



Baby-Boomers' Investment in Social Capital: Evidence from the Korean Longitudinal Study of Ageing

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Life and public policy in an ageing society

Korea and other industrialized countries are rapidly ageing.

Baby-boomers have reached the retirement age, and unprecedented numbers have been retiring in recent years.

Providing and ensuring high quality of life for them is a challenge for working-age population and for government.

Infrastructure meeting the needs of the retiring baby-boom generation is presently missing. This is not limited to financial assistance or healthcare. Recent years have seen many reports of the elderly who are deprived on various fronts, isolated, excluded from social life, and disempowered to help themselves. Grievances, resentment, intergenerational conflicts, crime and suicides have resulted.

The challenge is to assist the elderly in making efficient use of their own available resources, and to aim policies and public resources at the dimensions of their living conditions where the interventions have the highest impacts.

Importance of social capital

Commonly thought as the third source of human capabilities, beside human(-embodied) capital, and physical capital.

Includes social skills, personal and professional club memberships, extent and intensity of friendships and networks, trust in community and institutions (useful in particular social contexts).

Factor affecting various lifetime economic and social achievements.

Important (intermediate) outcome and itself a component of life satisfaction.

Among the Korean elderly, social capital is an essential factor on the path to achieving various economic, social and health goals, and a component of their welfare.

Key questions

How can we measure *individuals'* social capital, and what are its dimensions?

What is the distribution of social capital across demographic groups? Are there particular disparities? Who are the disadvantaged groups?

What is the relevance of social capital to, say, life satisfaction?

What determines the investment in social capital by the Korean elderly?

What is the relationship between their acquisition of physical, human and social capital?

How could welfare of the elderly be improved by targeted policy interventions without stretching public resources?

Theoretical model

Capital acquisition literature suggests that individuals maximize the benefits of investment net of its costs at the margin, subject to a dynamic law of motion.

$$U_{it} = \sum_{j=t}^{T_i} \beta_i^{j-t} \{S_{ij} R(S_{ij}, S_{-ij}, H_{ij}) - w_{ij} I_{ij} C(I_{ij}, I_{-ij}, S_{-ij}, K_{ij})\}$$

$$\text{s.t. } S_{it} = (1 - \delta_{it}) S_{it-1} + I_{it-1}$$

$$I_{it}^* = \operatorname{argmax}\{U_{it} | I_{t-1}, I_{t-2}, \dots\}$$

Under some assumptions about the return & cost of investment, this leads to an estimable linear equation (in log-log form):

$$I_t^* = \alpha_1 \overset{+}{I_{-it}} + \alpha_2 \overset{-}{S_t} + \alpha_3 \overset{+}{S_{-it}} + \alpha_4 \overset{+}{K_t} + \alpha_5 \overset{+}{H_t} + \alpha_6 \overset{+}{w} + \alpha_7 \overset{+}{\beta} + \alpha_8 \overset{-}{\delta} + \alpha_9 \overset{+}{(T-t)} \\ + \alpha_{10} \overset{+}{\beta} \overset{-}{(T-t)} + \alpha_{11} \overset{+}{\delta} \overset{-}{(T-t)} + \alpha_{12} \overset{+}{\beta} \overset{-}{\delta} \overset{+}{(T-t)} + \varepsilon_t$$

Glaeser, Laibson & Sacerdote (2002), An Economic Approach to Social Capital, Economic Journal.

Testable hypotheses

$$\partial I_t^* / \partial (T - t) > 0$$

$$\partial I_t^* / \partial \beta > 0$$

$$\partial I_t^* / \partial \delta_t < 0$$

$$\partial I_t^* / \partial w_t < 0$$

$$\partial I_t^* / \partial R \times \partial R / \partial S_t < 0$$

$$\partial I_t^* / \partial R \times \partial R / \partial H_t > 0$$

$$\partial I_t^* / \partial C \times \partial C / \partial K_t > 0$$

$$\partial I_t^* / \partial R \times \partial R / \partial S_{-it} + \partial I_t^* / \partial C \times \partial C / \partial S_{-it} > 0$$

$$\partial I_t^* / \partial C \times \partial C / \partial I_{-it} > 0$$

Empirical issues and identification strategy

Individuals' social capital & their investment in it are unobservable

- > Principal component analysis

Relationships between individuals' characteristics and social capital are potentially complex, and not smooth

- > Kernel density estimation

Latent and omitted variables

- > PCA of explanatory variables (pre-existing stock of social capital)

- > Various measures of explanatory variables, control variables

- > Regressions with individual-level fixed effects

Endogeneity

- > Control variables to ensure fully-specified models

- > Explanatory variables in lagged form

Data

Korean Longitudinal Study of Aging (KLoSA) covers health-related, economic, social and emotive aspects of the lives of 45+ year-olds.

Waves 1-4 for 2006, 2008, 2010, 2012 (& 2014)

10,000+ people aged 45+ from 6,000+ families and from across the Korean society

Through sampling stratification and population weights, sample represents 15+ million baby-boomers.

Results 1:

Measurement of social capital

Components of social capital (stock):

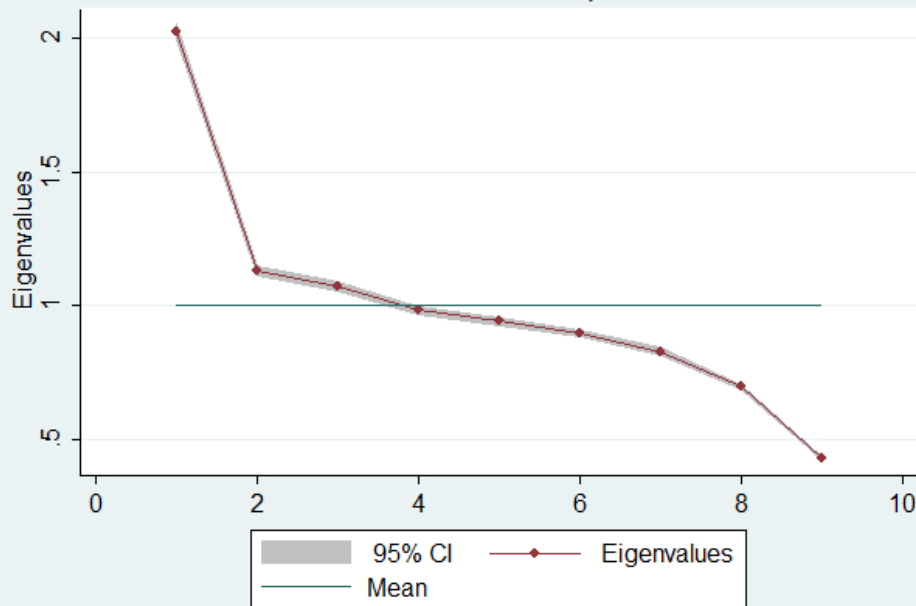
- How often you meet your peers
- What type of groups you participate in & how frequently (or none)
- Amount of money you lent to/borrowed from someone
- Guarantor of debt for relatives/friends/or others
- Faith in the country to assist you in your old age
- Expectations over your future economic status
- Marital status

Components of social capital investment (flow):

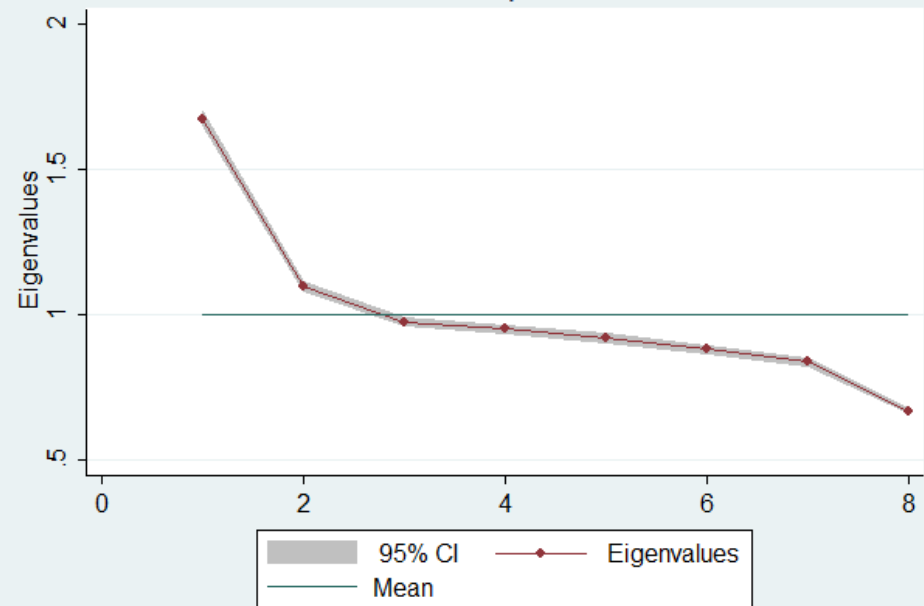
- How often you meet your peers
- What type of group you participate in & how frequently
- How frequently you meet/contact your children
- How frequently you participate in cultural events (movies/performances/concerts/sports)?
- Time spent participating in groups or programs for hobby or for fun
- How frequently you volunteer
- Faith in the country to assist you in your old age
- Expectations over your future economic status

Scree plots of eigenvalues: portions of sample variance captured by individual factors

