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Academic Insights**Harnessing the best ideas from academia****Welcome to our monthly Academic Insights report****Fresh insights from academia**

Every month we scan the academic world for new ideas related to quantitative investing. This month we focus on two broad themes: 1) the search for fresh data sources; and 2) new risk management techniques.

On the data front, we highlight two interesting papers that utilize unique new data sources. The first looks at using text mining techniques to extract alpha signals from Twitter posts, and the second utilizes a database of class-action lawsuit filings to evaluate the performance of stocks in the wake of litigation.

We also flag two interesting papers that focus on new risk management techniques. One takes a micro approach and develops a real-time measure of order flow toxicity, while the other steps up to the macro level and proposes a new index to measure systemic risk in the financial system.

Key papers this month

This month we focus on five papers spanning a range of topics including alpha generation, risk management, and portfolio construction:

- Tweets and trades: The information content of stock microblogs
- Misdeeds matter: Long-term stock price performance after the filing of class-action lawsuits
- Measuring global systemic risk: What are markets saying about risk?
- The microstructure of the flash crash
- Performance attribution: Measuring dynamic allocation skill

Upcoming events

We also highlight upcoming conferences and seminars in the quantitative investing space that may be of interest.

The best of the rest

At the back of this report we include abstracts from some additional papers that we think are also quite interesting. These are arranged by topic to make skimming the list quicker. If you need any further information on any of the papers in this report, please contact the Deutsche Bank Equity Quantitative Strategy team on (+1) 212 250 8983 or (+44) 20 754 71684, or email us at DBEQS.Global@db.com.

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Introduction

Welcome to *Academic Insights*

The steady stream of interesting academic research shows no signs of slowing

The year may be rapidly drawing to a close, but there seems to be no slowdown in the steady stream of interesting academic papers that are crossing our desk. The papers we have picked this month form an eclectic bunch, but they do share a few common themes.

Data, data, data

Regular readers will know that we spend a lot of time looking for new data sources to hopefully provide fresh alpha signals. Fortunately, our counterparts in the academic community also devote considerable time to this topic. This month we highlight two papers that, while interesting in their own right, are also worth reading just for the new data sets they utilize.

The first theme we focus on this month is one of our favorites: the quest for new and unique data sources

The first is a fascinating paper by Sprenger and Welpel [2010] who use Natural Language Processing (NLP) techniques to mine Twitter posts for alpha signals. For those who haven't come across it yet, Twitter is a microblogging service that allows users to post short text messages online. Over the past year Twitter has experienced explosive growth, and there is now a growing community of Twitter users who regularly post (or "tweet") stock investment ideas. The authors find some predictive power in Twitter sentiment (not enough to survive transaction costs), but from our perspective we think this paper is interesting because it highlights a growing desire by quant investors to quantify qualitative data.¹

Also on the data front, an interesting paper by Bauer and Braun [2010] looks at how class-action lawsuits impact short- and long-term stock returns. We think this paper is particularly relevant given the current litigious environment following the financial crisis. The paper is also worth reading from a data perspective, because the authors utilize an interesting database of litigation proceedings that goes all the way back to 1995.

Real-time risk management

A second theme we emphasize this month is the search for new risk management techniques; unsurprisingly this has become very popular post the financial crisis

A second theme we are seeing in the academic literature is on the risk management front. Unsurprisingly, the turmoil of the financial crisis has prompted a deluge of research on new risk management techniques, and more specifically on techniques that help quantify risk on a timelier basis. We through two papers on this front looked interesting.

The first, by Easley, de Prado, and O'Hara [2010] introduces a new Probability of Informed Trading metric called *VPIN* that can be used to measure the toxicity of order flow in real-time. They illustrate the efficacy of their measure by looking at the so called "flash crash", and show how *VPIN* could have given an early warning signal that liquidity was evaporating across a range of asset classes. The second paper, by Sullivan, Peterson, and Waltenbaugh [2010], steps back to the macro level and develops a new way to measure systemic risk in the financial system. The outcome of this paper is a risk index that can be tracked to gauge the overall risk in the system.

As always, we hope you enjoy reading *Academic Insights*.

Regards,
The Deutsche Bank Equity Quantitative Strategy Team

¹ We explored this idea in more detail in our news sentiment research, see: Cahan, R., Y. Luo, J. Jussa, and M. Alvarez, 2010, "Signal Processing: Beyond the headlines", *Deutsche Bank Quantitative Strategy*, 19 July 2010

Five key papers this month

Paper 1: "Tweets and trades: The information content of stock microblogs"

- Timm Sprenger and Isabell Welpé
- SSRN, available at <http://ssrn.com/abstract=1702854>

Why it's worth reading

One recent research trend that we are fascinated by is the idea of transforming qualitative data into quantitative data. For example, we recently studied how the sentiment in news stories can be quantified by applying a technique called Natural Language Processing (NLP) to the text of the article.² This new paper takes the idea a step further by analyzing how stock predictions in Twitter posts can be quantified using NLP and potentially used to predict future returns, volume, or volatility.

Data and methodology

Twitter is a microblogging system that allows users to publish, or "tweet", short messages that are up to 140 characters in length. These messages are then displayed on the Twitter website or via third-party applications in real-time. Like other social media websites, Twitter is used for broadcasting a wide range of messages, but this paper focuses on the growing community of users who actively share their stock trading ideas via tweets. In such trading-related tweets, a convention has evolved whereby the poster will reference a stock by its ticker, preceded by a dollar sign (e.g. \$AAPL for Apple).

