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:
  - \$600 bil in 1999, \$17 trillion in 2006.
- 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:

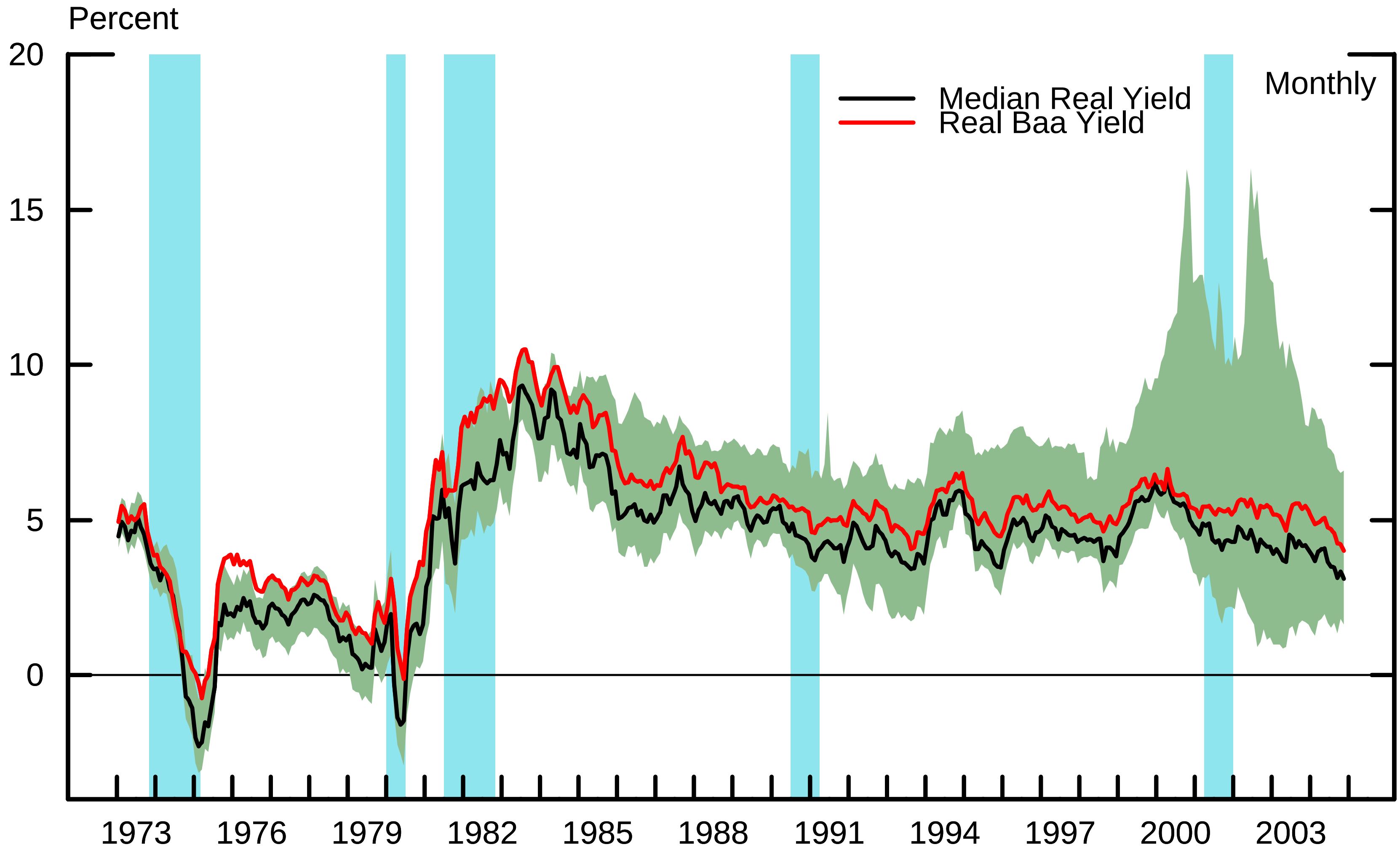
- What has happened to corporate risk spreads over time?
- What can we learn about corporate bond spreads from CDS rates?
- Does expansion of CDS market have direct implications for the cost of capital?
- Does the cost of capital matter for investment?

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?