PCA: Social Capital



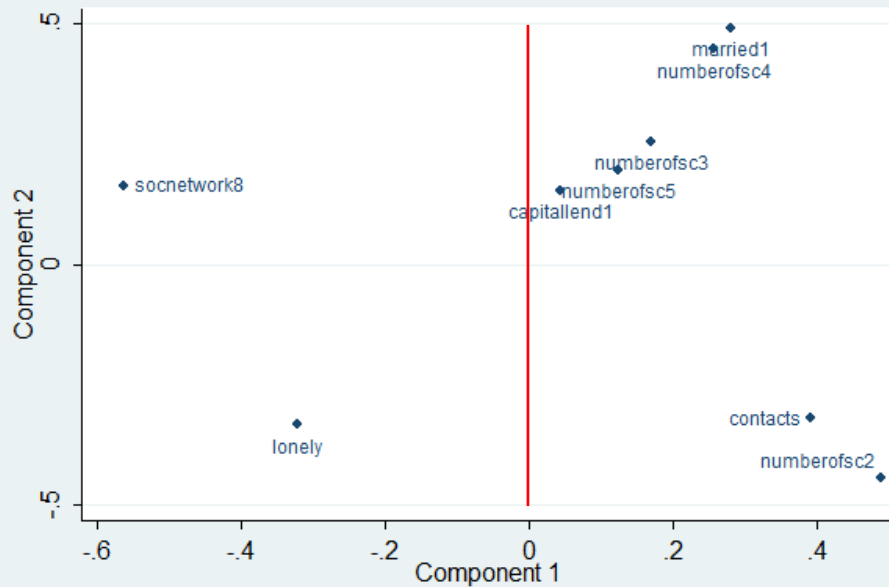
PCA: Social Capital Investment



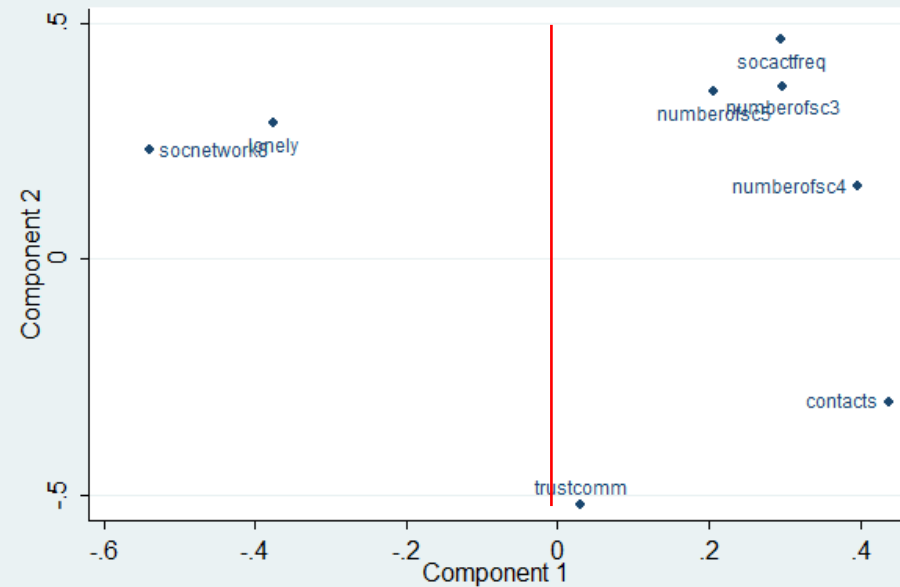
The first factor is superior to following factors at capturing variation in social capital as evidenced by the observable variables, using a single dimension. However, up to 8 and 10 factors could be used respectively to distinguish various dimensions of social capital.

Variable loadings

PCA: Social Capital

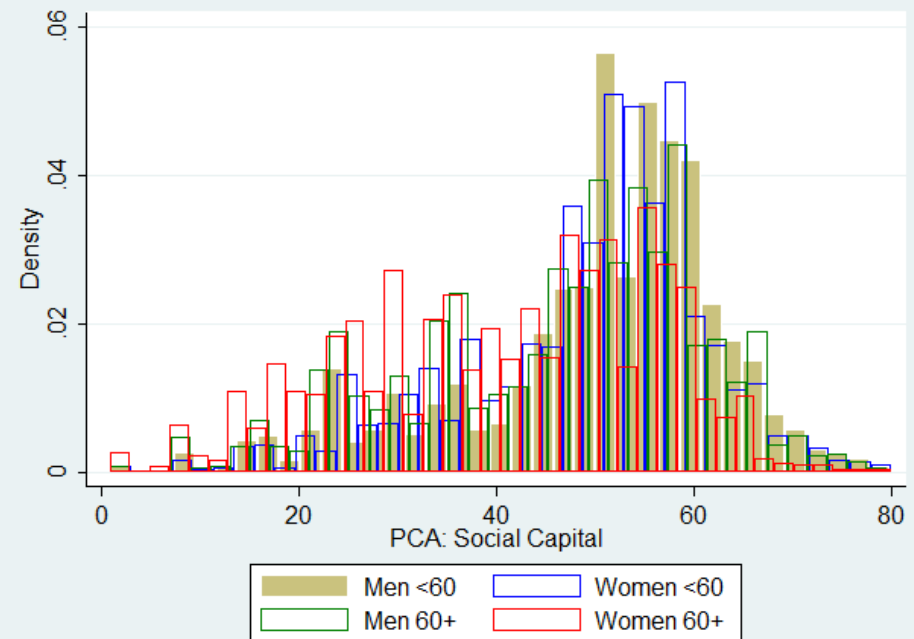
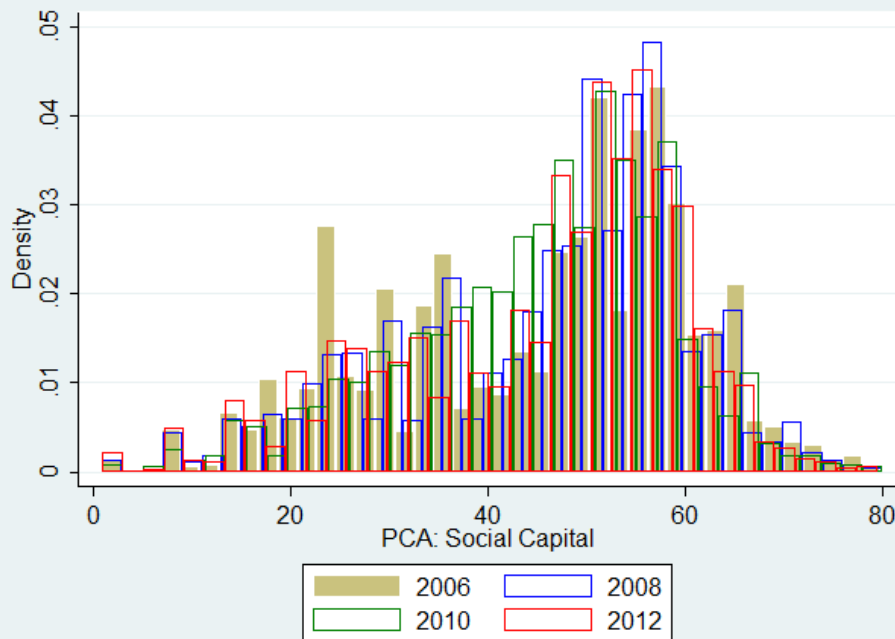


PCA: Social Capital Investment

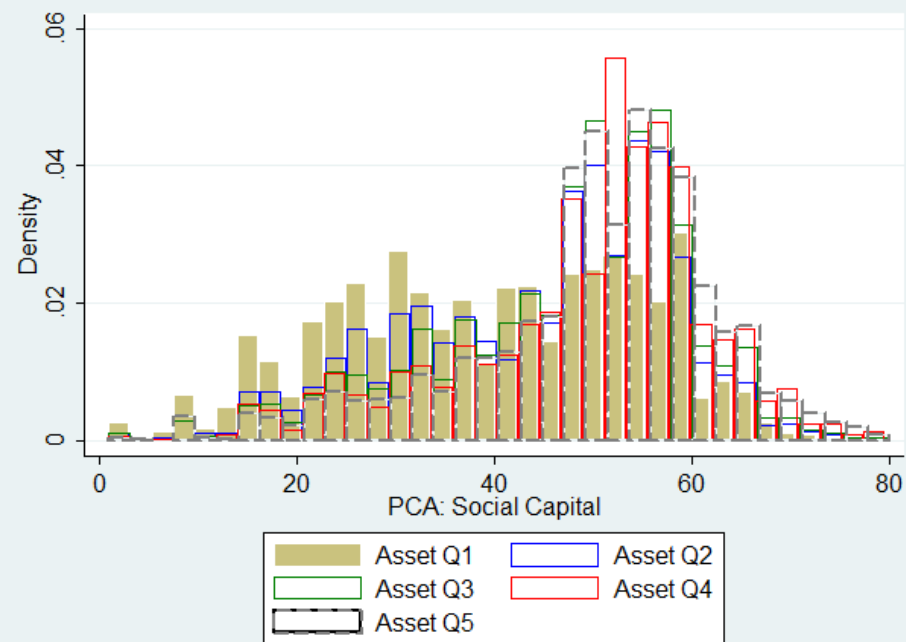
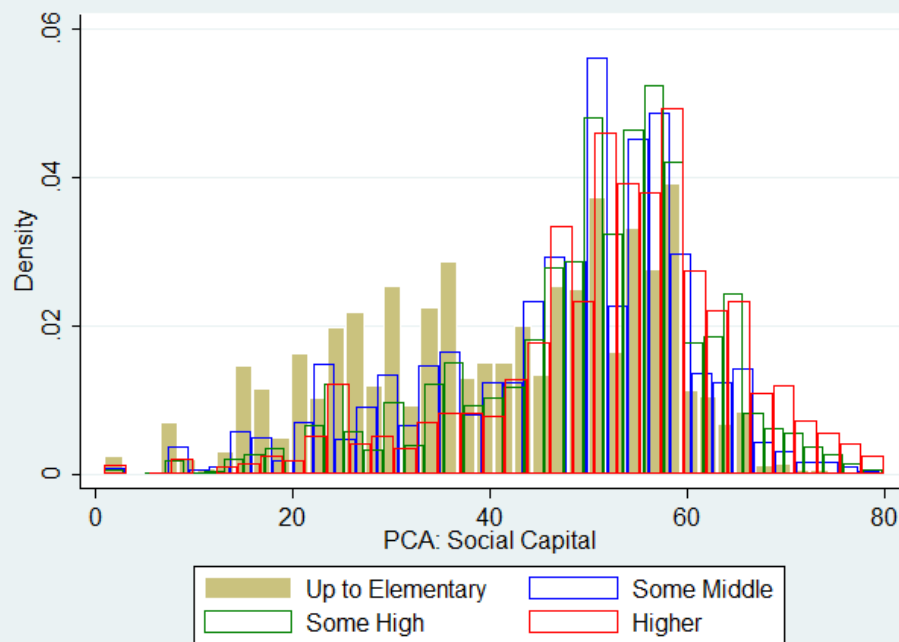


The effects of most observable variables have the expected sign on the index. Club memberships and attendance rates are the strongest determinants of social capital. Faith in the public sector & expectations do not affect it.

