Household Saving Behavior and the Effect of Income Growth: Evidence from Korean Household Survey Data

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In this paper the behavior of the household saving rate is investigated. The life-cycle hypothesis of saving is tested with pooled cross-age time series data of Korean household survey data from 1977 to 2002. The investigation reveals that real saving rates increase when the duration of life span and per household real disposable income rise, whereas they decrease when the growth rate of income and net worth-to-GDP ratio rises. The elasticities with respect to the lifetime horizon and in the growth rate of real disposable income are 0.58 and −0.03, respectively. The younger and the older age dependency ratios have insignificant effects on household saving rate behavior.

Keywords: Saving, Growth and demography, Korea

JEL Classification: D1, E21, J1

I. Introduction

The percentage of Korean population under the age of 15 years fell to 20.6 percent of the population in 2002 from 25.6 percent in 1990 and is projected to decline to 12.4 percent by 2030. At the same time, the proportion of people aged 65 and over reached 7.3

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[**Seoul Journal of Economics** 2003, Vol. 16, No. 3]

percent of the Korean population in 2000 and is projected to reach 23.1 percent in 2030. As the lifetime expectancy and the elderly population increase, Korea is entering into the class of a "rapidly aging population nation."

The rapid demographic shift in Korea is expected to raise both micro and macro-economic issues. On the microeconomic front, health care, housing, and other related services for the purpose of improving the welfare of the elderly need to be addressed. In addition, macroeconomic issues related to saving, labor productivity, and capital flows also need to receive attention.[1]

To derive the saving implications of this demographic change, the determinants of the household saving ratio in Korea are investigated using the life-cycle hypothesis of saving behavior. The life cycle hypothesis is tested with the Korean household data from 1977 to 2002. The investigation deals with an unresolved issue of the growth rate effect on the saving ratio.[2]

Five sections follow this introductory section. In section II, as a foundation for the empirical work, a simple model of the life-cycle hypothesis of household saving is presented. The role of income growth is formalized. In section III, the econometric specification and data sources are set up. The empirical results obtained using the annual household data of Korea from 1977 to 2002 are discussed in. Section IV. A summary is provided in section V.

II. Saving Rate under the Life-Cycle Hypothesis

As a foundation for the empirical work, a simple model of the saving rate under the life-cycle income theory is presented (Modigliani and Brumberg 1954).[3] Consider an individual who lives for T periods and where there are perfect capital markets. His/her utility is

[1]For research on the implications of population aging, see De Serres and Pelgrin (2002) and Heller (1999).

[2]Modigliani and Brumberg (1954) presented a positive relationship. Carroll and Weil (1994) showed the relationship between household income growth and saving is negative. Farrell (1970) concluded that the growth rate effects are not necessarily positive.

[3]More or less, the descriptions of Romer (1996, Chapter 7) are followed until the specification of life cycle/permanent income. For further details, see Weil (1989).

$$U = u(C_t) \quad u'(\cdot) > 0, \ u''(\cdot) < 0, \tag{1}$$

where $u(\cdot)$ is the instantaneous utility function and C_t is consumption in period t. The individual has net wealth of W_{t-1} which yields capital income at a rate of return, r_t, and labor income of Y_t. The individual's budget constraint is

$$\dot{W}_{tt} = r_t W_{t-1} + Y_t - C_t \tag{2}$$

It is hypothesized that he determines his consumption to maximize his utility over his lifetime. By denoting λ_t the Lagrangian multiplier on the budget constraint at time t, the first-order maximum conditions are:

$$u'(C_t) = \lambda_t \qquad \frac{\dot{\lambda}_t}{\lambda_t} = (\rho - r_t). \tag{3}$$

where ρ is time rate of discount. Assume that the consumer has time-additive isoelastic preferences given by

$$U_t = \frac{C_t^{1-\theta}}{1-\theta}, \qquad \theta > 0 \tag{4}$$

The time path of consumption is described by

$$\frac{\dot{C}_t}{C_t} = \frac{1}{\theta}(r_t - \rho), \qquad \theta = -\frac{u''(c)C_t}{u'(c)} \tag{5}$$

In the long-run equilibrium, consumption is constant. This case arises when the time rate of discount equals interest rate. For simplicity and without loss of generality, assume that the individual's time rate of discount and interest rate are equal and are zero, as done by Romer (1996, p. 310).[4] Under the assumption of zero interest rates, the equilibrium consumption over his lifetime is written in a discrete form:

[4]When the interest rate and the discount rate are not equal, the assumption would have only modest effects on the analysis in this section.

$$C_t = \frac{1}{T}\left(W_0 + \sum_{\tau-1}^{T} Y_\tau\right) \tag{6}$$

W_0 is his initial net worth and Y_T is labor income in each of the T periods of his life time.

