Executive Summary

Q Members gathered at the Trump National Doral, a historic site bought and renovated by Donald Trump in 2012, for their Spring meeting. It is ironic that the first meeting after the 2016 election of Trump was held at one of his properties—certainly something that was not anticipated when the event was scheduled years ago.

“Going forward with Reverse Mortgages”

Deborah Lucas opened the meetings with a discussion of why “reverse mortgages”—a product that seems to solve a lot of the cash flow problems of seniors—are not a popular financial product. The reasons behind this unpopularity include an “image” problem among seniors, but Lucas focused on the high cost of such borrowing to homeowners and how competition among lenders is not currently driving down such costs.

“The extraordinary role of money”

William Goetzmann delivered a very colorful and interesting talk on the history of money, drawing from both Eastern and Western civilization for examples. He emphasized that the innovation of money facilitated the investment in projects through time and space—such as projects in the New World financed by Europeans that would take decades to pay off.

“Playing possum”

Lauren Cohen welcomed Q participants back from One-on-Ones with a fascinating talk on the information contained in 10-Q and 10-K filings over time, and the inertia displayed by both the filers and the readers of those documents. Cohen used natural language processing to examine all filings from 1994-2014, when the SEC first enacted electronic filing.

“It’s the cash flows”

Lars Lochstoer shed new light on an old question: What drives the returns of equity anomalies? By employing a panel VAR system and aggregating firm-level cash flow and discount rate estimates, he presented strong evidence that cash flow variation is the primary driver of anomaly returns. Discount rate changes amplify cash flow variation in that they are negatively correlated. Time-varying aggregate risk aversion seems to have very little role in forecasting anomaly returns.

“It’s not just all about Trump”

Thomas Mann and Norman Ornstein, for the dinner keynote, presented a tough criticism of the Trump administration, as well as some background on the genesis of the “Trump phenomenon.” They noted that populism has been growing on both sides of the political spectrum for decades; evidence of this can be seen in the relatively successful campaigns of Ross Perot, Ralph Nader, and Bernie Sanders—all somewhat extreme in their views—during past elections.
Clifford Asness, Q board member, kicked off the second day of the Spring 2017 seminar and re-examined the betting-against-beta (BAB) phenomenon --- whereby low beta stocks outperform high beta stocks on a risk-adjusted basis. By decomposing the beta factor into a correlation factor and a volatility factor, he presented evidence that both low-volatility and low-correlation stocks perform “better than they should”—suggesting that leverage aversion is an important part of the low-risk effect (as are lottery preferences).

Jules van Binsbergen argued that active management has incorrectly been labeled as a “deadweight loss” to the economy, as popularized by Sharpe’s so-called “active arithmetic.” In contrast to popular opinion, active management contributes great value to the economy because of its role in correcting mispricing in the form of incorrect discount rates of firm cash flows (by trading mispriced stocks). In turn, correction of such incorrect discount rates improves the allocation of capital to positive NPV projects.

Two papers on climate change followed. First, Ravi Bansal estimated the sensitivity of industry portfolios of stocks on long-term climate change, as well as the present-value implications of expected climate change. Next, Harrison Hong focused on stocks from food companies, which tend to be small companies that derive most of their revenues from a single country. In studying 31 countries, Hong finds that investors appear to underreact to worsening drought conditions in some countries, and improving conditions in others.

Steve Heston used a dataset of more than 900,000 news stories to examine whether news can predict stock returns. He found that daily news predicts stock returns for only 1 to 2 days. Weekly news, however, predicts stock returns for one quarter. Positive news stories increase stock returns quickly, but negative stories have a long-delayed reaction.

Joseph Gerakos employed a dataset of $17 trillion of assets under management to document that actively-managed institutional accounts outperform strategy benchmarks by 86 basis points on a gross basis (42 on a net basis) during the 2000-2012 period. Estimates from a Sharpe (1992) model imply that their outperformance comes from factor exposures (“smart beta”). Recent growth of the ETF market implies that asset managers are losing previous advantages.

We close with a thought: there is nothing more gorgeous than the north in autumn. Accordingly, Q-members can look forward to a very new northerly setting for the Fall meetings: Vancouver!
Paper #1: Hacking Reverse Mortgages

Deborah Lucas, Sloan Distinguished Professor of Finance, and Director, MIT Golub Center for Finance and Policy, has been working on issues involving government investments and loans for quite some time, such as government-subsidized student loans (see Lucas, 2012). In this talk, she discussed her research on “reverse mortgages,” a product for senior citizens that is subsidized by the federal government.

Reverse mortgages are somewhat like regular mortgages, in that there is a (house-) collateralized loan made in return for a promise to repay—with the option to prepay the loan and the option to default on the loan by the homeowner (the Reverse Mortgage “writer”). From the homeowner’s perspective, it is a position that is long your house, short a loan, long a put option (where the house is abandoned upon exercise—usually death), and long a pre-payment call option (where the reverse mortgage disappears). However, instead of making payments on the loan, interest plus insurance (paid to the federal government, in return for bearing the losses upon default) accrues and becomes capitalized into the loan over time.

