The Role of Pension Wealth in the Start-up Decision of New Self-employed:
Evidence from a Pension Policy Reform

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VU University Amsterdam & Netspar

January 29, 2015
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- Self-employed will approach retirement with substantial wealth holdings
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- Causality: wealthy individuals → self-employed? OR self-employed → wealthy?
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- Causality: wealthy individuals $\rightarrow$ self-employed? OR self-employed $\rightarrow$ wealthy?

- Compensate self-employed the lack of collective pension income after retirement?
Literature in wealth & shift into self-employment

- Positive correlation in self-employment & wealth $\rightarrow$ liquidity constraints:
  
  (Evans and Jovanovich (1989), Fairlie (1999); Statistics Netherlands (2011), Gentry and Hubbard (2004))
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  (Dunn et al. (2000) and Hurst et al. (2004))
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- Endogeneity in wealth

- Exogenous wealth shocks, e.g winning a lottery, receiving an unexpected bequest:
  (Lindh and Ohlsson (1996), Imbens et al. (2001) and Taylor (2001), Brown et al. (2010))
Literature in pension wealth & labor supply

- Labor supply declines when social security benefits becomes lower: Krueger and Pischke (1991)

Unanticipated increases in social security wealth lead older individuals to retire earlier: Anderson et al. (1986)

Removal of the retirement earnings incentives leads older individuals to continue working: Baker and Benjamin (1999)

Pension coverage reduces the likelihood to enter self-employment: Zissimopoulos and Karoly (2007)
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Our Approaches

- Quasi-natural experiments: Dutch pension system reform in 2006

Wage-employees born on or after 01-01-1950: substantial reduction of their pension wealth

Wage-employees born until 31-12-1949: no reduction of their pension wealth
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- Exogenous shocks in pension wealth
The three-pillar Dutch pension system

- **1st pillar**: pay-as-you-go, basic old age state pension
- **2nd pillar**: collective and funded system
  - Only for wage-employees
  - Mandatory
  - Depends on: average wages, tenure, % of fte, institutional parameters
  - Not disposable before retirement
- **3rd pillar**: voluntary, with insurers or banks
  - Not many wage-employees buy
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- **1st pillar**: pay-as-you-go, basic old age state pension
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A wage-employee, birth year = 1950, started working year = 1975, continuous participation, average wage from employment = 60000 euro/year, the retirement replacement rate: 67% → 63%.
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- Assumption: all wage employees are full-time
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- From 1996 to 2011: no other comprehensive nationwide systemic reforms of the pension system
Data: Dutch Income Panel

- Administrative dataset
  - Accurately identify wage-employed and self-employed

Limitation
- No household wealth shocks: receiving bequest, winning lottery
- No education level, health condition, other personal characteristics
- Cannot distinguish: entrepreneurs, solo consultants, farmers, farm owners and so on
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- **Dependent variable:**
  - Dummy for: wage-employment (WE) \( \rightarrow \) self-employment (SE)
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Selection

- Year 2003-2011, age 31 to 65, the head of a household
Selection

- Year 2003-2011, age 31 to 65, the head of a household

Figure: Proportion of self-employment and wage-employment in 2011

Wage-employed 63%
Self-employed 12%
Others 25%
Selection

- Year 2003-2011, age 31 to 65, the head of a household
- Focus on wage-employment (WE) → self-employed (SE)
Selection

- Year 2003-2011, age 31 to 65, the head of a household
- Focus on wage-employment (WE) → self-employed (SE)

- Keep wage-employed whose yearly wage > 27000 euro
Figure: Self-employment transition rates of treatment group and control group
## Mean-comparison tests, treatment group

