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Global

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Academic Insights

Harnessing the best ideas from academia

Welcome to our monthly academic Insights report

Fresh insights from academia
The overlap between what academics are researching and what practitioners are thinking about continues to be high. This month's selection of papers ties in nicely with a number of the themes we have been researching recently.

For example, one paper proposes a new "riskiness" measure that can be derived from options data. This new metric offers a way to play the low volatility anomaly (i.e. the empirical finding that low risk stocks outperform high risk stocks on average) whilst steering away from the traditional – and potentially crowded – minimum variance approach.

Another interesting paper finds that stocks with higher "innovative efficiency", as measured by patent filings, tend to outperform on average. This is a great example of turning a fresh, less scrutinized database into a new source of alpha.

Finally, we flag a paper that continues a theme close to our hearts – the interaction between macroeconomic data and stock performance. The authors explore the link between stock returns and inflation, and debunk some of the common beliefs about which assets make good inflation hedges.

Key papers this month
This month we focus on five papers spanning a range of topics including alpha generation, macroeconomic drivers, and portfolio construction:

- Riskiness measures and expected returns
- Innovative efficiency and stock returns
- Inflation and individual equities
- Practitioner portfolio construction and performance measurement: Evidence from Europe
- International diversification works (eventually)

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 at (+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*

As is usually the case, the overlap between what academics are researching and what practitioners are thinking about is high, so we think you'll enjoy this month's papers.

Minimum variance investing is rapidly gaining popularity; this new papers suggests an alternative way to play the anomaly that is a bit different from the common approach

A new take on the low volatility anomaly

An investing strategy that is rapidly gaining popularity right now is the minimum variance portfolio.[1] Such a strategy seems to offer something that shouldn't exist in financial markets: that elusive free lunch. The strategy is designed to profit from the puzzling anomaly that low risk stocks on average outperform high risk stocks, and as such seems to have the best of both worlds – higher returns at lower risk. Unfortunately, the burgeoning popularity of the strategy also increases the risk that low volatility investing becomes the next crowded trade. With this in mind, a new paper by Bali, Cakici, and Chabi-Yo [2011] caught our attention. In the paper, the authors propose a new "riskiness" metric, which can be derived from options data. They show that stocks with low riskiness significantly outperform stocks with high riskiness – another manifestation of the low risk anomaly. Even better, they show that riskness is different from traditional measures of risk, such as volatility. As a result, their factor suggests a new way to profit from low risk investing while steering away from the standard minimum variance strategy.

An interesting new paper finds that stocks with better "innovative efficiency", as measured by patent filings, outperform on average

Innovative alpha… literally

Staying on the alpha front, an interesting paper by Hirshleifer, Hsu, and Li [2011] finds that stocks with higher "innovative efficiency" outperform in the future at both an operational level and in terms of future stock price performance. Innovative efficiency is measured using novel data from a free patent database provided by the NBER. The authors also show that their innovative efficiency factor is different from more traditional measures of innovation, such as R&D intensity or growth in R&D spending.

This paper delves into the link between inflation and stock and sector returns, and finds some surprising results

The rise and rise of the macro-quant

Regular readers of our research will have noticed that we have spent a lot of time researching ways to incorporate macroeconomic data into bottom-up quant models. In a world where big macro themes continue to be a dominant driver of stock returns, finding a way to systematically adjust models for changing economic conditions is crucial. For example, in Europe we recently explored how announcements of economic news influence stock, sector, and factor performance[2], while in the U.S. we recently studied better ways to construct oil price betas.[3] A new academic paper by Ang, Briere, and Signori [2011] fits nicely with this theme. In the paper, the authors examine the relationship between individual stock returns and inflation. Some of the results are surprising, and debunk some of the commonly held beliefs about which stocks/sectors are best at hedging inflation.

For the rest of this month's papers, read on.

Regards,
The Deutsche Bank Equity Quantitative Strategy Team

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[1] For our take on the subject, see: Alvarez, M., Y. Luo, R. Cahan, J. Jussa, and J. Chen, 2011, "Portfolios Under Construction: Minimum variance: exposing the magic", *Deutsche Bank Quantitative Strategy*, 9 February 2011

[2] Mesomeris, S., M. Salvini, A. Kassam, and J.-R. Avettand-Fenoel, 2011, "Quantitative Musing: Style, sectors and macroeconomic news", *Deutsche Bank Quantitative Strategy*, 11 April 2011

[3] Cahan, R., Y. Luo, M. Alvarez, J. Jussa, and J. Chen, 2011, "Signal Processing: Oil shock – A quant perspective", *Deutsche Bank Quantitative Strategy*, 25 March 2011

Five key papers this month

Paper 1: "Riskiness measures and expected returns"

- Turan Bali, Nusret Cakici, and Fousseni Chabi-Yo
- SSRN, available at http://ssrn.com web site

One of the most intriguing puzzles in finance is that fact that on average low risk stocks outperform high risk stocks

Why it's worth reading

One of the most intriguing "anomalies" in all of finance is the empirical finding that low risk stocks on average outperform high risk stocks in the future. The intrigue comes from the fact that the empirical result runs contrary to one of the fundamental tenets of finance, namely that investors should be compensated for taking on higher risk via higher future returns. This new paper by Bali et al. suggests a potentially exciting new factor for playing the contradictory finding that low risk stocks tend to outperform high risk stocks.