In this paper the authors examine over 200,000 stock-related tweets, covering S&P 100 companies over the first six months of 2010. Using NLP techniques, the authors automatically classify each tweet as "buy", "hold", or "sell" based on the linguistic characteristics of the tweet. They then propose a "bullishness" indicator that is essentially the ratio of buy versus sell tweets for a given stock over a trailing window. This metric, along with the number of tweets about each stock, is used to predict future stock returns, volume, and volatility.

Results

The authors present a range of interesting results assessing the lead-lag relationship between tweet characteristics (e.g. bullishness, number of tweets) versus market variables. However, the key result from our perspective is the profitability of simulated trading strategy that goes long the three stocks with the most bullish sentiment and short the three least bullish stocks. The paper finds positive returns using a daily rebalance, but as the authors are quick to acknowledge, those returns are too small to survive reasonable transaction costs.

Our take

We think the actual trading strategy proposed is somewhat unrealistic, and would not survive even moderate transaction costs. Furthermore, the length of the backtesting (six months) is hardly enough to draw any concrete conclusions. However, looking at the bigger picture we think this paper is a great example of where quant is heading. Increasingly, it will no longer be good enough to rely on standard financial databases (company fundamentals, analyst earnings revisions, etc.) and expect to generate significant alpha. Future outperformers will be those who can best harness unique new datasets before the rest of the Street.

The idea of quantifying non-numerical data is rapidly gaining traction in the quant community

Twitter is a microblogging service which is increasingly being used to pass on stock trading ideas

This paper examines whether such user-generated stock picks have predictive power for future returns

The authors find positive returns to a simple, sentiment-based trading strategy, but these returns are too small to survive transaction costs

Notwithstanding the weak profitability, we think this paper is indicative of the future of quant – those who outperform in the future will be those who can harness new data the best

² Cahan, R., Y. Luo, J. Jussa, and M. Alvarez, 2010, "Signal Processing: Beyond the headlines", *Deutsche Bank Quantitative Strategy*, 17 July 2010

Paper 2: “Misdeeds matter: Long-term stock price performance after the filing of class-action lawsuits”

- Rob Bauer and Robin Braun
- *Financial Analysts Journal*, Volume 66, Number 6, available at <http://www.cfapubs.org/doi/abs/10.2469/faj.v66.n6.6>

Why it’s worth reading

The fallout from the financial turmoil of the past few years has precipitated a dramatic rise in litigation activity. This in itself is no surprise – litigation also spiked after the bursting of the dot com bubble – but what is surprising is the relative lack of academic research studying the impact of litigation on firm performance. So we were particularly pleased to see this recent paper that comprehensively examines the short- and long-term impact of class-action lawsuits on stock prices.

Data and methodology

The most interesting data source in this paper is the Securities Class Action Clearinghouse database which is maintained jointly by Cornerstone Research and the Stanford Law School. According to the authors, this database starts in 1995 and contains class-action lawsuit data for over 2,800 U.S. listed companies. To augment these data, the authors also hand collected further details for each case, which allowed them to divide their sample into categories (e.g., “illegal business practices”, “accounting fraud”, etc.). The rest of the data used in the study are standard, e.g., CRSP for security returns.

The methodology is broadly divided into two sections. The first is a classic event study that examines average excess stock returns for companies before and after the filing of a class-action lawsuit. The second is a calendar-time portfolio study in which the authors track the monthly performance of a portfolio of companies that have experienced litigation over some trailing window.

Results

The paper presents a number of interesting results looking at both the short- and long-term implications of lawsuits on stock returns. At a short horizon, the authors find that share prices fail to recover in the first 40 days after the filing of a lawsuit. Interestingly, almost all the negative performance actually occurs *before* the filing date, even when the authors control for explicit pre-event “triggers” (e.g. a voluntary announcement by the company that a lawsuit is impending before it is actually filed). At a longer-term horizon, the authors track calendar-time portfolios that contain all stocks with litigation events over a range of trailing windows (six to 48 months). These results show that underperformance is strong up to an 18-month holding period, and then gradually diminishes from there as stocks are held longer. When the authors break the sample up into different event types, underperformance on the back of accounting fraud persist for longest (up to 30 months) while negative returns to insider trading litigation only last for six months. The authors make the intuitive argument that accounting fraud indicates pervasive problems at the firm level, while insider trading typically involves only certain individuals at a firm. Hence it makes sense that the latter problem is easier to overcome, for example by terminating the individuals in question.

Our take

We think this paper is an excellent starting point for investors looking to better understand the short- and long-term implications of litigation on stock returns. Given the highly litigious post-financial crisis environment, there will no doubt be an increasing opportunity set for these types of strategies in the years ahead. At a higher level, we think combining event-based strategies with the more traditional factor-based modeling will be a fruitful avenue of research going forward.

There is a surprising lack of academic research on the impact of litigation on stock prices; this paper is a good first step

Data for this study comes from the Securities Class Action Clearinghouse database

Event studies and calendar time portfolios are used to examine pre- and post-event returns

Stock prices fall before litigation events in the near term, but then continue to underperform in the long run

We think this paper is an excellent read, particularly given the increasingly litigious environment post the financial crisis

Paper 3: “Measuring global systemic risk: What are markets saying about risk?”