Professor Lucas shared the general sentiment that reverse mortgages should be much more popular than they are (less than 2% of eligible households per year enter into a reverse mortgage). For instance, home equity is, for most households (all but the wealthiest), the main (non-Social Security) annuitizable asset (see the figure below). Further, many seniors wish to remain at home and potentially face high costs of moving or downsizing. And, a reverse mortgage provides longevity insurance, since the homeowner is allowed to live in the home as long as desired. Finally, about 80% of households over 62 years old own their home. Clearly, reverse mortgages could fulfill many needs.

In the U.S., about 95% of reverse mortgages are originated by private lenders under the FHA’s HECM program, then are sold to GNMA; next, they are sold to an underwriter, pooled, securitized and sold to the marketplace.
So, why aren’t they more popular among elderly homeowners? Past studies have found several reasons, among them that seniors appear to distrust lenders, partly because of the complexity of the loan. Lucas, however, focuses on cost as a major driver: HECMs are very expensive for borrowers. Her study computes that origination fees range from $2,500 to $6,000 (based on home value) plus closing costs. On top of this are annual fees to the federal government for the default option. Lucas estimates that the average NPV of a reverse mortgage is -$27,000, or -18.6% of the average loan amount.

The federal government receives an NPV of -$4,000. Private lenders are the ones who receive the $31,000 NPV surplus.

Lucas pointed out an interesting “loophole” in HECM, which she called the “ruthless strategy.” This strategy has a homeowner originating a reverse mortgage line-of-credit, but waiting to draw on it until some future date. If, at that date, the house (equity) value is less than the line-of-credit, borrow the maximum amount. The result is that the federal government takes the shortfall.

Why doesn’t competition among lenders in the reverse mortgage market make these products more attractive for homeowners? Lucas offers that (1) homeowners may be reluctant to shop or lack the know-how to compare offers, (2) there may be high marketing and selling costs of lenders—to reach borrowers—may be responsible for their high costs, or (3) there may be high risk-premia for bearing longevity or prepayment risk. Lucas also wondered why the federal government should be so deeply involved as an intermediary—why not let the private sector compete in this market more freely?

For further study by Q members, a useful survey of seniors’ attitudes toward reverse mortgages is available at http://retirement.theamericancollege.edu/sites/retirement/files/Home_Equity_Literacy_Survey_Report.pdf.

Bibliography

Paper #2: Money Changes Everything

William Goetzmann, Edwin J. Beinecke Professor of Finance and Management Studies, and Director, International Center for Finance at the Yale School of Management, presented a fascinating and wide-ranging historical talk that gave an overview of his new book, “Money Changes Everything” (Goetzmann, 2016).

The theme of the book, and Goetzmann’s lecture, is that time and space are the essential dimensions in finance. Specifically, money allows speculators to invest in a project that is far away, geographically, and may take many years to pay back investors (think New World investments by Europeans). Thus, money takes a central role in the development of civilizations.

Goetzmann first discussed a museum piece from the Yale Babylonian collection that showed an early record of compounding of interest.

Next, he displayed a picture of some 400 B.C. Greek Drachmas, which carried the image of an Athenian owl on one side and an olive leaf (olives were produced in Athens) on the other. These coins were created because Athens had become much more populous than its ability to feed itself; coins were created to enable trade with outside regions for food. In essence, money was created as a contract between parties, where the contract could either be redeemed for goods in Athens, or traded with others. Such tradeable contracts had the effect of increasing trade both outside and within Athens.

Goetzmann next introduced Guan Zhong, an economist and reformer of the State of Qi, the last state to be consolidated into China, during the 7th century, BC. Guan focused on the value of money, which resulted in Qi becoming a major center of commerce in the ancient world.

Marco Polo, the great Venetian explorer of China, wrote about how the Chinese made paper money; such money contained anti-counterfeiting inscriptions. And, copper-plate engraving was first invented in China since there was a need to mass-produce paper money.

Polo was from Venice. In Venice, Rialto Square was the first bond trading market. A merchant in Venice who wished to borrow or lend came to this place, as did bankers, and investors could also buy government bonds in the square. The bonds issued were bearer securities; one would receive periodic interest if you physically presented the bond to the borrower; Goetzmann showed a picture of a perpetual bond issued in 1648, which still pays interest; Yale owns it, but someone must travel to Europe to collect the interest.

Goetzmann showed a painting of a mill in Toulouse, the Bazacle, which was organized as a company in 1372 by merging 12 smaller companies. Innovations including shareholder voting rights were established with this company. Goetzmann showed a chart of Bazacle Share Prices and Dividends; the chart shows that (smoothed) dividends and prices are cointegrated—evidence of rational pricing!

He next showed a piece of stone from the Eastern shore of Canada (Frozer Bay); this stone was the motivation for many voyages, as explorers thought the stone held gold. This episode is
especially interesting because it was an example of how a European could invest in equity in a very risky project that took place geographically very far away.

Goetzmann then discussed the Mississippi Bubble (1719-1720), the biggest bubble in history; he showed a picture of investors furiously trading pieces of paper that were claims on the New World.

