



The Regulation of Competitive Pension Funds with Endogenous Financial Literacy

Valentina Catapano (U. Padua & CRIEP)
Luciano Greco (U. Padua & CRIEP)

June 8th, 2023

International Conference on Financial Fragility and
Financial Education of Households and Firms



Why financial literacy matters?

- ▶ Global trends in pension reforms (e.g., OECD 2019)
 - ▶ funded schemes, defined-contribution
 - ▶ more risks (and choices) on individuals
- ▶ Open policy issues:
 - ▶ How to design funded retirement schemes?
 - ▶ public vs private
 - ▶ mandatory vs subsidized (low financial literacy)
 - ▶ occupational plans vs personal plans
 - ▶ Main policy task: pension adequacy
 - ▶ Key policy tools: competition vs regulation; improve financial literacy

Financial literacy

- ▶ Financial literacy is low (OECD 2017) and depends on other individuals' features (e.g., income, age, gender)
 - ▶ targeted financial education programs (Lusardi and Mitchell 2014)
- ▶ Is financial education effective?
 - ▶ reduction of costs of information collection and processing (van Rooji et al. 2012)
 - ▶ need for complementary “policies” (Carpena et al. 2019; Nolan and Doorley 2019)
 - ▶ “depreciation” in the long run (Entorf and Hou 2018)





Financial education vs regulation

- ▶ Financial literacy as human capital investment (Jappelli and Padula 2013; Corsini and Spataro 2015; Lusardi et al. 2017)
 - ▶ risk exposure motivates investment
 - ▶ (financial) education costs matter
- ▶ Financial literacy or regulation?
 - ▶ complements (Lusardi and Mitchell 2014; Nieddu and Pandolfi 2021)
 - ▶ how to improve financial literacy?
 - ▶ publicly provided education
 - ▶ transparency regulations
 - ▶ default public option



Financial literacy and imperfect information

- ▶ Focus: personal pensions provided by competitive fund managers/pension funds
- ▶ Main intuition:
 - ▶ being able to distinguish financial products (i.e., risk-return profile) requires (private) information
 - ▶ if asset-management skill is productive, but fund managers lack effective signaling technologies (e.g., reputation or marketing)...
 - ▶ individuals may invest in financial literacy to increase the probability of being able to screen pension plans
 - ▶ the government may foster financial literacy by transparency regulations and/or by direct subsidies to financial education efforts; however, it can also use a public option



Work in progress: policy implications

- ▶ Financial literacy can be fostered by a set of policy tools...
 - ▶ transparency (which may entail bureaucracy costs)
 - ▶ public provision of financial education (e.g., subsidies)
- ▶ ...however, it cannot provide a full solution
 - ▶ a publicly provided default option is a necessary complement to solve the problem for (unavoidably) financial illiterate [work in progress]
- ▶ Other results
 - ▶ larger (mandated) savings in funded schemes based on competitive pension funds foster investments in financial literacy
 - ▶ competition does not (per se) solve the problem





Basic assumptions (I)

- ▶ Benevolent government regulates the pension funds market:
 - ▶ mandatory pension savings s ;
 - ▶ transparency standard $\gamma \geq 0$;
 - ▶ public provision of financial investments: $\theta \in [0, 1]$ of individuals' costs;
 - ▶ (public provision of default pension plan)
- ▶ Each individual (out of infinite identical ones)
 - ▶ $\max_{\pi} \underbrace{y - s - I(\pi, \gamma)(1 - \theta)}_{c_w} + \beta \underbrace{[E(s(1 - \omega_i)R)]}_{c_r} - \frac{\rho}{2} \text{Var}(c_r)$
 - ▶ β time discount; ρ constant absolute risk aversion;
 - ▶ c_w and c_r consumption when working and retired; y exogenous labor income;
 - ▶ $I(\pi, \gamma)$ investment in financial literacy; π probability of being able to screen pension plans;
 - ▶ ω_i pension fund's management fee; $R \sim N(\mu, \sigma^2)$ gross return of chosen pension plan;

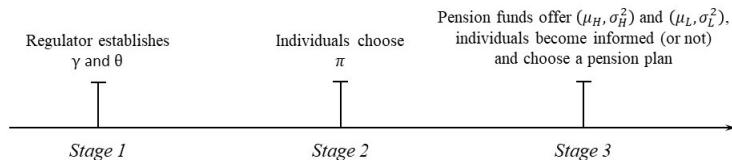


Basic assumptions (II)

- ▶ Pension funds market:
 - ▶ free entry of fund managers, no sunk costs; fund manager i

$$\max \Pi_i = \omega_i s_i - a_i - k(\gamma) s_i$$
 - ▶ $a_i = a > 0$ if the fund i has high asset management skills;
 $a_i = 0$ if the fund i has low asset management skills;
 - ▶ $k(\gamma)$ ($k' \geq 0$) costs of transparency;
 - ▶ high (or low) skill pension funds provide high return-risk pension plans $\{\mu_H, \sigma_H\}$ (or $\{\mu_L, \sigma_L\}$) where
 - ▶ $\mu_H > \mu_L$ and $\sigma_H > \sigma_L$
 - ▶ depending on ρ , it is rational to invest in high return-risk plans – technically: $\bar{k} \leq 1 - \frac{a}{\pi s \frac{\mu_H - \mu_L}{\mu_H}}$ and $a < \pi s \frac{\mu_H - \mu_L}{\mu_H}$
- ▶ financial literacy: informed (or uninformed) individuals are able (or not able) to screen pension plans H and L

Sequential game



Who buys high return-risk pension plans?

