

# Consumption Inequality of South Korea Urban Household

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**Abstract**—This paper reviews whether consumption inequality of South Korea exists or not. South Korea is regarded to have lower economic inequality level. However, many Korean still have suffered economic difficulties and their economic inequality has grown vastly since a financial crisis in 1998.

When discussing inequality, we have considered ‘income inequality’ as one of the representative index for showing the living standard. Recently, some researchers suggest that consumption is more suitable measure for analyze the economic well-being than income as consumption is direct measure of household living standard and can be adequate measure on permanent well-being.

According to the life-cycle hypothesis households in smoothing their consumption allocate resource properly over lifetime by using credit market, therefore many researchers does not attention to consumption inequality in South Korea and it is also restricted to access consumption expenditure survey micro-data to freely use.

This paper investigate whether consumption inequality in Korea have worsened by consumption inequality over last 15 years using micro data on expenditure survey at household level. We show that the consumption and income inequality pattern through difference in specific goods expenditure with different income group and use demand system with corrected measurement errors. This research shows consumption gap of high-low income households has arisen significantly, which might distort economic incentives.

**Keywords**—Consumption inequality, Income-Consumption gap, Demand System, Consumer Expenditure Survey

## I. INTRODUCTION

**T**HE issue of consumption inequality has arisen as important inequality problem with the income inequality. Many remarkable empirical research findings are that households allocate their consumption resources appropriately over lifetime, despite facing the increase of income inequality.

South Korea has achieved rapid economic development for last fifty decade and is considered as one of countries with relatively lower level of inequality. However, South Korea had experienced financial crisis in the late 1990s, which have increased the gap between the rich and the poor.

There are many researchers who studied income inequality in each society. Similarly, a study related with the inequality of South Korea has focused on mainly income inequality, but not

at all consumption. This is because many researchers support that household tend to smooth consumption expenditure using credit market with short income shock, consumption inequality, therefore, does not increase as much as income inequality and there are not consumption inequality under the society of South Korea [4]. Even if the income shocks were permanent, the changes expected ahead of time [3]. Also there are some restrictions so as to access statistics data for analysis from Korea Statistical Information Service(KOSIS) Korea National Statistical Office, especially micro survey data at the household level.

In this paper, we show that consumption inequality grows considerably in South Korea using household consumption expenditure survey micro data.

## II. OUTLINE OF CONSUMPTION INEQUALITY

### A. Outline of data

Consumption expenditure micro data at household level are reported by Korea National Statistical Office, which consist of complete survey question about household expenditure and some information related to income. Households reported about their expenditure on detailed categories for up to every quarters and KOSIS has released monthly average expenditures by quarter and year.

In this paper, we review consumption inequality for the South Korea from 1999 to 2013 using average data based on annual report. We include only urban households in sample and all data being used to carry out the empirical work such as income, detailed good and service expenditures saving are expressed in constant 2010 Korea Won using CPI. Also we exclude households in the top 5% of income and bottom 5% of income so as to eliminate outliers. We use expenditure categories into 12 groups which classification of expenditure goods is consistent with National Account Household Final Expenditure and adjust income and savings categories. This is because savings and installment savings in the survey questionnaire does not reflect real savings at each household. So we adjust alternative measure of income and savings. Herein, savings consist of savings and installment savings, saving insurance, financial fund and purchase of securities. When it comes to income, we use labor income, market income and disposable income. Market income represents before tax income and it includes labor income, business income, property income and private transfer income. Disposable income includes market

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income and public transfer income and subtracts public non-consumption expenditure, for instance ordinary income tax, pension and social insurance.

TABLE I  
SAMPLE DATA CONSTRUCTION

Total households	197,651
Age 20-65 years	169,003
Income 5-95 %	177,887
5% median value(income)	(456,427.6)
95% median value(income)	(7,094,693)

B. Trends of the consumption inequality

Figure 1 shows how high(top income quintile in market income) versus low(bottom income quintile) income households allocate their expenditure across certain goods. The spending ratio of top income quintile to bottom income quintile on particular goods is represented each point. According to compare respective ratio across income group, during 1999-2013, food expenditure gap between high vs. low income households are somewhat stable and yet the spending ratio on education is increasing remarkably from 6% to 16%. Compared with another expenditure ratio between high-low income groups, upper income group spends much more on education spending relative to lower income groups and it may cause inequality of opportunity access.

