Sentiment and Financial Frictions

Sloan-Nomis Workshop

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Financial crisis research

- Financial frictions models: Ability to borrow is constrained, combined with externalities in leverage choice.
  - Bernanke and Gertler (1989), Kiyotaki and Moore (1997), Lorenzoni (2008), Stein (2012), Davila and Korinek (2016), Farhi and Werning (2016) etc.
- Empirical research: Predictability of economic slowdown or crisis in the time series
  - Schularick and Taylor (2012), Gilchrist and Zakrajsek (2012), Greenwood and Hanson (2013), Mian, Sufi, and Verner (2017), Baron and Xiong (2017), Lopez-Salido, Stein, and Zakrajsek (2017) etc.

$\rightarrow$ **This paper: Argue that financial frictions and sentiment need to be looked at in conjunction**

A simple model

- 3 time periods: $t = 0, 1, 2$
- 2 goods: consumption (c_t) and capital (k_t)
  - Consumption goods can be turned into capital goods one for one during period 0, but not after
  - The reverse is not possible
- 2 types of agents: consumers and entrepreneurs
  - Consumers have utility $\mathbb{E}[c_0 + c_1 + c_2]$, and receive a large endowments at each period (*deep pockets*)
  - Entrepreneurs have utility $\mathbb{E}[c_2]$, and receive an endowment n_0 only in period 0
- Entrepreneurs have access to a sophisticated technology $z_t k_{t-1}$
  - Entrepreneurs' technology is subject to aggregate risk
  - In period 1, capital needs to be maintained by paying a cost of ρ per unit
- Consumers own firms in the traditional sector, with technology $F(k)$ satisfying $F'(0) < 1$ and $F'' < 0$

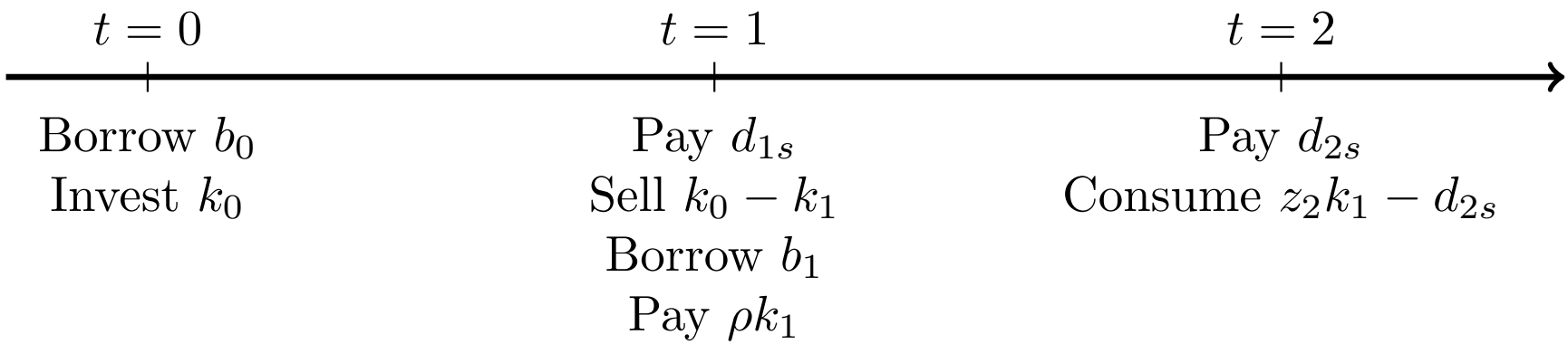
Financing investment

- Entrepreneurs need to borrow money from consumers in order to invest more than their net worth
- Short-term debt is available, with a required interest rate of 1
- **Friction:** Entrepreneurs can only pledge a fraction θ of future profits

