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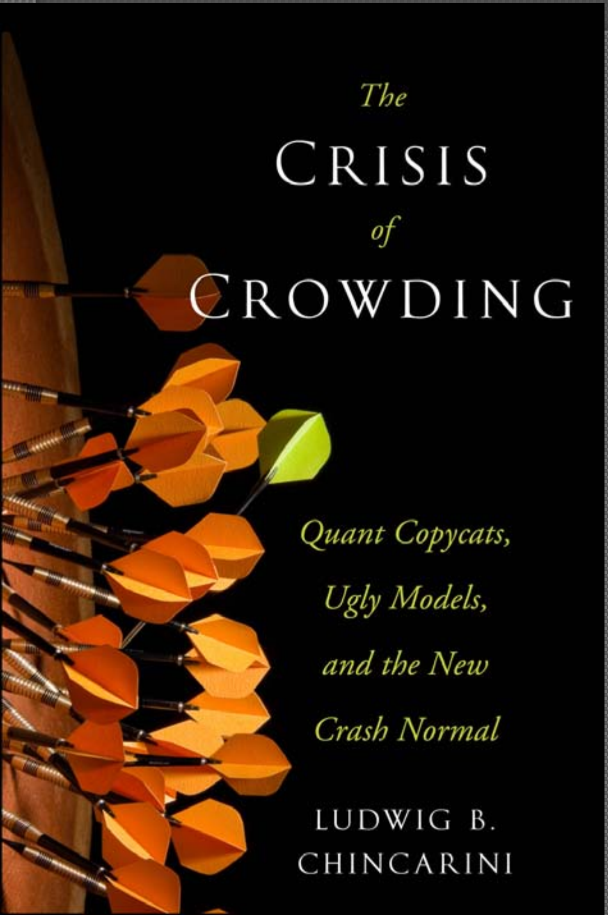
The Crisis of Crowding
Stories from the Financial Crisis of 2008



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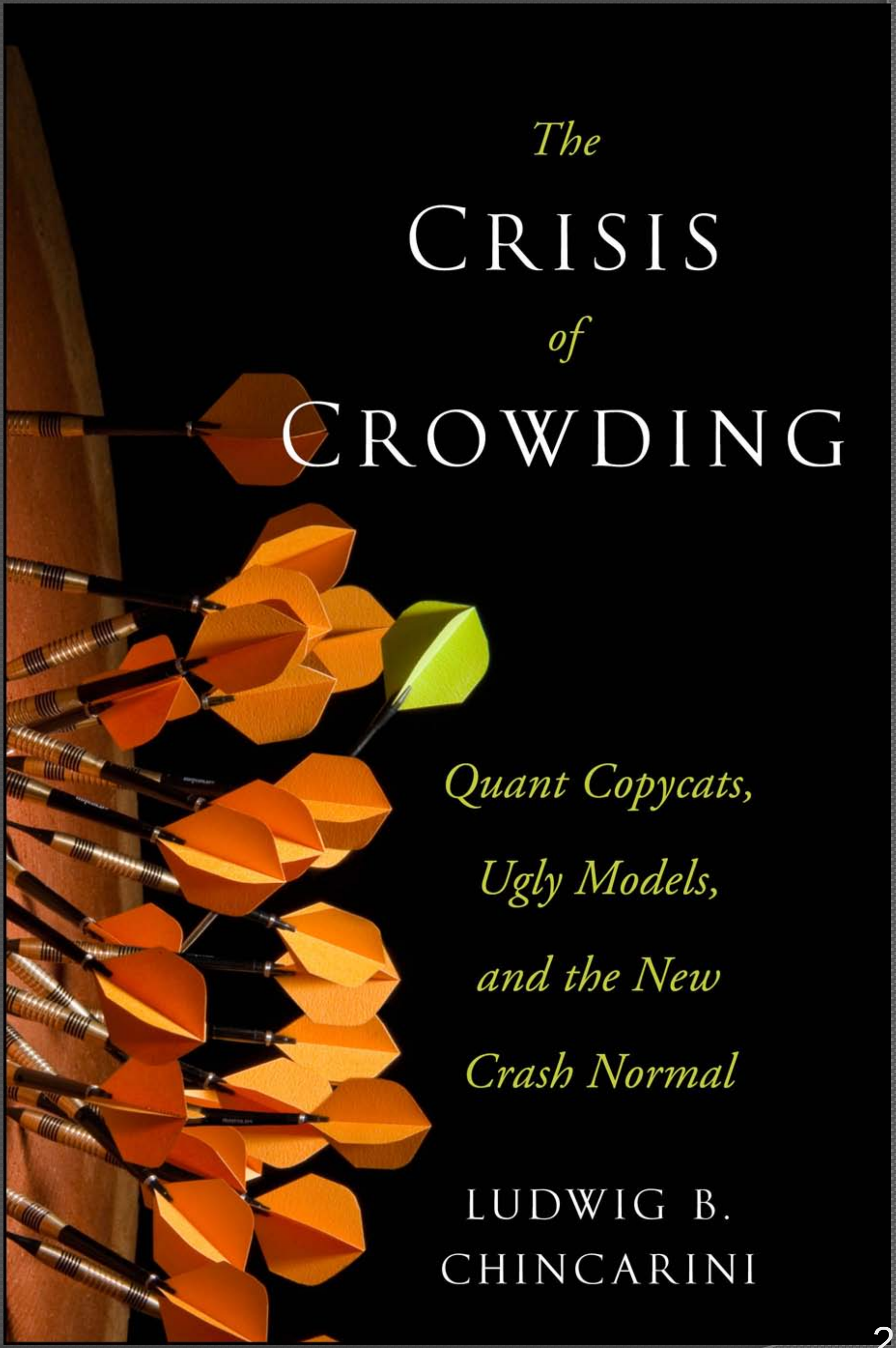
IndexIQ and University of San Francisco
December 4, 2012

