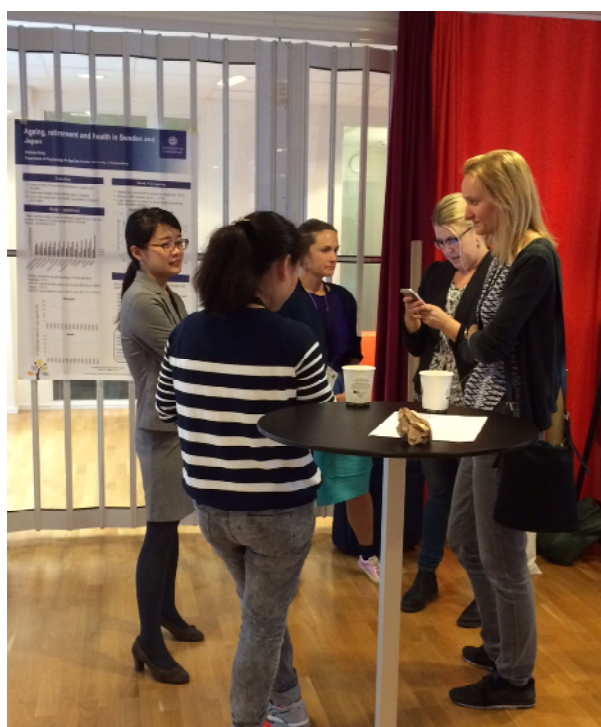
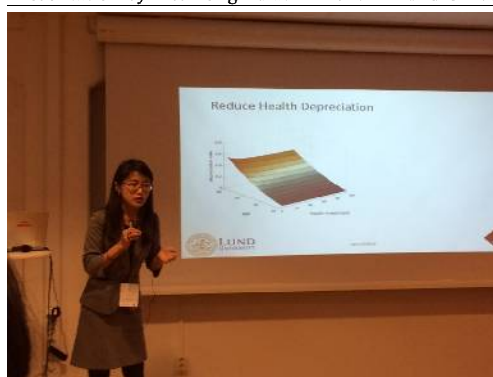


Presentation by Ms. Rong Fu at IDEON in Lund University



Does Marriage Make Us Healthier? –Evidence from Japanese Elderly–

Rong FU, Haruko NOGUCHI, Koichi SUGA

Background and Motivation

• Motivation

Elderly health relates to social insurance, fiscal balance, labor markets...

• Previous works show,

Marriage protection effect vs Marriage selection effect on health

• But, they are

Medical science, descriptive results without theoretical models

Case study, insufficient data

Working for Western societies, diametrical culture in Asia

• Therefore present study aims to investigate,

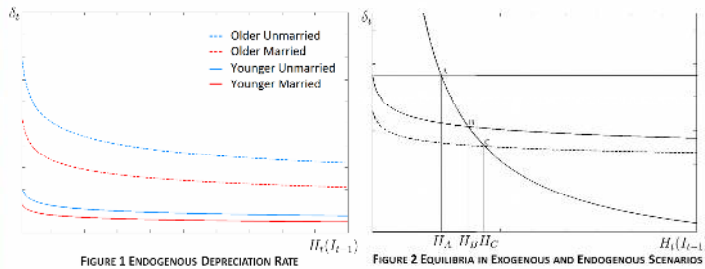
marriage protection effect by theoretical model and generalized data

Theoretical Approach

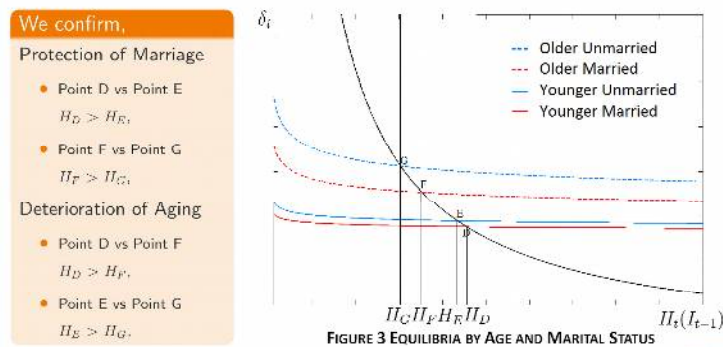
- Following Grossman's Model $H_{t+1} = I_t + (1 - \delta_t)H_t$, but assume $\delta_t = \delta(I_{t-1}, t; m_t)$. Solve the UMP to derive the F.O.C,

$$\underbrace{\phi'_t w_t / \pi_{t-1}}_{\text{Health Demand}} = \underbrace{\delta_t + (\partial \delta_t / \partial I_{t-1}) H_t}_{\text{Health Supply}} \quad (1)$$

- By which **optimal health capital (OHC)**,



- Confirm the influence of **Marriage and Aging** on the **OHC**,



Empirical Strategy

- Three **theoretical hypotheses** to be empirically investigated,

1. **Married individuals enjoy higher OHC vs unmarried ones**
2. An endogenous δ_t decreasing to I_{t-1} contributes a higher OHC
3. OHC decreases to time t , and eventually approaches minimal required H_{\min}

- By **linearization** of equation (1) and **specification** of δ_t ,

$$\delta_t = \beta_6^{\lambda_1} \left(\frac{\beta_7}{(m_t + 1)^{\beta_8} I_{t-1}^{\beta_9}} \right)^{\frac{1}{\lambda_1}} \quad (2)$$

