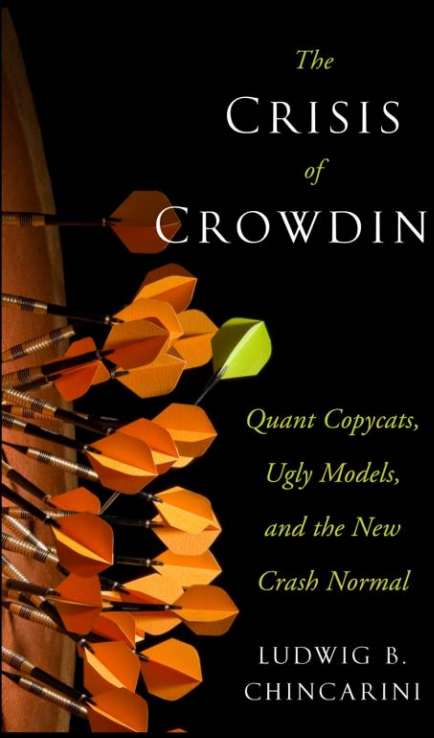
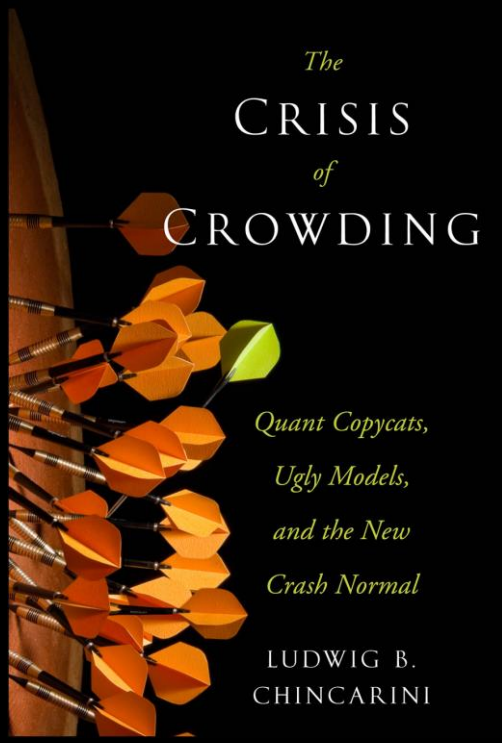


Spotting the Crowd

November 8, 2014



Ludwig B. Chincarini, Ph.D., CFA

University of San Francisco, Index IQ, FutureAdvisor, and NERA

BEHAVIORAL FINANCE: THE FINANCIAL GAME CHANGER
NOVEMBER 8, 2014


EXIT
One sign of crowding is th
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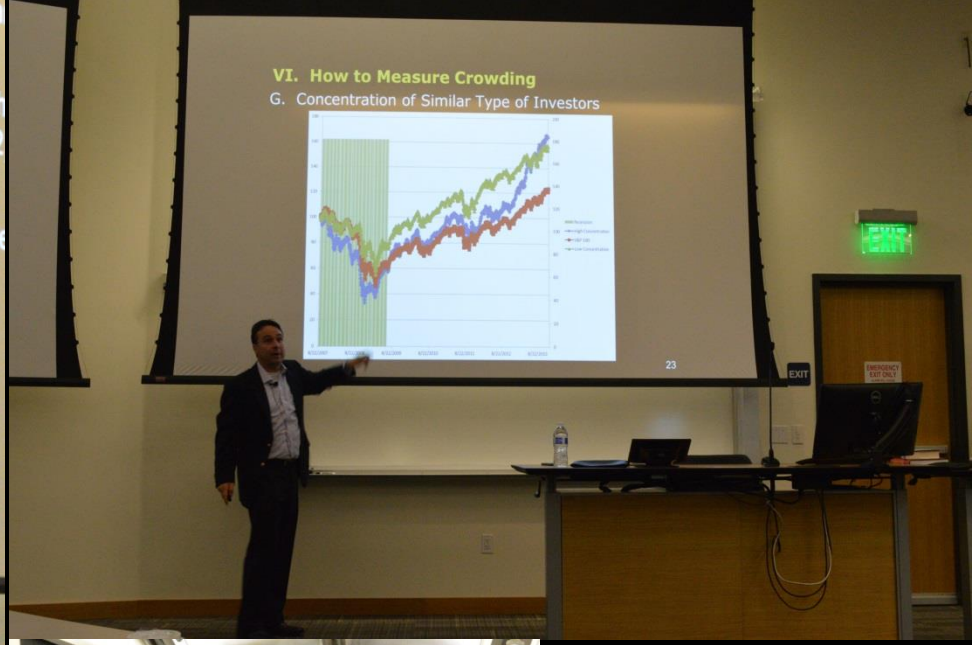

VI. How to Measure Crowding
G. Concentration of Similar Type of Investors
23
EXIT


VI. How to Measure Crowding
G. Concentration of Similar Type of Investors

- Thank you for coming. Thanks to Golden Gate University and Richard Lehman for organizing such a wonderful event.
- Thanks to my students for coming as well.
- I also want to thank Gabriel Baracat for his continual interaction on crowding.
- Please ask questions if something is unclear and/or at the end of the presentation.

- http://www.bloomberg.com/video/koesterich-this-is-the-market-going-back-to-normal-q~Cqp0HqTyK75hnqu_1dpg.html

- (Go to 1:15)

- What should you do?
- What you do will affect others.
- If everyone does the same thing, the problem may get worse.

I. Crowding

- 2012: I published the book *The Crisis of Crowding* documenting the fascinating new problem in finance with respect to dealing with crowded trading spaces.

- The book tells the real stories of the financial crisis of 2008 and beyond 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.

- "…and argues convincingly that the central risk in these crises was accentuated from within the financial system rather than from external economic forces (it includes the best analysis I have read on the LTCM crisis). This bold new theory has important implications for both industry practices as well as for new regulations…" --- Eric Rosenfeld, Co-Founder LTCM, JWMP

II. Further Research on Crowding

- 2014 – I'm doing new exciting research on crowding showing how crowding occurs even when traders and investors are very different.

- I'm hoping the first results of this work will be available in a month or so.

- If you're interested, please leave your business card and I'll email you the paper.

- In addition, after the publication of my book, a whole host of researchers have examined crowding in diverse places, including stock exchanges.