- ▶ solution by backward induction, last stage: π informed and $1 - \pi$ uninformed:

- ▶ **Lemma.** *If $k(\gamma) < 1 - \frac{a}{\pi s \frac{\sigma_H - \sigma_L}{\sigma_H}}$, then $\hat{\rho} > 0$ and only*

individuals with $\rho < \hat{\rho}$ invest in high pension plans. If

$k(\gamma) \geq 1 - \frac{a}{\pi s \frac{\sigma_H - \sigma_L}{\sigma_H}}$, then $\hat{\rho} < 0$ and all individuals invest in

high pension plans.

- ▶ $\hat{\rho} = \frac{2[(1-\omega_H)\mu_H - (1-\omega_L)\mu_L]}{s[(1-\omega_H)^2\sigma_H^2 - (1-\omega_L)^2\sigma_L^2]} = \frac{2\Delta}{s\Sigma}$
- ▶ pension plans H are (relatively) risky, then only (relatively) low risk aversion (informed) individuals buy them (i.e., $\rho < \hat{\rho}$)
- ▶ pension plans H are not very risky (i.e., $\hat{\rho} < 0$), then all (informed) individuals buy them



Market equilibrium

- ▶ **Proposition 1.** *If $\pi = 0$, all customers are uninformed and only pension plans L are traded at the equilibrium on the market of pension funds.*
- ▶ **Proposition 2.** *If $\pi > 0$, a separating equilibrium of the market of pension funds is a perfect Bayesian equilibrium such that: only informed customers with low risk aversion or when there is relatively low volatility buy pension plans H ; uninformed customers and high-risk aversion informed customers buy pension plans L .*



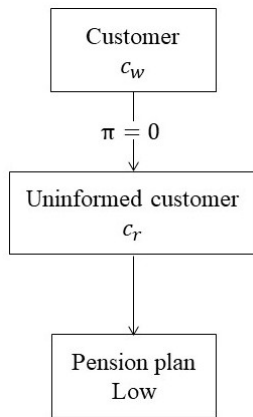


Investment in financial literacy

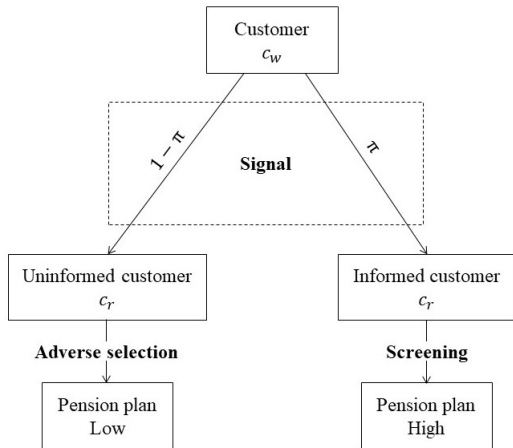
- ▶ ...in the working period:
 - ▶ **Proposition 3.** *When customers are very risk averse and the pension plan H is very risky (i.e., $\rho > \hat{\rho} > 0$), the optimal investment in financial literacy is $\pi = 0$.*
 - ▶ **Proposition 4.** *When customers are not so much risk averse (i.e., $\rho < \hat{\rho}$) or the pension plan H is not too risky (i.e., $\hat{\rho} < 0$), the optimal investment in financial literacy $\pi > 0$, provided that Δ is high enough.*
- ▶ comparative statics: the optimal π increases with γ and with θ



Market equilibrium when $\rho > \hat{\rho} > 0$



Market equilibrium when $0 < \rho < \hat{\rho}$ or $\hat{\rho} < 0$



Regulation, subsidies... and other policies

- ▶ **Proposition 6.** *When $\pi > 0$, the optimal level of transparency is $\gamma > 0$.*
- ▶ **Proposition 7.** *When $\pi > 0$, the optimal level of government's subsidy to financial literacy investments is $\theta > 0$.*
- ▶ work in progress:
 - ▶ a mix of policy tools (e.g., $\gamma > 0$ and $\theta > 0$) is welfare improving
 - ▶ this mix should include a public option pension plan



Concluding remarks

- ▶ Our theory of the poor performance of competitive pension funds is linked to information asymmetries
 - ▶ imperfect competition cannot explain some stylized facts (e.g., why cap on fees seems to reduce performance? – Hamdani et al. 2017)
 - ▶ efficiency-enhancing “technologies” arise in the market: signaling/marketing (Greco 2006); screening/financial literacy (this paper)
- ▶ Public policies are relevant:
 - ▶ many complementary policy (e.g., transparency, subsidies) may foster financial literacy...
 - ▶ ...however financial literacy cannot fully solve the pension inadequacy risk: we may need a public (default) option

