Discussion of

"Pension Plan Systems and Asset Prices"

by Coimbra, Gomes, Michaelides, Shen

Vadim Elenev
Johns Hopkins Carey
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A Brief History of Equilibrium Asset Pricing

- C-CAPM: an intuitive way to price assets in an endowment economy
  - Simple SDF; aggregate consumption
  - Challenge: doesn't match the data at all
- Solution: "Clever" SDFs with aggregate consumption
  - Challenge: puzzles come back when you replace endowment with production
  - Endogenous consumption/savings gives agents an extra margin to smooth consumption
- Solution (?): replace aggregate with (much more volatile and negatively skewed) individual consumption
  - Why: incomplete markets
  - Challenge: high consumption vol not enough to explain equity prices, need high covariance of consumption with stock returns
- This paper: new source of this covariance
  - Defined-benefit pension fund contributions ↑ (i.e. after-contribution income ↓) when stock returns ↓

Pension funds make risk sharing worse

- Pension fund exposure to the stock market shifts risk across the lifecycle
  - Consumption too smooth in retirement
  - Too volatile in working age
  - Report sd(C) by age
  - Is welfare monotonic in size of pension fund?
- Why don't households undo these effects with private savings?
  - Type Bs do, to an extent
  - Limited participation
  - General equilibrium pricing effects: insurance is costly
- Why don't we see this in equity prices?
  - Price of risk goes up
  - Higher precautionary savings → higher capital stock → less volatile MPK → quantity of risk goes down
  - Once you recalibrate, it shows up!

Table 3: Baseline and noDBPF Models: Comparison.

Variable	Moment	Models			Data
		Baseline	noDBPF	r-noDBPF	
r_f	Mean	1.14%	4.90%	1.18%	0.86%
r_f	St. Dev.	1.34%	1.46%	1.09%	1.35%
r^m	Mean	5.79%	9.86%	4.40%	8.17%
r^m	St. Dev.	13.67%	13.81%	13.61%	19.81%
$r^m - r_f$	Mean	4.65%	4.95%	3.22%	7.55%
$\frac{Mean(r^m - r_f)}{Std.Dev.(r^m - r_f)}$		0.34	0.37	0.24	0.34
Cons. growth (all)	St. Dev.	2.91%	1.86%	2.23%	2.90%
Cons. growth (A)	St. Dev.	3.42%	1.65%	1.43%	(-)
Cons. growth (B)	St. Dev.	2.49%	2.15%	3.14%	(-)
K	Mean	4.69	3.24	5.21	(-)
$Kprivate$	Mean	3.67	3.24	5.21	(-)
W^P/Y	Mean	0.74	0	0	0.67
K/Y	Mean	2.35	1.85	2.53	(-)
Participation (all)	Mean	52.3%	52.4%	52.2%	51.1%
Participation (A)	Mean	18.6%	22.6%	18.5%	(-)
Participation (B)	Mean	86.0%	82.2%	86.0%	(-)