$$d_{t,s} \leq \theta z_{t,s} k_{t-1}$$

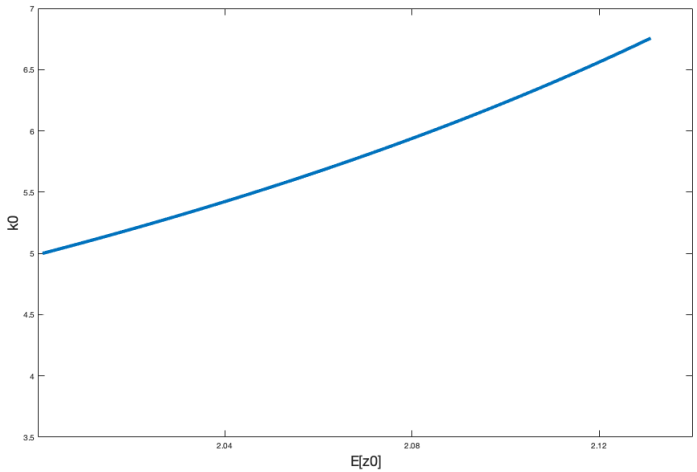
- Which means that the amount lent must be less than:

$$b_{t-1} \leq \theta \mathbb{E}_{t-1}[z_t] k_{t-1}$$

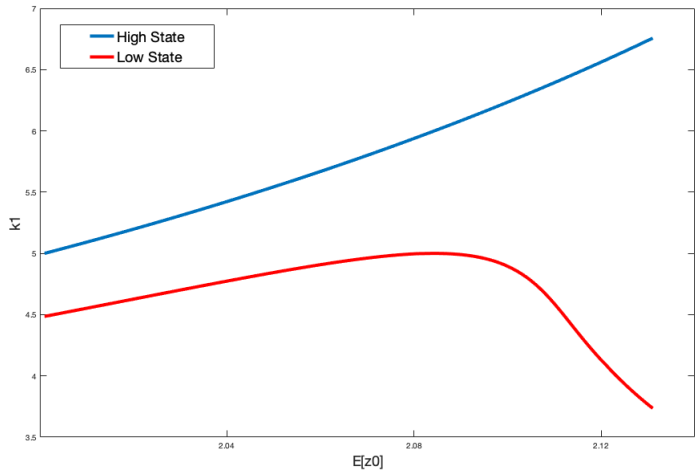


Equilibrium characterization

$t=0$	$t=1$		$t=2$
$k_0 = \frac{n_0}{1-\theta\mathbb{E}_0[z_1]}$	if $(1-\theta)z_1 + \theta\mathbb{E}_1[z_2] \geq \rho$	$k_1 = k_0$	$z_2 k_0$
	if $(1-\theta)z_1 + \theta\mathbb{E}_1[z_2] < \rho$	$k_1 = \frac{\theta z_1 + q_1 k_0}{\rho + q_1 - \theta\mathbb{E}_1[z_2]}$ $q_1 = F'(k_0 - k_1)$	$z_1 k_1$ $F(k_0 - k_1)$



(a) Initial capital holding



(b) Intermediate capital holding

Sensitivity to sentiment

Even though the first best displays absolutely no sensitivity to expectations, with financial frictions the sensitivity is increasing in θ:

