Stress and Retirement

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Introduction and Background

- Many factors may be associated with one's retirement decision (financial and non-financial incentives).
  - Bad physical health or a negative health shock (Blundell et al., 2017, Disney et al., 2006, Macken, 2019, Quinn, 1977).
  - Working conditions and job strains (Blekesaune and Solem, 2005, Sutinen et al., 2005, Wahrendorf et al., 2012).
  - Leisure interests (Shultz et al., 1998).
  - Work-life balance (Angrisani et al., 2017).
  - Working effort-reward imbalance (Hoven et al., 2015, Wahrendorf et al., 2012).
- Retirement has an effect on either physical or mental health (Binh Tran and Zikos, 2019, Butterworthet al., 2006, Charles, 2004, Coe and Zamarro, 2011, Dave et al., 2008, Eibich, 2015).

Aim and Contribution

- Aim : to disentangle the possible direction of causality between mental health and retirement.
  - One aspect of mental health : *stress*.
  - Panel Study of Income Dynamics (PSID) data for the period 2007-2015.
  - To determine whether stress induces workers to retire earlier, or if it is rather that retirement provokes stress in new retirees.
- Contribution :
  - We perform a simultaneous equation analysis where both outcomes (retirement and stress) are instrumented :
    - Retirement is instrumented with legal retirement ages (Charles, 2004 ; Fonseca et al., 2017).
    - The choice of the instrument for stress, which is physical activity (Binh Tran and Zikos, 2019 ; Eibich, 2015 ; Michaud et al., 2016).

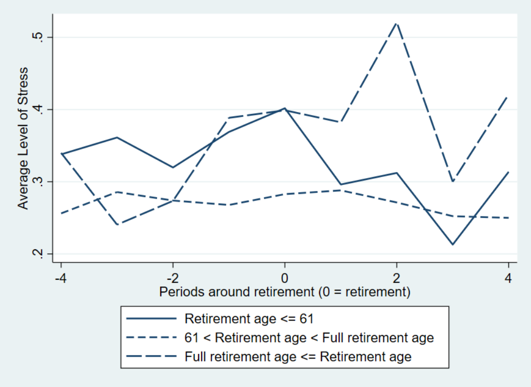
Data and Variables

Stress and age (50-80)

- Proxy for Stress : "In the past 30 days about how often did you feel restless or fidgety (nervous)". On five values scale : 1. none of the time ....5. all of the time.
- Retirement : Conditional on working in the previous period, they report to be retired.

Data and Variables

Stress and period around retirement, by retirement age subgroups



Data and Variables

Stress and period around retirement, by subgroups

Empirical Strategy

- A simultaneous equation analysis, where both outcomes (retirement and stress) are instrumented.
  - $\text{Retirement}_{i,t} = \beta_0 + \beta_1 Stress_{i,t} + \beta_2 I_{i,t} + \beta_3 X_{i,t} + \delta_t + \xi_{i,t}$
- $\text{Stress}_{i,t} = \gamma_0 + \gamma_1 Retirement_{i,t} + \gamma_2 Physical\_activity_{i,t-1} + \gamma_3 Physical\_activity^2_{i,t-1} + \gamma_4 O_{i,t} + \gamma_5 X_{i,t} + \delta_t + \mu_{i,t}$
  - $Retirement_{i,t}$: is individual's retirement probability in period t, conditional on not being retired in the previous period.
  - $Stress_{i,t}$: respondentÃs self-reported level of stress in period t.
  - $I_{i,t}$: a matrix regarding institutional retirement age.
  - $O_{i,t}$: an objective measure of mental health condition.
  - $Physical\_activity_{i,t-1}$: number of heavy physical activities.
  - $X_{i,t-1}$: control vector
  - δ_t : time fixed effects.
  - $\xi_{i,t}$ and $\mu_{i,t}$: error terms with Mundalk correction.

Results

	(1)	(2)	(3)	(4)
Retirement				
Stress	0.426**	0.492**	0.462***	0.498***
	(0.152)	(0.189)	(0.053)	(0.060)
Age Above Full Ret. Age	0.313***	0.315***	0.313***	0.315***
	(0.014)	(0.016)	(0.012)	(0.013)
Age Above Early Ret. Age	0.182***	0.182***	0.181***	0.177***
	(0.011)	(0.011)	(0.010)	(0.010)
Stress				
Retirement	-0.200***	-0.203***	-0.197***	-0.231***
	(0.047)	(0.048)	(0.047)	(0.050)
Physical activity,	-0.032***	-0.028***	-0.023***	-0.020**
	(0.006)	(0.006)	(0.005)	(0.005)
(Physical activity (squared),	0.004***	0.003***	0.003***	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Anx./dep.bad nervers/			0.297***	0.277***
			(0.020)	(0.020)
Observations	10677	10677	10677	10677
Mundlak	NO	YES	YES	YES
Demographic	NO	NO	NO	YES

Results (heterogeneity)

