RIETI-JER Workshop

Economics of Aging in Japan and other Societies

Presentation

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Health Consequences of Transitioning to Retirement and Social Participation:
Evidence from JSTAR panel data

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Retirement and health

- One of major transitions in one's life
- Japan with an exceptionally high labor participation among 65+
  - Economic and health policy impact of retirement
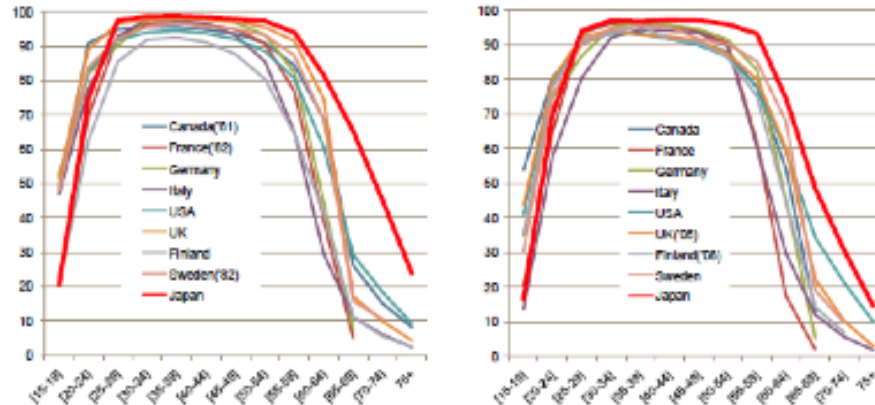
Male
1975 vs. 1990

データ出典:ILO, LABORSTA Internet

Theory of retirement and health

- Human capital (Grossman) model
  - Investment cost
    - Wage as a marker of time cost
    - Is time cost cheaper after retirement?
  - Return of investment (depreciation rate)
    - Larger depreciation rate due to physiological decline
    - Lower return of investment for same input
    - Depends on technical efficiency of applied healthcare
  -> Ambivalent suggestion for retirement impact on health

Theory of retirement and health

- Role theory (e.g. Wang, et al. Am. Psychol - ogist, 2011)
  - Social role as a source of psychological and physical health
  - Retirement as a role transition from work-related one to informal (family, or community)
    - Impact of retirement depending on the significance of role transition that may be further determined by former job characteristics, degree of job commitment, role repertoire other than job, and significance of new roles.

Previous studies

- Negative impact
  - Dave Rashad,and Spasojevic 2006 HRS fixed effect panel analysis on self-reported health and comorbidity
  - Behncke 2010 ELSA panel with propensity matching on newly diagnosed chronic conditions
- Positive impact
  - Coe and Zammaro, 2008, 2011 SHARE cross-section (latest one used panel data) with IV estimator

Challenges

- Heterogeneous population, diverse paths from labor participation to full retirement
  - Definition of "retirement" is problematic
- Reciprocal relationship b/w health and labor participation
  - Needs proper selection of health outcomes
- Analytic strategy to account for endogeneity and misspecification
  - IV or not IV

Choice of health outcomes

- Self-reported health and psychological response is susceptible to reverse causation
- Newly emerging chronic conditions (heart disease, stroke, cancer) after two-year interval cannot be attributed to retirement event (latent period bias)
  - more likely to be diagnosed after retirement with more frequent visit to clinic?
- Physical strength is rather a determinant of retirement than result.
- In this study, we chose "cognitive function" as responsive enough to role change.

Japanese Study on Ageing and Retirement （JSTAR)

- A family member of HRS/ELSA/SHARE and Asian sisters.
- 1st wave in 2007 (5 municipals, N=4,200) followed for 2nd wave in 2009 (FU 75%)
- Additional 2 municipals since 2009
- Further additional 3 cities since 2011
- Funded by Hitotsubashi Univ. and Research Institute of Economics, Trade, and Industry (PI; Profs. Ichimura and Takayama with Dr. Shimizutani)
- Open data! (http://www.rieti.go.jp/jp/projects/jstar)

Sample for this study

- Sample drawn
  - Participation both in wave 1 and 2
  - limited to age<65 (statutory retirement age) and at paid work in wave 1

    1095 males and 696 females
- Work transition (full-time, part-time, self-employed, other employment, unemployed, retired, homemaker, and other)
- Socio-economic
  - Income, asset (deposit, bond/stock), marital status, education
  - Expected public pension availability
- Health measures
  - Cognitive function (word recall)
- Social participation
  - Community voluntary activities, own leisure/hobby/learning activities

Multiple imputation with chained equations
Not included if outcome (cognitive measure) was imputed

Estimation strategy

- Propensity score for being at paid work at wave 2, predicted by regression on characteristics at wave 1

  -> avoid reverse causation.