This paper introduces a new metric for measuring the "riskiness" of a stock, based on options data

Data and methodology

The key feature of the paper is the introduction of a new "riskiness" measure. The idea behind riskiness is that traditional measures of risk only consider dispersion, and not the value of the potential outcomes. For example, under the traditional variance measure, an asset with a mean return of 5% and a standard deviation of 1% is considered to have the same risk as an asset with a -5% mean return and a standard deviation of 1%. However, an actual investor would clearly perceive the first asset as less risky. To improve on this shortcoming, Bali et al. turn to options data to derive a forward-looking measure of riskiness. The riskiness metric that they propose is a function of the prices of call and put options trading over a stock, and can be computed for any stock with options trading over it.

Options data comes from OptionsMetrics, which is the de factor standard for options data in the academic world

The input data comes from a variety of sources, the most important of which is OptionsMetrics, which is used for the options pricing data. Standardized options (i.e. interpolated options with a set strike and maturity) are used to avoid making arbitrary decisions about which individual options contracts to use at each point in time. The rest of the data comes from the usual sources: CRSP for pricing and Compustat for fundamental data.

The authors find a statistically and economically significant outperformance for low riskiness stocks versus high riskiness stocks

Results

Two sets of results are relevant for quantitative investors. First, the new riskiness measure is shown to be statistically significant in explaining the cross-section of one month forward stock returns. Furthermore, the difference in average returns between the low risk quintile portfolio and the high risk quintile portfolio is around 0.8% per month, which would appear to be quite economically significant as well. This finding is made even better by the fact that the results hold even after controlling for standard risk measures like volatility, skewness, and VAR. In other words, the new riskiness measure is not just a proxy for existing ways of measuring risk.

Aggregate riskiness can forecast future economic activity

Second, the authors also develop an aggregate measure of riskiness for the S&P 500. They show that this measure can predict one month ahead changes in the Chicago Fed National Activity Index, a proxy for economic growth.

Playing the low risk anomaly is popular right now; this paper suggests a differentiated way to play the idea

Our take

Strategies that take advantage of the low risk anomaly have become extremely popular recently – witness the rapid rise of minimum variance strategies. This paper suggests a new way to harness the alpha in this anomaly that appears to be somewhat different from the standard minimum variance strategy.

Paper 2: "Innovative efficiency and stock returns"

- David Hirshleifer, Po-Hsuan Hsu, and Dongmei Li
- SSRN, available at http://ssrn.com web site

Leveraging on a powerful database of patents, the authors show that companies innovating in an efficient manner are generating higher future returns.

Why it's worth reading

This new paper by Hirshleifer et al. gathers all the ingredients necessary for an interesting article. Leveraging a powerful database of patents, they show that companies innovating in an efficient manner actually generate not only superior subsequent operating performance, but also higher future stock returns. This second fact can notably be explained by the limited attention hypothesis, a theory we have found to be quite convincing in our recent research[4]. Overall, this paper contributes to a community-wide effort to find new sources of uncorrelated alpha and this one pager will hopefully make this research easy-to-process so that you can pay attention.

To measure the innovative efficiency (IE) of companies, three ratios of R&D output to R&D input are computed from the NBER patent database and Compustat.

Extensive tests a la Fama-MacBeth are used to assess the predictive power of IE, both on operating performance and on stock returns.

Data and methodology

We particularly like papers investigating new databases, and this one has two additional advantages: the data is available online, and it's free. To measure the innovative efficiency (IE) of companies, the authors use three proxies, all based on the NBER patent database and on accounting data from Compustat: patents granted scaled by R&D capital, patents granted scaled by R&D expenses, and adjusted patent citations scaled by R&D expenses. This gives stocks a yearly score from 1981 to 2006. To understand a bit more the predictive power of IE, three tests are conducted a la Fama-MacBeth. The first one examines the effect of IE on a firm's future operating performance by regressing the firm's return on assets and cash flows on the log of one plus IE and some control variables. The second one is a traditional test for returns predictability, and the third one tests the limited attention hypothesis as well as the valuation uncertainty hypothesis. To do this, they conduct Fama-MacBeth regressions in subsamples (split by size and analyst coverage to proxy for investor attention, and by firm age, turnover, and idiosyncratic volatility to proxy for valuation uncertainty).

Hedge portfolios constructed on the IE signal generates a 5.2% annualized return, rising to 6.8% when restraining the investment universe to stocks with little investor attention.

