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# DO KOREANS CONSUME EXCESSIVELY?

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*Recent declining growth rates and the IMF balance of payment crisis in Korea have often been attributed partly to excessive consumption. After examining several definitions commonly used for excessive consumption, this paper suggests that a more appropriate definition of excessive consumption should be based on dynamic optimization considerations: consuming more than permanent income. This paper constructs permanent income hypothesis consumption, and shows that Korean consumers consumed too little, 15.0%~19.7% less than their permanent income. Therefore, this paper concludes that Korea does not suffer from excessive consumption.*

JEL Classification: E21
Keywords: Excessive Consumption, Permanent Income Hypothesis

## I. INTRODUCTION

Excessive consumption has been blamed for numerous economic illnesses in Korea. Critics have often pointed out that consumption in Korea is comparable to G7 countries while her income is still comparable to developing countries. Various social, cultural and semi-public organizations as well as the Korean government vigorously have campaigned to discourage excessive consumption, forming "Pan-National Movement Against Excessive Consumption." They argue that excessive consumption of foreign goods worsens our trade deficit and prevents our own industries from growing, which eventually caused the IMF balance of payment crisis in Korea. They also argue that we waste our resources by consuming luxury goods excessively. This paper, however, shows

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that claims about excessive consumption are based on misconceptions which do not stand up to careful and consistent economic analysis. In fact, this paper shows that Korean consumers consume too little.

Although the term, excessive consumption, has been used widely in Korean economic policies, it is not an academic terminology, nor defined precisely. Excessive consumption is loosely defined as consuming luxury goods excessively, consuming foreign goods excessively, or consuming beyond one's current income. How much is excessive, however, is subjective and judgmental, and hence it is difficult to analyze objectively. Yet, a careful examination of excessive consumption even in these descriptive contexts suggests that Korea does not suffer from excessive consumption, contrary to common belief.

None of the above definitions of excessive consumption are, however, satisfactory for rigorous economic analysis. A more appropriate definition would be whether or not we consume more than optimal consumption which would maximize our welfare. Consuming more than optimal consumption would by definition lower our welfare, and hence would be more appropriate as a definition of excessive consumption. We can define optimal consumption with the permanent income hypothesis (PIH) formulated by Friedman (1957). The PIH stipulates that people should be forward-looking and should base their consumption decisions on their permanent income rather than their current income. Therefore, we define excessive consumption as consuming more than optimal consumption, PIH consumption.

Following Kim (1996a, 1996b, 1999), we measure the deviation of consumption from PIH consumption. PIH consumption can be constructed with the Hansen and Sargent (1980) cross-equation restriction approach and the VAR approach. Then, we can measure the extent to which consumption deviates from constructed PIH consumption. We find that Korean consumers tend to consume significantly less, 15.0% ~ 19.7% less, than their PIH consumption.

Section 2 examines several definitions of excessive consumption, and descriptively suggests that Korea does not suffer from these excessive consumption. Section 3 sets up a PIH framework to address excessive consumption based on microeconomic principles. Section 4 develops estimation strategies and shows that the Korean data exhibits no excessive consumption. Finally, section 5 concludes the paper.

## Ⅱ. WHAT IS EXCESSIVE CONSUMPTION?

Excessive consumption has never been defined precisely and has been used differently in various contexts. There are at least three different contexts in which excessive consumption is commonly used. After briefly examining these definitions of excessive consumption, this section suggests a more appropriate definition of excessive consumption.

First, excessive consumption is sometimes used as excessive consumption of luxury goods. Koreans were blamed for excessive consumption when imports of furs, automobiles, golf clubs, cosmetics, and furnitures increased 326%, 78%, 69%, 49% and 40% respectively in July 1996 compared to the previous year.[1] The number of private foreign motor vehicles increased from 45,578 in 1970 to 9,908,561 in 1998, a 217 fold increase. Overseas travel expenditures increased from $369.3 millions in 1980 to $4.7 billions in 1997, a 13 fold increase. But which are luxury goods is subjective and judgmental, and hence difficult to analyze objectively: one person's luxury may be another person's necessity. For example, taking overseas vacations may be considered an unnecessary luxury, but observing different people, languages and cultures may be in fact a very productive investment. Ignoring these judgmental issues, even complete prohibition of the so called consumption of luxury goods would not affect Korean economy significantly since it is just a minuscule part of our economy. Korean GDP in 1996 was $520 billion whereas imports of furs, automobiles, golf clubs, cosmetics, and furnitures were $47 million, $253 million, $60 million, $193 million, and $160 million respectively through July 1996. Their total value is less than 0.23% of our GDP. Hence, excessive luxury consumption may be a moral, cultural or political issue at best, but it should not be a serious economic issue.

Second, excessive consumption is sometimes used as excessive consumption of imports. Koreans were blamed for excessive consumption when growth rates of imports for raw materials, capital goods and consumption goods were 10.2%, 10.0%, 21.2% respectively in 1996. Imports of raw materials and capital goods, which would be used in production, are considered to be acceptable, while imports of consumption goods, which would not contribute to our production, are considered to be unnecessary and wasteful. Since Korean imports of consumption goods increased more than imports of raw materials and capital goods in 1996, critics blamed Koreans for consuming imports excessively. Yet, a simple economic analysis shows that this pattern of importing consumption goods does not amount to excessive consumption. During economic slowdowns, consumption does not slowdown very much even if production and income slowdown significantly. Consumers dislike sudden changes in their consumption and hence they tend to maintain smooth consumption in the short run. Therefore, growth rates of imports of consumption goods are expected to remain stable while growth rates of imports of raw materials and capital goods are expected to decline significantly during economic slowdowns. After the IMF crisis, eventually, growth rates of imports of consumption goods declined drastically: growth rates of imports for raw materials, capital goods and consumption goods were 2.3%, -10.4%, -7.9% in 1997, and -34.0%, -35.9%, -41.3% respectively in 1998. Also, the ratio of imports of consumption goods to total imports was only 10% in 1997 while they were 23% in the US, 34% in Japan and 13% in Taiwan.

