INSTITUTE FOR QUANTITATIVE RESEARCH IN FINANCE®

SUMMARY

SPRING 2011 SEMINAR
APRIL 3 – 6, 2011

THE RITZ CARLTON
AMELIA ISLAND, FLORIDA

I. INTRODUCTION, SUMMARY AND CONCLUSIONS

The Q-Group® provides a number of ways for the attendees and their colleagues to access the presentations from past seminar series. First there are brief overviews of the themes and insights presented during a meeting, such as the ones shown below for the Spring 2011 Q-Group Seminar series. If you want more information about a particular presentation after reading these, you can read the full summaries of each presentation which are also in this report. For even more information copies of the slides used during each presentation and the paper from which the presentation was derived, as well as the complete audio recordings for each presentation and question and answer period, are available from the Q-Group website at *The Q-Group*: The Institute for Quantitative Research in Finance.

Themes and Insights Spring Meeting 2011

There were several important themes of the Spring 2011 Q Group presentations. All had at their core important messages for both investment practitioners and scholars as well as public policy makers. One continuing theme at the Q-Group seminars, and this one was no different, has been the factors and events behind the "Financial Crisis of 2007-08." During the Q-Group's Spring 2011 meetings innovative thinking and research added more to our understanding of the financial crisis' causes and possible public policy changes needed for prevention.

To open the Spring 2011 meeting, Andrei Shleifer, presented "Neglected Risks, Financial Innovation, and Financial Fragility" in which he points to new product innovation as the cause of the damaging risk concentration in financial intermediaries. Shleifer finds that when there is excessive demand for risk-free assets, intermediaries create new and profitable "false substitutes." The twin forces of demand and profitability create a glut followed by a sell off as investors recognize they are imperfect substitutes. This sell off overwhelms the intermediaries wealth, adds fuel to the decline, and concentrates the risk in intermediaries. Policy discussions, which up to now have focused on leverage and plumbing must, Shleifer says, focus on the speed and potential consequences of innovation. (Presentation 1)

In a shift of focus from markets past to markets future, Christopher Polk presented "Hard Times." He says that given there were two US stock market boom-bust events in the past 15 years, it would have been useful to both understand and forecast them and to be able to do so in the future. Polk's focus is on whether stock prices, and their declines, are driven by changes in discount rates or expectations about profits. The difference is important: price declines from increased discount rates are usually due to sentiment changes which can reverse quickly. Price changes from reduced profit expectations do not quickly reverse and can be long lasting. The "Internet Bubble" was induced by a shift in risk that impacted discount rates while the recent "Financial Crisis" was largely based on changes in expected cash flows, and is a crisis that Polk calls "Hard Times." (Presentation 10)

Dealing with the widely held notion that High Frequency Traders (HFT) created or propelled the rapid decline on May 6, 2010, the "Flash Crash," Pete Kyle looks at what

triggered it, how traders behaved on May 6 in comparison to other days, and especially at the role HFTs played in the crash. He reports the crash was due to one very large algorithmic trade with a target that was quantified relative to trading volume. This relative volume target, Kyle says, exacerbated the decline. The presentation looks at the roles of various traders and concludes that while technological innovation is critical for market development, safeguards must be implemented to keep pace with advanced technology enabled trading practices. (Presentation 3)

Portfolio choice is another recurrent theme which is particularly interesting in light of the financial crisis. At the Spring 2011 Q-Group seminar series there were several presentations that looked at portfolio models in the light of the crisis.

Andrew Ang looks at one victim of the "Financial Crisis," Harvard University. In the 2008 Financial Crisis its Endowment lost over 27% of its value and the University lost 34% of its revenue. Ang attributes the losses to the unusually high level of semi- and illiquid assets the endowment held as asset markets were in chaos. This high level of illiquidity was, in part, due to the asset allocations prescribed by the "Endowment Model" the Endowment used, a model that does not take into account potential asset illiquidity in a downturn. Ang's own model includes the periodic inability to trade and its use results in asset allocation and consumption levels that are quite different from those of a standard portfolio (Merton) model. He calculates illiquidity premiums relative to the length of time the assets will be illiquid. (Presentation 7)

Taking on the role of housing, another semi liquid portfolio asset, Raj Chetty says that the interaction between housing and financial markets is important to an understanding of the link between macroeconomic fluctuations, asset pricing and portfolio management. In his model he takes into account housing's twin roles – for consumption and as an asset, albeit illiquid. He finds that while mortgage debt reduces demand for stocks, home equity raises it, and the impact on portfolios is as large an impact as those from the investor's income and wealth. In practical terms, he shows that households should hold more conservative portfolios when they have more housing commitments. His insights into the impact of mortgage debt/committed consumption on portfolios may be a useful predictor of fluctuations in demand for risky assets and asset prices. (Presentation 2)

Picking stocks has been another Q-Group Seminar theme. There were three presentations that provided useful new ways to think about stock selection and performance.

Relative to other firms, those issuing stock subsequently underperform, and those repurchasing have subsequent higher returns. Robin Greenwood, in his presentation "Share Issuance and Factor Timing," asks if this could be the result of asset mispricing. Using a new approach to answering this question, he finds that firms arbitrage time-varying demand for characteristics while investor sentiment is driven by "themes" or "narratives" for which characteristics serve as a proxy. Firms can arbitrage this demand by issuing stock. Thus, he believes, share issuance forecasts characteristic-based factor returns: firms issue equity prior to periods when other stocks with similar characteristics

perform poorly, and repurchase prior to periods when other firms with similar characteristics perform well. He examines which characteristics result in the strongest results. (Presentation 6)

In his presentation, "Short Sellers and Financial Misconduct," Jonathan Karpoff looks at whether short sellers identify overvalued stocks. For overvalued stocks he uses stocks from companies that misrepresented their financial statements and are overpriced, at least until the misrepresentation is made public. He finds that short sellers convey substantial benefits to uninformed investors, the severity of the fraud is important, short sellers dampen price inflation before the misconduct is revealed and do not exacerbate the price decline when it is revealed. Thus, the assertion that short sellers undermine investors' confidence in financial markets and decrease market liquidity seems, in this case, unwarranted. (Presentation 8)

Sudheer Chava looks at socially responsible investing and lending in his presentation, "Socially Responsible Investing and Expected Stock Returns." He finds that stocks that do not meet socially responsible (SRI) environmental screens have significantly higher expected returns, lower institutional ownership, and are held by fewer institutional investors than those that do. For lenders, environmental concerns increase and environmental strengths decrease loan spreads and affect covenants. He concludes that the elevated cost and availability of debt and the increased cost of equity capital are two channels through which companies are rewarded for socially responsible investing. Implicit in this analysis is that SRI investors and lenders are expecting lower returns on their capital, and thus they should not be surprised at their investment results. (Presentation 11)

For investors in mutual funds, Utpal Bhattacharya looks at the role of affiliated funds of mutual funds in a fund family's internal fund flows, in his presentation **"**Conflicting Family Values in Fund Families." These funds are funds-of-funds that invest solely in other funds in the same fund family. This, he says, is legal and useful as they provide liquidity to distressed family members. He finds that this facility acts as an insurance pool against temporary liquidity shocks, benefits the family by preventing other fund fire sales, and thus improves their performance. However, while the cross-subsidy is rational for the family, it is not for the affiliated fund-of-funds, nor for their investors who must take care in reading the prospectus before investing. (Presentation 4)

Typical of Q-Group meetings there are several papers that do not fall into neat categories, yet cover very interesting topics.