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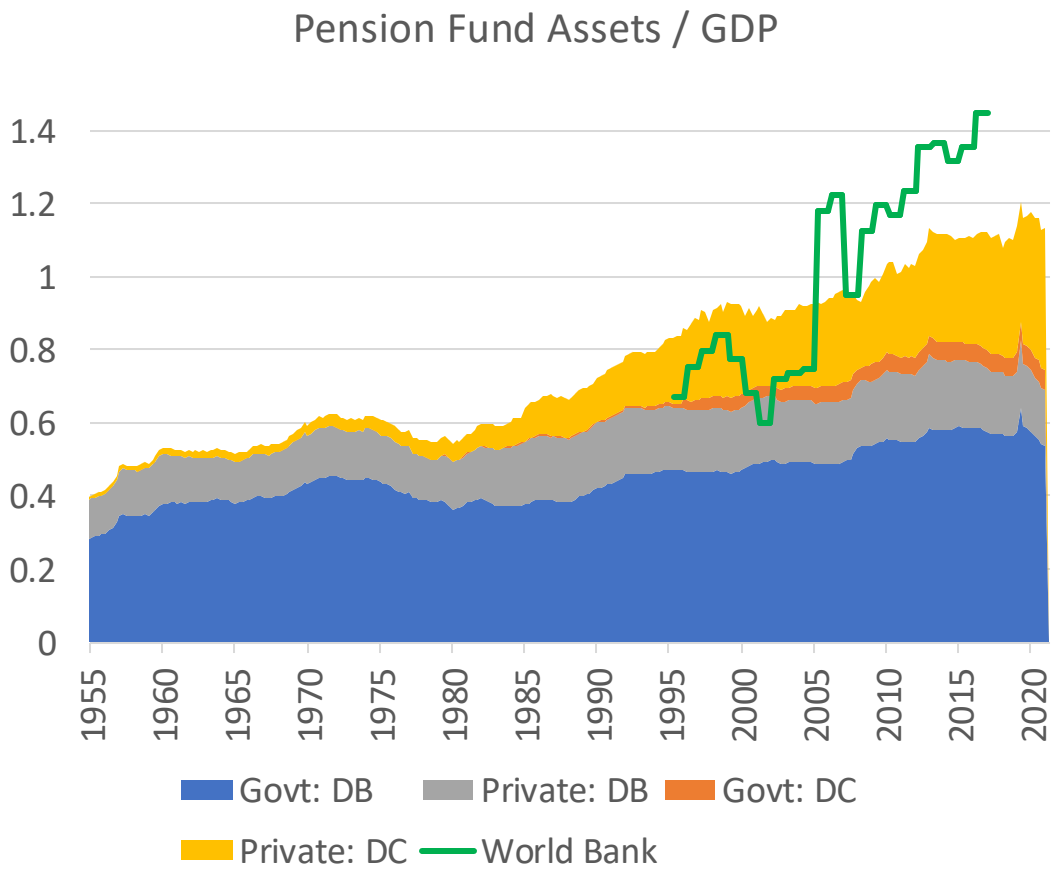
An anti-"intermediary asset pricing" model

- At first glance, this seems like an intermediary asset pricing model
  - Introduce an intermediary → risk premia go up
- But channel is **exactly opposite** to typical IAP models
  - HK 08; BS 12; ELVN 21: risk premia are large when intermediary wealth is small. Time variation in WI → time variation in risk premia
  - Here: pension fund wealth remains constant by design
  - Contributions must adjust to make it so
  - HHs still price assets but now with a more volatile HH SDF
- Moreover, pension fund portfolio choice essentially doesn't matter
  - Within a space of non-optimal linear rules. What if pension funds invested optimally?
  - Right now, stark implications e.g. don't bother studying equilibrium effects of agency conflicts in pension fund manager compensation