Finally, Goetzmann discussed a book written by Fibonacci in 1202, Liber Abaci, generally thought to be one of the most influential math books ever written; it was written in Florence, and covers Fibonacci’s work. Among other things, the book advocates the use of the digits zero through nine as the basis of a numeral system! Only recently have scholars noted that this book also contains early insights into finance and business, such as how to divide up the profits from a company based on capital structure, and no arbitrage conditions among commodities. In addition, Fibonacci was the first to figure out how to compare cash flows with different timing!

**Bibliography**

Paper #3: Lazy Prices

Lauren H. Cohen, L.E. Simmons Professor of Finance at Harvard Business School wondered whether investors are too lazy to read 10-Q and 10-K filings, and, accordingly, examined whether changes to 10-Q and 10-K forms are predictive of future stock returns. The idea is that, if investors miss changes in information contained in SEC filings of corporations, there may be “hidden gold” in such information.

They test several different variables for predictive power. The bulk of the presentation focused on the power of linguistic variables to predict stock returns. Using different similarity measures for text, e.g., cosine similarity, Jaccard similarity, and minimum edit distance, they measure year-over-year similarities between all 10-Q and 10-K filings from 1994-2014 (electronic data is available from the SEC EDGAR website starting in 1994). They create quintile portfolios each quarter, where Q1 are the highest changers (the least similar to the prior year filing) and Q5 are the lowest changers.

They find that a portfolio which is long the lowest changers and short the highest changers (Q5-Q1) returns almost 8% per year, with the shorts contributing twice as much as longs. Performance of a long/short portfolio returns a whopping 22% per year if the portfolio is constructed from measuring just the Risk Factors section in the filing.

To understand the genesis of the paper, Professor Cohen began by sharing his journey through the research process, which began as a study of the supply chain. Companies are required to publish the names of customers that account for more than 10% of revenue in their filings. For example, Wal-Mart might account for 14% of a company's revenue. However, filings sometimes include customers that account for less than 10% of a company's revenue. Since most companies don't report data unless required, Mr. Cohen hypothesized that companies were too lazy to update their template. After all, copy-paste is the easiest way to file paperwork, especially if each change in wording needs approval from a boss, an auditor, and a team of lawyers. As one former auditor said, “CEOs asked that I change the 10-K as little as possible.”

Professor Cohen shared several fun examples of inertia and the desire not to change (none of these appear in the paper): (1) a scanned expense form, with marks from three-hole punches, from the SEC, (2) his own academic papers, which borrow heavily from previous papers, and (3) the SALY rule (Same As Last Year), which is the solution to a high turnover problem at the auditing firms.

A Case Study

To motivate his findings, Cohen led a case study of NetApp. According to his linguistic measures, the NetApp 10-Q filings had not changed for several quarters until June 2011. In June 2011, the filing included new language that included a reference to a potential legal challenge related to resellers. In November 2011, news broke that a NetApp reseller in Italy had sold equipment to Syria. The U.S. government opened an investigation and recommended not buying equipment from NetApp. The stock tanked.
The main contribution of the paper is relating changes in the text of SEC filings to future stock returns, including changes in text:

- Regarding the executive team
- Measuring negative words
- Measuring uncertainty words
- Measuring litigiousness words
- Prepared by internal vs. external legal counsel
- Within different sections of the filings.

Cohen’s models included several control variables, such as Post-Earnings Announcement Drift (PEAD), structural breaks (Sarbanes-Oxley), and the risk-factors of three-factor and five-factor models.

The presentation focused on the changes within different sections of the filings. It showed that the section entitled “Management’s Discussion and Analysis” (MD&A) is the section that changes the most, but that the section that is most predictive of future stocks returns is the “Risk Factors” section. They assert that the Risk Factors section is the kitchen sink of the filing, as companies put anything and everything in the section to keep their fiduciary responsibility, but is also the section which almost no one reads.

In unpublished results, they show the “most convincing” evidence of lazy prices. The SEC publishes an anonymized website traffic log file. By tying the number of downloads to their measurements, they show that inattention to filings is directly related to their results. They conclude that “investors are very good at looking at changes in accounting statements, but not in text.”

During Q&A, it was relayed that back in the day, the SEC encouraged companies to update their MD&A section. If they did not, the SEC would send letters to those companies.

During Q&A, it was asked whether the order independent measures (Jaccard) are better or worse that the edit distance measures. Professor Cohen indicated that the order independent measures were slightly better, as they were less prone to overfitting.

During Q&A, it was asked if they had controlled for industries. Professor Cohen indicated that industry adjustments do not materially change the outcomes.
Paper #4: What Drives Anomaly Returns?

Lars A. Lochstoer, Associate Professor of Finance, Anderson Graduate School of Management, UCLA, wondered “What drives the variance in anomaly returns?” Lochstoer chose five long-short anomalies—value, size, profitability, investment, and share issuance (or buyback)—which past research has shown exhibit positive alphas (CAPM or Fama-French factor models). Of course, a positive alpha contradicts the efficient market hypothesis.

