Discussion of:

Risk Taking and Implicit Guarantees Inside Financial Firms

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Overview

1. Money Market Mutual Funds
2. Financial Crisis
3. Empirical Analysis
4. Additional Issues/Questions

Money Market Mutual Funds

1. Money Market Mutual Funds (MMMFs) are regulated by the SEC, under rule 2a-7 of the ICA of 1940.
2. This rule specifies in detail how these funds must be run:
    1. Quality of Securities Held
    2. Maturity of Securities Held
    3. Diversification
    4. Accounting
        - NAV calculation
        - Yield calculation
3. The funds can further be categorized into:
    - Retail/Institutional Funds.
    - Prime/Treasury Funds

Rule 2a-7 - Amortized Cost Method

- According to the SEC†,

  "Rule 2a-7, among other things, facilitates money market funds' ability to maintain a stable net asset value per share by permitting them to use the amortized cost method of valuation ..."

- This means that "...portfolio securities are valued at the fund's acquisition cost as adjusted for amortization of premium or accretion of discount rather than at their value based on current market factors."

† from http://www.sec.gov/rules/final/2010/ic-29132.pdf

Rule 2a-7 Quality/Diversification Restrictions

- All securities must be rated in the top one or two short-term rating categories by nationally recognized statistical rating organizations (“NRSROs”).
- A fund, moreover, may only invest up to 5% (now 3%) of its portfolio in securities rated in the second highest rating category (“second tier” securities).
- Only 5% holdings can come from any one issuer.

Rule 2a-7 Maturity Restrictions

- All securities must have a remaining maturity of 397 calendar days or less.[†]
- The weighted average portfolio maturity cannot exceed 90 days. (now 60)

Rule 2a-7 Risk Control Restrictions

- The firm must periodically “shadow price” the NAV.
- If the mark-to-market value differs by more than 0.5% from the amortized cost value, the fund’s board must meet promptly To if it is in the interest of the fund’s investors to “break the buck.”

"Breaking the Buck."

- The amortized cost method allows purchasers of MMMFs access to a steady NAV of $1, much like a savings account.
  - In 2009, the SEC considered requiring mark-to-market for MMMFs, but at least one commentator thought that this would "destroy the industry."
  - See Gennaioli, Shleifer, Vishny (2010), "Financial Innovation and Financail Fragility."
- Of course, MMMFs are subject to bank runs *à la* Diamond and Dybvig.
- "breaking the buck" is one mechanism that can be used to prevent/stop runs.
  - Until 2008, it was used once (in 1994).
- The other is using internal or external funds to support the fund via a guarantee.

History – Money Market Mutual Funds

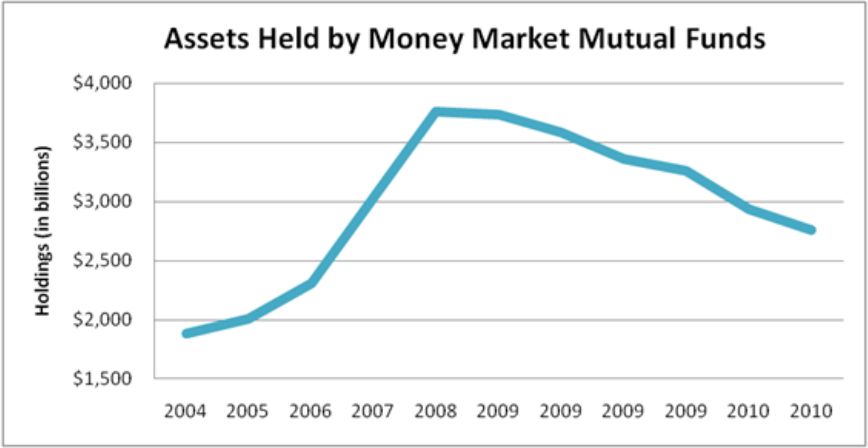
- In 1971, Bruce R. Bent, Sr. and Henry B. R. Brown established The Reserve Fund
  - This was the first money market mutual fund (MMMF).
- By May, 2008, The Reserve Fund was a fund complex with 18 money market funds, and $125 Billion AUM.
  - The "Flagship" Primary Reserve Fund was at $62 Billion in AUM.
- By May '08, There were more than 600 MMMFs, with a total AUM above $3.5 trillion.
  - This is roughly the size of the commercial banking sector.
  - At least in the popular press, much of this growth was attributed to "reaching for yield" in the low interest rate period of the 2000.