The individual's saving in period t is the difference between income and consumption. Saving is high (low) when income is high (low) relative to its permanent-income or life-cycle income. Thus, saving is utilized to smooth the path of consumption over the consumer's lifetime. Saving is described by

$$S_t = \left(Y_t - \frac{1}{T}\sum_{\tau=1}^{T} Y_\tau\right) - \frac{1}{T}W_0 \tag{7}$$

The saving rate, s_t, is S_t/Y_t, that is,

$$s_t = \left(1 - \frac{1}{TY_t}\left(\sum_{\tau=0}^{T} Y_{t\ \tau}\right)\right) - \frac{W_0}{TY_t} \tag{8}$$

Consider three alternative schemes for forming the individual's expectation on his future income. The first scheme is forward-looking and assumes that he expects his income to grow at the current rate of growth, g, until he retires at the period $t+\omega$:

$$\sum_{\tau=0}^{T} Y_{t+\tau} - Y_t \sum_{\tau-0}^{\omega}(1+g)^\tau - Y_t\left(\frac{1-(1+g)^\omega}{-g}\right) \tag{9}$$

where ω denotes the working period of earning. According to the binomial theorem,

$$(1+g)^\omega - 1 + \omega g + \frac{\omega(\omega-1)}{2!}g^2 + \frac{\omega(\omega-1)(\omega-2)}{3!}g^3 + \cdots \tag{10}$$

Substitution of $(1+g)^\omega$ in (9) by the second order approximation of equation (10) yields:

$$\sum_{t=1}^{T} Y_t = Y_t\left(\omega + \frac{\omega(\omega-1)}{2}g\right) \tag{11}$$

In the second scheme the consumer expects his income to remain at the same level, so that $g=0$ and thus

$$\sum_{t=1}^{T} Y_t = Y_t \omega \tag{12}$$

In the third scheme, adaptive expectation, the consumer expects his income to rise at the current rate of growth, g, as it did in the past.[5] The adaptive expectation approach can be written in a simple expositional form as[6]

$$\sum_{\tau=0}^{T} Y_{t+\tau} = Y_t \sum_{\tau=0}^{\omega} (1+g)^{-\tau} = Y_t\left(\frac{1-(1-g)^{\omega}}{g}\right) \tag{13}$$

Using the second order approximation of $(1-g)^{\omega}$, the adaptive expectation can be expressed as

$$\sum_{t=1}^{T} Y_t = Y_t\left(\omega - \frac{\omega(\omega-1)}{2}g\right) \tag{14}$$

Combining of (8) and (9)-(14) leads to

$$s_t = \left(1 - \frac{\omega - \nu(\omega(\omega-1)/2)g}{T}\right) - \frac{W_0}{TY_t}, \qquad \nu = -1, 0, 1 \tag{15}$$

$\nu=-1$ denotes the case of forward looking expectation, $\nu=0$ and $\nu=1$ represent the case of static expectation and adaptive expectation, respectively. Equation (15) is the theoretical specification of life cycle income hypothesis of the individual household

[5] This could be regarded as habit-formed regressive expectation mechanism. For example, Bentzel and Berg (1983) assume that life cycle /Permanent income is a geometrically declining weighted average of past income. $Y_t^p = \sum_{i=0}^{n} \lambda^i Y_{t-1-i} = Y_{t-1} + \sum_{i=1}^{n} \lambda^i Y_{t-1-i} = Y_{t-1}$, assuming that the value of weight parameter is small enough to ignore the second term.

[6] The relation $\sum_{\tau=0}^{\omega}(1+g)^{-\tau} = (1-(1-g)^{\omega})/g$, $g/(1+g) \approx g$ are utilized.