Eric Zitzewitz, addresses the issue why bond trading is so much more expensive than equity trading. He particularly looks at small lot bond trading costs in "Paired Bond Trades." Specifically, he addresses whether trading costs reflect rents, if current price regulation is optimal, and whether exchange-based trading should be mandated. He uses paired bond trades, dealer-client corporate bond trades paired with dealer-dealer trades, and TRACE data to look at the profits from paired trading. He finds that for all his matched trades there were no trades made at a loss, and the costs of small paired

trades were higher: dealer markets increase costs and are less transparent. Excessive markup regulation, he says, may have had an impact in holding down excessive profits. As for exchange trading, it is presently small and not likely to increase due to the nature of the securities. This is interesting insight for individual bond investors and the ongoing discussion of the current and future public policy. (Presentation 9)

These presentations informed, enlightened, and challenged those in attendance in conceptual and practical ways. The discussions began during question and answer periods following each presentation and continued in the informal and formal meetings throughout the Spring 2011 Seminar series.

TABLE OF CONTENTS

1. Neglected Risks, Financial Innovation, and Financial Fragility

Andrei Shleifer, Professor of Economics, Harvard University, presented "Neglected Risks, Financial Innovation, and Financial Fragility" coauthored with Nicola Gennaioli, Assistant Professor, Universitat Pompeu Fabra, CREI and Robert Vishny, the Myron S. Scholes Distinguished Service Professor of Finance at the University of Chicago Booth School of Business. Shleifer had previously presented a paper at the Q-Group® seminar in the Fall of 1995.

In this first presentation of the Spring 2011 Q-Group Seminar series, Shleifer and his coauthors seek to understand the financial fragility that created the chaos of the recent financial crisis. At the heart of his concern is the fact that in this crisis, as opposed to the earlier internet crisis, intermediaries concentrated the risk.

Shleifer's and his coauthors' perspective on the cause of this crisis is new: they do not focus on leverage and institutional structure, what he calls the plumbing. Rather, they focus on the creation of "false substitutes" that meet the demand for safe investments in a high-demand, limited-supply environment. This increase in substitute products creates private money and importantly, he says, increases risk as both investors and, to a lesser degree, intermediaries neglect risks and leverage. Shleifer says that the focus on leverage and plumbing by policy makers needs to be expanded to include the speed of innovation, a critical variable in creating a financial crisis.

In this work Shleifer adapts a standard model of financial innovation where:

- Investors demand a particular (often safe) stream of cash flows.
- Traditional securities become limited and intermediaries create new substitute securities from risky assets. These new securities are designed to offer the desired cash flow stream to risk-shy investors.
- Large numbers of these new securities, called by Shleifer "false substitutes," are issued to meet the ensuing demand.
- At some point previously unattended to risks are revealed, surprising investors and intermediaries.
- There is a flight from the "false substitutes."

Shleifer notes that recent events fit this innovation model: securitization; collateralized mortgage obligations; money market funds. He suggests that junk bonds, and the import of Drexel as an intermediary, may be included on the list.

To this familiar innovation model, Shleifer and his colleagues add two real world adaptations.

- Surprise when investors, and often intermediaries as well, recognize the unusual risks that accompany the new "safe cash flow" securities.

- Investors' subsequent flight from the "false substitutes" to safe traditional securities.

Important to their model is their assumption that investors have a preferred habitat for safe assets modeled as infinite risk aversion. Shleifer says that their model suggests the following scenario as the innovation proceeds:

- Markets for new securities are fragile. When news about unattended risks catches investors by surprise, they dump the "false substitutes" and flee to the safety of traditional securities. Over-issuance then is the source of risk.
- In equilibrium intermediaries buy back many of the new securities. However, in a crisis fueled by innovation the supply is huge. Over issuance causes prices to fall sharply even without fire sales.
- Prices of new claims collapse below initial values as investors flee to safety.
- Intermediaries' wealth provides insurance against price collapses but the glut of new securities is a crucial driver of the crisis: new claims are risky due to over-issuance and intermediaries' wealth is insufficient for the volume.

Shleifer says that their two-agent financial market model includes the risk-adverse investor and the risk-neutral intermediary and it emphasizes the central role of neglected low probability risks. It includes both an assessment of the nature of financial innovation and of financial fragility.

After discussing the two-asset, three-period model, he turns to describing how it provides a novel perspective on the cause of the frozen asset-based commercial paper market in the summer of 2007. Shleifer does acknowledge there are two alternative explanations for the events: institutional speculation and what is called a "perfect storm."

1. Institutional speculation. This is the leading alternative explanation of the events of 2007. Institutions speculated in AAA-rated securities using short-term finance while counting on a government bailout. The positions sustained huge losses and led to the eventual bailouts.
2. "Perfect storm." In this view investors correctly consider the extremely low probability of a crisis and price securities accordingly. However, in this instance the very-low-likelihood event occurred.

Shleifer questions both explanations. First, as to the role of institutional speculation, he reminds us that prior to the events of the summer of 2007, financial markets universally perceived AAA-rated MBS and CDOs to be safe, the banks' credit default swaps traded as if banks were totally safe, and banks provided repo financing to hedge funds using MBS as collateral with very low haircuts. He argues that both the banks and the investors neglected the risks and were shocked by what subsequently happened. Second, as for the "perfect storm," Shleifer says that this view is inconsistent with the assertion that investors actually used the wrong models rather than the correct models without adequate evaluation of low-probability extreme events.

Their model, Shleifer points out, is in agreement with the widely accepted prescription that greater capital and liquidity of financial intermediaries would lead to more stable markets. However, he says, it goes further by questioning the idea that all creation of private money by the banking system is necessarily desirable: at least in some cases such securities owe their very existence to neglected risks and have proved to be "false substitutes" for the traditional ones. "False substitutes" by themselves lead to financial instability and may reduce welfare, even without the effects of excessive leverage. He does conclude that financial fragility in their model could interact, perhaps dangerously so, with leverage when mispriced securities are used as collateral and thus can result in fire sales. Sales from unwinding levered positions and sales from disappointed expectations thus go in the same direction.

Shleifer concludes with public policy concerns. He says that recently proposed policy, while desirable in terms of its intent to control leverage and fire sales, does not go far enough. It is not just the leverage, he points out, but the scale of financial innovation and of the creation of new claims itself that require regulatory attention. Such attention might be especially warranted when investors buy securities through an intermediary that explicitly or implicitly guarantees them. Regulators may wish to require that intermediaries hold enough capital to make good on those guarantees or else refrain from making them. This might be a particularly significant issue when the safety of either securities or intermediaries is illusory.

2. The Effect of Housing on Portfolio Choice

Raj Chetty Professor of Economics, Harvard University and National Bureau of Economic Research (NBER) presented "The Effect of Housing on Portfolio Choice" coauthored with Adam Szeidl, Associate Professor, Department of Economics, University of California at Berkeley and NBER.

Chetty starts with the question that motivates this research. How does homeownership effect household financial investment decisions? He says that the interaction between housing and financial markets has attracted attention because of its importance for understanding the link between macroeconomic fluctuations, asset pricing and, in this case, portfolio management.

Theoretical studies have shown that housing, due to its twin roles as a consumption good and as an illiquid asset, effects optimal portfolio allocations through two channels. Owning a home increases a household's exposure to risk while adjustment costs in housing, such as moving, effectively amplify risk aversion because both force households to concentrate fluctuations in wealth away from housing. While these effects can have a large quantitative impact on portfolios, theory and evidence reach conflicting conclusions about the nature of the impact: theory predicts that housing lowers the demand for risky assets; empirical studies find no systematic relationship between housing and portfolios.