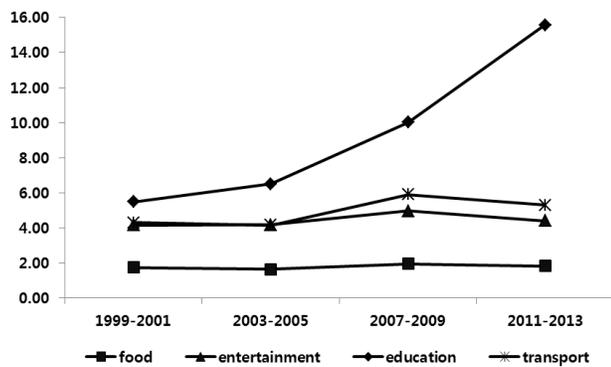


Fig. 1 Expenditure gap on high vs. low income household

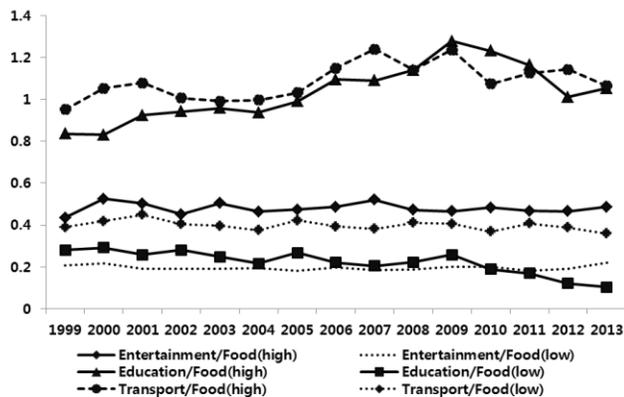


Fig. 2 The ratio of some goods to Food spending (high&low income)

Figure 2 illustrates the ratio of spending certain goods-entertainment, education and transport) to food for 1999-2013. In general, large literature concerning consumption inequality employs nondurable entertainment as one of luxury goods whereas it is hard for consider entertainment spending as luxury in South Korea. Figure 2 shows the particular spending pattern in Korea. The education spending to food in top income quintile household is sharply increasing relative to for that in bottom income quintile household. High income group allocate their consumption on education as much as food and they also spend much more on transportation; the ratio of transport to food spending is more than 1.

TABLE II  
INEQUALITY TRENDS OF INCOME AND CONSUMPTION<sup>a</sup>

	1999-01	2003-05	2007-09	2011-13	Change
Labor Earnings	12.16	13.30	17.44	17.48	0.36
Market income	7.42	8.08	9.00	9.51	0.19
Disposable income	6.11	5.87	6.24	6.03	0.02
Expenditures <sup>b</sup>	2.87	2.83	3.46	3.37	0.19
Expenditures2 <sup>b</sup>	7.24	8.29	8.92	9.79	0.21

a. Ratio of high income group to low income group

b. Expenditures (Household total consumption expenditure), Expenditure2 (Alternative total consumption expenditure using adjusted savings)

TABLE III  
INEQUALITY TRENDS OF INCOME AND CONSUMPTION  
(90-50 RATIO/50-10 RATIO)

	1999-01	2003-05	2007-09	2011-13	Change
90-50 Ratio					
Labor Earnings	2.35	2.40	2.45	2.23	0.04
Market income	2.04	2.04	2.07	2.06	0.01
Disposable income	1.97	1.96	1.97	1.97	0.00
Expenditure	1.60	1.55	1.58	1.53	-0.01
Expenditure2	1.99	2.03	2.06	2.05	0.03
50-10 Ratio					
Labor Earnings	5.18	5.54	7.12	7.84	0.32
Market income	3.63	3.95	4.34	4.63	0.18
Disposable income	3.10	2.99	3.17	3.07	0.02
Expenditure	1.80	1.83	2.18	2.20	0.20
Expenditure2	3.63	4.08	4.34	4.78	0.18

Table II and Table III show the inequality trends of income and consumption for four three-year periods, 1999-2001, 2003-2005, 2007-2009, and 2011-2013. Table III represents the inequality trends of two sub group; we split two parts, one is about upper part from 50 to 90 quintile group in income and

another is lower group below 50. The inequality of labor earning increased from 12.01 in 1999-2001 to 17.48 in 2011-2013. This ratio is more than 30 percent over this period. However the changes of disposable income grew a little from 6.11 in 1999-2001 to 6.03 in 2011-2013 and even inequality ratio of upper income group above 90-50 quintile in income did rarely changed over same period. Table III indicates difference in income and spending within lower income group is larger than for that higher income group, which means that the inequality of income and consumption may be caused by inequality in bottom income group and it may give arise to serious social economic problem.