- Rodney N. Sullivan, Steven P. Peterson, and David T. Waltenbaugh
- *The Journal of Portfolio Management*, Volume 37, Number 1, available at <http://www.ijournals.com/doi/abs/10.3905/jpm.2010.37.1.067>

Why it’s worth reading

Building on the failure of market participants to anticipate extreme events, Sullivan et al.’s effort aims at improving quantitative methods used in monitoring risk. Indeed, the main idea resides in understanding market dynamics, which then provide a monitoring device to help manage portfolio risk proactively, via sensitivity and scenario analyses. Using observable market risk factors, this new paper presents a plausible approach to modeling systemic risk.

Data and methodology

The study is done using generic cross-asset indices (more specifically the Russell 3000 for US equities, S&P Developed ex-US for non-US equities, Citigroup U.S. BIG for fixed income, Merrill Lynch High Yield Master II for high yield, and Dow Jones Wilshire REIT for real estate). The authors focus on the last 20 years, the failure of Lehman Brothers serving as the case to demonstrate the efficacy of the proposed framework.

Sullivan et al. build their global systemic risk indicator in three steps. First, they apply the Extreme Value Theory (EVT) to calibrate the distributions of returns, thus taking into account fat-tails and extreme events and avoiding ill-suited normal distributions. Bootstrapping improves the robustness of the estimates, including the threshold used in the second stage of their model. This parameter helps define a failure (i.e., an asset return below the threshold level is defined as a failure), which is in turn modeled via a hazard function. This time-varying probability of instantaneous failure (i.e., the probability that returns will be below the threshold at each point in time) is calibrated using a set of observable risk factors, namely, the VIX, the TED spread, and the default spread. The relevance of these baseline hazards is assessed not only by their economic significance, but also by their success in predicting failure dates.

In this framework, global systemic risk is defined as the simultaneous failure of three or more asset classes on any given day. The joint relationship is modeled using a logistic regression, such that we end up with a probability of systemic failure at each point in time.

Results

First of all, the use of EVT clearly reveals (as expected) an increased likelihood of downside risk and a structural parametric shift, between the pre- and post- Lehman era. Then, the hazard ratios built from the probability of failure interestingly show that the default spread has become increasingly important in driving the baseline hazards of US equities, while the sensitivity to the VIX has been diminishing. The same feature is observed with the systematic risk index, where a 1% increase in the default spread increases approximately eight-fold the chances of a systemic event occurring. Nevertheless, it is not clear enough whether the jump in the risk index is concurrent with Lehman’s collapse or whether it precedes it.

Our take

The purpose of this new risk index is not to perfectly forecast the next Lehman Brothers type event, but to provide portfolio managers with a new framework to assess systemic risk. The investor could now for instance use a sensitivity analysis to periodically reassess his risk budget, or diversification level. Also, we see potential in the flexibility of the framework; as suggested by Sullivan et al., it’s easy to use additional risk factors. Integrating (with the benefit of hindsight) a sovereign CDS index might have helped around the Greek crisis.

This paper uses observable market risk factors to suggest quantitative methods that can improve risk monitoring

Generic cross-asset indices are employed over the last 20 years.

Extreme Value Theory is used for calibration of asset returns in order to capture extreme events, while failure is modeled using a hazard function. The probability of failure is calibrated based on observable risk factors.

Systemic risk is defined as the simultaneous failure of three or more asset classes.

The evolution of the hazard ratios depicts an increasing importance of the default spread in systemic risk around the Lehman failure.

This new tool could help investors periodically reassess their risk budget, or diversification level.

Paper 4: “The microstructure of the flash crash”

- David Easley, Marcos Mailloc Lopez de Prado, and Maureen O’Hara
- SSRN, available at <http://ssrn.com/abstract=1695041>

This article argues that the “flash crash” is a result of a severe withdrawal in liquidity by electronic market makers due to high levels of order toxicity.

To investigate this theory, the authors calculate a measure of toxicity (VPIN) which is the average ratio of unbalanced volume to total volume.

The paper also shows that the VIX lagged the VPIN metric before, during, and after the flash crash implying that the VIX would likely not be a suitable replacement for VPIN

This paper is an interesting example of how high frequency data can be useful even for low frequency investors

Why it’s worth reading

The so called “flash crash” of May 6th 2010 saw the biggest one-day drop, 998.5 points, in the history of the Dow Jones Industrial Average (DJIA). Ongoing debate has arisen within the investment community and academia with regards to the causes of the flash crash. This article argues that the flash crash was the result of a severe withdrawal in liquidity by electronic market makers due to high levels of order toxicity. Furthermore, the authors provide evidence that the events on May 6th 2010, could have been anticipated to some degree and as such could have potentially been avoided. The authors propose a new metric, VPIN (Volume-Synchronized Probability of Informed Trading), that can gauge order flow toxicity, and show how this metric could potentially have served as an early warning for the events of May 6th.