In their work Chetty and his coauthor identify two things that reconcile the theoretical predictions and the evidence:

1. Separating mortgage debt and home equity effects on a portfolio: mortgage debt reduces demand for stocks while home equity raises it.
2. Understanding that endogeneity of housing choice biases previous empirical estimates: those who buy bigger houses may face lower labor income risk. As an example of how this may happen, Chetty discusses the very different house purchase decisions of tenured and untenured faculty members.

In previewing the conclusions, Chetty says that there are large impacts of housing on portfolios of the same order of magnitude as the impacts that come from variations in income and wealth.

For their research they use a two-period Merton-style portfolio model with housing featuring both risks, the covariance between home prices and stock returns, and illiquidity, the probability that housing cannot be adjusted in second period of housing. For data they use the 1990-2004 asset modules from the Survey of Income and Program Participation. They observe asset data both before and after the purchase of a new house for 2,784 households.

To generate the information on the variation in mortgages and home equity they use several sets of information.

1. To identify housing price information they use state level repeat-sale home-price indices for property value and home equity wealth. This measure compares the average location, state, house price in year in which portfolio is observed ("current year") and the house price in the state in year of home purchase.
2. One concern is that of the impact of labor market conditions on home prices. To incorporate fluctuations in house prices with labor market conditions, they correlate them with labor market conditions using national house price interaction with variation in land availability across states. This, Chetty says, incorporates information about land scarcity in places such New York, Boston, and LA, versus places, such as Kansas, where land is abundant.
3. To incorporate the risk preferences of people who buy houses when local house prices are high, they use panel data that tracks changes in the portfolio for same household over time.

Using their model they find that housing purchases have both immediate and long-lasting effects on household portfolio choices.

- Increasing mortgage debt, holding wealth constant, reduces a household's propensity to participate in the stock market and reduces the share of stocks in the portfolio conditional on participation: they estimate the elasticity of the share of liquid wealth allocated to stocks with respect to mortgage debt is -0.3.

- Increases in home equity wealth, while holding property value fixed, increases stockholding. The estimated elasticity of the stock share of liquid wealth with respect to home equity is 0.44.
- These elasticities are larger for households with larger adjustment costs, but similar across high and low-risk housing markets.

In practical terms, Chetty concludes:

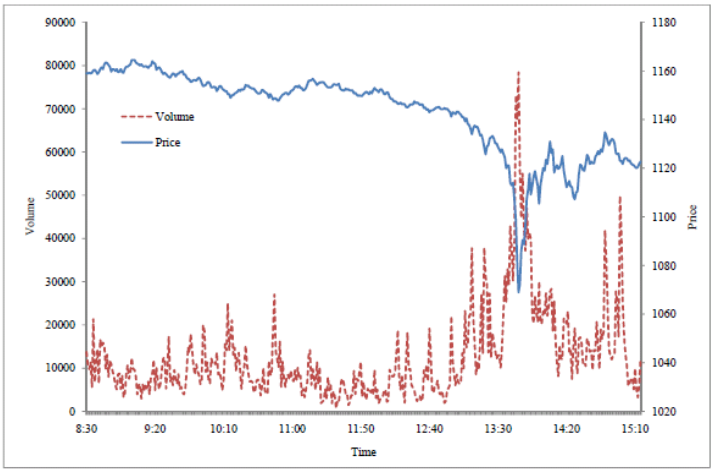
- Mortgage debt/committed consumption may be a useful predictor of fluctuations in demand for risky assets and asset prices.
- Households should have more conservative portfolios when they hold a lot of housing commitments.

Clearly, home ownership plays a very important role in assessing the risk and planning the asset allocation for individual financial portfolios, and it did so in the most recent financial crisis.

3. The Flash Crash: The Impact of High Frequency Trading on an Electronic Market

Albert S. Kyle, Charles E. Smith Chair Professor of Finance at the University of Maryland's Robert H. Smith School of Business, and Commodities Future Trading Commission (CFTC) presented "The Flash Crash: The Impact of High Frequency Trading on an Electronic Market" coauthored with Andrei Kirilenko, Chief Economist, CFTC, Mehrdad Samadi, Economist, CFTC, and Tugkan Tuzun, Ph.D. candidate University of Maryland and the CFTC. Kyle has been a frequent contributor to Q-Group® seminars.

On May 6, 2010, major US stock market indices, stock-index futures, options, and exchange-traded funds experienced a sudden price drop of more than 5% followed by a rapid rebound, all in about 30 minutes. The price and volume data for June 2010 E-Mini S&P 500 Stock Index Futures Contract on May 6, 2010 are shown below.



Kyle points out two dramatic examples of the incredible volatility during the period: Accenture's share price fell to $0.01 and Apple's rose to $100,000. He also reminds us that flash crashes are not that rare. After the October 1987 stock market decline, there were several other flash crashes in the week that followed.

This brief period of extreme, intraday volatility on May 6, 2010, commonly referred to as the "Flash Crash," raised a number of questions about the structure and stability of US financial markets. One survey reported that over 80 % of US retail advisors believed that "overreliance on computer systems and high-frequency trading" were the primary contributors to the volatility.[1] The results of a survey of retail advisors included as culprits the use of market and stop-loss orders, a decrease in market-maker trading activity, and order routing issues among securities exchanges. In August, following the crash, representatives of individual investors, asset management companies, and market intermediaries, testifying at a hearing before the CFTC and the SEC, suggested that in the current electronic marketplace such an event could easily happen again.[2]

Kyle and his coauthors take on the assertion that High Frequency Traders (HFT) played a role in creating the "Flash Crash." To examine the role of HFTs in the crash he asks three questions:

1. What may have triggered the Flash Crash?
2. How did HFT and other traders act on May 6 in comparison to other days?
3. What role did HFT play in the Flash Crash?

To examine these questions, Kyle first provides a brief tutorial of the S&P 500 E-mini contract provisions and distinguishes between electronic trading (all E-mini trading), algorithmic trading (electronic trading based on computer algorithms) and high frequency trading (algorithmic, electronic trading that takes advantage of trading opportunities in the shortest time intervals measured in milliseconds).

In answer to his first question, the origin of the crash, Kyle says that it was the result of one account that sold 75,000 contracts worth $4.1 billion, 1.5% of the day's volume, precisely at 13:32 CT. It was executed by an algorithm set to target 9% of trading volume, and it was the largest net position change in the E-mini of the year. While trades of this size are usually executed over a day, it was executed in approximately 20 minutes. Kyle believes that the way the trade was targeted, as a percent of trading volume, exacerbated the market selloff: as volume increased the sell target remained fixed at 9% of trading volume. In addition to the sell target of this very large trade, market conditions played a role: there had been large price declines earlier in the day and the buy side of the limit order book was greatly depleted at the moment of the sale.

To answer the questions about the role of HFT, Kyle and his coauthors use trading data on the E-mini S&P 500 equity index futures on May 6. They use audit-trail, transaction-level,

[1] A survey by Market Strategies International between June 23-29, 2010.
[2] August 11, 2010.

data for all regular transactions. This allows them to identify the price, quantity and time of execution, as well as the identity of buyer and seller.

They sort the 15,000 trading accounts that participated in transactions on May 6 into one of six categories:

1. High Frequency Traders (16): high volume and low inventory relative to volume that account for significant portion of trading volume, although they do not accumulate large net positions.
2. Intermediaries (179): market makers with lower volume and low inventory relative to volume.
3. Fundamental Buyers (1,263): consistent buyers during the day.
4. Fundamental Sellers (1,276): consistent intraday sellers (including the 75,000 contract sell program).
5. Small (Noise) Traders (6,880): trade few contracts each day.
6. Opportunistic Traders (5,808): all other traders including index arbitrage, day traders and miscellaneous speculators.