[1] All data are taken from the website of The Bank of Korea, www.bok.or.kr, and National Statistical Office, www.nso.go.kr, unless indicated otherwise.

Imports of consumption goods are still a small fraction of total imports in Korea, and in this context, Koreans do not seem to consume imports excessively.

Third, excessive consumption is sometimes used as consuming beyond one's current income. Although how much is excessive is again subjective and judgemental, Korean consumption does not seem to be excessive considering our own income. The ratio of consumption to GDP in Korea is one of the lowest in the world: in 1999, the ratio was 56% in Korea, 68% in US, 58% in Canada, 66% in UK, 58% in Germany, 54% in France, 68% in Mexico, 62% in Japan, 48% in China, 56% in Thailand, 60% in Hong Kong, and 72% in Philippines. If Koreans consume excessively, so do most of the countries in the world. Furthermore, the ratio of consumption to GDP in Korea has declined: 84% in 1953, 85% in 1960, 75% in 1970, 65% in 1980, 54% in 1990, and 56% in 1999. Even from our own historical perspective, Koreans today do not seem to consume excessively considering our current income.

Let us not forget that consumption is essential to happiness. We derive pleasure from consumption. Of course, this does not mean we should maximize consumption today as much as we can. Too much consumption today means too little savings today, which would lead to too little investment and too little capital formulation. With too little capital stock, we will produce too little income in the future, which will allow too little consumption in the future. In other words, too much consumption today implies too little consumption in the future. Therefore, we need to find a right balance between consumption today and consumption tomorrow.

Hence, the right question should involve dynamic considerations of whether we consume more than our permanent income, not static considerations of whether we consume more than our current income. Assuming we optimize our life-time utility, consumption should depend on permanent income, not on current income, as Friedman (1957) noted. Consumers should consume more than their current income by borrowing if their permanent income is higher than their current income, and consumers should consume less than their current income and save if their permanent income is less than their current income. If a country expects higher growth in the future, her permanent income is higher and hence the country should consume more today. On the other hand, if a country expects slower growth or economic declines in the future, her permanent income is low and hence the country should consume less today and save more to prepare for future rainy days. To put it succinctly, consumption should not be based on current income. Hence, statically comparing consumption with current income, would not accurately tell us if Koreans consume excessively. Korea has higher growth expectations than western economies, and hence should consume more due to the higher future expected income. In other words, Korean consumption/GDP ratio should be higher than western economies considering our growth potential. The fact that Koreans consume less than western economies strongly suggests that Koreans do not consume excessively.

These dynamic optimization considerations lead to a more appropriate definition of excessive consumption: consuming more than permanent income. If consumers consume more than their permanent income, they will be forced to cut back on their future consumption below their permanent income since consumers' budget constraints, which need not be balanced every period, must be balanced in their lifetime. The next section presents an analytical framework in which we can examine excessive consumption in this context.

## Ⅲ. PIH CONSUMPTION

The PIH literature based on Hall's (1978) formulation focuses on the following representative agent framework. A representative agent chooses $\{C_t\}_{t=0}^{\infty}$ and $\{W_t\}_{t=1}^{\infty}$ so as to maximize[2]

$$E_0\left[\sum_{t=0}^{\infty}\beta^t\left(u_0+u_1 C_t-\frac{u_2}{2}C_t^2\right)\right],$$

subject to the sequence of budget constraints

$$W_{t+1}=(1+r)W_t+y_t^l-C_t+\eta_{t+1} \tag{1}$$

for $t=0,\ldots,\infty$. $W_t$ is real nonhuman wealth, $y_t^l$ is labor income, $C_t$ is con sumption, $\eta_t$ is unanticipated capital gain, and $r$ is real interest rate, which is constant.[3] $\frac{u_1}{u_2}$ is the satiation point; therefore we assume $0\le C_t\le\frac{u_1}{u_2}$ for all t. We assume $\lim_{T\to\infty} E_0(\frac{1}{1+r})^T W_T=0$ to rule out perpetual borrowing. Then, the budget constraint (1) implies:

$$E\left[\sum_{i=0}^{\infty}\left(\frac{1}{1+r}\right)^i C_{t+i}\,\middle|\,\Phi_t\right]=(1+r)W_t+E\left[\sum_{i=0}^{\infty}\left(\frac{1}{1+r}\right)^i y_{t+i}^l\,\middle|\,\Phi_t\right],$$

where $\Phi$ denotes information available to the representative agent at t.

We assume that the discount rate for future consumption is equal to the real rate of return from asset holdings[4]: $\beta=\frac{1}{1+r}$. Then, the first-order condition

[2] We use a quadratic utility function since our approach applies only if there exists a closed form solution.

[3] This paper assumes that the real interest rate is constant. Mankiw (1981) allows a varying interest rate but still rejects the PIH. Michener (1984) analyzes a general equilibrium case where the interest rate is allowed to fluctuate. He shows the sensitivity to current income in the general equilibrium case exceeds that in the partial equilibrium case.