Bruce R. Bent, Sr., Co-founder of *Reserve Fund*

Money Market Funds – Total AUM Growth

- $2.2 billion at the end of 1974
- $74.4 billion at the end of 1980
- $200 billion at in the middle of 1982.

Money Market Fund Asset Growth



Bruce R. Bent, Sr., and Bruce Bent II†

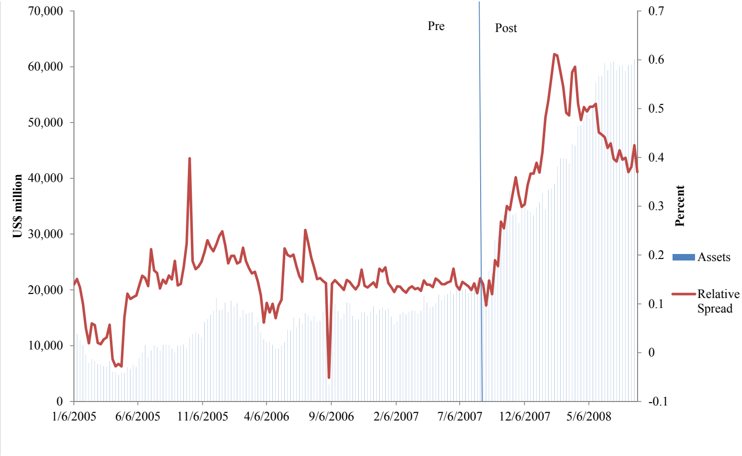
† drawings from "SEC Sues Reserve's Bent and Son.", *The Wall Street Journal*, May 6, 2009

Bruce Bent, II

- "... Known in the industry as Bruce Two, his long hair and a beard hinted at his youthful past as a drum-playing philosophy major."†
- "...the 42-year-old had greatly expanded his father's business. Assets under management grew from about $4 billion in the mid-1990s, when he was handed day-to-day control of operations, to $18 billion in 2002, and swelled to $125 billion in 2008."
- "... Reserve shifted from courting individuals to attracting big corporate accounts like Time Warner. Its biggest client last year, with $5.4 billion in the Primary Fund, was China Investment Corp."

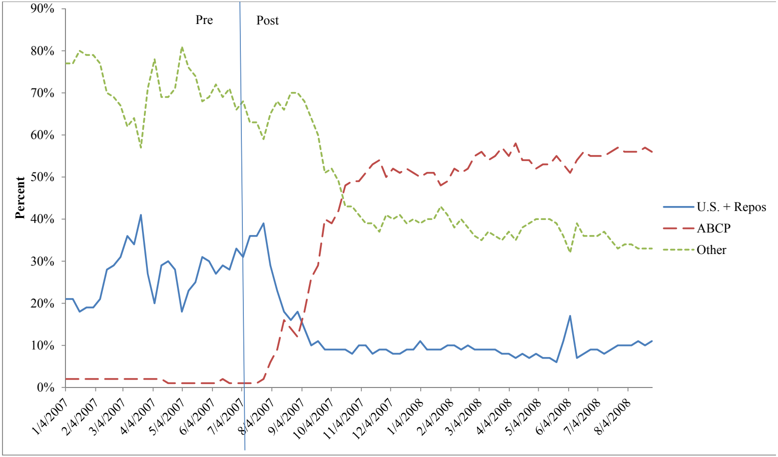
†All quotes from "Inside the panic at Reserve Fund," *Crain's*, May 10, 2009

