# The Behavioral Financial Accelerator
by
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September 2019

# Question

How can we explain the observed behavior of measures of credit spreads and aggregate economic activity?

# Answer

$\downarrow$ expected profits $\Rightarrow$ $\uparrow$ spreads $\Rightarrow$ $\downarrow$ economic activity

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The paper presents a very nice new mechanism:

- empirical evidence: revisions in SPF forecast of profits forecast spreads, which in turn forecast future economic activity

- firm-default model: lenders observe noisy signal $s_t$ of firm fixed costs
  - bad signal $\rightarrow$ higher spreads $\rightarrow$ lower investment
  - noisy info model predicts countercyclical spreads
  - full info model predicts procyclical spreads

# Comment 1: a more direct test of models

**Revisions to forecasts of corporate profits ($\text{Rev}_t$) important for empirical story.**

- behavior of $\text{Rev}_t$ never shown in either model
- instead in incomplete info model, paper argues that $\frac{\text{Rev}_t}{\text{GDP}_t}$ is a proxy for $s_t$, use it as realizations of $\{s_t\}$ in simulations
- why not show $\text{Rev}_t$ in full info and incomplete info models and see which model generates correlation between $\text{Rev}_t$ and spreads better

# Comment 2: give full info a fighting chance

- full info model not re-calibrated, incomplete info model calibrated to hit moments. not surprising that full info does badly
- why not show $\text{Rev}_t$ in full info and incomplete info models and see which model generates correlation between $\text{Rev}_t$ and spreads better

# Comment 3: Unfair comment

- technology driven RBC-esque costly external finance models: counterfactual **procyclical** credit spreads
  - productivity $\downarrow$ $\Rightarrow$ demand for credit $\downarrow$ $\Rightarrow$ **spreads** $\downarrow$
  - thus, need imperfect info
- other shocks that **lower credit supply** generate correct correlation
  - why not this, rather than incomplete info + productivity shocks

# Comment 4: Behavioral?

- somewhat unconventional use of phrase “herding”
  - in the model, there is no notion of one lender following another lender’s action
- imperfect info is still rational expectations
- behavioral variants better fit some aspects of model but these have more shocks

# Clarification 1: regarding incomplete info model

- assumption: "*investors observe ... the firm's decision rules* $(b_{t+1}, k_{t+1})$"
  - firms choose $(b_{t+1}, k_{t+1})$ knowing $z_t$.
  - observing $(b_{t+1}, k_{t+1})$ provides investors additional information about current $z_t$
  - if investors can learn by observing actions, then imperfect info model is closer to full info model and also potentially gives counterfactual correlation

# Clarification 2: Notation

- In full info model recuperation rate of bond (depends on realization of $z_{t+1}$):

$$
\begin{aligned}
\widetilde{B}(b_{t+1}, k_{t+1}, z_{t+1}, A_{t+1}) \quad = \quad & \min\Big[\max\big[0, \Big((1-\tau)(A_{t+1}k_{t+1}^{\alpha} - z_{t+1}) \\
& + V(k_{t+1}, b_{t+1}, z_{t+1}, A_{t+1}) \\
& + (1-\lambda)q(b_{t+2}, k_{t+2}, z_{t+1}, A_{t+1})b_{t+1} \\
& - \xi k_{t+1}\Big)\frac{1}{b_{t+1}}\big], 0.69\Big]
\end{aligned}
$$

and bond price is:

$$
\begin{aligned}
q(b_{t+1}, k_{t+1}, z_t, A_t) \quad = \quad & \beta \mathbb{E}_t \Big\{ F(z_{t+1}^*)\left[c + \lambda + (1-\lambda)q(b_{t+2}, k_{t+2}, z_{t+1}, A_{t+1})\right] \\
& + \int_{z^*}^{\infty} \widetilde{B}(b_{t+1}, k_{t+1}, z_{t+1}, A_{t+1}) dF(z_{t+1}) \Big\}
\end{aligned}
$$

where $z^*$ is the lowest value of $z_{t+1}$ for which the firm will default at $t+1$

