Pension Policy and the Financial System

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Substitution between Public and Private Pensions

Slope = $-0.73 \pm 0.12$

Adjusted $R^2 = 0.61$

Data Sources: OECD Pensions at a Glance 2015
Total Pension Assets and Public Pension Benefits

Slope = \(-2.1\) *** (0.26)

Adjusted $R^2 = 0.521$

Data Sources: OECD Pensions at a Glance 2015; OECD Pension Statistics Database
Total Pension Assets and Public Pension Benefits

$\text{Slope} = -2.1^{***} (0.26)$

$\text{Adjusted } R^2 = 0.521$

Data Sources: *OECD Pensions at a Glance 2015; OECD Pension Statistics Database*
Finance Share and Public Pensions

\[ Slope = -0.062 \quad *** \quad (0.011) \]
\[ Adjusted R^2 = 0.477 \]

![Graph showing the relationship between Finance Share and Public Pension Replacement Rate](graph.png)

- Finance Value Added = Profits + Compensation
- Finance Share \( \equiv \) Finance Value Added/GDP

Data Sources: OECD Pensions at a Glance 2015; OECD National Accounts Statistics Database
Main Idea

Policies that promote pension savings also promote the development of capital markets. I explore the implications for:

- Corporate Finance
  - Bank vs. bond financing
  - Firm size
  - Ownership
- Household Finance
  - Asset Holdings: Deposits, Housing, Other Financial Assets
  - Household Leverage
- Banking
- Size of the Financial Sector
- Financial Stability
Pension Savings and Household Financial Assets

- Key assumption: private pensions add to household savings
  - Public pensions crowd out private savings (Feldstein, 1974)
  - Private pensions do not crowd out all non-pension savings (Poterba, Venti and Wise, 1996)
- Some debate about the magnitude of the effect but reasonable to assume private pensions add to household savings

\[
\text{Slope} = -2.3 \quad *** (0.73) \\
\text{Adjusted } R^2 = 0.285
\]
Theory

- Model banks per William Diamond (2017)
  - Households have demand for safe, money-like assets (e.g. Gorton and Pennachi, 1990; Stein, 2012; Greenwood, Hanson and Stein, 2015)
  - Banks issue deposits to meet this demand
  - Bank hold low-risk assets to back safe deposits rather than issue a lot of costly equity
  - Households own relatively risky assets in the capital market
  - Banking in this model is about "safety transformation," not about monitoring
- Embed these banks in a general equilibrium model to explore the role of pension savings in shaping the financial system
Further Modeling Assumptions

- Exogenous savings, $s$, distributed uniformly on $[m^*, m^* + 2\alpha]$ within an economy
- $\alpha$ indexes savings in an economy: on average, higher $\alpha$ in countries with more private pension funding. (Italy = low $\alpha$; Denmark = high $\alpha$)
- Household must hold minimum amount of deposits, $m^*$
- Production economy with low risk and high risk projects in infinite supply
- High risk project also has higher expected payoff
- Fixed cost of investing in the capital market, $K$
- In model extensions, I will introduce mortgages and asset management costs
Basic Results

- Households invest in capital market if they have enough savings to make it worthwhile to pay $K$; otherwise they keep their savings in the bank.

- As a result, in high pension savings economies more households want to invest in the capital market and they put less of their savings in bank deposits.

- **Proposition:** In high pension savings economies, more investment activity goes through the capital market rather than through banks. More high risk, high value projects are taken.

**Interpretation:** Countries with more private pension funding will be more capital markets oriented; PAYGO countries will be more bank-centered.
Implications for Corporate Finance

- More bank-dependent firms in PAYGO countries
- Smaller firms in PAYGO countries
  - Evidence that banks with market power constrain firm growth (Black and Strahan, 2002; Weinstein and Yafeh, 1998)
  - Bank risk limits (Ivashina, 2009)
- More inside ownership in PAYGO countries
Share of Bank Loans in Corporate Debt

**Slope** = 0.28 **( 0.11 )
Adjusted $R^2$ = 0.222

Data Sources: OECD Pensions at a Glance 2015; OECD National Accounts Statistics Database
Firm Size: Small Firm Share of Employment

Slope = 0.32 ** (0.13)
Adjusted $R^2 = 0.258$

Data Sources: OECD Pensions at a Glance 2015; OECD Structural and Demographic Business Statistics
Firm Size: Large Firm Share of Employment

\[ \text{Slope} = -0.26 \; \text{***} \; (0.08) \]

\[ \text{Adjusted } R^2 = 0.261 \]

Data Sources: OECD Pensions at a Glance 2015; OECD Structural and Demographic Business Statistics
Inside Ownership

Slope = 0.42 *** (0.08)
Adjusted $R^2$ = 0.536

Data Sources: OECD Pensions at a Glance 2015; Worldscope
Extending the Model to Include Mortgages

- Everyone has to own $H$ units of housing
- Housing is low risk so can be used to back deposits
- The financial returns on housing equity are lower than the returns on capital market investments
- As before, households can hold deposits and capital market investments, but now also housing equity
- Now everyone holds minimum deposits, $m^*$
- Low savers put the rest of their savings in housing equity
- High savers "borrow" (sell off equity in the house) so they can invest as much as possible in capital market, which has higher financial returns than housing equity.
Proposition: Household Finance

- Housing Leverage (LTV) and Household Debt to GDP are higher in economies with more private pension savings.
- Deposits are a smaller share of financial assets in economies with more private pensions; Deposits to GDP do not vary with pension policy.
- Mortgages are a larger share of loans on bank balance sheets in economies with more private pension savings.
Housing Leverage (Loan-to-Value Ratios)