Spread & AUM of Primary Reserve Fund

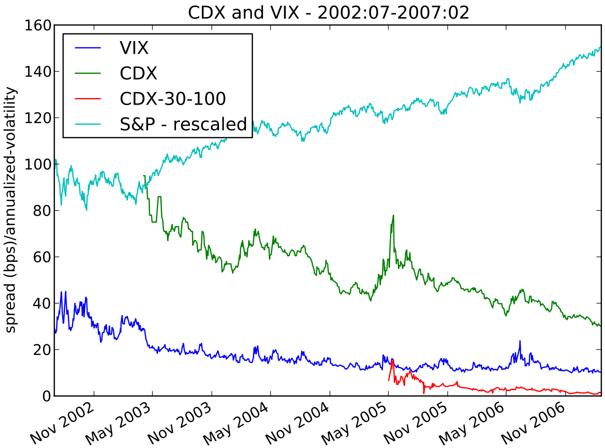


†Spread is calculated relative to all institutional prime funds

Reserve Fund Holdings



Decreasing Volatility Preceded Crisis



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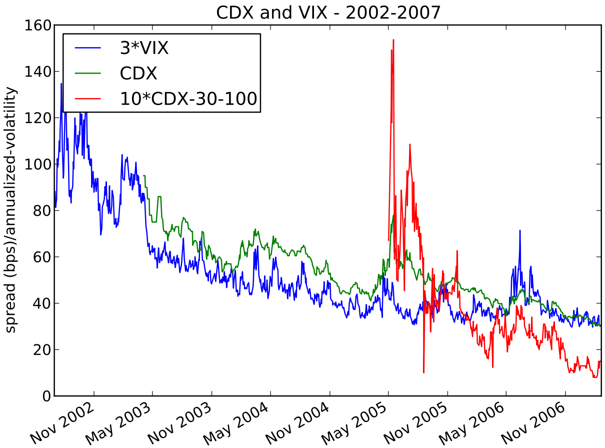


Financial Institutions increased effective leverage

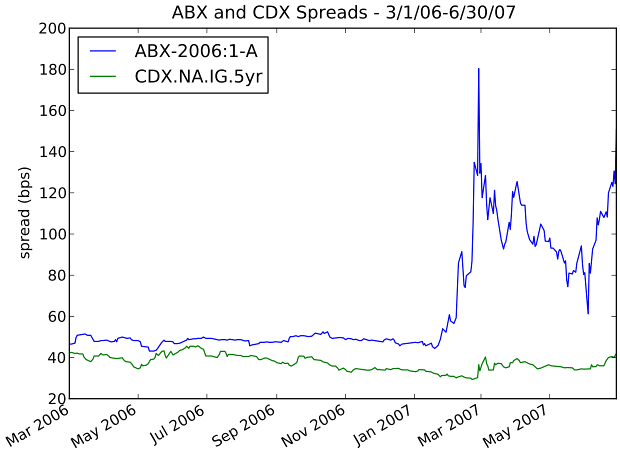
- Perhaps as a response to the perceived lower risk, a number of financial institutions “levered up:”
- By 2007, the leverage of financial institutions was high:

Bear Stearns	40:1	(20:1 in 2002)
Merrill Lynch	32:1	(16:1 in 2002)
Morgan Stanley	33:1	
Citibank	33:1	
Goldman Sachs	25:1	

  - financial institutions were using more short-term financing.
- Hedge-fund leverage had increased (Khandani and Lo (2008))
  - And hedge funds AUM had increased.