High frequency traders were the least numerous of the trading categories with only 16.

Kyle then turns to the his question about trading activity on May 6 versus that on previous days. In the table shown below, the average activity of the 3 days preceeding the Flash Crash and May 6, one can see that May 6 was quite unusual.

	May 3-5	May 6th
Volume	2,397,639	5,094,703
# of Trades	446,340	1,030,204
# of Traders	11,875	15,422
Trade Size	5.41	4.99
Order Size	10.83	9.76
Limit Orders % Volume	95.45%	92.44%
Limit Orders % Trades	94.36%	91.75%
Volatility	1.54%	9.82%
Return	-0.02%	-3.05%

Kyle and his colleagues also plot the holdings of various types of traders, and their profits and losses relative to price, for each of the 4 days. Kyle makes the following observations about HFT activity during the period:

- The net holdings of HFTs fluctuated around zero so rapidly that they rarely held more than 3,000 contracts long or short on the day of the Flash Crash.

- HFTs did not change their trading behavior during the Flash Crash from that before: HFTs aggressively took liquidity from the market when prices were about to change and actively kept inventories near a target level.

- The trading of HFTs appears to have exacerbated the downward move in prices: HFTs initially bought contracts from Fundamental Sellers, reversing this after a few minutes competing for liquidity with Fundamental Sellers.

- HFTs appeared to buy and sell contracts from one another rapidly and many times, generating what Kyle calls a "hot potato" effect before falling prices attracted Fundamental Buyers to take these contracts off the market.

In an assessment of the HFTs role, Kyle says that their analysis shows that HFTs:

- Exhibit trading patterns inconsistent with the traditional definition of market making.

- Aggressively trade in the direction of price changes. This comprises a large percentage of total trading volume but does not result in a significant accumulation of inventory.

- Whether under normal market conditions or during periods of high volatility, HFTs are not willing to accumulate large positions.

- Fundamental Traders may mistake higher trading volumes for liquidity.

- When rebalancing their positions, High Frequency Traders may compete for liquidity and amplify price volatility.

Consequently, Kyle concludes:

- Irrespective of technology, markets can become fragile when:
  - Imbalances arise as a result of large traders seeking to buy or sell quantities larger than intermediaries are willing to temporarily hold,

    and
  - Long-term suppliers of liquidity are not forthcoming even if significant price concessions are offered.

- Technological innovation is critical for market development.

- As markets change, appropriate safeguards must be implemented to keep pace with trading practices enabled by advances in technology.

4. Conflicting Family Values in Fund Families

Utpal Bhattacharya, Associate Professor, Kelley School of Business, Indiana University, presented "Conflicting Family Values in Fund Families" co-authored with Jung Hoon Lee, PhD candidate, Kelley School of Business, Indiana University and Veronika Krepely Pool, Assistant Professor of Finance, Kelley School of Business, Indiana University.

Mutual fund families have been studied in a variety of ways. Bhattacharya and his colleagues address an interesting question: the role of a mutual fund that invests solely in other funds in the same fund family. Bhattacharya calls these funds affiliated funds of mutual funds (AFoMFs).

While there are a number of interesting issues with these funds, Section 17 of the Investment Company Act of 1940 which severely restricts trades between individual funds, is not one of them. Bhattacharya says that AFoMFs can both invest (i.e., lend) and disinvest (i.e., borrow) in funds in their own family without running afoul of the law.

Bhattacharya next describes the importance of these funds in the industry: while these funds were virtually non-existent in the 1990s, by 2007, the last year of their sample, 27 of the 30 large fun families had AFoMFs, constituting 75% of the mutual fund industry. Given that this kind of fund maximizes the interest of the whole family rather than the interest of its shareholders, he and his colleagues seek to answer two questions:

1. How do the internal capital markets of a fund family operate?
2. Do these internal capital markets conflict with some shareholder objectives?

Bhattacharya hypothesizes that AFoMFs provide liquidity to distressed family member funds and that AFoMFs inflows to funds occur when outsider outflows from the other funds in the family is high. Thus, he says the AFoMFs act like the Fed's discount window by investing in funds in the family to offset their temporary liquidity shortfalls. This investing offsets potentially costly fire sales when the fund in family is experiencing very large redemptions.

Bhattacharya and his colleagues' goal is to investigate the relationship between AFoMFs flows and outside investor flows, especially when the outside investor flows are large and negative (an outflow). To study this they use AFoMFs and other family funds holdings data from the Morningstar Principia and the CRSP Survivor-Bias-Free Mutual Fund databases from October 2002 to January 2008. Their data covers more than 90% of the AFoMFs universe.

To test whether AFoMFs provide an insurance pool to offset temporary liquidity shocks of member funds they document that affiliated funds-of-funds invest a disproportionately large amount of money in the distressed funds in the family and provide several subsample results to show that this behavior is consistent with liquidity provisions. From their analysis they find that the cost for industry wide AFoMFs to provide liquidity is 7.11 basis points per month or about $88 million. The benefit to the distressed fund is 2.94 basis points per month for a family wide saving of $107 million.

The coauthors conclude that:

- AFoMFs offset severe liquidity shortfalls in other funds in the family, thus providing the fund family with an insurance pool against temporary liquidity shocks to other same family funds.
- The AFoMFs sacrifice does benefit the family by preventing other fund fire sales and thus improving other fund's performance.
- The benefit exceeds the cost for the family, which suggests that the cross-subsidy is rational for the family.
- Although the family benefits because target funds can avoid fire-sales, the cost of this insurance is borne by the investors in the AFoMFs.

While the benefit to the family outweighs the costs, what Bhattacharya and his coauthors do not answer is why the manager, and more importantly the AFoMF fund board, sacrifice the fund's investment performance to benefit the family, and why the SEC does not close this loophole on behalf of the AFoMFs shareholders.

5. Who Is Doing What to Whom on Wall Street and Why?

Leo Guzman introduced the Monday dinner speaker, Charlie Gasparino, Senior Correspondent for FOX Business Network, a Wall Street insider, book author and commentator.

His topic was "Who Is Doing What to Whom on Wall Street and Why?" However, he suggested his talk really was simpler and suggested the title, What's Going on Inside Wall Street? He began with his sense of what those on Wall Street are talking about at present: they seemed obsessed with insider trading, although he was unsure how to define insider trading. With regard to the SEC, he said he was unsure of what action they might be planning, and which financial executives might be implicated. Further, in talking about some widely known company heads, he said that their tenure may be coming to an end and there are those who are gleeful at the prospect.

Gasparro was especially concerned about the bailouts of bankers and wondered whether some of those bankers who say their firm was not bailed out were actually bailed out, albeit indirectly. He said that he is opposed to banker bail outs and would like to have them stopped. This would significantly reduce risk taking, he said, describing hedge funds as an example of risk taking that does not depend upon the comfort of bail outs.

Finally, turning to politics he said that while Wall Street does not entirely trust Obama, they will support him in the next election. In answer to a question about who would be the Republican candidate, he said he had no idea who it might be.

6. Share Issuance and Factor Timing

Robin Greenwood, Associate Professor of Business Administration, Harvard Business School and NBER, presented "Share Issuance and Factor Timing" coauthored with Samuel Hanson, Ph.D. Candidate, Harvard University. Greenwood had previously presented a paper at the Q-Group® seminar in the Fall of 2009.

Greenwood started by noting that research has found that, relative to other firms, firms that issue stock subsequently underperform and repurchasers subsequently have high returns. He notes that there is a debate about whether these patterns should be interpreted as evidence of a corporate response to mispricing, or as fully consistent with market efficiency.