III. Definition

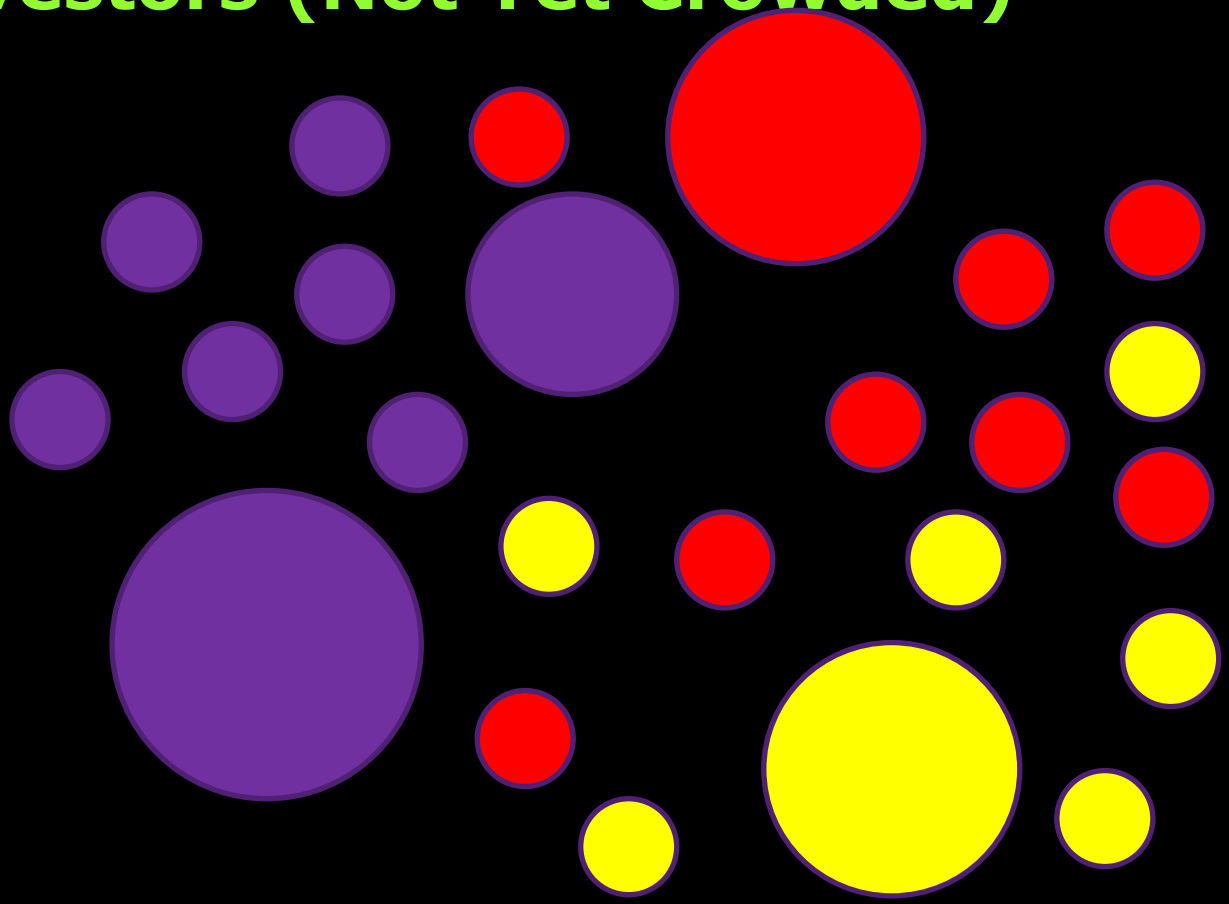
Crowding takes place when multiple market participants begin to follow the same trade altering the risk and return dynamics of the trade.

- 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.

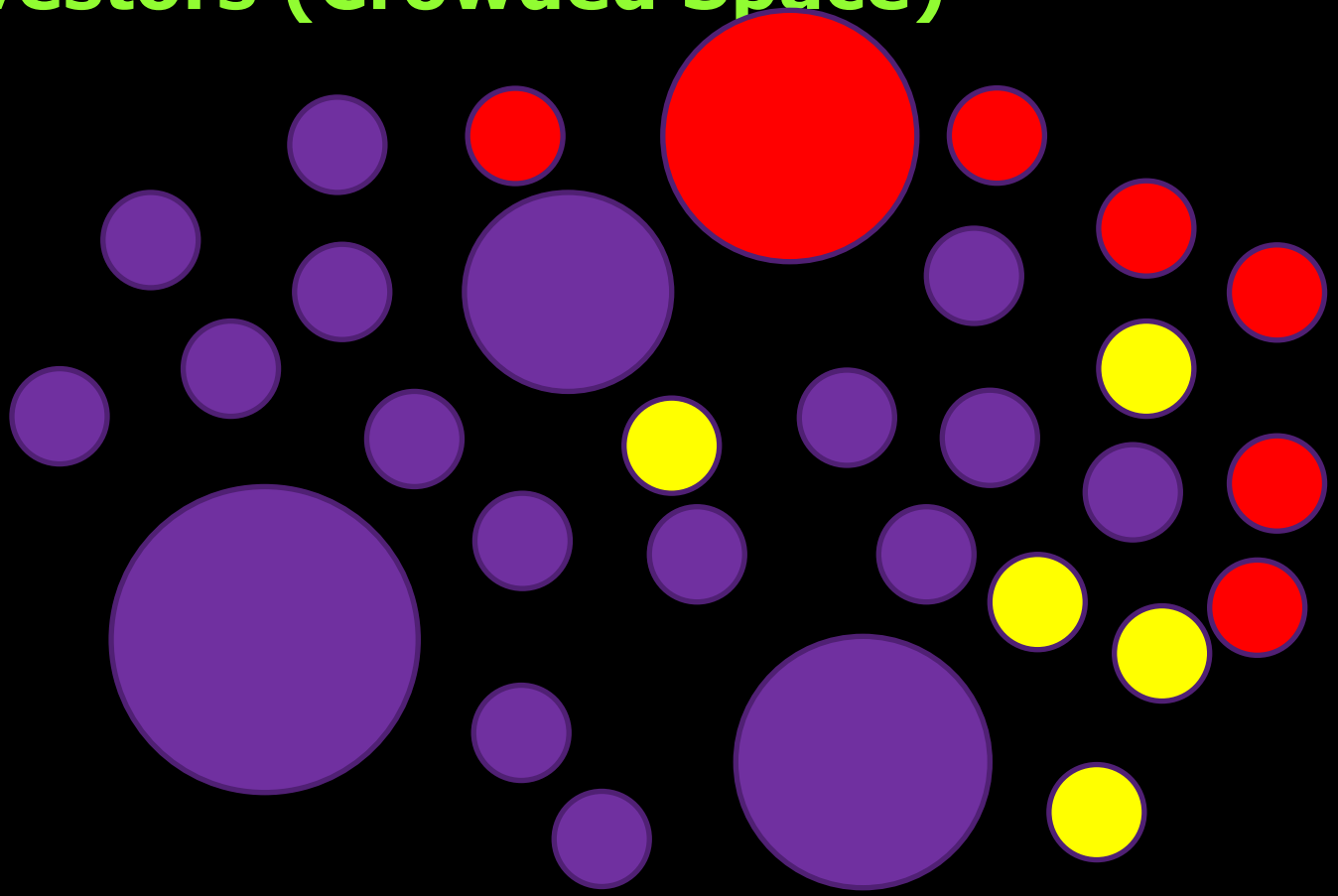
IV. How Crowding Typically Happens

1. Attractive Trading Opportunity Develops
2. Copycats rush to follow the leader (even if it's not their core business)
3. Herding occurs, but sometimes very hidden (not obvious)
4. The trading space becomes crowded
5. Not all crowded spaces are similar.
   a. 1 type of holder (all traders similar)
   b. N types of holders (different motivations and behaviors to risk)
   c. Holders can have exactly same position or slightly different positions, still leading to crowded behavior.
   d. Inadvertent Crowding (see Bruno, Chincarini & Davis (2013) and Chincarini (2014)).

V. Crowding Visual: Traders & Investors (Not Yet Crowded)



V. Crowding Visual: Traders & Investors (Crowded Space)



VI. How to Measure Crowding

A. Similarity of Portfolios
B. New Measure of Crowding
C. Herding or the Flow of Crowding
D. Turnover or Trading as a Flow of Crowding
E. Co-movement of a Basket Factor
F. The Relative Presence of Different Groups in a Position
G. Concentration of Similar Type of Investors

VI. How to Measure Crowding

A. Similarity of Portfolios

$$S = (H'H) \circ \hat{\hat{H}}$$

From Chincarini (2014) and Bruno, Chincarini, Davis (2013). A (0,1) measure.

