Arbitrage Crashes and the Speed of Capital

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NBER Discussion by Darrell Duffie
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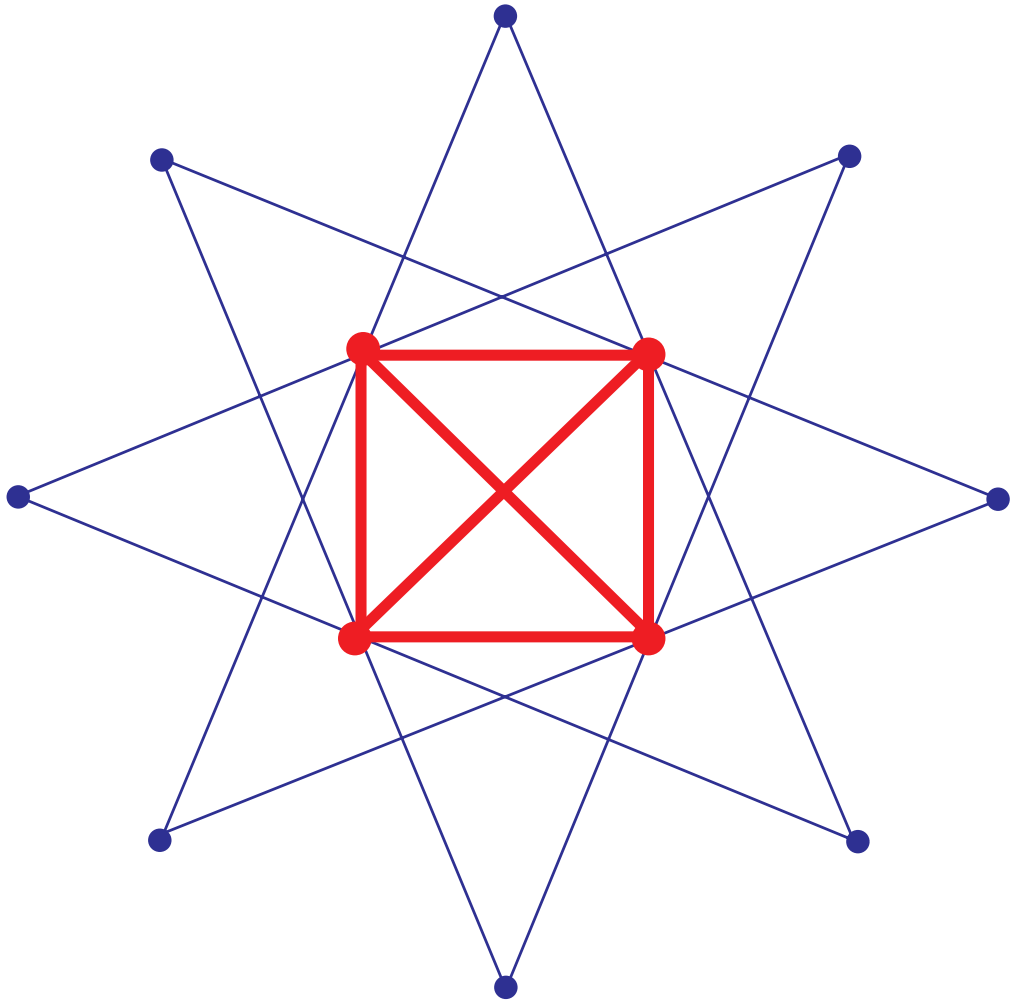
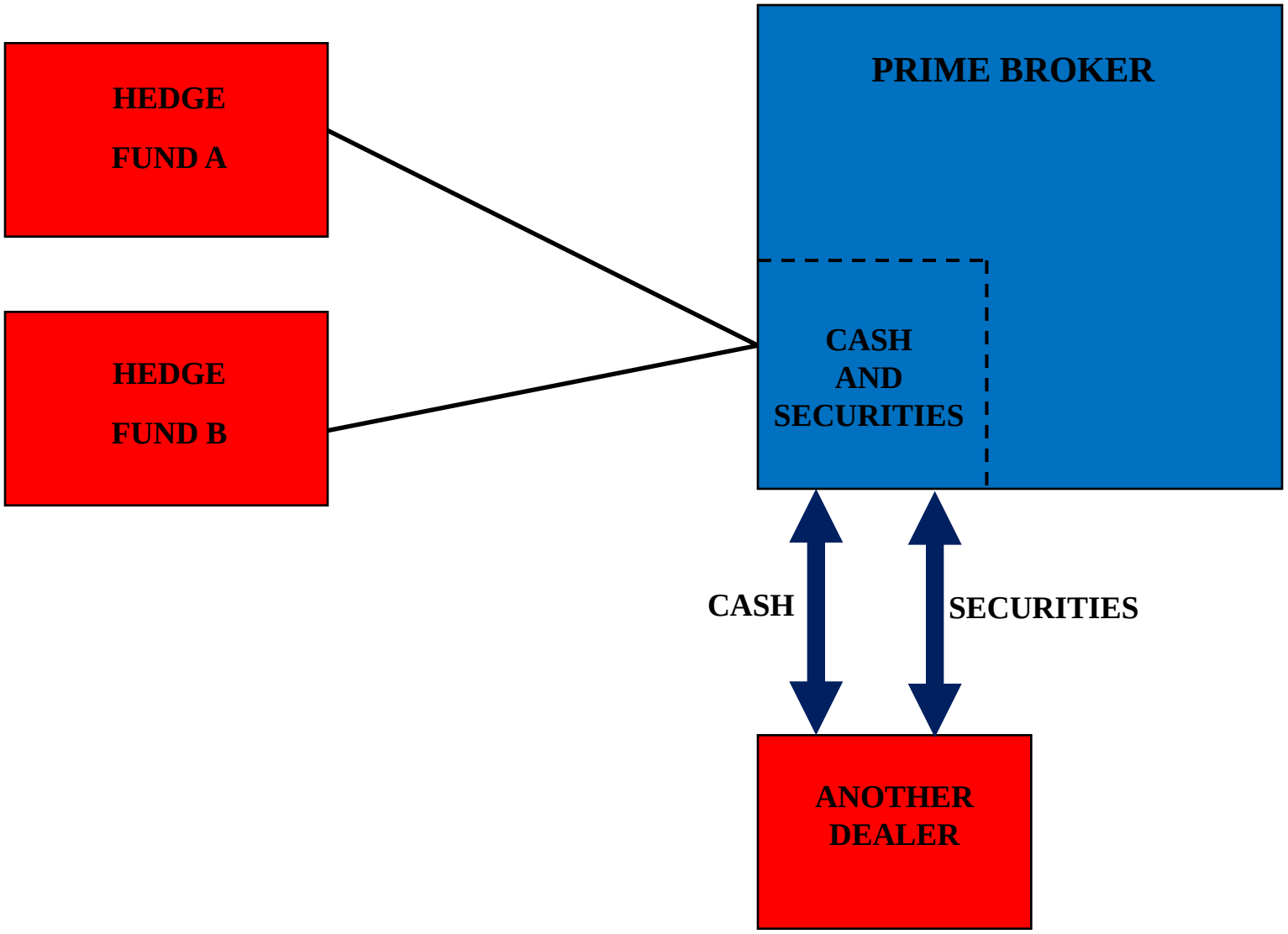
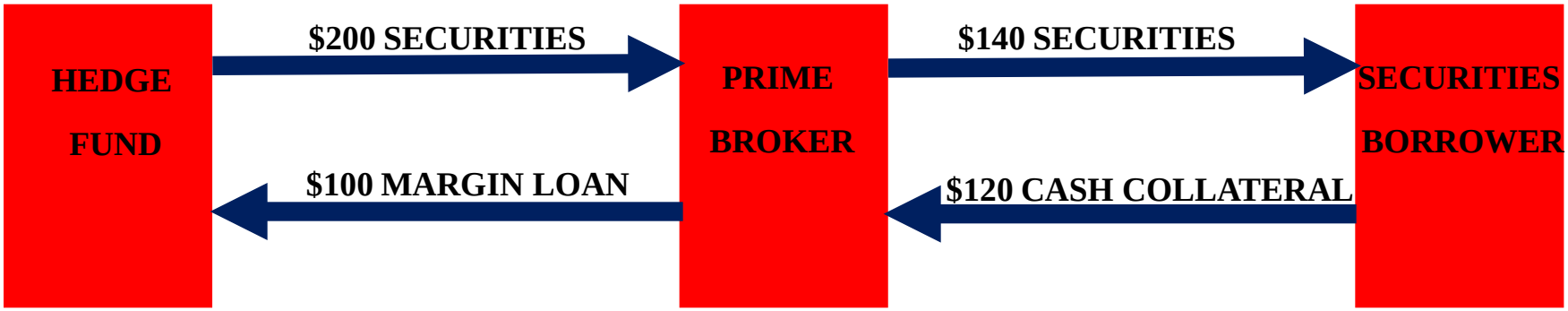