indexIQ

New Book

- ***The Crisis of Crowding***
- *Available on Amazon and other book ordering sites.*

- *For more info:*
- *www.ludwigbc.com*
- *http://www.wiley.com/WileyCDA/WileyTitle/productCd-1118250028.html*



What is the book about?

- The book tells the real story of LTCM, the real story of the financial crisis of 2008, clarifying what really went wrong, the Flash Crash of 2010, the ongoing Euro crisis and how they are all connected by elements of crowding.
- The book is easy to read and informative with lots of interviews with insiders, including Goldman Sachs executives, Jimmy Cayne, Myron Scholes, John Meriwether, Vice Chairman of Citibank, government regulators, and others.

What is the book about?

- The Circle of Greed
- The Quant Crisis
- The LTCM Debacle
- The Lehman Collapse
- The Bear Stearns Hibernation
- Asleep in Basel
- The End of the LTCM Legacy
- Much more…

Definition

Crowding takes place when multiple market participants begin to follow the same trade altering the risk and return dynamics of the trade.

- Not always east to detect – holders matter
- Risk will be incorrectly measured if not accounted for, both market and liquidity risk.
- Can lead to levered firms failing rapidly.

Examples of Crowding

- Portfolio Insurance in the 1980s

  - Dynamic put option replication
  - Works fine if small number of investors do it.
  - Too many can lead to spiral effect as stock prices plunge…

Examples of Crowding

- LTCM in 1998

- Sophistication to bond markets brought lots of profits
- Hedge funds, bank prop desks, and others began copying
- Space saturated (crowded) and opportunities vanished…but risk was higher than thought

Examples of Crowding

- Internet Bubble of 2000

  - Everyone and their cab driver was buying internet stocks, even liberal arts college professors
  - Valuation out of whack, space saturated, prices had to go up…
  - Crowd runs for the exits, market collapses…

Examples of Crowding

- Internet Bubble of 2000: PALM Mystery

March 2, 2000 3COM sold part of it's stake in PALM (about 5 %).

Issued at $38 and rose to $165 on first day of trading, closing at $95.06.

An owner of 1 share of 3COM owned 1.5 shares of PALM (by relative share issuance).

3COM held 95 % of PALM and had cash/securities worth about $10 per share

Thus, we would expect 3COM to trade at somewhere greater than 1.5*95.06+10=152.59

Examples of Crowding

- Internet Bubble of 2000: PALM Mystery

Ironically, it traded down that day at $81.81. This implied a negative value for everything else in 3COM…not possible?

The crowds were racing for anything internet-like regardless of valuation.

Examples of Crowding

- Financial Crisis of 2008 and Beyond

- Crowded spaces and their problems, including mis-measurement of risk were everywhere in the crisis of 2008.

