Discussion: Finance Over the Life Cycle of Firms by Federico Kochen

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Motivation

- Theory: There is a life cycle in the pattern of firms' finance (Rajan and Zingales, 1998).
- Evidence: Little is known about how constrained young firms are and how important financial frictions are at different stages of firms' life cycles.
  - Crucial for the debate on the quantitative relevance of financial frictions as a source of capital misallocation.
  - More general, macroeconomic debate of financial frictions relevance for aggregate implications.

Overview Kochen (2022)

1. New evidence on the nature of external financing over the life cycle of firms in countries of different levels of development.
2. Model of firm dynamics, learning, and financial frictions with endogenously determined interest rate spreads: captures the relation between firms' age, access to external financing, survival and growth observed in the data.
3. Quantify macro implications: output losses from financial frictions are explained by distortions in firms' exit decisions.

Summary I: Evidence

- New evidence on the nature of external financing over the life cycle of firms in countries of different levels of development (19 European countries from 1996-2018).
  - Younger firms rely more on external financing: borrow more, pay higher interest rate spreads and more likely to receive equity injections from shareholders.
  - Younger firms face more uncertainty and are subject to more volatile shocks: more likely to exit and have more volatile growth rates than older firms.

Summary II: Model

- Endogenous entry and exit:
  - Entry: every period there is a mass of prospective entrants who decide whether to enter after observing their initial capital and a noisy signal about their profitability.
  - Exit: depends on the evolution of firms' profitability and a stochastic operating cost that the firm incurs every period.

- Two key ingredients:
  1. Firms decide whether to finance their operations using internal funds, defaultable *long-term* debt, and costly equity injections.
     - Financial friction 1: upon default the intermediary only recovers a fraction $\rightarrow$ endogenous interest rate spreads.
     - Financial friction 2: equity injections are costly $\rightarrow$ infrequent.
  2. Firms learn about their profitability over time.

Summary II (Model): How life cycle dynamics are introduced in the model

- Relation between firms' profitability shocks and firms' age.
- z_{it} profitability of firm 'i' at time 't' (observed):

$$z_{it} = \underbrace{s_{it}}_{permanent} + \underbrace{\epsilon_{it}}_{transitory}$$

- Transitory shocks (ϵ_{it}) have an age-specific volatility: early signals are noiser $\rightarrow$ less informative about s_{it} $\rightarrow$ younger firms revise beliefs less $\rightarrow$ takes time for firms to learn. Implications:
  - Avoids *fast* learning dynamics of macro models (Arkolakis, Papageorgioy, and Timoshenko (2018) and Chen et al. (2020).
  - s_{it}: firms *learn* over time but s_{it} stochastic and learning *incomplete* (different from Jovanovic (1982) where firms eventually fully learn their type).

Summary III: Quantitative Exercise

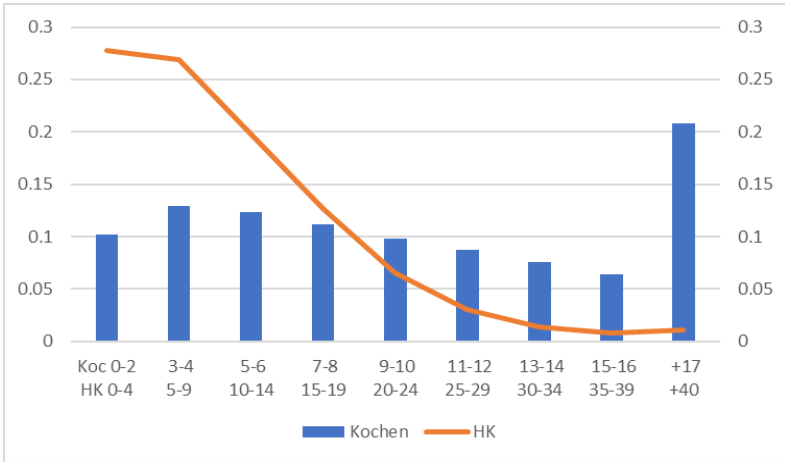
- Financial frictions can reduce TFP through two channels:
  - Intensive margin: TFP losses arise because of capital misallocation among active firms (which manifest in the dispersion of firm-level capital output ratios).
  - Extensive margin: TFP can be lower because of distortions in the mass of active firms, the extensive margin (capturing firms' entry/exit decisions).
- How important is external financing over the life cycle of firms?
  - Financial frictions generate sizeable losses in output per worker in high-income countries (15%)
  - The bulk of losses (60%) explained by a new channel: financial frictions exacerbate exit of young firms.