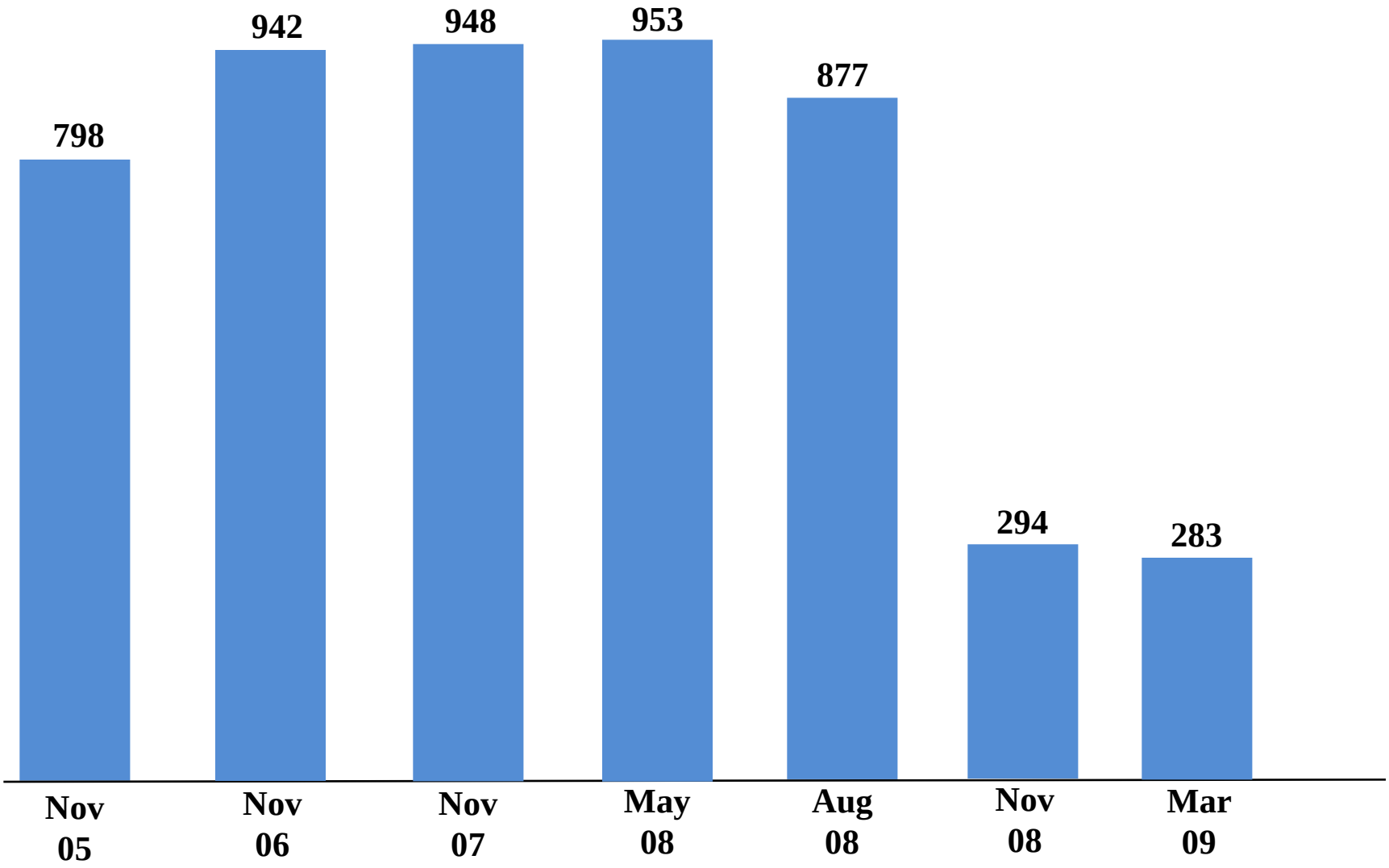
Figure: A dealer-intermediated over-the-counter market.