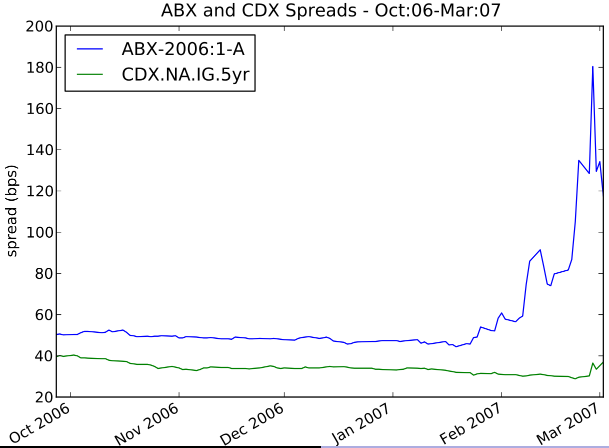
Subprime ABS vol increases in Jan '07

- ABX-A volatility increases dramatically in January 07:



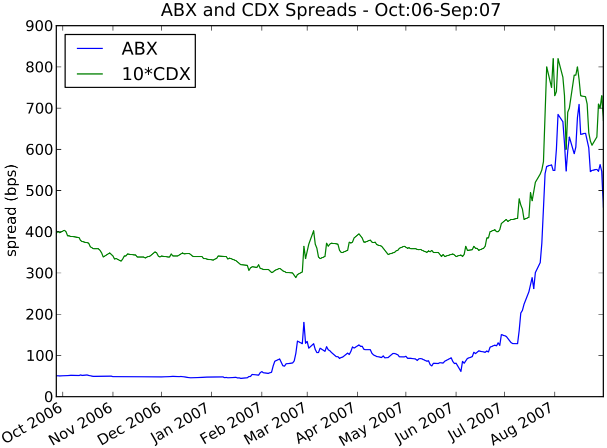
Lags in Shock Transmission

- However, before March, CDX spreads narrowed as ABX widened.



Post July ’07, ABX and CDX both increase

- ABX/CDX spreads, volatility and correlation increase.



Crisis Timeline

July 2007:

- Two Bear Stearns Hedge Funds collapse

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October 29, 2007:

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September 15, 2008:

- Lehman Bros. files for Bankruptcy

Where were the MMMF assets coming from?

- Close to $2 Trillion dollars flowed into MMMFs between 2005 and 2008.
  - This flow appears to have accelerated dramatically after August 2007.
- Where was this money coming from?
  - Commercial Banks?
  - Commercial Paper?
  - Repo?
- KS note that:

  > *Assets originated by the financial industry ... accounted for 91.4% of money market funds.*

  It would be great to know how this was changing over this period.
- At least in the Reserve Primary Fund, $787 Million of it's holdings were Lehman commercial paper.

Reserve Primary Fund Collapse

- "The evening of Sept. 15, 2008, was the worst of Bruce Bent II's career."
- On Sept. 15, Reserve Fund met all redemption requests.
- However, by midmorning on September 16, redemptions reached $40 billion over 2 days.
- Its bank, State Street, stopped wiring funds shortly after 10 a.m.
- They contacted the Federal Reserve Bank of New York for assistance. The Fed declined.
- "Mr. Bent in New York and his father in Italy fruitlessly searched for a cash lifeline or an acquirer. Later that afternoon, Reserve announced that the buck had in fact been broken."

2008 Crisis

- Over the next week, $172 Billion flowed out of MMMFs.
- On September 19, the Treasury announced a "deposit insurance" plan covering all money market mutual fund investments.
- Simumtaneously, they announced a plan to funnel capital to commercial banks so that they could buy securities from money funds.
- Interestingly,

  . . . the guarantee plan also drew immediate attack from the American Bankers Association, whose members compete with the money fund industry. The A.B.A.'s leaders warned that the plan could encourage investors to withdraw money from an already stressed banking system to seek higher yields in money funds while the guarantee is in place.