Results

Hirshleifer et al. emphasize that IE's predictive power is different and incremental to that of other innovation-related variables such as R&D intensity or R&D growth, variables which have already been exploited in the literature[5]. The Fama-MacBeth regressions show that a higher IE will result in higher return on assets and cash flows over the next year, but also in higher future stock returns. The portfolio analysis shows that the IE signal can generate in the best case 42 basis points monthly or 5.2% annualized using hedge portfolios. Both the Carhart (1997) four-factor model and the Chen, Novy-Marx and Zhang (2010) investment-based factor model fail to explain the returns of the new factor. Also, when restraining the investment universe to stocks with little investor attention, the alpha increases to 6.8% annualized.

Our non-US clients might not be able to exploit easily the data. Paradoxically, that's actually why there could be alpha in it.

Our take

Beyond the fact that the authors exploit a new database to extract uncorrelated alpha, we like that the IE anomaly is also backed by predictive power on operating performance and not only on future stock returns: innovative efficiency really matters for firm value. A potential caveat of the factor for our non-US clients would be the availability of such a database in Europe or in Asia and more importantly, its ease of use. Paradoxically, that's actually why there could also be alpha in it.

[4] See for instance Mesomeris S., Salvini M., and Kassam A., 2010, "Macromomentum County Rotation", *DB Equity Quantitative Strategy*, 15 August 2010.

[5] Existing studies have investigated the input (R&D expenses) or the output (patents) of innovation separately, while here, the authors focus on the ratio of the output to the input, thus studying the productivity of the R&D.

Paper 3: "Inflation and individual equities"

- Andrew Ang, Marie. Briere, and Ombretta Signori
- SSRN, available at http://ssrn.com web site

The authors define a simple inflation beta to assess the hedging ability of individual stocks and equity portfolios

Why it's worth reading

Inflation is certainly one of the major macroeconomic concerns for investors globally. Adjusting one's equity portfolio exposures to take into account inflation is a challenge, whether one's aim is to preserve it against inflation or to benefit from it. Both our European and US teams have suggested frameworks to incorporate inflation in the evaluation of expected returns for equity factors[6][7]. In this paper, the authors focus on the ability of individual stocks and portfolios to provide adequate hedges against inflation risk. Following Bekaert & Wang[8], the ability of a stock to hedge inflation is defined as its monthly return beta with respect to the monthly rate of realized inflation. The authors conduct in-sample and out-of-sample analysis to characterize the best and worst inflation hedgers, review the inflation ability of sectors and high dividend yield stocks.

The study focuses on S&500 constituents over the past 20 years. Inflation beta portfolio characteristics are assessed with a Carhart model

Data and methodology

The study is only conducted for the S&P500 universe. The authors build a dataset of monthly total returns, market caps, headline CPI from Datastream, and supplement it with the Fama-French factors from Kenneth French's website. The dataset starts in 1990 and ends in May 2010. In order to characterize inflation beta, standard asset pricing tests are conducted. Stocks are sorted according to their inflation beta, grouped in quintiles to build capitalization weighted portfolios. The in-sample test uses the full-sample inflation beta whereas the out-of-sample test uses rolling 60 months realized betas. Monthly regressions on inflation beta portfolio returns against Fama-French and momentum factors are run. The same asset pricing tests are applied to the S&P500 sectors and high dividend-yield stock portfolios.

In-sample, the best inflation hedgers have been large cap, growth stocks.

Results

In-sample, the authors find a positive inflation *premia*. They show that the best inflation hedgers have tended to be large cap, growth stocks and belonged to the Oil & Gas and Technology sectors. The worst inflation hedgers experienced the worst performance whilst at the same time collecting the value and size *premia*. They included mainly Financials.

Inflation betas are unstable: high inflation beta stocks, sectors and high-dividend yield stocks do not provide adequate hedges

Out-of-sample analysis reveals that it is difficult to forecast good inflation hedgers. This is explained by the lack of stability of inflation betas over time. On average, during the whole sample, 21.4% of S&P500 stocks had their betas change sign over one year, with a peak close to 70% once the financial crisis broke. This instability makes sector portfolios and high dividend-yield stocks even worse inflation hedges than the out-of-sample high inflation beta portfolio. The good performance of the high dividend yield index is explained by its very significant exposure to value and momentum, and is not related to its inflation ability.

This paper offers a good starting point for further research

Our take

This paper is straightforward and debunks the "idea" that sector allocation and/or high dividend yield stocks can provide hedges against inflation. One could argue that the instability of betas against any "variable" is an issue our readers would have already faced. Further research to assess other methodologies to "track" inflation would be welcome.

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[6] Mesomeris, S., Kassam, A., Salvini, M. and Avettand-Fenoel, J.-R., "Quantitative Musing ", *Quantitative Musing*, Deutsche Bank Quantitative Strategy, 8 February 2011,

[7] Luo, Y., Cahan, R., Alvarez, M., Jussa, J. and Chen, J, "Global Macro – Quant Equity Model", *Emerging Issues*, Deutsche Bank Quantitative Strategy, 18 March 2011

[8] Bekaert G. and Wang X., "Inflation Risk and the Inflation Risk Premium", *Economic Policy*, Volume 25, Issue 64, p. 755-806, October 2010.