Data and methodology

The article argues that when trading order flow is in equilibrium, high frequency market makers can earn thin profits across a huge number of trades. However, when order flows are in unbalanced, market makers face losses due to adverse selection. Market makers estimate of toxicity now becomes a crucial factor in determining market making participation. To investigate this theory, the authors calculate a measure of toxicity (VPIN) which is the average ratio of unbalanced volume to total volume. VPIN is essentially a measure of the volume of trade derived from informed traders. The authors calculate the VPIN metric for various asset classes (e.g., futures, commodities, currencies, etc.) for the time period between January 1st, 2008 and August 27th, 2010. The paper also examines the behavior of the VPIN metric from a statistical perspective in the hours and days prior to the flash crash

Results

The authors find that VPIN was abnormally high one week before the flash crash and that it worsened even more several hours before the crash. The paper further finds a positive and statistically significant correlation of 15% between the VPIN metric and future volatility of E-mini S&P 500 futures, suggesting that an increase in the VPIN metric foreshadows an increase in volatility. The authors also find that the VPIN metric Granger-causes volatility, suggesting that the causal link goes from the VPIN metric to volatility and not vice versa. The paper also shows that the VIX lagged the VPIN metric before, during, and after the flash crash, implying that the VIX would likely not be a suitable replacement for VPIN

Our take

We think this paper is an interesting example of how real-time risk management is becoming increasingly important. It also ties in with our recent research looking at how high frequency data can be useful even for low frequency investors.³ The VPIN metric is promising because it is relatively easy to calculate, and hence can be tracked in real-time as a gauge of order flow toxicity. As market volume becomes increasingly dominated by high frequency players, it is important to have tools to track when liquidity is likely to be available and when it might dry up. This paper suggests a useful way to monitor the market’s vital signs on this front.

³ Cahan, R., Y. Luo, J. Jussa, and M. Alvarez, 2010, “Signal Processing: Frequency arbitrage”, *Deutsche Bank Quantitative Strategy*, 10 November 2010

Paper 5: “Performance attribution: Measuring dynamic allocation skill”

- Jason C Hsu, Vitali Kalesnick, and Brett W. Myers
- *Financial Analysts Journal*, Volume 66 Number 6, available at <http://www.cfainstitute.org/learning/products/publications/faj/Pages/faj.v66.n6.3.aspx>

Why it’s worth reading

Readers who have kept up with our research are aware of our recent focus on style timing as a partial remedy for traditional quant factor underperformance. This paper follows our efforts in that it extends one of the more basic performance attribution methodologies – Brinson Analysis – to incorporate the effect of dynamic allocation decisions. The new dynamic framework presented in this article allows quantitative equity investors to attribute their performance across both the stock selection and factor timing dimensions. This new method is in line with an attribution technique we presented (see Cahan et al., “It’s all in the timing”, 19 August 2010) that decomposed alpha model skill (IC) across both of these dimensions.

Data and methodology

The authors test their methodology on two sets of data. The first is a simulated set of data that constructs returns for different style managers based on a static and a dynamic allocation strategy. The second set of data focuses on a select set of well known mutual funds such as Fidelity Magellan Fund, Janus Fund, and T. Rowe Price Small-Cap Stock Fund. The funds spanned both the large-cap and small-cap universes and were selected from the top 100 funds by AUM in their category in 2008. To illustrate the base case, the authors included the Vanguard 500 Index Fund Investor Shares, which is an index fund that should not have any significant stock selection or factor allocation exposure. The holdings information for each of the funds is obtained from the Thomson Reuters mutual fund database and the fund return data is from the CRSP database.

The attribution analysis relies on a new methodology that combines a simple dynamic return decomposition (see Andrew Lo [2008]) with the conventional Brinson attribution model. The mechanism behind the dynamic return decomposition is straightforward and intuitive. It defines the dynamic return as the covariance between the factor weights and factor returns over time. Therefore, if weights are positively correlated with the returns then the manager has added value via style timing. On the contrary, if the factor weights are negatively correlated with factor returns over time, then the manager’s factor timing decisions has subtracted value. The overall methodology is similar to the original Brinson analysis in that it accounts for both allocation and stock-selection effects, but it goes further in that it also accounts for the dynamic asset allocation or style timing decisions in the strategy.

Results

In the case of the simulated data, the authors show the importance of accounting for the dynamic component of the investment strategy. Indeed, they show how ignoring this component can mislead the attribution analysis to form the wrong conclusion on the real drivers of performance. In the case of the actual mutual funds, the authors find that most are adhering to their investment objective of mostly relying on stock selection, but they were able to detect a few interesting and important style tilts in the funds via the methodology.

Our take

Past holdings-based or returns-based attribution methodologies were unsuitable to correctly disentangle the effect of style timing versus stock selection in an accurate manner. This paper bridges that gap by combining a conventional attribution methodology with a newly found dynamic return decomposition. In addition, the paper adds to the new and exciting literature on dynamic portfolio attribution, which is becoming increasingly important now that style or factor timing seems to be a necessary part of the quantitative toolkit.

This research develops a new attribution methodology to accurately measure returns to dynamic allocation decisions

The methodology is tested in two ways: using simulated data, and using real life data from well known mutual funds

Returns to dynamic allocation are measured as the covariance between factor weights and factor returns over time

The results show that ignoring the dynamic component of the investment strategy can distort the attribution