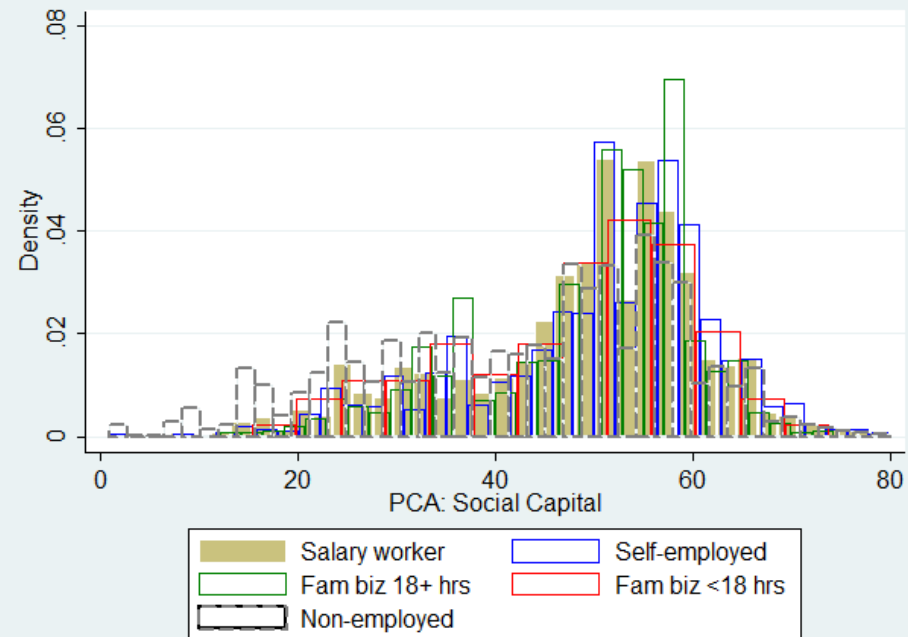
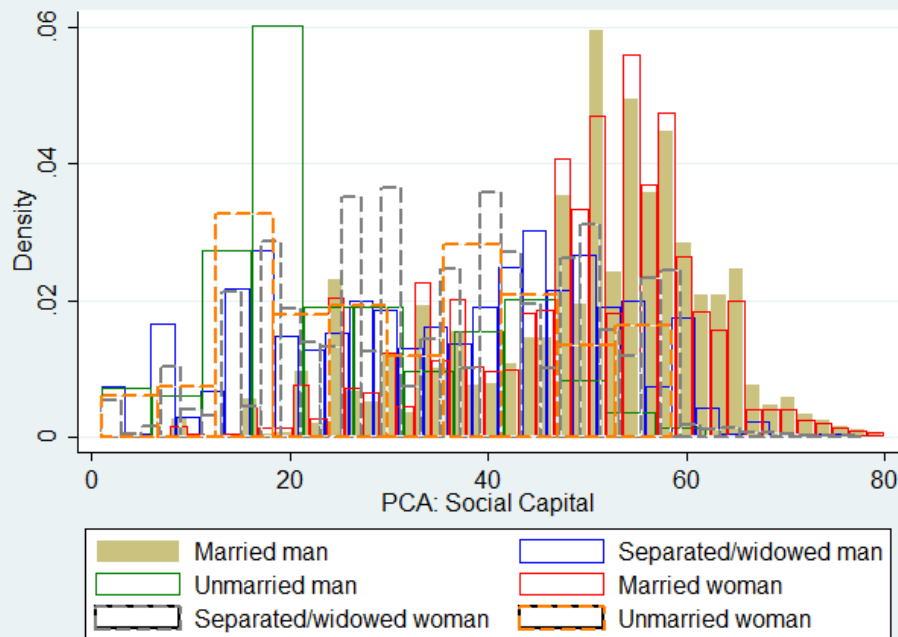
Results 2: Distribution of social capital



Social capital stock/investment show a long right tail. The distribution is stagnant over time. 60+ year-old women have a particularly low distribution of social capital, near lower end.



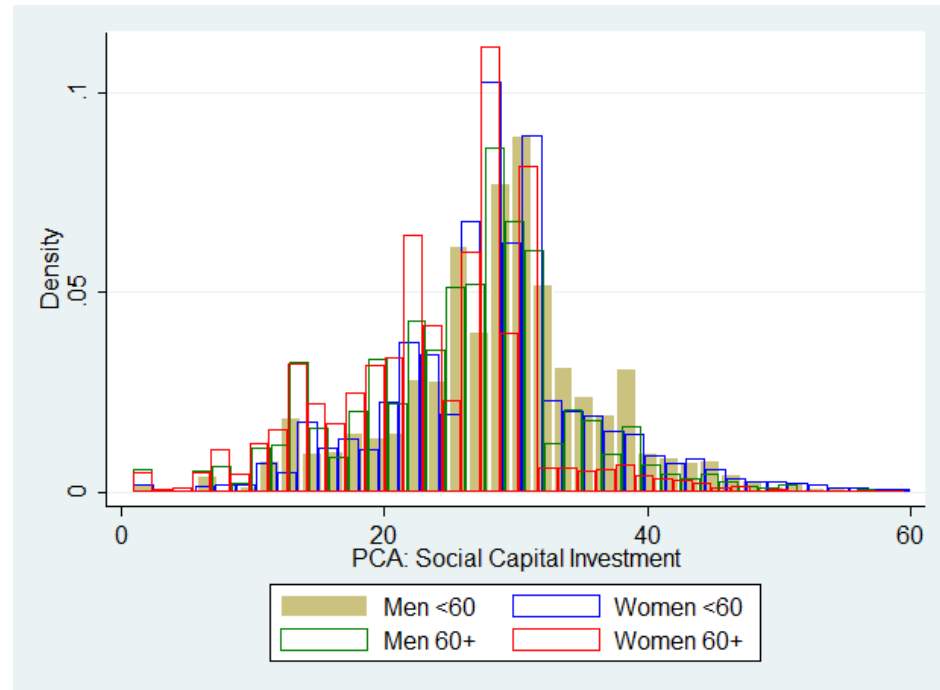
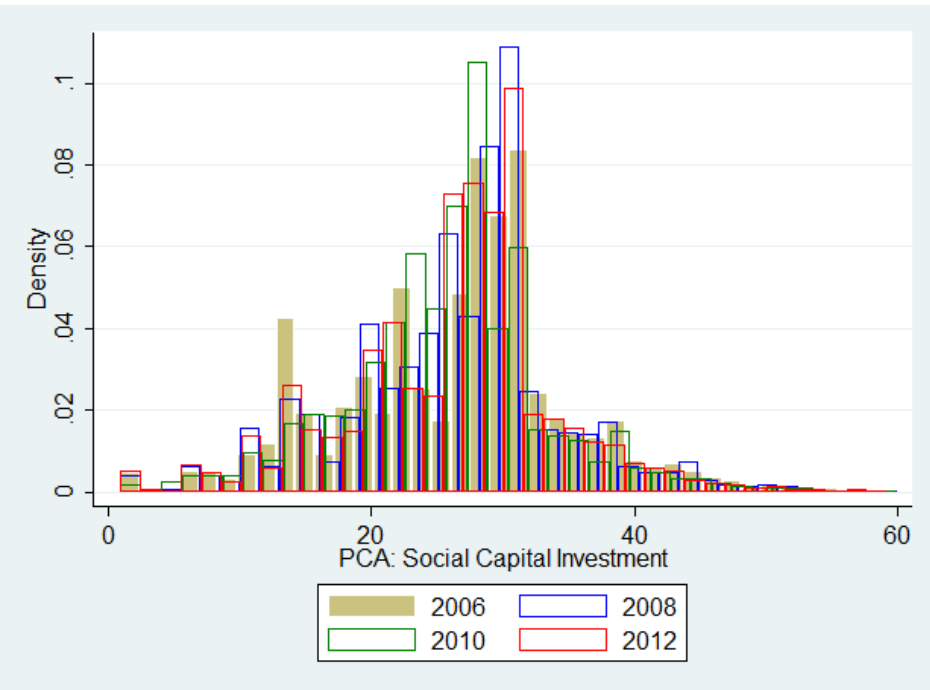
The least educated and the poorest individuals also have very low social capital. College educated, and the wealthiest 20% of individuals are clearly more endowed with social capital.