In fact, he and his coauthor suspect that what is really going on it that firms are arbitraging time-varying demand for characteristics. He says that investor sentiment revolves around "themes" or "narratives" for which characteristics serve as a proxy, and firms arbitrage this demand by issuing stock. This suggests to Greenwood that issuance may be useful for forecasting returns to characteristic-based factors. It is this idea that is the core of the research and this presentation.

The typical approach to a resolving a problem like this is to collect information about the characteristics of a company and associate these characteristics with average returns in a cross-sectional analysis. To clarify how their analysis is different, Greenwood lays out an example of the two approaches using Google as an example:

- Usual approach:
  - Collect data on Google's characteristics such as beta, size, book-to-market ratio, profitability and dividend yield.
  - Associate each characteristic with some average return in a cross-sectional analysis.
- Greenwood's approach:
  - Collect data on other firms that have the same characteristics as Google.
  - Use net issuance by similar firms to back-out when these characteristics are mispriced.
  - Use this to improve the forecast of Google's returns.

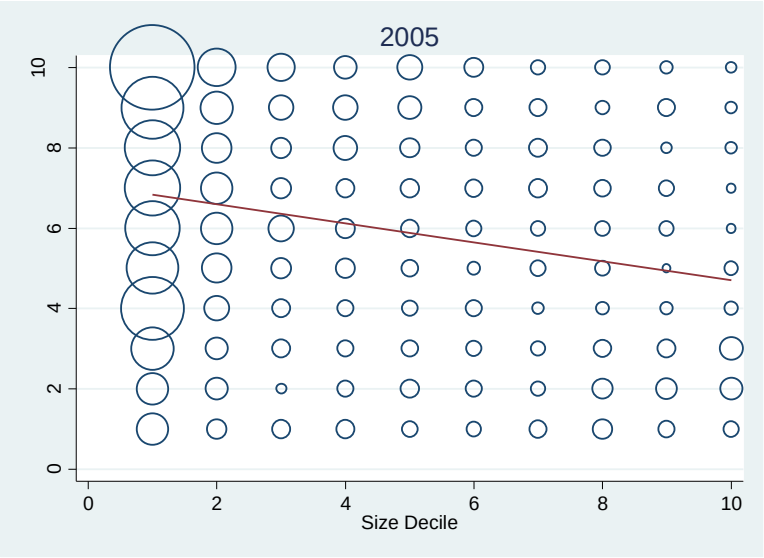
Implicit in this approach is assuming that firms can act as arbitrageurs or liquidity providers relative to the time-varying characteristic return, albeit in a noisy fashion. He notes two caveats: market timing may not be the primary determinant of net issuance; there may be limitations on the ability to act opportunistically. He believes that conditioning on behavior of other firms may provide more information than simply looking at the company's own issuance and repurchase decisions.

In this research Greenwood and his coauthor limit themselves to characteristics that are measurable and have been recognized as important in previous research:

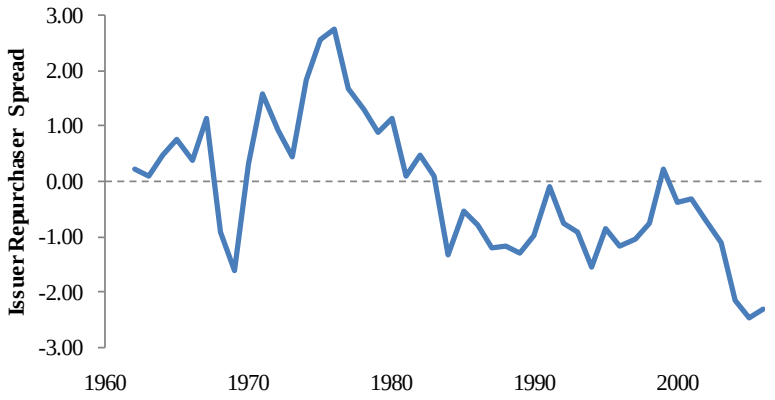
- Value & Size
  - Book-to-Market
  - Size
- Size Related
  - Nominal Share Price
  - Age: Years on CRSP
  - ß from 24-month trailing CAPM regression
  - Σ, residual volatility from CAPM regression
  - Distress, bankruptcy hazard rate
  - Dividend policy as a binary indicator for firms that pay dividends
- Other
  - Sales growth (DS/S): year-over-year sales growth
  - Accruals (Acc/A)
  - Profitability (E/B)

They allow the data to tell them which characteristics are important.

One way to examine what impacts net share issuance (N/S) is to relate it to a single characteristic. Using deciles Greenwood creates Issuance Characteristic Tilt Graphs for different characteristics and for several different years. Shown below is the 2005 graph relating size and share issuance. The size of the circles in the first column varies by the number of firms in the N/S deciles. As can be seen, the relationship between issuance and company size is negative in 2005. This suggests the importance of the characteristic to share issuance in that year. The slope and level of the line varies from year to year.



Shown in a somewhat different way, Greenwood relates the issuer repurchase spread to the characteristic. The chart for the size characteristic is shown below.



Not surprisingly, the spreads correlate across characteristics. Greenwood says that:

- Share issuance forecasts characteristic-based factor returns.
- Firms issue equity prior to periods when other stocks with similar characteristics perform poorly, and repurchase prior to periods when other firms with similar characteristics perform well.
- The strongest results are for portfolios based on book-to-market, size (i.e. HML and SMB), and industry.

He takes it a step further and concludes issuer-repurchaser characteristic spreads:

- Forecast characteristic returns.
- Contain information beyond B/M and have forecasting power for non-issuing firms.
- Are consistent with the role of firms as macro liquidity providers.

Whether it is due to required returns or mispricing, he says the evidence points to mispricing.

Greenwood believes their work has implications for researchers who study the stock market performance of secondary, initial public offerings, and recent acquisitions. Among other things, he says that those doing event studies that compare the performance of sample firms to firms matched on characteristics will omit any returns coming from event firms' timing of those characteristics when they should not do so.

7. Portfolio Choice with Illiquid Assets

Andrew Ang, Ann F Kaplan Professor of Business, Columbia Business School and NBER presented "Portfolio Choice with Illiquid Assets" co-authored with Dimitris Papanikolaou, Assistant Professor of Finance, Kellogg School of Management Northwestern University, and Mark M Westerfield, Assistant Professor of Finance and Business Economics, Marshall School of Business University of Southern California. Ang had previously presented papers at the Q-Group® seminars in the Spring of 2004 and the Fall of 2007.

Ang looks at one of the "victims" of the Financial Crisis of 2008, the Harvard Endowment and why it lost so much value. While the endowment had a slightly positive performance relative to the S&P500 from June 2008 to June 2009, it still lost 27.3% of its value. This was a significant turnaround from past performance as its assets shrank from $36.9 billion to $26.0 billion.

Harvard University relies heavily on endowment distributions for operations. In 2008, the overall endowment contributions represented 34% of the University's $3.5 billion revenue, and some schools within Harvard were more heavily reliant on the endowment for their operating budgets. The spending rate for the endowment is variable but smoothed over time and by June 2008 it was 4.8%. Any significant decline in assets impacts that payout. Clearly, this dichotomy between spending and earning sets up a conundrum during an endowment fund's downturns. Ang says that the Endowment losses from the financial crisis meant that Harvard's budget had to shrink by about 20%not including the massive cash outflows due to its swap position.