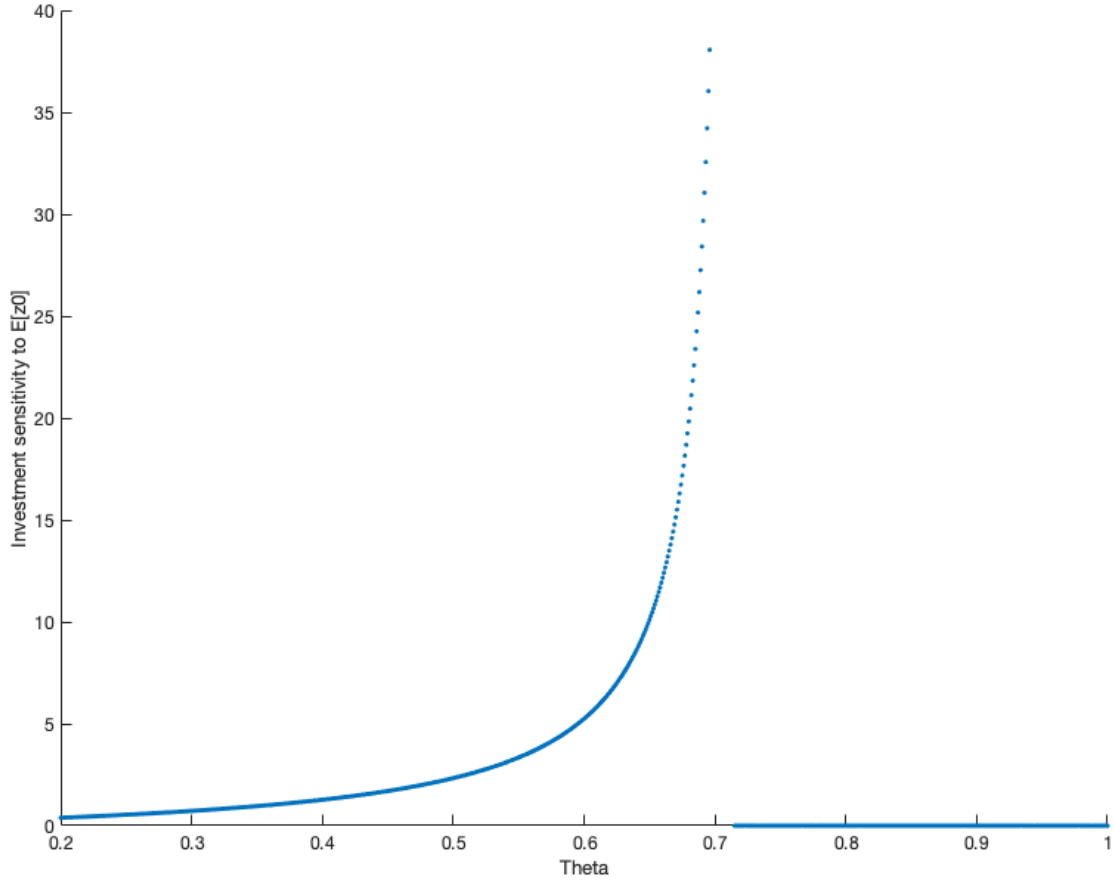


Figure: Sensitivity to expectations as a function of θ for a fixed $\mathbb{E}_0[z_1]$

Expectations in the intermediate state

- The economy disinvests when

$$(1-\theta)z_1 + \theta\mathbb{E}_1[z_2] < \rho$$

- When θ increases, more weight is put on expectations rather than actual realizations
- If a deviation of expectations from a steady-state of $\bar{z}$ causes the economy to slip in the fire sales case, capital falls with the multiplier:

$$\frac{\partial k_1}{\partial \mathbb{E}_1[z_2]} \frac{\mathbb{E}_1[z_2]}{k_1} = \frac{\theta}{(1-\theta)\bar{z} + F'(0)}$$

- Once again, this multiplier is increasing in θ, and convex

Welfare and Sentiment

- Over-optimism has two effects:
  1. It exacerbates fire sales if a bad shock happens at $t = 1$
  2. It relaxes the financial constraint and brings the allocation of funds closer to the first-best
- For small deviations, the result of the trade-off depends on wether the *rational expectations equilibrium* is constrained efficient

"While some part of the investment which was going on in the world at large was doubtless ill judged and unfruitful, there can, I think, be no doubt that the world was enormously enriched by the constructions of the quinquennium from 1925 to 1929..."