<table>
<thead>
<tr>
<th></th>
<th>Year 2006 Mean</th>
<th>Year 2005 Mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-employment transition rate</strong></td>
<td>0.92%</td>
<td>0.55%</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Reduction in replacement rate due to reform</strong></td>
<td>0.0275</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reduction in expected total pension wealth / 10^5</strong></td>
<td>0.324</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lag income from wage-employment</strong></td>
<td>48515</td>
<td>47167</td>
<td>0.015</td>
</tr>
<tr>
<td>Age</td>
<td>44.0</td>
<td>43.1</td>
<td>0.000</td>
</tr>
<tr>
<td>Tenure</td>
<td>16.9</td>
<td>15.9</td>
<td>0.000</td>
</tr>
<tr>
<td>Household size</td>
<td>3.559</td>
<td>3.574</td>
<td>0.257</td>
</tr>
<tr>
<td>Number of persons with income in a household</td>
<td>2.108</td>
<td>2.107</td>
<td>0.890</td>
</tr>
<tr>
<td>Indicator for relocation</td>
<td>0.051</td>
<td>0.052</td>
<td>0.417</td>
</tr>
<tr>
<td>Indicator for living in high urbanization</td>
<td>0.124</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator for immigrant</td>
<td>0.123</td>
<td>0.124</td>
<td>0.756</td>
</tr>
<tr>
<td>Indicator for unmarried</td>
<td>0.150</td>
<td>0.151</td>
<td>0.791</td>
</tr>
<tr>
<td>Indicator for married</td>
<td>0.787</td>
<td>0.788</td>
<td>0.799</td>
</tr>
<tr>
<td>Indicator for widowed</td>
<td>0.004</td>
<td>0.004</td>
<td>0.996</td>
</tr>
<tr>
<td>Indicator for divorced</td>
<td>0.059</td>
<td>0.057</td>
<td>0.393</td>
</tr>
<tr>
<td>Number of observations</td>
<td>17763</td>
<td>18002</td>
<td></td>
</tr>
</tbody>
</table>

Table: Treatment group: Mean-comparison tests, year 2005 (before the reform) and year 2006 (after the reform)
Mean-comparison tests, control group

<table>
<thead>
<tr>
<th>Control group: cohort ≤ 1949</th>
<th>Year 2006 Mean</th>
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<tbody>
<tr>
<td>Self-employment transition rate</td>
<td>0.53%</td>
<td>0.19%</td>
<td>0.045</td>
</tr>
<tr>
<td>Reduction in replacement rate due to reform</td>
<td>0</td>
<td>0</td>
<td>/</td>
</tr>
<tr>
<td>Reduction in expected total pension wealth / 10^5</td>
<td>0</td>
<td>0</td>
<td>/</td>
</tr>
<tr>
<td>Lag income from wage-employment</td>
<td>52072</td>
<td>51973</td>
<td>0.315</td>
</tr>
<tr>
<td>Age</td>
<td>59.2</td>
<td>58.5</td>
<td>0.000</td>
</tr>
<tr>
<td>Tenure</td>
<td>25.5</td>
<td>24.8</td>
<td>0.008</td>
</tr>
<tr>
<td>Household size</td>
<td>2.329</td>
<td>2.381</td>
<td>0.034</td>
</tr>
<tr>
<td>Number of persons with income in a household</td>
<td>1.947</td>
<td>1.989</td>
<td>0.063</td>
</tr>
<tr>
<td>Indicator for relocation</td>
<td>0.023</td>
<td>0.029</td>
<td>0.161</td>
</tr>
<tr>
<td>Indicator for living in high urbanization</td>
<td>0.124</td>
<td>0.124</td>
<td>0.946</td>
</tr>
<tr>
<td>Indicator for immigrant</td>
<td>0.118</td>
<td>0.117</td>
<td>0.903</td>
</tr>
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<td>Indicator for unmarried</td>
<td>0.056</td>
<td>0.055</td>
<td>0.924</td>
</tr>
<tr>
<td>Indicator for married</td>
<td>0.839</td>
<td>0.836</td>
<td>0.715</td>
</tr>
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<td>Indicator for widowed</td>
<td>0.014</td>
<td>0.018</td>
<td>0.328</td>
</tr>
<tr>
<td>Indicator for divorced</td>
<td>0.094</td>
<td>0.088</td>
<td>0.412</td>
</tr>
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<td>Number of observations</td>
<td>2887</td>
<td>3001</td>
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Table: Control group: Mean-comparison tests, year 2005 (before the reform) and year 2006 (after the reform)
Estimation Results (1)

\[ y_{it} = \alpha_i + \beta_1 \times T{D}_{it} + \beta_2 \times D_{\text{cohort} \leq 1949} + \beta_3 \times D_{\text{year} \geq 2006} + \gamma \times X_{it} + u_{it}, \]

where \( t = 2003, \cdots, 2011 \)