Ang says that the primary cause of the distress was the adoption an "Endowment Model" that includes a significant investment in illiquid assets, exacerbated by an illiquid asset overweighting. The Harvard's Endowment policy model and actual portfolio in 2008 are shown below.

Harvard Endowment Asset Allocation Pre-Financial Crisis

	Policy Portfolio	Actual Portfolio	
Liquid	36%	27%	Dev Mkt Equity, Liquid Commodities, Govt Bonds
Semi-Liquid	33%	35%	Emg Mkt Equity, High-Yield Bonds, Hedge Funds
Illiquid	31%	39%	Private Equity, Timber/Land, Real Estate
Total	100%	100%	

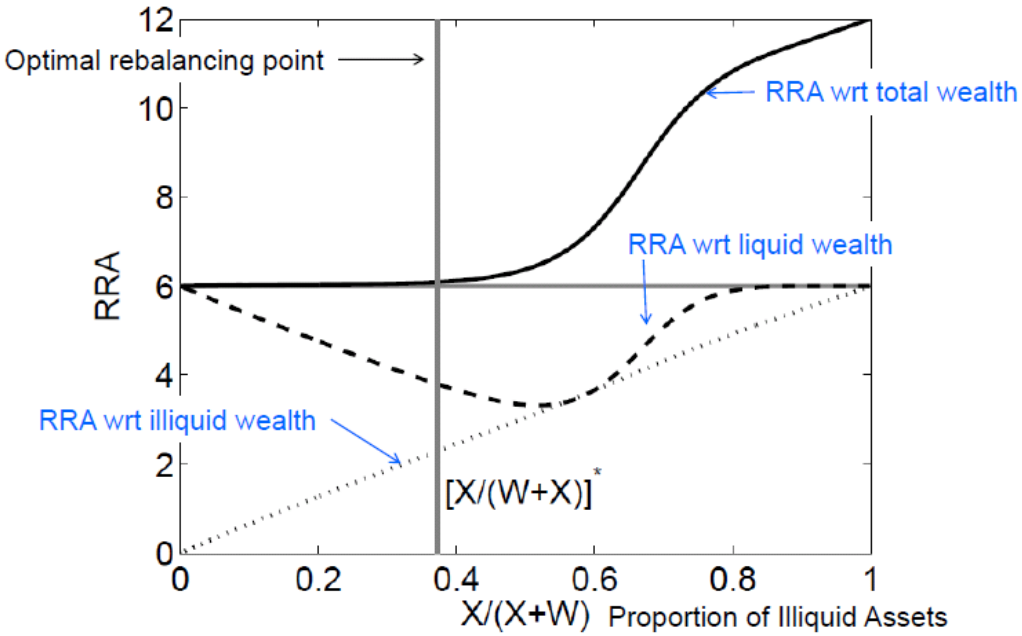
As a result of the decline in its endowment, Harvard found itself with four choices: liquidate Harvard; get increased donations; cut expenses; issue debt. Harvard cut expenses and was forced to raise over $2 billion in debt, half of it taxable. Ang says that this prompted him and his coauthors to think about the normal asset allocation model, a standard Merton model, in the light of potential asset illiquidity.

The Merton model has tradable assets with an agent that is only concerned with wealth. In this model, risk comes from the possible loss when total wealth goes to zero. However, since the agent can only consume out of liquid wealth, Ang says they should not be concerned with total wealth but liquid wealth going to zero. The potential loss of liquid wealth is an important source of risk.

This risk associated with illiquidity leads Ang to examine how illiquid assets affect asset allocations. His model includes riskless bonds, risky assets, and equity that is freely

tradable, as well as illiquid risky assets that are tradable only at random times based on a Poisson distribution. As outputs he determines the appropriate asset allocation and spending rate given the newly incorporated risk of illiquidity.

In the model the presence of illiquidity induces time-varying, endogenous, risk aversion. The ratio of liquid to total wealth becomes a state variable and effective risk aversion depends on liquidity solvency ratios. Ang provides a graphic illustration of effective relative risk aversion (RRA) as shown below.



Ang spells out the implications of his model:

1. Illiquidity markedly reduces optimal holdings relative to the Merton benchmark model. Furthermore, illiquid asset holdings are highly skewed.
2. In the presence of illiquidity, near-arbitrage opportunities arising from high correlations are not exploited. There is no arbitrage because illiquid and liquid assets are not close substitutes.
3. To be able to trade the illiquid asset continuously an investor requires liquidity premiums that depend upon skewness. Ang quantifies the premiums as shown below.

Average Turnover	λ	Illiquidity Premium
10 years	0.1	0.060
5 years	0.2	0.043
2 years	0.5	0.020
1 year	1.0	0.009
½ year	2.0	0.007

Ang concludes with three observations.

1. Illiquidity risk induces time-varying risk aversion that is greater than the constant risk aversion coefficient of utility. This is because illiquid assets cannot be used to fund immediate consumption.
2. The periodic inability to trade has a large impact and creates significant outcomes for allocation and a consumption that differs from that from the standard Merton model.
3. For endowments, the endowment model and its spending regime must include the impact of illiquidity as the proportion of less liquid assets increases.

8. Short Sellers and Financial Misconduct

This paper was funded by a Q-Group Grant in 2008.
The grant application provided the following description of the project

Short Sellers and Financial Misconduct

We examine short selling in the stocks of firms that subsequently are identified by the SEC as having misrepresented their financial statements. We first examine whether short selling anticipates the initial public revelation of financial misconduct, and whether the selling is sensitive to the misconduct's severity. We then examine whether short selling conveys external benefits or harms to other investors, including the extent to which short selling: (i) helps uncover the misconduct, (ii) facilitates a downward price spiral when bad news is revealed to investors, or (iii) decreases the amount by which share prices are inflated by the misrepresentation.

Many investment management processes consider short selling, either as a source of information about values or as a trading strategy. The proposed research examines frauds identified by the SEC to determine whether short sellers anticipated them and to quantify the extent to which the short selling attenuated investor losses. The topic is of great current importance because the short selling is under attack as issuers and some investors pressure regulators to restrict short selling when security prices are uncertain.

Jonathan M. Karpoff, Washington Mutual Endowed Chair in Innovation, Finance and Business and Professor of Finance at the Michael G. Foster School of Business, University of Washington presented "Short Sellers and Financial Misconduct" he coauthored with Xiaoxia Lou, Assistant Professor of Finance, Lerner College of Business and Economics, University of Delaware. This research was supported by the Q-Group. Karpoff had previously presented a paper at the Q-Group® seminar in the Fall of 2002.

Short selling is controversial: detractors claim that short sellers undermine investors' confidence in financial markets and decrease market liquidity; liquidity advocates argue that short selling facilitates market efficiency and the price discovery process. Either way investors who identify overpriced stocks can sell short thus incorporating unfavorable information into market prices. The issue for Karpoff is whether short selling conveys

information about external costs or benefits to other investors. In this research Karpoff looks at overvalued stocks and short selling. Put plainly, he and his coauthor seek to answer two questions with this research:

1. Do short sellers anticipate financial misrepresentation?
2. How do short sales affect markets and social welfare?

Karpoff turns to the first question. To answer it he needs a sample of overpriced stocks that subsequently reverse their overpricing. For overpriced stocks he and his coauthor use companies that misrepresented their financial statements and are overpriced, at least until the misrepresentation is made public. An example of the stock prices before and after misrepresentation is revealed is shown below.

To collect their sample of misrepresenting companies, the authors use firms that had SEC/DOJ enforcement actions for financial misrepresentation initiated against them during 1988-2005. To this data they add the monthly short interest and stock price data during the violation period for the 454 firms in their sample. The focus is on the period before the misrepresentation is revealed and whether the short sellers get it right, and, when the price drops, whether the results are sensitive to the severity of the conduct.