# Comment 5: Clarification

- In incomplete info model recuperation rate of bond:

$$\begin{aligned}\widetilde{B}^{\text{learn}}(b_{t+1}, k_{t+1}, \mathbb{E}_t z_{t+1}, A_{t+1}) \quad = \quad & \min\Big[\max\big[0, \Big((1-\tau)(A_{t+1}k_{t+1}^{\alpha} - \mathbb{E}_t z_{t+1}) \\ & +V(k_{t+1}, b_{t+1}, \mathbb{E}_t z_{t+1}, A_{t+1}) \\ & +(1-\lambda)q(k_{t+2}, b_{t+2}, \mathbb{E}_t z_{t+1}, A_{t+1})b_{t+1} \\ & -\xi k_{t+1}\Big)\frac{1}{b_{t+1}}\big], 0.69\Big]\end{aligned}$$

and bond price is:

$$\begin{aligned}q(b_{t+1}, k_{t+1}, z_t, A_t) \quad = \quad & \beta\mathbb{E}_t\Big\{F(\mathbb{E}_t z_{t+1}^*)\left[c + \lambda + (1-\lambda)q(b_{t+1}, k_{t+1}, \mathbb{E}_t z_{t+1}, A_{t+1})\right] \\ & + \int_{\mathbb{E}_t z_{t+1}^*}^{\infty} \widetilde{B}(b_{t+1}, k_{t+1}, \mathbb{E}_t z_{t+1}, A_{t+1})dF(\mathbb{E}_t z_{t+1})\Big\}\end{aligned}$$

where $\mathbb{E}_t z_{t+1}^*$ is the expected value of the lowest level of $z_{t+1}$ for which the firm will not default.

- confusing notation: seems to not respect **Jensen's inequality**

# Comment 5: Clarification

- default decision and recuperation depends on actual realization of $z_{t+1}$ rather than expectation of $z_{t+1}$:

$$
\begin{aligned}
\widetilde{B}^{\cancel{\text{learn}}}(b_{t+1}, k_{t+1}, \cancel{\mathbb{E}_t} z_{t+1}, A_{t+1}) \quad = \quad & \min\Big[\max\big[0, \Big((1-\tau)(A_{t+1}k_{t+1}^{\alpha} - \cancel{\mathbb{E}_t} z_{t+1} \\
& + V(k_{t+1}, b_{t+1}, \cancel{\mathbb{E}_t} z_{t+1}, A_{t+1}) \\
& + (1-\lambda)\mathbb{E}_t q(k_{t+2}, b_{t+2}, \cancel{\mathbb{E}_t} z_{t+1}, A_{t+1} b_{t+1} \\
& - \xi k_{t+1}\Big)\frac{1}{b_{t+1}}\big], 0.69\Big]
\end{aligned}
$$

.

- the bond price is:

$$
\begin{aligned}
q(b_{t+1}, k_{t+1}, z_t, A_t) \quad = \quad & \beta\mathbb{E}_t\Big\{\cancel{F(\mathbb{E}_t z_{t+1}^{*})\left[c+\lambda+(1-\lambda)q(b_{t+1}, k_{t+1}, \mathbb{E}_t z_{t+1}, A_{t+1})\right]} \\
& c + \lambda + (1-\lambda)\int_{-\infty}^{z_{t+1}^{*}} q(b_{t+2}, k_{t+2}, z_{t+1}, A_{t+1}) dF(z_{t+1} \mid s^t, k^{t+1}, b^{t+1}) \\
& + \int_{\cancel{\mathbb{E}_t} z_{t+1}^{*}}^{\infty} \widetilde{B}(b_{t+1}, k_{t+1}, \cancel{\mathbb{E}_t} z_{t+1}, A_{t+1}) dF(z_{t+1} \mid s^t, k^{t+1}, b^{t+1})\Big\}
\end{aligned}
$$

# Conclusion

- very interesting paper!
- some clarification needed about the *behavioral* tag