- Outcome
  - Cognitive function (CF) measured in word recall
  - Difference b/w Wave2 CF – Wave1 CF

    -> control for time-consistent unmeasured heterogeneity

    (e.g. genetic and neuro-pathological conditions)

- Three modes of matching for robustness check
  - kernel matching
  - Nearest neighborhood matching with Mahalanobis distance, bias corrected for continuous variables
  - propensity score matching with common support

Posed question

- Difference in subpopulation with different social roles for job participation
  - Gender difference
  - Work conditions (fulltime vs. non-fulltime; secured vs. not; stressful vs. not)

Descriptive statistics (males)

	observation	mean	SD
age	732	57.559	3.738
married	732	0.881	0.324
highschool graduate	731	0.420	0.494
college graduate	731	0.358	0.480
fulltime work at wave 1	732	0.561	0.497
secured job at wave 1	732	0.716	0.451
job with compulsory retirement	732	0.511	0.500
job with excess stress*	732	0.246	0.431
expecting public pension	713	0.820	0.384
treatment (leaving paid job at wave2)	732	0.078	0.268
smoker at wave1	731	0.435	0.496
poor self-rated health at wave1	730	0.441	0.497
IADL limitation at wave 1	732	0.398	0.490
ADL limitation at wave1	730	0.023	0.151
grip strength at wave 1 (Kg)	725	38.663	6.404
word recall counts at wave1	720	5.206	1.545
depression at wave1	732	0.145	0.352
heart disease at wave1	728	0.073	0.260
hypertention at wave1	728	0.265	0.442
diabetes at wave1	728	0.102	0.302
arthritis at wave1	728	0.018	0.133
cataracts at wave1	728	0.038	0.192
ln(income) at wave1	727	5.630	1.817
ln(deposit) at wave1	723	5.109	2.596
stock/bond posession at wave1	725	0.207	0.405
social network (commitment) at wave1	731	0.209	0.407
social netwok (preference-based) at wave1	731	0.246	0.431

Descriptive statistics (females)

	observation	mean	SD
age	472	57.494	3.892
married	471	0.781	0.414
highschool graduate	469	0.516	0.500
college graduate	469	0.309	0.463
fulltime work at wave 1	472	0.239	0.427
secured job at wave 1	472	0.729	0.445
job with compulsory retirement	472	0.354	0.479
job with excess stress*	472	0.267	0.443
expecting public pension	467	0.869	0.337
treatment (leaving paid job at wave2)	472	0.133	0.340
smoker at wave1	472	0.153	0.360
poor self-rated health at wave1	472	0.392	0.489
IADL limitation at wave 1	472	0.269	0.444
grip strength at wave 1 (Kg)	471	24.338	4.409
word recall counts at wave1	468	5.711	1.503
depression at wave1	472	0.157	0.364
heart disease at wave1	471	0.040	0.197
hypertention at wave1	471	0.208	0.406
cancer at wave1	471	0.028	0.164
arthritis at wave1	471	0.053	0.224
cataracts at wave1	471	0.064	0.244
ln(income) at wave1	472	5.394	1.733
ln(deposit) at wave1	467	5.353	2.477
stock/bond posession at wave1	469	0.228	0.420
social network (commitment) at wave1	472	0.174	0.379
social netwok (preference-based) at wave1	472	0.239	0.427

