

The displacement effect of compulsory pension savings on private savings.

Evidence from the Netherlands, using institutional differences across occupations.

Yue Li

Rik Dillingh

Mauro Mastrogiacono

PhD, Vrije Universiteit Amsterdam, The Netherlands

Introduction

Central research question

- *Study the displacement effect of compulsory occupational pensions on private household wealth?*
 - Based on pension fund balance sheet, a quasi-natural experiment → endogeneity & causality
 - Instrument Variable (IV) estimation → displacement effect

Literature

- Attanasio and Rohwedder (2003):
 - UK pension reforms 1975-1981.
 - displacement effects: -55% to -75%.
 - only exists among older and higher income households.
- Engelhardt and Kumar (2011):
 - US Health and Retirement Study
 - displacement effect: -60% (IV), +23% (OLS)
 - bias from measurement errors in pension wealth & unobserved heterogeneity

Introduction

Literature (cont.)

- Kapteyn and Panis (2005):
 - Displacement rate of USA < the Netherlands
 - Compensate almost fully by annuitizing higher net wealth in US.

- Alessie et al. (2013) :
 - 13 European countries.
 - Displacement effect of -47%.

- A wide range of estimate of displacement effect (+23 to -100%):
 - Heterogeneity: institutional and cultural differences.
 - Measurement error in pension wealth: estimated v.s. observed pension wealth

Introduction

Our contribution

- Merging pension funds balance sheet data with the micro data of their members.
- Different impact of financial crisis on pension fund → a quasi-natural experiment.
- Separately estimate displacement effect for self-employed (SE) and wage-employed (WE)
 - Control for unobserved endogeneity, such as institutional differences, risk aversion, occupation choice.
- Unique administrative data on Dutch second pillar pension wealth

Three pillar pension in NL

- **1st pillar**: flat-rate, no difference between gender and income
 - Ignore. Controlled by indicator migration.
- **2nd pillar**: capital funded, occupational pension schemes.
 - Mandatory. However.....
 - But 90% of wage-employed participate in NL.
 - 5-10% self-employed also participate
 - Medical specialists, general practitioners, notaries...
- **3rd pillar**: voluntary annuity and life insurance product.
 - Add third pillar into private household wealth

Data

- Dutch income Panel Study
 - + pension funds balance sheet data (top 20 largest pension fund, covers 45% of sample)
 - + Dutch pension dataset (2007-2010).
- Required (by Dutch Central Bank) and actual funding ratio of pension funds
- Compulsory occupational pension wealth: potential annuity value at retirement.
- Financial information: income, net assets, 3rd pillar pension wealth.
- Background characteristics: gender, age, household composition, WE/SE, working contract information, urbanization level, country of origin, etc.

A quasi-experiment (I): setup

- 2007-2010: a strong reduction in the funding ratios in almost all pension funds in NL.
- The Dutch central bank required a recovery plan to increase the funding ratio:
 - No recovery plan in 2007.
 - Recovery plans started in: 2008, 2009 or 2010.
- Pension Funds that face reduction in the funding ratios :
 - cut pension entitlement,
 - raise premiums and
 - or refrain from indexation.
 - → A negative wealth shock for participants in these funds.

A quasi-experiment (II): equation

$$HW_{it} = \beta_0 + \beta_1 D_{it}^{treatment} + \beta_2 D_{it}^{pensionfund} + \beta_3 D_t^{year} + \mathbf{X}'_{it} \boldsymbol{\beta}_x + \varepsilon_{it}$$

- HW_{it} : private household wealth of individual i
- $D_{it}^{pensionfund} = 1$ if i 's pension fund was required for a recovery plan
- $D_t^{year} = 1$ if time is within recovery plans started (2008-2010)
- $D_{it}^{treatment} = D_{it}^{pensionfund} * D_t^{year}$

A quasi-experiment (III): results

Table 2: Estimates of the displacement effect for wage-employed (diff-in-diff), 2007-2010

<i>Wage-employed</i>	<i>Couples</i>
Displacement effect (diff in diff)	- € 3,468 ** (1,725)
<i>NxT</i>	32,665

- Magnitude of average pension fund ‘shock’:
 - (actual funding ratio - required funding ratio) * household pension wealth = € 25,000
- 7 years=25,000/3,468

IV estimation: displacement effect

- The displacement effect (β_1):

$$HW_i = \beta_0 + \beta_1 PW_i + \mathbf{X}'_i \boldsymbol{\beta}_x + \varepsilon_i$$

HW_i =household wealth, PW_i =pension wealth

\mathbf{X}'_i : includes the variance of funding ratio, a proxy for uncertainty in pension wealth

- To Instruments PW_i , we use company size and industry sector dummies:
 - First stage: strongly significant relationship with PW_i
 - But Sargan test for overidentifying restrictions suggests that not all of our IV's are exogenous.

IV estimation

Table 1: Estimates of the displacement effect for wage-employed (IV) and self-employed (OLS)

<i>Wage-employed</i>	<i>Wage-employed</i>
All income levels	-0.332*** (0.040)
<i>Income quintile 1 (lowest incomes)</i>	-0.105 (0.121)
<i>Income quintile 2</i>	-0.337*** (0.092)
<i>Income quintile 3</i>	-0.394*** (0.092)
<i>Income quintile 4</i>	-0.608*** (0.092)
<i>Income quintile 5 (highest incomes)</i>	-0.214** (0.098)
<i>N</i>	18,740

IV estimation

Table 1: Estimates of the displacement effect for wage-employed (IV) and self-employed (OLS)

<i>Wage-employed</i>	<i>Wage-employed</i>	<i>Self-employed</i>
All income levels	-0.332*** (0.040)	-0.520*** (0.103)
<i>Income quintile 1 (lowest incomes)</i>	-0.105 (0.121)	0.195 (0.297)
<i>Income quintile 2</i>	-0.337*** (0.092)	-0.482* (0.249)
<i>Income quintile 3</i>	-0.394*** (0.092)	-0.098 (0.209)
<i>Income quintile 4</i>	-0.608*** (0.092)	-0.194 (0.272)
<i>Income quintile 5 (highest incomes)</i>	-0.214** (0.098)	-0.837*** (0.216)
<i>N</i>	18,740	3,597

Additional checks, Propensity score matching

- Potential measurement errors & possible selection effects
- Comparing the private household wealth:
 - between WE with pension (WEP) and WE without pension (WEN)
 - between SE with pension (SEP) and SE without pension (SEN)

Table 3: Estimates of the displacement (PSM), 2010

	<i>Wage- employed</i>	<i>Self-employed</i>
ATT – Matched difference in household wealth (i.e. the HW of WEP minus the HW of WEN)	- € 11,430 * (7,177)	- € 68,647 (92,109)
<i>Matched difference in HH occupational pension wealth</i>	€ 47,793 *** (3,161)	€ 82,138*** (14,744)
<i>Tentative displacement effect of PW on HW</i>	- 24%	- 84%
<i>N</i>	18,740	3,597

*Notes: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Conclusions

- Wage-employed respond their pension fund's recovery plan by accumulating more private household wealth.
- Accumulated 3,500 euro more.
- Displacement effect: -33% for WE and -52% for SE.
- Potential explanations for higher displacement among SE:
 - SE are more aware of their pension entitlements accrue than WE. Higher awareness → higher displacement effect .
 - SE are less risk-averse than WE and thus, would hold less precautionary savings.

Thank you for your attention.