saving rate.[7] The properties of the saving rate given in (15) are:

$$\frac{\partial s}{\partial T} = (\omega - \nu\omega(\omega - 1)g + \frac{A_0}{Y})T^{-2} = (1-s)T^{-2} > 0.$$

$$\frac{\partial s}{\partial \omega} = -(1 - \nu\omega g + \frac{\omega}{2}g)T^{\ 1} < 0 \quad \text{for} \quad \nu = -1 \text{ and } 0, \text{ and}$$

$$\frac{\partial s}{\partial \omega} = ? \quad \text{for} \quad \nu = 1.$$

$$\frac{\partial s}{\partial g} = \frac{\nu(\omega(\omega - 1)/2)}{T} < 0 \quad \text{for} \quad \nu = -1, \quad \frac{\partial s}{\partial g} = 0 \quad \text{for} \quad \nu = 0, \text{ and}$$

$$\frac{\partial s}{\partial g} > 0 \quad \text{for} \quad \nu = 1.$$

$$\frac{\partial s}{\partial Y_t} = (A_0/T)Y_t^{\ 2} > 0.$$

$$\frac{\partial s}{\partial A_0} - -(TY_t)^{-1} < 0.$$

The sign on a rise in the lifetime expectancy, T, is negative. The sign on the expected length of earning periods, ω, is negative when $\nu - -1$ and 0, as shown by Modigliani and Sterling (1983). When $\nu = 1$, it depends upon the magnitude of g and ω. The effect of a rise in the growth rate of income on the saving rate depends upon the expectation formations. This is consistent with the conclusion made by Farrell (1970) that the growth rate effects on aggregate saving are not necessarily positive. The effect of a rise in the growth rate of income on the saving rate is negative in the case where households have forward looking expectations, *i.e.*, $\nu - -1$. A rise in the growth rate of income leads to a rise in the life cycle or permanent income, and hence, it causes a reduction in the

[7]The life cycle income hypothesis is better suited to explaining individual household saving behavior than national saving which includes government saving and foreign saving.

saving rate.[8] There is no growth rate effect when the expected income is the same as the present income. The growth rate effect is positive when the adaptive expectations are used, *i.e.*, $\nu - 1$. Modigliani and Brumberg (1954) presented a positive relationship. They assume that in each year the consumer extrapolates his current income over his future earning-span.[9] If the income in the preceding period is assumed to represent the life cycle or permanent income, the transitory income equals a change in income, and thus yields a positive growth rate effect.

III. The Specification and Data Sources

A. Equation Specification

To cover the cases of fixed and variable saving rates, it is assumed that the amount saved is the sum of a fraction (α) of the current income and a fraction $(1-\alpha)$ of transitory income (which equals the current income minus life cycle income). The saving rate specification can be written as

$$s_t = \alpha + (1-\alpha)\left(1 - \frac{\omega - \nu\,(\omega(\omega-1)/2)g}{T}\right) - (1-\alpha)\frac{W_0}{TY_t}, \qquad (16)$$

If the coefficient α equals zero, equation (16) is the same as equation (15), a pure form of life cycle hypothesis of the saving rate. If α equals one, the saving rate is constant.

While the government had extensively regulated Korean financial markets, the intervention of the government has been greatly relaxed in recent years. In particular, loans by banks to individuals were very restricted. Until recently, no significant credit and mortgage loans were available to consumers. Such restrictions and imperfections in consumer loan markets are likely to raise the

[8]Carroll and Weil (1994, pp. 168-72) showed the negative growth rate effect on household saving rate. Tobin (1967) also showed the negative correlation between aggregate growth and saving. For a comprehensive discussion on the growth and saving, see Carroll and Weil (1994).

[9]See Modigliani (1986) for summarized description of life-cycle hypothesis. Modigliani (1966) presented a positive ralationsip. For counter-argument, see Russell (1977).

household saving rate.[10] To incorporate this effect, a measure of the restriction on loans by banks to households is introduced. Outstanding loans of commercial banks to the household sector as a proportion of Korean gross domestic product (GDP) is considered here to be a proxy for such imperfections.[11] The information on net worth of an individual age group is unavailable.[12] We utilized the net worth of the individual sector of the economy as reported by the Bank of Korea. In addition, the saving rate of individuals at a higher per capita income level would be higher than at a lower per capita income level. Hence, we introduce per household real disposable income as a determinant of household saving behavior. The age interval is a period of five years beginning from 25 years age up to 54 years old. However, there are two distinct groups; 24 years old and below, and 55 years old and above. These two groups differ from the other groups in terms of the age interval. Since the group of 24 years age and below is the young dependency group, it is expected for the young dependency group to have a saving rate lower than the average saving rate of the households. The group of 55 years and above is the old dependency group and is expected to have a saving rate lower than the average saving rate, according to the life cycle hypothesis. To capture possible differential age-fixed effects, we introduce two dummy variables, *i.e.* $D24$, and $D55$ for the group of age 24 and below, and age 55 years and above, respectively.[13]

The proposed econometric specification takes into account the determinants from the life-cycle saving rate hypothesis and the other determinants we have introduced: the imperfections in consumer loan markets, per capita income level, and the two dummy variables. It is specified in a linear form:

[10]See Deaton (1991), Jappelli and Pagano (1989), and Zeldes (1989) for detailed discussions on the role of capital market imperfections.