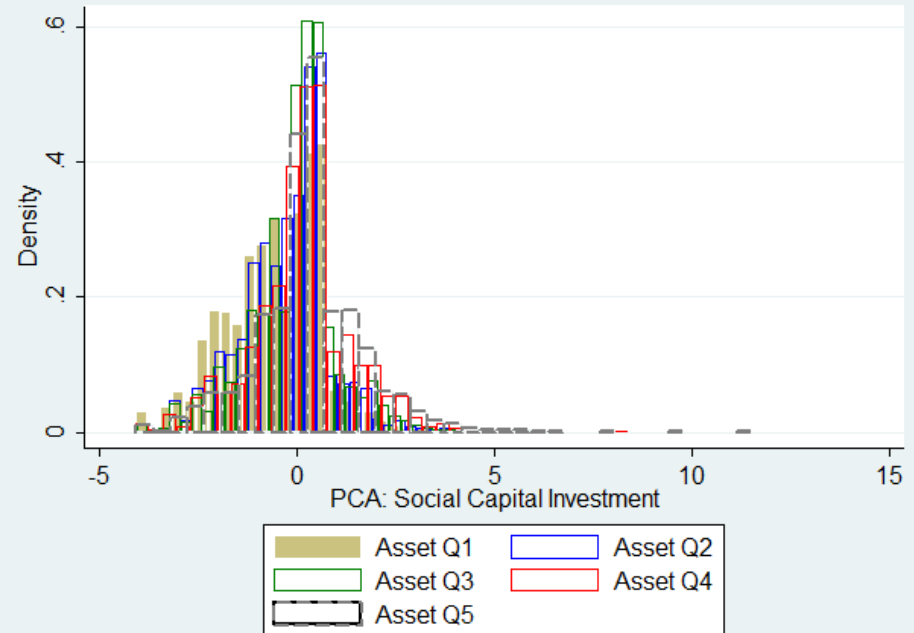
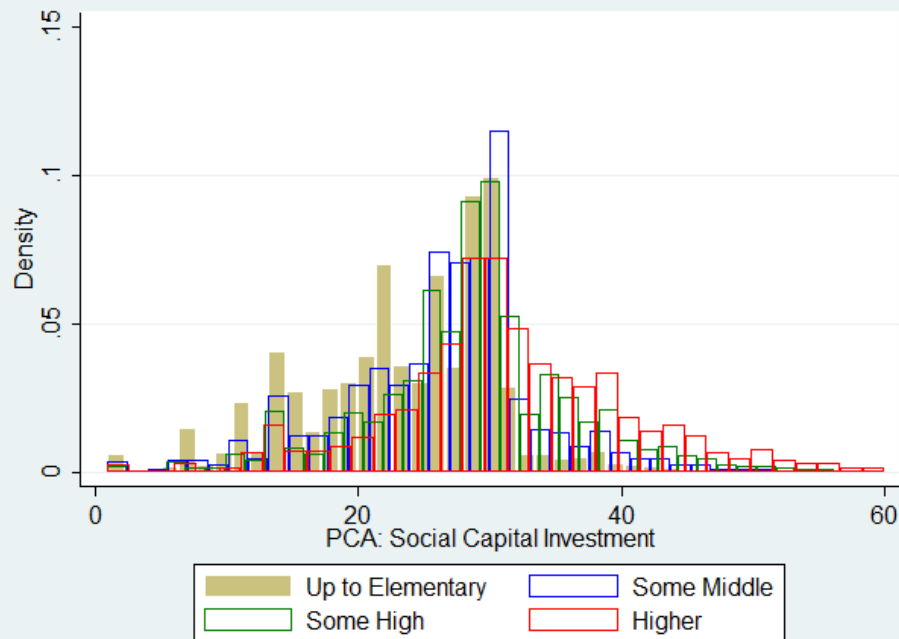
Unmarried men/women show the least social capital while married men/women show the highest. Non-employed shows the least social capital while self-employed/family business working less than 18 hours show the highest.

Results 3:

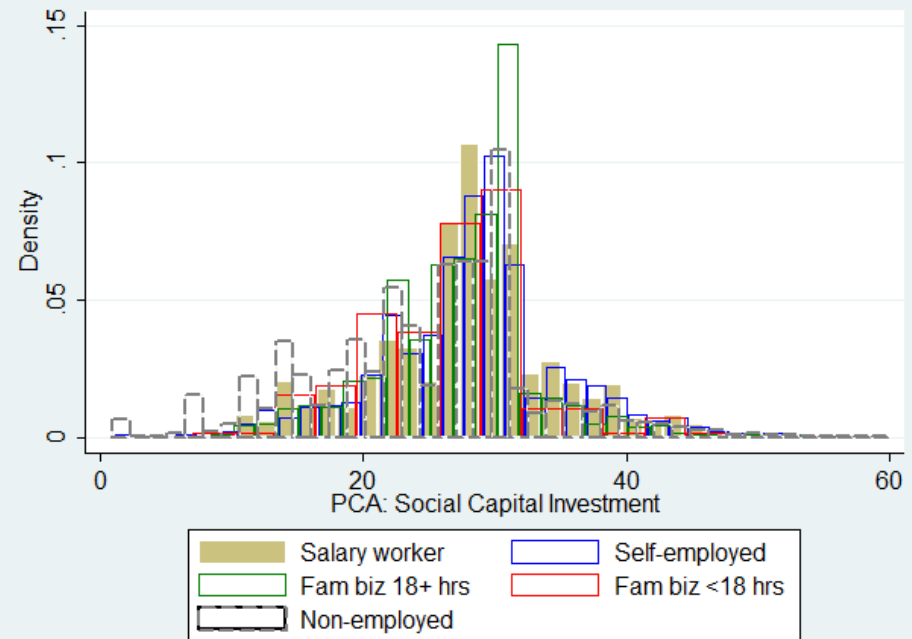
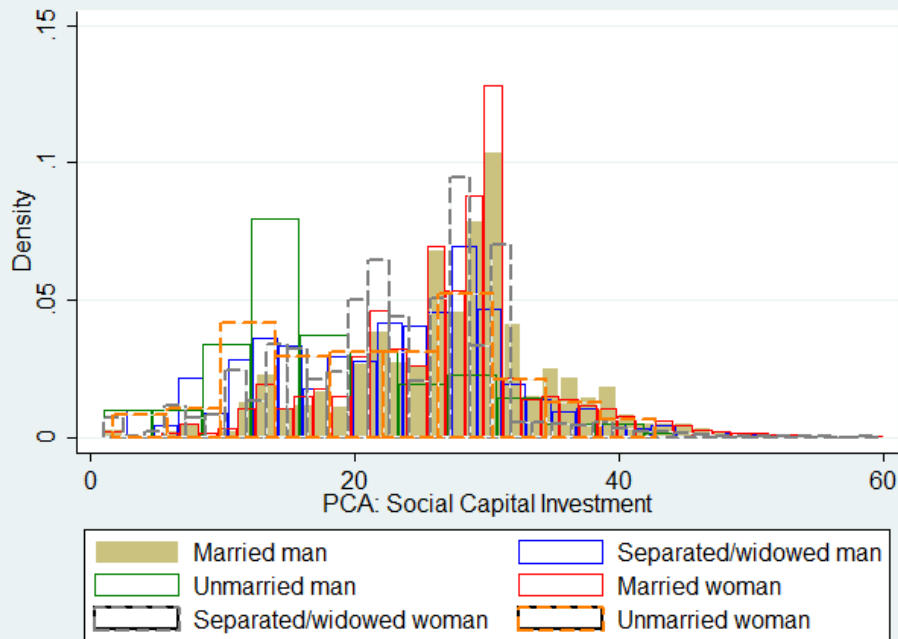
Distribution of social capital investment



Social capital investment has a relatively low mean and median (at 30% of the scale) and a long right tail. The distribution is stagnant over time. 60+ year-olds, particularly women, have very low rates of acquisition of social capital.



The least educated and the poorest individuals exhibit very low investment in social capital. The highest investment appears among college-educated and the wealthiest 20% of individuals.

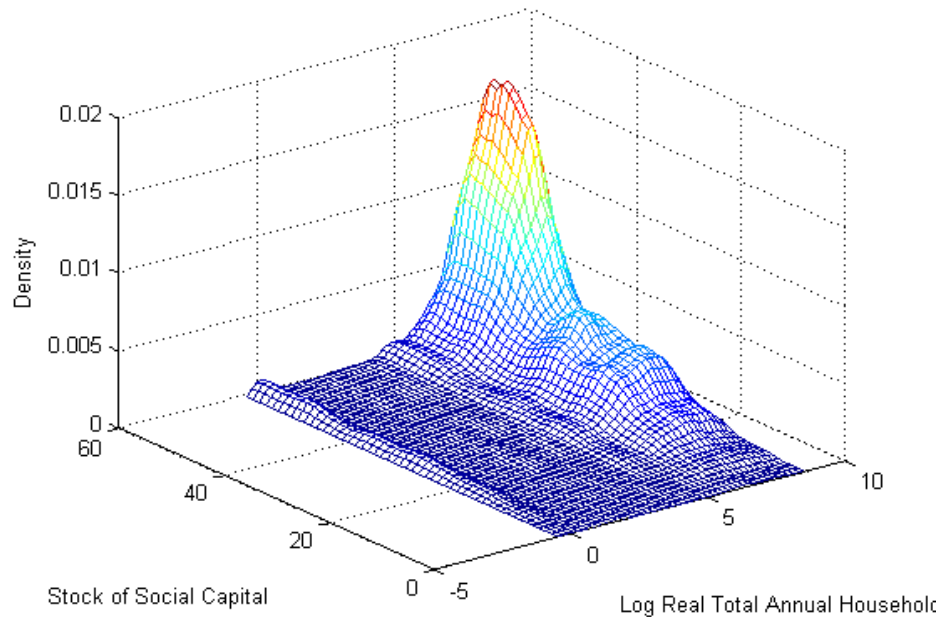


Unmarried men/women & separated/widowed men show the least social capital investment while married men/women show the highest. Non-employed shows the least social capital acquisition while salary worker/self-employed show the highest.