Story 1:

- JP Morgan and the Relative Value HF Community

- J.P. Morgan had large losses in the 2nd quarter due to bad hedges. $5-7 billion.
- Losses related to bets on corporate credit indices.
- Bruno Iksil (aka London Whale) was involved.
- Fudging marks, lying, and misunderstanding real risk of instrument partly due to crowds and holders.

Story 1:

- JP Morgan and the Relative Value HF Community

- It happened in 2008, but slightly differently.

- Many relative-value hedge funds and banks were roasted, including Meriwether's new fund.

Story 1:

- JP Morgan and the Relative Value HF Community

Background:

CDX – new indices based on corporate bond CDS.

- IG index 125 largest, biggest U.S. companies equal-weighted.
- Tranches 0-3, 3-7, 7-10, …30-100.
- If companies begin defaulting on debt, 0-3 takes first losses, then 3-7, and so on.
- For 30-100 to lose, about 63% of U.S. companies must default or fail.

Story 1:

- JP Morgan and the Relative Value HF Community

Which trade would you take if you thought 2008 would be a bad year?

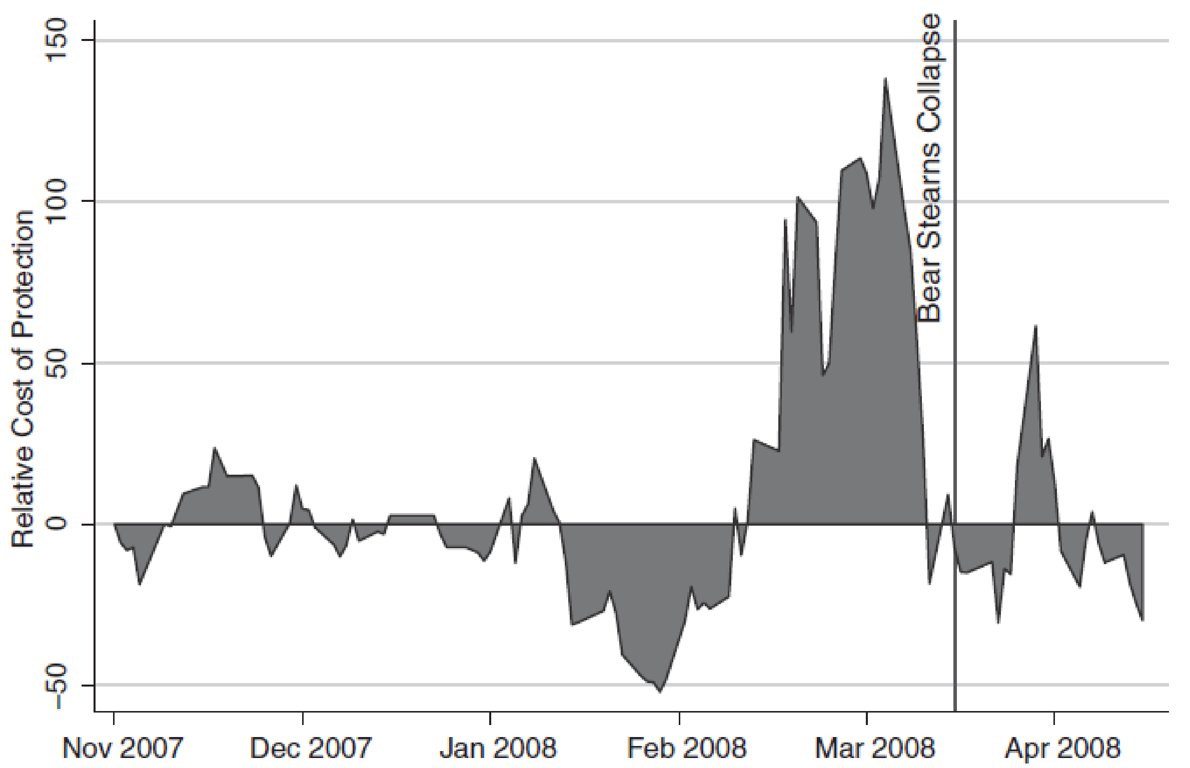
Trade 1: Buy insurance 30-100, sell insurance 0-10

Trade 2: Sell insurance 30-100, buy insurance 0-10.

Story 1:

- JP Morgan and the Relative Value HF Community

FIGURE 15.3 The Percentage Increase in the Cost of Insuring the 30–100 Tranche versus the 3–30 Tranche (Base Period: November 5, 2007)



Cost of insuring 30-100 rose by **150%** over cost of insuring 0-10 in March 2008!

