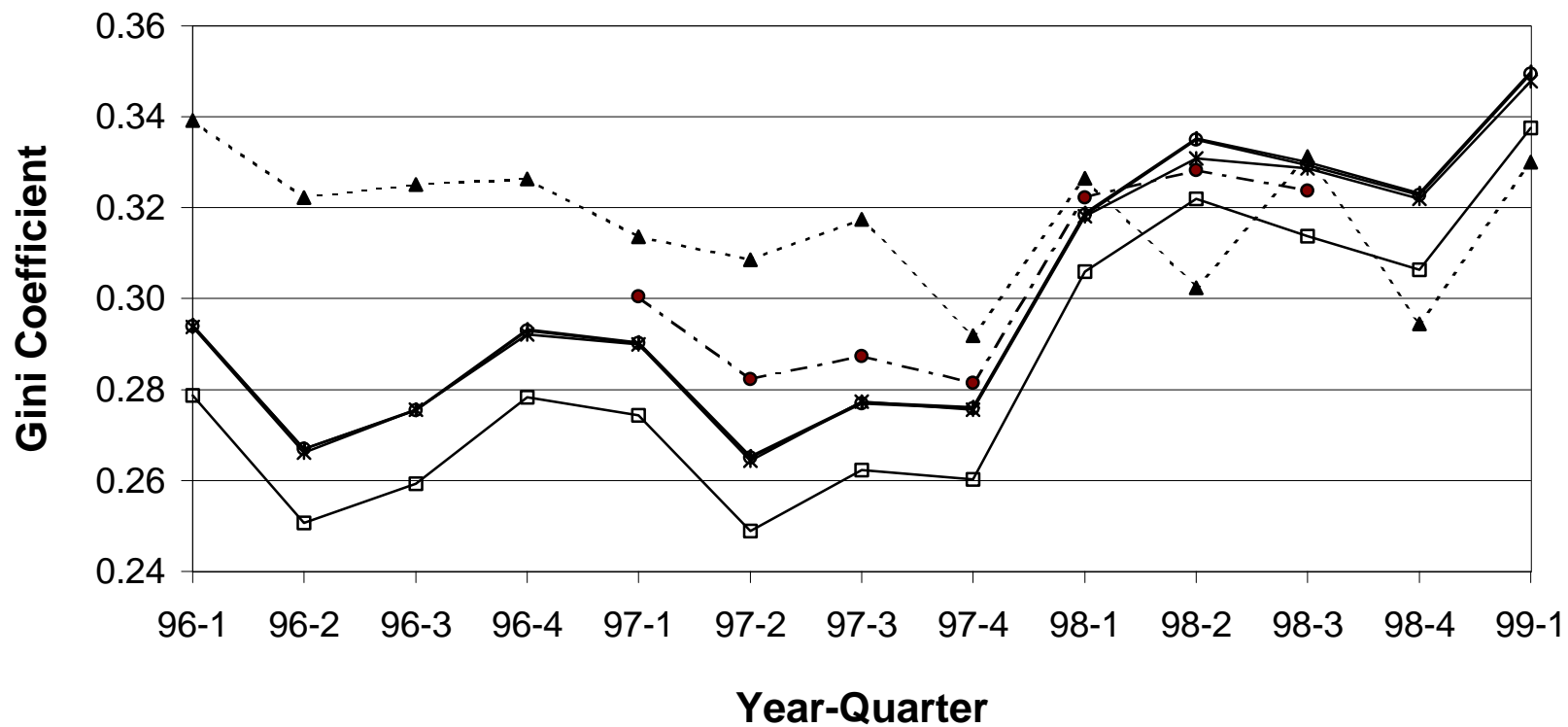


Table 1. Number of Household Members

Decile	96-1	96-2	96-3	96-4	97-1	97-2	97-3	97-4	98-1	98-2	98-3	98-4	99-1
Bottom	3.3	3.0	3.1	3.0	3.1	3.0	3.1	3.1	3.2	3.2	3.2	3.1	3.1
Ninth	3.4	3.4	3.4	3.3	3.3	3.3	3.4	3.3	3.3	3.3	3.3	3.2	3.3
Eighth	3.5	3.5	3.5	3.5	3.4	3.6	3.5	3.5	3.5	3.5	3.4	3.5	3.5
Seventh	3.6	3.6	3.6	3.6	3.7	3.7	3.7	3.6	3.6	3.5	3.6	3.5	3.5
Sixth	3.8	3.7	3.6	3.7	3.7	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.6
Fifth	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.6
Fourth	3.9	3.8	3.8	3.7	3.8	3.8	3.7	3.8	3.8	3.7	3.8	3.8	3.7
Third	3.9	3.9	3.9	4.0	3.9	3.9	3.9	3.9	3.9	3.8	3.9	3.8	3.8
Second	4.0	4.0	4.0	4.0	4.0	3.9	4.0	4.0	3.9	4.0	3.9	4.0	3.9
Top	4.2	4.2	4.1	4.0	4.2	4.2	4.1	4.1	4.1	4.2	4.2	4.1	4.1

Table 2. Age of Household Head

Decile	96-1	96-2	96-3	96-4	97-1	97-2	97-3	97-4	98-1	98-2	98-3	98-4	99-1
Bottom	40.6	40.7	41.1	40.8	40.4	40.5	40.7	42.0	40.9	40.7	42.0	41.1	41.3
Ninth	39.1	38.8	38.9	38.5	38.5	38.4	38.3	38.3	38.5	38.8	38.2	39.2	38.7
Eighth	37.8	38.7	37.7	37.4	38.1	38.4	38.8	38.5	38.1	37.8	37.8	38.7	38.5
Seventh	38.1	38.5	39.0	38.4	37.7	38.8	39.5	39.1	38.1	37.5	37.9	38.8	38.2
Sixth	39.3	38.4	38.9	39.0	39.3	39.3	39.4	40.0	38.2	38.8	38.1	38.9	38.5