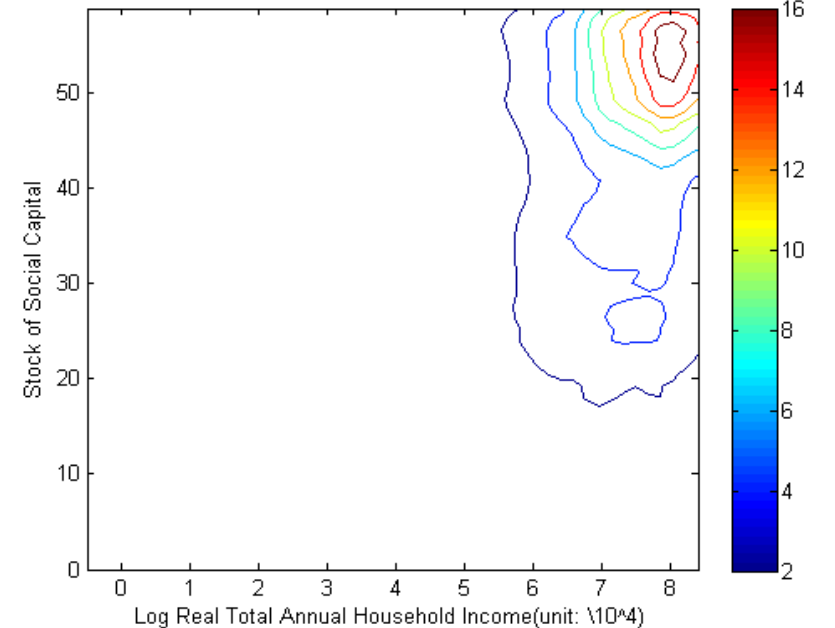
Bivariate Kernel density estimates

Log-valued Real total household income & Stock of social capital

Stock of Social Capital & Log Real Total Annual Household Income



Contour of Stock of Social Capital & Log Real Total Annual Household Income $\times 10^{-3}$

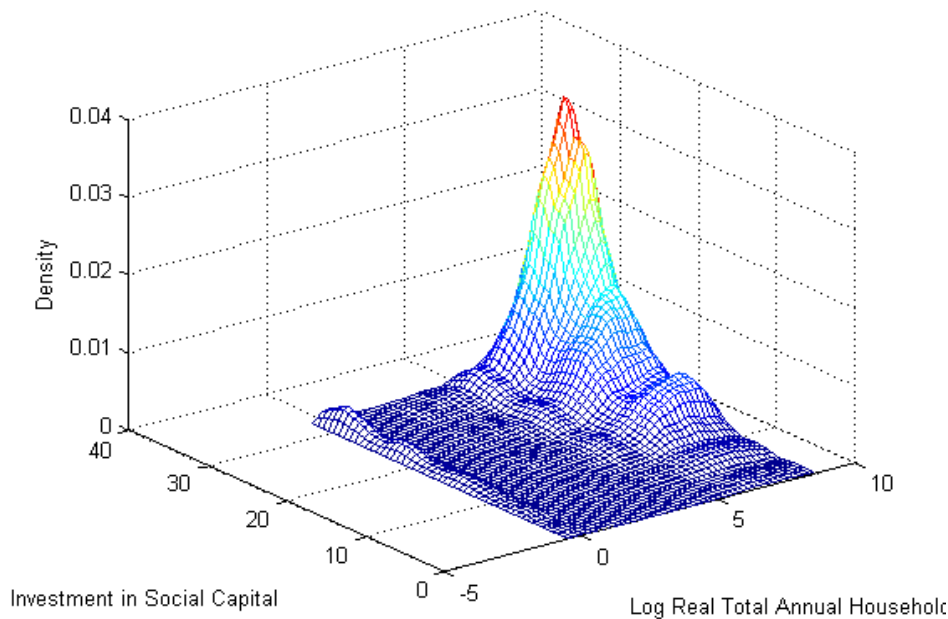


Those who have higher real total household income show higher stock of social capital compared to those who have lower income with the same social capital level.

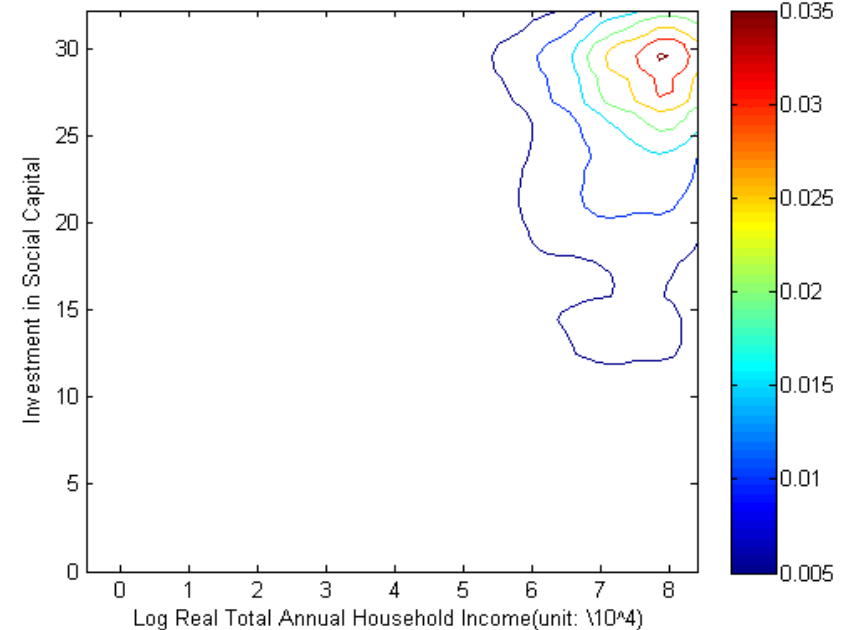
Bivariate Kernel density estimates

Log-valued Real total household income & Investment in social capital

Investment in Social Capital & Log Real Total Annual Household Income



Contour of Investment in Social Capital & Log Real Total Annual Household Income

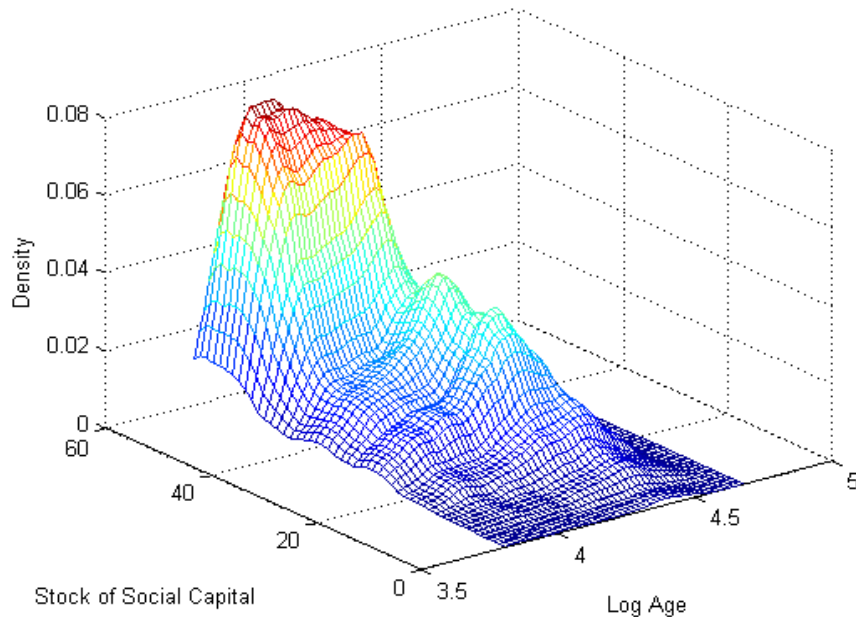


Those who have higher real total household income show higher investment in social capital compared to those who have lower income with the same social capital investment level.