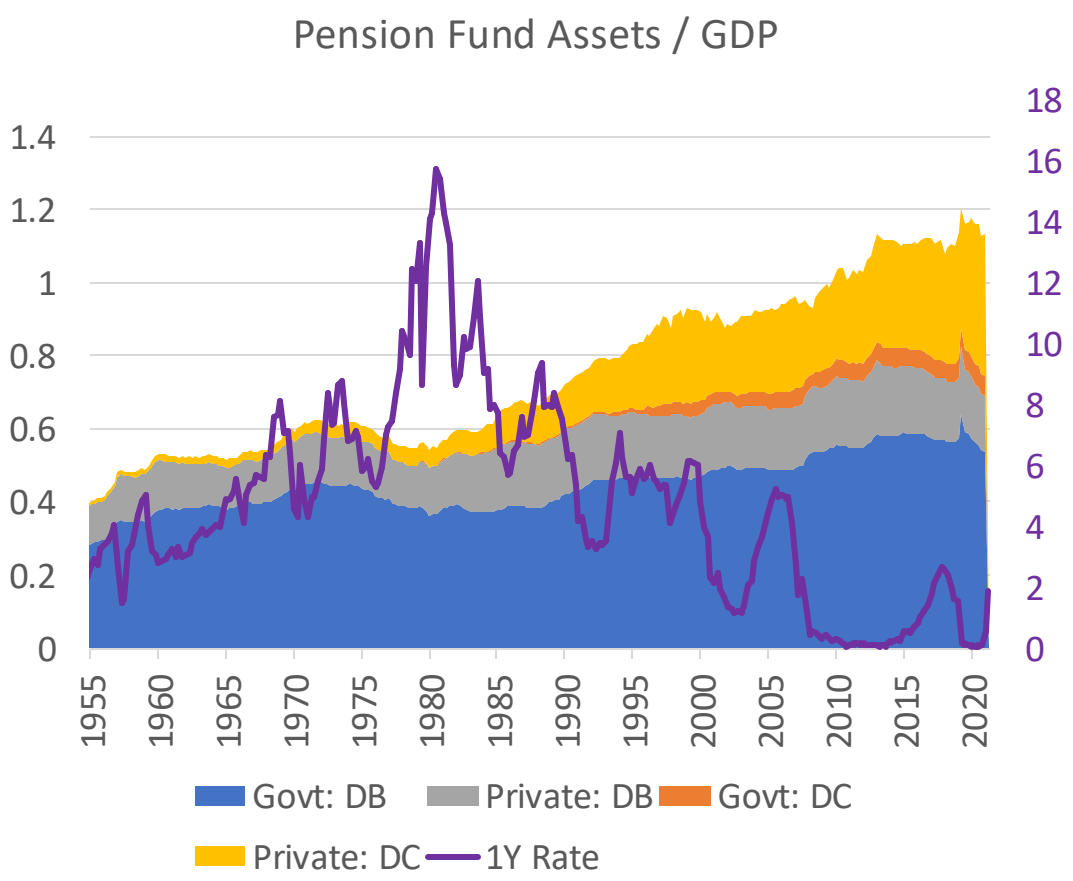
Pension Funds In the Data: Sources

- Paper uses World Bank data (green)
  - *"Ratio of assets of pension funds to GDP. A pension fund is any plan, fund, or scheme that provides retirement income."*
- Instead, use Financial Accounts (formerly Flow of Funds)
  - DB vs. DC separation: you only want the DB part
  - Private vs. public separation: will get back to this



Pension Funds in the Data: Trend

- Paper acknowledges difficulty in calibrating size of PF sector b/c of trend in Assets/GDP
- Common issue when calibrating financial stocks largely caused by rate decline-driven revaluation
- Alternative: measure share of total financial assets (in FoF) instead of GDP