Paper 4: "Practitioner portfolio construction and performance measurement: Evidence from Europe"

- Noel Amenc, Felix Goltz, and Abraham Lioui
- *Financial Analysts Journal*, Vol 67, No. 3, available at http://www.cfapubs.org web site

This paper surveys the portfolio construction techniques of buy-side managers in Europe

Why it's worth reading

In our research, we have always argued that portfolio construction is just as important as alpha generation. However, in our recent survey of what topics are most popular with quantitative buy-side managers, portfolio construction research topics finished a distant second to new alpha ideas.[9] It seems we are not alone in our findings. This interesting paper by Amenc et al. summarizes the results of a survey the authors conducted on the portfolio construction practices of a sample of European portfolio managers. The authors find that while managers are aware of sophisticated portfolio construction techniques, translating these ideas into actual implementation is a bigger challenge than it often appears in the pages of academic journals.

229 European portfolio managers were surveyed, representing a broad cross-section of asset managers

Data and methodology

The authors surveyed the portfolio construction practices of 229 European portfolio managers, ranging in size from €5 billion assets under management to over €100 billion. The managers represented a broad cross-section of the asset management industry, with a mixture of asset management firms, investment banks, private banks, and pension funds represented. The survey was conducted via an online, multiple-choice questionnaire over the third quarter of 2007.

In general, the results suggest that managers largely stick to simplistic portfolio construction methods

Results

Among the varied questions that were asked, a few stand out with interesting – and perhaps somewhat surprising – results. When asked how they estimate their covariance matrix, 60% of respondents indicated they use the sample covariance matrix, versus 29% using explicit factor models and 13% using implicit factor models. Only 4% use shrinkage methods. The authors are somewhat scathing of this finding, given that the academic literature is, in a rare display of unison, consistent in finding that the sample covariance matrix is generally a poor option.

Even when they do try to adjust for known shortcomings, they tend to do so in an ad hoc manner

Another interesting result concerns the ways managers deal with estimation error in optimization. 68% use weight constraints to help steer the portfolio away from extreme solutions, while minimum variance portfolios, Bayesian methods, and resampling all weigh in at around 15%.

We don't completely agree with the authors' conclusion that more sophistication is the answer; in our research we have found that many so-called advanced techniques fall over in the real world

Our take

The authors conclude that despite advances in portfolio construction theory, the majority of practitioners still use relatively simple portfolio construction techniques, and that even when they attempt the address the shortcomings inherent in these basic techniques they do so in an ad hoc manner. They go on to argue that practitioners need to be enticed to start adopting more advanced methods of portfolio construction. We don't completely agree with this view; in our research we have often found that more complicated techniques don't translate into better performance. For example, in our recent work on robust factor models, we found that some structure in the covariance matrix is good, but excessively complicated models like GARCH techniques and Bayesian shrinkage failed to add any further improvement.

[9] Cahan, R., Y. Luo, M. Alvarez, J. Jussa, and J. Chen, 2011, "Emerging Issues: What's hot in the world of quant?", *Deutsche Bank Quantitative Strategy*, 12 April 2011

Paper 5: "International diversification works (eventually)"

- Clifford Asness, Roni Israelov, and John Liew
- *Financial Analyst Journal*, Vol 67, No. 3, available at http://www.cfapubs.org web site

Diversification implies that a portfolio of global equity markets should produce a superior risk-adjusted return to any one country held in isolation.

Why it's worth reading

Diversification is a familiar term to most investors. In the most general sense, it can be summarized with a simple analogy: "Don't put all your eggs in one basket". In the context of global investing, diversification implies that a portfolio of global equity markets should produce a superior risk-adjusted return to any one country held in isolation. The authors investigate what drives the difference between short-term and long-term diversification. They demonstrate that short-term market downturns are about panics and broad-based, frenzied selling while long-term results tend to be more about economic performance.

They use MSCI total return indices in local currency, exchange rates and inflation data from difference data providers (CANSIM, GFD, and Thomson Reuters Datastream).

They also investigate the benefits of diversification in down markets across different investment horizons.

Data and methodology

The authors analyze diversification benefits from the perspective of local investors in 22 developed countries. They use MSCI total return indices in local currency, exchange rates and inflation data from difference data providers (CANSIM, GFD, and Thomson Reuters Datastream). To examine the benefits of diversification they construct a local and a global portfolio for an investor in each country. To measure how much global diversification protects an investor against the worst local market crashes, they calculate the performance of the local and global portfolios during the worst 1st percentile and 5th percentile months for each of the 22 local portfolios. For the same percentile, they show the conditional value at risk (CVaR), which is the average performance during months with returns below their percentile value. To analyze the strength of diversification in the long run, they decompose country returns in two dimensions: 1) the returns attributable to multiple expansions versus the returns attributable to economic performance, and 2) the returns attributable to common global performance versus the returns attributable to country-specific performance. Combining these two components they obtain a four-term decomposition of country's total return: 1) country-specific multiple expansion, 2) country-specific economic performance, 3) global multiple expansion, and 4) global economic performance.