Stress and period around retirement, by subgroups

	Gender		Occupation		Wealth		Ethnicity	
	Male	Female	White	Blue	Under mean	Over mean	White	Non-white
Retirement								
Stress	0.581***	0.494***	0.302***	0.856***	0.457***	0.466***	0.399***	0.712***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age Above Full Ret. Age	0.311***	0.349***	0.324***	0.294***	0.301***	0.285***	0.294***	0.359***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age Above Early Ret. Age	0.163***	0.210***	0.183***	0.159***	0.179***	0.138***	0.174***	0.170***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Stress								
Retirement	-0.329***	-0.138*	-0.234***	-0.204*	-0.162***	0.022	-0.313***	-0.052
	(0.074)	(0.064)	(0.057)	(0.099)	(0.049)	(0.081)	(0.064)	(0.080)
Physical activity, t-1	-0.025***	-0.016*	-0.023**	-0.017*	-0.022**	-0.019*	-0.026***	-0.011
	(0.001)	(0.048)	(0.001)	(0.029)	(0.001)	(0.023)	(0.000)	(0.121)
(Physical activity, t-1)^2	0.003**	0.002*	0.003**	0.002*	0.003**	0.002$^+$	0.003**	0.002$^+$
	(0.002)	(0.033)	(0.002)	(0.049)	(0.001)	(0.055)	(0.002)	(0.068)
Anxiety/depression/bad nerves	0.213***	0.312***	0.267***	0.296***	0.236***	0.314***	0.242***	0.385***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	5658	5019	6889	3788	6851	3826	6999	3678

p-values in parentheses. $^+$ $p < 0.11$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Calculations made by the authors with the PSID dataset (2007-2015).

Conclusions

- The main results show that a rise in stress increases the probability to retire.
- This effect is stronger for males, blue-collar workers, and respondents with below-average wealth, implying an equity issue.
- Taking into account simultaneity of causality, we find that retirement reduces stress levels.
- We find a higher effect for males, white-collar workers, respondents with above-average wealth, and white respondents.
- We find that this latter effect of retirement on stress is of larger incidence than the effect of stress in retirement.

Results (robustness)

Robustness check

	(1) Retirement	(2) Stress	(3) Stress	(4) Stress	(5) Mental Health	(6) Mental Health	(7) Mental Health	(8) Health	(9) HRS	(10) Waves	(11) Age RAnge
Retirement											
Stress	0.176***	0.470***	0.272***	0.195***	0.173***	0.541***	-0.407***	0.436***	0.216***	0.399***	0.445***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.655)	(0.000)
Above Full Ret. Age	0.198***	0.304***	0.311***	0.309***	0.284***	0.296***	0.303***	0.308***	0.245***	0.275***	0.222***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Above Early Ret. Age	0.122***	0.172***	0.175***	0.174***	0.160***	0.165***	0.175***	0.171***	0.132***	0.172***	0.126***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Stress											
Retirement	-0.368***	-0.168***	-0.368***	-0.471***	0.003	-0.080*	0.177+	-0.207***	-0.639***	-0.301***	-0.059
	(0.000)	(0.000)	(0.000)	(0.000)	(0.866)	(0.018)	(0.057)	(0.000)	(0.000)	(0.000)	(0.521)
Physical activity, t-1	-0.022***	-0.022***	-0.032***	-0.040***	0.000	-0.017***	0.023***	-0.012**	-0.021***	-0.014**	-0.011**
	(0.000)	(0.000)	(0.000)	(0.001)	(0.797)	(0.000)	(0.009)	(0.030)	(0.000)	(0.007)	(0.014)
(Physical activity, t-1)^2	0.003***	0.003***	0.004***	0.005***	-0.000	0.002***	-0.002**	0.002**		0.002**	0.001**
	(0.001)	(0.000)		(0.001)	(0.865)	(0.000)	(0.038)	(0.021)		(0.010)	(0.022)
Anxiety/depression /bad nerves	0.267***	0.284***	0.501***	0.698***	0.717***	0.239***	-0.313***	0.257***	0.086***	0.288***	0.279***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	10534	10677	10677	10677	10673	10677	8682	10673	55119	13509	14574

p-values in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Calculations made by the authors with the PSID dataset (2007-2015) and the HRS dataset (1992-2014)

Mundlak Correction

We allow individual correlation over time by splitting the error term : $\xi_{i,t} = \epsilon_i + \varepsilon_{it}$.

- ϵ_i is the individual time-invariant effect with $\epsilon_i \sim N(0, \sigma_\epsilon^2)$.
- ε_{it} is an independent error term with $\varepsilon_{it} \sim N(0, 1)$.
- $Cov(\epsilon_i, \varepsilon_{it}) = 0$.

In this setting it is assumed that the error terms are random and not correlated with the observable explanatory variables.

The relevant and widely-used solution to address this issue would be that proposed by Mundlak (1987), as justified in Ferrer-i-Carbonell (2004, 2005).

We consider $\epsilon_i = u_i + \omega_{it}$

- u_i : the pure error term, which is normally distributed with zero mean and independent of the idiosyncratic error ε_{it}.
- ω_{it} is correlated with a subset of observable time-varying regressors, with correlation $\overline{\omega_i}\eta$, where $\overline{\omega_i}$ is the average of ω_{it} across time.