Banking and Interest Rates in Monetary Policy Analysis:
A Quantitative Exploration

Comments prepared for Federal Reserve Bank of San Francisco
Conference

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Motivation:

- Rapid expansion of market for credit default swaps:

- Previous research:
  - Use pricing of CDS to measure price of default risk.

- This paper:
  - Does CDS trading reduce the firm-specific cost of capital?
Issues to consider:

• What has happened to corporate risk spreads over time?
• What can we learn about corporate bond spreads from CDS rates?
• Does expansion of CDS market have direct implications for the cost of capital?
• Does the cost of capital matter for investment?
Trends in corporate bond spreads

- Corporate bond spreads are countercyclical.
- Large increase in dispersion of corporate bond spreads since late 1990’s.
  - More firms appear willing to float junk bonds rather than investment grade securities.
  - Why?
- Recent boom-bust cycle – are credit spreads consistent with underlying default probabilities?
Corporate Bond Characteristics

Figure 1: The Evolution of Real Bond Yields

Interest Rates and Investment Redux
Figure 3: The Evolution of Year-Ahead EDFs
CDS Arbitrage:

- Arbitrage:
  \[ P_{cds} = r^B - r^f \]

  where
  - \( P_{cds} \) = Annualized price of insurance against default
  - \( r^B \) = Corporate bond yield
  - \( r^f \) = Risk free rate.

- Limits to shorting bonds (repo costs) and CTD (cheapest to deliver) options on CDS imply:
  \[ P_{cds} > True\ Default\ Premium > r^B - r^f \]

- Blanco et al. argue that arbitrage holds in long-run. Short-run deviations owing to repo and CTD options combined with information acquisition occurs in CDS market rather than cash bond market.
CDS Pricing I:

- Berndt et al. estimate:
  \[ P_{cds} = \alpha EDF + \sum \gamma_i d_t \]
  where \( EDF \) measures KMV expected default probability.
  then
  \[ \hat{\alpha} = 16/10 \]

- Given recovery rate \( R \) model implies:
  \[ R \Delta P_{cds} = \alpha \Delta EDF \]

- Since
  \[ R \approx 0.75 \]
  then:
  \[ \frac{\Delta P_{cds}}{\Delta EDF} = 2 \]
Implication:

- Risk neutral default probability implies that the market price of risk rises by $2 for every $1 increase in expected discounted loss!
- There is a large multiplicative risk premium on credit default
- Models with credit frictions may be able to explain this (Levin, Natalucci, Zakrajsek).
CDS Pricing II

- Log specification provides better fit:

\[ \ln P_{cds} = \alpha_0 + 0.75 \ln EDF + \sum \gamma_i d_t, \quad R^2 = 0.75 \]

- Also true if we estimate this on corporate bond spreads using annual data.

\[ \ln R^B - \ln R^f = \alpha_0 + 0.43 \ln EDF + \sum \gamma_i d_t, \quad R^2 = 0.51 \]
Time-variation in default risk premia:

- Most of recent run-up and collapse of corporate bond spreads is due to unexplained “aggregate “default-risk factors”
  - Expected default probability only explains a fraction of time-series variation in bond spreads.
- This finding is also apparent in Levin, Natalucci and Zakrajsek
  - Unexplained time variation in the cost of monitoring.
- Bottom line:
  - Price of credit risk implies large and time-varying default risk premia.
  - Why?
Does CDS trading have a direct influence on cost of capital?

- Increased information:
  - CDS market allows investors to go long and short in corporate risk.
  - Cash bond market difficult to short. Buy and hold behavior also limit investor ability to go long.

- Increased supply:
  - Allows lender (bank) to hedge credit risk associated with any given borrower.
  - Borrower may be willing to lend more and/or at a lower price.
Does contractual interest rate fall when lender can insure credit risk?

- Standard debt contract:
  - Borrow $B = K - N$.
  - Project pays $\omega R^K K$.
  - If $\omega > \bar{\omega}$ borrower pays $\bar{\omega} R^K K$
  - Contractual interest rate:
    \[ R^* = \frac{\bar{\omega} R^K K}{B} \]

- Default insurance effectively reduces costs in default state. Equivalent to a reduction in the cost of monitoring.
  - When monitoring costs fall, borrower is monitored more frequently $\bar{\omega}$ rises.
    - Leverage ($K/B$) will also increase.

- Effect of insurance on contractual interest rate $R^*$ is ambiguous.
- Also, insurance costs should be included in contractual rate since they are paid in non-monitored states of world.
Does availability of insurance necessarily reduce effective cost of capital for the borrower?

- Absent insurance, lender self insures through loan portfolio.
- If lender insures one borrower, this may actually increase loan portfolio risk.
- If lender can insure all borrowers, this would reduce cost of capital for loan portfolio but we would not see a direct effect on a specific firm.
Comments on empirical work I:

• Sample selection is an issue – why do some firms have traded CDS?
• Matched sample appears substantially different from traded sample:
  – 50% smaller.
  – Twice as likely to have lowest credit rating.
  – Twice as likely to have a secured loan.
Comments on empirical work II:

- Reduced form regression has endogenous variables on right hand side:

\[ R^* - R^f = \alpha CDS + \gamma Q + \varepsilon \]

- Firms have high \( Q \) because they are low quality (Himmelberg, Hubbard and Love).
- Improvement in financial contract is priced in \( Q \), in equilibrium it should fall as \( CDS \) trading occurs – \( \alpha \) should be zero?

- Better way to do this:

\[ R^* - R^f = \alpha CDS + \gamma EDF + \varepsilon \]

Holding expected default probability fixed, what is effect of \( CDS \) trading on bond or loan spread?
Summary:

- Impressive data efforts.
- Simple contracting framework would be useful to obtain clearer empirical predictions.
  - Financial innovation may lead to higher leverage rather than reduction in contractual interest rate.
- More generally
  - Credit default swaps can inform us about movements in price of default risk.
  - Macroeconomists need to understand what drives aggregate fluctuations in the default risk premium and whether they have real effects.