Source: Chapter 15 The Crisis of Crowding

Story 1:

- JP Morgan and the Relative Value HF Community

A market crisis is coming, what trade would you do in the commercial real-estate market?

Trade 1: Buy A rated and short AAA rated.

Trade 2: Short A rated and buy AAA rated.

Parkcentral and other hedge funds did Trade 2 in 2008.

Story 1:

- JP Morgan and the Relative Value HF Community

The trade lost them 39% unleveraged from September to November 2008 (November losses along 26%!)

Why?

1. Post-Lehman behavior was chaotic.
2. New Instrument – CMBX – didn't hedge correctly. Short history, strange holders, AAA held by levered risk averse institutions → J.P. Morgan found this too.
3. Became difficult to trade as prices dropped. Value irrelevant…

Story 1:

- JP Morgan and the Relative Value HF Community

What trade would you do in 2008?

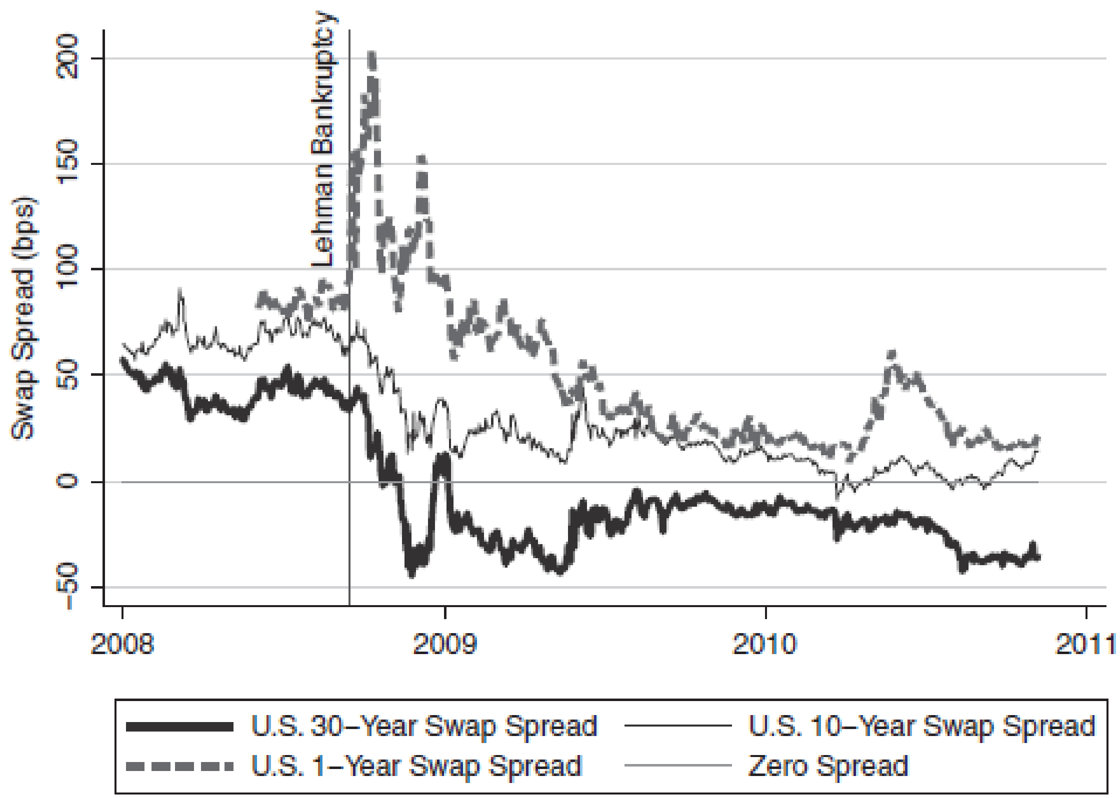
Trade 1: Go long the 30-year swap spread (i.e. bet that swap spreads widen).

Trade 2: Go short the 30-year swap spread (i.e. bet that swap spreads narrow).

Story 1:

- JP Morgan and the Relative Value HF Community

FIGURE 12.4 The U.S. Swap Spread



Holy Irrationality!

Source: Chapter 12 The Crisis of Crowding

Story 2:

- The Quant Crisis of 2007

  - What are Quants?

  - Some well known firms: Barclays Global Investors, GSAM, State Street, Morgan Stanley PDT, AQR, Panagora, Mellon Capital, etc.

