

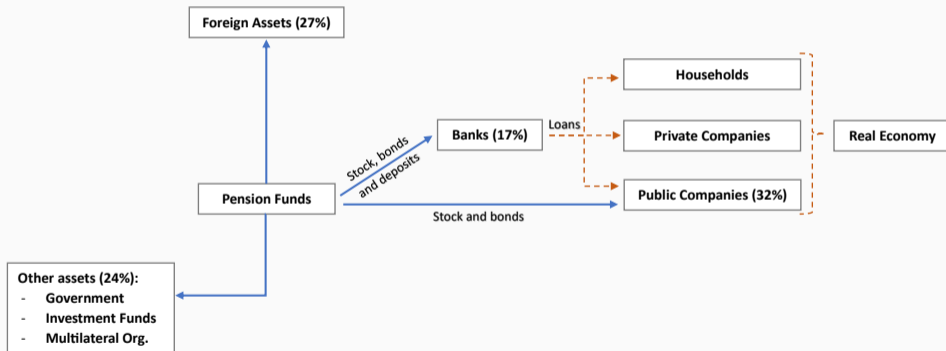
The Real Effects of Pension Funds Domestic Investments

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- Pension Funds are key institutional investors in financial markets
 - PF assets to GDP ratio is 20 percent in Latin America [cross-country average]
- Provide **medium and long-term capital**, critical in developing economies
 - *“Businesses (in the developing world) are crying out for capital. What little they get often comes from foreigners, who are quick to pack their bags when things get tough. There is no such risk with local pension funds.”* **The Economist. October 2021.**
- However, little is known about their **effects on economic growth**

What are the real effects of pension funds domestic investments?



- Pension funds affect the cost of financing of public firms (directly) and other firms in the economy (indirectly, through the bank lending channel)

What are the real effects of pension funds domestic investments?

- Reform increased limit of pension funds' foreign investments from 30 to 40% of total assets
 - increasing foreign assets + reducing domestic investments
 - plausibly exogenous treatment: ex-ante dependence of pension funds
- Direct and indirect treatment
 - Direct treatment: pension funds investments over total assets [**public firms and banks**]
 - Indirect treatment: weighted average bank direct exposure [**other firms**]
- We compare differently treated firms before and after the reform

What are the real effects of pension funds domestic investments?

- Do pension funds affect the cost of financing (stock px & bond yields) of **listed firms**?
- Can listed firms **substitute** through other types of funding?
- If not, what are the **real consequences** of pension funds investments?

- Do pension funds affect **banks funding**? What **type of funding**: short- and/or long-term?
- If so, does it affect bank lending? what **type of lending**?
- What are the **real consequences** of pension funds through the **bank-lending channel**?

Pension funds

- Lakonishok et al. (1992), Guercio and Hawkins (1999), Walker and Lefort (2002), Impavido et al. (2003), Raddatz and Schmulker (2008), Rocholl and Niggemann (2010), Thomas et al. (2014), Schmidt-Hebbel (1998), Davis and Hu (2008), Zandberg and Spierdijk (2010), Sialm et al. (2015), Da et al. (2018), Aldunate et al. (2022)
Contribution: Economic effects of pension funds on domestic investments and economic growth

Finance and economic growth

- ...
Contribution: The role of pension funds, under-explored financial institution, managing great amount of savings

Capital controls in emerging markets

- ...
Contribution: Regulation of pension funds' foreign investments and capital controls

Data & Institutional Background

We expect to combine the following datasets

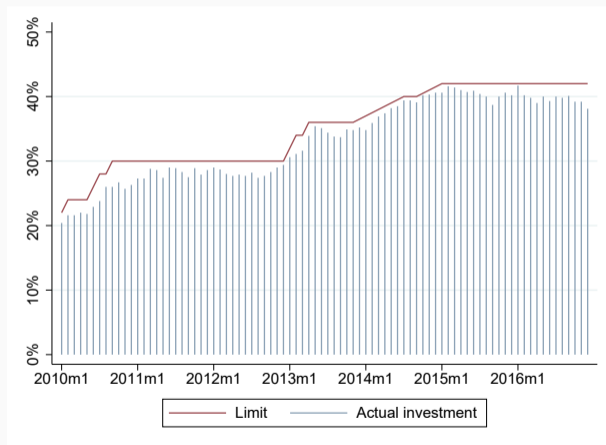
- Pension funds investments in domestic firms by instrument: stocks, bonds, and deposits
 - **Construct direct exposure**
- Stock prices and bond yields of domestic firms
 - **Estimate effects on financial outcomes**
- Bank-firm credit registry data
 - **Indirect exposure through bank lending channel**
- Balance sheet of domestic firms
 - **Estimate real effects**

Institutional background

- Peru has four private and one public pension funds agencies
- Private pension funds represent 20% of GDP and 50% of bank total assets in 2010
- Multiple regulations: risk, currency, domestic/foreign assets, etc.
- Limit on investments in foreign assets increased from 30 to 40% over 2013-2014
 - PF reallocated investments away from domestic firms towards foreign assets

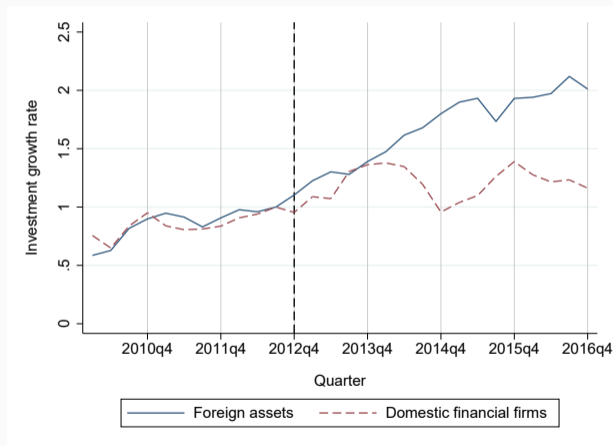
Limit of pension funds' foreign investments always binding