Country-specific multiple expansion and global multiple expansion combined explain an overwhelming 96% of quarterly returns, whereas country-specific economic performance and global performance explain only 4%.

Results

Asness at al. emphasize that the average worst monthly return for the local portfolios is -27%, whereas the global portfolios is -17.2%. These results are consistent with the well-documented observation that correlations across countries rise during bear markets. The variance decomposition of the country returns calculated for holding periods ranging from 3 months to 15 years shows that over the short term, returns are primarily driven by multiple expansions. Country-specific multiple expansion and global multiple expansion combined explains an overwhelming 96% of quarterly returns, whereas country-specific economic performance and global economic performance explains only 4%. The common global multiple expansion component of returns is the largest contributor to risk, accounting for 51% of the variation in quarterly returns. Over longer holding periods, however, the multiple component becomes a less important driver of returns and economic performance becomes a more influential one. Country-specific economic performance dominates long-term performance, explaining about 1% of quarterly returns and 39% of 15-year returns. These results support the hypothesis that long-term returns are primarily about country's economic performance and long-term economic performance varies across countries.

It could be interesting to repeat this analysis considering sector and style portfolios

Our take

With so many investments to choose from, it may seem that diversification is an easy objective to achieve. However, as the authors demonstrated, this is only partially true. Investment time horizon and risk tolerance are crucial factors in dictating the investment mix. It could be interesting to repeat this analysis considering sector and style portfolios.

Upcoming conferences

Europe

Figure 1: European event calendar

Date	Location	Conference
16-17 May 2011	**London**	**LQG Spring Seminar**
		http://www.lqg.org.uk/events/seminars/spring_seminar_2011
17 May 2011	**London**	**Buy-Side Technology Summit Europe**
		http://www.incisive-events.com/enquiry/802-buyside-technology-europe
25-27 May 2011	**Marseille,**	**Forecasting Financial Markets**
	France	http://www.ffm-conference.com/
22-25 June 2011	**London**	**2011 Annual Meeting of the European Financial Management Association**
		http://www.efmaefm.org/
16 June 2011	**Braga,**	**Battle of the Quants**
	Portugal	http://www.battleofthequants.com/
30 June – 2 July 2011	**Samos Island,**	**International Conference on Applied Financial Economics**
	Greece	http://www.ineag.gr/AFE/index.php
17-20 August 2011	**Stockholm**	**38th European Finance Association Annual Meeting**
		https://fisher.osu.edu/blogs/efa2011/
29 November – 1	**Paris**	**Quant Invest 2011**
December 2011		http://www.terrapinn.com/2011/quant-invest/

Source: Deutsche Bank

North America

Figure 2: North American event calendar

Date	Location	Conference
29 April 2011	**Chicago**	**R/Finance 2011: Applied Finance with R**
		http://www.RinFinance.com
26 May 2011	**New York**	**SQA Fuzzy Day 2011: Collective Intelligence – Social Networks, Contagion, and Information Diffusion**
		http://www.sqa-us.org/cde.cfm?event=347511
27-29 June 2011	**Chicago**	**Quant Invest Chicago 2011**
		http://www.terrapinn.com/2011/quant-invest-chicago/
16 June 2011	**New York**	**CQA/SQA Trading Seminar**
		http://www.cqa.org/events/2011/CQASQATradingSeminar_2011.php
17 July 2011	**Boston**	**CQA 2011 Academic Review**
		http://www.cqa.org/events/2011/Academic_Review_2011.php
14-15 September 2011	**Chicago**	**CQA Annual Fall Conference 2011**
		http://www.cqa.org/events/2011/Fall_Conference_2011.php
17-19 October 2011	**Toronto**	**Quant Invest Canada 2011**
		http://www.terrapinn.com/2011/quant-invest-canada/

Source: Deutsche Bank

Asia Pacific

Figure 3: Asia Pacific event calendar

Date	Location	Conference
23-24 May 2011	**Singapore**	**Quant Invest Asia 2011**
		http://www.terrapinn.com/2011/quant-asia/

Source: Deutsche Bank

Other papers of interest

Alpha generation and stock-selection signals

The option market's anticipation of information content in earnings announcements

- Mary Brooke Billings and Robert Jennings
- SSRN, available at http://ssrn.com web site
- Abstract: "We exploit information in option prices in order to study whether the ex post responsiveness of stock prices to earnings information is reflected from an ex ante, firm- and quarter-specific perspective. Specifically, we develop a measure of anticipated information content (AIC) that isolates the forecasted magnitude of the stock market's reaction to earnings information. We find that the AIC positively correlates with the ex post magnitude of the stock market sensitivity to unexpected earnings, increases with earnings persistence, firm growth prospects, the richness of firms' information environments and the presence of (and changes in) sophisticated ownership, and decreases with discount rates. Our paper sheds light on the role that earnings information plays in shaping option-market behavior and offers researchers an option-market approach to studying the responsiveness of stock prices to earnings information."