Lochstoer performed a return attribution using the two sources of net present value (NPV): (1) cash flow and (2) discount rate, where the discount rate incorporates risk aversion and the riskless interest rate—following the work of Campbell and Shiller (1988), using index data, and Vuolteenaho (2002), using individual stock data. Using annual data (1962-2015) and a vector autoregression (VAR) model, they find that time-series variation in cash flows explains more variation in anomalies than variation in discount rates, whereas the market is driven more by discount rates than cash flows. Furthermore, there is little commonality in anomaly and market cash flow or discount rate shocks.

The chart below shows the variance decomposition of the returns to these five well-researched anomalies; for all five anomalies, cash flow variation is substantially more important than discount rate variation in explaining anomaly returns. In addition, the covariances between cash flow and discount rate shocks are negative --- amplifying the impact on stock prices.
The importance of a one standard deviation in anomaly characteristics is summarized in the following impulse-response graph that is based on the fitted VAR models:
The evidence presented by Professor Lochstoer is inconsistent with theories of time-varying risk aversion and theories of common shocks to investor sentiment. It is most consistent with theories in which investors over extrapolate firm-specific cash flow news and those in which firm risk increases following negative cash flow news.

**Bibliography**


Dinner Keynote:

Q members heard a blistering critique of the Trump administration, at least in its actions so far, from two leading “global thinkers for diagnosing America’s political dysfunction,” according to Foreign Policy.¹

The speakers were Thomas E. Mann from the Brookings Institute, a centrist or liberal-leaning Washington, D.C., think tank, and Norman J. Ornstein from the American Enterprise Institute, a Washington, D.C., conservative think tank.

Both have specialized in chronicling Washington politics for a long time. They are working on a new book, which will be released in the fall of 2017. Mann and Ornstein gave Q participants some insights into the contents of the book, as well as into their past work and books.²

Ornstein opened the discussion with a monologue on the genesis of the Donald Trump phenomenon. He opined that Trump did not emerge from nowhere; Mann and Ornstein have been documenting the conditions that led to the “angry populism and partisan tribalism” for two decades, and have documented their findings in a couple of their published books.

In short, Donald Trump did not just emerge from nowhere. The two speakers have been documenting the evolution of U.S. society for two decades. During this period, they have documented the explosion in nativism, isolationism, and protectionism in the U.S. We saw some hints of this in the 1992 election, where Ross Perot—who talked on the campaign trail of the “giant sucking sound of jobs going to Mexico”—led all candidates in the polls during the summer and even into the fall of 1992. Another hint could be seen in the popularity of Ralph Nader, who played a role in spoiling Al Gore’s election chances in 2000.

Perhaps most interesting is that outsiders with relatively extreme views have come from both the political left and right—e.g., Bernie Sanders and Donald Trump. Ornstein stated that a widespread view was that there would be another flirtation with an outsider, then we would settle with someone like Jeb Bush. It is partly due to the unconventional conservatism displayed by Trump—at times sounding like a true tax-cutting conservative, while, at other times, sounding like a big-spending liberal—that led to his surprisingly widespread popularity.

Nativism, which Ornstein also referred to as “Tribalism,” has been building since the 1970s and 1980s. By 1994, Newt Gingrich harvested some of its growing power to lead his party out of 40 years of being in the minority in Congress, but, Ornstein argues, at the cost of the populace feeling that the party in power is always out-of-touch or even corrupt. Ornstein pointed out that the media—starting with talk radio, then escalating through other media forms using the internet—has “enabled” tribalism and populism.

Ornstein noted the surprising fact that 61% of the electorate believed, when he was elected, that he was not competent to be President. In addition, Trump is the first President with no prior experience in government—either in the military or through holding elective office at the

¹ “The FP Top 100 Global Thinkers,” Foreign Policy, November 26, 2012.
² See, for example, “It’s Even Worse than it Looks,” Basic Books, 2012.
state or federal level. Further, Trump has (so far) surrounded himself with several people with little or no experience.

Ornstein ended with one important comment. Tribalism is not just partisan. Tribalism is also formed between U.S. states, as well as between large cities, between smaller cities, and between small towns. An especially important trend is that “tribes” tend to be surrounded with mutually reinforcing viewpoints and media.

Mann then presented his monologue. He first discussed the election, pointing out that the Clinton campaign was so confident of winning that her team did not have a concession speech. He opined that even the Trump campaign thought that Clinton would win.

Trump’s first promise was an even better health care plan than Obamacare. Unfortunately for him, congressional Republicans did not really want this; they appeared to want to abolish Obamacare without a replacement. Mann suggests that a Faustian bargain has been made: Trump needs Republican leadership to disable congressional oversight of his problems with Russia and his businesses, and to counteract the media. Congress needs Trump’s signature on new policies, such as tax reform. Mann also opined that, as a result of being out of power for a long time, Republicans wish to do a lot of reactive things (cut taxes, repeal Obamacare, etc.) rather than actually confront the real problems of the country. That is, they are stuck in the role of fighting the majority, rather than being the majority that runs the country.

An audio recording of the entire dinner speech can be obtained on the Q-Group website, www.q-group.org.

**Bibliography**

**Paper #5: Betting Against Correlation**

Cliff Asness, Founder, AQR, posed the question of “What is the best way to cash in on the low-risk effect (in cash equities)?” And, more importantly, “why does low-risk investing work”?