Simple Example (3 stocks, 3 managers)

$$H = \begin{bmatrix} 0.4 & 0.8 & 0.45 \\ 0.4 & 0.1 & 0.45 \\ 0.2 & 0.1 & 0.05 \end{bmatrix}.$$

$$S = \begin{bmatrix} 1 & 0.7796 & 0.9660 \\ . & 1 & 0.7906 \\ . & . & 1 \end{bmatrix}.$$

VI. How to Measure Crowding

B. New Measure of Crowding

- Bruno, Chincarini, and Davis (2013) and Chincarini (2014) have constructed a more relevant measure of crowding.

- It will be available soon when the papers are publicly available.

- *Note*: For those who have seen the paper already, please cite us.

VI. How to Measure Crowding

C. Herding or the Flow of Crowding

- Instead of measuring the "crowdedness" of the space, may want to measure the flow of crowding or the herding taking place. Herding is a flow, different than crowding.
- Use 13-F statements or mutual fund holding reports to see flows each quarter.

$$Raw\Delta_{k,t} = \frac{No.\ of\ \ institutions\ buying_{k,t}}{No.\ of\ \ institutions\ buying_{k,t} + No.\ of\ \ institutions\ selling_{k,t}}.$$

$$\Delta_{k,t} = \frac{Raw\Delta_{k,t} - \overline{Raw\Delta_t}}{\sigma(Raw\Delta_{k,t})},$$

Sias (2004) measure of mutual funds buying (selling) similar securities in a given period.

VI. How to Measure Crowding

D. Turnover or Trading as a Flow of Crowding

- Observe the relative trading of a security in a given period.

- For example, measure the shares traded/shares outstanding in a given month and order the securities from highest to lowest. Could also be dollars traded divided market capitalization.

VI. How to Measure Crowding

E. Co-movement of a Basket Factor

- Do the returns of a group of "similar" securities (in the eyes of certain traders) move unusually (over time or compared to other securities) similarily?

Step 1: Select a universe of stocks (top 3000).

Step 2: Identify a factor.

Step 3: Create deciles of that factor.

Step 4: Compute returns of each security in the universe over time and compute residual risk from multi-factor model (e.g. Fama-French).

Step 5: Compute correlations of returns of highest and lowest deciles relative to randomly selected group of securities.

VI. How to Measure Crowding

E. Co-movement of a Basket Factor

Note: Easy to do, not clear easy to interpret correctly or measure accurately.

VI. How to Measure Crowding

F. The Relative Presence of Different Groups in a Position

- Look at how different types of traders behave in a space. If one group of traders begins to saturate, the space may be crowded and dangerous.

VI. How to Measure Crowding

F. The Relative Presence of Different Groups in a Position

- Example: For loser stocks (stocks with past negative returns), look at stocks with highest short-interest to market cap in period t-1 and then further divided into those with highest selling of institutional investors to market cap in period t-1.

- These "loser" stocks are crowded, since presumably type 1 traders have taken bet and type 2 traders have moved out…an imbalance.

VI. How to Measure Crowding

G. Concentration of Similar Type of Investors

- Choose a selected type of trader or investor and observe their concentration in a trade or security with respect to the other universe of traders.

- To do this right is difficult. Must select the appropriate group and must find a level of concentration that matters.

- Also, must realize that the "dangers" may only occur during market turbulence. In normal times, might be beneficial.

VI. How to Measure Crowding

G. Concentration of Similar Type of Investors

- Example: Use 13F statements to find the total dollar value of stocks owned by hedge funds and divide by market cap and order by highest concentration. These stocks "might" be crowded.

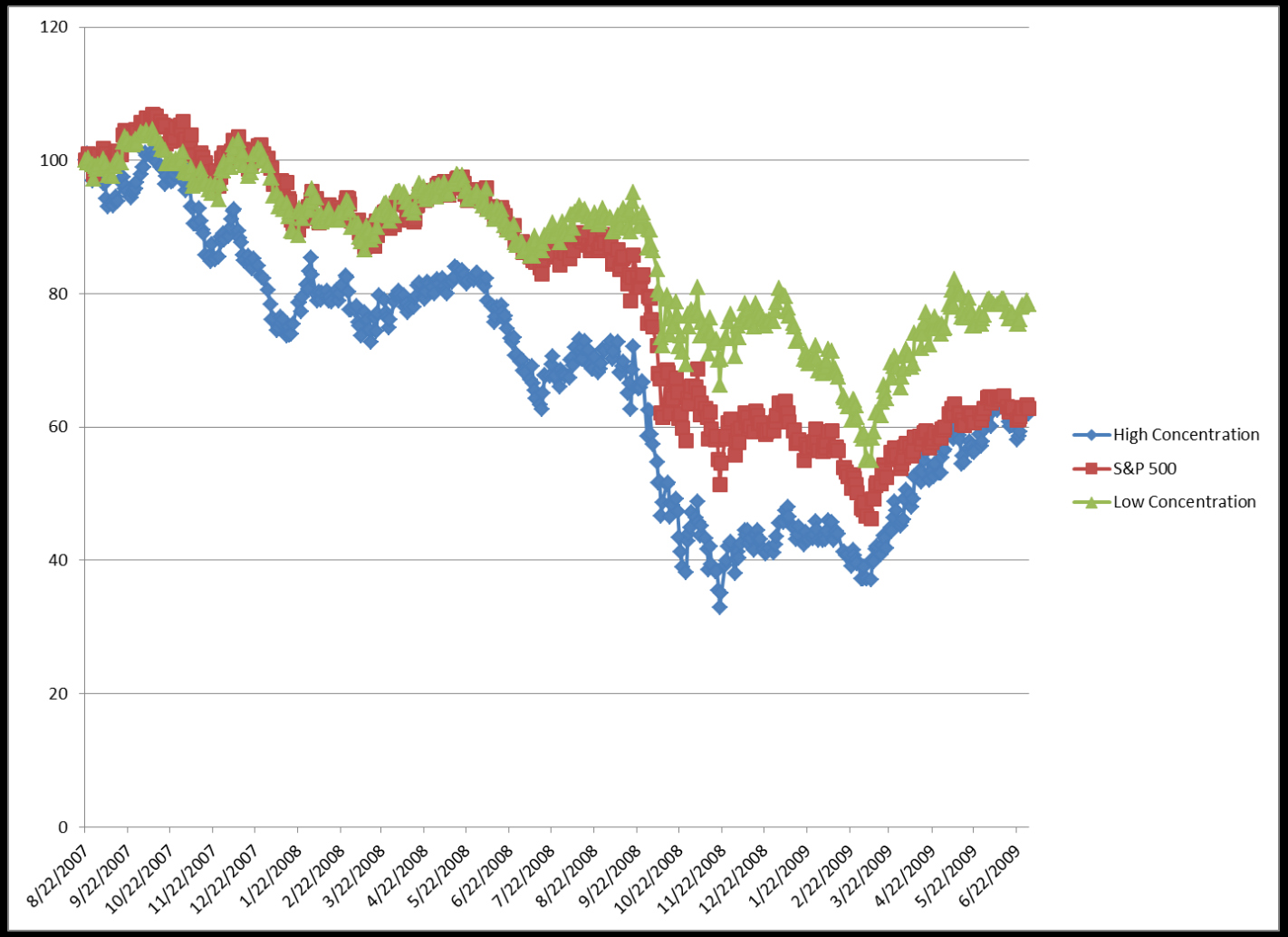
- *Note*: Investment banks are starting to produce these reports regularly.