Fifth	38.8	39.3	38.6	40.1	39.0	39.8	39.9	41.2	39.0	39.9	39.7	40.3	39.2
Fourth	40.2	39.8	40.2	40.7	40.1	40.7	40.4	40.9	39.7	40.3	39.4	40.6	40.0
Third	40.9	41.7	41.4	41.5	41.5	41.9	42.3	41.8	40.3	40.6	40.2	40.8	41.3
Second	42.4	42.8	43.0	42.3	42.6	42.7	43.2	42.7	41.2	41.1	41.9	41.5	41.5
Top	44.6	44.4	44.9	43.6	44.7	45.2	44.8	45.2	43.4	43.1	44.3	43.4	42.9

Table 3. Quarterly Income for Income Deciles (1000 Won)

Decile	96-1	96-2	96-3	96-4	97-1	97-2	97-3	97-4	98-1	98-2	98-3	98-4	99-1
Bottom	590	617	670	630	639	659	718	662	546	502	500	540	531
Ninth	967	962	1052	995	1035	1052	1130	1051	963	878	883	914	907
Eighth	1183	1169	1291	1215	1288	1291	1401	1283	1209	1090	1104	1137	1142
Seventh	1382	1350	1512	1420	1510	1504	1635	1484	1418	1283	1306	1327	1353
Sixth	1591	1533	1746	1629	1745	1698	1872	1690	1632	1479	1505	1526	1568
Fifth	1822	1746	1985	1858	1987	1913	2120	1911	1872	1694	1721	1741	1798
Fourth	2078	1981	2262	2123	2266	2167	2417	2185	2161	1926	1990	1996	2074
Third	2408	2283	2608	2466	2624	2495	2770	2510	2514	2242	2343	2305	2417
Second	2906	2706	3120	2994	3160	2971	3309	2991	3053	2693	2844	2806	2934
Top	4438	4129	4525	4779	4760	4366	4829	4395	4922	5085	4767	4727	5449

Table 4. Quarterly Consumption for Income Deciles (1000 Won)

