Deutsche Bank
Markets Research

Global

Quantitative Strategy
Academic Insights

Date
2 January 2013

# Harnessing the best ideas from academia

## Welcome to our monthly Academic Insights report

### Fresh insights from academia

2013 will be the fourth year of our "Academic Insights" research series, and today's report is our 33rd edition. Over the three years that we have been publishing "Academic Insights" a lot has happened in the world – markets have gone up and down, economies have risen and fallen, world leaders have come and gone – but through it all academia has continued to be a tremendously useful source for new quantitative investing ideas. Indeed, viewing the world from an Ivory Tower is perhaps not such a bad thing if it allows one to sidestep the maelstrom of day-to-day noise that permeates today's financial markets.

### Key papers this month

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

- Exchange traded funds and asset return correlations
- Factor-timing model
- The enhanced risk premium factor model & expected returns
- Financing asset growth
- Forecasting through the rear-view mirror: Data revisions and bond return predictability

### 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 (+852) 2203 6990, or email us at DBEQS.Global@db.com.

Rochester Cahan, CFA
rochester.cahan@db.com

Miguel-A Alvarez
miguel-a.alvarez@db.com

Jean-Robert Avettand-Fenoel
jean-robert.avettand-fenoel@db.com

Mehmet Beceren
mehmet.beceren@db.com

Zongye Chen
john.chen@db.com

Javed Jussa
javed.jussa@db.com

Ada Lau
ada-cy.lau@db.com

Khoi Le Binh
khoi.lebinh@db.com

Yin Luo, CFA
yin.luo@db.com

Spyros Mesomeris, Ph.D
spyros.mesomeris@db.com

Marco Salvini
marco.salvini@db.com

Sheng Wang
sheng.wang@db.com

Yiyi Wang, Ph.D
yiyi.wang@db.com

North America: +1 212 250 8983
Europe: +44 20 754 71684
Asia: +852 2203 6990

Table Of Contents

# Introduction

## Welcome to *Academic Insights*

In 2013 we are delighted to kick off the fourth year of *Academic Insights*. Since we launched this research series back in February 2010 we have published 33 editions of this perennially popular report.[1] The world has changed a lot in the past three years, but fortunately academia – less prone as it is to the travails of quarterly earnings, economic despair, and geopolitical conflagrations – has continued to be a source of great ideas. As we said in the first edition, quantitative investors are lucky. Waiting at our doorstep is a vast library of fresh ideas just waiting to be explored. We start our fourth year of *Academic Insights* as we always have, by highlighting some of those ideas.

*This is our 33rd edition of Academic Insights, a research series that has turned out to be one of our most popular*

### ETFs: the correlation culprit?

One of the big challenges for asset managers since the financial crisis has been stubbornly high correlations between assets.[2] In a world where big macro themes are driving investment decisions, stocks are being traded less on their fundamentals and more on their exposure to macro risks. A common way to trade on top-down themes is to use ETFs, which leads to the question of whether the explosion in ETF popularity is contributing to the high correlation between stocks. An interesting paper by Da and Shive [2012] finds empirical support for this argument.

*Do ETFs drive up the correlation between stocks? This paper says yes*

### Smarter asset growth

A factor (or "anomaly" in academic speak) that is getting a lot of attention is the so-called asset growth anomaly. This idea is simple: companies that expand their asset base too quickly underperform on average. This could be due to agency issues, i.e. management going on empire-building sprees instead of returning funds to shareholders when attractive opportunities cannot be found. A new paper by Brennan and Kraft [2012] digs deeper into this anomaly and discovers that it is, in part, driven by the issuance and retirement of debt. A related paper by Mortal and Schill [2012] – which we don't review but which can be found in the "Other Papers of Interest" section at the back of this report – shows that the asset growth effect can also be delineated by cash versus stock acquisitions. Both papers suggest useful ways of conditioning asset growth to find the firms most likely to underperform after rapid expansion.

*A large body of empirical evidence suggests companies that grow their asset bases too quickly underperform in the future; but is all growth created equal?*

### Macro-aware models

Two seemingly unrelated papers this month are actually quite closely connected. Hua, Kantsyrev, and Qian [2012] describe a framework for variable selection when doing factor-timing, while Ghysels, Horan, and Moench [2012] illustrate the dangers of using restated (instead of point-in-time) macroeconomic data. Both these papers are useful references for those building style rotation models. The first tells us how to select macro variables from a large library of such variables; the second tells us how to get the data in that library right in the first place.

*Style-timing models are very popular, and two papers we highlight this month have useful ideas on how to build such models*

Regards,
The Deutsche Bank Quantitative Strategy Team

[1] If you'd like to peruse the back issues, you can get them all on the DB Quant Research Website at https://eqindex.db.com/gqs/. You will need your DB login to access the site, if you don't have one just email us at DBEQS.Global@db.com and we'd be happy to set you up.

[2] For a wider discussion on this phenomenon, see Alvarez et al., 2012, "Correlation & Consequences", *Deutsche Bank Quantitative Strategy*, 24 January 2012.

# Five key papers this month

## Paper 1: "Exchange traded funds and asset return correlations"

- Zhi Da and Sophie Shive
- SSRN, available at http://ssrn.com/abstract=2158361
- Reviewed by Ada Lau

### Why it's worth reading

Recently, the mainstream adoption of Exchange Traded Funds (ETFs) has raised questions about their potential impact on asset co-movement and market efficiency[3]. Arbitrage between the basket of underlying shares in an ETF and the ETF itself may drive correlations higher. This paper seeks to quantify this effect.

*The mainstream adoption of ETFs has raised the concern about their potential impacts on asset co-movement and market efficiency*

### Data and methodology

The authors focus on 788 US ETFs with at least 50% holdings in stocks from 2006-2011. ETF prices, holdings and shares outstanding are obtained from CRSP and Morningstar. Stock data are from CRSP and Compustat. The authors first define ETF activity by three measures: 1). Holdings Percentage, which is the ratio of the market capitalization of the ETF to the underlying portfolio, 2). Creation and Redemption Activity, defined as the standard deviation of the daily ETF shares outstanding over the mean shares outstanding, and 3). Turnover, which is the average ratio of the number of ETF shares traded to ETF shares outstanding. Then, they study if ETF activities increase correlations among stocks within its basket by regressing the average correlation among stocks on the three measures of ETF activity. Average correlation is proxied by the *Fratio*, i.e. the variance of the average daily returns divided by average of the variances of the returns of the stocks. The authors also investigate how ETF ownership of a stock relates to its co-movement with the market as measured by the *Sratio*, i.e. the ratio of total variance to idiosyncratic variance of the stock's daily returns. Co-movement of each stock's returns with the market is regressed on its associated ETF activity.

*Average correlation among stocks in an ETF is regressed on 3 measures of ETF activities: 1). Holding percentage, 2). Creation and redemption activity, and 3). Turnover.*

*Co-movement of each stock's returns with the market is regressed on its associated ETF activity*

### Results

The authors find that the strongest predictor for the *Fratio* is the daily turnover of the corresponding ETF. At the stock level, both the proportion of the stock held by ETFs and ETF turnover are significantly and positively correlated to the stocks' co-movement with the market. ETF creations and redemptions have a less significant impact.

*The strongest predictor for the Fratio is the daily turnover of the corresponding ETF*

### Our take

Asset correlations have increased significantly in recent years. Many studies, including this paper, have considered ETF activities to be a possible culprit. However, as we have ourselves documented, macroeconomic uncertainly (the so-called "risk-on/risk-off" regime) is probably the largest drivers of these correlations[4,5]. A macro-driven strategy could be in turn implemented via ETFs which could compound the effects. It would hence be desirable to disentangle them.

*Macroeconomic uncertainly (the so-called "risk-on/risk-off" regime) is probably the largest driver of these correlations.*

[3] Wurgler, J., 2010, "On the Economic Consequences of Index-Linked Investing", *Challenges to Business in the Twenty-First Century*, American Academy of Arts and Sciences, available at www.amacad.org/pdfs/challenges.pdf
[4] Alvarez et al., 2012, "Correlation & Consequences", *Deutsche Bank Quantitative Strategy*, 24 January 2012
[5] Alvarez et al., 2012, Uncertainty and Style Dynamics, *Deutsche Bank Quantitative Strategy*, 18 April 2012

## Paper 2: "Factor-timing model"

- Ronald Hua, Dmitri Kantsyrev, and Edward Qian
- *Journal of Portfolio Management*, Volume 39, Number 1, available at http://www.iijournals.com/doi/abs/10.3905/jpm.2012.39.1.075
- Reviewed by Rochester Cahan

### Why it's worth reading

Factor-timing has been a hot topic since the financial crisis.[6] In a world dominated by big shifts in risk appetite, many quants have moved towards more nimble factor models that can (hopefully) better adjust to rapidly changing conditions. However, many of the style rotation models that have been proposed so far are somewhat ad hoc and subjective in nature (e.g. "I think Europe will deteriorate further, therefore I'm overweighting quality factors"). What we need is a more rigorous, systematic framework. As usual, Hua et al. do not disappoint.

*Factor-timing has been a hot topic for quant investors, but many models tend to be qualitative rather than quantitative*

### Data and methodology

The authors argue that building a factor-timing model requires two steps. First, one must select a set of conditioning variables, i.e. variables that change the way a factor performs. These could be macroeconomic variables (e.g. industrial production, inflation), market related variables (e.g.VIX, TED spreads), or other types of variables (e.g. aggregate news sentiment). From this big library one then picks some relevant variables to use at a given point in time. The second step is to use the subset of conditioning variables from step one to determine optimal factor weights at that point in time. In this paper, the authors focus on the first step – picking conditioning variables – and point the reader to past research (e.g. Qian et al. [2004]) for the second step.