VI. How to Measure Crowding

G. Concentration of Similar Type of Investors

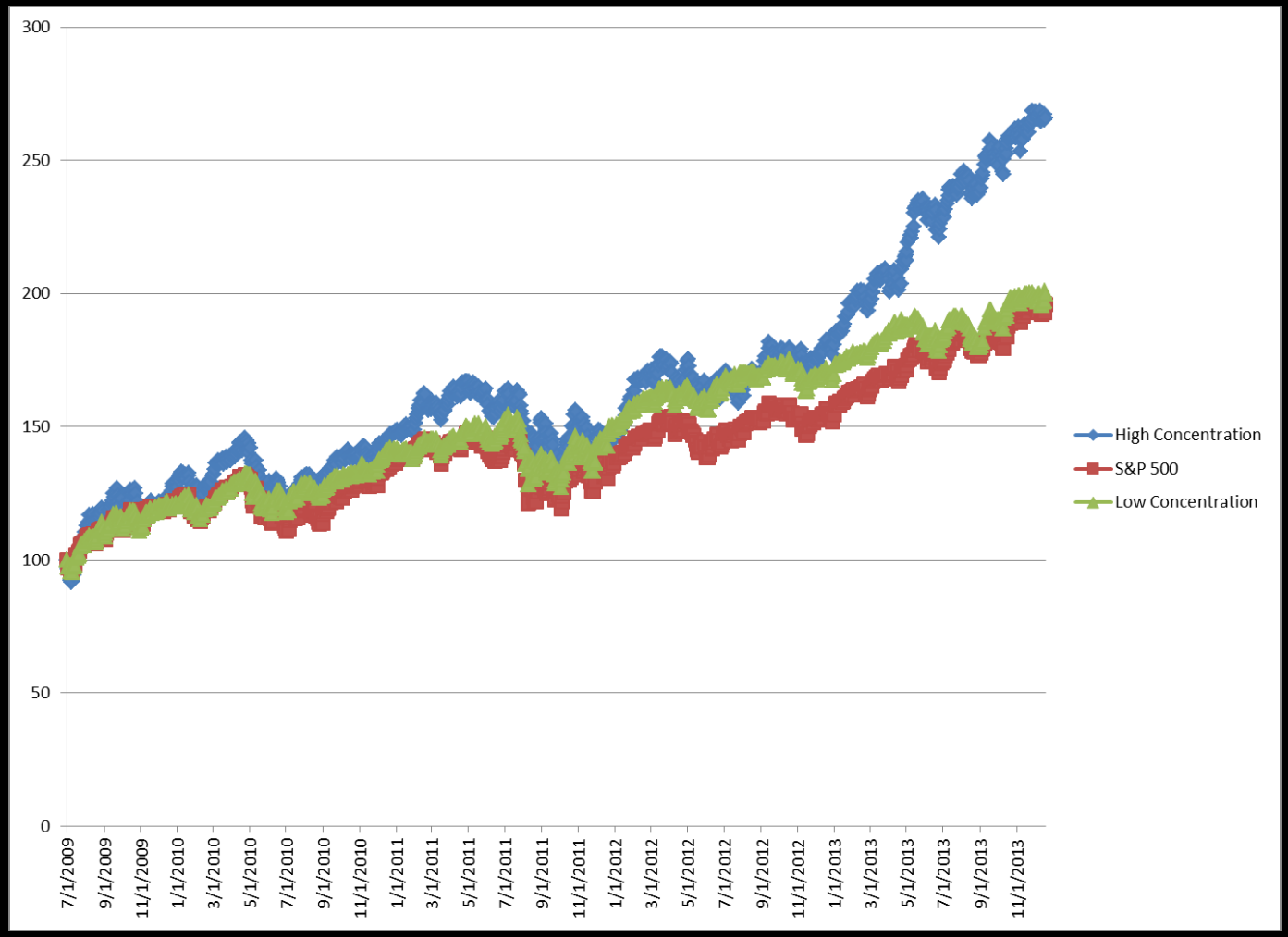
VI. How to Measure Crowding

G. Concentration of Similar Type of Investors



VI. How to Measure Crowding

G. Concentration of Similar Type of Investors



VI. How to Measure Crowding

G. Concentration of Similar Type of Investors

- One sign of crowding is that risk is mis-measured ex-ante (Chincarini (2012)).

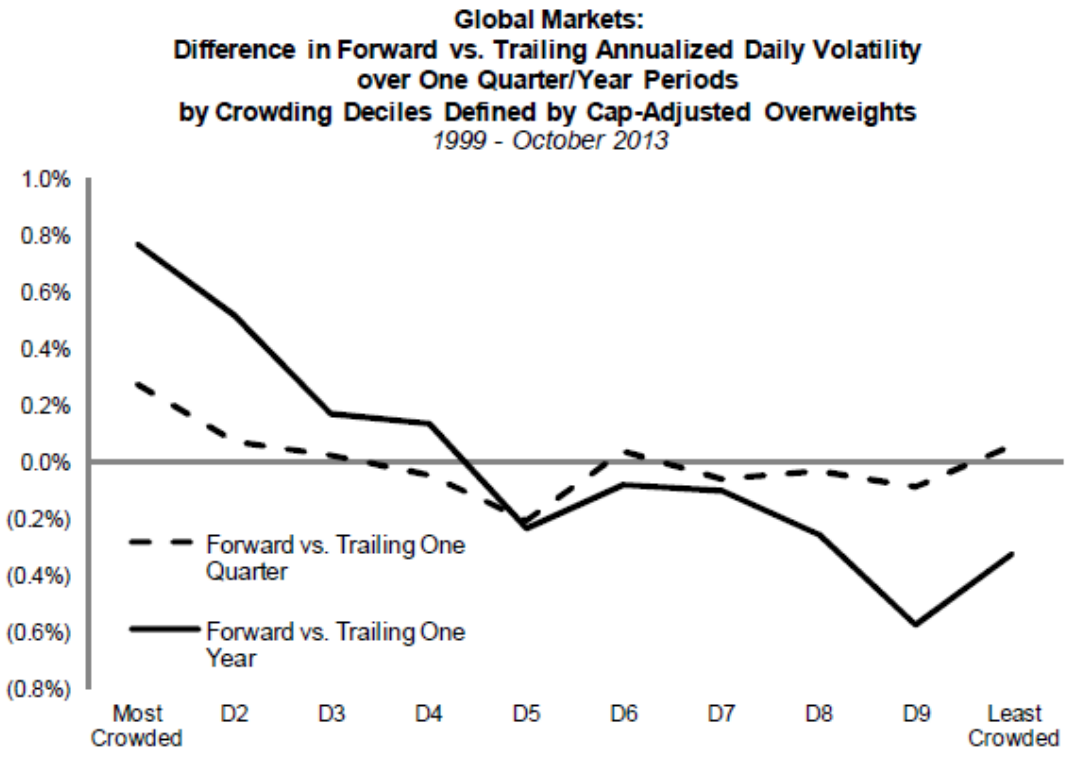
- Researchers at Sanford Bernstein hint at some of this.