[11]Bentzel and Berg (1983) and Collins (1994) use a similar credit-to-GDP ratio for the study of the saving rate in Sweden and Korea, respectively.

[12]The National Statistical Office, *Annual Report on the Family Income and Expenditure Survey* does not include net worth or asset holding information by ages. It seems no such data are available in Korea.

[13]The dummy variables representing for possible differential effects of individual age groups from the 25 years to 54 years were found to be insignificant factors.

$$s_{jt} = \beta_1 + \beta_2 T_{jt} + \beta_2 g_{jt} + \beta_4 \frac{W_t}{GDP_t} + \beta_5 \frac{LB_t}{GDP_t} + \beta_6 Y_{jt} + \beta_7 D24_t + \beta_8 D55_t \qquad (17)$$

In (17), s_j is real saving per unit of the household's real disposable income for age group j, T_j is the years of lifetime horizon of the household, which is the nationwide average life expectancy minus the mean age of age group j, g_j is the growth rate of the household's real disposable income, and Y_j is the household's real disposable income.[14] W is real net worth of the individual sector of the economy at the beginning of the period; LB is real loans outstanding of commercial banks to the individual sector of the economy; $D24$ is the dummy variable for the 24 year and under age group, *i.e.*, 1 for this group and 0 for other age groups; $D55$ is the dummy variable for the 55 year and older age group.

B. Data Sources

The primary sources of the data are *the Annual Report on the Family Income and Expenditure Survey*, and www.nso.go.kr of the National Statistical Office (NSO); *National Accounts*, and *Flow of Funds Accounts in Korea* published by the Bank of Korea. The Korean average life expectancy data are from the NSO's *Major Statistics of the Korean Economy*, *Korea Statistical Yearbook*, and www.nso.go.kr, while the mean ages of each individual age group are from the NSO's *Annual Report on the Family Income and Expenditure Survey*. The lifetime horizon of an age group is the difference between the Korean average life expectancy and the mean age of each individual age group. The nominal net worth of the individual sector and the loans of commercial banks to the individual sector are from the Bank of Korea's *Flow of Funds Accounts in Korea*. The household's real net worth is the nominal net worth of the individual sector divided by the implicit GDP price deflator, and real bank loans are nominal bank loans outstanding divided by the implicit GDP deflator.

C. Household Saving Ratios

The eight different age groups, 24 years and below, 25-29 years,

[14]Time subscript is dropped in the text.

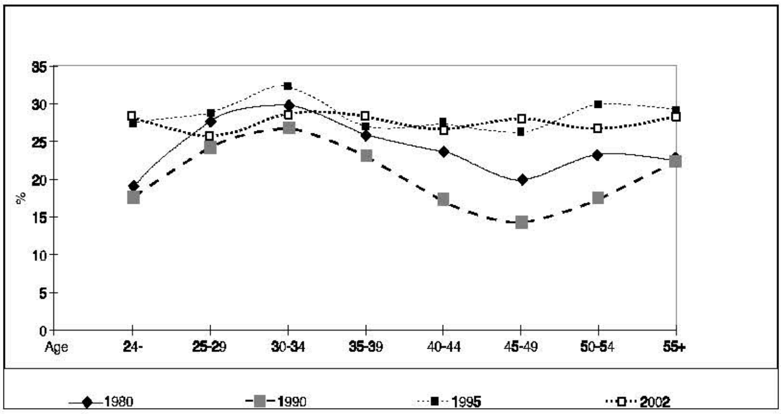

CHART 1

REAL SAVING RATES OF KOREAN HOUSEHOLDS BY AGES

30-34 years, 35-39 years, 40-44 years, 45-49 years, 50-54 years, and 55 years and above are considered based on the breakdown in the National Statistical Office, *Annual Report on the Family Income and Expenditure Survey*.[15] Real disposable income and consumption are obtained by dividing the nominal disposable income and consumption by the implicit GDP deflator and consumption deflator, respectively.[16] The real saving is the difference between the real disposable income and the real consumption, and the saving rate is the ratio of the real saving to the real disposable income.