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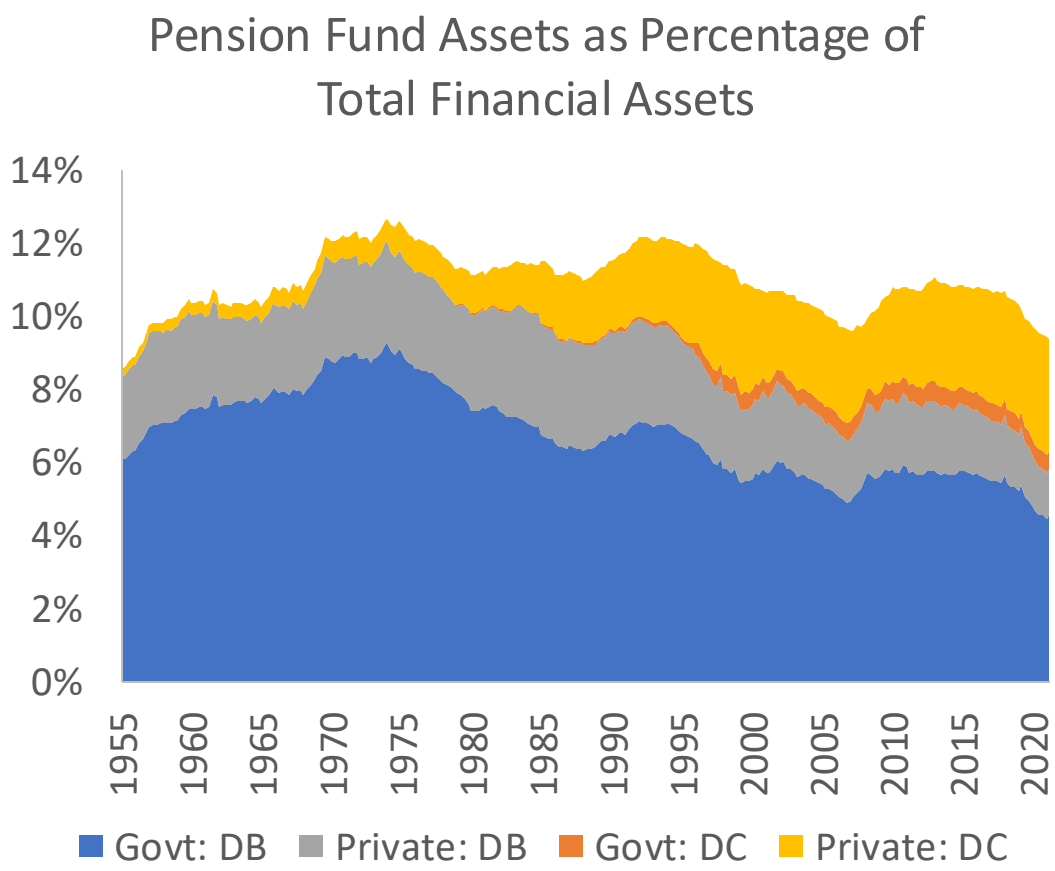
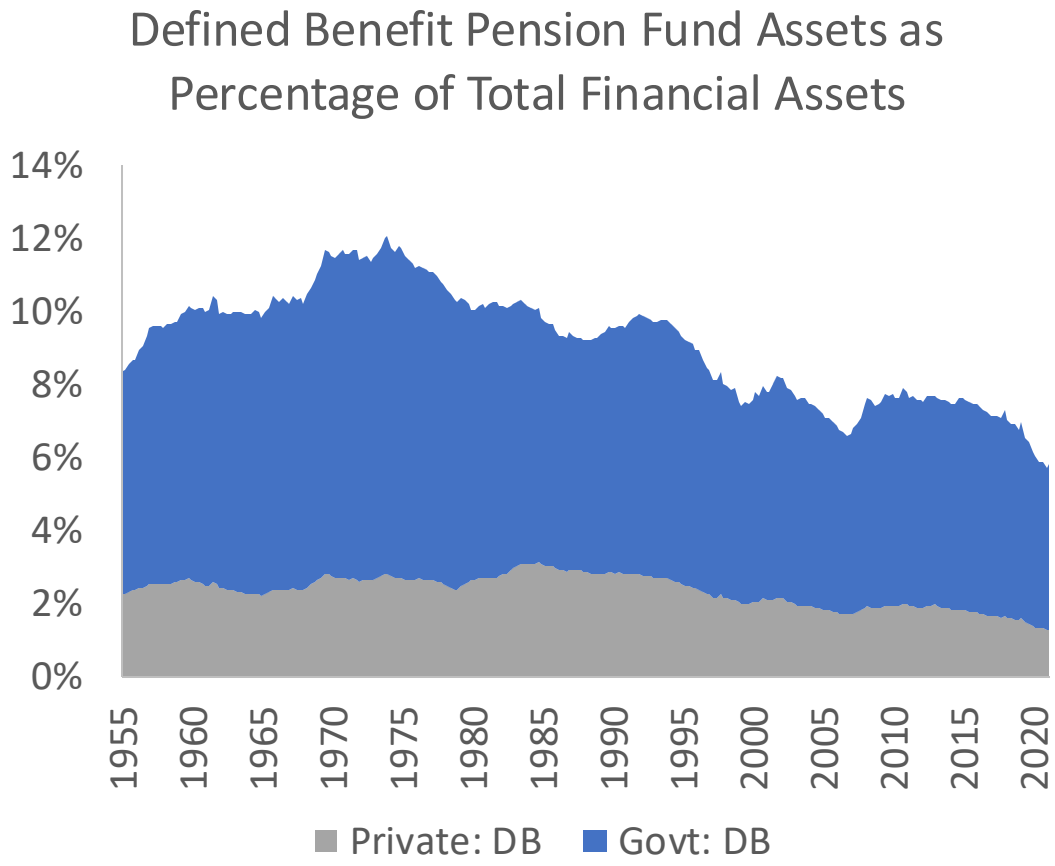