*This paper proposes a systematic and rigorous framework for selecting the right conditioning variables to use in factor rotation*

Furthermore, the authors focus on how to go about picking a subset of good conditioning variables from a wider library of such variables. As they rightly point out, no model selection algorithm will uncover a good variable that was omitted from the library in the first place. Therefore, this paper narrows the focus to a single problem: given a library of potential conditioning variables, how do I systematically select a subset to use in factor-timing?

### Results

The authors show that a variable selection model based on Akaike's [1979] information criterion (AIC) can be effective in optimally selecting conditioning variables from a wider library of such variables. Their algorithm, which is an iterative process, is not dissimilar to the backwards stepwise regression framework we used in our own research. The authors illustrate their methodology using a simple empirical example with three factors (ROE, earnings yield, and price momentum). One of the beauties of their framework is that it allows one to attribute where the IR improvement of the dynamic model versus the static model is coming from. In their example, the dynamic model improves performance by 67% compared to the static model.

*The authors propose a formal variable selection algorithm based on Akaike's information criterion (AIC)*

### Our take

With the investment world likely to be dominated by big macro forces for the foreseeable future, the need to build more macro-aware models is not going away. This paper presents a useful framework for rigorously implementing dynamic factor-timing.

*This paper is an invaluable resource for anyone considering a factor-timing model*

[6] A case in point: our own paper on style rotation – Luo et al., 2010, "Signal Processing: Style rotation", *Deutsche Bank Quantitative Strategy*, 7 September 2010 – remains the single most requested paper we have ever written.

## Paper 3: "The enhanced risk premium factor model & expected returns"

- Javier Estrada
- SSRN, available at http://ssrn.com/abstract=2172164
- Reviewed by Yiyi Wang

### Why it's worth reading

The Equity Risk Premium (ERP) is probably one of the most debated topics in finance. How large is the ERP? What is the driving force behind the ERP? Can the ERP be predicted? Researchers have exerted great effort trying to answer these questions. This paper adds its own angle to the topic by building an "Enhanced Risk Premium Factor Model" to forecast ERP and the market's return, based an earlier paper by Hassett [2010].

*This paper builds "the Enhanced Risk Premium Factor Model" to forecast the ERP and the market's return*

### Data and methodology

Starting with the same structure as Hassett (2010), the author argues that the ERP can be expressed as the product of the risk-free rate and a multiplier, which is called the risk premium factor (RPF). Different from Hassett (2010), the author acknowledges that the RPF is far from a "constant", and hence he utilizes a rolling window to dynamically estimate and forecast it. The process is as follows: in each month, the author measures the historical RPF by calculating ratios between previous 10 years' monthly stock market (S&P 500) returns and risk-free rates, resulting in a vector of RPF that contains 120 data points. Meanwhile the author estimates the cyclically-adjusted P/E ratio (CAPE) – the ratio between the level of the market and the average earnings per share over the previous 10 years – for the same period as the RPF but with one month lag. The next step is to run a linear regression between in-sample RPFs and lagged CAPEs. The estimated coefficients together with the current CAPE are used to forecast the next period's RPF, which in turn leads to the expected ERP by multiplying the current risk-free rate. The author repeats the same process for the period from 1959 to 2011. The predictive power of the above model ultimately lies in the relationship between the ERP and the CAPE. Therefore, the author also tests an alternative – so called "unrestricted" model by skipping the intermediate steps with regard to the RPF and regressing the future returns on the CAPE directly.

*The author dynamically estimates and forecasts the risk premium factor (RPF), which is the ratio between the ERP and the risk-free rate. The RPF is forecasted from a linear regression of the RPF on cyclically-adjusted P/E ratio.*

### Results

Using the Enhanced Risk Premium Factor model, the author finds a neat way to make unbiased forecasts that are highly correlated with the realized returns. Moreover, the unrestricted model, which relates the market's expected return to the expected RPF (estimated on the basis of the current CAPE) and current risk-free rate without imposing a specific functional relationship among these variables, even outperforms the ERPF model.

*Using the Enhanced Risk Premium Factor model, the author finds a neat way to make unbiased forecasts that are highly correlated with the realized returns.*

### Our take

Compared to the "restricted" model relying on the assumption that the ERP links the risk-free rate with RPF, we believe the "unrestricted" model offers more intuition. We have addressed other methodologies to estimate ERP in our own research[7]. It would be interesting to compare our model to the Enhanced Risk Premium Factor model proposed by this paper.

*We have addressed other methodologies to estimate ERP in our own research.*

[7] Mesomeris et al, 2011, "Road Map to the Equity Risk Premium", *Deutsche Bank Quantitative Strategy*, 15 August 2011

## Paper 4: "Financing asset growth"

- Michael Brennan and Holger Kraft
- SSRN, available at: http://ssrn.com/abstract=2160017
- Reviewed by Sheng Wang

### Why it's worth reading

The corporate capital structure is an interesting aspect to look at in order to understand a company's future performance. Like past research, this paper points out that high asset growth is a strong *negative* predictor of future stock returns. However, it goes further by studying where this abnormal return comes from. The authors explore the reasons for the two financing decisions that can determine asset growth – debt issuance and debt retirement – by analyzing the factors that might influence those decisions.

*Corporate capital structure is an interesting aspect to look at in order to understand the future performance.*

### Data and methodology

The main data sources are the merged Compustat-CRSP data set from 1968 to 2010. To mitigate back-filling biases they disregard the first year's observation for each firm and match the accounting data with stock return data. They use the IBES database for analyst earnings forecast, and Execcomp data from Compustat for information about CEO appointments, compensation and exits.

The authors estimate the abnormal returns using the Fama-French three factor model; the regression is estimated using the stock returns from the 7th to 18th month after signal date. Decile portfolios of asset growth rate and debt growth rate are constructed, and double sorted portfolios further divide each decile. Portfolio characteristics and returns are analyzed. Panel logistic regression for debt issuance and debt retirement are performed to explore the factors that might impact the financing decision, and the properties of the debt issuers and retires are analyzed.

*The merged Compustat-CRSP data set from 1968 to 2010 are used. Multiple regressions and double sorting are used to analyze the predictability of asset growth rate and the properties of debt assurance and debt retirement.*

### Results

The author concluded that within high asset growth rate firms, the negative abnormal returns are mainly due to the negative returns by those firms that either issue or retire large amounts of debt. The magnitude of debt issuance is the main reason for the negative returns for debt issuers rather than asset growth; while both asset growth and debt retirement are import for debt retirees. The paper finds that debt issuance predicts declines in profitability as measured by the return on assets. However, debt retirement is the result of two offsetting influences, on one hand it is a signal of good future operating performance; on the other hand the market timing motive leads firms to retire more debt when the stock prices are high. The paper also demonstrated that managerial concerns are of importance in financing decisions and they deserve more attention, these concerns will differ according to the conditions of the firm and the manager and the terms of security of employment.

*Firms with high asset growth rate, the abnormal returns are mainly due to the debt issuance or debt retirement. Debt issuance predicts declines in profitability while debt retirement predicts improvements in profitability but to be over-priced.*

### Our take

This paper helped us better understand what is driving the so-called asset growth anomaly. The factors discussed in this paper are easy to construct and can be added to a factor library quite easily. The multiple regression methodology this paper is quite useful in analyzing the relationship among multiple factors. Furthermore, adding dummy variables in the regression for certain binary decisions is also a useful technique for analyzing the data.

*The factors discussed in this paper are easy to construct, and the regression techniques in this paper are useful to analyze multiple factors.*

## Paper 5: "Forecasting through the rear-view mirror: Data revisions and bond return predictability"

- Eric Ghysels, Casidhe Horan, and Emanuel Moench
- SSRN, available at http://ssrn.com/abstract=2175150
- Reviewed by Rochester Cahan

### Why it's worth reading

This paper makes a simple but critical point: when using macroeconomic data to do forecasting, one *must* use non-restated data. We made this point ourselves back in 2010 when we built a style rotation model based on macroeconomic data. To ensure our model was free from look-ahead bias, we painstakingly constructed a true as-reported database of U.S. macroeconomic releases.[8] This paper confirms our finding that downloading the restated economic data today can lead to models with significant look-ahead bias.

*This paper confirms what we found in our own research: using restated macro-economic time-series is dangerous*

### Data and methodology

The paper focuses on macroeconomic models designed to predict Treasury yields. A number of recent research papers, including Ludvigson and Ng [2009], Duffee [2011], and Joslin et al. [2010], have suggested that macroeconomic variables like real growth and inflation can predict the Treasury yield curve and term structure. This paper revisits some of those findings, after taking into account the same two biases we did in our work: (1) publication delays and (2) data revisions. The former is relatively easy to adjust for (one just needs to correctly lag the data) but the latter is more insidious. Like us, they find that revisions in macro data tend to show significant serial correlation. The real-time economic data that this paper uses includes 68 economic time-series from 1982-2011 and are obtained from the Archival Federal Reserve Database (ALFRED) which is maintained by the Federal Reserve Bank of St. Louis.[9]

*The authors use an archival database of as-reported macro data from the St. Louis Fed*

### Results

First, from a purely data perspective, the authors show that the difference between the as-reported and revised time-series are significant across the 68 variables on average. They show that on average the revision series have negative serial correlation, i.e. a positive revision is more likely to be followed by a negative revision. Furthermore, the errors in revisions are cross-sectionally correlated, meaning that if one series has to be revised up or down for a given period, the chances are other series will also need revisions in the same direction.