CEOs, CFOs, and COOs: Why are certain insiders' trades more informative?

- Heather Knewston
- SSRN, available at http://ssrn.com web site
- Abstract: "I examine whether the information content of certain executive insider trades reflects different trading skill or a different willingness to exploit the information asymmetry that exists between executives and outside shareholders. I consider the information content of equity purchase activity for chief executive officers, chief financial officers and chief operating officers using portfolios based on trading activity. Using the purchase activity of chief financial officers generates significantly higher daily excess returns than using either the purchase activity of chief operating officers or chief executive officers. Superior trading profitability of CFOs suggests that they are either more skilled at trading (skills hypothesis) or are more willing to use asymmetric information (information hypothesis). I test the skills hypothesis and find no evidence that different skill drives my results. Instead, I find evidence supportive of the information hypothesis with CFOs appearing to exploit asymmetric information in their insider trading."

Optimization, portfolio construction, and risk management

How long should a track record be?

- Marcos Mailoc Lopez de Prado
- SSRN, available at http://ssrn.com web site
- Abstract: "Sharpe ratio is one of the most widely used metrics to evaluate a strategy's performance. However, in general it is misleading to compare Sharpe ratios from two different strategies unless they have very similar confidence bands around their point estimates. We define Probabilistic Sharpe Ratio (PSR), a probabilistic translation in an IID non-Normal framework of the Sharpe ratio. This takes into account estimation errors due to higher moments (skewness, kurtosis), sample length and sampling frequency. PSR can be used to consistently compare different strategies. As an application, we answer the critical question of how long should a track record be for its Sharpe ratio to manifest skill subject to a certain confidence level. A typical hedge fund's track record exhibits negative skewness and positive excess kurtosis, which has the effect of "inflating" its Sharpe ratio. One solution is to "compensate" for such deficiencies with a longer track record. When that is not possible, a viable option may be to provide returns with the highest sampling frequency (q) such that the IID assumption is not violated. The reason is, for negatively skewed and fat-tailed returns distributions, the number of years required may in fact be lowered as q increases. This has led us to affirm that "badly behaved" returns distributions have the most to gain from offering the greatest transparency possible, in the form of higher data granularity."

Practitioner portfolio construction and performance measurement: Evidence from Europe

- Noel Amenc, Felix Goltz, and Abraham Lioui
- *Financial Analysts Journal*, Vol 67, No 3, available at http://www.cfapubs.org web site
- Abstract: "Responses to a survey of investment management practitioners in Europe show that most practitioners are aware of key academic concepts in portfolio construction. But they still resort to ad hoc heuristics when they construct portfolios. Consideration of risk–return matters is less common in performance evaluation than in portfolio construction. An economically significant firm-size effect plays a role in the use of sophisticated (versus unsophisticated) portfolio construction but not in performance measurement."

Hedge fund systemic risk signals

- Roberto Savona
- SSRN, available at http://ssrn.com web site
- Abstract: "In this paper we realize an early warning system for hedge funds based on specific red flags that help to detect symptoms of impending extreme negative returns and contagion effect. To do this we rely on regression trees analysis identifying a series of splitting rules which act as risk signals. The empirical findings prove that contagion, crowded-trade, leverage commonality and liquidity concerns are the leading indicators to be used to predict worst returns. We do not only provide a variable selection among potential predictors, but we also assign the values for such predictors that should be considered as excessively risky. Out-of-sample analysis documents that such an approach would have been able to predict more than 90 per cent of the total worst returns occurred over the period 2007-2008. Yet, an in depth analysis of contagion reveals a changing and complex nature of hedge fund systemic risk which reflects on poor forecasting ability."

What determines stock price synchronicity in REITS?

- Richard Chung, Scott Fung, James Shilling, and Tammie Simmons-Mosley
- SSRN, available at http://ssrn.com web site
- Abstract: "This paper studies the behavior of REIT stock price synchronicity for the years 1997 through 2007. Theory suggests that REIT stock prices should be largely independent of market changes; and, at the very least, REITs should have a low covariance with other assets, including other REIT stocks. The evidence presented below does not support this view. Instead, synchronicity appears to be quite high in the equity REIT market, especially among REITs that larger and more liquid. We also find that REIT stock price synchronicity is negatively related to hedge fund ownership, but positively related to pension fund and insurance company ownership. The evidence further suggests that synchronicity is the highest among industrial and regional mall REITs, and lower among apartment, health care, and mixed property REITs."

Value investing in credit markets

- Maria Correia, Scott Richardson, and A. Irem Tuna
- SSRN, available at http://ssrn.com web site
- Abstract: "We outline a parsimonious empirical model to assess the relative usefulness of accounting and equity market based information to explain corporate credit spreads. The primary determinant of corporate credit spreads is the physical default probability. We compare existing accounting-based and market-based models to forecast default, and find that a modified structural model with accounting and market inputs is best able to forecast default and explain cross-sectional variation in credit spreads. We then assess whether the credit market completely incorporates this default information into credit spreads. Interestingly, we find that information about forecasted default rates explain future changes in credit spreads with a significant lag. This evidence is suggestive of a role for value investing in credit markets."