This paper adds to an exciting new literature on dynamic portfolio attribution

Upcoming conferences

Europe

Figure 1: European event calendar

Date	Location	Conference
7-9 December, 2010	Zurich	Hedge Fund World 2010 http://www.terrapinn.com/2010/zurich/
8-10 December, 2010	Copenhagen	CFA Institute Third Annual European Investment Conference http://www.cfainstitute.org/learning/products/events/Pages/11082010_28493.aspx
9 December, 2010	London	Fifth Annual Conference on Advances in Analysis of Hedge Fund Strategies https://www.imperial.ac.uk/riskmanagementlaboratory
10-12 December, 2010	London	Computational and Financial Econometrics 2010 http://www.cfe-csda.org/cfe10/cfp.html
16-17 December, 2010	Paris	Eighth International Paris Finance Meetings https://www.eurofidai.org/
20-21 January, 2011	Lausanne	Asset and Risk Management in the Aftermath of the Financial Crisis http://www3.unil.ch/wpmu/ibf2011/
3-5 April, 2011	Cambridge	Inquire UK Spring 2011 Conference http://www.inquire.org.uk/
22-25 June, 2011	Braga, Portugal	2011 Annual Meeting of the European Financial Management Association http://www.efmaefm.org/
17-20 August, 2011	Stockholm	38th European Finance Association Annual Meeting https://fisher.osu.edu/blogs/efa2011/

Source: Deutsche Bank

North America

Figure 2: North American event calendar

Date	Location	Conference
10-11 December, 2010	New York	Courant Institute High-Frequency Finance and Quantitative Strategies Workshop http://www.cims.nyu.edu/~mathfcon/index.php/upcoming-events/december-10-11-2010
18-19 December, 2010	Las Vegas	2010 Financial Research Association Meeting http://www.financialresearchassociation.org/
7-9 January, 2011	Denver	American Finance Association Annual Meeting http://www.afajof.org/association/annualconf.asp
6-8 March, 2011	San Diego	Journal of Investment Management Spring Conference https://www.joimconference.com/conferences.asp
13-15 April, 2011	Las Vegas	CQA Annual Spring Conference http://www.cqa.org/events/2010/April_2010.php
29 April, 2011	Chicago	R/Finance 2011: Applied Finance with R http://www.RinFinance.com

Source: Deutsche Bank

Asia Pacific

Figure 3: Asia Pacific event calendar

Date	Location	Conference
15-18 December, 2010	Sydney	2010 Quantitative Methods in Finance http://www.qfrc.uts.edu.au/qmf/

Source: Deutsche Bank

Other papers of interest

Alpha generation and stock-selection signals

ETF arbitrage

- Ben Marshall, Nhut Hguyen, and Nuttawat Visaltanachoti
- SSRN, available at <http://ssrn.com/abstract=1709599>
- Abstract: "The prices of S&P 500 ETFs diverge on an intraday basis. This allows arbitrageurs to profit from a pairs trading strategy of going long (short) the underpriced (overpriced) ETF. The divergence does not seem to be driven by well-documented arbitrage risks and is generally removed quickly as rational investors exploit the inefficiency. The compensation these arbitrageurs receive is economically significant. Profits, net of spreads, average 6.7% p.a. over the 2001-2010 period for transactions involving the two US-listed S&P 500 ETFs and are considerably larger for opportunities including the US Dollar denominated Swiss-listed S&P 500 ETF."

When are analyst recommendation changes influential?

- Roger Loh and Rene Stulz
- *Review of Financial Studies*, forthcoming, available at <http://dx.doi.org/10.1093/rfs/hhq094>
- Abstract: "The existing literature measures the contribution of analyst recommendation changes using average stock-price reactions. With such an approach, recommendation changes can have a significant impact even if no recommendation has a visible stock-price impact. Instead, we call a recommendation change influential only if it affects the stock price of the affected firm visibly. We show that only 12% of recommendation changes are influential. Recommendation changes are more likely to be influential if they are from leader, star, previously influential analysts, issued away from consensus, accompanied by earnings forecasts, and issued on growth, small, high institutional ownership, or high forecast dispersion firms."

Predictability of nonlinear trading rules in the U.S. stock market

- Terence Tai-Leung Chong and Tau-Hing Lam
- *Quantitative Finance*, forthcoming, available at <http://dx.doi.org/10.1080/14697688.2010.481630>
- Abstract: "Most of the existing technical trading rules are linear in nature. This paper investigates the predictability of nonlinear time series model based trading strategies in the U.S. stock market. The performance of the nonlinear trading rule is compared with that of the linear model based rules. It is found that the self-exciting threshold autoregressive (SETAR) model based trading rules perform slightly better than the AR rules for the Dow Jones and Standard and Poor 500, while the AR rules perform slightly better in the NASDAQ market. Both the SETAR and the AR rules outperform the VMA rules. The results are confirmed by bootstrap simulations."

Not all buybacks are created equal: The case of accelerated stock repurchases

- Allen Michel, Jacob Oded, and Israel Shaked
- *Financial Analysts Journal*, Volume 66, Number 6, available at <http://www.cfapubs.org/doi/abs/10.2469/faj.v66.n6.4>
- Abstract: "The authors documented the characteristics and market performance of ASR (accelerated share repurchase) stock. They found that post-announcement ASR stock performance is poor, unlike that documented in the literature for other repurchase methods, which implies that ASRs do not signal undervaluation, a frequently suggested motivation for repurchases."

Optimization, portfolio construction, and risk management

Decomposing cross-sectional volatility

- Jose Menchero and Andrei Morozov
- SSRN, available at <http://ssrn.com/abstract=1708246>
- Abstract: "Cross-sectional volatility is given by the standard deviation of a set of asset returns over a single time period. CSV is critical because it represents the opportunity to outperform a benchmark. In this Research Insight, we present an exact methodology for decomposing CSV into contributions from individual factors. Our approach treats countries, industries, and style factors on an equal basis. We employ our framework to investigate several relevant questions in the global equity markets, such as the importance of industries versus countries, emerging markets versus developed markets, or the strength of style factors relative to industries or countries. We also extend our methodology to decompose and analyze the root mean squared (RMS) return, which is of greater relevance to absolute return managers."