Story 2:

- The Quant Crisis of 2007

➢ What are factors?

➢ Example: The Value Factor.

Story 2:

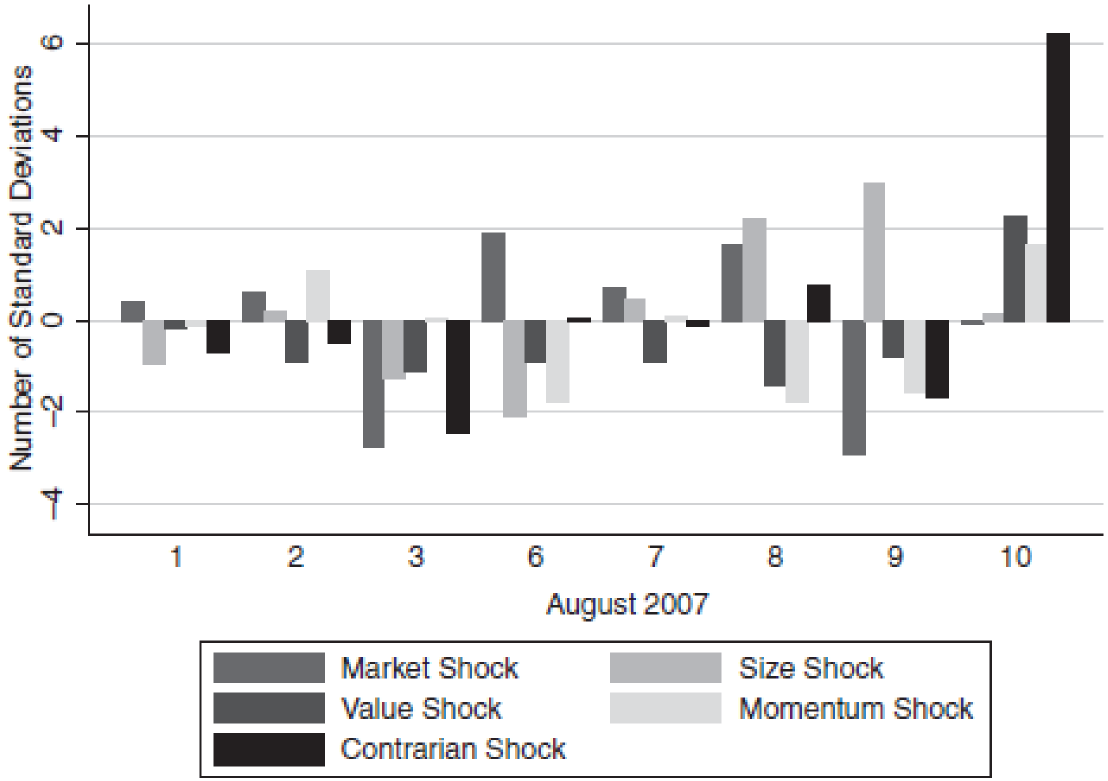
- The Quant Crisis of 2007

- In August 2007, even standard factors behaved erratically.
- For example, value factor moved 0.75% in one day – unheard of – with 8x leverage moved 6%. August 2 – August 8, every day was within worst 5% moves in 20 years.

Story 2:

- The Quant Crisis of 2007

FIGURE 8.4 Ratio of Daily Returns of Common Factors Divided by Historical Standard Deviations



Source: Chapter 8 The Crisis of Crowding

Story 2:

- The Quant Crisis of 2007

- Quant copycats everywhere…
- Factors different, but correlated…
- Transaction costs models similar
- Result→Similar small portfolios

- A seemingly liquid space became very illiquid…risk mismeasured.

Story 2:

- The Quant Crisis of 2007

We saw the growth of quant assets under management, but didn't see how far these strategies had extended into statistical arbitrage desks and hedge funds. We felt our proprietary factor specifications and weightings would provide differentiation, and this was supported by historical correlations plus low exposures of other quant managers to our factors. Our individual equity positions were small, liquid, and diversified—we didn't foresee a significant liquidation event focused on similar portfolios.

—Goldman Sachs analyst statement, December 13, 2007
(GSAM 2007)

Story 2:

- The Quant Crisis of 2007

> Crowding among quants happens for several reasons, but the transaction costs model was of primary importance, as it caused us to trade similar securities at each point in time.
>
> —Mark Carhart interview, former co-CIO of Quantitative Strategies at GSAM and Founder of Kepos Capital, October 11, 2011

Story 2:

- The Quant Crisis of 2007

- Many hedge funds completely wiped out.