Stock return volatility surrounding management earnings forecasts

- Andrew B. Jackson
- SSRN, available at http://ssrn.com web site
- Abstract: "The primary aim of this study is to investigate the stock return volatility surrounding management earnings forecasts. Disclosure by managers of expected earnings are particularly important communications, and as such, it is important to understand the capital market implications surrounding them. In doing so, the research questions are essentially aimed at examining the stock return volatility, first, at the release of a management earnings forecast, and second, at the eventual announcement of the realised earnings for that period. The first test investigates whether there is an increase in volatility surrounding a management earnings forecast for those firms who release them compared to a matched-firm sample of firms without a management earnings forecast at that date, and then further examines that result based on different forecast antecedents and forecast characteristics. In brief, the evidence using the Garman and Klass (1980) 'best analytic scale-invariant estimator' of volatility in an Australian context, between 1993 and 2003, finds that stock return volatility is greater for bad news forecasts, forecasts of low specificity, and forecasts issued by firms perceived ex ante as being of lower credibility using both permutation analysis and modeling daily volatility."

Asset allocation and sector/style rotation

Out-of-sample performance of asset allocation strategies

- Daniela Kolusheva
- SSRN, available at http://ssrn.com web site
- Abstract: "Using data for the S&P 500 Sector portfolios between 1989 and 2007, I find that sample-based mean-variance portfolios are very unstable and perform poorly out of sample in terms of Sharpe ratios, certainty equivalent returns and turnover. Minimum-variance and Bayes-Stein portfolios, which are supposed to be less susceptible to the estimation error plaguing mean-variance, also fall significantly short of a naive equally-weighted policy. Imposing shortsale or turnover constraints limits the fluctuation of portfolio weights and improves performance considerably. When the normality assumption about excess portfolio returns is relaxed, there is no evidence of the constrained portfolios performing worse than the exulted equally-weighted portfolio. I propose a sophisticated turnover constraint rule which recognizes the path dependency of the optimal portfolio policy and enhances the out-of-sample monthly Sharpe ratio by 13% relative to the best of the other strategies considered in this paper."

Trading and market impact

Mean variance optimal VWAP trading

- James McCulloch and Vlad Kazakov
- SSRN, available at http://ssrn.com web site
- Abstract: "VWAP is the Volume Weighted Average Price of traded stock over a defined period. It is a metric of trade execution quality used by institutional traders to minimize the execution cost of large trades. A riskless VWAP trading strategy is not possible without knowledge of final market volume. We formulate a mean-variance optimal VWAP strategy by assuming knowledge of final volume and then project this onto the space of strategies accessible to the VWAP trader."

Optimal allocation across dark pools as a probabilistic decision problem

- Vacslav Glukhov
- *Journal of Trading*, Volume 6, Number 2, available at http://www.iijournals.com web site
- Abstract: "A liquidity-conscious trader facing the problem of the efficient execution of a sizable order these days has a multitude of execution venues ranging from traditional exchanges to MFTs to internalizing dark pools and institutional crossing networks. Typically, a more or less heuristic "liquidity seeking algorithm" is employed whereby a randomized strategy repeatedly exposes and re-exposes the order to one or multiple crossing venues while executing some quantity in the lit markets. The efficiency of these heuristic algorithms is never assured and missing is the predictability of the results. There are reasons for relatively slow adoption and development of quantitative dark trading algorithms: dark venues are characterized by a somewhat restrained information outflow. Yet, brokers and traders do possess some quantitative information about the quality of liquidity in the pools. The question remains: is it possible to engage a quantitative theory to make sure that allocation across dark venues is efficient and that it optimally utilizes all of the available information? The author's answer is: affirmative. In this short article the author presents a straightforward quantitative optimal dark allocation framework. It is based on our experience developing dark allocation algorithms for the EMEA markets."

Informed institutional trading around merger and acquisition announcements

- Guphua Li
- *Journal of Trading*, Volume 6, Number 2, available at http://www.iijournals.com web site
- Abstract: "Merger and acquisition (M&A) activities are not well-anticipated corporate events in the equity market. Do institutional investors possess material non-public information before M&A announcements? Using a novel methodology that infers high frequency institutional trading, this article investigates the daily trading behavior of institutional investors in target firms before and after M&A announcements in the U.S. equity market from 1993 to 2004. The methodology is based on combining two publicly available datasets: the NYSE Trades and Quotes (TAQ) dataset and the institutional ownership report (13F). The author finds that all institutional investors start to accumulate net buying positions in target firms as far as 30 days before an announcement date. Institutional investors are not a homogeneous group in terms of trading strategies, regulations or information venues, but, surprisingly, they exhibit similar trading patterns prior to the event. This trading pattern indicates that institutional investors may possess material non-public information. On and after the announcement day, investment advisors tend to be merger arbitragers and buy more shares of target firm stocks to speculate on final deal consummation; while banks, insurance companies, and mutual funds immediately reverse their positions to cash in, a behavior consistent with the early informed traders acting as "short-term profit takers." The author rules out the possibility of a market-wide information leak prior to the event because prices of

target firms do not show any significant price run-ups. Also, the fact that institutions are net sellers in rival firms of targets before the announcement, allows us to rule out the possibility that institutional investors have better models to predict possible takeovers, rather than inside information. Finally, the author shows that the trading by institutions before M&A announcements is associated with a higher probability of informed trading, for the firms they trade."