— John Maynard Keynes

Output and initial optimism

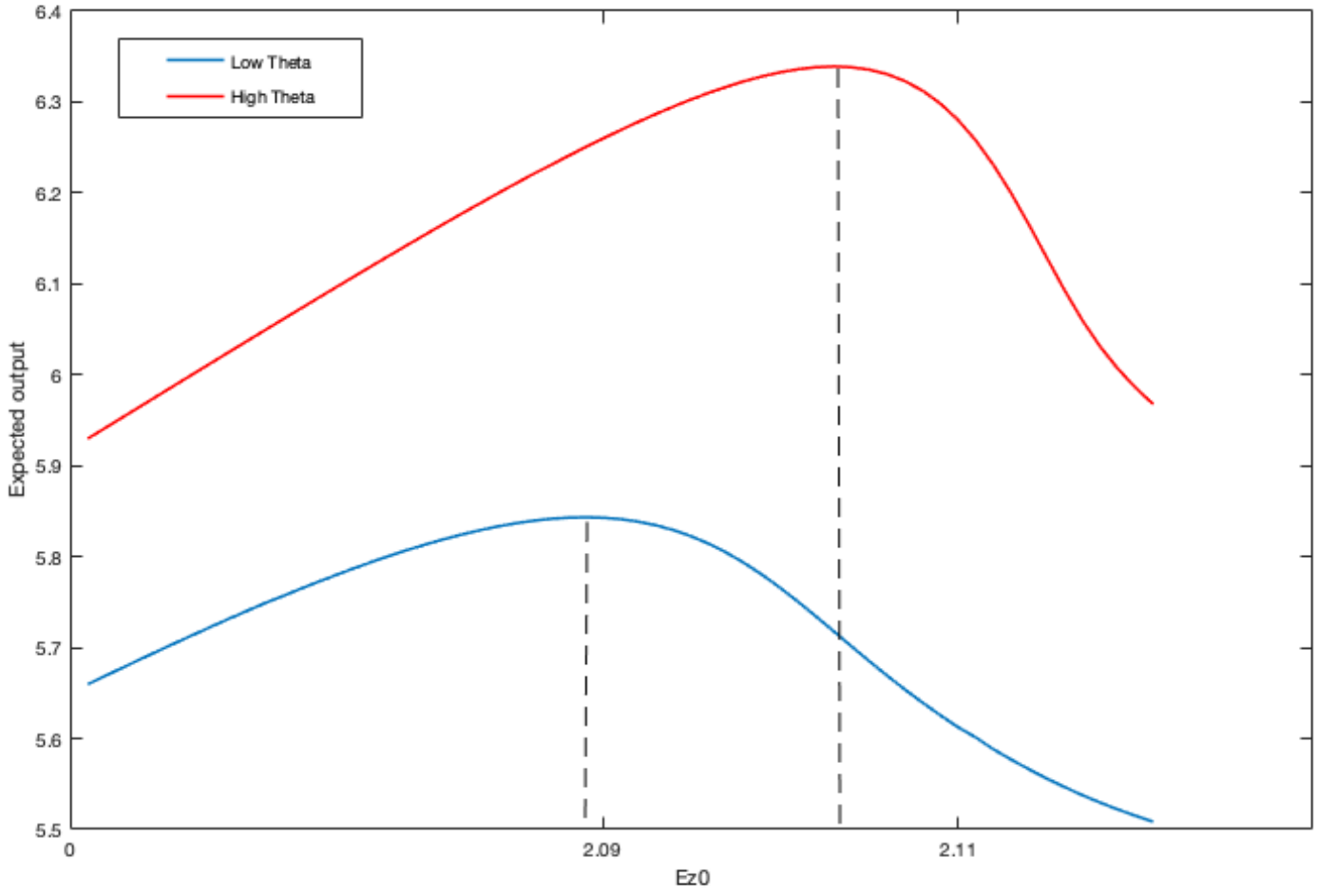


Figure: Expected output as a function of optimism for two θ

Output and over-reaction

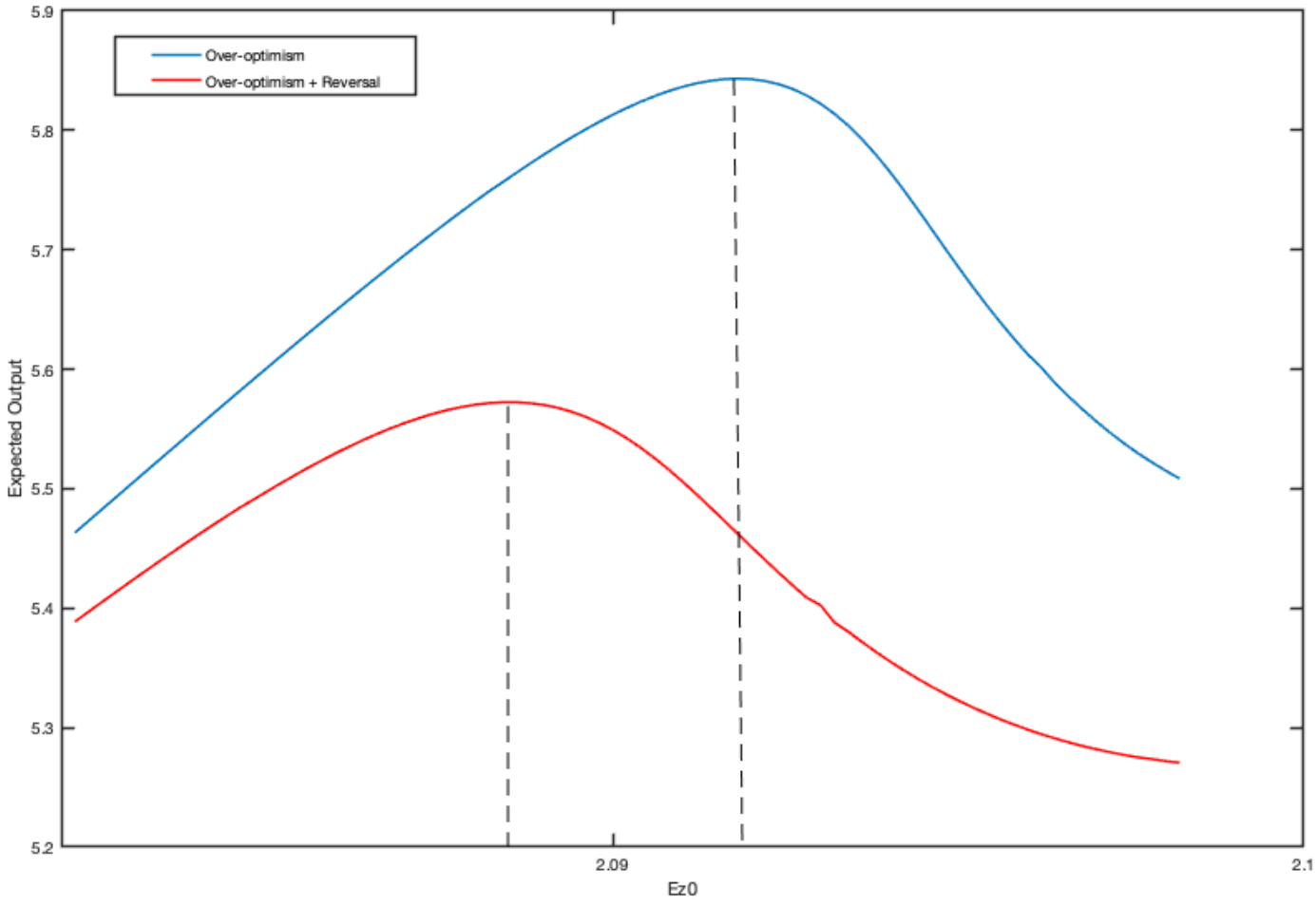


Figure: Expected output with and without reversal

Going forward

1. Dynamic setup:
   - An infinite-horizon model would allow for more careful business cycles analytics
   - Especially relevant to study the slow build-up of a fragile situation
   - Costly in terms of tractability and transparency of relevant channels
2. Which expectation process matters?
   - In principle, several deviations from rational expectations are consistent with the booms and busts narrative
   - Characterizing policies that are robust to a whole range of non-rational expectations would be a key result
3. What does the Social planner know about expectations?
   - To intervene optimally, one needs to know the current state of expectations as well as the true underlying process
   - Even more, one needs to know how expectations of agents will predictably evolve in the future

Thank you