Systematic Risk, Debt Maturity, and the Term Structure of Credit Spreads by Chen, Xu & Yang

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Outline

- Aim
- Why do we care?
- Model Summary & Results
- Comments

Paper's aim:

- How do liquidity and market risk interact with firms' management of debt maturity to affect credit spreads
  - Time series: focus on impact of business cycle
  - Cross section: focus on impact of systematic risk exposure
- Key features
  - Leland-type model
  - Aggregate risk: 2-state Markov chain
  - Firms issue (finite-maturity) debt and rollover a constant fraction: depends on aggregate state
  - Exogenous, unpriced liq. shocks directly decrease debt prices, not equity
  - Optimally select
    - Face value of debt
    - Debt maturity
    - Default time

Debt maturity management and you

- Firms which have a suboptimal maturity structure may reduce liabilities in bad times by firing people
- Would like to understand impact of debt maturity management on
  - Financial variables
    - prices, spreads, returns, risk premia, volatility, correlation, etc
  - Real variables
    - real investment
    - production
    - employment
    - household welfare $\leftarrow$ YOU
  - choice of maturity structure affects financial variables and can feed into real economy, affecting welfare
- this paper focuses solely on financial side
  - most interesting question: how much can maturity management help firms reduce the impact of a crisis episode on credit risk?

Model Summary

- cross-section of firms
- typical firm's cash flow dynamics

$$\frac{dy}{y} = \hat{\mu}(s_t)dt + \sigma_\Lambda(s_t) \overbrace{dZ^\Lambda}^{\text{sys. shock}} + \sigma_f(s_t)dZ^f$$

- exogenous SDF, Λ: jumps up when $\hat{\mu}$ is lower
- exogenous liquidity costs: effectively increasing discount rate for corporate bonds. This discount rate is increasing in maturity and higher in bad states.
  - part of cashflow used to pay a constant coupon: choose this coupon
  - default on debt when y falls below some value $y_D(s_t)$: choose this level for each state
  - debt is rolled over cts'ly at a rate dependent on s_t: choose this rate for each state
    - benefit of higher maturity is lower default rate
    - cost of higher maturity is lower debt value because of liquidity discount

Implications

- Average maturity will be shorter in bad states: driven by much higher liquidity costs in bad states
- High beta firms will choose longer maturity debt – liquidity costs impact them less, leading to less variation in maturity over the business cycle
- Crisis risk management: a firm can avoid a huge increase in credit spreads by issuing longer-term debt and maintaining long average maturity over time.

Suggestions: more on crisis management

Explore more fully the impact of suboptimal v optimal maturity choice on

- firm value (cross-sectional average and total value across firms) – quantify loss in value stemming from suboptimality
- equity value
- equity risk premium
- the liquidity component of credit spreads

Suggestions: derivatives

- Usage of derivatives is huge
- How would modelling this change implications?

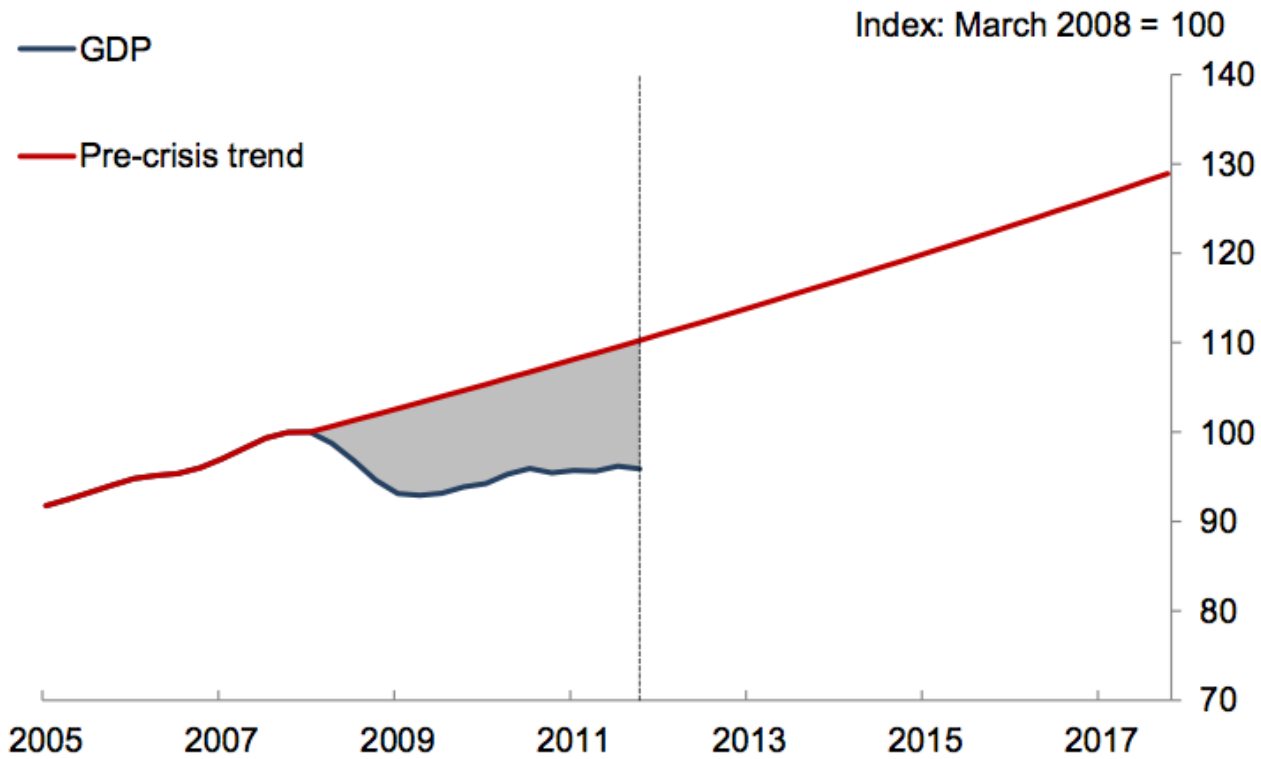
Comments: theory

Posited (exogenous) SDF inconsistent with liquidity shocks

- Non-diversifiable liquidity shocks make markets incomplete
- Need to assume illiquid assets are a very small part of individual investors portfolios to use SDF

Conclusion

- Paper focuses on financial implications of managing market and liquidity risk via maturity choice
- We really care about the real implications



Cumulative output loss=37% of pre-crisis GDP