*They show that revisions to macro data are not random, and indeed have some negative serial correlation*

Second, the authors compare and contrast some recent models for predicting future Treasury returns, using restated and non-restated data. They find that in-sample a sizeable percentage of the predictive power of macroeconomic variables is eliminated when using non-restated data. More importantly, they show that out-of-sample predictive power almost vanishes completely!

*Recent macro-based models for predicting Treasury returns are ineffective once correct point-in-time data is used*

### Our take

Given the increased interest in using macroeconomic inputs in systematic models, this paper is a 'must-read'. Equity quantitative investors have historically been very good at ensuring there is no look-ahead in their fundamental company data (e.g. by using point-in-time databases); this paper highlights that we need to apply the same rigor when using macroeconomic data.

*The new interest in using macro data in quant models means this paper's conclusions are cautionary for all*

[8] Luo et al., 2010, "Signal Processing: Style rotation", *Deutsche Bank Quantitative Strategy*, 7 September 2010

[9] Appendix A in the paper is a useful reference for anyone trying to build a similar point-in-time economic database.

# Upcoming conferences

## Europe

Figure 1: European event calendar

| Date | Location | Conference |
|---|---|---|
| 28 Feb – 1 Mar 2013 | Venezia, Italy | IMA Conference on Mathematics in Finance<br>http://www.quant.it/ |
| 26-27 March 2013 | London | EDHEC-Risk Days Europe<br>http://www.edhec-risk.com/events/edhec_conferences/europedays2013 |
| 8-9 April 2013 | Edinburgh | Quantitative and Asset Management Workshop 2013<br>http://www.eurofidai.org/december2012.html |
| 26-28 June 2013 | Monaco | Factset Symposium<br>www.factset.com/symposium_emea |
| 26-29 June 2013 | Reading, UK | European Financial Management Association Annual Meeting<br>http://www.efmaefm.org/0EFMAMEETINGS/EFMA%20ANNUAL%20MEETINGS/2013-Reading/2013meetings.shtml |

*Source: Deutsche Bank*

## North America

Figure 2: North American event calendar

| Date | Location | Conference |
|---|---|---|
| 24 January 2013 | New York | SQA Luncheon Program: Equity Risk Premiums (ERP): Determinants, Estimation, and Implications, with Aswath Damodaran<br>www.sqa-us.org |
| 22-24 March 2013 | Miami | International Mathematical Finance Conference<br>http://www.bradley.edu/academic/continue/professionals/imfc/ |
| 3 April 2013 | New York | Second Edition of the EDHEC-Princeton Academic meets Practice Conference<br>http://www.regonline.co.uk/builder/site/Default.aspx?EventID=1172884 |
| 17 April 2013 | Las Vegas | CQA Spring Conference<br>www.cqa.org |
| 31 May 2013 | New York | SQA Fuzzy Day Conference: Sustainable Investing: Hype or Opportunity<br>www.sqa-us.org |
| 13 June 2013 | New York | CQA/SQA Trading Seminar<br>www.cqa.org |
| 11 July 2013 | Boston | CQA Academic Review Session<br>www.cqa.org |
| 16-18 July 2013 | New York | CFA Institute/EDHEC-Risk Advances in Asset Allocation Seminar<br>http://www.cfainstitute.org/learning/products/events/Pages/04152013_77335.aspx |
| 8-9 October 2013 | New York | EDHEC-Risk Days in North America<br>http://www.edhec-risk.com/events/edhec_conferences/northamericadays2013?newsletter=yes |
| 11 September 2013 | Chicago | CQA Fall Conference<br>www.cqa.org |
| 10-12 November 2013 | New Orleans | Factset Symposium<br>http://www.factset.com/campaigns/symposium2013 |

*Source: Deutsche Bank*

## Asia

Figure 3: Asian event calendar

| Date | Location | Conference |
|---|---|---|
| 9-11 January 2013 | Hong Kong | 1st Asian Quantitative Finance Conference<br>http://cqf.nus.edu.sg/AQFC2013/aqfc2013.htm |
| 15-16 May 2013 | Singapore | EDHEC-Risk Days Asia<br>http://www.edhec-risk.com/events/edhec_conferences/asiadays2013 |
| 19-22 May 2013 | Singapore | 66th Annual CFA Institute Annual Conference<br>http://www.cfainstitute.org/learning/products/events/Pages/05192013_66150.aspx |

*Source: Deutsche Bank*

# Other papers of interest

## Alpha generation and stock-selection signals

### Change in cash-holding policies and stock return predictability in the cross-section

- William Sodjahin
- *Financial Analysts Journal*, Volume 69, Number 1, available at http://www.cfapubs.org/doi/abs/10.2469/faj.v69.n1.1
- Abstract: "The author found that stocks with a positive change in company cash holdings have significantly higher risk-adjusted returns than stocks with a negative change in cash holdings (CCH). Moreover, the return predictive power of CCH is (1) distinct from the effect of cash holdings (CH), (2) absent among cash-rich companies, (3) stronger among small-cap stocks, and (4) limited to non-January months. The CCH anomaly appears to be more "contaminated" than the CH effect by mispricing"

### What do short sellers know?

- Ekkehart Boehmer, Charles Jones, and Xiaoyan Zhang
- SSRN, available at http://ssrn.com/abstract=2192958
- Abstract: "Using proprietary short-sale order data, we investigate the sources of short-sellers' informational advantage. Heavier shorting occurs the week before negative earnings surprises, analyst downgrades, and downward revisions in analyst earnings forecasts. The biggest effects are associated with analyst downgrades. While these event days constitute only 12% of sample days, they account for 24% of the overall underperformance of heavily shorted stocks. The results indicate that short sellers are well-informed about upcoming earnings news and anticipate analyst recommendation changes. Shorting predictability remains significant after controlling for information in analyst actions, suggesting that short sellers know more than analysts about firm fundamentals."

### Aggregate news tone, stock returns, and volatility

- Michal Dzielinski and Henrick Hasseltoft
- SSRN, available at http://ssrn.com/abstract=2192532
- Abstract: "We examine whether soft information in firm-specific news contains valuable information about aggregate stock returns and volatility. Using a large data set in which the language of millions of firm-specific news items has been quantified, we construct two novel measures: The aggregate level of news tone and the aggregate dispersion of news tone. Our news tone variables are strongly related to economic factors but only weakly related to investor sentiment. The dispersion of news tone is countercyclical, asymmetric, and significantly forecasts aggregate stock returns and realized variance, controlling for a range of hard-information variables. We interpret the dispersion of news tone as a direct measure of aggregate information uncertainty. Our findings suggest that soft firm-specific information matters for aggregate stock prices while also providing a new perspective on why volatility is countercyclical and asymmetric."

### What is common among return anomalies? Evidence from insider trading decisions

- Qingzhong Ma and Andrey Ukhov
- SSRN, available at http://ssrn.com/abstract=2188653
- Abstract: "Conventional wisdom suggests that insiders buy shares on positive, and sell on negative, information. Under regulations of insider trading, however, insiders keep silent while possessing extreme information. We find that this phenomenon of insider silence is systematically related to a broad set of anomalies, particularly in the short legs. Specifically, among firms in the short legs, those whose insiders kept silent in the past experience significant negative future returns, which are even lower than when insiders net sold. On average, insider silence accounts for 64% of the short-leg abnormal returns. Our paper provides quantitative evidence of mispricing for return anomalies."

### The post-acquisition returns of stock deals: Evidence of the pervasiveness of the asset growth effect

- Sandra Mortal and Michael Schill
- SSRN, available at http://ssrn.com/abstract=2189038
- Abstract: "A growing literature finds that the cross-section of stock returns is negatively correlated with past asset growth rates. Based on a large sample of U.S. firms, we show that the poor post-deal returns associated with stock acquisitions are more precisely explained by the systematically larger asset growth rates associated with stock relative to cash deals. We find a similar result when we examine other well-known cross-sectional and time-series acquisition effects, including glamour deals, weakly monitored deals, and deals done during high valuation periods. This observation calls into question the existing literature by asserting that the distinguishing characteristic associated with poor performing acquisitions is simply their tendency to grow assets."

### Media-based merger arbitrage

- Matthias Buehlmaier and Josef Zechner
- SSRN, available at http://ssrn.com/abstract=2187144
- Abstract: "Using a large sample of merger announcements, this paper provides strong evidence that information in financial media is not fully incorporated in stock prices. Cross-sectional regressions show that a one standard deviation increase in the media-implied probability of deal completion results in an increase of 1.2% in the subsequent twelve-day return. Media content information released on the announcement day contains information, not captured by announcement day stock returns, which are found to be largely unrelated to the probability of deal completion. The results for media coverage are much weaker. A trading strategy based on media content increases annualized alphas by 12.5%, while the effect of media coverage on alphas is statistically insignificant. Finally, we find weak evidence in favor of a certification role of the media, with the top newswire and top newspapers contributing more information to the market."

