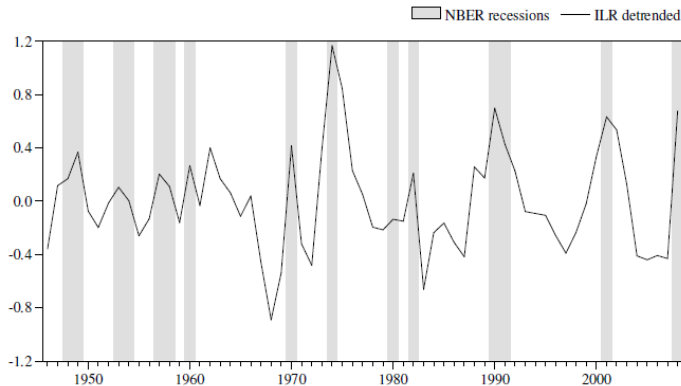


A Theory of Endogenous Liquidity Cycles

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Liquidity and the Business Cycle



Source: Næs, Skjeltnop, and Ødegaard (*Journal of Finance*, forthcoming)

Contributions of This Paper

- Develops a theory of liquidity cycles
 - Fluctuations in liquidity are driven by endogenous changes in economic activity and the availability of informed capital
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- Liquidity dry-ups result from imperfect monitoring
 - Information collection efforts are unobservable

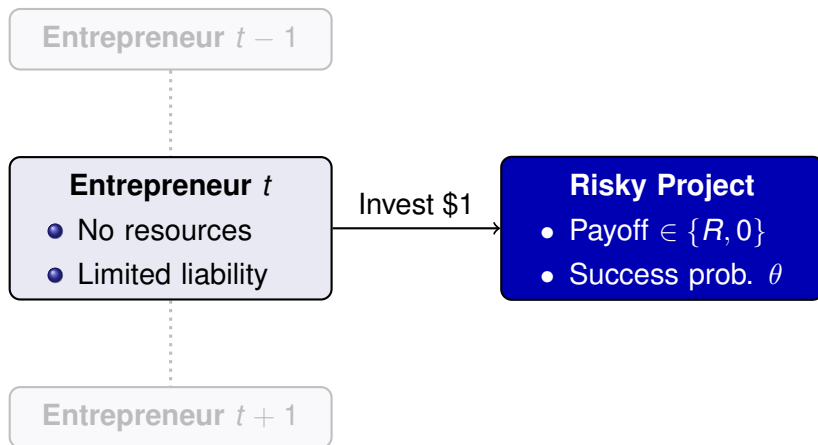
Related Literature

- Evidence of a systematic component of liquidity
 - Chordia, Roll, and Subrahmanyam (2000, 2001), Hasbrouck and Seppi (2001), Huberman and Halka (2001), Næs, Skjeltorp, and Ødegaard (2010), ...
- Liquidity as a self-fulfilling phenomenon
 - Pagano (1989a, 1989b), Allen and Gale (1994), Dow (2004), Plantin (2009), ...
- Market liquidity and funding liquidity
 - Gromb and Vayanos (2002), Brunnermeier and Pedersen (2009)
- Endogenous fluctuations in liquidity
 - Eisfeldt (2004), Carlin, Lobo, and Viswanathan (2007)