Table 3 – Flow/Performance Relationship

	Fund $Flow_t$			
Period	Post	Pre	Post	Pre
	(1)	(2)	(3)	(4)
$Spread_{t-1}$	0.010**	-0.001	0.026***	-0.001
	(0.004)	(0.003)	(0.010)	(0.004)
$Log(TNA)_{t-1}$	-0.002***	-0.001***	-0.088***	-0.074***
	(0.001)	0.000	(0.007)	(0.015)
Expense $Ratio_{t-1}$	0.000	-0.018***	-0.055	-0.059
	(0.005)	(0.005)	(0.043)	(0.088)
Age_{t-1}	0.000	-0.001	-0.004	-0.003
	(0.001)	(0.001)	(0.006)	(0.010)
$Log(FamSize)_{t-1}$	0.000	0.001**		
	(0.001)	0.000		
Constant	0.005***	0.005***	-0.016	0.011
	(0.001)	(0.001)	(0.014)	(0.008)
Week FE	Y	Y	Y	Y
Fund FE	N	N	Y	Y
Observations	7,725	7,592	7,725	7,592
R-squared	0.02	0.01	0.11	0.07
DD: $Spread_{t-1}$*Post	0.011**		0.028***	
	(0.005)		(0.010)	

1. Is the percent flows over one week the right dependent variable?
   - It seems like this should scale with the fund size.
   - consistent with signif. neg coefficient on TNA ($t \approx -11$)
2. Why doesn't the relation with spread show up in the pre-period?
   - Authors' argument is that this is because there is no variation in opportunities in the pre period.
   - But, this would drive up the standard error, which we don't see.
3. Why isn't the implicit guarantee variable in this regression?
   - One of the key ideas here is that investors are (irrationally?) ignoring the extra risk that comes with the higher spreads.
   - Do investors ignore the implicit guarantee? Include this.

Table 4 – Capital and Risk Taking

	Spread_t		Holdings Risk_t		Maturity Risk_t	
Period	Post	Pre	Post	Pre	Post	Pre
	(1)	(2)	(3)	(4)	(5)	(6)
Owner Characteristic						
Log(Equity)_{t-1}	-0.019***	-0.000	-0.018**	0.002	-1.542*	-0.646
	(0.006)	(0.002)	(0.008)	(0.010)	(0.792)	(0.630)
Fund Characteristics						
Log(TNA)_{t-1}	0.022**	0.004***	0.017*	0.008	0.150	0.506
	(0.010)	(0.001)	(0.010)	(0.013)	(0.697)	(0.668)
$\text{Expense Ratio}_{t-1}$	-0.825***	-0.980***	0.153*	0.194*	10.392*	9.799*
	(0.058)	(0.013)	(0.082)	(0.104)	(5.558)	(5.040)
Age_{t-1}	-0.005	-0.008	-0.002	-0.000	0.003	-0.960
	(0.020)	(0.005)	(0.023)	(0.021)	(1.379)	(1.155)
Flow_{t-1}	-0.056*	0.019**	-0.041	-0.101***	-1.337	-5.630**
	(0.031)	(0.008)	(0.028)	(0.030)	(1.828)	(1.511)
$\text{Log(FamSize)}_{t-1}$	0.021**	0.005**	0.013	0.015	1.108*	0.581
	(0.010)	(0.002)	(0.011)	(0.013)	(0.633)	(0.592)
Zero Equity_{t-1}	-0.034	0.006	-0.064	0.001	-4.321	-0.748
	(0.032)	(0.009)	(0.045)	(0.055)	(3.138)	(3.127)
Constant	1.195***	0.086***	0.774***	0.807***	40.075***	38.323***
	(0.013)	(0.003)	(0.017)	(0.020)	(11.730)	(9.845)
Week Fixed Effects	Y	Y	Y	Y	Y	Y
Observations	7,717	7,585	7,717	7,585	7,717	7,585
R-squared	0.89	0.81	0.11	0.07	0.13	0.89

1. Equity should be scaled by TNA.
    - Note that coefficient on $log(TNA)$ is $= -1\times$ coefficient on $log(Equity)$.
2. For spread regressions, pre- & post-, note the strong relation with the expense ratio. ($t \approx -15$)
    - Is this driven by an outlier?
        - This is consistent with high R^2s.
    - *But*, you see it in both pre- and post- periods.