Comments

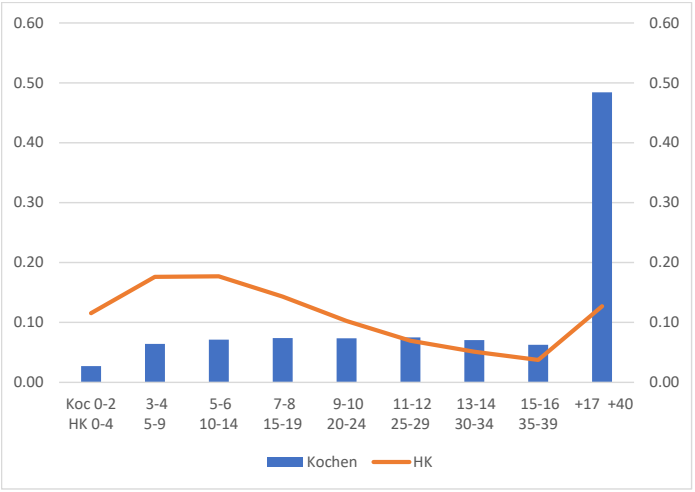
- Comment I: Age categories and relevance for external financing.
- Comment II: Capital definition
- Comment III: Interplay between Age and Size
- Comment IV: Exit Rates

To guide the discussion I will present evidence from the Spanish economy.

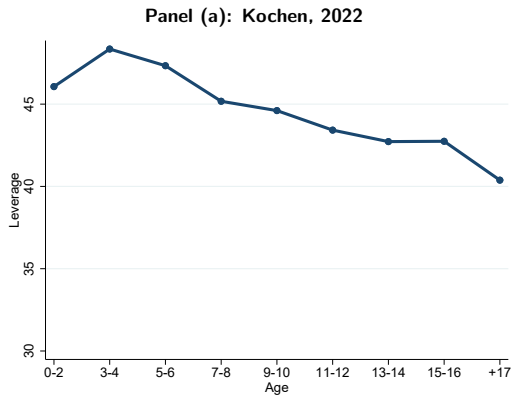
Comment I: Distribution of Firms across Age Categories