> What does solvency mean? The answer is, I don't know. I still could not answer that question . . .
>
> —Jamie Dimon, CEO of J.P. Morgan, October 20, 2010, in FCIC

Story 3:

- The Lehman Aftermath

  - In typical markets, swaps trade above governments – government debt is seen as less risky to bank debt.
  - After Lehman, different holders acted differently and as crowds ran for exits, odd market prices emerged.

Story 3:

- The Lehman Aftermath

- Pension funds typically receive 30-year fixed swaps (*long duration to hedge long duration liabilities*).
- Hedge funds (& others) pay fixed 30-year (*to offset other exposures*).
- Lehman is an intermediary for this.

Story 3:

- The Lehman Aftermath

FIGURE 12.3 A Typical Swap Situation with Lehman Brothers

- Upon Lehman's bankruptcy, ISDA allows counterparties to terminate positions w/ a fax.

Story 3:

- The Lehman Aftermath
- No one wanted to keep contracts open with Lehman – no upside.
- Pension funds had huge A-L mismatch and had to find new swap receiving fixed.
- Hedge funds did not want to restore pay fixed – (a) interest rates likely to come down (b) hard to get financing and even cut Treasury.

Story 3:

- The Lehman Aftermath
- Supply and Demand imbalance. Demand for long-dated swaps high, but supply low.
- Thus, swap spread inverted … unusual indeed.
- Not just in the US.

Story 3:

- The Lehman Aftermath

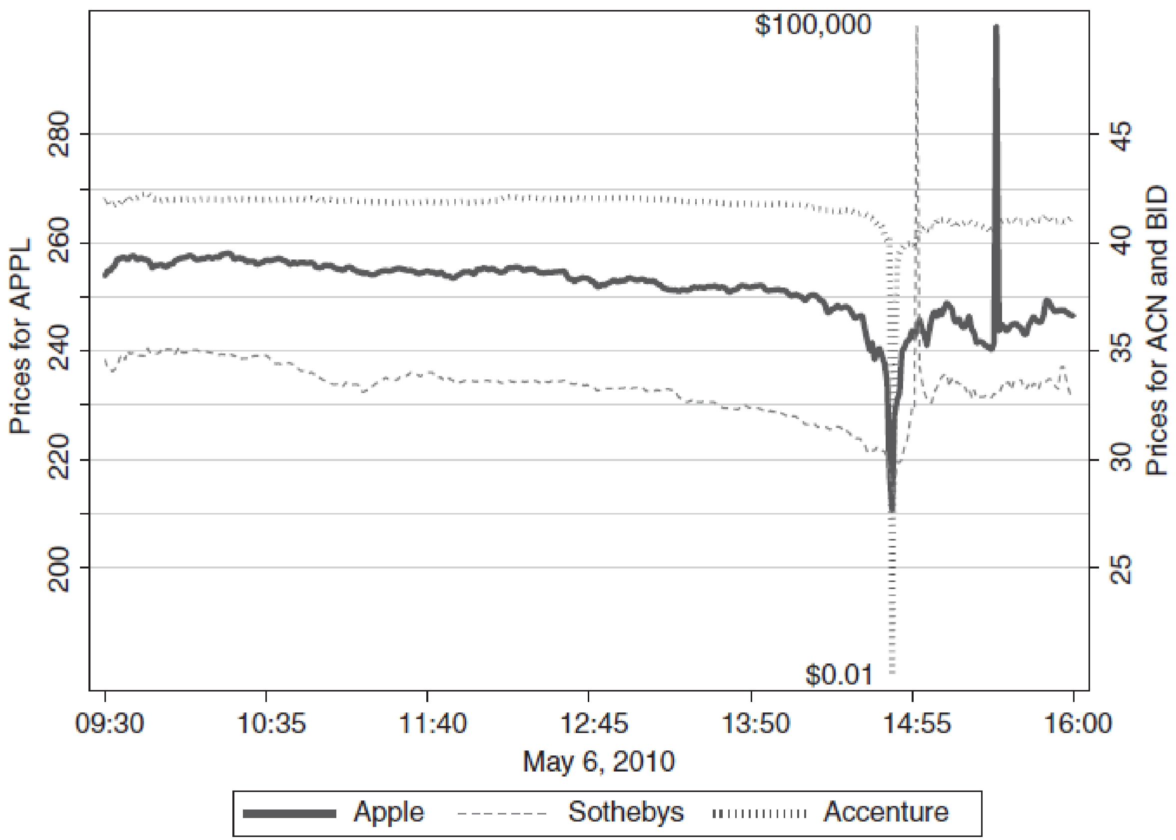
Typical 30-Year Spread Before and After Lehman Collapse			
	Before	After	
USA	55	0.69*	
UK	49	-29	
Japan	7	-25	
Germany	20	-6	
*Later became -19 bps negative. All numbers in bps.			