To assess the anticipation of misconduct by short sellers they measure abnormal short interest (ABSI): raw short interest minus expected short interest. Raw short interest is measured by the number of shares that are short divided by the outstanding shares in a month. The expected short interest is short interest relative to one of three benchmarks based upon the firm's characteristics. The chart below shows the three measures of abnormal short interest and the importance of each. ABSI Model 1 includes the smallest number of factors.

	Model 1 (used to calculate *ABSI(1)*)	Model 2 (used to calculate *ABSI(2)*)	Model 3 (used to calculate *ABSI(3)*)
$Size_{low}$	-1.952	-0.709	-0.813
	[-13.09]	[-8.22]	[-8.32]
$Size_{medium}$	-0.922	-0.322	-0.395
	[-9.92]	[-4.76]	[-5.02]
BM_{low}	0.345	0.270	0.264
	[7.49]	[6.51]	[6.28]
BM_{medium}	-0.353	-0.266	-0.286
	[-14.12]	[-11.92]	[-12.05]
$Momentum_{low}$	0.402	0.454	0.466
	[8.16]	[11.07]	[10.30]
$Momentum_{medium}$	-0.147	0.093	0.093
	[-5.48]	[3.64]	[3.59]
$Turnover_{low}$		-2.261	-2.248
		[-16.10]	[15.73]
$Turnover_{high}$		-1.899	[-1.88]
		[-16.14]	[-15.72]
$Institutional\ ownership_{low}$		-0.949	-0.931
		[-10.46]	[-8.94]
$Institutional\ ownership_{high}$		-0.588	-0.531
		[-8.38]	[-6.84]
Total accruals			0.419
			[7.38]
Insider selling			3.823
			[10.28]
Industry controls	Yes	Yes	Yes
Adj-R^2	0.21	0.27	0.28

Included in *ABSI(2)*

Karpoff plots the raw and abnormal short interest during the 20 months before and after the initial revelation of financial misconduct for each stock. All measures of ABSI rise continuously and peak about 5 days after the misrepresentation is made public. Using this information Karpoff concludes that short sellers anticipate misrepresentation.

Next, Karpoff turns to the question of the importance of the misconduct's severity. He considers three measures of severity based on fraud charges, insider trading charges, and total accruals. He concludes, as can be seen in the chart below, each of the severity measures are economically meaningful.

Change in severity measure	Implied change in *ABSI(1)*, in %
Fraud	1.65
Insider trading	2.03
Total accruals: 10th to 90th percentile	3.02

Fraud charges nearly double ABSI

Insider trading charges more than double ABSI

Karpoff concludes that, on average, short sellers convey substantial benefits to uninformed investors, although for the median firm these benefits are negligible and slightly negative.

Finally, Karpoff turns to the question of whether short sellers affect markets and social welfare. For this he asks the question, do short sellers help uncover financial misconduct? To this he answers yes, short interest:

1. Dampens price inflation during the violation period and does not exacerbate price decline when the misconduct is revealed.
2. Decreases the time to public discovery of the misconduct.
3. Does not exacerbate price decline when the misconduct is revealed.

9. Paired Bond Trades

Eric Zitzewitz, Associate Professor of Economics, Dartmouth College, presented "Paired Bond Trades." Zitzewitz had previously presented a paper at the Q-Group® seminar in Fall of 2007.

Zitzewitz begins by pointing out what we know about bond trading:

- Essentially all bond trading is in dealer markets despite existence of exchanges (e.g. NYSE bonds).
- Bonds do not trade frequently.
- Trading costs are high, especially for small trades.
- Many investors are locked into using a single dealer as a counterparty.
- Recent regulation has sought to reduce trading costs with some success.

In spite of what we know, he says that there are many open questions:

- Do trading costs reflect rents?
- Is price regulation (ex post enforcement actions when markups are deemed excessive) optimal?
- Should exchange-based trading be mandated?

In this research Zitzewitz examines why trading costs are so much higher for small versus large bond trades. There are two leading explanations for the difference: bonds trade almost exclusively in dealer markets rather than on an exchange; a lack of price transparency. Trading in dealer markets increases costs for several reasons: it is more labor intensive than exchange trading; trading and dealer costs have a fixed component per trade, thus requiring a higher percentage spread for smaller trades. The second explanation focuses on transparency: dealer markets are less transparent than exchanges. This can differentially disadvantage small-trade clients particularly if they face higher costs of comparison shopping across dealers.

To examine this, Zitzewitz uses information about small corporate bond trades. He finds that these trades are routinely "paired" - same size client and interdealer trades occur

within 60 seconds of each other, and these pairs of trades are usually for exactly the same quantity and/or are executed during the exact same second. Controlling for trade size, pairing of clients is more common for "vanilla bonds," senior investment grade bonds with no credit enhancements, callable/convertible issues, and non-round-number-priced client trades. He does find that the pairings are typically made for seasoned bonds, although not right before they mature. In addition, his pairings show that two dealers pair more frequently as shown in the following chart, though he says it is not clear why.

Dealer	Trades	Pairing rate (%)
1. Bank of America	2,153	0.9
2. Morgan Stanley	1,941	8.7
3. Citi	1,919	9.8
4. J.P. Morgan	1,650	2.4
5. Jeffries	1,568	1.8
10. UBS	**876**	**52.2**
16. Merrill Lynch	**580**	**50.5**
All others	21,601	4.7

To look at the paired trades Zitzewitz uses the ex-post corporate bond transaction information from Trade Reporting and Compliance Engine (TRACE). From that data he locates what appear to be paired trades: trades of equal quantities occurring in proximate time. He finds:

1. Thirty seven percent of dealer-client corporate bond trades are paired with a dealer-dealer trade, usually for same exact quantity and executed at exact same second.
2. Trading costs are higher for paired trades of given size and the spread is split roughly 50-50 between pairing dealer and ultimate dealer
3. Implied pairing dealer profit is essentially never negative (0.4 % of pairs).
4. Pairing rates are:
    a. Much higher for trades under $100k (46%) than for trades over $500k (4.5%).
    b. Lower for institutional (NAIC matched) trades of a given size.

In addition he finds that the pairing rate is lower for round-price trades and the interdealer spread is higher for small trades and bonds of low credit quality, although pairing shows the dealer spread is U-shaped in trade size and credit quality. Putting trade size and cost together with pairing dealer profit, Zitzewitz finds that profits for paired trades decline as the trade size increases but are non-negative for paired trades made within 15 minutes. For all of his matched finds there were no trades made at a loss.

Zitzewitz spells out the implications of his research. First, pairing suggests many investors do not (or cannot) search over the entire market, and dealers with preferred access to orders (due to contracts or relationships) earn substantial and nearly risk-free trading profits. Second, by Wall Street standards, pairing dealer profits are tiny, out of $3.8B/yr. corporate bond dealer profits, only $360M are pairing dealer profits. Third, there is, he says, some evidence that excessive markup regulation has an impact in holding down excessive profits. Finally, he concludes that understanding pairing is important to other empirical bond asset pricing research.

10. Hard Times

Christopher Polk, Director of the Financial Markets Group, Professor of Economics, London School of Economics, presented "Hard Times" coauthored with Stefano Giglio, Ph.D. Candidate, Department of Economics, Harvard University.

Polk begins with the question that motivates this study: where will the market go? He says that many think it is easy to forecast the market's direction, particularly when there is a bubble. However, it is not, and, at times, has been banned. To demonstrate this Polk provides the NY State Statute 899 that explicitly forbade forecasting. Guilty transgressors face jail time and/or a fine.