[4] We do not consider the case where the discount rate is not equal to the interest rate because, without the equality in this model, consumption will converge to the satiation level or

implies that consumption is a random walk as Hall (1978) first recognized:

$$E(C_{t+1}|\Phi_t) = C_t. \tag{2}$$

The budget constraint (1) and the first order condition (2) lead to the following expression for PIH consumption, $c_t^e$:

$$c_t^e \equiv r\Big[ W_t + \sum_{i=0}^{\infty}\Big( \frac{1}{1+r}\Big)^{i+1} E(y_{t+i}^l|\Phi_t)\Big]$$

where the right-hand side is permanent income. The empirical strategy followed here is to use data on capital income rather than wealth; in that connection, note that PIH consumption can be rewritten as

$$c_t^e \equiv y_t^k + \Big( \frac{r}{1+r}\Big) \sum_{i=0}^{\infty}\Big( \frac{1}{1+r}\Big)^i E(y_{t+i}^l|\Phi_t) \tag{3}$$

where $y_t^k$ is capital income and $y_t^k = rW_t$. From (1), we see that capital income obeys

$$y_{t+1}^k = (1+r)y_t^k + r[y_t^l - C_t] + r\eta_{t+1}.$$

We define excessive consumption as consuming more than PIH consumption: $C_t > c_t^e$. Let

$$C_t = c_t^e + S_t,$$

where $S_t$ is a deviation of consumption from PIH consumption, as specification errors in Durlauf and Hall (1988). Hence, excessive consumption is defined as $S_t > 0$.

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negative infinity asymptotically. If $\beta \neq \frac{1}{1+r}$, the first-order condition becomes

$$E(C_{t+1}|\Phi_t) = \frac{1}{\beta(1+r)} C_t + \frac{u_1}{u_2}\Big[1 - \frac{1}{\beta(1+r)}\Big].$$

That implies

$$E(C_{t+i}|\Phi_t) = \Big[ \frac{1}{\beta(1+r)}\Big]^i C_t + \frac{u_1}{u_2}\Big[1 - \Big( \frac{1}{\beta(1+r)}\Big)^i\Big].$$

Thus, if $\beta > \frac{1}{1+r}$, $E(C_{t+i}|\Phi_t) \to \frac{u_1}{u_2}$, and if $\beta < \frac{1}{1+r}$, $E(C_{t+i}|\Phi_t) \to -\infty$. Furthermore, we have another empirical problem because, without the equality, we need to know the unknown satiation level, $\frac{u_1}{u_2}$.

## Ⅳ. ESTIMATION OF EXCESSIVE CONSUMPTION

This paper follows Kim (1996a, 1996b) to estimate a deviation of consumption from PIH consumption by directly constructing PIH consumption, using the Hansen and Sargent (1980) cross equation restriction approach and the VAR approach. This paper computes

$$\frac{S_t}{C_t} = \frac{C_t - c_t^e}{C_t} .$$

The raw data set for income and expenditures comes from *Family Income and Expenditure Survey,* which is obtained from the website of the National Statistical Office, www.nso.go.kr. *Family Income and Expenditure Survey* has been conducted monthly by the National Statistical Office since 1963, and contains basic information on urban household incomes and expenditures. The average number of households in the 1997 monthly survey was 5095. This paper uses the data set of "monthly income and expenditure per household for salary and wage earners' households in all cities."[5, 6] This data set, which is quarterly, contains detailed information on incomes and expenditures and covers 1974:Q1 ~ 1999:Q1. *Annual Report on the Family Income and Expenditure Survey* (1998) discusses the description of the survey and the data in detail. Consumer price index (CPI) for various expenditures are also obtained from this website. The appendix describes how this paper constructs disposable labor income and capital income. Following Campbell (1987), we set $\frac{1}{1+r} = 0.99$, which corresponds to 4.04 percent interest rate on an annual basis, unless indicated otherwise.

The consumption literature is usually concerned with consumption of nondurables since expenditures on durables do not accurately reflect true consumption of durables in each period. While other works are concerned with the variability of consumption alone since they test Euler equation, this paper is concerned with the level as well as the variability of consumption and therefore nondurable consumption has to be scaled. We assume the ratio of nondurable consumption to total consumption is constant, although the ratio has declined over the period in our Korean data set as well as in Blinder and Deaton's (1985) US data set. Nondurable consumption is multiplied by the mean ratio of total consumption to nondurable consumption, which is 1.14555 for 1974:Q1 ~ 1999:Q1. We thus use total consumption and the weighted nondurable consumption in this paper.

The data are exponentially detrended throughout this paper. For the represen-

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[5] This paper uses the official translation for data description by the National Statistical Office, although they are sometimes awkward and inappropriate.

[6] Although "other households," which include "enterprises' households" and "no-occupation households", can potentially consume too much, their income data do not exist and hence are not included in this paper.

tative agent model to make any sense, the data have to be detrended since the representative agent model does not address the issue of growth when the discount rate is equal to the interest rate.[7] Even with growth in labor income, the representative agent model dictates that consumption should be a random walk without drift under the PIH. The consumption data simply reject a random walk without drift if we do not detrend it. On the other hand, detrending may cause erroneous inferences; for example, Mankiw and Shapiro (1985) show that detrending will lead to excessive rejection of the PIH when the data contain a unit root. This paper, however, constructs PIH consumption directly rather than tests the Euler equation as in Hall (1978) and Flavin (1981), and hence the erroneous inferences should not cause a problem in our approach.