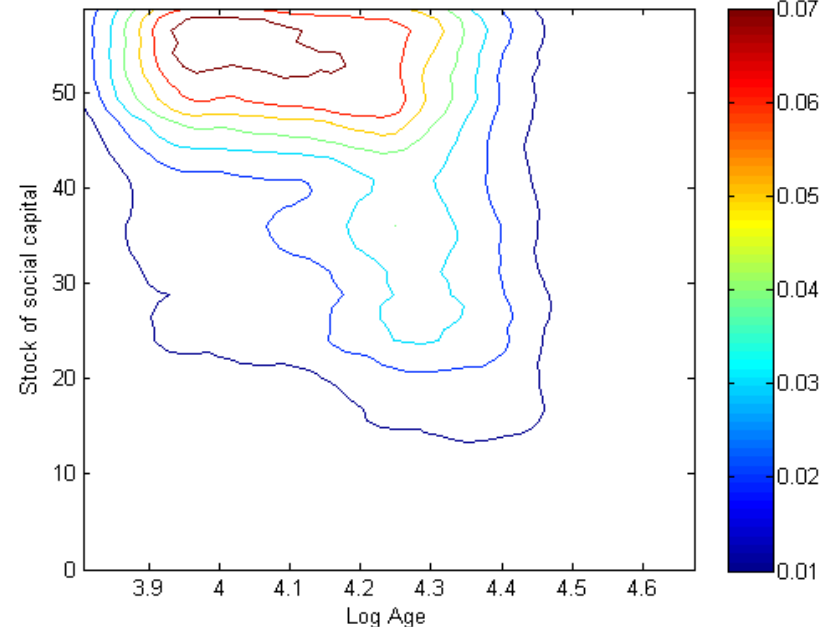
Bivariate Kernel density estimates

Log-valued Age & Stock of social capital

Stock of Social Capital & Log Age



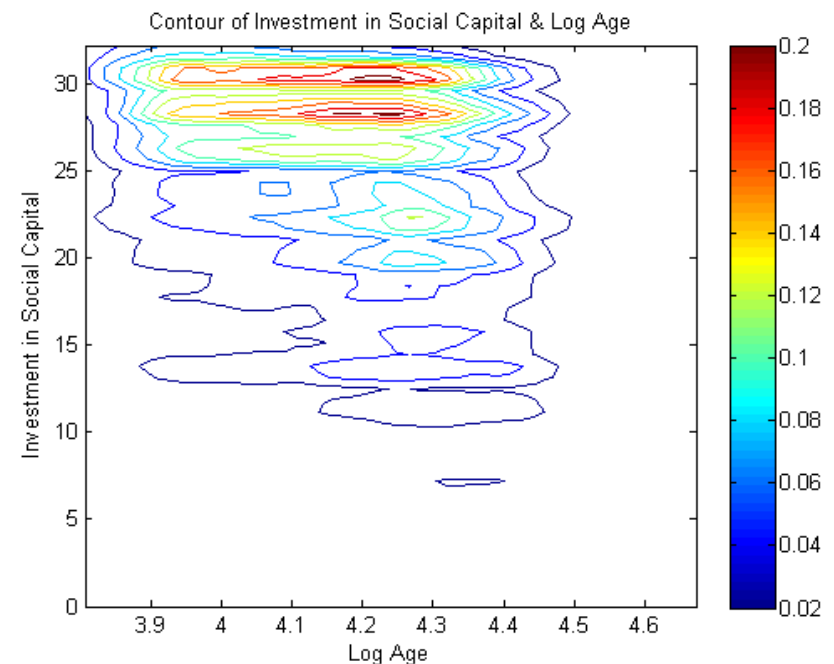
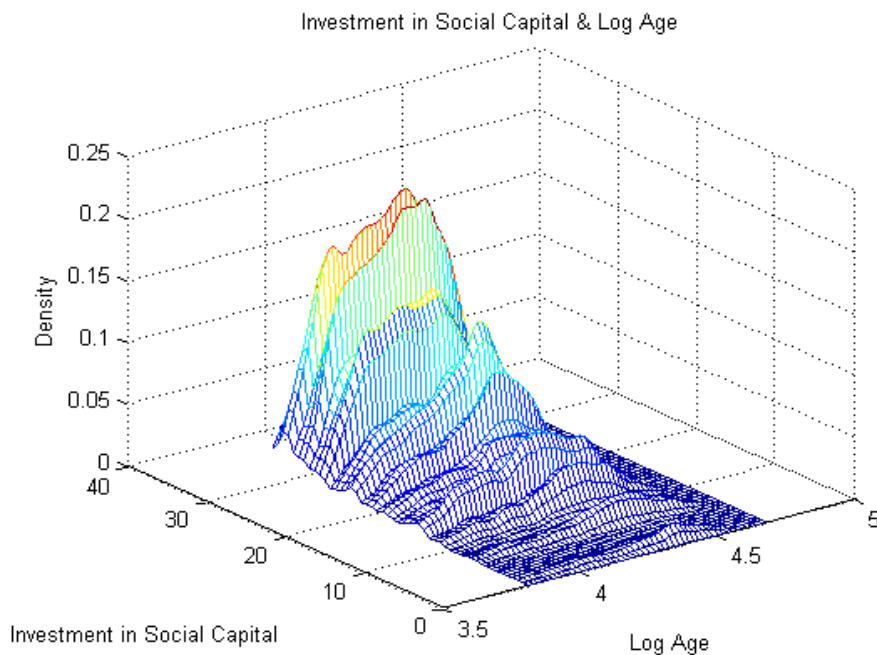
Contour of Stock of Social Capital & Log Age



The older the individuals are, the less stock of social capital they are found to accumulate. The greatest stock of social capital has the highest density among individuals aged 50 to 55 if log value is rescaled back, a relatively young cohort in the KLoSA sample.

Bivariate Kernel density estimates

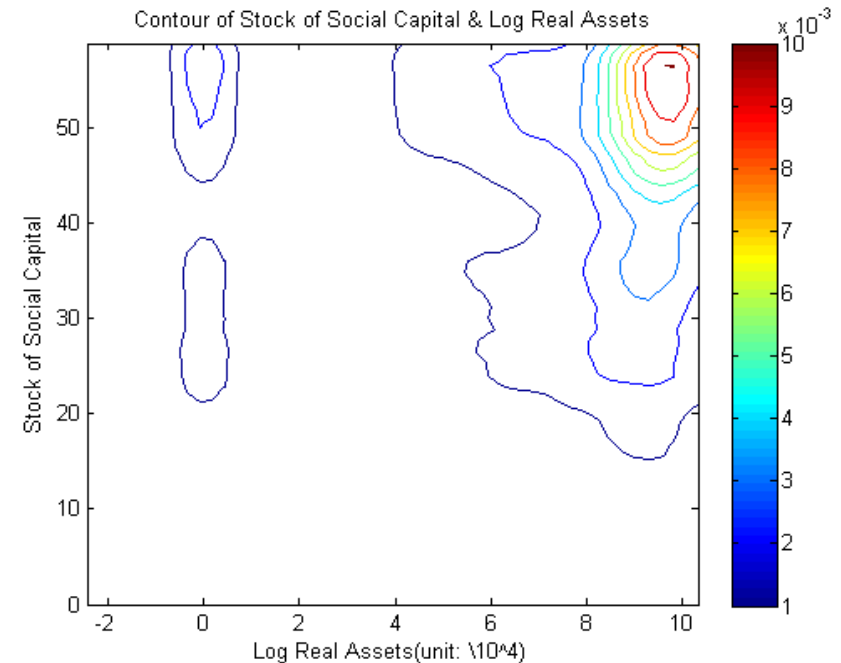
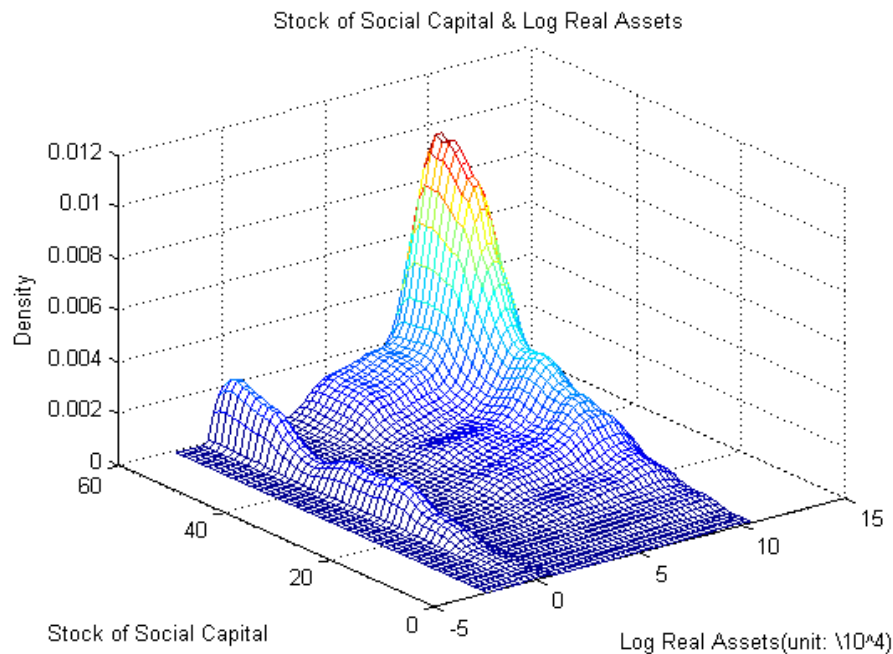
Log-valued Age & Investment in social capital



The density is the highest among 65-70 years old if log value is rescaled back and the density of the highest investment levels rapidly decreases as individuals age, implying dis-accumulation of social capital through depreciation or loss.