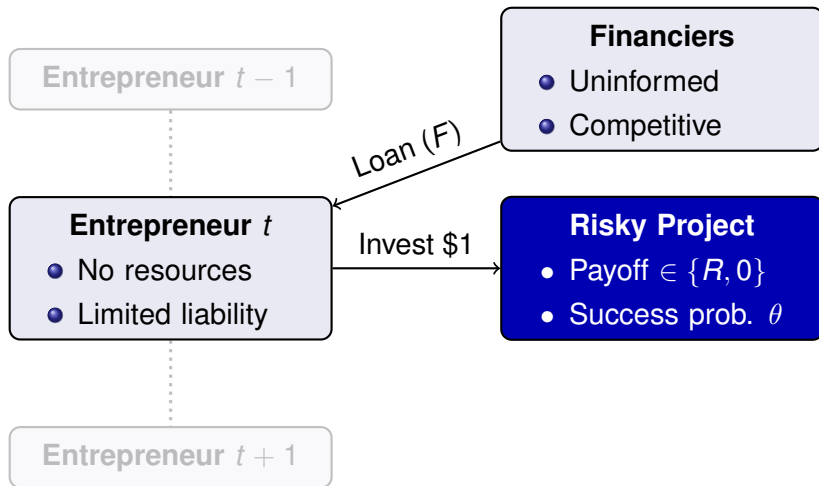
The Model



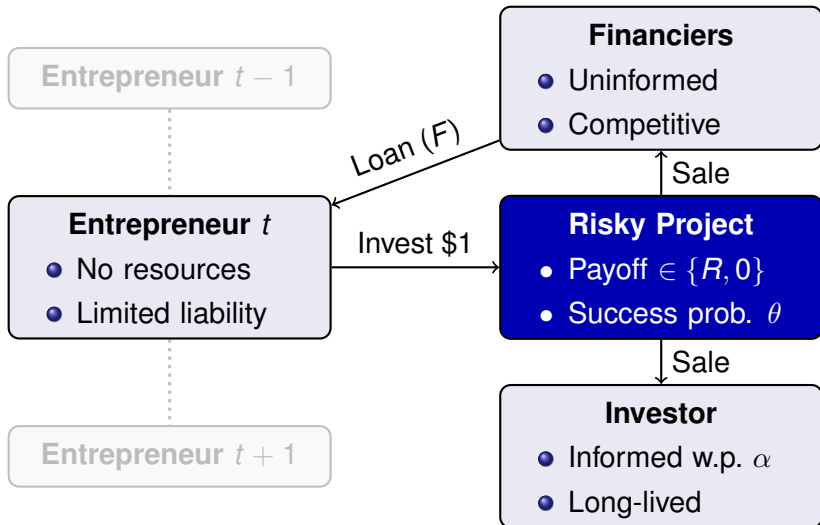
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- Two-stage bargaining game
 - Bargaining breaks down after first stage with probability β

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- Nash bargaining solution when investor is informed
 - Seller keeps a fraction β of the surplus
 - Informed buyer receives a fraction $1 - \beta$

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- Measure liquidity by the difference between an asset's fundamental value and its price
 - $IL = R - \mathbb{E}[P] \propto 1 - \alpha$

Equilibrium of the Stage Game

- Entrepreneurs invest more when liquidity is high
 - Entrepreneurs' profit increases in $\mathbb{E}[P]$
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- Unique solution α^* if cost function ϕ is sufficiently convex

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- Commitment to $\alpha > \alpha^*$ leads to Pareto improvement
 - Increases entrepreneurs' expected profit
 - ... as well as investor's expected utility

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 - Investor chooses a level of information production above α^*
 - Entrepreneur invests in projects with quality below θ_c^*
- Imperfect monitoring
 - Deviations cannot be unambiguously detected
 - Entrepreneurs can't be sure whether the investor complied
 - E.g., the outcome of the bargaining game for a failed project does not reveal whether the investor is informed

Trigger-Strategy Equilibrium

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Proposition

If the investor is sufficiently patient, there exist trigger-strategy equilibria with $\alpha_n > \alpha^$.*

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- Punishments occur on the equilibrium path
 - Player prefer punishments to be as lenient as possible
 - Optimal trigger strategy trades off a higher α_n against a longer punishment phase

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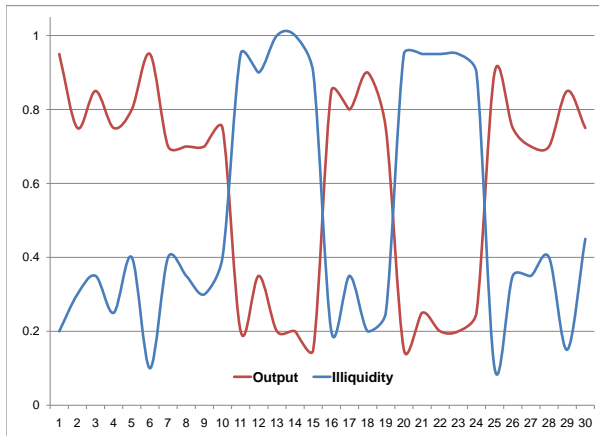
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Liquidity and Economic Output



Conclusion

- Model of liquidity provision as repeated game
 - Assets are illiquid due to adverse selection
 - Degree of adverse selection depends on endogenous information structure
- Stochastic liquidity cycles
 - Due to imperfect public monitoring
 - Trigger-strategy equilibria
- Liquidity is procyclical
 - Increased liquidity is associated with high economic growth
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