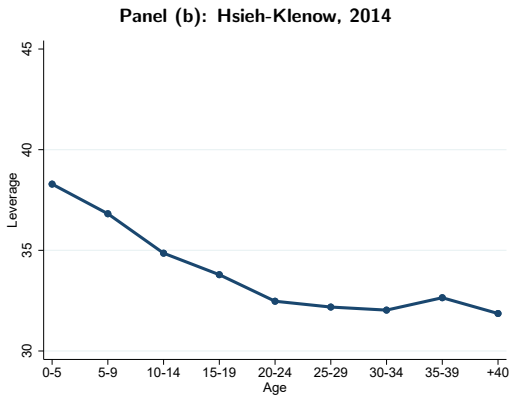


Comment I: Distribution of Firms across Age Categories based on Output

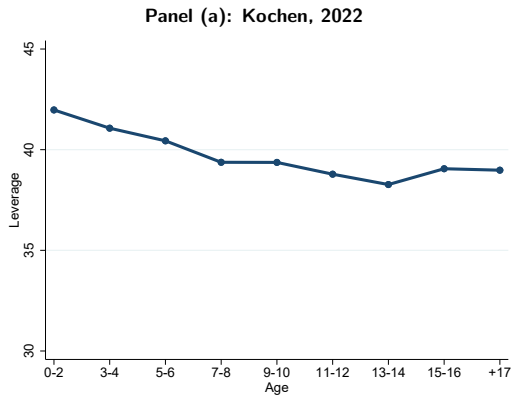


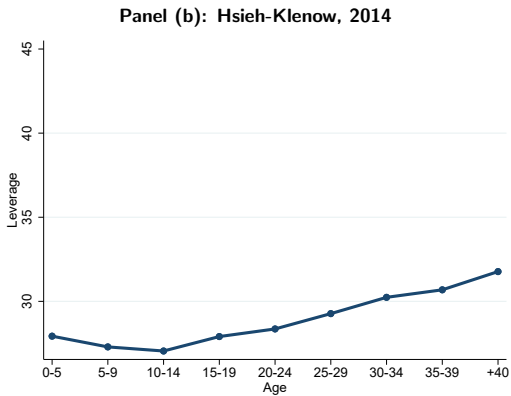
Comment I: Age Groups & Leverage (Cross-Section)





Comment I: Age Groups & Leverage (Fixed Effects)





Comment II: Financial Capital (k)

$$k = \underbrace{TFAS}_{k^{tan}} + \underbrace{IFAS}_{k^{int}} + \underbrace{STOK}_{k^{inv}} + \underbrace{DEBT - CRED}_{k^{tr}} + \underbrace{OCAS - CASH - OCLI}_{k^{oc}} + \underbrace{OFAS - ONCL}_{k^{onc}}$$

	k^{tang}	k^{int}	k^{inv}	k^{tr}	k^{oc}	k^{onc}
Kochen, 2022	0.76	0.11	0.06	0.04	0.02	0.02

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Spain	0.28	0.05	0.64	0.10	-0.21	0.15

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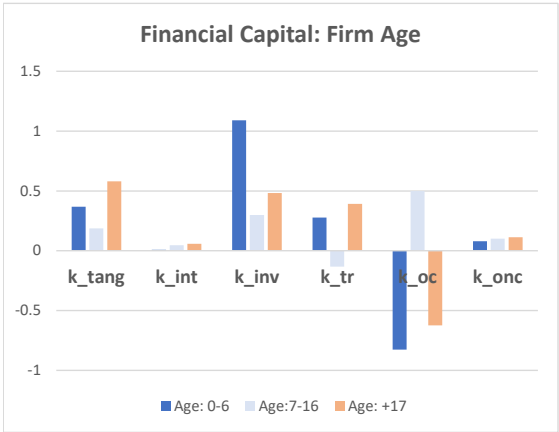
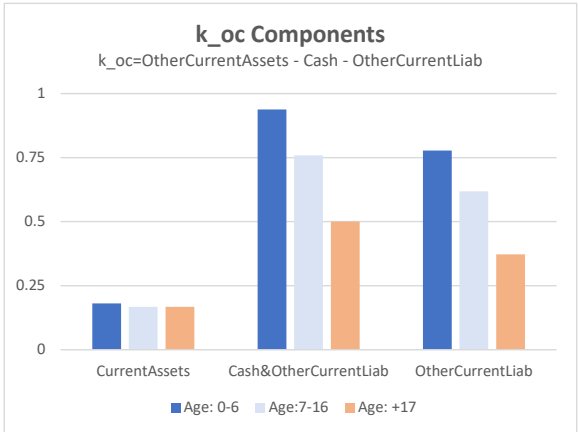
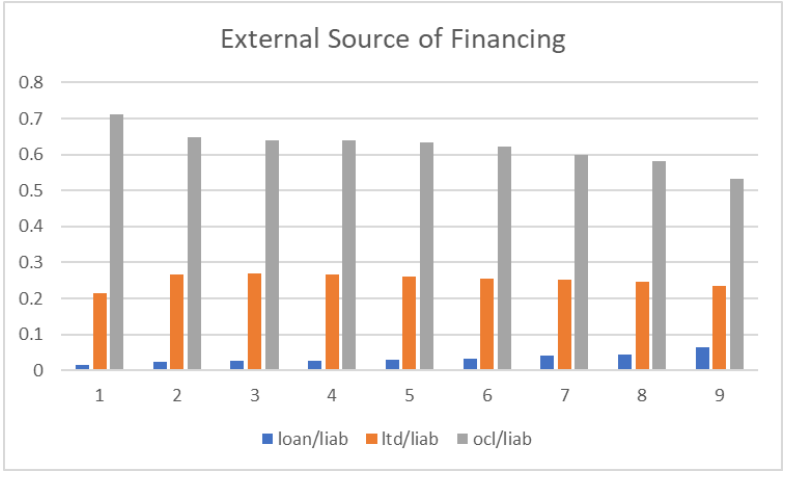
Spain	0.28	0.05	0.64	0.10	-0.21	0.15
Spain-Balanced	0.43	0.03	0.30	0.51	-0.37	0.10
Spain-Unbalanced (weighted)	0.50	0.07	0.32	0.20	-0.31	0.22