First, using the Hansen-Sargent (1980) cross equation restriction methodology, PIH consumption becomes

$$c_t^e = y_t^k + \frac{r}{1+r}\left[\frac{1-\frac{1}{1+r}a^{-1}\left(\frac{1}{1+r}\right)a(L)L^{-1}}{1-\frac{1}{1+r}L^{-1}}\right]y_t^l + \frac{1}{1+r}a^{-1}\left(\frac{1}{1+r}\right)\mu,$$

using the Wiener-Kolmogorov formula in Sargent (1987), and assuming univariate labor income processes $a(L)y_t^l = \mu + \varepsilon_t$. We specify the labor income process as AR(1), AR(2) and a random walk since the Wiener-Kolmogorov formula may be sensitive to labor income specifications. The labor income series in our data set yields the following AR(1) process (estimated over 1974:Q2 ~ 1999:Q1),

$$\underset{}{y_t^l} = \underset{(0.1706)}{0.3961} + \underset{(0.0539)}{0.8741}\, y_{t-1}^l \qquad \text{s.e.e.} = 0.1670$$

and the following AR(2) process ( estimated over 1974:Q3 ~ 1999:Q1),

$$y_t^l = \underset{(0.1661)}{0.3029} + \underset{(0.1064)}{0.7143}\, y_{t-1}^l + \underset{(0.0831)}{0.1893}\, y_{t-2}^l \qquad \text{s.e.e.} = 0.1651,$$

where the standard errors are in parentheses. They imply the following PIH consumptions respectively:

$$c_t^{e1} = y_t^k + \frac{r}{1+r}a^{-1}\left(\frac{1}{1+r}\right)y_t^l + \frac{1}{1+r}a^{-1}\left(\frac{1}{1+r}\right)\mu,$$

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[7] Setting $\beta > \frac{1}{1+r}$ may be a preferable way to address the growth issue. As indicated in footnote 4, however, consumption is expected to reach the satiation level in that case. Moreover, adopting that approach would present practical difficulties such as setting unknown $\frac{u_1}{u_2}$, $\beta$ and $\frac{1}{1+r}$ arbitrarily.

and

$$c_t^{e2} = y_t^k + \frac{r}{1+r} a^{-1}\left(\frac{1}{1+r}\right)\left[y_t^l + \left(\frac{1}{1+r}\right) a_2 y_{t-1}^l\right] + \frac{1}{1+r} a^{-1}\left(\frac{1}{1+r}\right)\mu.$$

Alternatively, if we assume that the labor income series is a random walk with drift as in Mankiw and Shapiro (1985), and Stock and West (1988), the labor income series may be modeled as, for 1974:Q2~1999:Q1:

$$y_t^l = -\underset{(0.0142)}{0.0009} + y_{t-1}^l \qquad \text{s.e.e.} = 0.1709.$$

The corresponding PIH consumption is

$$c_t^{e3} = y_t^k + y_t^l - \frac{0.0009}{r}.$$

Second, we use a two-variable VAR of labor income and consumption to forecast future labor income since agents are likely to use more information than their past labor income to forecast their future labor income. Under the PIH, consumption is a forward looking variable and is likely to help to predict future labor income:

$$\begin{pmatrix} y_t^l \\ C_t \end{pmatrix} = \begin{pmatrix} \mu_1 \\ \mu_2 \end{pmatrix} + \begin{pmatrix} a(L) & b(L) \\ c(L) & d(L) \end{pmatrix} \begin{pmatrix} y_{t-1}^l \\ C_{t-1} \end{pmatrix} + \begin{pmatrix} \varepsilon_t^1 \\ \varepsilon_t^2 \end{pmatrix}$$

where the polynomials in the lag operator $a(L)$, $b(L)$, $c(L)$, $d(L)$ are all of order p, and $\varepsilon_t^1$ and $\varepsilon_t^2$ are white noises with mean zero. This can be stacked into a first-order system:

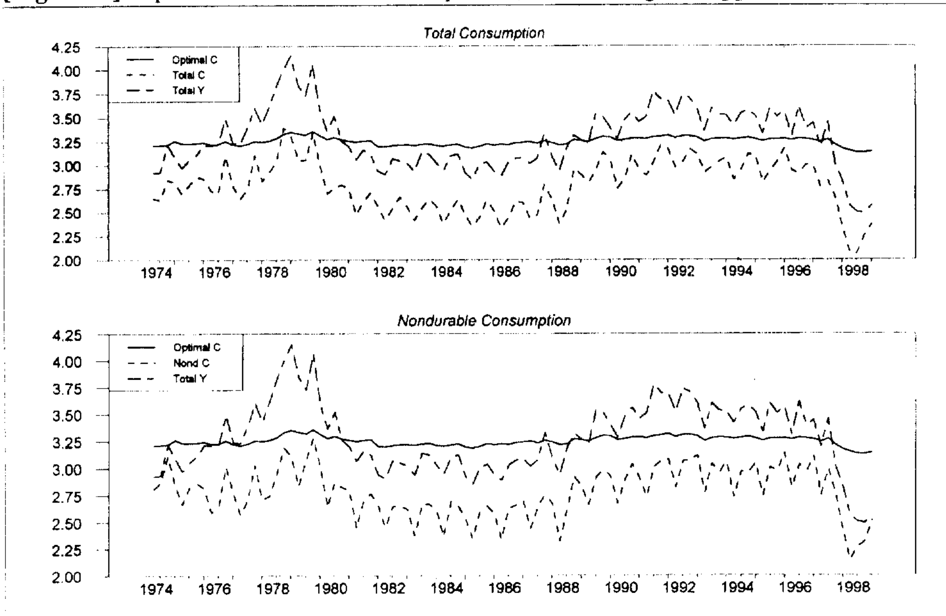
$$\begin{pmatrix} y_t^l \\ y_{t-1}^l \\ \vdots \\ y_{t-p+1}^l \\ C_t \\ C_{t-1} \\ \vdots \\ C_{t-p+1} \end{pmatrix} = \begin{pmatrix} \mu_1 \\ 0 \\ \vdots \\ 0 \\ \mu_2 \\ 0 \\ \vdots \\ 0 \end{pmatrix} + \begin{pmatrix} a_1 & \dots & a_p & b_1 & \dots & b_p \\ 1 & & & & & \\ & & & & & \\ & 1 & & & & \\ c_1 & \dots & c_p & d_1 & \dots & d_p \\ & & & 1 & & \\ & & & & & \\ & & & & 1 & \end{pmatrix} \begin{pmatrix} y_{t-1}^l \\ y_{t-2}^l \\ \vdots \\ y_{t-p}^l \\ C_{t-1} \\ C_{t-2} \\ \vdots \\ C_{t-p} \end{pmatrix} + \begin{pmatrix} \varepsilon_t^1 \\ 0 \\ \vdots \\ 0 \\ \varepsilon_t^2 \\ 0 \\ \vdots \\ 0 \end{pmatrix}$$