### Trend factor: A new determinant of cross-section stock returns

- Yufeng Han and Guofu Zhou
- SSRN, available at http://ssrn.com/abstract=2182667
- Abstract: "In this paper, we propose a trend factor to capture cross-section stock price trends. Stronger trends are likely when firms are experiencing some persistent and fundamental changes. Following traders and investors in practice, we use simple moving averages to measure trends. Like the popular

size, book-to-market or momentum factor, our trend factor is a spread portfolio of buying stocks with the highest expected returns as forecasted by trends and selling those with the lowest forecasted expected returns. We find that the trend factor earns a risk-adjusted 3% return per month, more than tripling that of the size, book-to-market and momentum factors. The trend factor has more than five times the Sharpe ratio of the market, and, during the recent financial crisis, it earns 4.47% per month while the momentum factor loses 1.34% per month. The trend factor return is robust to a variety of control variables including size, price, book-to-market, idiosyncratic volatility, liquidity, etc, and is much higher under greater information uncertainty. Moreover, the trend factor explains well the cross-section portfolio returns sorted by short-term reversal and various price ratios (e.g. E/P) as well as industry portfolios, and performs much better than the momentum factor."

### Economically-linked economies and forecasting Chinese stock returns

- Steven J. Jordan, Mark E. Wohar, and Andrew Vivian
- SSRN, available at http://ssrn.com/abstract=2172126
- Abstract: "We explore whether economic links via trade affect aggregate Chinese stock market returns. We find that market return indices from countries that China net exports from can forecast the Chinese aggregate market return at the weekly time horizon. Countries that China net exports to have no consistently significant OOS predictability. The economic intuition for our results follows from the fact that China has positioned itself as a low-cost provider competing on price. As a low-cost provider China has a more difficult time passing cost increases through to export customers because of sticky prices. However, production must meet demand implying that costs will drive short term economic gains for the overall Chinese economy. One interpretation of our results is that supply shocks are absorbed within 2 weeks."

### Media and Google: The impact of information supply and demand on stock returns

- Yanbo Wang
- SSRN, available at http://ssrn.com/abstract=2180409
- Abstract: "This paper is the first to examine the joint effect of information supply and demand on stock returns. Unlike previous studies, I examine the relationship between cross-sectional stock returns and "pairs" of information supply and demand shifts. The number of news articles and Google search volume (for a company) are used as proxies for information supply and demand respectively. I show that only an upward shift in both information supply and demand is an economically and statistically significant predictor of future returns among shift pairs. A monthly rebalanced portfolio of buying stocks with this shift "pair" and short selling the other stocks generates an abnormal return between 16% and 22% per year, with the Sharpe ratio between 0.85 and 0.9 (compared with a Sharpe ratio of 0.049 for the S&P500 during the same period). The abnormal return increases to between 23% and 34% per year in a subsample of small stocks. These findings imply that the supply of information affects stock returns conditional on the demand for information. The result is consistent with the hypothesis that investor attention boosts stock prices. It also affirms the importance of incorporating both information supply and demand in the analysis."

### Analyzing valuation measures: A performance horse race over the past 40 years

- Wesley R. Gray and Jack Vogel
- *Journal of Portfolio Management*, Volume 39, Number 1, available at http://www.iijournals.com/doi/abs/10.3905/jpm.2012.39.1.112
- Abstract: "In this article, the authors compare the investment performance of portfolios sorted on different valuation measures. They find that EBITDA/TEV has been the best performing metric, historically, and outperforms many investor favorites, such as price-to-earnings ratio, free cash flow to total enterprise value, and book-to-market ratio. The authors also explore the investment potential of long-term valuation ratios, which replace one-year earnings with an average of long-term earnings. They find that in contrast to prior empirical work, long-term ratios add little investment value over standard one-year valuation metrics."

### Short-term residual reversal

- David Blitz, Joop Huij, Simon D. Lansdorp, and Marno Verbeek
- SSRN, available at http://ssrn.com/abstract=2166823
- Abstract: "Conventional short-term reversal strategies exhibit dynamic exposures to the Fama and French (1993) factors. We develop a novel reversal strategy based on residual stock returns that does not exhibit these exposures and consequently earns risk-adjusted returns that are twice as large as those of a conventional reversal strategy. Residual reversal strategies generate statistically and economically significant profits net of trading costs, even when we restrict our sample to large-cap stocks over the post-1990 period. Our results are inconsistent with the notion that reversal effects are the result of trading frictions or non-synchronous trading of stocks and pose a serious challenge to rational asset pricing models."

### External financing, growth and stock returns

- Gikas A. Hardouvelis, Georgios Papanastasopoulos, Dimitrios D. Thomakos, Tao Wang
- SSRN, available at http://ssrn.com/abstract=2164036
- Abstract: "In this paper we investigate the relation of the value/growth anomaly with the anomaly on corporate financing activities. We confirm and expand earlier results that value/growth and external financing indicators are, to some degree, related predictors of stock returns in the cross section. We show that external financing indicators are incrementally informative since they pick up stock returns associated with earnings quality. Portfolios that combine information from both these indicators generate significantly higher returns than portfolios containing each individual indicator. More importantly, our analysis strongly suggests that the external financing anomaly is, to some extent, distinct from the value/growth anomaly, in that it may also reflect investors' misunderstanding of the effects of opportunistic earnings management."

### Forecasting returns: New European evidence

- Steven J. Jordan, Andrew Vivian, and Mark E. Wohar
- SSRN, available at http://ssrn.com/abstract=2172125
- Abstract: "This paper builds on the recent debate on the in-sample and out-of-sample predictability of US aggregate returns using a wide range of predictors by providing new evidence for smaller and less market-oriented European countries. We find evidence that macro and technical predictors can

(statistically) improve forecast accuracy and (economically) generate gains to investors; in contrast to the US results, predictability in our sample of European countries exists in recent data. We also find that simple forecast combinations consistently yield substantial benefits both in forecast accuracy and economic gain. For example, the magnitude of the forecasting gains for our European countries is often larger than those found for the US and other G7 countries. We provide initial evidence on the link between country characteristics and out-of-sample forecast performance. Our empirical results suggest forecast performance is not strongly related to market size. However market liquidity is related to the forecast performance of fundamental variables and market development is related to the forecast performance of macro variables."

### A survey of day of the month effect in world stock markets

- Jay Desai and Arti Trivedi
- SSRN, available at http://ssrn.com/abstract=2171634
- Abstract: "A curious seasonal anomaly found in finance is the turn of the month effect, where the daily mean return of stock market at the end of a month and beginning of a month is significantly higher than the average daily return of all the days of a month. There have been evidences that certain months in a year deliver significantly higher returns. Similar anomalies are found for week days also, where some days in a week deliver above average returns. Seasonal anomalies for researchers have been a subject of great interest and lot of literature is available worldwide. This paper examines presence of day of the month effect on ten stock markets, geographically located in different corners of the world. This paper is not intended to study only the anomalies and inefficiencies present in various world markets, it is intended to highlight the profit potential available to individual investors and professional fund managers. The date wise daily returns are calculated in percentage terms to make the phenomena easy to understand. The statistical significance of daily returns is tested with Z-Statistics, in total 310 hypotheses are tested in the research. We found day of the month effect present in all the stock markets tested across the world, some days in a month historically are found to have delivered significantly higher returns."

### Investors demand for sell-side research: SEC filings, media coverage, and market factors

- Alastair Lawrence, James Ryans, and Yuan Sun
- SSRN, available at http://ssrn.com/abstract=2173546
- Abstract: "Using a novel dataset of web traffic for a leading website of analyst report information, we perform a comprehensive analysis, along three dimensions, examining when investors demand firm-specific analyst information. First, we highlight that the majority of firm-specific requests for analyst information are concentrated within a few weeks of the year and in terms of all SEC mandated disclosures, demand is highest in weeks with earnings announcements, followed by Form 10-K and Form 8-K filings, respectively. Second, management guidance, absolute abnormal returns, trading volume, and media coverage, all positively relate to investors' demand, and negative abnormal returns appear to lead investors' demand. Third, regarding the type of analyst information provided, target price revisions are most related to investor demand, followed by recommendations, and then by earnings forecast revisions."

## Drained by DRIPS: The hidden cost of buying on the dividend pay date

- Henk Berkman and Paul Koch
- SSRN, available at http://ssrn.com/abstract=2172448
- Abstract: "On the day that dividends are paid we find a significant positive mean abnormal return, followed by a reversal that negates most of this price appreciation. This temporary dividend pay date effect has grown in magnitude since the 1970's, and is concentrated among high dividend yield stocks that offer dividend reinvestment plans (DRIPs). Since the mid-1990s, these stocks yield a mean abnormal return close to 0.5% on the dividend pay date. This temporary inflation is larger in magnitude for stocks subject to greater limits to arbitrage. Quarterly profits from a trading strategy to exploit this anomaly are economically significant, and related to time series movements in market sentiment, transaction costs, the dividend premium, and the VIX. For investors who reinvest their dividends on the pay date, this temporary inflation represents a substantial implicit transaction cost."

## Optimization, portfolio construction, and risk management

### Implementing a simple rule for dynamic stock-loss strategies

- Julien Chevallier, Wei Ding, and Florian Ielpo
- *Journal of Investing*, Volume 21, Number 4, available at http://www.iijournals.com/doi/abs/10.3905/joi.2012.21.4.111
- Abstract: "This article proposes a simple rule to implement dynamic stop-loss strategies in the case of a long-only S&P 500 portfolio, that is a problem market participants such as pension funds have to ponder when investing in US equity. It is based on a Monte Carlo analysis, as advised in Phoa [1999]."