The Flash Crash Story 4:

- How does AAPL trade at $100,000 per share?
- How does Accenture trade at 1 cent per share?

The Flash Crash Story 4:

FIGURE 17.1 Apple, Accenture, and Sotheby's Stock Prices



Source: Chapter 17 The Crisis of Crowding

The Flash Crash Story 4:

- What happened?
- SEC said it was Waddell-Reed…riiiiight.
- 75,000 e-mini futures sell order.
- Too small, happened before, and liquidity dried up later.

The Flash Crash Story 4:

- What happened?
- NYSE Arca had old computers on many of the stocks.
- Fast trading caused a glut and delayed quotes appeared on orders.
- Market makers saw inconsistencies in ticker tape and got scared.

The Flash Crash Story 4:

- What happened?
- Odds bumps in price quotes.

TABLE 17.1 Consolidated Tape for Accenture on May 6, 2010

Time	Shares	Price	Exchange
2:47:25 P.M.	100	38.66	ISE
2:47:25 P.M.	100	40.22	FINRA
2:47:25 P.M.	100	40.22	FINRA
2:47:25 P.M.	100	39.06	NYSE Arca

The Flash Crash Story 4:

- What happened?
- The market maker crowd ran for the exits.
- Left stub quotes (due to regulation)
- One major brokers kept sending orders through system…catching stub quotes.
- Eventually, liquidity came back.

The Future

- Better risk models
- Regulation Dangers & Avatar's Life Force
- Lessons

The Future

- Better risk models
  - Need to model risk – return space as function of holders in the space.
  - Need to consider valuation.
  - Need to consider crowding.

The Future

- Better risk models

- The Million $ Question: How?
- Indirect Methods: Measure the expected opportunities.

  Example: Swap Spread behavior over recent past and current value.

The Future

- Better risk models

- The Million $ Question: How?
- Direct Methods: Gather data on people in space and behavior. Simulate the way they might behave in various situations.

Example: Short-interest with stocks or more detailed information on holders (institutional, etc).

The Future

- Regulation dangers & Avatar's Life Force

OPINION | October 3, 2012, 7:04 p.m. ET

Why Dodd-Frank Rules Keep Losing in Court

The left is trying to stigmatize appellate judges, but the real culprits are badly written regulations.

By EUGENE SCALIA

Since the mid-2000s, regulations of the Securities and Exchange Commission have been challenged six times in the federal court of appeals in Washington, D.C. The SEC lost every time. I brought four of those lawsuits, and sometimes am asked why the agency has such difficulty defending its rules.

