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# Laying off Credit Risk: Loan Sales versus Credit Default Swaps

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# Model Framework

- Model assumptions:
  1. A bank makes a unit loan that pays  $R^l$  (success) or  $C$  (default).
  2. With probability  $\theta$  the bank learns that no monitoring is needed and the loan pays  $R^l$  with probability  $p+\Delta$ .
  3. With probability  $1-\theta$  the bank learns that monitoring at cost  $b$  is needed for a success probability of  $p+\Delta$ . Else, the success probability is only  $p$ .
  4. If the bank retains the loan, its “capital” cost rises by  $\beta(R^l - C)$ .
  5. If the bank sells the loan, the loan buyer does not know whether monitoring is needed but can monitor at cost  $b$  to ensure that the probability of success is  $p+\Delta$ .
  6. The bank may buy credit protection via a CDS to reduce its funding cost, but protection sellers cannot monitor.

# Main Results

- Types of equilibria are parameter dependent:
  1. Monitoring equilibria occur if  $b$  is low relative to  $\Delta(R^l - C)$ .
    - a. When capital costs,  $\beta$ , are low, only originating banks with loans needing monitoring sell loans. (Efficient monitoring, low risk-sharing.)
    - b. When capital costs,  $\beta$ , are high, all banks sell loans. (Excess monitoring, efficient risk-sharing.)
  2. No-monitoring equilibria occur if  $b$  is high relative to  $\Delta(R^l - C)$ .
    - a. When capital costs,  $\beta$ , are low, only originating banks with loans needing monitoring sell loans or buy CDS. (No monitoring, low risk-sharing.)
    - b. When capital costs ( $\beta$ ) are high, all banks sell loans or buy CDS. (No monitoring, efficient risk-sharing.)

# Why Rule Out Partial Loan Sales?

- Let  $\Delta(R^l - C) > b$  so that there are monitoring equilibria.
- Suppose the originating bank retains a proportion  $\omega$  of the loan and sells a proportion  $(1-\omega)$ .
- Choose  $\omega^* = b / [\Delta (R^l - C)] + \varepsilon$ , so that the originating bank has a sufficiently large stake to want to monitor.
- Thus, loan buyers never need to monitor because the originating bank does it when appropriate.

# Partial Loan Sale Equilibrium

- The profit of the originating bank is

$$\begin{aligned} & [\omega^* + (1 - \omega^*)][C + (p + \Delta)(R^l - C)] - 1 - (1 - \theta)b - \beta\omega^*(R^l - C) \\ & = C + (p + \Delta)(R^l - C) - 1 - (1 - \theta)b - \beta b / \Delta \end{aligned}$$

- The “social” value of the loan equals

$$\Omega^* - \beta b / \Delta$$

- This equilibrium (efficient monitoring, low risk-sharing) can be superior to ones restricted to complete loan sales when  $\theta\Delta > \beta$ .

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# Partial Sales of C&I Loans Are the Norm

- In general, partial loan sales may lead to less than first-best monitoring efficiency (Pennacchi 1988 *JF*).
- Yet, evidence including Simons (*FRBB* 1993), Gorton and Pennacchi (*JME* 1995), Dennis and Mullineaux (*JFI* 2000), and Sufi (*JF* 2007) shows that originating banks/syndicate lead arrangers retain larger proportions of loans that are more likely to require monitoring.

# Partial Hedging with CDS

- Likewise, an originating bank that hedges only  $(1-\omega^*)$  of its loan exposure could obtain the same equilibrium.
- A possible benefit of partial hedging with CDS is that the originating bank does not risk losing its relationship with the borrower to a loan buyer.
- However, due to the private nature of CDS contracts, it is not clear what, if anything, limits hedging.
- Ashcraft and Santos (*FRBNY* wp) and Hirtle (*JFI* forthcoming) find that CDS increase credit spreads for some borrowers, consistent with reduced monitoring.

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# Private versus Social Cost of Capital

- Unlike loan sales without recourse, the counter-party risk of buying CDS may not eliminate a capital charge.
- Bank capital is assumed to be socially costly, equal to  $\beta$  per unit.
- Equity capital probably has private costs due to its tax disadvantage, but may not have direct social costs.
- However, tax and regulatory distortions may motivate a great deal of loan selling and CDS trading.

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# The Role of Reputation

- Undoubtedly, repeated participation helps a loan selling or CDS-buying bank commit to efficient monitoring.
- The model's number of defaults that “trigger” punishment of a shirking bank might be decreasing in  $p$ .
- Reputation can be applied to partial loan sales / syndications. Dennis and Mullineaux (*JFI* 2000) find that more reputable lead arrangers need retain a smaller share ( $\omega$ ) of the loan.

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# Credit Lines versus Term Loans

- Drucker and Puri (*RFS* forthcoming) show that credit lines are less likely to be sold compared to term loans.
- Credit lines require a loan buyer to perform by providing liquidity on demand. Loan buyers are likely be limited to large commercial banks. See Gatev and Strahan (*JF* 2006) and Pennacchi (*JME* 2006).
- CDS may be best to dynamically hedge the uncertain exposure (balances) of credit lines.

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# Conclusions

- This paper focuses on the transfer of monitoring rights as a factor that distinguishes loan sales from CDS.
- Its model provides valuable insights regarding situations when loan sales dominate CDS.
- The model might provide even more realistic predictions by allowing partial loan sales.