The Information-Driven Financial Accelerator

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Disclaimer: The views expressed in this paper are those of the authors and do not necessarily reflect the views of the Federal Reserve Board of Governors or the Federal Reserve System.
Empirically, it is well-known that credit spreads are large, volatile and countercyclical (Gilchrist and Zakrajsek, 2012; Greenwood and Hanson, 2013)

What are the sources of credit market and macroeconomic fragility?

Existing theories have focused on frictions in financial intermediation (Gertler and Kiyotaki, 2010; He and Krishnamurthy, 2013) and behavioral biases (Bordalo et al. 2018)
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• This paper shows that imperfect information in credit markets is a strong force behind credit cycles.
  – Debt investors are uninformed about firms’ creditworthiness
  – Update beliefs using publicly-available forecasts of profit outlook
• Empirically, it is well-known that credit spreads are large, volatile and countercyclical (Gilchrist and Zakrajsek, 2012; Greenwood and Hanson, 2013)

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• This paper shows that imperfect information in credit markets is a strong force behind credit cycles.
  – Debt investors are uninformed about firms’ creditworthiness
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  Bond prices move in response to the arrival of noisy information, not just to changes in fundamentals.

• Policies that help to anchor investors’ expectations could have substantial financial stability benefits.
**New Fact**
Changes in professional forecasters’ expectations of quarter-ahead corporate profit

\[ \text{rev}_t = E_t [\pi_{t+1}] - E_{t-1} [\pi_{t+1}] \]

jointly predict:

- excess corporate bond returns
- macroeconomic aggregates

\[ \Rightarrow \text{at long horizons} \]
New Fact
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jointly predict:

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\[ R_{t \to t+k} = \alpha + \beta \text{rev}_t + \gamma \text{controls}_t + u_{t+k} \]

The combined effect of ↓ rev\text{t} and ↑ σ\text{t} during 2007 financial crisis:

- spreads ↑ 80 basis points
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Changes in professional forecasters’ expectations of quarter-ahead corporate profit

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\[
\begin{align*}
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\sigma_t
\end{align*}
\]

\[
\begin{align*}
y_{t \rightarrow t+k} &= \alpha + \beta_{\hat{R}_{t \rightarrow t+k}} + \gamma_{\text{controls}_t} + u_{t+k} \\
\end{align*}
\]

The combined effect of \( \downarrow \text{rev}_t \) and \( \uparrow \sigma_t \) during 2007 financial crisis:
- spreads \( \uparrow \) 80 basis points
- investment \( \downarrow \) 1 percentage point and GDP \( \downarrow \) 40 basis points
**Dynamic Model with Financing and Investment**

Costly debt financing

- default risk

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Model-based counterfactual for 2007 financial crisis:

- 1/2 of increase in spread
- 1/5 of contraction in aggregate investment

\[ q_t(z_t) \]

Imperfect information \[ \Rightarrow \] Amplification

- investors do not observe firm's state \[ z_t = \rho z_t - 1 + \varepsilon z_t \]
- learn from a noisy public signal \[ s_t = \varepsilon z_t + u_t \] using a Kalman filter

\[ q_t(s_t, s_t-1, ..., s_0) \]
Motivation Model Results Mechanism Evidence

Dynamic Model with Financing and Investment

Costly debt financing + Imperfect information

- default risk
- investors do not observe firm's state
  \[ Z_t = \rho_z Z_{t-1} + \epsilon_t^Z \]
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**Dynamic Model with Financing and Investment**

Costly debt financing + Imperfect information $\Rightarrow$ Amplification

- **default risk** $q_t(z_t)$
- investors do not observe firm's state
  
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Model-based counterfactual for 2007 financial crisis:

- 1/2 of increase in spread
- 1/5 of contraction in aggregate investment from noisy signals
Imperfect information model matches the **size** and **cyclical variation** of credit spreads.
**Information uncertainty:**

1. higher mean spread

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Information uncertainty:

1. higher mean spread
2. countercyclical defaults and spreads

Only financial frictions

- default probability $p$ increasing in $b'$
- lending schedule $r_b(p)$ increasing in $b'$
- recession $\downarrow \rightarrow$ deleveraging $\rightarrow r_b \downarrow \quad b' \downarrow$
  (first-order effect)
**Information uncertainty:**

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**Motivation Model Results Mechanism Evidence**

- Only financial frictions
  - default probability $p$ increasing in $b'$
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  - recession $\downarrow \rightarrow$ deleveraging $\rightarrow r_b \downarrow$ $b' \downarrow$
    (first-order effect)

- Financial frictions + information frictions
  - lending schedule shifts to the left due to:
    (i) bad signal ($s_L$), (ii) noisy signal ($\sigma_u$ $\uparrow$)
    in recession $\rightarrow r_b$ $\uparrow$ $&$ $b'$ $\downarrow$
Microdata:

- IBES: firm-level estimates of earning forecasts
- ICE/IDC and Warga: bond-level spreads
- Compustat

5,000 bonds & 10,000 firms (1982-2010)
Motivation Model Results Mechanism Evidence

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\[ \begin{align*}
5,000 \text{ bonds} & \quad 10,000 \text{ firms} \\
(1982-2010)
\end{align*} \]

More direct support for our mechanism:

- Predictability results hold at the firm-level
  - *Quarter-ahead* forecast revisions are strongly and economically related to spreads and investment over long horizons
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\[\implies\text{Imperfect information in credit markets is a quantitatively important source of macroeconomic fragility.}\]