Finance theory and techniques

Systematic risk and the cross-section of hedge fund returns

- Turan Bali, Stephen Brown, and Mustafa Caglayan
- SSRN, available http://ssrn.com web site
- Abstract: "This paper introduces an aggregate measure of systematic risk for individual hedge funds and finds a significantly positive link between the composite measure of systematic risk (SR) and the cross-section of future hedge fund returns. Hedge funds in the highest SR quintile generate 6% more average annual returns compared to funds in the lowest SR quintile. The results are robust across alternative measures of systematic risk (both for time-fixed SR and time-varying SR) and across different states of the economy. After controlling for Fama-French-Carhart's four factors of market, size, book-to-market, and momentum as well as Fung-Hsieh's two bond and three trend-following factors in currencies, bonds, and commodities, the positive relation between systematic risk and future hedge fund returns remains economically and statistically significant."

When does company-specific news matter? Determinants of news-related stock returns

- Michael Dzielinsky
- SSRN, available at http://ssrn.com web site
- Abstract: "The study is the first one outside the high-frequency domain to use sentiment-signed news to directly compare news and no-news stock returns. This is done by estimating whether returns on positive, neutral and negative news days are significantly different from the average daily return for a large sample of US stocks. The analysis covers more than 900 stocks over the period from January 2003 to August 2010. The general results show that positive news days indeed have above-average returns and negative news days returns are below average, while the neutral news days are economically barely distinguishable from the average. The market also proves to be fast and accurate at pricing new information, as there are no signs of drift in the event window around news days. These results hold across various risk factor groups and industries and are not driven by the presence of earnings announcements or the recent financial crisis nor do they merely reflect past stock returns or the market return. Furthermore, news are also shown to play an important role in updating investor expectations in situation where they might have been subject to bias. Taken together this should inform policy makers and companies on how important and effective a transparent information environment is for the stock market."

Investing in stock market anomalies

- Turan Bali, Stephen Brown, and K. Ozgur Demirtas
- SSRN, available at http://ssrn.com web site
- Abstract: "This paper provides an explanation of investing in stock market anomalies in an expected utility paradigm. Classical selection rules fail to provide a preference for high expected return portfolios. The paper utilizes the almost dominance rules to examine the practice of investing in size, book-to-market, momentum, short-term and long-term reversal anomalies. The results indicate that popular investment choices such as value and small stocks do not dominate growth and big stocks. However, the short-term reversal and momentum strategies create efficient investment alternatives. Bilateral comparisons of stock market anomalies provide evidence for the superior performance of size, short-term reversal, and momentum for 1-month to 12-month horizon and book-to-market and long-term reversal for longer term horizons of 3 to 5 years. The relative strength of small, value, momentum-winner, short-term and long-term losers becomes more prevalent when the time-varying conditional distributions are examined."

Sentiment revealed in social media and its effect on the stock market

- Hailiang Chen, Praduddha De, Yu Jeffrey Hu, and Byoung-Hyoun Hwang
- SSRN, available at http://ssrn.com web site
- Abstract: "This paper investigates the extent to which sentiment revealed by traditional media and social media affects the stock market. We extract sentiment by conducting a textual analysis of articles published in the Wall Street Journal and Seeking Alpha, a popular social-media platform. We find that social-media sentiment associates strongly with contemporaneous and subsequent stock returns, even after controlling for traditional-media sentiment. The media effect is stronger for articles more closely followed by market participants and for companies mostly held by retail investors. Together, these findings point to the importance of social media as an additional channel through which views become reflected in the stock price."

Derivatives and volatility

Factors explaining movements in the implied volatility surface

- Scott Mixon
- SSRN, available at http://ssrn.com web site
- Abstract: "This paper explores the relationship of changes in the S&P 500 index implied volatility surface to economic state variables. Observable variables can explain some of the variation in implied volatility, with the majority of explanatory power from index returns. While the contemporaneous return is most important for explaining changes in short dated volatility, the path of the index is important for explaining changes in long dated volatility. Other variables also display statistically significant relations to volatility changes. Shocks to the Nikkei 225, short term interest rates, and the corporate/government bond yield spread are correlated with small, systematic changes in implied volatility. The results suggest a multifactor model for market volatility, with factors other than index returns adding negligible explanatory ability."

Appendix 1

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