- \( T{D}_{it} \): treatment dummy. \( T{D}_{it} = 1 \) if cohort \( \geq 1950 \) & year \( \geq 2006 \)
Estimation Results (1)

\[ y_{it} = \alpha_i + \beta_1 \cdot TD_{it} + \beta_2 \cdot D_{\text{cohort} \leq 1949} + \beta_3 \cdot D_{\text{year} \geq 2006} + \gamma \cdot X_{it} + u_{it}, \]

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<th>Fixed-effects Estimate</th>
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<tr>
<td>Self-employed (se income $\neq 0$)</td>
<td>-0.0006</td>
<td>-0.0024*</td>
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<td>Full-time self-employed (se income $\neq 0$ &amp; wage income=0)</td>
<td>-0.0010**</td>
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Note: Total number of observations is 213409.
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*Note:* Total number of observations is 213409.

- \( \Pr(\text{shift into full-time SE}): 0.12\% \) (avg. in 2005) \( \rightarrow 0.12\%-0.10\%=0.02\% \)
Estimation Results (2)

- $y_{it} = \alpha_i + \beta_1 \ast \text{Reduction in Replacement Rate}_{it} + \beta_2 \ast \cdots \cdots\cdots$,
  where $t = 2003, \cdots, 2011$

- **Reduction in Replacement Rate**$_{it}$: instrumented by dummy for treatment
Estimation Results (2)

- $y_{it} = \alpha_i + \beta_1 \times \text{Reduction in Replacement Rate}_{it} + \beta_2 \times \cdots \cdots$, where $t = 2003, \cdots, 2011$

- **Reduction in Replacement Rate**$_{it}$: instrumented by dummy for treatment

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<td>-0.0226</td>
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<td>-0.0354**</td>
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<tr>
<td>Full-time self-employed (se income$\neq 0$ &amp; wage income$=0$)</td>
<td>-0.0260**</td>
<td>-0.0354**</td>
</tr>
</tbody>
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*Note*: Total number of observations is 213409. The F-statistic for the relevance of the instrument is 1553.4.

- Reduction in replacement rate in 2006: 0.03
- $\text{Pr(shift into full-time SE)}$: 0.12% (avg. in 2005) $\rightarrow$ 0.12% - 2.6% * 0.03 = 0.04%.
Estimation Results (3)

- \( y_{it} = \alpha_i + \beta_1 \ast \text{Total Pension Wealth Reduction}_{it} + \beta_2 \ast \cdots \),
  where \( t = 2003, \cdots, 2011 \)

- \textbf{Total Pension Wealth Reduction}_{it}: instrumented by dummy for treatment
Estimation Results (3)

- $y_{it} = \alpha_i + \beta_1 \times \text{Total Pension Wealth Reduction}_{it} + \beta_2 \times \cdots$, 
  where $t = 2003, \cdots, 2011$
- **Total Pension Wealth Reduction}_{it}: instrumented by dummy for treatment

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<th>Total Pension Wealth Reduction / $10^5$</th>
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*Note:* Total number of observations is 213409. The F-statistic for the relevance of the instrument is 1477.2.
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*Note*: Total number of observations is 213409. The F-statistic for the relevance of the instrument is 1477.2.

- For reduction in 100,000 euro, \( \text{Pr}(\text{shift into full-time SE}) \) decreases by 0.54% percentage point (avg. in 2005: 0.55%)
Findings in other literature and Robustness Check

- Anderson et al. (1986) and Baker and Benjamin (1999):
  Loss (gain) in social security and pension wealth → old individuals to continue working but not retire (retirement earlier):

Robustness check:
- Weak evidence that anticipation effects exist only in 2005 (announced in July 2005)
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- When pension wealth drops, wage-employed tend to stay longer in wage-employment to accrue that back