### Beta calculation in emerging markets in the cross-border context – selected problems

- Marci Peksyk, Mariusz Chmielewski, Marek Panfil, and Karol Sledzik
- SSRN, available at http://ssrn.com/abstract=2183874
- Abstract: "When investing in emerging markets, investors face issues regarding the valuation of potential investments that may considerably affect the investment decision. This article discusses the challenges of valuing a company within the European emerging markets. We will focus on several issues regarding the reliability and fitness of Beta estimates with the use of peer groups in the context of cross-border investment valuation."

### Equity portfolio diversification: How many stocks are enough? Evidence from five developed markets

- Vitali Alexeev and Francis Tapon
- SSRN, available at http://ssrn.com/abstract=2182295
- Abstract: "Choosing the number of stocks to hold in a portfolio can significantly affect its risk. We use daily observations for traded equity returns in the US, UK, Japan, Canada and Australia from 1975 to 2011 to simulate portfolios and calculate several measures of risk, including heavy tailed. For each measure, we estimate confidence bands to assure a specific reduction in diversifiable risk. The optimal number of stocks is shown to depend on the measure of risk, level of assurance required by investors, the specific stock market, and the changing correlation structure across time."

### Deleveraging risk

- Scott Richardson, Pedro Saffi, and Kari Sigurdsson
- SSRN, available at http://ssrn.com/abstract=2180785
- Abstract: "We assess whether deleveraging events have an impact on the cross section of stock returns. Deleveraging risk is the unique risk attributable to the existence of levered positions. When funding liquidity evaporates and short positions need to be covered, securities with greater presence of levered investors experience a significant shock as the levered investors unwind their positions. Using a unique dataset of equity lending data as a proxy for the degree of leverage in a stock, we find strong evidence of extreme return realizations attributable to the unwinding of these levered positions. We further find that these deleveraging risk events are attributable to (i) discrete liquidity events such as the quant crisis of August 2007 and the Lehman Brothers bankruptcy in September 2008, and (ii) reductions in funding liquidity as reflected in a variety of measures such as TED spread, LIBOR-OIS spread and credit risk of banks that facilitate the provision of levered capital to arbitrageurs."

### On diversification

- Ben Jacobsen and Frans De Roon
- SSRN, available at http://ssrn.com/abstract=2179180
- Abstract: "Undiversified - or stock picking - portfolios may dominate well diversified benchmarks, when these benchmarks are not mean-variance efficient. Starting from Markowitz's Modern Portfolio Theory we derive simple (linear regression) tests to separate stock picking from diversification. Over 60% of the time we cannot reject our null hypothesis of stock picking in favor of well diversified benchmarks, even for individual stocks. Stock picking dominates during recessions, diversification during expansions. 'Stockpicking' stocks tend to be stocks of large size companies, stocks with high B/M, high E/P or Momentum stocks. Our new tests also explicitly relate diversification and return predictability."

### The diversification delta: A higher momentum measure for portfolio diversification

- Maximilian A. Vermorken, Francesca R. Medda, and Thomas Schröder
- *Journal of Portfolio Management*, Volume 39, Number 1, available at http://www.iijournals.com/doi/abs/10.3905/jpm.2012.39.1.067
- Abstract: "The concept of diversification is central in finance and has become even more so since the 2008 financial crisis. In this article, the authors introduce a new measure for diversification. The measure, referred to as "diversification delta," is nonparametric, based on higher moments, easily interpretable due to its mathematical formulation, and incorporates the advantages of the present measures of diversification while extending them. The measure is applied to infrastructure returns data in order to understand the benefits of diversifying across various infrastructure classes, gaining useful insights for infrastructure fund managers and investors."

### Choose your betas: Benchmarking alternative equity index strategies

- Noël Amenc, Felix Goltz, and Ashish Lodh
- *Journal of Portfolio Management*, Volume 39, Number 1, available at http://www.iijournals.com/doi/abs/10.3905/jpm.2012.39.1.088
- Abstract: "This article clarifies that methodological choices can be made independently for two steps in the construction of alternative equity index strategies: the constituent selection and choice of a diversification-based weighting scheme. By flexibly combining the different possible choices for these steps, the authors create a large variety of strategies and test their performance and risk results. The results suggest that diversification approaches may be a superior alternative, or at least a very important complement, to pure stock selection approaches when it comes to reaching a risk–return objective. Moreover, even though some argue that the risk and performance of diversification-based weighting schemes are solely driven by factor tilts, the authors show how straightforward it is to correct such tilts through the selection of stocks with appropriate characteristics while maintaining the improvement in achieving a risk–return objective that is due to the respective diversification approaches."

### Multi-alpha equity portfolios: An integrated risk budgeting approach for robust constrained portfolios

- Raul Leote de Carvalho, Lu Xiao, and Pierre Moulin
- SSRN, available at http://ssrn.com/abstract=2173230
- Abstract: "We propose a robust optimization approach to construct realistic constrained multi-strategy portfolios which starts with the identification of different sources of alpha and the risk-budgeting exercise to optimally combine them. We show how systematic alpha-capture strategies can be combined with judgmental strategies and how bottom-up based strategies for stock picking can be combined with top-down sector and country allocation strategies. The approach is shown to be fully transparent for both unconstrained and constrained portfolios with a discussion of how constraints impact the final optimal portfolio allocation. In particular we show that the constrained portfolios retain the exposures to systematic risk in the unconstrained target solution as much as possible, and that specific risk takes the toll of portfolio constraints. Through a realistic back-tested example combining different well-known alpha capture strategies we demonstrate the robustness and transparency of the approach. Finally we also discuss the advantages of this approach over the alternative process based on selecting and investing in a mix of different index-funds implementing off-the-shelf active strategies for alpha capture. We believe that our approach is particularly suited for institutional investors interested in risk budgeting the alpha in their portfolios while fully understanding the final allocation in their constrained portfolios."

### The risk parity approach to asset allocation – Climbing the wall of worries?

- Fabian Dori, Frank Haeusler, Manuel Krieger, Urs Schubiger, and David Stefanovits
- SSRN, available at http://ssrn.com/abstract=2159283
- Abstract: "The risk parity asset allocation methodology has recently increased in popularity, as such strategies have in general avoided the hefty drawdowns during the recent volatile market periods. Even the most fervent critics appreciate the diversifying potential historically provided by risk parity concepts. However, they point out that the tide may be turning. It is often stated that the past merits of the strategy may be its future challenges. Concerns raised relate to issues like: While being of inestimable value during the subprime crisis, isn't it overly risky to be considerably exposed to government bonds in light of uncomfortably high sovereign debt? Having successfully exploited dynamic correlation relationships in the past, can the concept still provide a diversified portfolio even with the virtual outage of fixed income instruments as a source of return because of record low yields? In spite of facilitating the equalisation of risk contributions, does the leverage usually employed not expose the portfolio to heightened tail risks? The responses brought forward to these legitimate criticisms, are as diverse as the group of discussants is numerous. The objective of this note is, therefore, to contribute to the discussion by taking a general point of view. What can be inferred from empirical evidence in order to judge the future attractiveness of the risk parity concept relative to alternative asset allocation strategies in general? And how does the concept compare with respect to the specific concerns highlighted above? In order to answer these questions, we contrast three different yet popular allocation styles, namely a traditional balanced strategy, the minimum variance concept and the risk parity methodology. The results suggest that while the current criticism has its warrants, empirical evidence points towards the expectation that risk parity strategies may further climb up the wall of worries."

### The risk in risk parity: A factor based analysis of asset based risk parity

- Vineer Bhansali, Josh Davis, Graham Rennison, Jason C. Hsu, and Feifei Li
- SSRN, available at http://ssrn.com/abstract=2167058
- Abstract: "The risks embedded in asset-based risk parity portfolios are explored using a simple, economically motivated factor approach. We show that such an approach can substantially demystify and make explicit the drivers of returns for asset-based risk parity portfolios. The proposed framework can be used to assess the "true" parity in the underlying risk factor exposures for a given portfolio; it also allows investors to understand the active risks that a manager might be taking against his default risk parity position. Using a number of commercial risk parity portfolio returns, we find that traditional asset-based risk strategies, which are diversified in the asset space, can often be dominated by only one or two risk factors (equity and bond factors). In addition, these risk parity portfolios often exhibit very aggressive tactical allocations to the underlying factors, suggesting that active views on asset and/or factor are being expressed in many risk parity portfolios."

### Portfolio management under constraints on ex-ante and ex-post tracking-errors

- Riadh Belhaj, Didier Maillard, and Roland Portait
- SSRN, available at http://ssrn.com/abstract=2173268
- Abstract: "Investment fund managers are judged by ex post or realized tracking error rather than the ex ante tracking error, which is unobservable. The main objective of this paper is to examine the relation between the theoretical tracking error that the manager defines ex ante and the realised tracking error that is actually measured ex post. We determine the ex ante tracking error that must be set in order for the ex post tracking error to remain within a given tolerance margin."