which can be written compactly as

$$z_t = \mu + A z_{t-1} + \varepsilon_t.$$

Let e = ( 1,0,....,0) be a 2p row vector. Then,

**[Figure 1]** Optimal vs Actual Consumption (Hansen-Sargent Approach for AR(2))




$$E(y^l_{t+i} \mid \Phi_t) = E(ez_{t+i} \mid \Phi_t) = eA^i z_t + e\sum_{j=0}^{i-1} A^j \mu.$$

Thus, PIH consumption (3) can be constructed as[8]

$$c_t^{e4} = y_t^k + \frac{r}{1+r}\, e\left(I - \frac{1}{1+r}A\right)^{-1}\left(z_t + \frac{1}{r}\mu\right).$$

Figures 1 and 2 plot constructed optimal consumption, actual consumption, and total disposable income for $c_t^{e2}$ using Hansen and Sargent (1980) cross-equation restriction approach and the VAR approach with lag 5. As expected, optimal PIH consumption is very smooth compared to disposable total income. Actual consumption, which is much more volatile than optimal PIH consumption, is less than optimal PIH consumption, which indicates that Koreans consumed too little compared to optimal PIH consumption.

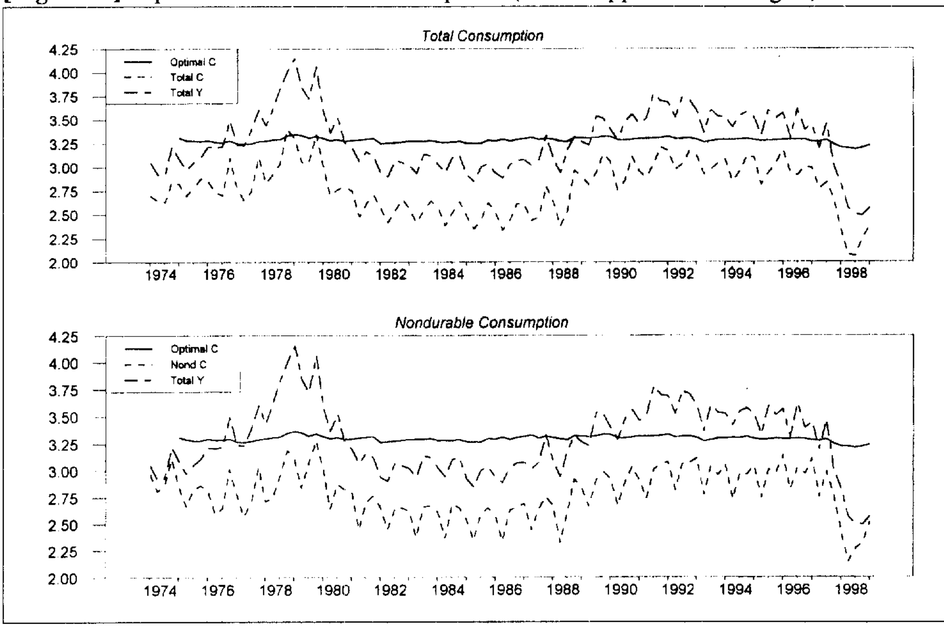
We measure the extent to which actual consumption deviates from the constructed PIH consumptions:

[8] Under the PIH, consumption is a random walk. Thus, we could estimate the VAR system with the Euler equation restriction imposed:

$$c_1 =, \ldots, = c_p = d_2 =, \ldots, = d_p = 0, \quad \text{and} \quad d_1 = 1.$$

Yet, since our consumption data is far from a random walk, the estimation with the Euler equation restriction imposed would be misleading.

**[Figure 2]** Optimal vs Actual Consumption (VAR Approach for lag=5)




**[Table 1]** Hansen-Sargent Approach

| | $E\left[\frac{C_t - c_t^e}{C_t}\right]$ | |
|---|---|---|
| | Total Consumption | W. Nondurable Consumption |
| $c_t^{e1}$ | -0.1807 | -0.1795 |
| $c_t^{e2}$ | -0.1788 | -0.1777 |
| $c_t^{e3}$ | -0.1504 | -0.1514 |

$c_t^{e1}$, $c_t^{e2}$, and $c_t^{e3}$ are constructed from AR(1), AR(2) and random walk labor income processes respectively.

$$E\left[\frac{C_t - c_t^e}{C_t}\right].$$

Table 1 shows that total consumption is 18.1% less than $c_t^{e1}$, 17.9% less than $c_t^{e2}$ and 15.0% less than $c_t^{e3}$, and the weighted nondurable consumption is 18.0% less than $c_t^{e1}$, 17.8% less than $c_t^{e2}$ and 15.1% less than $c_t^{e3}$. Table 2 computes deviations with the VAR approach with VAR lags 1,..,5. Columns 2 and 3 are regression coefficients of lagged labor income and consumption when the dependent variable is labor income. Columns 4 and 5 are regression coefficients