VI. How to Measure Crowding

G. Concentration of Similar Type of Investors

Exhibit 10

The most broadly held overweights realize increases in volatility



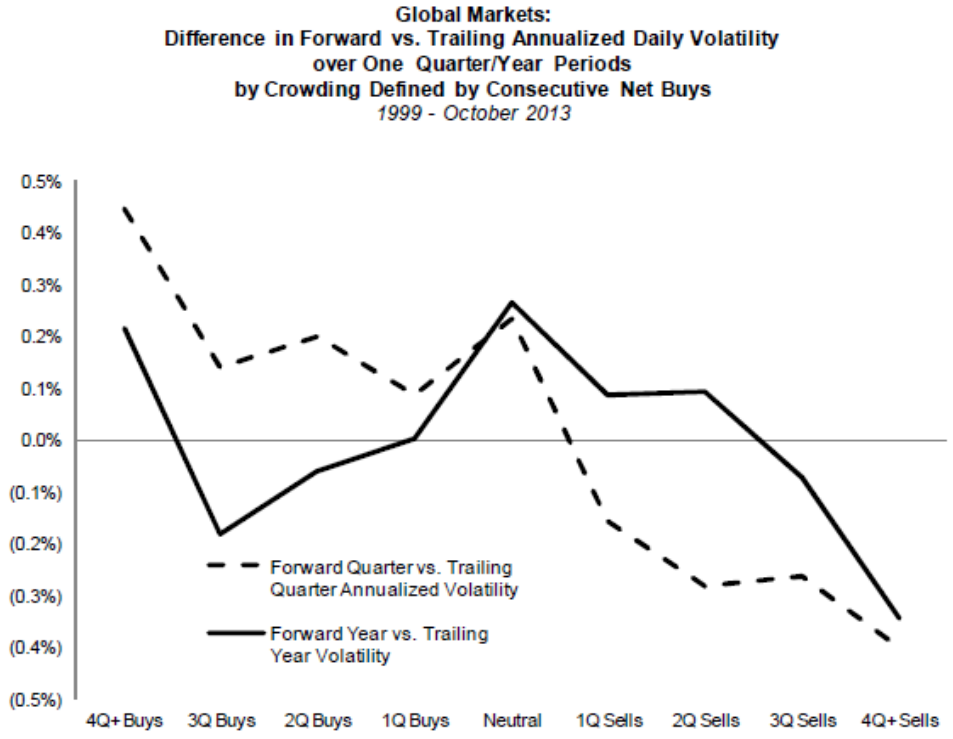
Source: MSCI, FactSet, Bernstein analysis

VI. How to Measure Crowding

G. Concentration of Similar Type of Investors

Exhibit 15

Reduction of stabilizing institutional inflows results in higher forward volatility



Source: MSCI, FactSet, Bernstein analysis

VII. Recent Applications of Crowding

A. Starting points matter – similar portfolios lead to similar trading (Bohlin and Rosvall (2014), Chincarini (2012)).

B. Peer or copycat flows of mutual funds influence returns due to crowded holdings (Blocher (2013), Chincarini (2012)).

C. Quant Crisis of 2007 may have been associated with crowded factors (Cahan and Luo (2013), Chincarini (2012)).

D. Exchanges or central clearing parties (CCPs) may underestimate margin requirements because they fail to account for crowding. Could cause systemic risk. (Menkveld (2014)).

VII. Recent Applications of Crowding

E. Stocks with relatively more trading versus market capitalization tend to have worse risk-adjusted returns (Ibbotson and Idsorek (2014)).

F. Momentum strategy that is exposed to crowded losers is more crash prone than non-crowded losers. Refining momentum strategies to non-crowded losers improves the performance of momentum strategies (Yan (2014)).

VIII. Crowding and Investing

A. S&P 500 Equal-Weight versus Cap-Weighted – a successful ETF/Index I helped invent/create maybe had some to do with avoiding crowded spaces.

B. More crowded (according to turnover) have lower risk-adjusted returns (Ibbotson and Idzorek (2014)).

Note: Measurement issues.

EXHIBIT 1

Quartiles of Popularity in U.S. Equity Markets 1972–2013

	Less Popular		More Popular	
	Q1	Q2	Q3	Q4
Annualized Return	15.51%	14.42%	12.80%	8.27%
Standard Deviation	20.18	20.66	22.74	28.35

VIII. Crowding and Investing

C. Crowding in certain ETFs? The ETF wave.

IX. Crowding Gaining Traction

A. Investment banks, portfolio managers, and academics are seriously considering this new and important risk.

IX. Crowding Gaining Traction

A. Examples bank reports from Goldman Sachs, Bank of America, Bernstein, JP Morgan Chase, and many others.

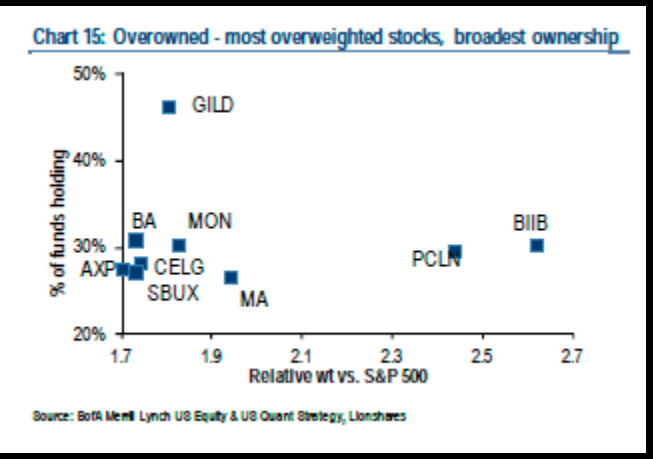


Exhibit 9: The 20 most concentrated stocks in the S&P 500 <Bloomberg: GSTHHFHI>
Holdings as of September 30, 2012; Pricing as of November 15, 2012

S&P 500: Twenty MOST CONCENTRATED Hedge Fund Holdings (Bloomberg Ticker: GSTHHFHI)

Company	Ticker	Sector	Sub-sector	Equity Cap ($ bil)	Total Return During 3Q	Total Return 2012 YTD	% of equity cap owned by Hedge Funds 30-Sep-12
TripAdvisor	TRIP	Consumer Discretionary	Internet Retail	5	(26)	45	50%
AutoNation	AN	Consumer Discretionary	Automotive Retail	5	24	9	45
LyondellBasell Industries N.V.	LYB	Materials	Specialty Chemicals	26	29	53	34
E*TRADE Financial	ETFC	Financials	Investment Banking & Brokerage	2	9	(1)	32
J.C. Penney	JCP	Consumer Discretionary	Department Stores	4	4	(53)	29
Tenet Healthcare	THC	Health Care	Health Care Facilities	3	20	23	23
Yahoo! Inc.	YHOO	Information Technology	Internet Software & Services	21	1	11	23
VeriSign Inc.	VRSN	Information Technology	Internet Software & Services	7	12	16	23
Beam Inc	BEAM	Consumer Staples	Distillers & Vintners	8	(8)	6	21
MetroPCS Communications	PCS	Telecommunication Servic	Wireless Telecommunication Services	4	94	20	20
Ralph Lauren Corp.	RL	Consumer Discretionary	Apparel Accessories & Luxury Goods	14	8	9	20
Life Technologies	LIFE	Health Care	Life Sciences Tools & Services	8	9	20	19
American Intl Group	AIG	Financials	Multi-line Insurance	46	2	35	19
CBRE Group Inc	CBG	Financials	Real Estate Services	6	13	14	19
WPX Energy	WPX	Energy	Oil & Gas Exploration & Production	3	3	(17)	19
Family Dollar Stores	FDO	Consumer Discretionary	General Merchandise Stores	8	0	15	18
priceline.com	PCLN	Consumer Discretionary	Internet Retail	31	(7)	32	18
Coca-Cola Enterprises	CCE	Consumer Staples	Soft Drinks	9	12	17	18
BMC Software	BMC	Information Technology	Systems Software	6	(3)	19	18
Motorola Solutions	MSI	Information Technology	Communications Equipment	15	6	16	17

Top 50 Holdings: Top 50 Hedge Funds

Market value is in millions of dollars and represents the market value held by the top 50 hedge funds at the end of the quarter. The market value change measures the total position change of each security multiplied by its quarter-end price. "% Port" indicates the weight of the stock in an aggregated equity portfolio of the top 50 hedge funds. "% Shares Out" indicates the proportion of the shares outstanding of the stock owned by the aggregated portfolio of the top 50 hedge funds and the "Total" and "50 Highest" lines show the average for this item*. "# of companies" indicates the number of funds (out of the top 50) holding the stock.