### Heuristic portfolio trading rules with capital gains taxes

- Marcel Fischer and Michael F. Gallmeyer
- SSRN, available at http://ssrn.com/abstract=2172396
- Abstract: "We study the out-of-sample performance of portfolio trading strategies when an investor faces capital gain taxation and proportional transaction costs. Under no capital gain taxation and no transaction costs, we show that, consistent with DeMiguel, Garlappi, and Uppal (2009), a simple 1/N trading strategy is not dominated out-of-sample by a variety of optimizing trading strategies, except the parametric portfolios of Brandt, Santa-Clara, and Valkanov (2009). With dividend and realization-based capital gain taxes, the welfare costs of the taxes are large with the cost being as large as 30% of wealth in some cases. Overlaying simple tax trading heuristics on these trading strategies improves out-of-sample performance. In particular, the 1/N trading strategy's welfare gains improve when a variety of tax trading heuristics are also imposed. For medium to large transaction costs, no trading strategy can outperform a 1/N trading strategy augmented with a tax heuristic, not even the most tax- and transaction-cost efficient buy-and-hold strategy. Overall, the best strategy is 1/N augmented with a heuristic that allows for a fixed deviation in absolute portfolio weights. Our results show that the best trading strategies trade diversification considerations off against tax considerations without solely focusing on one or the other."

## Asset allocation and country/sector/style rotation

### Does active country-exposure-shifting add value? A closer look at European equity funds

- Ulf Herrmann
- SSRN, available at http://ssrn.com/abstract=2189524
- Abstract: "In this article we introduce a new return-based measure of active portfolio management, country-exposures-shifting activity, which determines quarterly changes in a fund's country exposures. We relate country-exposures-shifting activity to the popular activity measure tracking error and compare the abilities of both measures to predict fund performance. Our empirical study covers 334 European mutual funds with investment focus European Economic and Monetary Union (EMU) for an evaluation period from 01/2001 to 03/2012. This time period allows us to focus on possible changes in the relation between fund activity and performance due to the Eurozone crisis starting with the first downgrades of Greece's credit rating in December 2009. Results of our analysis show that i) in contrast to tracking error, current country-exposures-shifting activity is positively related to future performance during our evaluation period. However, we find ii) no positive relation between current country-exposure-shifting activity and performance in the subperiod before the start of the Eurozone crisis. On the contrary, iii) fund managers who actively shifted country exposures in the subperiod after the start of the Eurozone crisis clearly outperformed those who kept their country exposures relatively constant. In addition, we find iv) that selecting funds based on country-exposures-shifting activity yields a considerably future economic value and that v) this positive relation between country-exposures-shifting activity and future performance is strongest for the group of currently underperforming funds."

### The commodity risk premium

- Mark Hannam and Jason Lejonvarn
- SSRN, available at http://ssrn.com/abstract=2187814
- Abstract: "The paper makes the case for commodities as an investible asset class, offering benefits through enhanced returns and portfolio risk diversification. The paper explains the various elements that combine to create a risk premium for commodity investment. It then discusses arguments against the existence of a risk premium, and suggests why they are mistaken."

### Strategic asset allocation: The global multi-asset market portfolio 1959-2011

- Ronald Q. Doeswijk, Trevin W. Lam, and Laurens A. P. Swinkels
- SSRN, available at http://ssrn.com/abstract=2170275
- Abstract: "The portfolio of the average investor contains important information for strategic asset allocation purposes. This portfolio shows the relative value of all assets according to the market crowd, which one could interpret as a benchmark or the optimal portfolio for the average investor. We determine the market values of equities, private equity, real estate, high yield bonds, emerging debt, non-government bonds, government bonds, inflation linked bonds, commodities, and hedge funds. For this range of assets, we estimate the invested global market portfolio for the period 1990-2011. For the main asset categories equities, real estate, non-government bonds and government bonds we extend the period to 1959-2011. To our understanding, we are the first to document the global multi-asset market portfolio at these levels of detail for such a long period of time."

### Advancing strategic asset allocation in a multi-factor world

- Farshid Asl and Erkko Etula
- *Journal of Portfolio Management*, Volume 39, Number 1, available at http://www.iijournals.com/doi/abs/10.3905/jpm.2012.39.1.059
- Abstract: "Strategic asset allocation is arguably one of the most important, yet least advanced, aspects of investing. The authors present a new approach to strategic asset allocation that leverages the idea that long-term investment returns derive from multiple distinct sources that they call "return-generating factors." Their approach addresses four key shortcomings of traditional approaches: First, their multi-factor model helps better understand the important sources of return in today's complex investment universe, generating a substantial increase in estimation precision across asset classes and providing investors with a new way to think about portfolio diversification. Second, their robust portfolio optimization methodology seeks to explicitly account for the uncertainties inherent in the estimates of expected returns, delivering well-diversified portfolios with superior risk/return characteristics. Third, the factor-based risk analytics better capture the true characteristics of asset returns, such as fat tails and increased correlations at times of crises, allowing the authors to more-accurately model the downside risks of portfolios. Finally, the factor-based simulation technique accounts for the impact of different economic conditions (e.g., low interest rates) on future portfolio returns, resulting in more-precise, forward-looking projections."

### Forecasting the size premium

- Valeri Zakamouline
- SSRN, available at http://ssrn.com/abstract=2166594
- Abstract: "In this paper, we provide evidence that the small stock premium is predictable both in-sample and out-of-sample through the use of a set of lagged macroeconomic variables. We find that it is possible to forecast the size premium over time horizons that range from one month to one year. We demonstrate that the predictability of the size premium allows a portfolio manager to generate an economically and statistically significant active alpha."

### Is gold overpriced?

- Lingjie Ma and George Patterson
- SSRN, available at http://ssrn.com/abstract=2157666
- Abstract: "The price of gold has risen dramatically since 2001 and there have been intense debates regarding the current price of this asset and its long-term outlook. Here we study a long history of the price of gold and construct a quantile regression model to identify distributional relationships between the price of gold and macroeconomic indicators, financial market performance and other relative factors. We find that while the traditional mean methodology indicates that gold is overpriced, the distributional results from quantile regression imply that gold is not overpriced in the current economic and financial environment. We provide gold price forecasts based on two economic scenarios that cover both the long-run economic environment as well as the recent economic environment experienced in 2009 and 2010."

## Equities (still) for the long run: A new look at the future equity premium

- Michael W. Crook and Brian Nick
- SSRN, available at http://ssrn.com/abstract=2172796
- Abstract: "The equity premium is a well-known and well-explored artifact of financial economics. However, relatively poor equity performance over the last decade leaves many investors questioning the persistence of the equity premium into the future. The lack of a relatively simple forward-looking equity premium model with sufficient historical data availability compounds this uncertainty. Such an equity premium model essentially needs to compare a reasonable forward-looking equity earnings yield to real bond return expectations and be fairy predictive of future relative returns. The data necessary to calculate a cyclically adjusted earnings yield has been available for decades, but real bond return expectations, based on Treasury Inflation Protected Securities or a similar measure, are only recently available in the United States. This article presents a forward-looking equity premium model based on cyclically adjusted S&P 500 earnings yield data and nominal Treasury bond data that has been adjusted utilizing the Cleveland Federal Reserve's Index of Inflation expectations. The resulting data series, representing forward-looking equity premium expectations across various time horizons for the 1982-2012 period, exhibits statistical significance and reasonable predictive power. Currently this ERP model implies far better returns on stocks than bonds over the balance of the next decade – 6.7%, 6.4%, and 5.8% annualized for the next 2, 5, and 10 years, respectively."

## Components of bull and bear markets: Bull corrections and bear rallies

- John M. Maheu, Thomas H. McCurdy, and Yong Song
- SSRN, available at http://ssrn.com/abstract=2171892
- Abstract: "Existing methods of partitioning the market index into bull and bear regimes do not identify market corrections or bear market rallies. In contrast, our probabilistic model of the return distribution allows for rich and heterogeneous intra-regime dynamics. We focus on the characteristics and dynamics of bear market rallies and bull market corrections, including, for example, the probability of transition from a bear market rally into a bull market versus back to the primary bear state. A Bayesian estimation approach accounts for parameter and regime uncertainty and provides probability statements regarding future regimes and returns. We show how to compute the predictive density of long-horizon returns and discuss the improvements our model provides over benchmarks. This article has online supplementary materials."

## Trading and market impact

### Why does ETF short selling provide a different signal?

- John Christopher Hughen and Xiaoyu Ma
- SSRN, available at http://ssrn.com/abstract=2190659
- Abstract: "Short selling is of great interest to investors because this activity has predictive value for future stock returns. We investigate whether this extends to foreign stock ETFs. In contrast to regular stocks, ETFs with high short interest experience positive abnormal returns. Our analysis suggests that the creation and redemption of ETF shares influences the level of short selling. We also find that foreign stock ETFs with low short interest have positive abnormal returns. These abnormal returns are typically caused by higher prices in foreign stock markets and not exchange rate changes. Boehmer, Huszár, and Jordan [2010] document excess returns for regular stocks with low short interest. Our study provides an important extension to this line of research by showing that it exists for securities with minimal asymmetric information."

### Trade classification algorithms: A horse race between bulk-based and the tick-based rules

- Bidisha Chakrabarty, Roberto Pascual, and Andriy Shkilko
- SSRN, available at http://ssrn.com/abstract=2182819
- Abstract: "We compare bulk-volume classification (BVC) proposed by Easley, Lopez de Prado, and O'Hara (2012b) to the traditional tick rule (TR) for a recent sample of equity trades executed on NASDAQ's INET platform. Although BVC leads to impressive (more than 99%) time savings when applied to pre-compressed data, this efficiency comes at a significant (7.4% to 16.3%) loss of accuracy. Users of conventional trade data such as TAQ only save about 5% of processing time by choosing BVC over TR. In addition, TR produces more accurate estimates of order imbalances and of order flow toxicity (VPIN)."