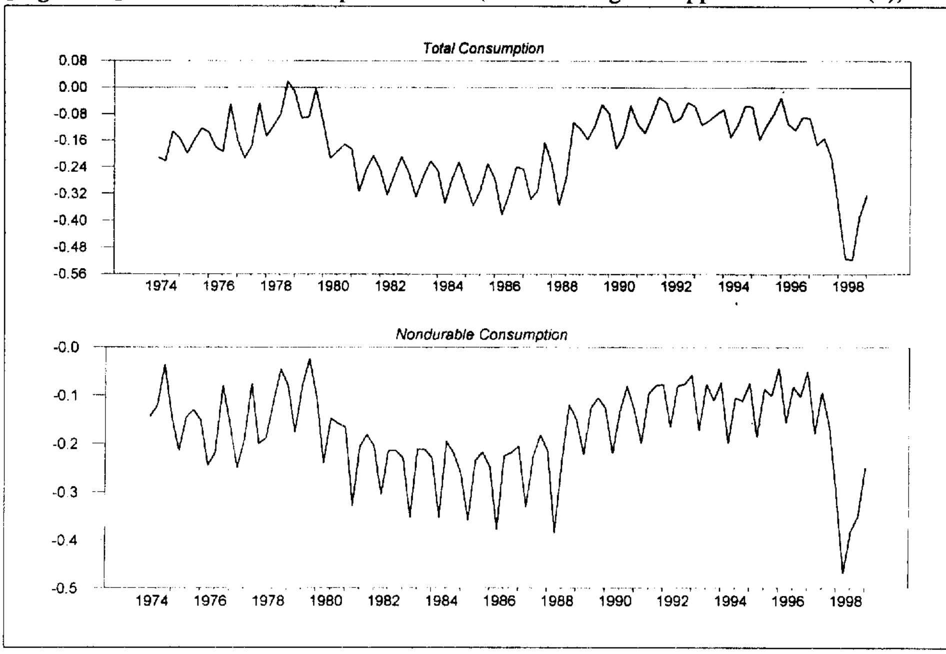
**[Table 2]** VAR approach

| | $\sum_{i=1}^{p} a_i$ | $\sum_{i=1}^{p} b_i$ | $\sum_{i=1}^{p} c_i$ | $\sum_{i=1}^{p} d_i$ | $E\left[\frac{C_t - c_t^e}{C_t}\right]$ |
|---|---|---|---|---|---|
| | | | Total Consumption | | |
| Lag=1 | 1.0409*** | -0.2103 | 0.5517*** | 0.2233 | -0.1817 |
| | (0.1304) | (0.1502) | (0.1204) | (0.1387) | |
| Lag=2 | 1.0292*** | -0.1420 | 0.4583*** | 0.3033* | -0.1724 |
| | ( 0.1563 ) | (0.1814) | (0.1477) | (0.1714) | |
| Lag=3 | 0.7043*** | 0.2929 | 0.0499 | 0.8542*** | -0.1666 |
| | (0.1678) | (0.2016) | (0.1444) | (0.1735) | |
| Lag=4 | 0.8753*** | 0.0549 | 0.0798 | 0.8292*** | -0.1646 |
| | (0.1707) | (0.2064) | (0.1530) | (0.1850) | |
| Lag=5 | 0.8304*** | 0.0355 | 0.0956 | 0.7467*** | -0.1900 |
| | (0.1606) | (0.1938) | (0.1426) | (0.1720) | |
| | | | Weighted Nondurable Consumption | | |
| Lag=1 | 1.1900*** | -0.5151*** | 0.4580*** | 0.0891 | -0.1810 |
| | (0.0879) | (0.1190) | (0.0972) | (0.1316) | |
| Lag=2 | 1.1749*** | -0.4381*** | 0.4318*** | 0.1317 | -0.1716 |
| | (0.1009) | (0.1465) | (0.1126) | (0.1636) | |
| Lag=3 | 1.1096*** | -0.2966* | 0.3732*** | 0.2779 | -0.1700 |
| | (0.1106) | (0.1680) | (0.1205) | (0.1830) | |
| Lag=4 | 1.1619*** | -0.3306* | 0.4098*** | 0.4031** | -0.1827 |
| | (0.1133) | (0.1759) | (0.1010) | (0.1567) | |
| Lag=5 | 1.0036*** | -0.2296 | 0.2478** | 0.5015*** | -0.1965 |
| | (0.1210) | (0.1794) | (0.1041) | (0.1544) | |