High/Low - %Portfolio	GICS Sector	Qtr End Market Value	Mkt Val Chg - 3 mo ($millions)	Mkt Val Chg 3mnth	% Port	%Shrs Out*	# Of Co's
Total							
55 Highest							
LyondellBasell Industries N.V. Cl A							
Google Inc. Cl A							
Realogy Holdings Corp.							

Highlights

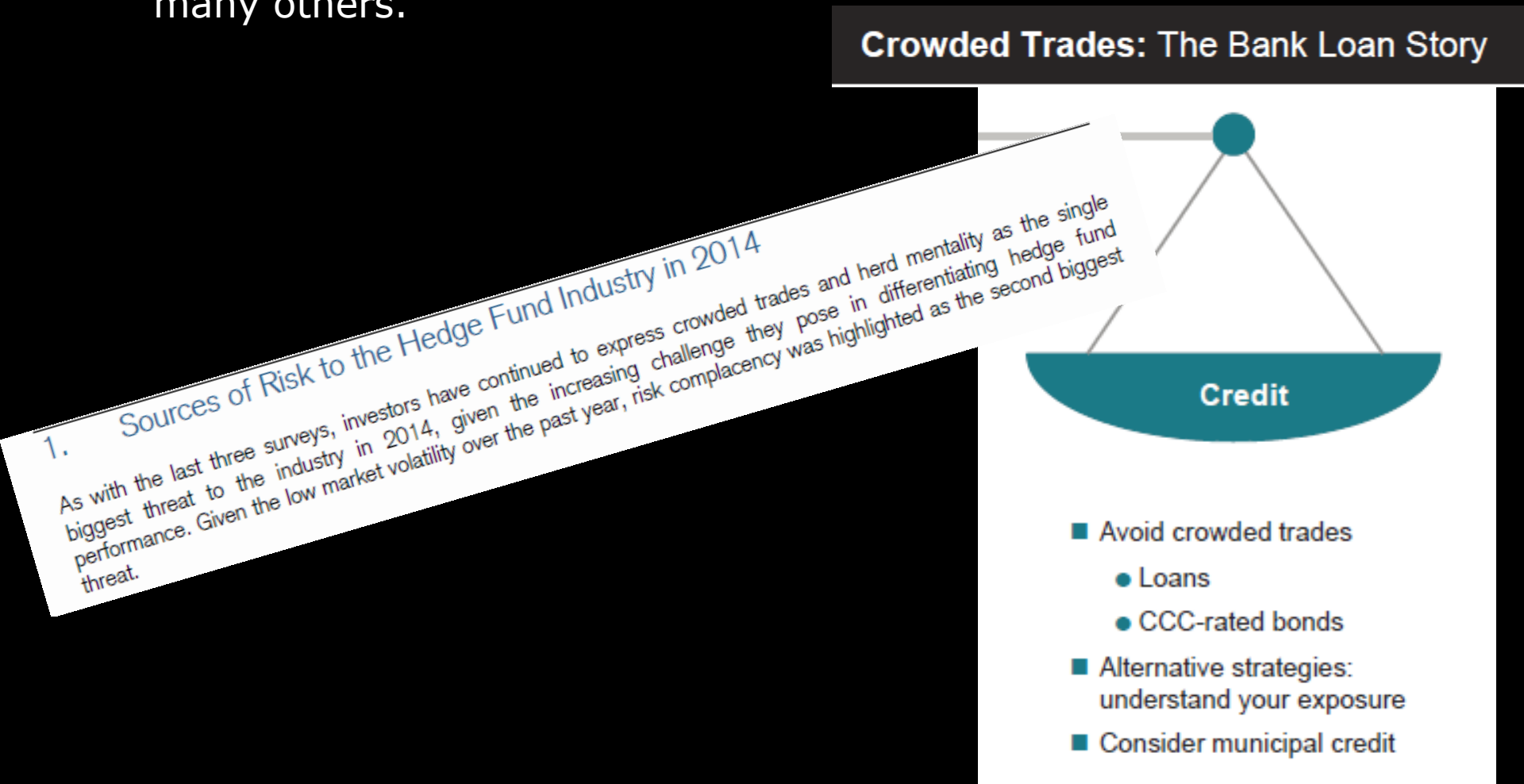
In this report we extend the definition of crowding to include breadth of high conviction overweights by active managers, as well as persistence of accumulation by active managers. We also demonstrate that crowding is an important risk factor at the stock level (with neutral performance profile), but tends to be a useful contrarian performance indicator at the aggregate sector, region level.

IX. Crowding Gaining Traction

A. Examples bank reports from Goldman Sachs, Bank of America, Bernstein, Credit Suisse, JP Morgan Chase, and many others.

1. Sources of Risk to the Hedge Fund Industry in 2014

As with the last three surveys, investors have continued to express crowded trades and herd mentality as the single biggest threat to the industry in 2014, given the increasing challenge they pose in differentiating hedge fund performance. Given the low market volatility over the past year, risk complacency was highlighted as the second biggest threat.



I don’t know what this guy is talking about. The only crowds I see are at SF Giant parades and Paul McCartney concerts!

X. A Story from the Crisis of Crowding:

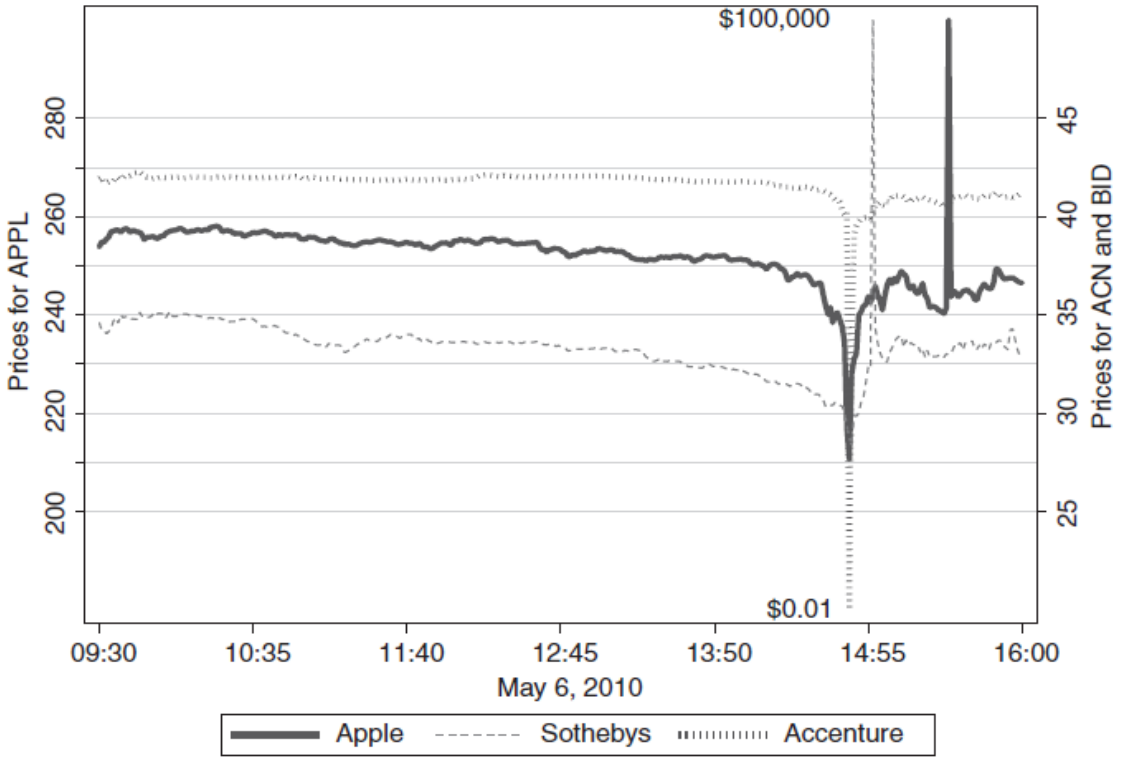
- The Flash Crash

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

X. A Story from the Crisis of Crowding:

- The Flash Crash

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



Source: Chapter 17 The Crisis of Crowding

X. A Story from the Crisis of Crowding:

- The Flash Crash

- 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.