Chart 1 shows the trend of household saving rates by age groups over time. The Korean household saving rates appear to be humped shaped.[17] The saving rates in the four age groups covering the ages

[15]Since the mean ages of the group of 55 years and older are in the range of 58 to 60 years old, we regard this group as the age group of 55-64 years. It would have been more informative if the age group of 55 years and older were broken down further into several different age groups, for example, the ages of 55-59 years, 60-64 years, 65-69 years, and 70 years and older.

[16]Household income data contains regular income—labor income, business income, asset income and transfers—and non-regular income—retirement allowance and gifts. The household's non-labor income is very small.

[17]Hump phenomenon also is reported to have occurred in Japan. See

from 30 to 49 years are higher, around 28 percent, while the saving rates for the younger and elderly groups are lower, about 24 and 25 percent, respectively. The saving rate of the age group of 55 years and above is slightly higher than the saving rate of the age group of 50-54 years, particularly in the recent years. The higher saving rate, contrary to what would be expected according to the life-cycle hypothesis, appears to be a reflection of Korean retirement plans which allow retirees to receive a lump sum payment at the time of their retirement.[18] In addition, the persons in the ages of 55 years and older realize the need for more saving for the future, as they believe that their life expectancy is longer.[19]

IV. Empirical Results

Equation (17) was estimated with the pooled cross-age section time series annual data of the Korean household sector between 1977 and 2002. The preliminary regression finding was that the ratio of bank loans to GDP, (LB/GDP), was insignificant.[20] Regressions were run with and without the variable. It was found that the estimated equations had a low Durbin-Watson statistics. This is perhaps not surprising, as our specification probably exclude many institutional factors affecting the behavior of household saving rates.[21] However, the overall results are very satisfactory.

Table 1 presents four regressions. The saving rate with a one

Horioka (1990), and Takayama and Kitamura (1994).

[18]The lump payment is a legal option. See Hyun and Cho (2000) for Korean corporate retirement system.

[19]In the presence of lifetime uncertainty, individuals want to undertake precautionary wealth accumulation. In this case, the saving rate would not be negative among retirees. See Abel (1985), Caballero (1991), Hayashi and Ando (1988), and Yaari (1965). Additional explanations include a bequest motive. See Bernheim, Shleifer, and Summers (1985).

[20]The variable with a lag of one year was tried, but no significant coefficient estimates were obtained. Also, the consumer loans by financial institutions yielded very insignificant coefficient estimates. Collins (1994, p. 243) used the growth in domestic credit to GDP as an indicator of consumer credit constraints, and reported no significant relationship between the national saving rate and the variable.

[21]Because of data limitation, the variability in income to capture the effect of income uncertainty on saving rates, as advanced by Carroll (1994), and Skinner (1988) was not introduced.

TABLE 1
HOUSEHOLD SAVING RATE EQUATIONS

Eq. No.	1.1	1.2	1.3	1.4
Constant	10.3	10.1	4.77	22.7
	[8.67]	[8.64]	[4.16]	[24.3]
T	0.45	0.45	0.31	
	[13.3]	[13.2]	[9.51]	
G	−0.13	−0.13	−0.03	−0.11
	[5.91]	[5.96]	[1.41]	[3.82]
W/GDP	−13.6	−14.5	−11.9	8.83
	[4.27]	[4.77]	[4.62]	[2.62]
LB/GDP	−4.81			
	[0.91]			
YD	0.51	0.51	0.36	−0.11
	[5.19]	[5.15]	[4.21]	[0.95]
D24	−7.62	−7.62	−5.19	−2.61
	[8.74]	[8.76]	[6.64]	[2.44]
D55	7.26	7.23	4.87	−1.39
	[7.75]	[7.73]	[5.86]	[1.51]
s(−1)			0.44	
			[9.12]	
Adj R^2	0.55	0.55	0.68	0.17
SEE	3.16	3.17	2.66	4.32
DW	1.01	1.02	1.72	0.63

Note: Figures in [ ] are t-statistic.

year time lag was tried to estimate a rate of adjustment of the saving rate. The coefficient estimates of the one year lagged saving rate variable, about 0.45 in equations (1.3), indicates that the adjustment of the saving rate is slow. All the variables have expected signs of their coefficient estimates. The coefficient estimates of the variables other than the ratio of the bank loan to GDP are highly significant. Other things being equal, the coefficient estimates for the lifetime horizon, T, indicate that a longer lifetime horizon raises the saving rate of the household. Hence, all other things being equal, the saving rates of the younger age households are higher than the saving rates of the older age households. The duration of lifetime expectancy is a demographic factor in the specification. Empirical studies on saving rates that used the lifetime horizon as a determinant have not been found. To check its robustness, the F statistics (162) from equations (1.3) and (1.4) was computed. This statistics exceeds the critical value of $F_{(1,201)}$

ratio at one percent level of significance, 6.85, rejecting the null hypothesis that the coefficient of T variable is zero. Hence, the lifetime horizon variable is one of the most statistically significant determinants of the saving rate.