Slope = $-0.41 \, ** \, (0.18)$

Adjusted $R^2 = 0.157$

Data Sources: OECD Pensions at a Glance 2015; OECD National Accounts Statistics Database; Credit Suisse Global Wealth Databook 2016
Housing Assets Relative to GDP

\[ \text{Slope} = 0.52 \quad (1) \]

\[ \text{Adjusted } R^2 = -0.036 \]

Data Sources: OECD Pensions at a Glance 2015; World Bank World Development Indicators; Credit Suisse Global Wealth Databook 2016
Household Debt as a Share of GDP

\[ \text{Slope} = -0.9 \quad *** (0.24) \]
\[ \text{Adjusted } R^2 = 0.38 \]

Data Sources: OECD Pensions at a Glance 2015; World Bank World Development Indicators; Credit Suisse Global Wealth Databook 2016
Deposits as a Share of GDP

Slope = $-0.12 \ (0.28)$

Adjusted $R^2 = -0.051$

Data Sources: OECD Pensions at a Glance 2015; World Bank World Development Indicators; Credit Suisse Global Wealth Databook 2016
Deposits as a Share of Household Financial Assets

\[ \text{Slope} = 0.44 \quad *** \quad (0.15) \]

\[ \text{Adjusted } R^2 = 0.321 \]

Data Sources: OECD Pensions at a Glance 2015; OECD National Statistics Database
Financial Assets Relative to GDP

Slope = $-2.3 \, ***(0.73)***$

Adjusted $R^2 = 0.285$

Data Sources: OECD Pensions at a Glance 2015; OECD National Statistics Database; World Bank World Development Indicators
Housing Equity as a Share of Household Assets

Data Sources: OECD Pensions at a Glance 2015; World Bank World Development Indicators; Credit Suisse Global Wealth Databook 2016
Household Credit as a Share of Bank Loans

\[ \text{Slope} = -0.26 \quad **\quad (0.11) \]

\[ \text{Adjusted } R^2 = 0.355 \]

Data Sources: OECD Pensions at a Glance 2015; European Central Bank MFI Balance Sheets; Financial Accounts of the United States 2016
Capital Market Deepening

- Households hire a (pension fund) manager to invest in the capital market; fee of $f$ per unit of assets under management
- Fees lower capital market investment, increase bank lending
- Now suppose there is fixed cost of asset management, $F$
- Zero-profit condition implies the asset management fee such that:

\[ f \times \text{E[Capital Market Investment Output]} = F \]

Fee, $f$, is decreasing in capital market investment

- Multiple Equilibria:
  - Low capital market investment $\Rightarrow$ High fee $\Rightarrow$
    Low capital market investment
  - High capital market investment $\Rightarrow$ Low fee $\Rightarrow$
    High capital market investment
Proposition: Capital Market Deepening

- With fixed costs of asset management, an increase in aggregate pension savings leads to a reduction in the threshold for investing in the capital market.
- Households at lower savings levels choose to invest in the capital market
- This amplifies the effect of an increase in private pension savings on the size of capital market.

**Capital Market Deepening:** In high pension savings economies, capital market investment is high, which lower fees and brings less wealthy households into the capital market
Finance Share and Public Pension Replacement Rates

\[
\text{Slope} = -0.062 \, ***(0.011)\]
\[
\text{Adjusted } R^2 = 0.477
\]

Data Sources: OECD Pensions at a Glance 2015; OECD National Statistics Database
Finance Share and Pension Assets

\[
Slope = 0.019 \quad *** \quad (0.0047)
\]

\[
Adjusted R^2 = 0.314
\]

Data Sources: OECD Pensions at a Glance 2015; OECD National Statistics Database
Why is Finance Share Increasing in Pension Assets?

Each dollar increase in pension assets increases finance value added by 1.9 cents (1.9%)

- Asset management fees are only part of the story
  - Value added $\approx$ half of revenue in securities business
  - Thus, need fees to be 3.8% of AUM to explain the result, an implausibly high number
  - US asset management fees were about 0.75% in mid-2000s (French, 2008), probably lower now
  - Fees generally higher outside US, but not 5x higher

- Could be other costs on supply side of assets (underwriting, origination, etc.) as suggested in Philippon’s (2015) analysis of costs of finance

- But the large number could reflect capital market deepening whereby pension savings stimulates more capital market participation and a larger financial sector
Alternative Explanations

- Legal Origins (LLSV, 1997 and 1998)
- Faith in Finance
  - Social Capital and Trust (Guiso, Sapienza and Zingales, 2004)
  - Wealth Destruction: Hyperinflation (Perotti and Schweinbacher, 2009)
- Reverse Causality: Capital Market Development $\rightarrow$ Funded Pensions, not the other way around
Legal Origins, Pension Policy and Finance Share

Slope = −0.051 *** (0.014)  
Adjusted R² = 0.375

Civil Law Countries

Slope = −0.077 * (0.029)  
Adjusted R² = 0.358

Common Law Countries

Data Sources: OECD Pensions at a Glance 2015; OECD National Statistics Database; La Porta et. al., 1998
Implications for Financial Stability and Pension Policy

- Risks of private pension systems identified in public economics literature
  - Risks largely borne by individuals and/or employer
  - PAYGO mitigates risk through redistributive policies within and across generations, but increases fiscal risk
- My analysis points to other risks of private pension systems
  - Greater household debt
    - Mortgage exposure of banks implicated in financial crises (Jorda, Schularick and Taylor, 2014)
    - Household debt amplifies business cycles (Mian, Sufi and Verner, 2017)
  - Greater capital market reliance
    - May increase risk because of less stable funding (Gorton and Metrick, 2010)
    - May decrease risk as borrowers can substitute bonds for bank loans when banks contract lending (Kashyap, Stein and Wilcox, 1993; Becker and Ivashina, 2014)
- Implications for Policy