X. A Story from the Crisis of Crowding :

- The Flash Crash

- 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.

X. A Story from the Crisis of Crowding :

- The Flash Crash
  - 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

X. A Story from the Crisis of Crowding :

- The Flash Crash

- 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.

X. A Story from the Crisis of Crowding :

- The Flash Crash

- Liquidity providers act as a unit at times. They are surprisingly similar traders and behave like a crowd at times, rather than independent sources of liquidity.

- Before electronic trading, market makers didn't answer the phone when they were "scared".

- "Maybe all of liquidity is just a mirage and always has been." from *Crisis of Crowding*.

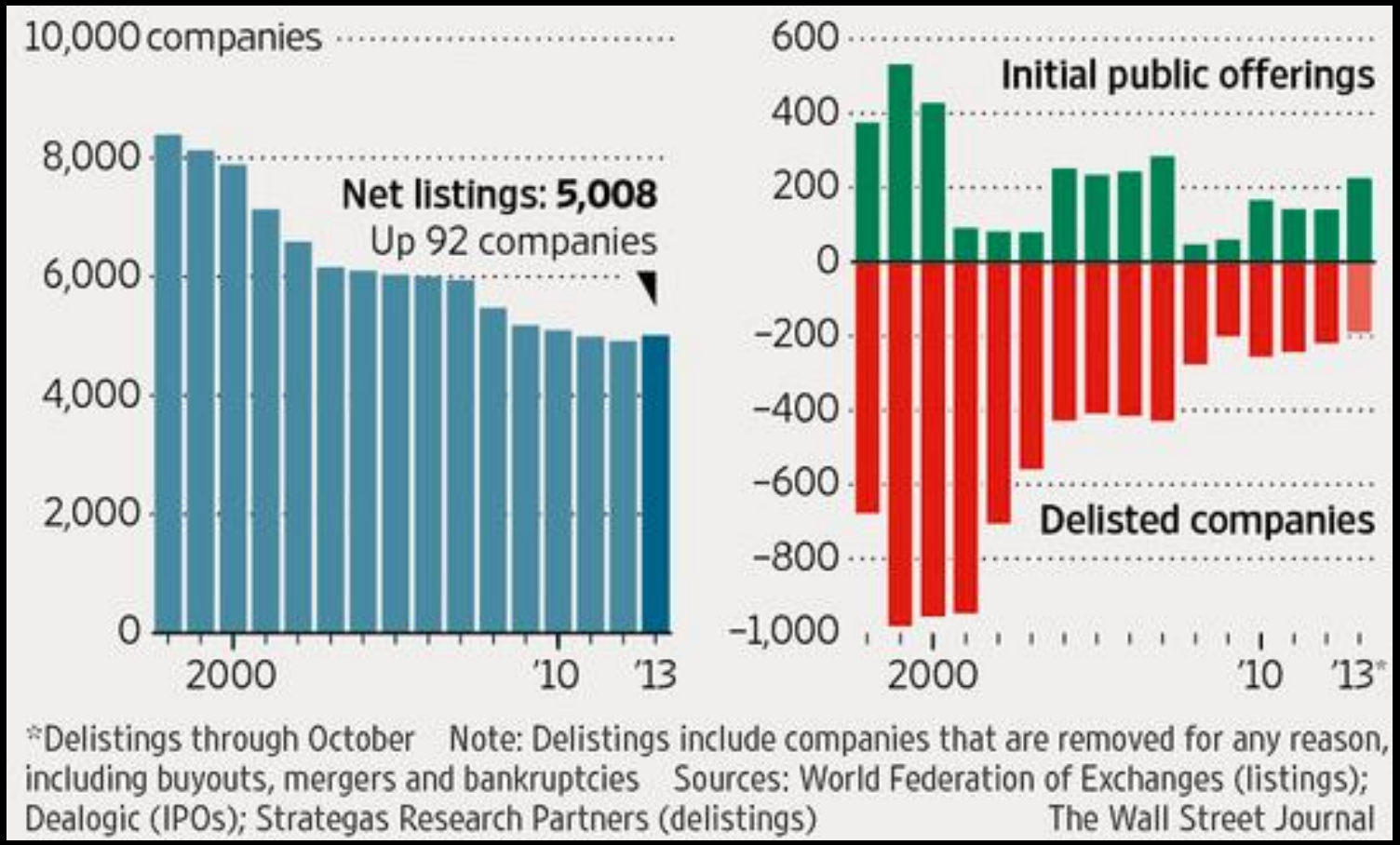
XI. Some Provoking Thoughts and the Future

- Could the growth of automated trading platforms (HFTs and others) lead to more chances of crowding?

- Could too much money chasing too few securities lead to overvaluation and crowding?