### A simple multimarket measure of PIN

- Travis Johnson and Eric So
- SSRN, available at http://ssrn.com/abstract=2181038
- Abstract: "We develop and implement a new measure of the probability of informed trade that uses information from both equity and options markets. We derive our measure in a multimarket asymmetric information model where trade direction is unobserved. Our multimarket measure, MPIN, is easy to implement empirically because it does not entail estimating a structural model, relies only on unsigned trading volumes, and can be estimated over short windows, including at the daily level. We show that MPIN is positively correlated with spreads, predicts future volatility, rises dramatically before earnings announcements, and exhibits several other empirical properties desirable in a measure of information asymmetry."

### Speed, algorithmic trading, and market quality around macroeconomic news announcements

- Martin Scholtus, Dick Van Dijk, and Bart Frijins
- SSRN, available at http://ssrn.com/abstract=2174901
- Abstract: "This paper documents that speed is crucially important for high frequency trading strategies based on U.S. macroeconomic news releases. Using order level data of the highly liquid S&P500 ETF traded on NASDAQ from January 6, 2009, to December 12, 2011, we find that a delay of 300

milliseconds (1 second) significantly reduces returns by 3.08% (7.33%) compared to instantaneous execution over all announcements in the sample. This reduction is stronger in case of high impact news and on days with high volatility. In addition, we assess the effect of algorithmic trading on market quality around macroeconomic news. Increases in algorithmic trading activity have a positive (mixed) effect on market quality measures when we use algorithmic trading proxies that capture the top of the order book (full order book)."

### Is there an S&P 500 index effect?

- Maria Kasch and Asani Sarkar
- SSRN, available at http://ssrn.com/abstract=2171235
- Abstract: "We find that the firms included in the S&P 500 index are characterized by large increases in earnings, appreciation in market value and positive price momentum in the period preceding their index inclusion. This strong pre-inclusion performance predicts (1) the permanent increase of market value and (2) the change in return comovement, reflected in declines of size, value and momentum betas, following index inclusion. Non-event firms with similar performance experience similar appreciation in value and changes in comovement coincident with the event firms. Contrary to the consensus in the literature, our results indicate that – after accounting for the firms' extraordinary pre-inclusion performance – index inclusion has no permanent effect on value and comovement."

### Concealing the trading footprint: Optimal execution horizon

- Marcos Lopez de Prado
- SSRN, available at http://ssrn.com/abstract=2172471
- Abstract: "Multiple empirical studies have shown that Order Flow Imbalance has predictive power over the trading range. The PIN Theory (Easley et al. [1996]) reveals the Microstructure mechanism by which: Market Makers adjust their trading range to avoid being adversely selected by Informed Traders; Informed Traders reveal their future trading intentions when they alter the Order Flow; Consequently, Market Makers' trading range is a function of the Order Flow imbalance. The Optimal Execution Horizon (OEH) algorithm presented here takes into account order imbalance to determine the optimal participation rate."

### High-frequency trading synchronizes prices in financial markets

- Austin Gerig
- SSRN, available at http://ssrn.com/abstract=2173247
- Abstract: "High-speed computerized trading, often called "high-frequency trading" (HFT), has increased dramatically in financial markets over the last decade. In the US and Europe, it now accounts for nearly one-half of all trades. Although evidence suggests that HFT contributes to the efficiency of markets, there are concerns it also adds to market instability, especially during times of stress. Currently, it is unclear how or why HFT produces these outcomes. In this paper, I use data from NASDAQ to show that HFT synchronizes prices in financial markets, making the values of related securities change contemporaneously. With a model, I demonstrate how price synchronization leads to increased efficiency: prices are more accurate and transaction costs are reduced. During times of stress, however, localized errors quickly propagate through the financial system if safeguards are not in place. In addition, there is potential for HFT to enforce incorrect relationships between

securities, making prices more (or less) correlated than economic fundamentals warrant. This research highlights an important role that HFT plays in markets and helps answer several puzzling questions that previously seemed difficult to explain: why HFT is so prevalent, why HFT concentrates in certain securities and largely ignores others, and finally, how HFT can lower transaction costs yet still make profits."

### Identifying international start dates for algorithmic trading and high frequency trading

- Michael J. Aitken, Douglas Cumming, and Feng Zhan
- SSRN, available at http://ssrn.com/abstract=2172455
- Abstract: "In this research note we provide international start dates for co-location, algorithmic trading (AT), and high-frequency trading (HFT). However, we explain that these start-dates are not well delineated or are even known by most exchanges themselves. Further, we explain that co-location start dates, where defined, do not properly measure effective AT and HFT start dates. As a result, inferences made in recent work, such as that which examines the relationship between international differences in the start of AT based on co-location and its effect on liquidity and firms' equity capital, are possibly misguided. We discuss other issues related to this new and timely literature."

### Short-sale constraints and securities lending by exchange-traded funds

- Naresh Bansal, Ryan McKeon, and Marko Svetina
- SSRN, available at http://ssrn.com/abstract=2173606
- Abstract: "A stock's inclusion in an ETF has the potential to reduce its short sale constraints by decreasing search costs and lowering recall risk. This paper examines how the introduction of ETFs impacts short interest levels of their constituent stocks. We find that short selling in the underlying securities significantly increases after ETFs are introduced. The increase in short interest is largest for firms which are most short-sale constrained prior to the inclusion. The analysis of subsequent additions of stocks to ETFs reveals that the effect of increased short interest is significantly attenuated when compared to the first-time additions. Overall, our evidence suggests that the introduction of ETFs helps to alleviate short-sale constraints for stocks that they hold."

## Finance theory and techniques

### Have we solved the idiosyncratic volatility puzzle?

- Kewi Hou and Roger Loh
- SSRN, available at http://ssrn.com/abstract=2190976
- Abstract: "We propose a simple methodology to evaluate a large number of potential explanations for the negative relation between idiosyncratic volatility and subsequent stock returns (the idiosyncratic volatility puzzle). We find that surprisingly many existing explanations explain less than 10% of the puzzle. On the other hand, explanations based on investors' lottery preferences, short-term return reversal, and earnings shocks show greater promise in explaining the puzzle. Together they account for 60-80% of the negative idiosyncratic volatility-return relation. Our methodology can be applied to evaluate competing explanations for a broad range of topics in asset pricing and corporate finance."

### Time-varying relationship of news sentiment, implied volatility, and stock returns

- Lee Smales
- SSRN, available at http://ssrn.com/abstract=2186267
- Abstract: "I examine the relationship between aggregate news sentiment, S&P 500 Index returns, and changes in the implied volatility index (VIX). I find a significant negative contemporaneous relationship between changes in VIX and both news sentiment and stock returns. This relationship is asymmetric whereby changes in VIX are larger following negative news and/or stock market declines. VAR analysis of the dynamics and cross-dependencies between variables reveals a strong positive relationship between previous and current period changes in implied volatility and stock returns, while current period and lagged news sentiment has a significant positive (negative) relationship with stock returns (changes in VIX). I develop a simple trading strategy whereby high (low) levels of implied volatility signal attractive opportunities to take long (short) positions in the underlying index, while extremely negative (positive) news sentiment signals opportunities to enter short (long) index positions."

### Systematic and idiosyncratic risk in the cross-section of price target expected returns

- Turan Bali and Scott Murray
- SSRN, available at http://ssrn.com/abstract=2174471
- Abstract: "Using a measure of ex-ante expected returns based on analyst price targets, we find strong evidence that investors price both systematic (beta and co-skewness) and non-systematic (idiosyncratic volatility) risk when determining the appropriate rate of return on a security. We demonstrate that price targets contain risk-related information not incorporated into other ex-ante measures of expected returns, as the risk/reward relations are not present using the other measures. Use of the price-target based measure therefore drastically improves our ability to detect risk/reward relations in financial markets."

### Forecasting through the rear-view mirror: Data revisions and bond return predictability

- Eric Ghysels, Casidhe Horan, and Emanuel Moench
- SSRN, available at http://ssrn.com/abstract=2175150
- Abstract: "Real-time macroeconomic data reflect the information available to market participants, whereas final data — containing revisions and released with a delay — overstate the information set available to them. We document that the in-sample and out-of-sample Treasury return predictability is significantly diminished when real-time as opposed to revised macroeconomic data are used. In fact, much of the predictive information in macroeconomic time series is due to the data revision and publication lag components."

### Does academic research destroy stock return predictability?

- R. David Mclean and Jeffrey Pontiff
- SSRN, available at http://ssrn.com/abstract=2156623
- Abstract: "We study the out-of-sample and post-publication return-predictability of 82 characteristics that are identified in the academic literature. The average out-of-sample decay due to statistical bias is about 10%, but not statistically different from zero. The average post-publication decay, which we attribute to both statistical bias and price pressure from aware investors, is about 35%, and statistically different from both 0% and 100%. Consistent with informed trading, after publication, stocks in anomaly portfolios experience higher volume, variance, and short interest, and higher correlations with portfolios that are based on published anomalies. Consistent with costly (limited) arbitrage, the post-publication return decline is greater for anomaly portfolios that consist of stocks that are large, liquid, have high dividend yields, and have low idiosyncratic risk."

