

# LECTURE NOTE (5): AGING AND CONSUMPTION

Economics of Aging

# Motivation

- Aging, consumption, and saving
- Life Cycle Hypothesis
  - Consumption smoothing phenomenon
  - Saving before retirement and use it for consuming after retirement
- Is it true? Do we have evidences?
- Understanding consumption pattern → firm's marketing strategy

## Previous relevant works

- Retirement-consumption puzzle
  - Consumption after retirement is drastically decreasing, which contradicts with Life-Cycle Hypothesis.
  - Banks, Blundell, and Tanner(1984): Unanticipated shocks
  - Carroll(1994): Uncertainty of retirement time
- What about saving?
  - Danziger et al.(1982): MPC of the elderly is lower than other population groups
- The clue? Decision on optimal timing of retirement and expectation of living year

## Interaction of consumption pre and post retirement

- Hamermesh(1984): the longer life expectation, the less consumption after retirement
- What about considering decision on optimal retirement timing and on economic activity of pre and post retirement at the same time?
- Feldstein(1974): Asset Substitution effect vs. Induced Retirement effect
- Diamond and Hausman(1984): the effect of early retirement on savings and labor supply before retirement

# Data analysis on aging and consumption of Korea

- Data: Korea Labor and Income Panel Study(KLIPS)
- Income and consumption
  - Income: only permanent income is considered
  - Consumption: monthly consumption of household
- Utilization of household equivalence scale

(단위: 만원, %)

	1997	1998	1999	2000	2001	2002	증가율	
							전기간	연평균
소득	75.40	76.51	81.85	84.79	100.48	101.44	34.53	6.11
소비	58.02	52.64	57.08	59.01	65.06	68.52	18.10	3.38

주: 전체 관측수는 1,283가구임.

출처: 인구고령화와 거시경제, KDI(2004)

# Effect of aging on income and consumption

- Classification of household per age on 1<sup>st</sup> wave
  - 1<sup>st</sup> group: 45~50 (313 households)
  - 2<sup>nd</sup> group: 50~54 (256 households)
  - 3<sup>rd</sup> group: 55~59 (241 households)
  - 4<sup>th</sup> group: 60~64 (201 households)
  - 5<sup>th</sup> group: above 65 (272 households)
- Trend of consumption and income of each group might be investigated.

# Effect of aging on income and consumption cont.

- Pattern of consumption and income of each group

(단위: 만원, %)

	인구 집단	1997	1998	1999	2000	2001	2002	증가율		관측수
								전기간	연평균	
소득	1	95.78	92.86	99.72	106.63	124.65	136.31	42.32	7.31	313
	2	95.22	91.82	103.60	106.06	126.22	129.77	36.29	6.39	256
	3	80.71	80.88	84.84	85.51	109.57	103.61	28.37	5.12	241
	4	62.77	63.27	68.96	74.90	90.01	78.33	24.79	4.53	201
	5	37.93	49.21	47.69	46.30	48.12	49.79	31.28	5.59	272
소비	1	69.74	63.44	71.76	76.61	85.24	91.64	31.39	5.61	313
	2	69.27	61.29	66.80	71.61	78.82	83.22	20.13	3.74	256
	3	59.56	52.94	57.84	54.97	62.03	64.38	8.09	1.57	241
	4	51.96	47.72	49.63	49.31	55.11	56.15	8.09	1.56	201
	5	37.05	35.43	35.85	37.63	38.91	40.91	10.40	2.00	272

주: 1차연도 조사당시 가구주 연령이 45~49세인 가구가 가구집단 1임.

출처: 인구고령화와 거시경제, KDI(2004)

- Comparison of group 1 vs. group 5
- The older, the less consumption

# Effect of aging on income and consumption cont.

- What about the retirement household? (출처: 인구고령화와 거시경제, KDI(2004))

(단위: 만원)

		은퇴 연도				
		1998	1999	2000	2001	2002
소득	은퇴 전	92.34	120.21	66.00	71.38	68.31
	은퇴 후	80.43	94.32	72.99	48.83	95.90
소비	은퇴 전	65.87	65.50	50.12	47.67	47.67
	은퇴 후	60.67	62.70	53.80	47.49	58.24
가구수		42	34	26	26	38

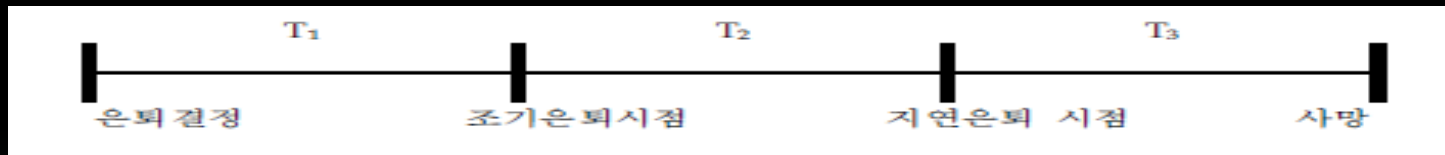
- Any consistent pattern? If not, what is the reason of it?
- Ratio of consumption and income pre and post retirement? (출처: 인구고령화와 거시경제, KDI(2004))