Propensity for leaving paid work at W2 (males)

	coefficient	std err	z	p
age	0.232	0.055	4.20	0.000
married	−0.786	0.433	−1.81	0.070
highschool graduate	0.112	0.399	0.28	0.778
college graduate	−0.066	0.471	−0.14	0.889
fulltime work at wave 1	0.443	0.371	1.20	0.232
secured job at wave 1	−0.737	0.317	−2.33	0.020
job with compulsory retirement	−0.043	0.391	−0.11	0.913
expecting public pension	0.184	0.352	0.52	0.601
job with excess stress*	−0.308	0.369	−0.84	0.404
smoker at wave1	−0.049	0.311	−0.16	0.875
IADL limitation at wave 1	0.062	0.323	0.19	0.848
grip strength at wave 1 (Kg)	−0.007	0.026	−0.26	0.791
word recall counts at wave1	−0.064	0.100	−0.64	0.522
depression at wave1	0.405	0.391	1.04	0.300
heart disease at wave1	−0.523	0.651	−0.80	0.422
hypertention at wave1	−0.118	0.341	−0.35	0.729
diabetes at wave1	0.338	0.448	0.75	0.451
arthritis at wave1	0.882	0.903	0.98	0.329
cataracts at wave1	1.208	0.599	2.02	0.044
ln(income) at wave1	0.210	0.133	1.58	0.115
ln(deposit) at wave1	−0.063	0.068	−0.92	0.359
stock/bond posession at wave1	−0.239	0.414	−0.58	0.564
social network (commitment) at wave1	−0.076	0.423	−0.18	0.857
social netwok (preference-based) at wave1	0.195	0.371	0.53	0.599
d_city3	0.277	0.451	0.61	0.540
d_city4	0.177	0.535	0.33	0.740
d_city5	−0.021	0.536	−0.04	0.968
d_city6	−0.539	0.581	−0.93	0.354
_cons	−15.708	3.831	−4.10	0.000

Number of obs   =   712
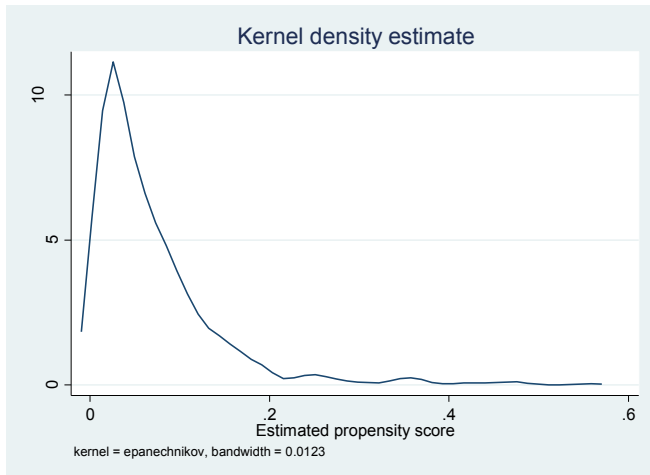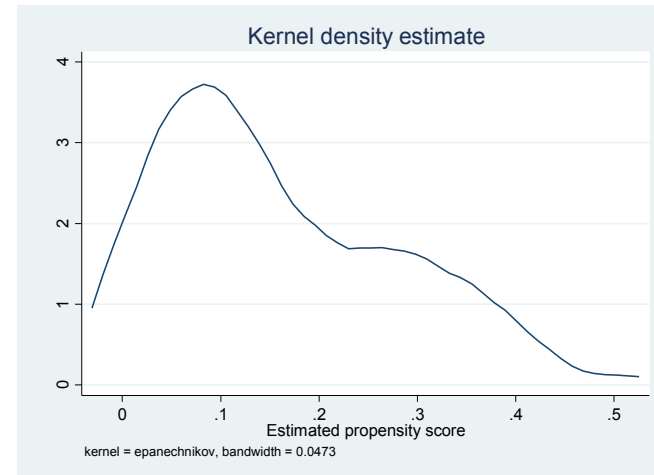LR chi2(28)   =   52.44
Prob > chi2   =   0.0034
Log likelihood = −167.44037
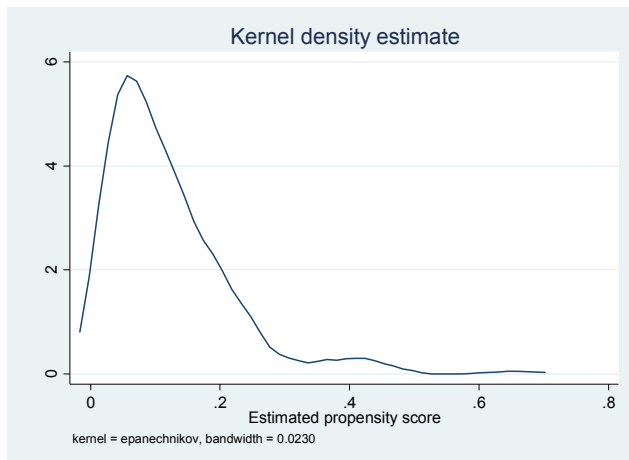Pseudo R2   =   0.1354