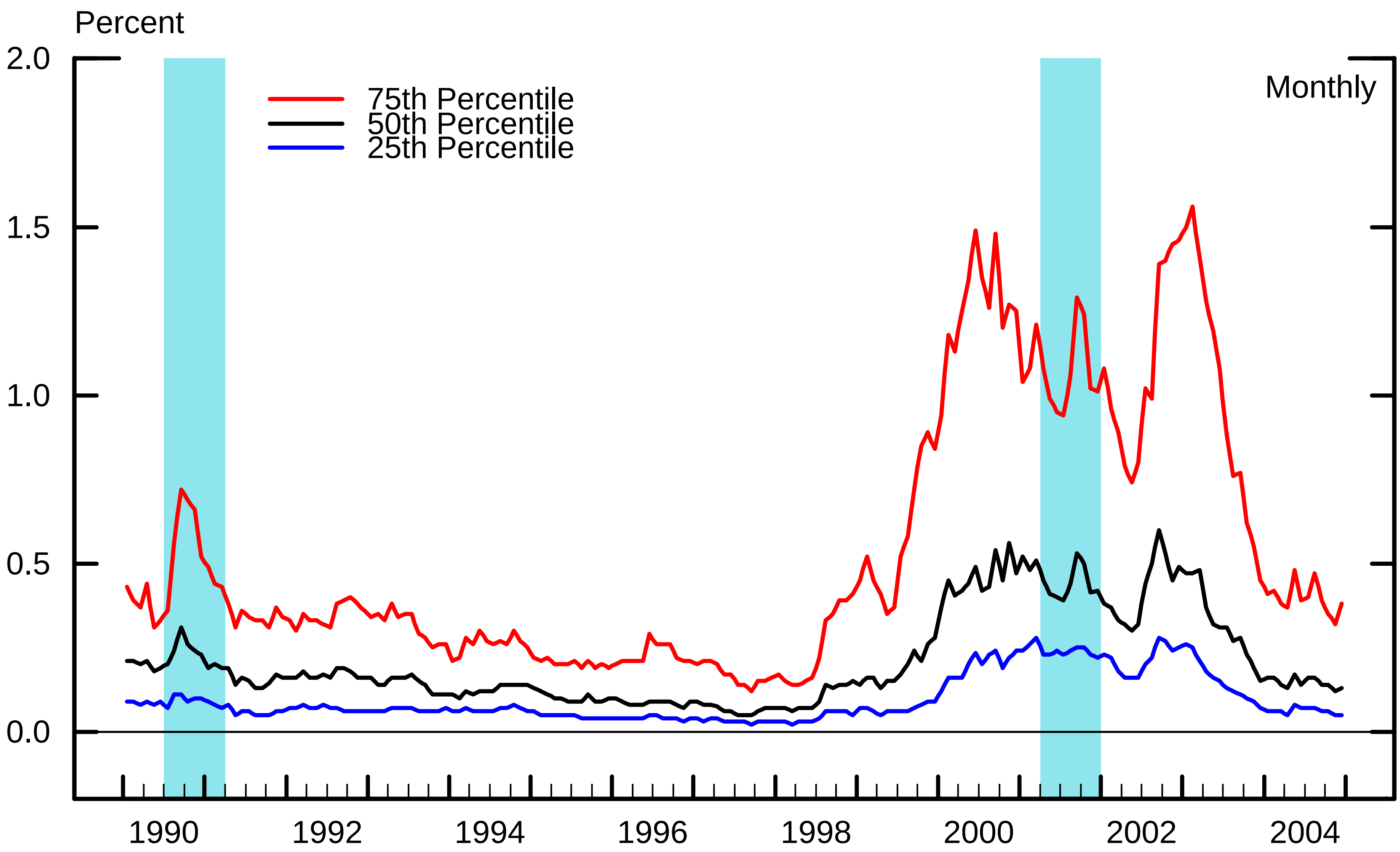
Corporate Bond Characteristics

Figure 1: The Evolution of Real Bond Yields



Expected Default Risk

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:

$$P_{cds} > True\ Default\ \Pr emium > r^B - r^f$$

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

CDS Pricing I:

- Berndt et al. estimate:

$$P_{cds} = \alpha EDF + \Sigma\gamma_i d_t$$

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).