	평균	표준편차
은퇴 전후 소득비율(IRATIO)	0.942	0.452
은퇴 전후 소비비율(CRATIO)	1.006	0.343
은퇴 후 소비 / 은퇴 전 소득	0.791	0.369



# Early retirement and consumption

- Intuition: early retirement → less consumption and more saving for preparing longer rainy days
- Hypothesis 1: the early retirement induces consumption to decrease.
- Hypothesis 2: the early retiree's marginal propensity to consume is smaller than that of the late retiree.
- Timing: 3 periods model (출처: 인구고령화와 거시경제, KDI(2004))



- Estimation equation

$$I_i^* = d + \beta_1 C_{ER,i} + \beta_2 C_{LR,i} + z_i \gamma - u_i > 0$$

$I_i = 1$ , 만일  $I_i^* > 0$ : 조기은퇴

$I_i = 0$ , 만일  $I_i^* \leq 0$ : 지연은퇴

- $E(C_{ER} | K_1, \varepsilon < X\eta) = E(C_{ER} | K_1) - \lambda_1 M_1$
- $E(C_{LR} | K_2, \varepsilon > X\eta) = E(C_{LR} | K_2) + \lambda_2 M_2$

$\lambda_1 > 0, \lambda_2 < 0 \rightarrow$  neg. bias

$\lambda_1 < 0, \lambda_2 > 0 \rightarrow$  pos. bias

## Early retirement and consumption cont.

- Data: KLIPS
- Variables (출처: 인구고령화와 거시경제, KDI(2004))

PRECONS	은퇴 전 소비
POSTCONS	은퇴 후 소비
AGE	1998년 당시 연령
SEX	성별(1=남성)
EDU	교육연수
NUM	부양가구원수
BADHEAL	건강상태(1=나쁨)
SSEC	국민연금가입여부(1=가입)
PREINC	은퇴 전 소득(소비자물가지수, 가구원수가중치 이용하여 조정)
POSTINC	은퇴 후 소득(소비자물가지수, 가구원수가중치 이용하여 조정)
INC_ER	조기은퇴시 생애 월평균 소득
INC_LR	지연은퇴시 생애 월평균 소득
IND	1998년 현재 속한 직업의 산업구분(1 = 제3차 산업)
SAMU	사무직 여부(1=사무직)
SELF	자영업 여부(1=자영업)

- Assumptions
  - Perfect information on future income level
  - Life expectancy is 85.
  - S/he early retires on 55 and retires late on 60.

## Early retirement and consumption cont.

- Estimation results
  - Retirement equation (출처: 인구고령화와 거시경제, KDI(2004))

	조기은퇴 = 1		
	계수값	표준오차	한계효과
C	55.7814	13.5988 ***	5.8394
AGE	-0.9068	0.2117 ***	-0.1018
SEX	2.3527	1.4679	0.2449
EDU	0.0024	0.0870	-0.0012
NUM	-0.1878	0.2178	-0.0396
BADHEAL	1.5713	0.9468 *	0.1452
INC_ER	21.1915	13.0492 *	0.8116
INC_LR	-21.6304	13.3039 *	-0.8407
SSEC	-1.3450	0.6659 **	-0.1578
IND3	0.6468	0.7881	0.0752
SAMU	0.3202	0.7944	0.0383
SELF	-.6279	1.0201	-0.0630
Log Likelihood	-16.1683		

주: \*, \*\*, \*\*\*: 10%, 5%, 1% 수준에서 유의함.

- SSEC has negative coefficient, and any implications?

## Early retirement and consumption cont.

- Estimation result of consumption equation (출처: 인구고령화와 거시경제, KDI(2004))

	log(PRECONS)		Log(POSTCONS)	
	조기은퇴	지연은퇴	조기은퇴	지연은퇴
Constant	2.9559 (1.8578)	1.4487 (0.8858)	3.8506 ** (1.5773)	0.8577 (0.5687)
AGE	-0.0237 (0.0339)	-0.0065 (0.0128)	-0.0331 (0.0288)	0.0104 (0.0082)
SEX	-0.1637 (0.2264)	0.0954 (0.1394)	0.0881 (0.1966)	-0.1486 * (0.0895)
EDU	0.0188 (0.0167)	0.0121 (0.0121)	0.0202 (0.0145)	0.0140 * (0.0078)
NUM	-0.0419 (0.0431)	-0.0218 (0.0278)	-0.0191 (0.0371)	0.0262 (0.0178)
BADHEAL	0.2286 0.1488	-0.0139 (0.1138)	-0.0588 (0.1269)	-0.0495 (0.0731)
INC_ER	0.5894 *** 0.1147		0.4384 *** (0.0987)	
INC_LR		0.6636 *** (0.0810)		0.5485 *** (0.0520)
Lambda	0.3190 * (0.1784)	0.1526 (0.1413)	0.0329 (0.1677)	-0.0958 (0.0908)
<i>Adj. R<sup>2</sup></i>	0.4619	0.7022	0.5741	0.7988
N	43	59	43	59

주: \*: 10%, \*\*: 5%, \*\*\*: 1% 수준에서 유의함.

- Implication on Lambda: there exists negative selection bias
- Income elasticity
  - Early vs. late = 0.59:0.66 on pre retirement
  - Early vs. late = 0.44:0.55 on post retirement