### The surprising 'alpha' from Malkiel's Monkey and upside-down strategies

- Robert D. Arnott, Jason C. Hsu, Vitali Kalesnik, and Phil Tindall
- SSRN, available at http://ssrn.com/abstract=2165563
- Abstract: "The latest index literature is bursting with new innovations based on quantitative strategies that are predicated on sensible investment beliefs. Empirical studies confirm that these strategies do indeed deliver economically large and statistically significant excess returns over the cap-weighted market benchmarks in nearly all geographical and country studies. To the casual observer, it will be shocking to learn that inverting the portfolio construction algorithms does not reverse the alphas. Embarrassingly, the inverted strategies often outperform the originals. This paradoxical result is driven by the phenomenon that seemingly unrelated and non-value-based strategies and their inverse strategies often have unintended and almost unavoidable value and small-cap tilts. Even Burt Malkiel's blind-folded monkey, throwing darts at the Wall Street Journal, would produce a portfolio strategy with a significant value and small-cap bias that would have outperformed historically. The value and small tilts stem from the fact that these new weighting schemes sever the link between a company's share price/capitalization and its weight in the portfolio. Generally, an investment thesis where price does not drive the weight in the portfolio will have a value tilt and an investment thesis where company size/capitalization does not drive portfolio weights will have a small-cap tilt. As a result, these strategies produce outperformance against the cap-weighted benchmark due to the often unintended value and small cap tilts and independent of the investment philosophies that drive the product design."

### Liquidity measurement in frontier markets

- Ben Marshall, Nhut Nguyen, and Nuttawat Visaltanachoti
- SSRN, available at http://ssrn.com/abstract=2168548
- Abstract: "Frontier markets, which are countries that have not yet reached emerging market status, have been shown to provide diversification benefits for international investors. However, many stocks in these markets are thinly traded so liquidity is an important consideration. We investigate which liquidity proxies best measure the actual cost of trading in 19 frontier markets that can be accessed by foreign investors. We find that the Gibbs, Amihud, and Amivest proxies have the largest correlation with liquidity benchmarks, while the FHT measure provides the best measure of the magnitude of actual transaction costs."

### Ownership and performance in Europe

- Thomas Hall and Fredrik Jörgensen
- SSRN, available at http://ssrn.com/abstract=2165948
- Abstract: "In this paper, we consider the relationship between performance and ownership concentration in a large number of publicly traded and privately held companies located in smaller European economies (Austria, Belgium, Finland, Ireland, and Ukraine). These countries represent the five legal families (German, French, Scandinavian, Common Law, and Eurasian, respectively), yet are characterized by fairly illiquid and small stock markets. This paper is the first cross-country study we know of to explore the relationship between corporate performance and ownership concentration for both public and private firms from all five legal traditions."

## Derivatives and volatility

### Better portfolios with options

- Gerda Cabej, Manfred Gilli, and Enrico Schumann
- SSRN, available at http://ssrn.com/abstract=2171774
- Abstract: "As a result of the recent financial crises, equity markets have performed poorly in the last five years or so. In consequence, equity long-only strategies have generally been unattractive over this period. This motivates the investigation on whether better performance can be achieved by including equity options in the portfolios. We show that simple systematic option strategies improve portfolio performance. Results are supported by thorough backtesting and simulations."

### What makes the VIX tick?

- Warren Bailey, Lin Zheng, and Yinggang Zhou
- SSRN, available at http://ssrn.com/abstract=2169815
- Abstract: "We seek the roots of one-minute changes in VIX, an index of S&P 500 option prices, to understand risk neutral volatility and its risk premium component. Beyond leverage and risk premium effects, macroeconomic influences and some proxies for noise trading in the S&P 500 ETF market are significant, though measures of small investor sentiment have little significance. VIX changes display negative serial correlation suggesting liquidity provision in the options market. Temporary price effects are observed around macroeconomic news releases. Though often viewed as an exogenous state variable, a significant portion of VIX variability relates to trader behavior and macroeconomic fundamentals."

### Macroeconomic uncertainty and the cross-section of option returns

- Sirio Aramonta
- SSRN, available at http://ssrn.com/abstract=2177069
- Abstract: "I empirically investigate whether macroeconomic uncertainty is a priced risk factor in the cross-section of equity and index option returns. The analysis employs a non-linear factor model, estimated with the Fama-MacBeth methodology, where the macroeconomic uncertainty factor is the return on a long/short portfolio of equity options, built on the basis of how implied volatilities change around scheduled macroeconomic announcements. I find that macroeconomic uncertainty is priced in the cross-section of option returns, even after controlling for a large set of relevant factors. The results are also robust to alternative ways of measuring option returns, and to the non-random pattern of missing returns."

# Appendix 1

## Important Disclosures

Additional information available upon request

For disclosures pertaining to recommendations or estimates made on securities other than the primary subject of this research, please see the most recently published company report or visit our global disclosure look-up page on our website at http://gm.db.com/ger/disclosure/DisclosureDirectory.eqsr

## Analyst Certification

The views expressed in this report accurately reflect the personal views of the undersigned lead analyst(s). In addition, the undersigned lead analyst(s) has not and will not receive any compensation for providing a specific recommendation or view in this report. Rochester Cahan/Miguel-A Alvarez/Jean-Robert Avettand-Fenoel/Mehmet Beceren/Zongye Chen/Javed Jussa/Ada Lau/Khoi Le Binh/Yin Luo/Spyros Mesomeris/Marco Salvini/Sheng Wang/Yiyi Wang

## Hypothetical Disclaimer

Backtested, hypothetical or simulated performance results have inherent limitations. Unlike an actual performance record based on trading actual client portfolios, simulated results are achieved by means of the retroactive application of a backtested model itself designed with the benefit of hindsight. Taking into account historical events the backtesting of performance also differs from actual account performance because an actual investment strategy may be adjusted any time, for any reason, including a response to material, economic or market factors. The backtested performance includes hypothetical results that do not reflect the reinvestment of dividends and other earnings or the deduction of advisory fees, brokerage or other commissions, and any other expenses that a client would have paid or actually paid. No representation is made that any trading strategy or account will or is likely to achieve profits or losses similar to those shown. Alternative modeling techniques or assumptions might produce significantly different results and prove to be more appropriate. Past hypothetical backtest results are neither an indicator nor guarantee of future returns. Actual results will vary, perhaps materially, from the analysis.

# Regulatory Disclosures

## 1.Important Additional Conflict Disclosures

Aside from within this report, important conflict disclosures can also be found at https://gm.db.com/equities under the "Disclosures Lookup" and "Legal" tabs. Investors are strongly encouraged to review this information before investing.

## 2. Short-Term Trade Ideas

Deutsche Bank equity research analysts sometimes have shorter-term trade ideas (known as SOLAR ideas) that are consistent or inconsistent with Deutsche Bank's existing longer term ratings. These trade ideas can be found at the SOLAR link at http://gm.db.com.

## 3. Country-Specific Disclosures

Australia and New Zealand: This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act and New Zealand Financial Advisors Act respectively.
Brazil: The views expressed above accurately reflect personal views of the authors about the subject company(ies) and its(their) securities, including in relation to Deutsche Bank. The compensation of the equity research analyst(s) is indirectly affected by revenues deriving from the business and financial transactions of Deutsche Bank. In cases where at least one Brazil based analyst (identified by a phone number starting with +55 country code) has taken part in the preparation of this research report, the Brazil based analyst whose name appears first assumes primary responsibility for its content from a Brazilian regulatory perspective and for its compliance with CVM Instruction # 483.
EU countries: Disclosures relating to our obligations under MiFiD can be found at http://www.globalmarkets.db.com/riskdisclosures.
Japan: Disclosures under the Financial Instruments and Exchange Law: Company name - Deutsche Securities Inc. Registration number - Registered as a financial instruments dealer by the Head of the Kanto Local Finance Bureau (Kinsho) No. 117. Member of associations: JSDA, Type II Financial Instruments Firms Association, The Financial Futures Association of Japan, Japan Investment Advisers Association. Commissions and risks involved in stock transactions - for stock transactions, we charge stock commissions and consumption tax by multiplying the transaction amount by the commission rate agreed with each customer. Stock transactions can lead to losses as a result of share price fluctuations and other factors. Transactions in foreign stocks can lead to additional losses stemming from foreign exchange fluctuations. "Moody's", "Standard & Poor's", and "Fitch" mentioned in this report are not registered credit rating agencies in Japan unless Japan or "Nippon" is specifically designated in the name of the entity.
Russia: This information, interpretation and opinions submitted herein are not in the context of, and do not constitute, any appraisal or evaluation activity requiring a license in the Russian Federation.

## Deutsche Bank Securities Inc.

## International Locations


Deutsche Bank Securities Inc.
60 Wall Street
New York, NY 10005
United States of America
Tel: (1) 212 250 2500

Deutsche Bank AG London
1 Great Winchester Street
London EC2N 2EQ
United Kingdom
Tel: (44) 20 7545 8000

Deutsche Bank AG
Große Gallusstraße 10-14
60272 Frankfurt am Main
Germany
Tel: (49) 69 910 00

Deutsche Bank AG
Deutsche Bank Place
Level 16
Corner of Hunter & Phillip Streets
Sydney, NSW 2000
Australia
Tel: (61) 2 8258 1234

Deutsche Bank AG
Filiale Hongkong
International Commerce Centre,
1 Austin Road West,Kowloon,
Hong Kong
Tel: (852) 2203 8888

Deutsche Securities Inc.
2-11-1 Nagatacho
Sanno Park Tower
Chiyoda-ku, Tokyo 100-6171
Japan
Tel: (81) 3 5156 6770


# Global Disclaimer