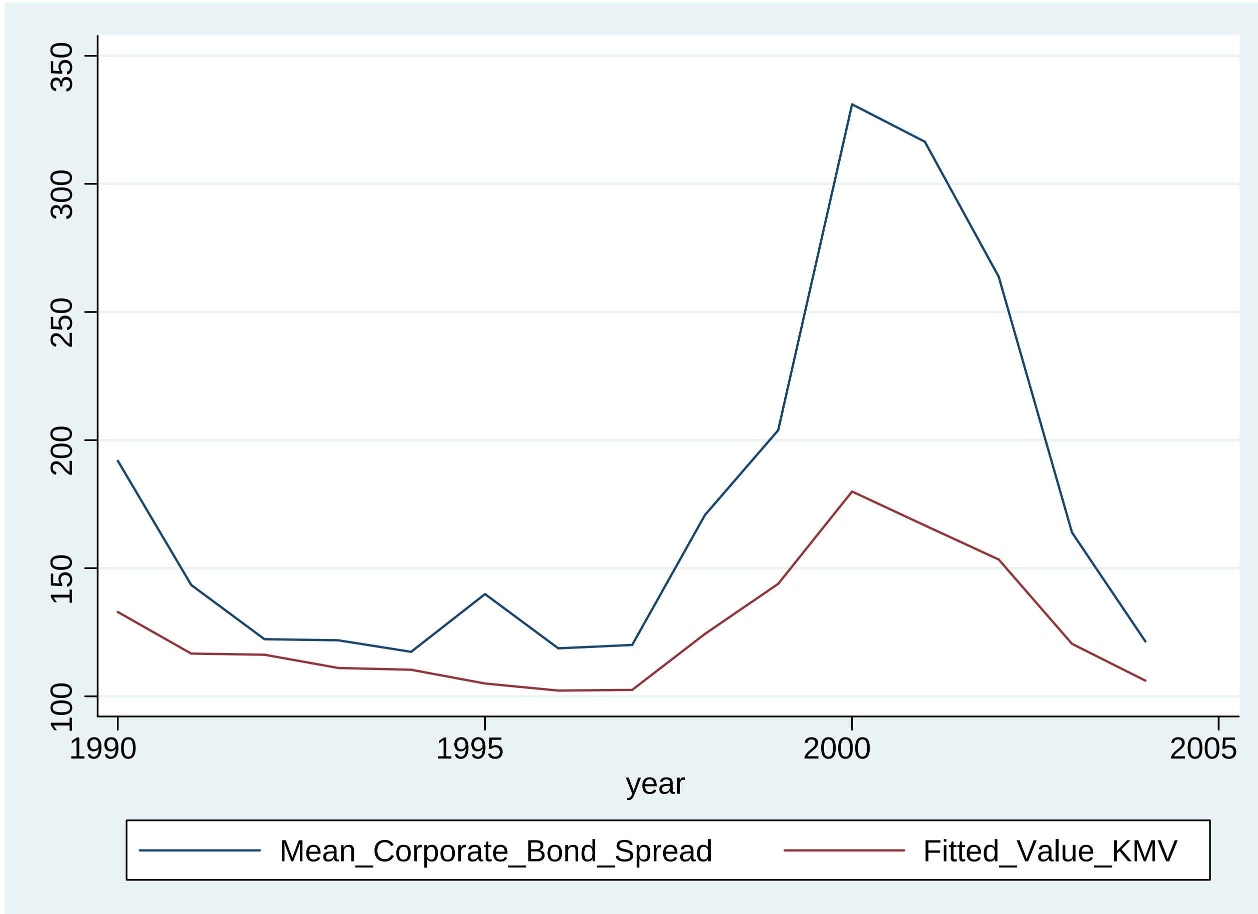
CDS Pricing II

- Log specification provides better fit:

$$\ln P_{cds} = \alpha_o + 0.75 \ln EDF + \Sigma\gamma_i d_t, \quad R^2 = 0.75$$

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

$$\ln R^B - \ln R^f = \alpha_o + 0.43 \ln EDF + \Sigma\gamma_i d_t, \quad R^2 = 0.51$$



350
300
250
200
150
100
1990
1995
2000
2005
year
Mean_Corporate_Bond_Spread
Fitted_Value_KMV

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 empiricalwork 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 – α 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.