In spite of prophecy's reputation, given that the US stock markets have had two major boom/bust cycles in the past 15 years, the ability to understand them is important and to predict them even more important. Thus, Polk asks the following questions:

- How should we interpret these dramatic fluctuations?
- Are stock prices driven by changes in discount rates or by expectations about profits?

Polk says that the answers to these questions are important because they tell us about the proximate causes of stock market fluctuations, and the answers may reveal future prospects for the stock market.

To begin, Polk focuses on the two recent downturns: the "Internet Bubble" of 2000-02, and the "Financial Crisis" of 2007-08. He says that during the first bubble stock prices fell primarily because discount rates increased. However, low discount rates were the main driver in the booms of 1990s. The Financial Crisis was, Polk says, largely expected cash flow based and cash-flow based declines are much more long lasting

To examine the distinction between the impact of discount rate and cash flow expectations changes, Polk uses a structured econometric approach that builds on research by others but adds the estimate of the aggregate VAR. This imposes the cross-sectional restrictions of the inter-temporal capital asset pricing model (which is assumed to be correct), thus reducing uncertainty about the components of the stock market fluctuations. This methodology, Polk says, relies on specific assumptions about the data generating process,

which he believes are reasonable, although their results also are consistent with a simpler and much less elegant model.

In the model, the authors include the following variables with data on French's six portfolios:

- Excess log return on CRSP value-weighted index
- Log ratio of S&P index to 10-year smoothed earnings
- Term spread in Treasury yields (10 years to 3 months)
- Small-stock value spread (difference in log B/M for small growth and small value portfolios)
- Default spread (BAA to AAA bonds)

Their analysis shows that:

- Theoretical restrictions improve the out-of-sample forecasting power of the VAR.
- Return forecasts were much lower in the 1990's than in the mid 2000's and increased much more rapidly in 2000-02 than in 2007-09. The contrast is particularly striking in their theoretically-restricted model.
- The increase in expected return mitigated the impact of the tech bust for long-term investors. However, the changes in expectations were particularly abrupt in March 2009, and a strong recovery should not have been anticipated at the time, a forecast in line with his presentation title "Hard Times."

From their analysis, Polk comes to three concluding observations:

1. Value stocks have higher returns on average because they have lower realized returns during periods of negative cash-flow shocks.
2. Imposing this theory when estimating a time-series model for the equity premium improves out-of-sample performance.
3. In contrast to the tech boom/bust, a good portion of the recent downturn reflects expectations of significantly lower future profitability.

11. Socially Responsible Investing and Expected Stock Returns

Sudheer Chava, Associate Professor, College of Management, Georgia Institute of Technology presented "Socially Responsible Investing and Expected Stock Returns."

The recent off-shore oil spill by British Petroleum in the Gulf of Mexico and the resulting environmental and economic damage emphasizes the need to understand how environmental externalities can be internalized by a firm. Chava points to four possible mechanisms that can impact a firm's environmental practices:

1. Taxes, such as a carbon tax.
2. Regulation, such as institution of a cap and trade program and/or imposition of tough new regulations on the environmental performance of firms.
3. Environmentally responsible lending where lenders may impose a higher cost of borrowed capital and/or more restrictive terms on non-responsible firms.
4. Socially responsible investing (SRI) where current and potential shareholders may demand higher expected returns from firms that are not socially responsible.

Exclusionary ethical investing can lead to polluting firms being held by fewer investors, thus resulting in a lower stock price and an increased cost of capital. Socially responsible lending can lead to an increase in the cost of capital for the affected firms if a significant number of lenders adopt environmentally sensitive lending policies and firms cannot easily substitute between various sources of capital.

The import of socially responsible investing, Chava points out, is clear: in late 2010, $3.07 trillion in assets were tied to SRI in the US and SRI constituted 12.2% of total US assets under management. In addition to an impact on stock price, environmental concerns can impact lending costs. As an example he points to The Equator Principles that were initiated by World Bank and International Financial Corporation (IFC). Signatories agree to integrate social and environmental risk into their lending decisions. Current signatories represent approximately 80% of global lending volume and include Bank of America, Citibank, and J.P. Morgan Chase.

Chava asks, does SRI or environmentally restricted lending actually impact the environmental profile of a firm? To answer this question he looks at the impact on the firm's expected stock returns and the price and terms of its bank loans. For firm level environmental data Chava uses ratings information from KLD Research & Analytics, Inc. on environmental concerns (e.g. hazardous waste, substance emission and climate change concerns), and environmental strength (e.g. environmentally beneficial products, pollution prevention and clean energy strength). KLD, he says, has data for a larger cross-section of firms over a longer time period than any of the alternate data sources. The data covers the S&P 500 from 1991-2000 and the Russell 2000 starting 2001. This data, Chava says, does have some problems:

- Disclosure of greenhouse gas emissions is not mandatory.
- It is difficult to evaluate and quantify the risk implied by the disclosed numbers.
- KLD collects information from a number of data sources.
- KLD's team of qualified analysts evaluates the data and makes decisions about whether the firm has a specific environment exposure or not.

From this data Chava constructs the following variables:

- Numconcerns measures the total number of environmental concerns for the firm recorded in the KLD database.
- Numstrength is the total number of environmental strengths for the firm recorded in the KLD database.
- Netconcerns is a net measure of environmental concerns and is constructed as numconcerns-numstrength.
- Climscore is constructed as the difference of climate change concerns (climchange) and clean energy strength (cleanenergy).

To determine the impact of the variables on stock price he uses as a proxy for ex-ante stock returns derived from the Implied Cost of Capital (ICC). His ICC is based on discounted cash flow model of equity valuation and his analysis controls for such things as leverage and includes a test for industry impact. ICC, Chava says, has the advantage of being a forward looking measure that does not explicitly rely on any asset pricing model and does not need long sample periods. He does point out, however, it requires assumptions about the forecasting horizon and dividend payouts.

Using implied cost of capital derived from analysts' earnings estimates, he finds investors demand significantly higher expected returns from non-SRI stocks; those that are excluded by environmental screens widely used by SRI. In addition, these stocks have lower institutional ownership and are held by fewer institutional investors.

Next Chava turns to the question of environmentally responsible lending. He asks why lenders consider the environmental profile of the firm in pricing loans. He suggests that it could be any or all of the following: potential credit risk related to regulatory uncertainty and unexpected change; uncertainty regarding borrower litigation and compliance costs; potential impact of expanded lender liability laws; possible impact of current and future environmental practices on the lender's reputational risk. As a result of his analysis, laid out in detail in his paper, he finds:

1. The environmental profile of a firm affects the price and non-price terms of its bank loans because:
    a. Environmental concerns increase loan spreads
    b. Environmental strengths decreases loan spreads

2. Lenders consider the environmental profile of the firm in pricing loans because:
    a. The environmental profile is not simply a proxy for an omitted component of the firms default risk.
    b. Environmental strengths and concerns are priced both in short-term and long-term loans.
    c. Lower syndicate size for firms with environmental concerns and larger syndicate size for firms with environmental strength.

While it is a challenging task to conclusively rule out the risk story, the results are consistent with reputation-risk-channel of information transmission. They suggest that socially irresponsible investing and the consequent increase in the cost of capital is one channel though which environmental externalities can be internalized by the firm. A second channel is that of the cost and availability of debt.

Regardless of channel, on the basis of this research, one can conclude that it pays for a company to be environmentally responsible. For the lenders and shareholders, it changes the environmental risk profile of the firm at the cost of potentially lower expected returns.