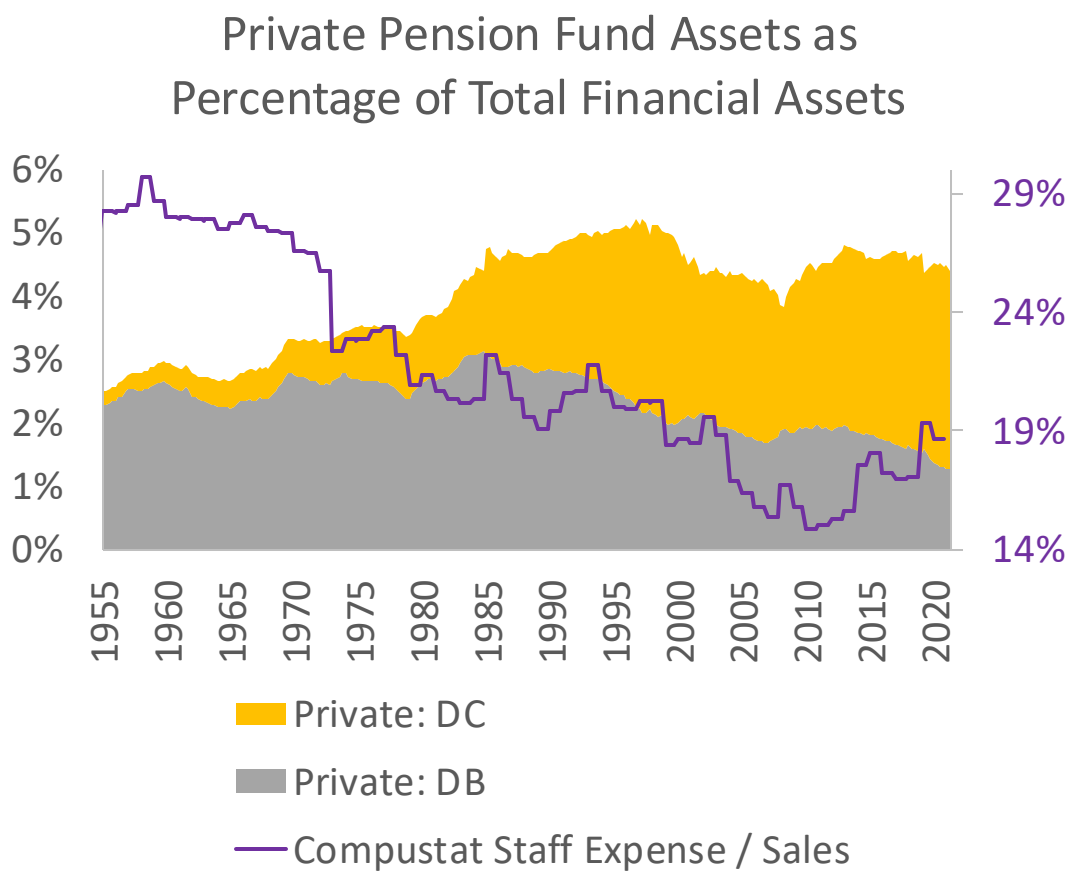
Pension Funds in the Data: Public vs. Private

- Most DBPFs are **and have always been** public
- Incidence of contribution risk
  - Employee: baseline
  - Employer: only equity-holders bear it
  - **Taxpayer: ?**
- Underfunded public pensions is a major source of state & local fiscal risk
  - Connects to literature on fiscal risk and asset pricing (Croce, Kung, Nguyen, Schmid)