A survey of alternative equity index strategies

- Jason Hsu, Tzee-man Chow, Vitali Kalesnik, and Bryce Little
- SSRN, available at <http://ssrn.com/abstract=1696333>
- Abstract: "A number of quantitative strategies are being offered to investors as "more efficient" than standard market-capitalization-weighted indices. This article reviews the methodologies and investment beliefs behind some of the popular alternative equity beta (passive) strategies and provides an integrated framework for understanding the link between them. U.S. and global equity data were used in various (simulated) horse races and the results are compared here. The Fama-French three-factor model was used to study the risk-adjusted alphas of the indices. The alternative betas do outperform the cap-weighted indices, but the outperformances are driven largely by exposure to the value and small-cap factors. These strategies are similar and, in fact, are isomorphic to naive equal weighting; one alternative beta can often be mimicked by combinations of others. Therefore, in choosing an alternative equity index, implementation cost should be an important evaluation criterion."

Sentiment, convergence of opinion, and market crash

- Qingwei Wang
- SSRN, available at <http://ssrn.com/abstract=1695410>
- Abstract: "I introduce a novel proxy of investor sentiment and differences of opinion among trendchasing investors to forecast skewness in daily aggregate stock market returns. The new proxy is an easy-to-construct, real time measure available at different frequencies for more than a century. Empirically I find that negative skewness is most pronounced when investors have experienced high sentiment. The role of differences of opinion depends on the states of average investor sentiment: it positively forecasts market skewness in an optimistic state, but negatively forecasts it in a pessimistic state. Conceptually, I provide an explanation for the role of differences of opinion based on the theory of Abreu and Brunnermeier (2003). I argue that convergence of opinion in an optimistic state indicates that the price run-up is unlikely to be sustained since fewer investors can remain net buyers in the future. Therefore rational arbitrageurs coordinate their attack on the bubble, leading to a market crash. Vice versa, the convergence of opinion in a pessimistic state promotes coordinated purchases among rational arbitrageurs, leading to a strong recovery."

Offensive risk management II: The case for active tail hedging

- Vineer Bhansali and Joshua Davis
- *Journal of Portfolio Management*, Volume 37, Number 1, available at <http://www.ijournals.com/doi/abs/10.3905/jpm.2010.37.1.078>
- Abstract: "Bhansali and Davis define offensive risk management as the use of tail hedges in a portfolio as a way for investors to allocate more capital to risky assets and simultaneously reduce the risk of large investment losses. If the hedge is purchased at the right price, the portfolio with tail risk hedges may have a more attractive risk–return profile than a buy-and-hold portfolio. The authors show, in the context of the 80-year history of the Standard & Poor's Index, that intuitive rules of thumb for monetization can be justified and that the active management of tail hedges is consistent with the cyclical behavior of the economy and the markets."

Minimum-variance portfolio composition

- Roger Clarke, Harindra de Silva, and Steven Thorley
- *Journal of Portfolio Management*, forthcoming, available at <http://www.ijournals.com/doi/abs/10.3905/jpm.2010.2010.1.009>
- Abstract: "Empirical studies document that equity portfolios constructed to have the lowest possible risk have surprisingly high average returns. Clarke, de Silva, and Thorley derive an analytic solution for the long-only minimum-variance portfolio under the assumption of a single-factor covariance matrix. The equation for optimal security weights has a simple and intuitive form that provides several insights on minimum-variance portfolio composition. While high idiosyncratic risk can lead to a low security weight, high systematic risk takes the large majority of investable securities out of long-only solutions. The relatively small set of securities that remains has market betas below an analytically specified threshold beta. The ratio of portfolio beta to threshold beta dictates the portion of ex ante portfolio variance that is market-factor related. The authors verify and illustrate the portfolio mathematics using historical data on the U.S. equity market and explore how the single-factor analytic results compare to numerical optimization under a generalized covariance matrix. The analytic and empirical results of this study suggest that minimum-variance portfolio performance is largely a function of the long-standing empirical critique of the traditional CAPM that low-beta stocks have relatively high average returns."

Asset allocation and sector/style rotation

Asset allocation under extreme uncertainty

- James Farrell Jr.
- *Journal of Portfolio Management*, forthcoming, available at <http://www.ijournals.com/doi/abs/10.3905/jpm.2010.2010.1.010>
- Abstract: "Asset allocation is always a critical consideration for investors and is difficult to execute. Farrell notes that it is especially so now, after coming out of the worst recession and most severe bear market since the 1930s. This market episode exposed the deficiency of standard risk control procedures such as, for example, international diversification. With extreme uncertainty as to how the economic environment might diverge with respect to inflation, deflation, and strong growth, the forecaster should assess how differing economic environments might impact risk and return for asset classes. In addition, the forecaster needs to assess the likelihood, or probability, of these scenarios occurring in order to determine how to best tilt asset classes in an allocation."

