Knightian Uncertainty and Interbank Lending

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Federal Reserve Board

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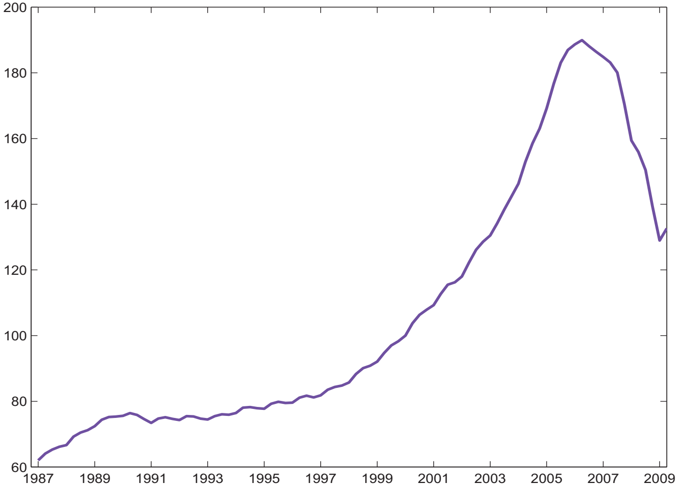
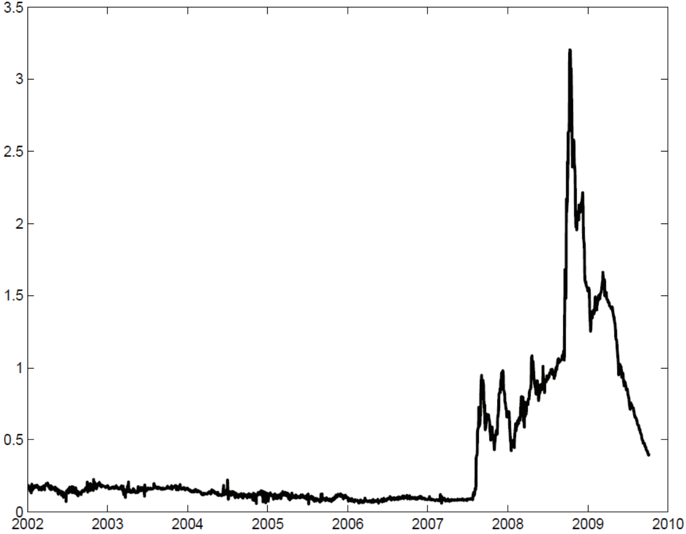
Housing Market: Case-Shiller Index



Bank Spreads: LIBOR-OIS



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- **Confusion, Knightian Uncertainty (KU)**
  1. KU creates problems if agents don't understand the environment when it matters.
  2. Agents behave more cautiously with KU causing market function to deteriorate.
- **Application: Interbank market**.
  1. Structural uncertainty about banks risk exposures built-up pre-crisis.
  2. During the crisis knowledge about risk exposures mattered.
  3. Private institutions can help reduce the effects of KU, but govt intervention may be needed.
  4. Policy proposals to reduce uncertainty through enhanced transparency:
     - Stress-test like policy to reduce uncertainty during a crisis.
     - Enhanced info on key banks total exposures to reduce uncertainty ex-ante.

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- Timeline: 3-Dates.

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Date 2 All loans mature.
Banks default if not solvent.

Remark: Tension at date 1.

The Effect of Knightian Uncertainty

- **Assumption**: i's default probability only depends on the performance of its long-run loan portfolio $\Rightarrow$

$$PD_i(\omega_i, t) = \Phi\left(\frac{\frac{L_i}{1+L_i}R^D - \omega_i'\mu(t)}{\sqrt{\omega_i'\Sigma(t)\omega_i}}\right)$$

Where portfolio weights are ω_i, Assets A_i, Deposits D_i, Equity E_i,

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\widehat{PD}_i &= \overline{PD}_i \text{ w/ extreme uncertainty aversion}
\end{aligned}$$