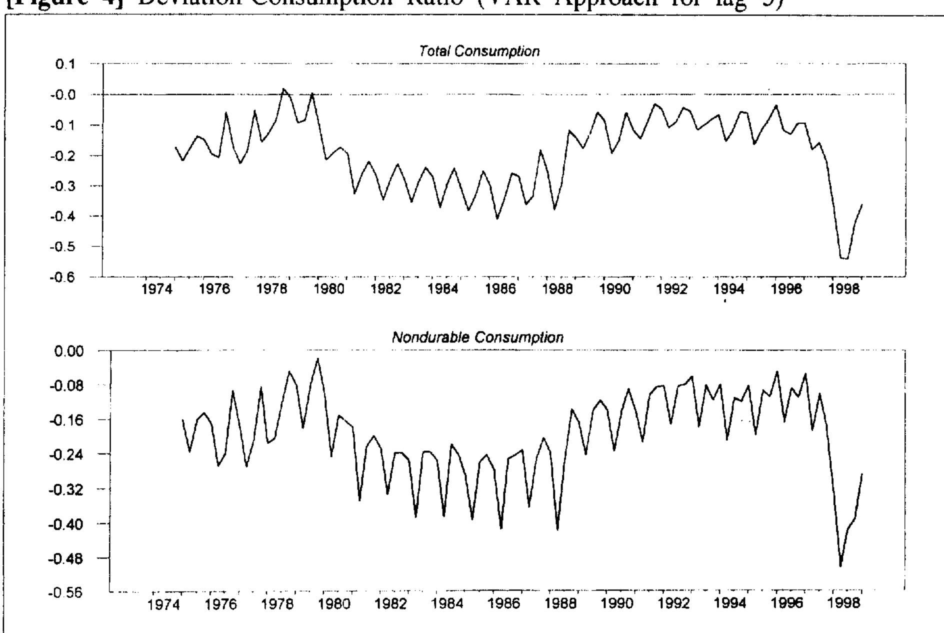
Appropriate standard errors are in parentheses. ***, ** ,* represent significance at 1, 5 and 10 percent respectively.

of lagged labor income and consumption when the dependent variable is consumption. The table presents the sums of coefficients to save space with appropriate standard errors. Past labor incomes are all significant in predicting future labor income. Past nondurable consumptions are usually significant in predicting future labor income whereas past total consumptions are not, suggesting nondurable consumptions are more likely to be forward looking than total consumption, as implied by the theory. Past labor incomes tend to predict future consumption, which suggest that Euler equation fails. Past consumption also tends to predict future consumption. Column 6 presents the deviation ratios. Deviations are -16.5%~-19.0% for total consumption, and -17.0%~-19.7% for the weighted nondurable consumption. As Kim (1996a) shows that deviations for US consumers range from -3.6% to -8.6%, Korean consumers seem to consume significantly less

[Figure 3] Deviation-Consumption Ratio (Hansen-Sargent Approach for AR(2))




[Figure 4] Deviation-Consumption Ratio (VAR Approach for lag=5)




than their permanent income.[9]

Figures 3 and 4 plot the deviation-consumption ratios for $c_t^{e2}$ using Hansen and

**[Table 3]** Deviation-Consumption Ratios for Different Interest Rates

$$E\left[\frac{C_t - c_t^e}{C_t}\right]$$

| | Total Consumption | W. Nondurable Consumption |
|---|---|---|
| For 1/(1+r) = 0.985 | | |
| Hansen-Sargent approach | | |
| $c_t^{e1}$ | -0.1808 | -0.1796 |
| $c_t^{e2}$ | -0.1790 | -0.1780 |
| $c_t^{e3}$ | -0.1608 | -0.1618 |
| VAR approach | | |
| Lag = 1 | -0.1817 | -0.1810 |
| Lag = 2 | -0.1731 | -0.1726 |
| Lag = 3 | -0.1675 | -0.1712 |
| Lag = 4 | -0.1657 | -0.1823 |
| Lag = 5 | -0.1896 | -0.1960 |
| For 1/(1+r) = 0.995 | | |
| Hansen-Sargent approach | | |
| $c_t^{e1}$ | -0.1807 | -0.1794 |
| $c_t^{e2}$ | -0.1786 | -0.1774 |
| $c_t^{e3}$ | -0.1190 | -0.1201 |
| VAR approach | | |
| Lag = 1 | -0.1817 | -0.1810 |
| Lag = 2 | -0.1716 | -0.1704 |
| Lag = 3 | -0.1656 | -0.1685 |
| Lag = 4 | -0.1634 | -0.1830 |
| Lag = 5 | -0.1905 | -0.1970 |

$c_t^{e1}$, $c_t^{e2}$, and $c_t^{e3}$ are constructed from AR(1), AR(2) and random walk labor income processes respectively.

Sargent (1980) cross-equation restriction approach and the VAR approach with lag 5. They range from -51.6% to 1.9% for total consumption and from -46.9% to -2.4% for weighted nondurable consumption in Figure 3, and from -54.2% to

[9] One reason for the difference may well be due to the age structure. Since US has a larger elderly population than Korea does and since the elderly tend to dissave rather than save for retirement, a larger elderly population in US may have caused higher consumption ratios. Finding the reasons for the difference is, however, beyond the scope of this paper, and I will examine the issue in my future research.

2.0% for total consumption and from -50.4% to -1.8% for weighted nondurable consumption in Figure 4. Figures for $c_t^{e1}$, $c_t^{e3}$, and VAR approach with other lags are very similar to Figures 3 and 4, and hence are omitted here. They all suggest that Korean consumers consumed too little compared to their PIH consumption, sometimes substantially less. Although consumption declined in 1998 due to the IMF balance of payment crisis, Figures 3 and 4 suggest that consumption should not have declined so much in 1998 if consumers had optimized their intertemporal allocations. This means that consumers may have overreacted to the IMF shock. Consumption may be less than a fully forward-looking variable, and thus may depend less on permanent income and more on current income.

For robustness tests, we set $\frac{1}{1+r}=0.985$ and $0.995$ which correspond to 6.09 and 2.01 percent interest rate on an annual basis respectively, and they do not make much difference qualitatively as shown in Table 3.