Decile	96-1	96-2	96-3	96-4	97-1	97-2	97-3	97-4	98-1	98-2	98-3	98-4	99-1
Bottom	771	712	749	799	834	739	802	839	819	703	701	788	782
Ninth	891	874	931	916	960	916	973	960	901	794	800	923	988
Eighth	1006	985	984	1061	1086	1071	1082	1123	980	938	900	1019	1081
Seventh	1151	1055	1079	1155	1205	1140	1245	1225	1094	1024	987	1114	1191
Sixth	1213	1196	1189	1282	1295	1247	1270	1244	1144	1092	1100	1227	1293
Fifth	1356	1266	1390	1432	1384	1387	1454	1367	1348	1169	1169	1338	1402
Fourth	1482	1324	1486	1469	1587	1450	1545	1514	1455	1324	1318	1430	1569
Third	1613	1568	1640	1718	1718	1669	1697	1627	1571	1368	1458	1604	1757
Second	1901	1803	1884	1852	2055	1798	1948	1802	1810	1608	1671	1817	2016
Top	2771	2636	2476	2805	2742	2675	2764	2529	2518	2274	2316	2411	2731

Table 5. Relative Income Share of Income Deciles (%)

Decile	96-1	96-2	96-3	96-4	97-1	97-2	97-3	97-4	98-1	98-2	98-3	98-4	99-1
Bottom	3.27	3.69	3.52	3.31	3.22	3.47	3.47	3.44	2.70	2.73	2.72	2.98	2.84
Ninth	5.22	5.51	5.34	5.22	5.11	5.69	5.40	5.57	5.01	4.70	4.72	5.01	4.54
Eighth	6.19	6.73	6.30	6.29	6.23	6.72	6.39	6.57	5.83	6.09	5.85	5.65	5.56
Seventh	7.05	7.37	7.45	7.36	7.26	7.46	7.53	7.37	6.87	6.62	6.77	6.79	6.66
Sixth	8.32	8.67	8.83	8.22	8.23	8.55	8.40	8.26	7.95	8.01	7.96	8.04	7.54
Fifth	9.41	9.31	9.20	9.15	9.77	9.72	9.12	9.53	9.17	9.02	8.93	8.95	8.51
Fourth	10.45	10.70	10.62	10.33	10.54	10.63	10.57	10.45	10.53	10.23	10.05	10.36	10.07
Third	12.00	12.06	12.16	11.72	12.50	12.04	12.42	11.96	12.37	11.80	12.54	11.81	11.75
Second	14.95	13.85	14.58	14.68	14.41	14.19	14.69	14.29	15.12	13.50	14.95	14.96	14.39
Top	23.14	22.11	22.01	23.71	22.75	21.55	22.01	22.55	24.44	27.31	25.51	25.46	28.15

Table 6. Relative Consumption Share of Income Deciles (%)

Decile	96-1	96-2	96-3	96-4	97-1	97-2	97-3	97-4	98-1	98-2	98-3	98-4	99-1
Bottom	5.82	5.83	5.89	5.80	5.92	5.53	5.80	6.16	6.03	5.86	5.81	6.05	5.70
Ninth	6.57	6.85	7.08	6.64	6.68	7.04	6.96	7.20	6.97	6.51	6.53	7.05	6.75
Eighth	7.18	7.77	7.20	7.60	7.40	7.92	7.39	8.12	7.03	8.03	7.28	7.05	7.18
Seventh	8.01	7.89	7.97	8.27	8.16	8.03	8.59	8.60	7.89	8.10	7.81	7.94	8.01
Sixth	8.66	9.27	9.01	8.94	8.60	8.93	8.54	8.59	8.29	9.07	8.89	9.00	8.49
Fifth	9.55	9.25	9.65	9.74	9.60	10.02	9.37	9.64	9.83	9.54	9.26	9.57	9.06
Fourth	10.17	9.80	10.47	9.89	10.41	10.11	10.12	10.23	10.55	10.78	10.17	10.34	10.40
Third	10.97	11.35	11.47	11.29	11.54	11.45	11.40	10.95	11.50	11.03	11.91	11.44	11.66
Second	13.35	12.65	13.20	12.56	13.21	12.21	12.96	12.16	13.33	12.36	13.41	13.49	13.50
Top	19.72	19.34	18.06	19.25	18.48	18.77	18.87	18.34	18.60	18.72	18.92	18.08	19.26