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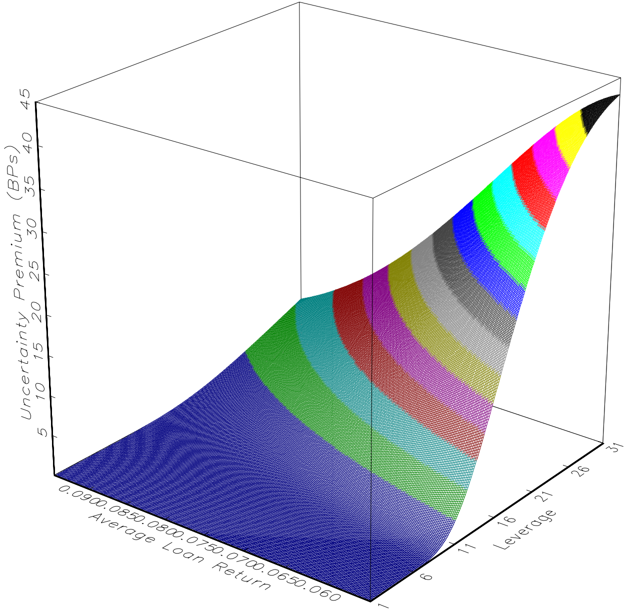
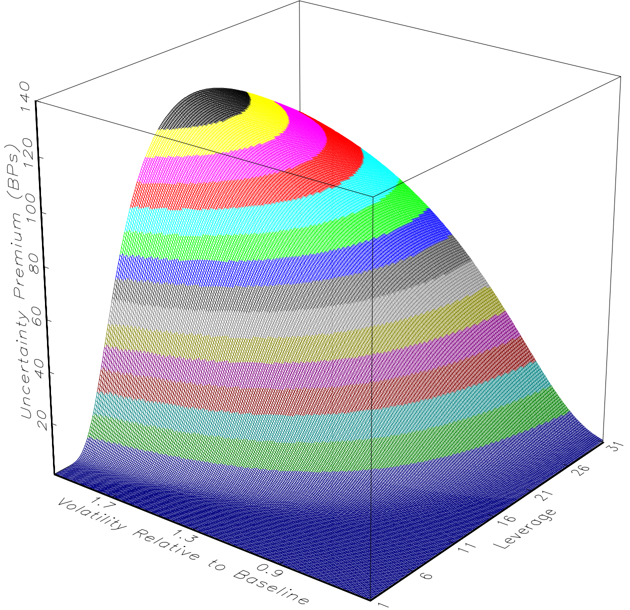
$\Rightarrow$ **Uncertainty over i's portfolio exposures can cause its borrowers to get cut off.**



(a) Uncertainty Premium and Expected Loan Return



(b) Uncertainty Premium and Loan Volatility

Results So Far

- Uncertainty premia depend on Leverage, Volatility, and Expected Asset Returns.
- Uncertainty premia can be low with high leverage if volatility is low, and/or expected returns are high [**Pre-Crisis Situation**].
- Uncertainty premia can become very elevated if leverage is high, and expected returns for some assets are lowered, or volatility for some assets becomes elevated [**Crisis Situation**].

Interbank Market: Anonymous Brokered Market

- Large (Core) banks extend loans to each other in an anonymous brokered market.
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1. Adding up constraint: $\sum_{k=1}^{2N} \omega_k A_k = Y_M$
2. Individual bank maximization constraint: $\omega_k \in C(\underline{\omega}, \overline{\omega}), k = 1, \ldots 2N$

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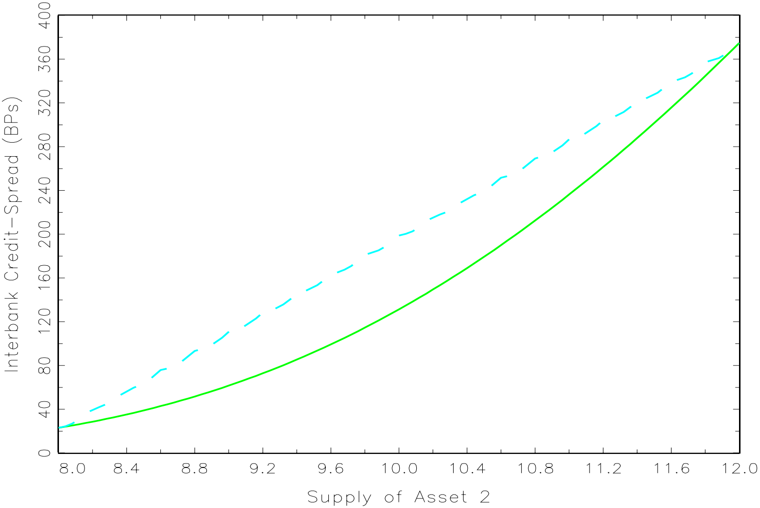
2. The market may break-down and because of positive externalities government audits that reveal information on exposures may be needed to restore market function.
3. Audits should "leverage" off of examiner knowledge.
4. Reducing uncertainty about "core" banks total exposures Y_M ex ante reduces the likelihood of market breakdown, and reduces the costs of breakdowns if they occur.

Effect of Uncertainty About Y_M in Bad Conditions



Closing Thoughts

1. I have shown that transparency initiatives may improve market function by reducing uncertainty and confusion ahead of and during a crisis.
2. The transparency is needed so that financial intermediation can take place.
3. The transparency initiatives I propose do not make individual banks fully transparent.
4. Many proposals to address future crisis are based on market information. For these to work, we need to improve the quality of information that the market uses to price risk.