We can compute the utility loss from these deviations. In 1999:Q1, monthly households consumption was 1,474,920 won. That implies that total consumption is on average 221,828 won~280,235 won less than PIH consumption monthly. As Cochrane (1989) shows, first-order deviations with the budget constraints binding have second-order utility consequences; the utility loss of deviating from the PIH in won is bounded above by $\gamma\frac{S_t^2}{c_t^e}$ where $\gamma$ is the relative risk aversion coefficient. In our paper, $\frac{S_t^2}{c_t^e}$ is 33,363 won~53,245 won. For reasonable values such as $\gamma$=1, 5, 10, the utility loss from not consuming PIH consumption can be significant when viewed in a representative agent framework.

## V. CONCLUSION

This paper suggests a more appropriate framework to examine excessive consumption based on microeconomic principles. Consumption is excessive if consumption exceeds optimal PIH consumption. This paper demonstrates that Korean consumers consume less than their PIH consumption by 15.0%~19.7%. We, however, admit that under-consumption in Korea may have resulted from specific assumptions underlying the implementation of the PIH rather than fundamental under-consumption in Korea. Therefore, we can debate about whether or not PIH consumption formulated in this paper is the optimal consumption, but we need not debate about whether consumption should be compared with optimal consumption in discussing excessive consumption.

Our framework can be criticized in that permanent income of a representative consumer is not well represented since people retire and their labor income stops at retirement. However, the relevant question here is whether the life span of a representative agent is infinite or finite. This paper assumes that a representative agent lives forever and therefore do not have to worry about retirement. Since the data used in this paper is household data rather than individual data, this assumption may be justified as a family dynasty model. As parents retire, their children become primary income earners. Specially in Korea where the family tie is very strong, it is not uncommon for the children to support their parents who are retired. Since families live forever, savings for retirement may be less important in Korean household data. Also, households include students who should consume more than their current income since they expect higher future income, which will also decrease saving rates. If individual data is used, it would be more appropriate to assume a life-cycle model with finite life span, in which case we need to worry about retirement. Without a panel data, however, it would be difficult to carry out the analysis of a life-cycle model to compute lifetime income. The Daewoo panel data, which is the longest Korean panel data, is too short to carry out the excercise in this paper. Since the age structure of population may potentially affect my results, the next step would be to examine if the age structure of population may have biased the result against finding excessive consumption.

Why is there so much uproar against excessive consumption in Korea when the economic data indicate otherwise? First, discouraging excessive consumption of luxury goods or foreign goods is an effective trade barrier. Since most foreign goods are considered luxurious, our government's true intention may be to discourage imports. Korea has consistently protected exporting sectors at the cost of importing sectors and consumers in general. Discouraging excessive consumption may be simply another way to protect domestic industries. Protecting domestic markets has always been a popular political strategy. Second, there exists persistent myth that frugality, more saving and less consumption, is a virtue in Korea. Many critics argue that we should always consume less and save more for the good of our future generation. Yet, they ignore that consumption today also improves our welfare and that excessive saving will lead to dynamic inefficiency, which will ultimately lower our welfare.

Korea does not suffer from excessive consumption. On the contrary, we should consume more and enjoy the fruits of our hard work, while simultaneously pulling our current economy out of the IMF balance of payment crisis. Consumption in Korea is a virtue, not a vice.

## Appendix

The appendix describes how this paper constructs the data set. First, this paper classifies expenditures in *Family Income and Expenditure Survey* into disposal labor income and capital income. Labor income and capital income are computed as:

labor income = "earnings" + ( "business & subsidiarily work" + "transfer income" + "non-current income") × ("earnings"/{"earnings" + "returns from assets"})

capital income = "returns from assets"+("business & subsidiarily work"+"transfer income" + "non-current income") × ("returns from assets"/{"earnings"+"returns from assets"})

To find disposable labor income and disposable capital income, "public pension" and "social insurance" are subtracted from labor income. Since "direct tax" and "other nonconsumption expenditures" would apply both to labor income and capital income, "direct tax" and "other nonconsumption expenditures" are subtracted from labor income and capital income according to the above labor/capital income ratio. Disposable labor income and capital income are converted to real terms by dividing them by CPI for "all items."

Second, nondurable consumption must be constructed. *Family Income and Expenditure Survey* divides consumption expenditures into ten main categories: "food & beverages," "housing," "fuel, light & water charges," "furnitures & utensils," "clothing & footwear," "medical care," "education," "culture & recreation," "transportation & communication," and "other consumption expenditure." Each main category is further divided into more sub-categories. Since this data set is quarterly, this paper defines each expenditure as nondurable consumption if it is completely consumed within one quarter. They are "food & beverages," "others" under main category "housing," "fuel, light & water charges," "services" under main category "furniture & utensils," "medicines" and "fee for medical consumption" under main category "medical care", "tuition fee" and "supplemental education" under main category "education," "culture & recreation services" under main category "culture and recreation," "transportation services" under main category "transportation & communication," "tobacco" and "personal care charges" under main category "other consumption expenditure." All other expenditures include at least some durable components and hence are not included in nondurable consumption. These expenditures are converted into real terms by dividing by their respective index from CPI.

The data set for "tuition fee," "supplemental education," "culture & recreation services" and "personal care charges" starts from 1982:Q1, and hence their previous data are inferred from their respective main categories "education," "culture and recreation," and "personal care" using the 1982:Q1 ratio. Consumer price indices for each main category and sub-category start from 1975:Q1 except for "food & beverages", and hence each CPI in 1974 is inferred from CPI for "all items" using 1975:Q1 ratio of CPI for "all items" and respective CPI. CPI for "others" under main category "housing" starts from 1990:Q1 and hence this paper uses CPI for "housing" instead. There is no separate CPI for "supplemental education" and hence CPI for "other education", which includes both "supplemental education" and "teachiry material" is instead used. Lastly, this paper corrects a few obvious typos from the data set I obtained from the website.

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