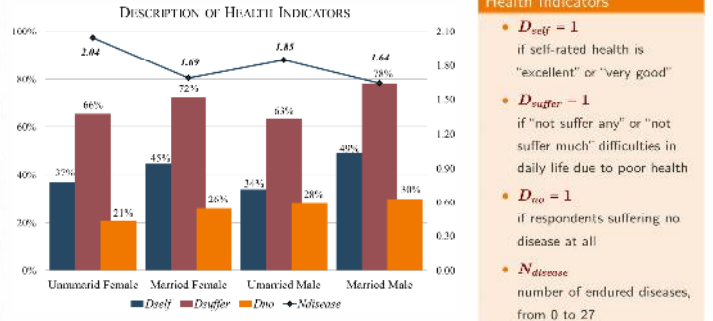
- Derive the regression function as,

$$\ln H_t = \alpha_0 + \alpha_1 \ln w_t - \alpha_1 \ln p_t + \alpha_2 E_t + \alpha_3 \ln I_{t-1} - \alpha_4 \ln t + \alpha_5 \ln(m_t + 1) - \lambda_1 \alpha_6 + u_t \quad (3)$$

1. $\alpha_3 > 0$ – **positive investment effect**
2. $-\alpha_4 < 0$ – **deterioration on health due to aging**
3. $\alpha_5 > 0$ – **positive marriage protection**

Data and Measurements

• Dependent Variable – Health Indicator



• Treatment and Instruments

	Basic Statistics											
	Basic Statistics						T-Test					
	ALL (N=3012)		MALE (N=1618)		FEMALE (N=1394)		ALL (N=3012)		MALE (N=1618)		FEMALE (N=1394)	
	mean	sd.	mean	sd.	mean	sd.	diff.	t-value	diff.	t-value	diff.	t-value
Treatment:												
D_m	0.85	(0.36)	0.80	(0.31)	0.8	(0.40)						
Instruments												
D_{no}	0.46	(0.50)	0.48	(0.50)	0.43	(0.50)	0.00	(0.2)	0.02	(0.6)	0.00	(0.0)
$house_{base}$	0.91	(0.28)	0.93	(0.26)	0.90	(0.31)	0.19***	(1.6)	0.23***	(1.4)	0.14***	(1.7)
$^{***} p < 0.001$, $^{**} p < 0.05$, $^* p < 0.1$												

Survey "Health and Retirement"

- by the National Institute of Population and Social Security Research (NIPSSR)
- annually implemented from 2007 to 2012, in total six waves
- targets aged from 45 to 80 randomly selected from 39,311 monitors in 2007

Results and Implications

• Marriage DOES Protect Health? — YES!

	ALL				MALE				FEMALE			
	OLS	t-stat	2SLS	t-stat	OLS	t-stat	2SLS	t-stat	OLS	t-stat	2SLS	t-stat
D_{self}												
$D_m = 1$	0.003**	(2.45)	0.004**	(2.00)	0.001**	(2.02)	0.001	(0.62)	0.001	(0.92)	0.002**	(3.62)
Endog-Test ²			7.01**				1.87				21.38**	
Over-Test ³			0.89				0.31				1.75	
F-statistics	22.05		25.21		15.39		18.59		9.57		7.58	
$D_{stuffer}$												
$D_m = 1$	0.089**	(3.90)	0.405**	(4.04)	0.116**	(3.44)	0.279*	(1.83)	0.062*	(2.44)	0.515**	(2.39)
Endog-Test ²			6.35**				1.93				3.89*	
Over-Test ³			0.02				3.02*				1.84	
F-statistics	18.06		15.93		11.96		11.50		9.71		5.45	
D_{no}												
$D_m = 1$	0.039*	(1.82)	0.213*	(1.85)	0.310	(1.15)	0.110	(0.76)	0.032*	(1.92)	0.132*	(1.21)
Endog-Test ²			2.50				0.25				4.06**	
Over-Test ³			1.70				1.05				0.46	
F-statistics	52.29		58.48		32.29		39.22		21.86		21.17	
$N_{disease}$												
$D_m = 1$	-0.253***	(-3.01)	-0.591***	(-2.09)	-0.203*	(-1.96)	-1.005*	(-1.67)	-0.277**	(-2.39)	-0.281**	(-2.61)
Endog-Test ²			6.87**				1.74				6.31**	
Over-Test ³			1.64				2.04				0.11	
F-statistics	58.67		50.87		45.56		30.77		28.11		23.47	
First Stage Equation												
Marriage Eq.												
D_m			0.011	(0.61)			0.006	(0.22)			0.028	(0.71)
$house_{base}$			0.247***	(7.07)			0.259***	(8.18)			0.189***	(4.63)
Wald-Test ⁴			29.17				18.45				19.70	

In summary, regardless of gender:

- D_{self} : Strongly marginal **increased** probability of optimistic self rating
- $D_{stuffer}$: Strongly marginal **increased** probability of not suffering difficulties
- D_{no} : Marginal **increased** probability of suffering no disease (except for male)
- $N_{disease}$: Strongly marginal **decreased** number of endured disease

• What Can Government Do?

As **mutual support** of elderly couples protect both mental and physical health

1. Take Marriage into account when implement public health policies for elderly;

In prospect,

1. Labor market: Promotion of participation
2. Long-term care insurance: Cost saving