Asset market linkages: Evidence from financial, commodity and real estate assets

- Kam Fong Chan, Sirimon Treepongkaruna, Robert Brooks, and Stephen Gray
- *Journal of Banking and Finance*, forthcoming, available at <http://dx.doi.org/10.1016/j.jbankfin.2010.10.022>
- Abstract: "We use a general Markov switching model to examine the relationships between returns over three different asset classes: financial assets (US stocks and Treasury bonds), commodities (oil and gold) and real estate assets (US Case-Shiller index). We confirm the existence of two distinct regimes: a "tranquil" regime with periods of economic expansion and a "crisis" regime with periods of economic decline. The tranquil regime is characterized by lower volatility and significantly positive stock returns. During these periods, there is also evidence of a flight from quality – from gold to stocks. By contrast, the crisis regime is characterized by higher volatility and sharply negative stock returns, along with evidence of contagion between stocks, oil and real estate. Furthermore, during these periods, there is strong evidence of a flight to quality – from stocks to Treasury bonds."

A scenarios approach to asset allocation

- Susan Gosling
- *Journal of Portfolio Management*, Volume 37, Number 1, available at <http://www.ijournals.com/doi/abs/10.3905/jpm.2010.37.1.053>
- Abstract: "A number of different approaches to asset allocation are used by practitioners, including purely qualitative assessment, simple mean-variance analysis, and more complex multifactor modeling. Since Markowitz published his seminal paper in 1952, however, approaches that rely on the selection of particular parametric return distributions, on summary measures of risk, and on historical data as an indicator of the future still remain widespread. Little doubt exists that such reliance has resulted in serious mismeasurement of risk and misallocation of assets. In this article, Gosling proposes an alternative approach that is important in its implications for investment philosophy and practice. The approach makes more complete use of the information available about the future and virtually forces serious consideration of different time frames, alternate outcomes, and tail risk. The depth of information provided about risk and diversification is also a principal benefit of the approach. The information is not provided by forecasting the future, but by describing what could happen. These changes have the potential to make a significant difference to long-term investment outcomes."

Strategic asset allocation and intertemporal demands: With commodity futures as an asset class

- Yongyang Su and Chi Keung Marco Lau
- SSRN, available at <http://ssrn.com/abstract=1700726>
- Abstract: "This paper analyzes the role of commodities in the process of strategic asset allocation, with an attempt of computing the weight of commodities relative to traditional assets in a multi-period portfolio choice problem and understanding the economic interpretations to its importance. We find U.S. investors have a significantly stable intertemporal hedging demand for commodities in the long horizons, even when they have access to foreign equity markets, for example, foreign stock market. Our results provide support to institutional investors attempting to include commodities into their strategic asset allocation decision."

Trading and market impact

Measuring flow toxicity in a high frequency world

- David Easley, Marcos Mailloc Lopez de Prado, and Maureen O'Hara
- SSRN, available at <http://ssrn.com/abstract=1695596>
- Abstract: "Order flow is regarded as toxic when it adversely selects market makers, who are unaware that they are providing liquidity at their own loss. Flow toxicity can be expressed in terms of Probability of Informed Trading (PIN). We present a new procedure to estimate the Probability of Informed Trading based on volume imbalance (the VPIN informed trading metric). An important advantage of the VPIN metric over previous estimation procedures comes from being a direct analytic procedure which does not require the intermediate estimation of non-observable parameters describing the order flow or the application of numerical methods. It also renders intraday updates mutually comparable in a frequency that matches the speed of information arrival (stochastic time clock). Monte Carlo experiments show this estimate to be accurate for all theoretically possible combinations of parameters, even for statistics computed on small samples. Finally, the VPIN metric is computed on a wide range of products to show that this measure anticipated the 'flash crash' several hours before the markets collapsed."

Are pairs trading profits robust to trading costs?

- Binh Huu Do and Robert Faff
- SSRN, available at <http://ssrn.com/abstract=1707125>
- Abstract: "We examine the impact of trading costs on pairs trading profitability in the US equity market over the period 1963-2009. After controlling for commissions, market impact and short selling fees; we find that pairs trading remains profitable, albeit at much more modest levels. Specifically, we document a risk-adjusted return of about 30 bps per month amongst portfolios of well matched pairs that are formed within refined industry groups. Strategies that are implemented on the top 30% largest stocks produce an average alpha of 19 bps per month. Pairs trading exhibits a lower risk and lower return profile than a short-term contrarian strategy that sorts stocks relative to their industry peers."

The best bid and offer: A short note on programs and practices

- Joel Hasbrouck
- SSRN, available at <http://ssrn.com/abstract=1699426>
- Abstract: "This note describes how to determine the best bid and offer (BBO) from the NYSE's monthly TAQ data, the source that underlies most academic research. At a given point in time the best bid is the maximum bid, taken over the set of current bids posted by all venues. This value persists until one of the bids posted by any of the venues changes. Then the maximum is recomputed. The best offer is computed in a similar fashion. This differs significantly, however, from the BBO defined and computed in Wharton Research Data System (WRDS) documentation and sample programs distributed prior to October 2010. Furthermore, the BBO calculation relies on correct ordering of the quote records. Incorrect sequencing within a reporting exchange's records is much more serious than incorrect sequencing between exchanges. This note explains these problems and makes some summary recommendations."

Finance theory and techniques

Are quants all fishing in the same small pond with the same tackle box?