Comment II: Financial Capital and Age



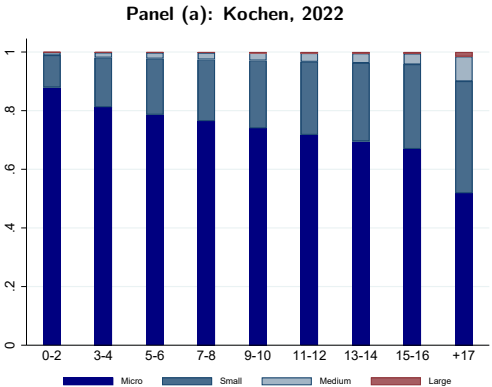


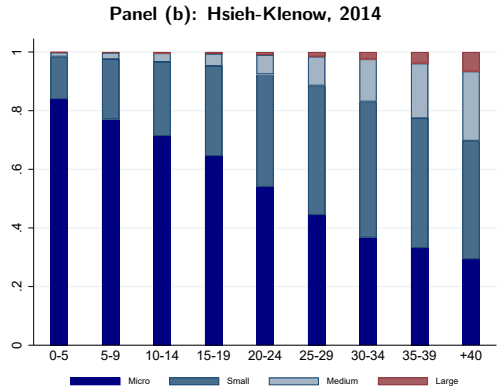
- Other Current Liabilities: Liabilities related with non-current assets maintained for sale + Short term provisions + Other short term debts + Short term debts with associated and affiliated companies + Other payable accounts + Short term periodifications + Short term debts with special characteristics



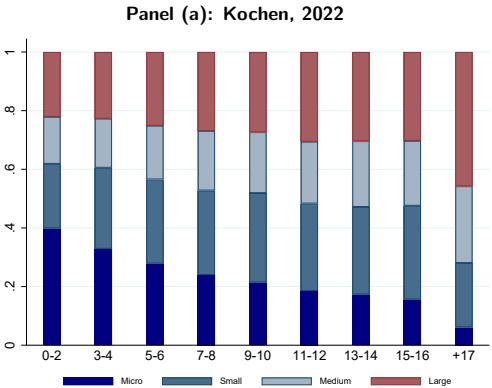
- In the paper equity injections to young firms are the financing form stressed (as opposed to LTD).
- What is the fraction of financially constrained firms predicted by the model (at different age stages)?

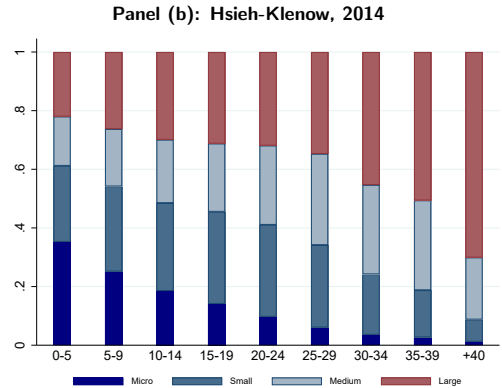
Comment III: Age and Size (Number of Firms)