To explore these questions, Asness ran a horse race between two new, low-risk factors: Betting Against Correlation (BAC) and an idiosyncratic volatility factor called Scaled MAX (SMAX). The BAC factor is long stocks with low correlation to the market and short stocks with high correlation to the market. The SMAX factor is long stocks with a low, volatility-normalized MAX factor and short stocks with the opposite characteristic. The MAX factor is the average of the five highest daily returns over the last month (akin to an upper-tail VaR). (Related papers use factors called LMAX and FMAX, which ignore the volatility-normalization transformation.)

Using data from 1931-2015, Asness finds that the BAC factor generates a Sharpe ratio of 0.93 (t-stat of five-factor alpha = 5.45) and the SMAX factor generates a Sharpe ratio of 0.78 (t-stat of five-factor alpha = 4.78). With tongue-in-cheek, Asness admits that this is a data-mined result. BAC is closely related to the Betting Against Beta (BAB) factor, but ignores the volatilities of the security as well as the market. Mr. Asness showed that BAC outperforms BAB, though the outperformance is due to a single year in the 1930s.

According to Asness, there are two main economic theories that explain why the low-risk effect exists that are derived from the tendency of investors to try and beat a benchmark:

1. **Leverage constraints.** This theory says investors tilt portfolios toward high-beta stocks to beat a benchmark because there may be constraints, perhaps self-imposed, to borrowing in order to invest in a leveraged portfolio of lower-risk assets. Given the supply-and-demand curve for low-risk assets, low-risk assets outperform high-beta assets on a risk-adjusted basis, out-of-sample (in which case risk should be measured using systematic risk).

2. **Demand for lottery-like payoffs.** This theory says investors tilt portfolios towards stocks with high probabilities of hitting home runs, rather than singles and doubles, in order to beat a benchmark (in which case risk should be measured using idiosyncratic risk).

Understanding the whys of low-risk investing determines which of the hows should be used to harvest it.

Asness argued that leverage aversion is best measured by beta. The BAC factor is mathematically related to the Betting Against Beta (BAB) factor. The key is understanding that any univariate beta, i.e. the CAPM beta, can be decomposed into a correlation component and a ratio of volatilities, \( \hat{\beta}_{i,mkt} = \rho_{i,mkt} \cdot \frac{\sigma_i}{\sigma_{mkt}} \).

The BAC factor isolates the first component in this definition. By stripping out the volatilities, BAC has no exposure to idiosyncratic risk; or, in other words, no exposure to lottery payoffs. (The paper also studies another dimension of beta, Betting Against Volatility (BAV), where BAV is long low-volatility stocks and long high-volatility stocks. But this factor was
mentioned only in passing during the presentation, as Asness made the case that BAC was at least as important as BAV.) BAC does not prove the leverage-aversion hypothesis, but at least it is consistent with the theory. BAC does not say anything about lottery demand.

To test the theory of lottery demand, Asness turned to SMAX, which evidence, he said, was not as convincing as BAC. The SMAX factor is related to idiosyncratic skewness.

Finally, Asness runs a horse race. However, to make the horse race fair, he had to slow down the clock on SMAX, the “high frequency value factor.” Extending the lookback window to one year, he shows that the SMAX factor no longer works. When he further examines the low-beta effect, he finds that the five-factor model indicates that the low beta effect is subsumed by profitability (RNW) and investment (CMA).

In summary, Asness’s central idea is to break up beta into two components: correlation and volatility, then to show that the correlation component is driving more of the beta results than the volatility component.

Marty Liebowitz, who introduced Mr. Asness, confessed he had one regret in life—that he could not hire Cliff Asness when he graduated from the University of Chicago.

Finally, Asness suggested an alternative title to his talk: “Making leverage-aversion great again.”
Paper #6: Real Anomalies

Jules van Binsbergen, Nippon Life Associate Professor of Finance at The Wharton School, presented a paper that “pushed back” on the popular notion that active investment management is a dead-weight loss, in aggregate, to the economy. Key to his paper’s more positive valuation of active management is that the “real economy” uses financial prices for important reasons; to illustrate, he explores the use of discount rates as a driver of the level of investment by the economy. More specifically, van Binsbergen pointed out that overvalued firms—those with a negative “alpha” using an asset-pricing model, such as the CAPM—are those which the market has discounted projects at a cost-of-capital that is too low, leading to overinvestment by these firms.

Conversely, the market has applied a positively biased discount rate to stocks with a positive alpha, leading to underinvestment. In this setting, active management has value in correcting the non-zero alphas, so that investment decisions in each firm are based on a (more) correct discount rate (cost-of-capital).

Van Binsbergen’s goal, in this paper, is to estimate the value to the economy of the correction of mispriced stocks by active management. Of course, it is impossible to know how much mispricing has been corrected through the trades of active managers. Therefore, van Binsbergen looks at some well-known anomalies in order to generate some estimates of how these anomalies distort investment and reduce economic output.

To motivate, van Binsbergen pointed out that recent papers have documented that lower stock alphas accrue to firms with a higher level of capital investment. The below figure shows an example of this relationship.