- Keith Gustafson and Patricia Halper
- *Journal of Investing*, Volume 19, Number 4, available at <http://www.ijournals.com/doi/abs/10.3905/joi.2010.19.4.104>
- Abstract: "Widening anecdotal consensus in recent years has posited that quantitative managers as a group pursue similar alpha factors and similar portfolio construction methodologies, resulting in a "crowded trade." In this article, the authors perform several types of empirical analysis to examine this claim. The authors find no distinguishable trend in return correlations among a broad set of quantitative managers in recent years, with an average monthly pairwise correlation of 0.34 during the 2007–2009 period versus 0.35 for the 2004–2006 period. Preceding years produced similar numbers. This evidence is corroborated through an analysis of actual portfolio holdings from quantitative managers. We find the average active weight holding correlations to be a low 0.14 over the 2007–2009 period. Moreover, in examining the factor loadings of the dataset, we find little evidence to support the notion of "common factor" loadings. We find only three factors where the mean is larger than the variance: price to forward earnings, CFROIC (cash flow return on invested capital), and shareholder yield (a combination of dividend yield, change in shares outstanding, change in total debt, and change in cash holdings). Even for these factors, the results are not strong, and for the vast majority of factors we find diversity to be the norm."

Comoment risk and stock returns

- Marie Lambert and Georges Hubner
- SSRN, available at <http://ssrn.com/abstract=1695493>
- Abstract: "This paper estimates higher-order comoment equity risk premiums for the US stock markets. We use an extension of the Fama and French (1993) method to infer the returns attached to a unit exposure to coskewness and cokurtosis risks in the US equity markets. The coskewness and cokurtosis premiums present significant monthly average returns of respectively 0.2% and 0.4% from March 1989 to June 2008. We test the ability of the moment-related premiums to explain the size and book-to-market (BTM) effects in stock returns. Coskewness and cokurtosis risks seem to be significant in explaining the stock returns of small caps and value stocks. The Four-Moment Asset Pricing Model even captures a higher proportion of the return variability of the portfolios sorted on size and book-to-market than an empirical Capital Asset Pricing Model. The higher-order comoment premiums do not subsume the empirical risk factors of Fama and French (1993) and Carhart (1997)."

A literature review of the size effect

- Michael Crain
- SSRN, available at <http://ssrn.com/abstract=1710076>
- Abstract: "The size effect in the finance literature refers to the observation that smaller firms, on average, have higher returns than larger firms. It also describes the contribution that firm size has in explaining stock returns. Discovered by Banz (1981) in testing the Sharpe-Lintner Capital Asset Pricing Model, subsequent research finds the size effect has diminished or disappeared since the 1980s in the U.S. and UK after small-cap funds were launched. Firm size is thought to proxy for underlying risk factors associated with smaller firms. Observed variations in the size effect can be explained by such underlying factors like market liquidity that change over time. Related research finds the size effect is linked to the January effect. The size effect occurs primarily during January has little or no presence in the other 11 months, which confounds empirical research on risk-

reward relationships. Research also finds the size effect is concentrated in smaller listed firms, making the effect nonlinear.”

Methods of valuation: Myths vs. reality

- Stanley Block
- *Journal of Investing*, Volume 19, Number 4, available at <http://www.iiijournals.com/doi/abs/10.3905/joi.2010.19.4.007>
- Abstract: “The author takes the position that too many entering the profession of finance are incorrectly trained in valuation methods. The price/earnings multiple dominates the investments material, while EV/EBITDA goes largely ignored. In this survey of 1, 209 financial analysts, 41.7% use the P/E ratio as their primary metric, while 36.2% prefer EV/EBITDA. More importantly, the survey participants predict the latter metric will be the primary measuring tool for the future. All of this is going on in spite of the fact that of the 10 leading investment texts, only one has EV/EBITDA in the index or glossary. The survey also shows a resounding negative attitude toward new measures of income proposed by the International Accounting Standards Board (which would be used in valuation models in the future).”

How efficiently does the stock market process news of price anomalies?

- John W. Peavy III and Jason R. Safran
- *Journal of Investing*, Volume 19, Number 4, available at <http://www.iiijournals.com/doi/abs/10.3905/joi.2010.19.4.122>
- Abstract: “If an investable anomaly is discovered and awareness of it spreads, one would expect market forces to bid it out of existence in the long run. In this article, the authors test whether this has happened with the relative value anomaly. This approach to value investing was introduced over 25 years ago and was shown to offer superior risk-adjusted returns. Its outperformance has been well documented in academic and professional journals as well as general interest publications. Has this broad market knowledge of the relative value anomaly diminished the opportunity it holds for investors? The authors examine its performance over time to find out.”

Derivatives and volatility

Comparing different explanations of the volatility trend

- Amir Rubin and Daniel Smith
- *Journal of Banking and Finance*, forthcoming, available at <http://dx.doi.org/10.1016/j.jbankfin.2010.11.001>
- Abstract: "We analyze the puzzling behavior of the volatility of individual stock returns over the past few decades. The literature has provided many different explanations to the trend in volatility and this paper tests the viability of the different explanations. Virtually all current theoretical arguments that are provided for the trend in the average level of volatility over time lend themselves to explanations about the difference in volatility levels between firms in the cross-section. We therefore focus separately on the cross-sectional and time-series explanatory power of the different proxies. We fail to find a proxy that is able to explain both dimensions well. In particular, we find that Cao et al. (2008) market-to-book ratio tracks average volatility levels well, but has no cross-sectional explanatory power. On the other hand, the low-price proxy suggested by Brandt et al. (2010) has much cross-sectional explanatory power, but has virtually no time-series explanatory power. We also find that the different proxies do not explain the trend in volatility in the period prior to 1995 (R-squared of virtually zero), but explain rather well the trend in volatility at the turn of the Millennium (1995-2005)."

Appendix 1

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