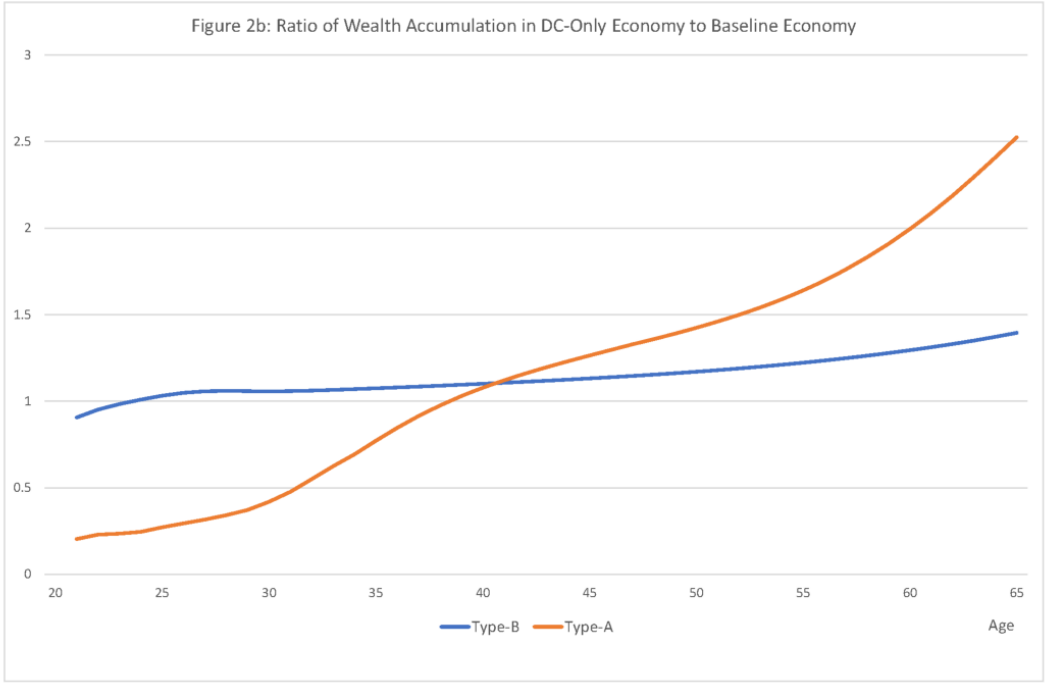
DB → DC Transition

- Two interpretations
  - Illustrates the total effect of DBPFs in the model (rather than just effect of return risk)
  - Forecast what a DC-only future will look like
- Second interpretation more interesting but faces challenges
  - Why is this transition occurring?
  - Anecdotally: effective pay cut
  - Why were pension plans underfunded? Bad luck vs. myopia vs. agency
  - Transition dynamics → short-run winners and losers
- Related to active → passive transition?
  - With DBPFs, role of private savings was partly to hedge contribution risk
  - Requires a more frequently rebalanced portfolio
  - Without DBPFs, set-it-and-forget-it index funds are fine



(Many!) Other Empirical Implications

- HHs in a DBPF plan invest differently than HHs not in a DBPF plan
  - This difference changes across the lifecycle, stock market participation
  - Probably intractable to have both DB and non-DB HHs in the economy at the same time like in the data
  - But can still take predictions from two regimes to CX data
- Regulatory Updates → Parameter Value Changes
  - E.g. 2008 PPA changed funding requirements



Conclusion

- Agenda: understand and quantify (net) income risk faced by HHs across lifecycle and other characteristics
  - Helps rationalize asset pricing puzzles
  - More importantly, helps **understand** asset pricing puzzles
- This paper is an exciting contribution to the agenda: returns on defined-benefit pension fund portfolios are a source of (priced) risk
- Ex-ante surprising, ex-post obvious: best kind of result!
  - DBPFs smooth consumption paths in retirement but at the expense of riskier consumption paths earlier when the agent is pricing risky assets
- Explore other empirical implications & refine calibration
- Can't wait to see the next version!