![Graph: CAPM alphas of decile portfolios (both series are demeaned)]

This relation between investment and alpha is also consistent, he argued, with the reverse causality: that firms with a higher level of investment (due to a negative alpha, or a discount rate that is too low) overinvest (ending up in investment Deciles 6-10 above).
To exploit this insight, van Binsbergen builds a model of a production economy, where firms adjust their investment slowly (due to search costs) and face diseconomies-of-scale. Importantly, firms find it more costly to disinvest than to increase investment, consistent with “fire-sales” when disinvesting fixed capital. Next, the model overlays an “exogenous alpha” process across firms, i.e., investors misprice stocks randomly. The model is calibrated by choosing parameters such that the model’s predictions fit several observed real-world stock characteristics, such as the cross-sectional distribution of the market-to-book ratio of U.S. stocks. Finally, he compares the investment of firms using the calibrated model under the “exogenous mispricing” mentioned above with a world where all alphas are equal to zero (due to perfectly competitive active management).

As a result of the model’s assumption about frictions of investing and disinvesting, anomalies that are short-lived, such as return momentum, are not a “big deal” to the real economy; the value premium, on the other hand, will have a large impact, since its mispricing lasts for a very long time. Another important result is shown by the below figure—the “Average Relative Value Gain” if active management perfectly eliminated the exogenous mispricing in the model is especially important for stocks from firms with a Q-value between about 1 and 1.5—i.e., (moderate) growth firms! This is due to the ease in which growth firms can both over- and under-invest; value firms are limited in their disinvestment due to the assumed frictions in selling capital—which value firms would (optimally) like to do more often than growth firms, since their market-to-book ratio (Q-value) is lower than one.

Van Binsbergen concluded that active management is important for setting proper discount rates, which incentivizes appropriate investment levels by firms. He also concluded that, for stock mispricing to be harmful, it:

1. Must be persistent,
2. Must not be constrained to only small firms, and
3. Must be present in firms with a Tobin’s Q between 1 and 1.5 (or at least greater than 1).
Paper #7: The Price of Long-Run Temperature Shifts in Capital Markets

Ravi Bansal, J.B. Fuqua Professor of Finance and Economics at Duke University, presented a paper that had a goal of estimating the risk-premium, for equities, associated with their exposure to temperature change. For Q members, the exposure of their portfolios to this subtle risk factor may be worth evaluating, especially if they are concerned with long-term asset-liability management.

As a second goal, Bansal wished to estimate how much society should spend today to manage climate change. For instance, what are the total worldwide expected economic damages, i.e., the discounted cash flows from doing nothing? Bansal’s approach uses a model of stock returns that includes a “temperature risk-factor” to estimate the magnitude of the Social Cost of Carbon (SCC). That is, he measures the exposure of industry portfolios to temperature change, then uses this result in a model of long-run consumption risk to estimate the SCC.

An important contribution of Bansal’s paper is that it endogenizes the risk of climate change into the choices of long-run consumption patterns by investors, rather than assuming (as many climate researchers do), that there is deterministic cost to climate change. That is, in Bansal’s model, investors optimally adjust consumption based on the extra source of temperature risk.

Bansal noted that measuring the exposure of industries to temperature change and the risk-premium that accrues to this exposure is especially difficult, since long-run temperature change is a slow-moving variable, has been moving in only one direction (increasing), and its effects are far in the future—this last fact making the discount rate to apply to the changes in cash flows of such exposure incredibly important in determining the SCC.

Bansal develops a long-run risk-based climate change model, LRR-T, to quantify the SCC. This model is basically a long-run consumption-based model that is augmented with temperature-driven natural disasters, thus, the LRR-T acronym.

First, global CO₂ emissions during any period, \( t \), are modeled as a function of aggregate consumption,

\[
E_t = C_t^{\lambda_t}
\]

where the exponent, \( \lambda_t \), is the carbon intensity of consumption. Next, the geophysical link between (logged) CO₂ emissions, \( e_t \), during any period, \( t \), and temperature is modeled as,

\[
T_t = \nu T_{t-1} + \chi e_t
\]

Finally, consumption growth is modeled as having (1) a long-run growth process, (2) periodic random shocks, and (3) a negative impact from disasters, \( D_t \), from climate change, which is modeled as a Poisson process that increases in size and frequency as temperature rises (which, in turn, is governed by the above equation). Importantly, if a disaster occurs, it has a permanent (long-term) impact on consumption.
Using this model, Bansal calibrates the emission and temperature paths from projections by environmental economists (e.g., Nordhaus, 2008 and 2014). Other features of the model, including the elasticity of equity prices to temperature risks, are calibrated using empirical data—which also provides an estimate of the “temperature risk-premium.” Finally, the SCC is measured as the required increase in current consumption that is necessary to compensate a risk-averse investor for a marginal increase in current emissions (over that investor’s entire future consumption path).

Using this model, Bansal answers the second question posed at the beginning of his talk. That is, he estimates, in equilibrium, that society—given current trends in global temperatures without any action—would impose a tax of up to about $0.23/gallon of gasoline to avoid the SCC.