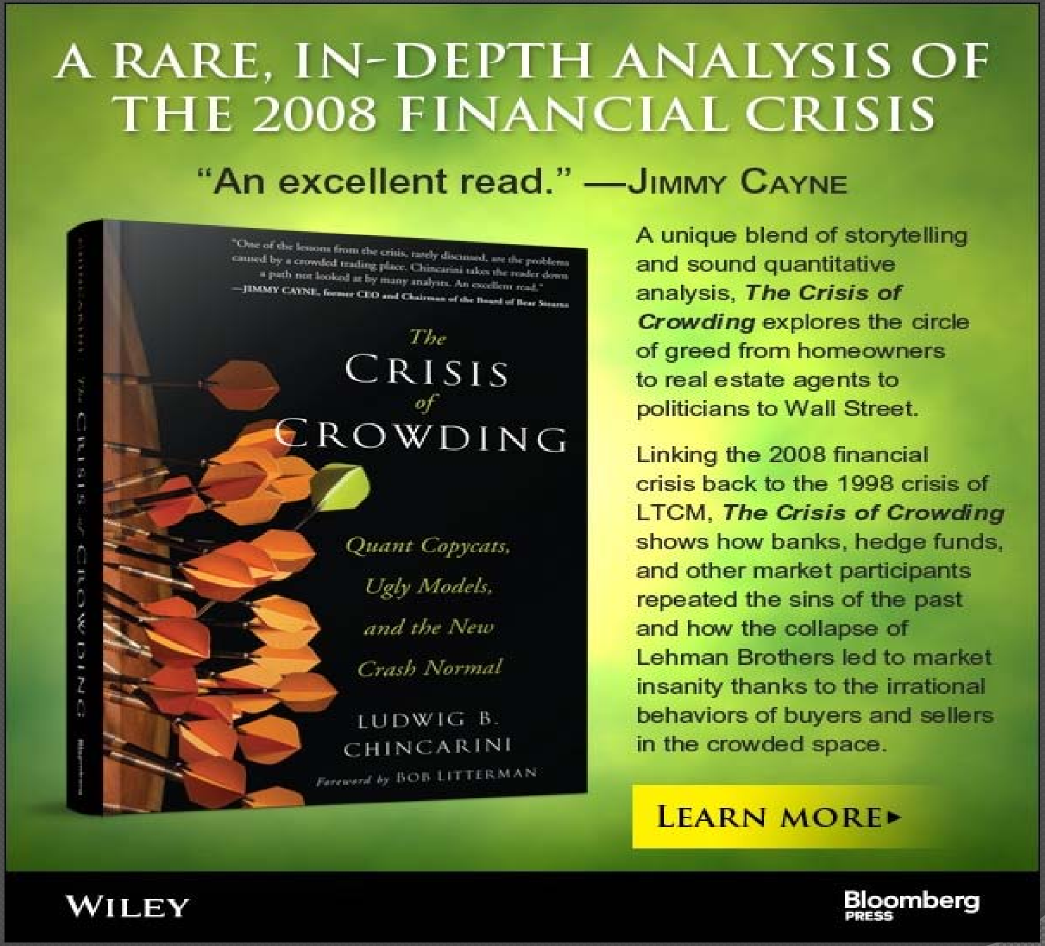
- Too many rules clogging system – the unintended consequences

Lessons for the Future

- 1. **Interconnectedness and crowds** - real estate, haircuts, ratings, all pro-cyclical, OTC Swap market back to LTCM
- 2. **Leverage** again on steroids - Freddie and Fannie
- 3. **Derivatives** - more education needed, less polishing the shoes. Encouragement of honesty rather than greed. Merton example.
- 4. **Conflicts of Interest** - complicated, rating agencies, mortgage lenders comp, real estate comp.
- 5. **Policy Lessons** - not prepared, runs happen faster than ever in today's age Bailouts - yes, needed, but how to prevent moral hazard.
- 6. **Risk Management** - crowds, valuation to measure risk, holders. Incentives.
- 7. **Counterparty Issues** - liquidity on down quote p. 304
- 8. **Hedge funds** - some nuances, dynamic risk hedging
- 9. **Importance of arbitrage** - p. 307 good things of finance

Thanks

- Enjoy the Crisis of Crowding. Available on Amazon and other online retailers.



Examples of Crowding

- Appendix A: PALM Mystery

Later, 3COM announced it would spin-off the rest of PALM pending approval from the US IRS on the tax status. Prices remained in a similar range.

An arbitrage strategy emerged: Short 1.5 shares of PALM, Buy 1 share of 3COM and wait. Almost guaranteed money maker.

Examples of Crowding

- Appendix A: **PALM Mystery**

- <u>The Arbitrage Strategy</u>

- 1 Share of 3COM = 1.5 shares PALM
- Price (3COM) = $81 Price (PALM) = $95.
- 3COM will spin-off all of PALM within 1 year
- Sell PALM, Buy 3COM
- At T, holders of 3COM will get 1.5 shares of PALM

Examples of Crowding

- **Appendix A: PALM Mystery**

- The Arbitrage Strategy

- Between t and T, if prices stay the same, make money = \$61.5 and still own one share of 3COM.
- If PALM rises, lose on short, but will eventually have collateral. Price(PALM) = 1000, short in "losing" a lot you will own security. So as long, as brokerage understands, you should be fine.
- If 3COM rises, you do better (you're long 3COM), if it falls, you're also ok, because whatever happens, you make \$61.5 plus 1 share of 3COM. Even a 0 value is ok for you.

Examples of Crowding

- Appendix A: PALM Mystery – Spread