Bivariate Kernel density estimates

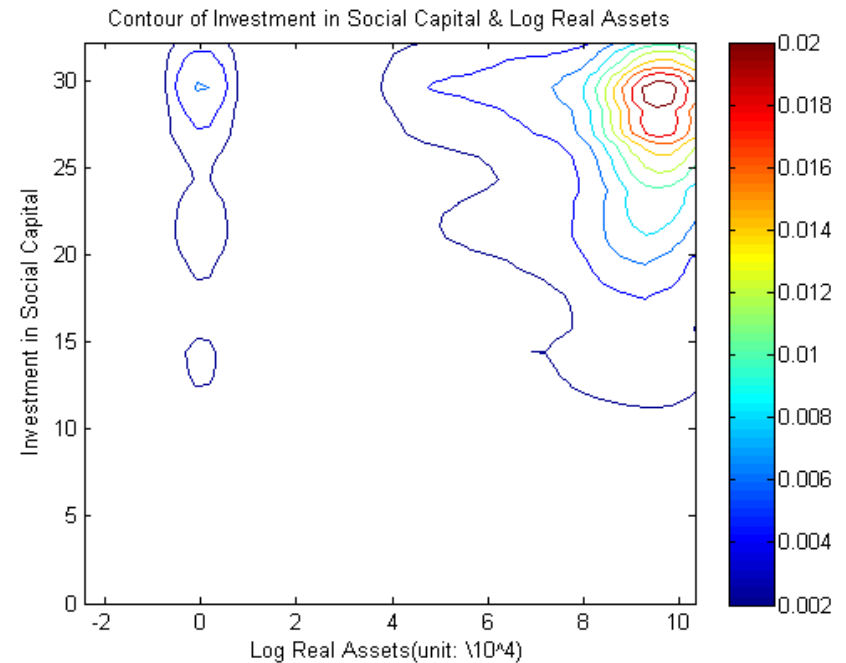
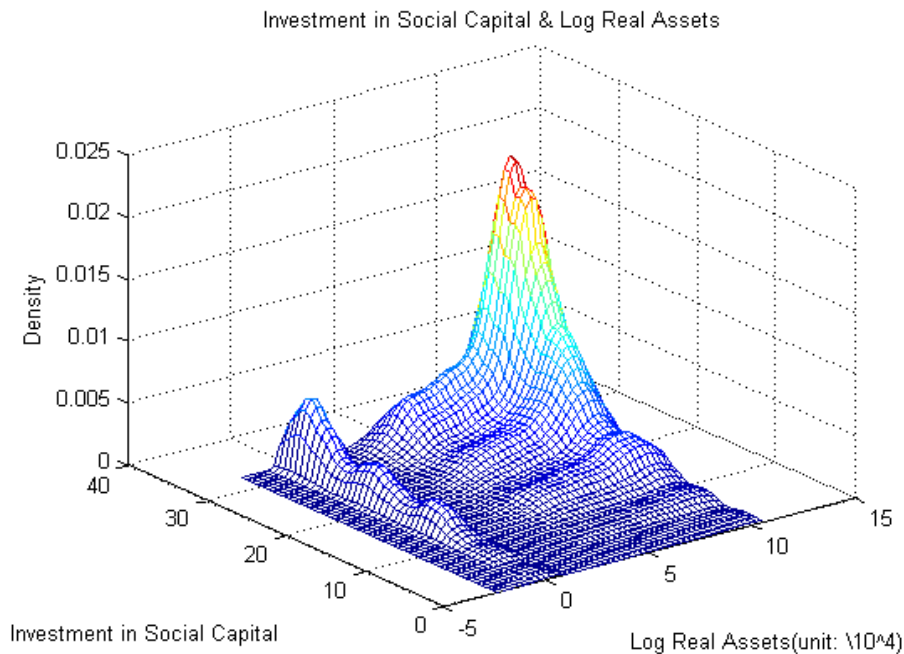
Log-valued Real Assets & Stock of social capital



Those who have higher real assets show higher stock of social capital compared to those who have lower assets with the same social capital level.

Bivariate Kernel density estimates

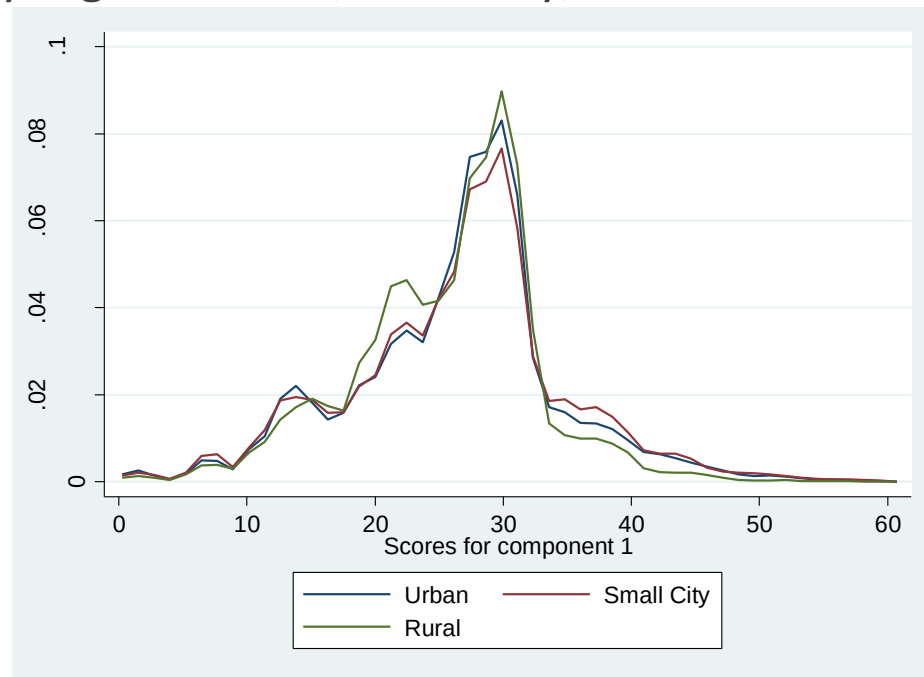
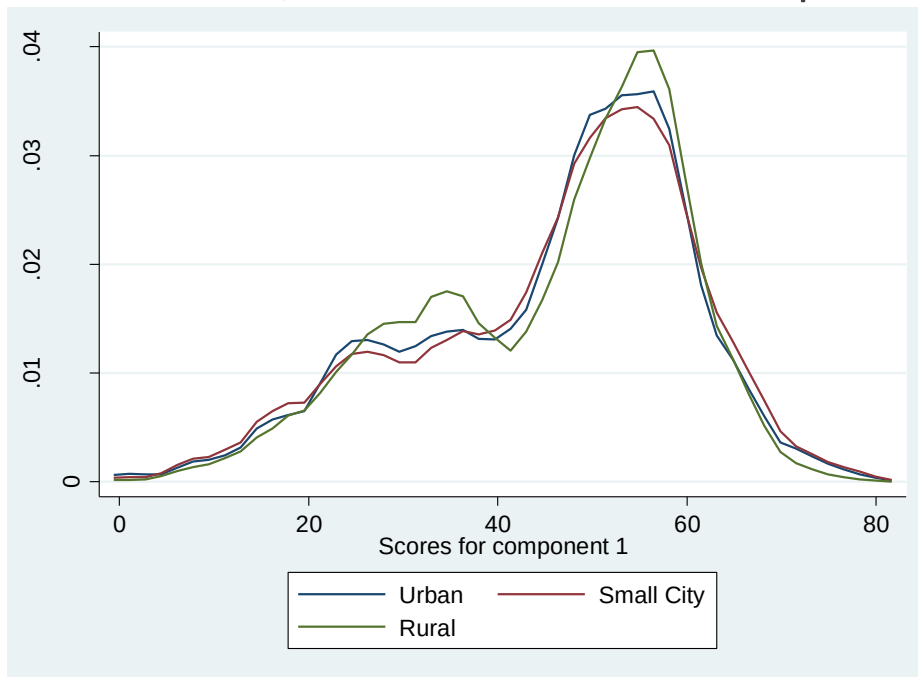
Log-valued Real Assets & Investment in social capital



Those who have higher real assets show higher investment in social capital compared to those who have lower assets with the same social capital investment level.

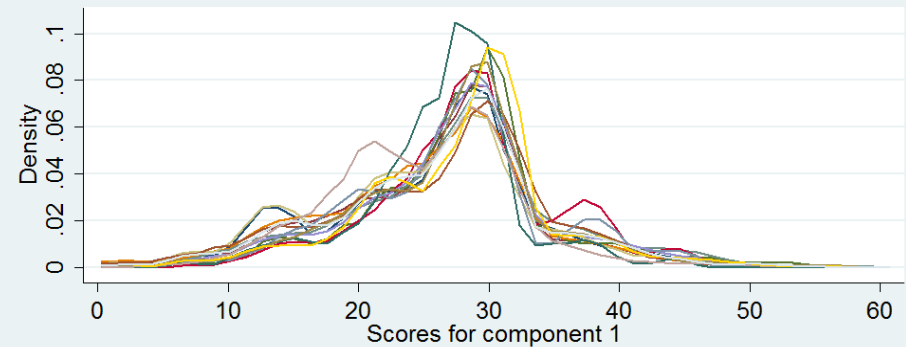
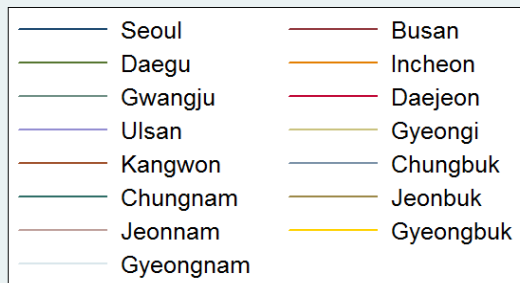
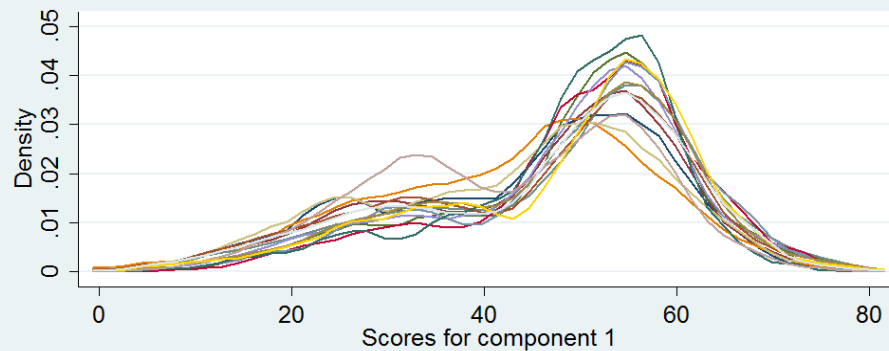
Results 4: Inequality in social capital acquisition

Stock/Investment of social capital by region: Urban/Small city/Rural



The densities are similar but residents of small towns appear to dominate among the top end of the distribution of social capital stock/investment, followed by residents of large cities.