Importantly, however, Bansal finds that this SCC is sensitive to the assumed risk-aversion of investors. If, for example, investors are less risk-averse to long-run consumption, then the SCC is only a fraction of the above-noted $0.23/gallon of gasoline. The implications of risk preferences of investors for the optimal policy response to climate change are explored in Bansal, Kiku, and Ochoa (2015).

**Bibliography**


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3 Specifically, Bansal estimates the temperature-related exposure of the Fama-French 25 book-to-market (btm) and size-sorted portfolios, as well as 10 industry portfolios having differential levels of “heat exposure”, according to the National Institute for Occupational Safety and Health; heat exposure is the sensitivity of an industry’s cash flows to temperature changes. In doing so, Bansal introduces an empirical asset pricing model that includes, for each of the 25 btm and size portfolios, a “temperature beta,” which measures the impact of temperature changes on portfolio return. The result of estimating this model is that value firms are more exposed to temperature risks than growth firms. In addition, the “temperature risk-premium” is about -1%/year, while the average “temperature beta” is -0.06 (equities, on average, are hurt by increases in temperature)—indicating an average risk-premium of 6 bps/year over the long-run for equities due to their exposure to temperature risk. Bansal also estimates that the elasticity of equity prices to temperature fluctuations has increased dramatically from pre-2000 to 2012—reflecting that stock prices are showing an increased sensitivity to long-run temperature changes.
Paper #8: Climate Risks and Market Efficiency

Harrison Hong, Professor of Economics at Columbia University, presented a paper that focuses on the long-term trends of droughts for food industry profitability, based on the fact that climate change likely has the most impact on food production, relative to other industries.

Hong ranks countries, each month, on their long-term trends in drought, using a drought-sensitivity index, PDSI (Palmer, 1965), which combines temperature and soil moisture data. The PDSI of a country contains both short-term and long-term components, so Hong estimates the long-term component (that associated with long-run climate change) from the coefficient on a time-trend variable in a model that also includes a lagged PDSI variable,

\[ \hat{PDSI}_{i,t} = a_i + b_i t + c_i PDSI_{i,t-1} + \epsilon_{i,t}, \]

an AR(1) model with a time trend coefficient \((b_i)\) that is estimated, using the above regression, at the end of each month, using an expanding window of observations as the monthly PDSI progresses through time. Hong applies this model to each of 31 countries having at least 10 stocks in the food industry that exist from 1985 to now.

Take, for example, Peru, which is a country that is currently being heavily negatively impacted by climate change, according to its estimated negative coefficient on time in the above PDSI model—i.e., suffering more droughts. Indeed, Hong noted that there is a lot of public outcry in Peru over the growing changes in its environment. New Zealand, on the other hand, is benefitting by experiencing fewer droughts over time, showing a positive time-trend coefficient.

Then, Hong estimates the change in Net Income/Total Assets for food stocks in Low (negative trending) vs. High groups, testing the hypothesis that the coefficient on time-trend has an economically detectable effect on the returns of food stocks from a particular country. Indeed, Hong finds that countries with a more negative PDSI time trend coefficient have lower profitability in their food sector (as measured by yearly change in Net Income to Total Assets) over the next three years, as compared with countries with a more positive PDSI. A long-short strategy based on this observation generates a 7-8%/year alpha. All of this indicates that investors underreact to the long-term trend component in droughts on the profitability of the food industry in each country. Hong also finds little sensitivity of other industries to this country-specific PDSI time-trend. Also helping with the country-specific identification is that food stocks tend to be small companies with the majority of their revenues earned within a single country.

Q Members may be interested in the coefficient on time trend in each country, which is shown in the below table:
Countries in the above table with a time-trend coefficient that is positive are, on average through all expanding windows, exhibiting improved food stock profitability from climate change in their region (at least so far).

Hong notes that these results may inform Q Members about what to buy-and-hold, rather than representing a profitable trading strategy, as most of the food stocks are small companies that may not be easily tradeable.

Hong concludes that country stock markets appear to be inefficient with respect to information about climate change and its ensuing long-term trends on droughts. Countries with negative time-trend have lower profitability in the food sector over time; and food stocks with a negative time-trend have lower future returns.

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<th>Country</th>
<th>Intercept</th>
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Steve Heston, Professor of Finance at the University of Maryland, asked a question that has been addressed by past research, “Do news stories predict future stock returns”? Using over 900,000 news stories from the Thomson Reuters covering U.S. stocks from 2003 to 2010, CRSP, and Compustat, Heston finds a news sentiment feature that predicts stock returns, with positive news predicting returns for the next 1-2 weeks, and negative predicting returns up to the next 13 weeks. Much of the return occurs around earning announcements. This result suggests that positive news is quickly incorporated into prices, but negative news is not. A long/short portfolio that is long positive news sentiment stocks and short negative news sentiment stocks earns 50 bps per month (excluding transaction costs and borrowing costs, which should eat meaningfully into the 50 bps).

While previous research has documented a contemporaneous relationship between news and returns, including Heston, finding a predictive relationship between news and returns has been more elusive. But Heston shows, through data, why previous studies may have been flawed. First, most studies use one-day formation period and forecast a few days forward. This can be problematic as the frequency of news releases is related to the size (SMB) factor—the larger the company, the more news. Only 35% of the firms have more than one news article written about them each week. Thus, it is hard to construct a daily trading strategy on sparse data.