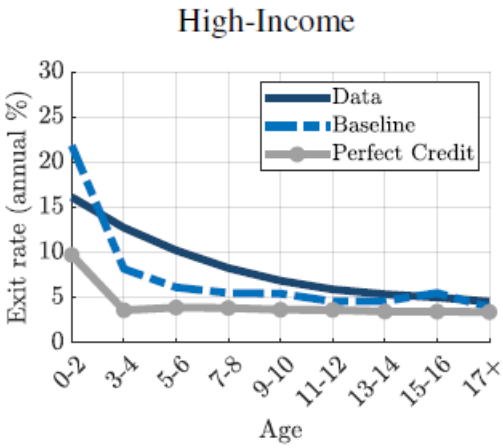


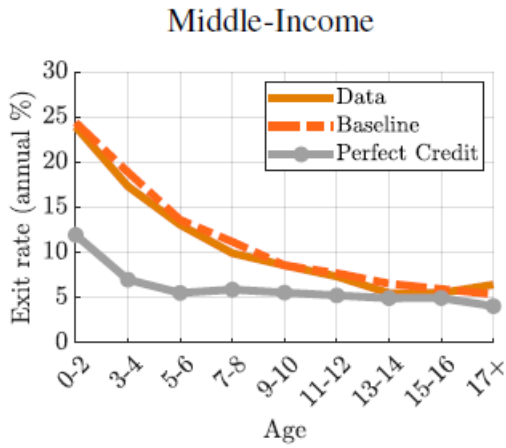
Comment III: Age & Size (Output Share)



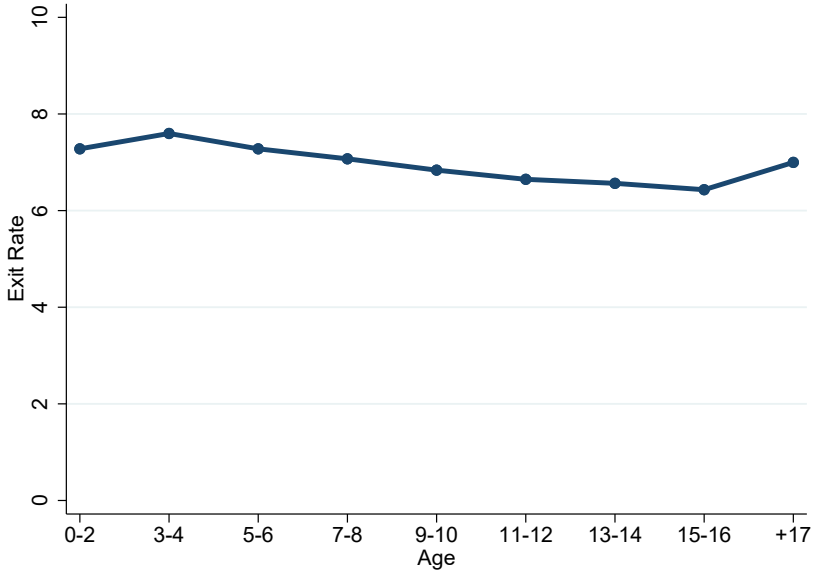


Comment IV: Exit Rates, Kochen (2022)





Comment IV: Exit Rates, Spain



Other Comments

- Assumption: firms in both regions have access to debt contracts with the same maturity, the expected duration of debt contracts is set to 4.5 years (European SME report): ignores differences in debt contracts in EMs (i.e., currency composition).
- How productive are exiting firms? Ates, Sina T., and Felipe E. Saffie. 2021. AEJ Macro: as firms born during the credit shortage are fewer but better in terms of idiosyncratic productivity.

Final Remarks

- Very nice paper, clearly written, economic intuition behind assumptions and very transparent on the mechanisms.
- Important contribution to the literature on firm dynamics, financial constraints and quantitative macroeconomics.
- New stylized empirical facts about firm dynamics guide a quantitative model to explore the TFP losses derived from the existence of financial constraints along firm intensive and extensive margins.
- Policy implication: policy maker target to alleviate financial constraints should be young firms. Looking forward to future work interacting age and size!