Stock/Investment of social capital by province



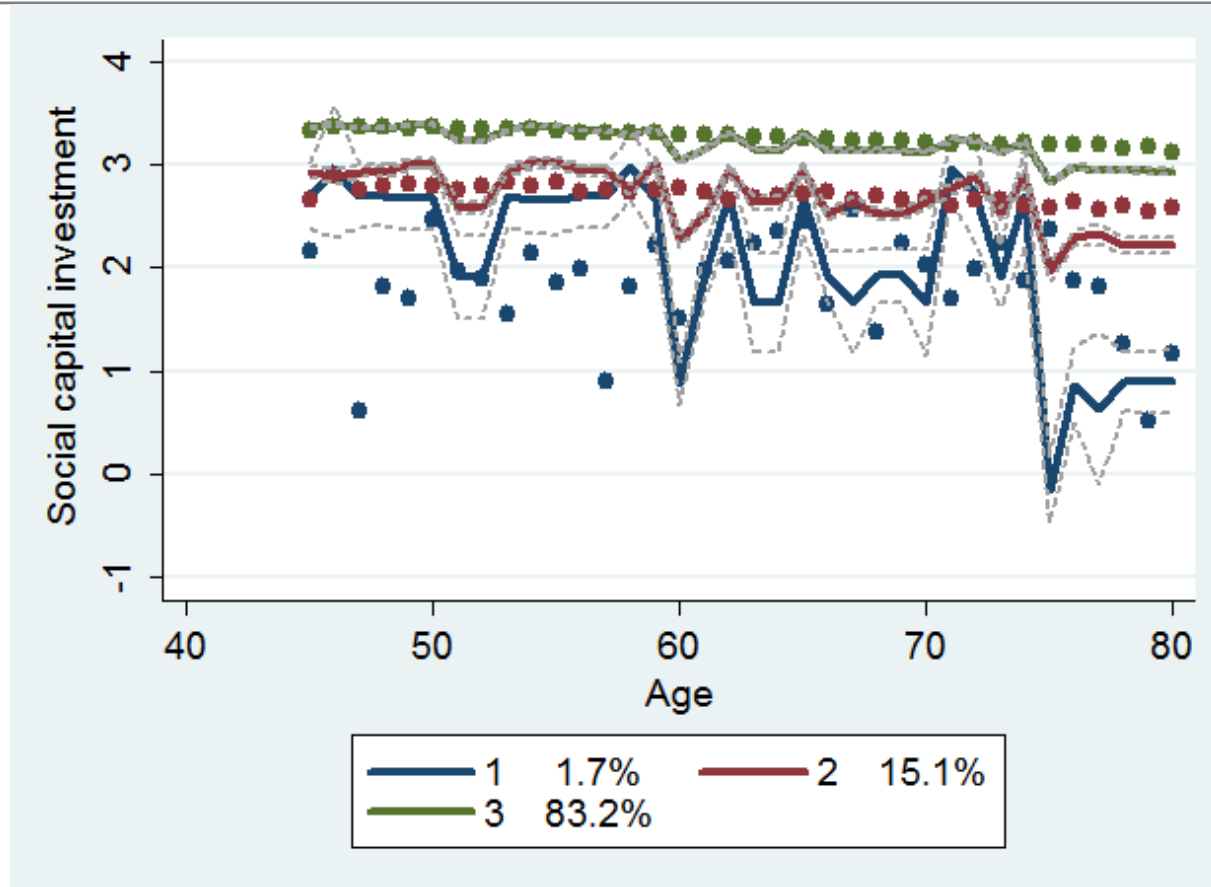
Residents of small towns such as Gyeongbuk, Chungbuk, and Daejeon show the highest densities among the top end of the distribution, while Jeonnam shows that among the low end of the distribution of social capital stock/investment.

Results 5: Models explaining SC investment

Model vars.	Indicators	OLS (1)	FE (1)	OLS (2)	FE (2)	OLS (3)	FE (3)
Log(I _i)	Log(I _i)	0.043	0.263***	0.296***	0.228***	0.316***	0.248***
Log(S _{t-1})	Log(S)	0.412***	-0.106***	0.401***	-0.102***	0.412***	-0.106***
S _i	Churches	0.012***	0.011	0.004	0.040	0.004	0.040
	Clinics			-0.003	-0.001	-0.004	0.004
	Elderly facilities					-0.004	-0.033***
	Health centers			0.002***	-0.003**	0.002***	-0.003**
	Pop. 45+	0.502***	1.092**	-0.110	1.988***	-0.108	2.289***
	Big city			0.041***		0.038***	
	Small city			-0.026***		-0.028***	
K	Assets			-0.002	0.006	-0.001	0.006
	Home value	0.009***	0.008	0.009**	-0.000	0.008**	0.001
	Vehicle	0.011**	0.003	0.031***	0.001	0.024***	0.001
H	Education	0.017***	-0.065	0.026***	-0.067	0.026***	-0.076
	Career dev. program	0.067***	0.039***	0.063***	0.040***	0.058***	0.040***
	Health satisfaction	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	Physical shape			-0.015***	-0.006	-0.013***	-0.006
	Bad health	-0.024***	-0.017***	-0.021***	-0.016***	-0.020***	-0.015***
	No health limit	0.018***	0.011**	0.020***	0.010**	0.019***	0.010**
	Analytic skills	0.042***	0.039***	0.036***	0.034***	0.034***	0.029**
	Depression	-0.151***	-0.108***	-0.143***	-0.104***	-0.144***	-0.103***

Model vars.	Indicators	OLS (1)	FE (1)	OLS (2)	FE (2)	OLS (3)	FE (3)
W	Household income			0.001	-0.004	0.002	-0.005
β	Spending on soc. act.	-0.058***	-0.005	-0.049***	-0.002	-0.144***	-0.021
Δ	Inform. recall	0.047***	0.025***	0.042***	0.022***	-0.066*	-0.142***
	Home ownership	-0.064**	-0.052	-0.070**	0.018	-0.062*	0.006
T-t	Age	0.001	-0.014***	0.003***	-0.024***	-0.002	-0.026***
	Time to retirement	0.015***	0.007	0.012***	0.006	0.014***	0.006
R	Employment					0.009	-0.002
	Biz. empl.–part time			0.009*	0.021*	0.004	0.020
	Biz. empl.–full time					0.005	-0.005
	Economic satisfaction			0.001***	0.001***	0.001***	0.001***
Controls	Female			0.015***		0.012***	
	Marital status	No	No			Yes***	Yes
	Travel frequency					0.009***	0.008***
	$\beta T, \Delta T, \beta \Delta T$	No	No	No	No	Yes***	Yes***
	Constant	1.152***	3.278***	0.400	3.631***	0.660**	3.630***
R-squared		0.416	0.083	0.425	0.084	0.434	0.092
F-test/Wald Chi ²		258.2***	33.67***	176.9***	24.37***	138.8***	20.11***
Obs. (Clusters)		21,970 (8,639)		21,154 (8,512)		21,154 (8,512)	
Prob. weights		Cross-sect.	Time-const. cross-sect.	Cross-sect.	Time-const. cross-sect.	Cross-sect.	Time-const. cross-sect.

Results 6: Trajectory models of SC investment



Group-based trajectory model allows identification of distinct clusters of individuals following similar developmental trajectories, by relying on finite mixtures of distributions in the dispersion of SCI.

Results 7: Models of life satisfaction

Model vars.	Indicators	OLS	FE	OLS	FE
H	Health satisfaction	0.263***	0.197***	0.261***	0.191***
	Physical shape	-0.264**	0.356	-0.276**	0.359
	Education	0.103	-3.106	0.098	-4.116
K	Economic satisfaction	0.351***	0.291***	0.349***	0.289***
	Assets	0.644***	0.393***	0.633***	0.463***
	Home value	0.078**	0.153**	0.051	0.121*
S	Social capital	0.112***	0.086***	0.110***	0.082***
w	Household income			0.432***	0.345*
T	Age	0.016	-0.463***	0.032**	-0.347***
	Time to retire			-0.089	0.306
Controls	Female	0.138**		0.140**	
	Married	5.756***	-1.128	5.408***	-1.122
	Separated/divorced	2.355*	-0.851	2.066	-0.830
	Widowed/emigrated	5.277***	-0.174	4.981***	0.326
	Large city			-0.829***	
	Small city			-0.187	
	Constant	9.353***	60.865***	6.752***	52.472***
	Within R-squared	0.525	0.216	0.527	0.208
	F-test/Wald Chi ²	1268	235.4	924.8	183.8
	Obs. (Clusters)	23,313 (8,831)		22,437 (8,698)	

Key findings

The Korean elderly suffer from having limited social networks, either through own isolation or exclusion by their communities, especially in case of 60+ year-old women.

At the same time, they reveal that social capital is an important component of their life satisfaction.

Given that club memberships and frequency of attendance of meetings appear to be the most significant determinants of individuals' effective stock of social capital, government and non-government organizations should try to promote social and civic engagement of the elderly by providing information, infrastructure or basic services.

Physical incentives are unlikely to be effective. Instead, providing meeting places, and ensuring good access to physical- and mental- health services, will promote elderly people's engagement.

This low-resource intervention could bring significant returns in elderly people's life satisfaction and presence in society.

Limitations & further work

To evaluate robustness & add perspective to these results:

Use World Values Survey as an alternative source of socio-economic and demographic data, to compare Korea to other East Asian countries.

Link to (literature on) China Health & Retirement Longitudinal Study; English Longitudinal Study of Ageing; Survey of Health, Ageing & Retirement in Europe

Distinguish private and public investment, and evaluate private and social returns, to understand the potential for policy interventions.

Comment on the relative returns to the investments in physical, human and social capital.

Distinguish various dimensions of social capital – such as personal and professional club memberships, friendships, social skills, trust in institutions.

Use alternative regression methods to estimate effects at various population quantiles (quantile regression).

Correct for potential endogeneity of explanatory variables representing individuals' choices (instrumental variables for residence, education, employment & retirement decisions).



Thank you!