Figure 1: Foreign investment share



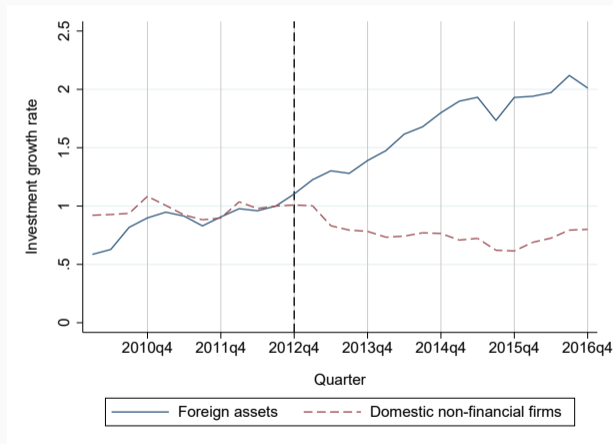
and also reduce investments in domestic financial firms

Figure 2: Pension funds' investments in foreign assets and domestic financial firms



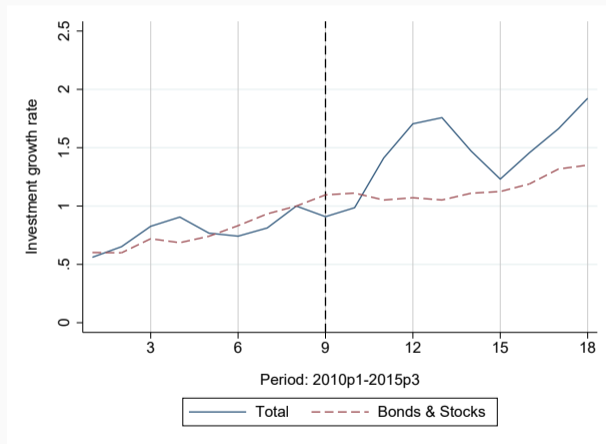
Pension funds move away from domestic NF firms towards foreign assets

Figure 3: Pension funds' investments in foreign assets and domestic NF firms



Hump-shaped growth rate associated with short-term deposits

Figure 4: Pension funds' investments in domestic financial firms



Empirical framework

Treatment

- We define treatment for different firms and at different levels

- Direct treatment for public non-financial firms in stock and bond market:

$$\text{Treatment}_i^S = \frac{\text{PF investments in stocks}_i}{\text{Market Capitalization}_i} \quad \text{and} \quad \text{Treatment}_i^B = \frac{\text{PF investments in bonds}_i}{\text{Long-term liabilities}_i}$$

- Direct treatment for financial firms:

$$\text{Treatment}_b^T = \frac{\text{PF total investments}_b}{\text{Total assets}_b}$$

- Indirect treatment for non-financial firms:

$$\text{Treatment}_i^I = \frac{\text{Loans}_{ib,0}}{\text{Loans}_{i,0}} \times \text{Treatment}_b$$

$$Y_{kt} = \sum_{\substack{\tau=2010q1 \\ \tau \neq 2012q3}}^{2015q4} \gamma_{\tau} \times \text{Treatment}_k^N \times \mathbb{1}[t = \tau] + \delta_k + \delta_{q(k),t} + u_{kt}$$

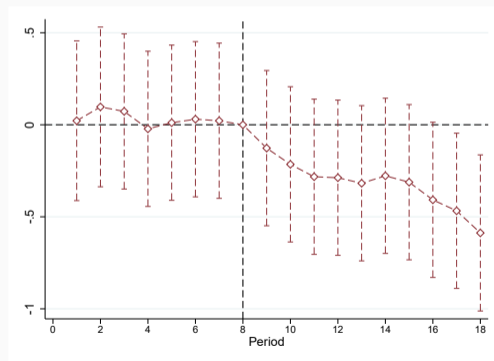
- Y_{kt} : outcome of firm ($k = i$) or bank ($k = b$) in quarter t
- Treatment_k^N : treatment based on stock ($N = S$), bonds ($N = B$), total investments ($N = T$), or indirect exposure ($N = I$)
- δ_k and $\delta_{q(k),t}$: firm and firm-size tercile \times time fixed effects
- SEs clustered at the firm level

Effects on Stock Prices

Decline in stock prices

$$Y_{it} = \sum_{\substack{\tau=2010q1 \\ \tau \neq 2012q3}}^{2015q4} \gamma_{\tau} \times (\text{Treatment}_i^S > 0) \times \mathbb{1}[t = \tau] + \delta_i + \delta_{q(i),t} + \delta_{j(i),t} + u_{it}$$

	Stock price (1)	Market cap (2)
$(\text{Treatment}_i^S > 0) \times \text{Post}_t$	-0.36*** (0.07)	
Fixed Effects		
Firm	✓	
Firm-size × time	✓	
Industry × time	✓	
Observations	1,669	



Decline in stock prices and market capitalization

$$Y_{it} = \sum_{\substack{\tau=2010q1 \\ \tau \neq 2012q3}}^{2015q4} \gamma_{\tau} \times (\text{Treatment}_i^S > 0) \times \mathbb{1}[t = \tau] + \delta_i + \delta_{q(i),t} + \delta_{j(i),t} + u_{it}$$

	Stock price (1)	Market cap (2)
$(\text{Treatment}_i^S > 0) \times \text{Post}_t$	-0.36*** (0.07)	-0.46*** (0.07)
Fixed Effects		
Firm	✓	✓
Firm-size × time	✓	✓
Industry × time	✓	✓
Observations	1,669	1,634