III. ESTIMATION OF CONSUMPTION ELASTICITY

We estimate the total expenditure elasticities of each good using log-linear approximation using two stage linear regressions. Reference [5] presented Almost Ideal Demand System(AIDS) for log-linear approximation in total consumption expenditure. We consider the statistical properties of measurement error as [1] and follow the elasticity estimation method of Aguiar and Bils [2] which consider mis-measurement errors i.e. residual term comprises income-specific systematic measurement error  $\phi_t^i$ , idiosyncratic taste shock  $\varphi_{hjt}$ , and mis-measurement error  $u_{hjt}$ . Engel curves may not be log-linear but, herein, we assume log-linear and further our studies will consider non-linear assumption.

$$\tilde{X}_{hjt} = \alpha_{jt} + \beta_j \log X_{ht} + \Gamma_j Z_h + u_{hjt} \quad (1)$$

$$u_{hjt} = \phi_t^i + v_{hjt} + \varphi_{hjt} \quad (1)(1)^2$$

Where,  $\tilde{X}_{hjt}$  is the percentage deviation from average expenditure on good  $j$  in year  $t$  by household  $h$ .  $X_{ht}$  is the total expenditure at time  $t$  by household  $h$ , and  $Z_h$  is demographic dummies vectors; age dummies(20-50, 51-65), number of family size(2-4, 5-7) and number of earner. Using (1), we estimate the total expenditure elasticity for 1999-2000 and each expenditure elasticity across income quintile using instrument variables.

Table IV shows the average share of goods in regard to total expenditure and expenditure elasticities. Education has the highest expenditure elasticity(1.35) over all categories and alcohol and cigar has lower elasticity of 0.27. The spending on alcohol and cigar tends to be inelasticity than other goods. Spending on food categories accounts for large share of total expenditure and it display 0.54 in 1999-2000.

As Table V and VI, two tables represent the relative expenditure elasticity across income quintile and the result is interesting. Bottom income quintile group displays low expenditure elasticity over all goods. Compared with bottom income quintile, the estimated expenditure elasticities of upper income quintile are very different values and significantly large

elasticities. Highest income quintile group have a tendency to react over goods. Especially, House ware and ect goods and services have high elasticity of 3.04 and 3.30. To the exclusion of bottom income quintile group, many households have large elasticity on entertainment goods from 1.28 to 2.81. The largest spending elasticity on education goods is 1.44 of the 4<sup>th</sup> income quintile whereas bottom income quintile household records 0.1 on the same good.

TABLE IV  
THE SHARE OF GOODS AND ELASTICITIES (INCOME QUINTILE 1-5, 1999-2000)

	Share	Beta	SE
Food	12.83	0.54	0.01
Alcohol and Cigar	1.11	0.27	0.02
Cloth and Shoes	4.94	1.16	0.02
Housing water/heater	7.56	0.57	0.03
House ware	2.74	1.33	0.08
Health	4.07	0.68	0.04
Transport	8.93	1.20	0.04
Communication	3.48	0.70	0.01
Entertainment	4.33	1.22	0.03
Education	7.49	1.35	0.03
Accommodation	8.68	1.04	0.02
Ect goods and services	6.15	1.01	0.05

TABLE V  
THE SHARE OF GOODS AND ELASTICITIES(A) (INCOME QUINTILE 1-3)

	income 1		income 2		income 3	
	Beta	SE	Beta	SE	Beta	SE
Food	0.51	0.01	0.64	0.02	0.63	0.03
Alcohol and Cigar	0.09	0.03	0.49	0.05	0.39	0.11
Cloth and Shoes	0.51	0.02	0.95	0.03	1.32	0.07
Housing water/heater	0.60	0.04	0.47	0.04	0.93	0.08
House ware	0.64	0.05	1.36	0.09	1.56	0.20
Health	0.73	0.05	1.34	0.08	1.25	0.13
Transport	0.38	0.03	0.83	0.09	1.50	0.20
Communication	0.24	0.01	0.44	0.02	0.39	0.05
Entertainment	0.64	0.03	1.28	0.05	1.99	0.11
Education	0.10	0.02	0.34	0.05	0.69	0.12
Accommodation	0.38	0.01	0.82	0.02	1.08	0.05
Ect goods and services	0.31	0.05	1.14	0.07	1.47	0.11

TABLE VI  
THE SHARE OF GOODS AND ELASTICITIES(B) (INCOME QUINTILE 4-5)

	income 4		income 5	
	Beta	SE	Beta	SE
Food	0.70	0.04	0.57	0.05
Alcohol and Cigar	0.54	0.12	0.50	0.13
Cloth and Shoes	1.83	0.10	2.45	0.13
Housing water/heater	1.11	0.10	1.22	0.14
House ware	1.87	0.28	3.04	0.40
Health	1.28	0.16	1.66	0.20
Transport	1.80	0.29	1.63	0.37
Communication	0.69	0.06	0.67	0.06
Entertainment	1.58	0.15	2.81	0.22
Education	1.44	0.17	1.34	0.22
Accommodation	1.34	0.06	1.51	0.07
Ect goods and services	1.66	0.16	3.30	0.20

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