The sign on the growth rate of per household real disposable income is consistently negative.[22] The result of a negative growth rate effect differs from the finding of Collins (1994) that the national saving-GDP ratio in Korea is positively correlated with unanticipated growth in real income. Collins (1994) inferred that Koreans regarded current income growth as transitory income.[23] In the period from 1989 to 2002, which is beyond the sample period of Collins's regression, the Korean economy has continued to maintain high growth rates. Koreans may have taken an optimistic view about future and hence lowered their saving rates.[24] This suggests that the households calculate their life cycle income in a forward-looking manner.

A rise in the ratio of the real net worth per GDP is found to reduce the saving rate, as expected. The household real disposable income has a positive effect on the saving rate, namely, as real income per household is higher, households save proportionally more than what would be when their income were low. The coefficients of two dummy variables are statistically significant. $D24$ has a negative coefficient and the saving rate of the age group of 24 years and under is lower than the average saving ratio. This is what would be expected from the life cycle hypothesis. $D55$ has a positive coefficient. This would reflect the individual decision to

[22]Meredith (1995) reported a negative growth rate effect in the case of Japan. Fry and Mason (1982) argued that the sign on the effect of the growth rate on aggregate saving rate is either positive or negative. If saving were concentrated among younger (or older) households, the effect would be positive (or negative). Fry and Mason found a positive effect on the national saving rates, using the pooled cross country time series data of seven Asian developing countries, Burma, India, Korea, Malaysia, Philippines, Singapore and Taiwan in the sample period of 1962-72. Most studies for OECD countries appear to suggest that the coefficient estimates on growth rate variables are unstable, and the signs on these estimates also vary. See Graham (1987, 1989) and Koskela and Viren (1989).

[23]Collins (1988, p. 344), stated that "current income is negatively related to income in the previous 2 years" The interpretation of this result is that high current income is viewed as transitory.

[24]Campbell (1987) showed that anticipated rises in income lower saving rates.

TABLE 2
LONG-RUN ELASTICITIES OF HOUSEHOLD SAVING RATE

Eq. No.	2.1	2.2	2.3
T	0.58	0.58	0.72
G	−0.03	−0.03	−0.01
W/GDP	−0.28	−0.30	−0.44
YD	0.33	0.33	0.41

Note: Long run elasticities are at the sample mean values.

save more for precautionary purpose as retirement nears, to receive the lump sum payments at the time of retirement, and to save in order to make bequests to their children and for services rendered by beneficiaries.[25]

Table 2 summarizes the respective elasticities of saving rates with respect to a change in each individual determinant computed at its sample mean, using the coefficient estimates from equations (1.1-1.3). The discussion here uses the elasticities computed from equation (1.2). The elasticities with respect to the lifetime horizon and in the growth rate of real disposable income are 0.58 and −0.03, respectively. A one percent rise in the net worth to GDP ratio reduces the saving rate by 0.3 percent. On the other hand, a one percent rise in per household real disposable income increases the saving rate by 0.33 percent. The household saving rates appear to be inelastic to a change in the determinants, and this reflects the relatively stickiness in adjusting the saving rate by households.

V. Summary

The saving rate hypothesis has been tested with the Korean data of cross-age pooled time series data over the period of years, 1977-2002. The empirical results suggest that the patterns of the Korean household saving rates are consistent with the life-cycle hypothesis. The elasticities with respect to the lifetime horizon and the growth rate of per household income are 0.58 and −0.03, respectively. A one percent rise in the net worth to GDP ratio

[25]See Hayashi and Ando (1988) for precautionary motive, and Weil (1994) for bequest motive. Also, see Bernheim, Shleifer, and Summer (1985) for strategic bequest motive.

reduces the saving rate by 0.3 percent. A one percent rise in per household income increases the saving rate by 0.33 percent.

It is found that the growth rate effect on the household saving rate is consistently negative. During the sample period, Koreans are better informed, as the economy has become more globalized. As the economy has continued to maintain high growth rates, Koreans take an optimistic view about the future and hence have lowered their saving rate.

(*Received 5 February 2004; Revised 28 April 2004*)

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