By lengthening the factor formation window to one week (Saturday to Friday) and lengthening the forecast window to one quarter, Mr. Heston shows that the news sentiment factor works. There were questions about contemporaneous measurements. Mr. Heston was very careful to differentiate contemporaneous returns from future returns. For example, a stock may have appreciated for three days, Monday, Tuesday, and Wednesday. On Thursday a positive news article may have been written, explaining why the stock had appreciated the previous three days. The weekly news sentiment factor will go long this stock, which is hind-casting returns. For this reason, the charts show cumulative returns starting on period one (the period after portfolio formation).

The raw news sentiment signal originates from Thomson Reuters NewsScope Data. In many respects, Heston treats NewsScope as a black box, though he reports it is a neural network trained on 3,000 news articles that were hand-coded. He repeatedly referenced an alternative model, the bag-of-words model, but the paper employed NewsScope (ostensibly he tested elsewhere). Heston’s news sentiment signal is constructed by the average positive minus negative sentiment on all news stories about a stock during the formation period. Putting it all together, the news sentiment factor is long stocks with positive news sentiment signal and short the opposite characteristics.

The following chart shows that the news effect is comparable in size to other well known anomalies.
Heston teased apart this news sentiment anomaly into the “news effect” and the “sentiment effect” via Fama-Macbeth regressions. He showed, quite convincingly, that the “sentiment effect” is the driving force behind the factor.

Through a battery of tests, the paper controls for several variables, including publication effect (information confirmation from multiple stories), distribution of news, earnings announcements, size, and momentum. They conclude that neither size nor momentum subsumes the news sentiment factor.

It was noted that other studies have used the contemporaneous daily stock return—not the Thomson Reuters NewsScope algorithm—to score news articles as positive or negative.
Joseph Gerakos, Associate Professor of Business Administration, Tuck School of Business at Dartmouth College, addressed whether institutional funds can be cloned with smart beta products. The main contribution of this research is its estimate of gross alpha attributable to active management, 131 bps per year. Gerakos calculates average blended fees of 44 bps per year from active management; in dollar terms, this amounts to $469 billion per year of alpha, with $307 billion accruing to the investor, and $162 billion to the asset manager (the numbers do not align due to the variation in asset classes).

Gerakos began the presentation by estimating the amount of capital invested in institutional funds (primary vehicles). He backed out allocations to secondary vehicles, such as institutional mutual funds, hedge funds, and private equity, to arrive at assets under management (AUM) of $43 trillion.

The paper then proceeds to analyze a novel data set provided by a consultant, covering $26 billion in AUM (2012) allocated to 15,893 funds across 3,318 firms (2000-2012). The authors perform several tests to validate that the data are from a random draw of the investment management population. The only issue noted was that data exhibits a structural break beginning in 2007, which is the year many firms adopted GIPS --- inducing a jump in reporting.

They estimate two gross alphas—one by subtracting out the broad market return corresponding to the fund’s stated asset class (U.S. equities, global equities, U.S. fixed income, and global fixed income) and one by subtracting out a strategy-specific, consultant-stated benchmark, e.g. Australian equities. They find that the overall asset-class gross alpha is 1.31% per year and the overall strategy-specific gross alpha is 0.86% per year, with higher alphas for fixed income and lower alphas for public equities. Net alphas are 44 bps lower. The tracking errors associated with these alphas are almost as large as the asset-class volatility themselves. There were repeated concerns regarding the size of the tracking error as well as the asset-class benchmarks (e.g., government fixed income vs. credit).

Because the strategy-specific alphas were so large, Gerakos also tests whether fund managers have gamed the system by choosing lower risk/easy-to-beat benchmarks. He finds that stated-benchmark coefficients are actually less than one, implying that fund managers are not gerrymandering.

Finally, Mr. Gerakos worked through an exercise to clone all the funds in the data set. With minor modifications to the Sharpe (1992) model, he estimates the exposures of each fund to 15 indexes using constrained regression, where the constraint is that the coefficients sum to one. Rolling forward the regression every month creates the mimicking portfolio. The gross alphas resulting from the mimicking portfolio are much lower than the strategy-specific alphas reported above, implying that asset managers have tilted their portfolios away from stated benchmarks to other risk factors, which tilt has been additive.
Setting aside the consultant’s database, they embark on an exercise to match (or beat?) the overall returns of the consultant’s database. To do so, they employ mean-variance optimization (MVO) within each of the four asset classes before aggregating to form the portfolio. (The details of which of the 15 assets are used in each asset class is in the paper; the details of MVO caused some confusion at the conference.) The expected returns were estimated from past returns. The plain vanilla version of MVO failed to replicate the institutional performance while a version of MVO with a diagonal covariance matrix (zeros on the off-diagonal) succeeded. It was noted that a diagonalized covariance matrix ignores important relationships, but which was countered with, “It was the only way we could get it to work.”

The audience highlighted that the horse race was biased in favor of the clone as the clone ignored trading costs and management fees (even replicating a fund in-house has overhead).