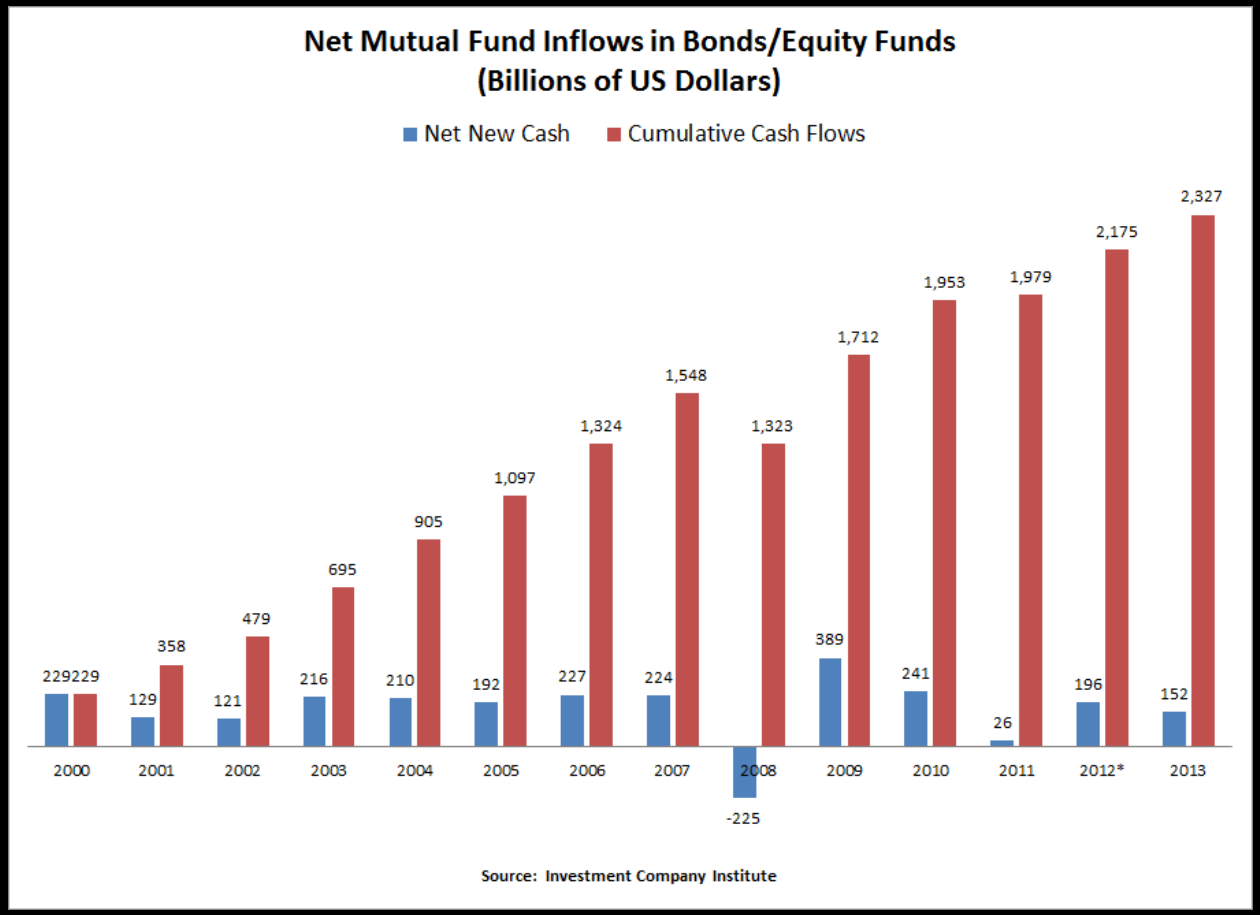
XI. Some Provoking Thoughts and the Future

- Less publicly traded securities in USA



XI. Some Provoking Thoughts and the Future

- But flows into equity mutual fund continue…



XI. Some Provoking Thoughts and the Future

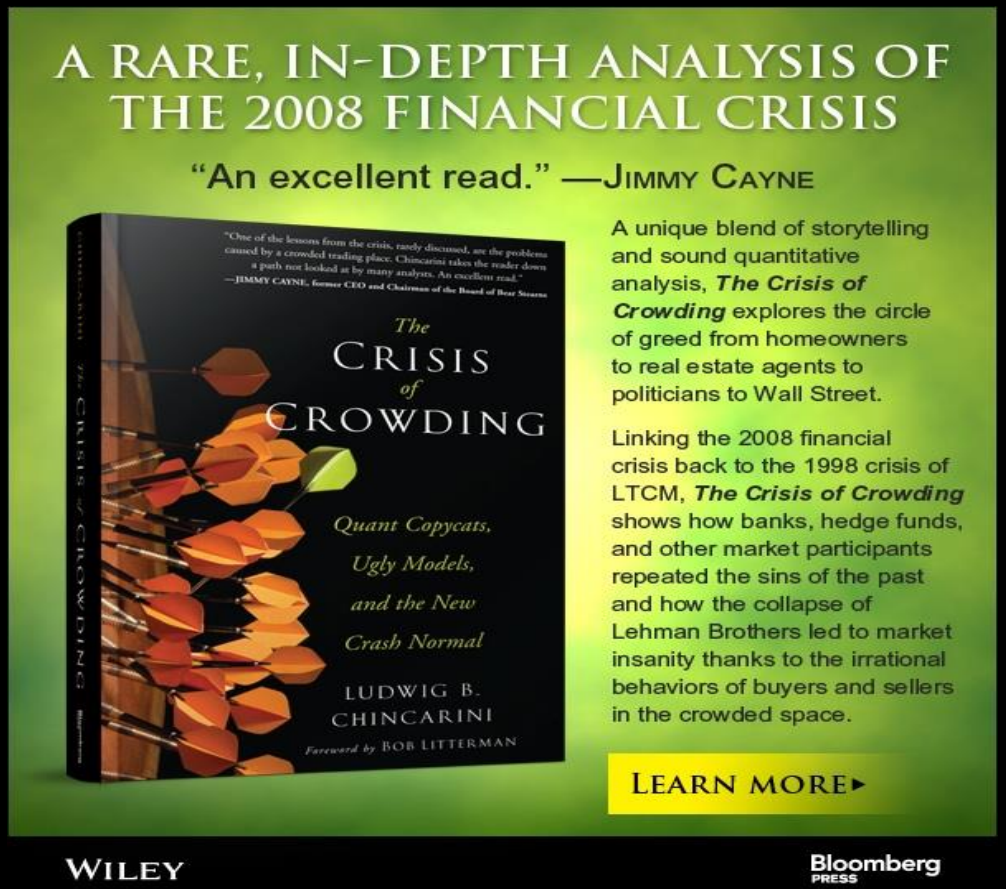
❖If you are interested in my new research and would like to see it when it's released, then please come by and give me your business card.

Thank you

- Dr. Ludwig Chincarini
- University of San Francisco
- IndexIQ, NERA, Future Advisor

www.ludwigbc.com
chincarinil@hotmail.com

Please buy the book for yourself or as a gift.



Stories Discussed in the Book

- The Circle of Greed – *The Housing Bubble how it got started, why it kept going, and everyone's role in its spreading.*
- Fannie and Freddie– *Although Wall Street is often blamed, much of the housing catastrophe started with the quasi-government institutions of Fannie Mae and Freddie Mac. This chapter described their colored past and how they and politicians manipulated the American housing market.*
- The LTCM Debacle – *The fascinating story of a hedge fund's troubles and how a problem in 1998 should have warned us about what could happen in the future.*
- The Lehman Collapse – *The inside story of what led to Lehman's collapse and why no one did anything to save it.*
- The Bear Stearns Hibernation – *With inside interviews of the key players, a detailed analysis of why the market decided to make a run on the Bear.*
- Asleep in Basel – *Discusses how regulation can fail and how rules that regulators made actually helped fuel the housing bubble.*
- The End of the LTCM Legacy – *John Meriwether, the legendary investor, made famous in Liar's Poker, fell again in 2008. Why did it happen? Why didn't their risk models work?*

Stories Discussed in the Book

- The Quant Crisis – *In early August 2007, one of the most efficient areas of portfolio management went into trouble for all the same reasons that would cause banks to suffer in 2008, yet it was hardly noticed. This discusses that amazing event.*
- Absurdity of Imbalance – *We failed to understand that a Lehman Collapse would cause market chaos. This chapter discusses the most bizarre, irrational things that happened due to the Lehman failure.*
- The Flash Crash – *In 2010, one of the most liquid markets in the world led to people buying Apple stock at $100,000 per share and selling Sothebys at 1 cent per share. What in the world happened?*
- Getting Greeked – *The Euro crisis has had its verberations everywhere, including the US. How did the whole problem start? Why did Greek politicians lie? What happened?*
- New and Old Lessons from the Crisis of 2008 – *Discusses the important lessons that we should all understand about the financial system.*

Open Discussion

- Your example of traffic crowding is different than financial crowding, because this crowding could be priced. Is it priced?
- During the Flash Crash, who was buying and selling at 1 cent and $100K? Was it just algo trading systems?
- You wonder if system trading could cause more crowding. Could it not also be the reverse? That is, computer systems can be programmed to detect crowding and avoid it?
- Which of the crowding measures you mentioned is being used the most at the present moment?