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## PRACTITIONER'S DIGEST

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### **ILLIQUIDITY AND FACTOR RETURNS: EXPLORING THE INTERSECTION BETWEEN ILLIQUIDITY/SMALL CAP AND POPULAR FACTORS**

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*Jason C. Hsu and Vivek Viswanathan*

Factor returns are often reported as the average of factor returns among large stocks and the factor returns among small stocks. However, factor returns among small, illiquid stocks are significantly higher than those among larger, more liquid stocks, suggesting that the factor returns in the literature are exaggerated and cannot be implemented with substantial assets. Moreover, investors who are able to take greater liquidity risk can capture higher factor returns by investing in factors among small stocks.

### **AUTOMATION, INTERMEDIATION AND THE FLASH CRASH**

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*Andrei Kirilenko, Albert S. Kyle, Mehrdad Samadi and Tugkan Tuzun*

The Flash Crash of May 6, 2010, shook the confidence of market participants and raised questions about the market structure of electronic markets. In these markets, intraday intermediation has been increasingly provided by market participants without formal obligations to do so. In our article titled “The Flash Crash: High-Frequency Trading in an Electronic Market” (Kirilenko, Kyle, Samadi, and Tuzun, 2017), we empirically examine intraday, non-designated market intermediation in an electronic market before and during the Flash Crash.

We examine trading in the E-mini S&P 500 stock index futures market from May 3, 2010, through May 6, 2010. We classify trading accounts that do not accumulate significant directional positions and whose inventories display mean reversion from May 3 through May 5 as intraday intermediaries. We further separate intraday intermediaries into high frequency traders (HFTs) and market makers. We find that the combined net inventories of the accounts classified as intraday intermediaries, both HFTs and market makers, over the four days of our sample, including the day of the Flash Crash, did

not exceed 6,000 E-mini contracts. This amount is an order of magnitude smaller than the large sell program of 75,000 contracts documented in the CFTC-SEC joint report (CFTC and SEC, 2010).

We find that during the period of large and temporary selling pressure on May 6, both categories of intraday intermediaries have accumulated net long inventory positions as prices declined. However, we also find that the trading activity of HFTs is distinct from that of a traditional market maker: the direction of HFT trading precedes price changes, while the activity of market makers does not. Furthermore, HFTs lift a disproportionate amount of the final best ask depth before an increase in the best ask level and provide a disproportionate proportion of depth first transacted against at the new price level.

Our findings regarding the behavior of HFTs have catalyzed a discussion regarding market design in the presence of traders that can use their relative speed advantage to extract rents from slower and less tech-savvy market participants.

## **TRADING METHODS AND TRADING COSTS FOR AGENCY MORTGAGE-BACKED SECURITIES**

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*Pengjie Gao, Paul Schultz and Zhaogang Song*

Agency mortgage-backed securities (MBS) offer several advantages for fixed income investors. First, they are free of default risk. Second, they make monthly payments rather than the semiannual coupon payments made by most bonds. Third, they offer attractive yields. Finally, the agency MBS market is more liquid than the corporate or municipal bond market.

In this article, we report findings that should be useful to institutional investors choosing among the many ways to trade agency MBS. Trading costs are much lower and liquidity is much greater in the too-be-announced (TBA) forward market than in the specified pool (SP) spot market. Nevertheless, investors who wish to trade MBS with the most desirable prepayment characteristics should do so in the SP market where the full value of the MBS can be realized. Investors who do not need immediacy can trade at significantly lower cost by using brokered trades in which the dealer waits until a counterparty is found before executing both sides of the trade. Investors who make use of brokered trades must, however, be willing to wait hours or even days for execution. We also find that trading costs are lowest for investors who trade with the most active dealers. Investors must, however, consider the fixed costs of trading with active versus inactive dealers as well as the costs per trade.

## **TIME AGGREGATION OF SHARPE RATIO—A BETTER EXTRAPOLATION RULE**

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*Ziemowit Bednarek, Pratish Patel and Cyrus Ramezani*

For over two decades, finance professionals have relied on the “square-root of T” rule (Rule) to extrapolate from one to T-period Sharpe Ratios. But, several studies document the decline in the Rule’s accuracy with the investment horizon. Specifically, the Sharpe Ratio term-structure is hump-shaped and not upward sloping as the Rule suggests. The discrepancy is due to overlooking the effect of

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compounding. As we show, ignoring compounding over a short horizon may be reasonable but, over longer horizons, ignoring compounding leads to a significant error in estimating the Sharpe Ratio.

We propose a better extrapolation rule. The proposed rule extrapolates using a non-linear adjustment factor, which depends on both compounding and higher-order moments of the return. We give several realistic examples showing the usefulness of the proposed rule.

To highlight the practical implications, we comprehensively analyze the Sharpe Ratios of several popular test assets. These include portfolios sorted by size, book-to-market, and earnings to price ratio, as well as industry portfolios and several mutual funds. Using the Generalized Method of Moments, we estimate the Sharpe Ratios of these assets across different horizons. The analysis shows the accuracy of extrapolating with our rule and it shows the inaccuracy of extrapolating with the square-root of T rule. The findings presented in this study have important implications for both asset allocation and performance evaluation.

## **EXPLAINING THE HIGH *P/E* RATIOS: THE MESSAGE FROM THE GORDON MODEL**

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*Heinz Zimmermann*

Practitioners often infer growth expectations or expected returns from individual valuation ratios. Unfortunately, most valuation models contain several “unobservables” which makes inferences of that kind unwarranted. However, as shown in this article, the interpretation of ratios can be enhanced by applying a valuation model consistently to *several* valuation ratios and by exploiting their *joint* explanatory power with respect to the underlying market expectations.

Using the simple Gordon model, the three unobservables (profitability, payout, and discount rate) can be uniquely determined from three commonly used ratios (*P/E*, *P/B*, *P/D*).

This approach is used for addressing the question whether the high valuation levels of equity prices, after controlling for the low interest rate level, are driven by irrational exuberance and excessive growth expectations. Overall, *P/E*-ratios do not seem to be caused by irrational growth expectations, rather a decline can be observed over the past years. Discount rates are the major drivers of high valuation levels in Europe and particularly in Switzerland, while profitability is the major source in the US and Germany.