Kernel density of propensity scores
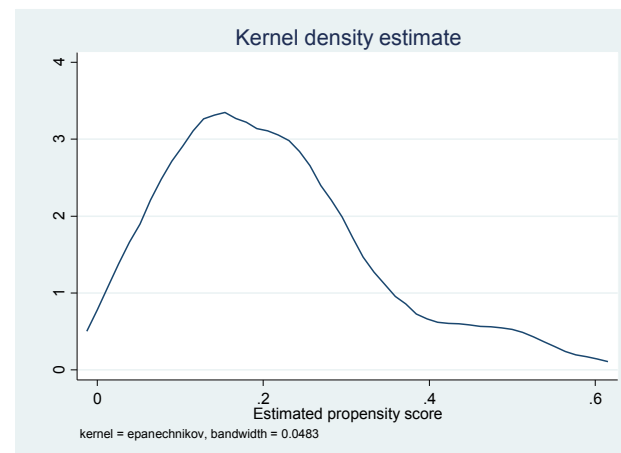

Treated=0
(stayed in paid work w2)

Treated=1
(left from paid work w2)

Males

Females

ATET estimation (males)

Table 6-1 Estimated average treatment effect in the treated (ATET, leaving paid work at wave 2), male

	N	ATET	std error	t-stat	p-value
ATET by kernel matching	544	−0.238	0.234	−1.02	0.238
				z-stat	
ATET by neighborhood matching	497	−0.627	0.382	−1.64	0.101
ATET by PS matching	497	−0.432	0.152	−2.84	0.004

Psmatching adhoc stratified analysis

	N	ATET	std error	t-stat	p-value
full time	251	−0.421	0.246	−1.71	0.087
non-fulltime	218	0.167	0.600	0.28	0.781
stressed	97	−1.250	0.921	−1.36	0.175
less stressed	361	0.240	0.432	0.56	0.578
secured	355	−0.762	0.661	−1.15	0.249
less secured	137	0.063	0.451	0.14	0.890

- CF declined after leaving paid work
- The decline more magnificent among those at fulltime job, job with stress, and job with expected security

ATET estimation (females)

Table 6-2 Estimated average treatment effect in the treated (ATET, leaving paid work at wave 2), female

	N	ATET	std error	t-stat	p-value
ATET by kernel matching					
	478	-0.023	0.303	-0.08	0.397
ATET by neighborhood matching				z-stat	
	365	-0.301	0.371	-0.81	0.287
ATET by PS matching					
	365	0.000	0.181	0.00	0.399

- No obvious impact among female

Summary of findings

- Transition from paid work has a negative impact on cognitive function among males
  - Esp. formerly engaged in full-time and secured job
  - suggesting a drastic change in role from full employment to full retirement may be culprit to functional decline.
- Women seems less vulnerable to work transition and related stress, possibly due to multi-facet roles in workplace, household, and community already.

- Basically in accordance with the role theory

Caution/limitation

- Treatment of time inconsistent heterogeneity
  - Income change
    - -> Income did decrease, but in both genders.
  - New participation to other roles in community
    - -> may counter against the impact by
      retirement, but less so among women.
- Possible violation of conditional independence assumption
- Operationalization of "retirement" in women

Implication

- Retirement and health
  - Diverse, simply "it depends"
  - Policy to smooth role transition may be effective to prevent functional decline for males.
- Comparative analysis with other countries (e.g. SHARE, HRS) further helps gender role difference and health impact
  - Preliminary analysis with SHARE tells the same, but less gender difference