HEDGE
FUND A
HEDGE
FUND B
PRIME BROKER
CASH
AND
SECURITIES
CASH
SECURITIES
ANOTHER
DEALER


HEDGE FUND
$200 SECURITIES
$100 MARGIN LOAN
PRIME BROKER
$140 SECURITIES
$120 CASH COLLATERAL
SECURITIES BORROWER

Value of Collateral Received that Can be Pledged

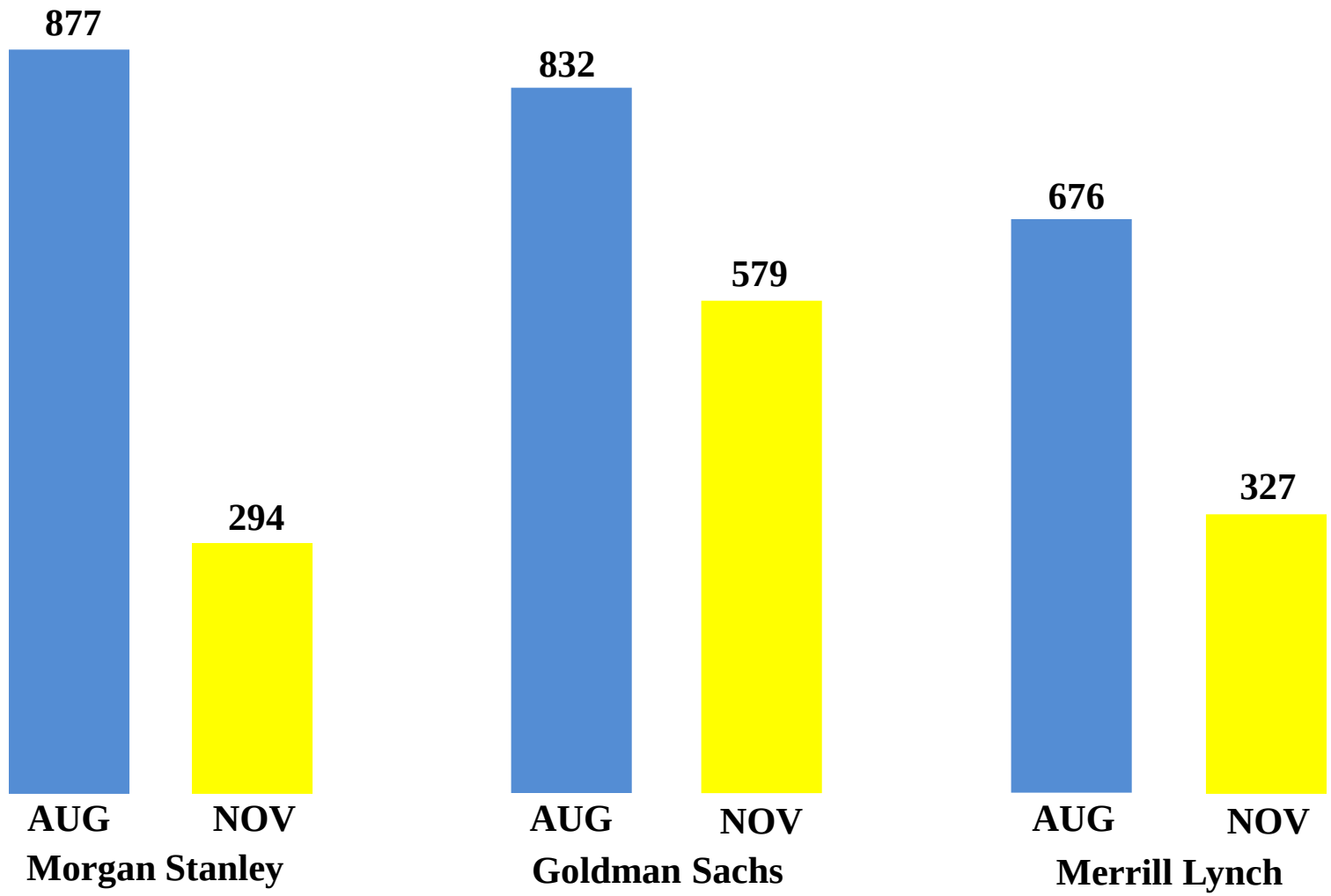
Morgan Stanley



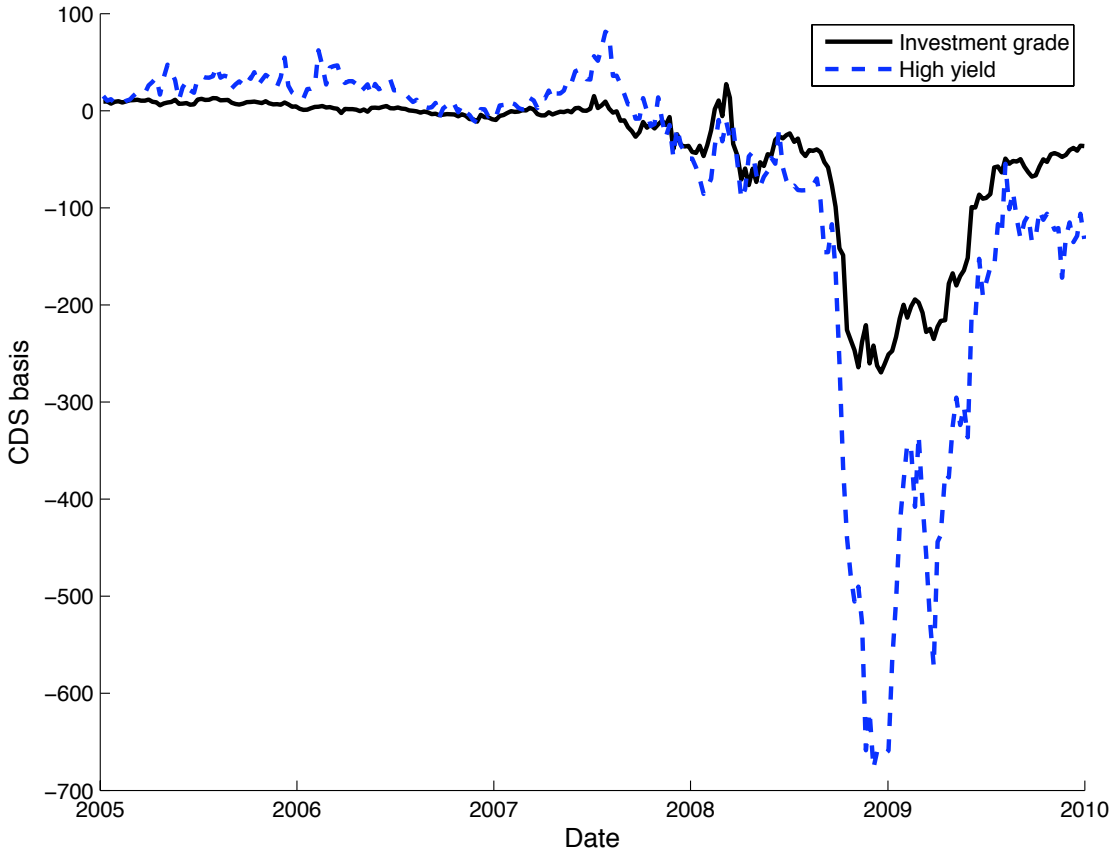
Data Source: Singh (2009)

Value of Collateral Received that Can be Pledged

Months Spanning Lehman's Default



Data Source: Singh (2009)


Investment grade
High yield
CDS basis
Date
100
0
−100
−200
−300
−400
−500
−600
−700
2005
2006
2007
2008
2009
2010

Is the Extreme CDS Basis Seems Explained by Counterparty Risk?

- Conservatively, suppose that there is no recovery at the failure of the CDS protection seller, and no risk of default by the protection buyer.
- The CDS rate is the risk-neutral expected payment rate of the CDS protection seller, pqL, where
  - p is the annual risk-neutral probability of default of the referenced borrower.
  - q is the risk-neutral probability that the seller of protection has survives to perform, conditional on the borrower's default.
  - L is the risk-neutral expected loss given default of the referenced debt.

The Extreme CDS Basis Seems Unexplained by Counterparty Risk

- The IG CDS rate was about $pqL = 250$ bps. Corrected for counterparty risk, the CDS rate is argued to be the IG bond spread, about $pL = 500$ bps.
- By this argument, the average risk-neutral counterparty performance probability, conditional on default of a typical IG borrower, is about $q = 0.5$.
- By comparison, the JP Morgan CDS rate was under 1.5% per year. Even under the proposed hypothesis, this implies a q (before conditioning) of over 0.91.

Related Modeling

- Trade through intermediaries with limited capital or risk bearing: Grossman and Miller (1988), Allen and Gale (1994), Morris and Shin (2006), Weill (2005), Brunnermeier and Pedersen (2006), He and Krishnamurthy (2006), Etula (2009).

- Collateralization, margin, leverage, and shortsale constraints: Shleifer and Vishny (1992), Stein (1995), Gromb and Vayanos (2002, 2007), Basak and Croitoru (2006), Anshuman and Viswanathan (2007), Fishman, Hong, and Kubik (2007), Krishnamurthy (2003).