Table 7. Center of Gravity of Income Distribution (scaled by 1000)

	96-1	96-2	96-3	96-4	97-1	97-2	97-3	97-4	98-1	98-2	98-3	98-4	99-1
consump	670	661	663	663	657	654	659	646	663	651	666	647	665
eqincome	639	625	630	639	637	624	631	630	653	661	657	653	669
income	647	634	638	647	645	633	639	638	659	668	665	662	675
Kakwani	647	633	638	647	645	633	639	638	659	667	665	661	675
RGKO	647	633	638	646	645	632	639	638	659	665	664	661	674
MLY					650	641	644	641	661	664	662		
NSO				645				642				658	

Note: consump=consumption expenditure
 eqincome=equivalent scale income
 Kakwani=income (using Kakwani's form for Lorenz curve)
 RGKO=income (using Rasche, Gaffney, Koo and Obst's form for Lorenz curve)
 MLY=gross income (quoted from Moon, Lee and Yoo)
 NSO=annual gross income (quoted from National Statistical Office)

Table 8. Gini Coefficient

	96-1	96-2	96-3	96-4	97-1	97-2	97-3	97-4	98-1	98-2	98-3	98-4	99-1
consump	0.3392	0.3223	0.3251	0.3264	0.3136	0.3085	0.3175	0.2918	0.3265	0.3024	0.3312	0.2945	0.3300
eqincome	0.2787	0.2507	0.2593	0.2783	0.2743	0.2489	0.2623	0.2603	0.3059	0.3219	0.3137	0.3064	0.3375
income	0.2942	0.2670	0.2756	0.2932	0.2904	0.2653	0.2772	0.2761	0.3188	0.3352	0.3300	0.3232	0.3499
Kakwani	0.2939	0.2669	0.2754	0.2930	0.2902	0.2651	0.2770	0.2759	0.3184	0.3349	0.3294	0.3228	0.3495
RGKO	0.2938	0.2662	0.2756	0.2922	0.2900	0.2644	0.2773	0.2756	0.3181	0.3308	0.3286	0.3220	0.3478
MLY					0.3005	0.2823	0.2873	0.2814	0.3222	0.3283	0.3238		
NSO				0.2907				0.2830				0.3157	

Table 9. Changes in Overall Inequality and Between-Group Inequality

	96-1	96-2	96-3	96-4	97-1	97-2	97-3	97-4	98-1	98-2	98-3	98-4	99-1
Gini	0.2942	0.2670	0.2756	0.2932	0.2904	0.2653	0.2772	0.2761	0.3188	0.3352	0.3300	0.3232	0.3499
CoG	0.6471	0.6335	0.6378	0.6466	0.6452	0.6327	0.6386	0.6381	0.6594	0.6676	0.6650	0.6616	0.6750
CoG(K)	0.4986	0.4918	0.4929	0.5009	0.4972	0.4887	0.4915	0.4905	0.5061	0.5150	0.5111	0.5070	0.5197
^CoG		-0.0136	0.0043	0.0088	-0.0014	-0.0126	0.0060	-0.0006	0.0214	0.0082	-0.0026	-0.0034	0.0134
^CoG(K)		-0.0067	0.0011	0.0080	-0.0038	-0.0084	0.0028	-0.0010	0.0156	0.0090	-0.0040	-0.0040	0.0127
^CoG(K)		49.57%	25.43%	91.31%	270.33%	67.22%	46.25%	181.07%	73.04%	109.35%	153.12%	118.64%	95.14%

Note: CoG=Center of Gravity of overall income distribution (overall inequality)
 CoG(K)=Center of Gravity of group income distribution (between-group inequality)
 ^CoG=absolute change in CoG
 ^CoG(K)=absolute change in CoG(K)
 ^CoG(K)=ratio of ^CoG(K) to ^CoG