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# PRACTITIONER'S DIGEST

The "Practitioner's Digest" emphasizes the practical significance of manuscripts featured in the "Insights" and "Articles" sections of the journal. Readers who are interested in extracting the practical value of an article, or who are simply looking for a summary, may look to this section.

## MEASURING RISK PREFERENCES AND ASSET-ALLOCATION DECISIONS: A GLOBAL SURVEY ANALYSIS PAGE 5

*Andrew W. Lo, Alexander Remorov and Zied Ben Chaouch*

We study the risk and asset-allocation preferences of the three major stakeholder groups in the investment management industry—individual investors, financial advisors, and institutional investors—by using the results of three comprehensive global surveys between 2015 and 2017, covering over 22,000 individuals, 4,892 advisors, and 2,060 institutional investors. The breadth of our dataset sets it apart from previous survey data in the literature. This dataset covers 22 countries in the individual investor surveys and 16 countries in the financial advisor surveys each year, allowing us to compare survey results across countries as well as across stakeholders. All survey subjects have a significant stake in the market: the individual investors have a net worth greater than $200,000, while the financial advisors and the institutional investors are employed in the financial industry. As a result, their answers will generally be more realistic and have greater relevance for modeling investor behavior than results from surveys conducted among students in a laboratory, as many other studies have done.

Our main goal is to understand how different market participants and different types of individuals compare along the dimensions of risk aversion and asset allocation. To this end, we poll members of these groups about their investment decisions under various historical and hypothetical scenarios and obtain two sets of results. The first set of results shows that investors tend to be significantly more risk averse and mostly extrapolative in their asset allocation, while institutions tend to be significantly less risk averse and mostly contrarian in their investment decisions, with advisors falling in the middle of the risk aversion scale while also following a contrarian asset allocation strategy.

The second set of results focuses on using a clustering algorithm applied to our survey responses, allowing us to identify five distinct types of investors: "extrapolators" tend to decrease their equities allocation following bad market performance and increase it following good returns, extrapolating past trends; "passive" investors leave their allocation unchanged in both scenarios; "risk avoiders" cut their equity allocation significantly when they observe large moves in the S&P 500 in either direction;

"contrarians" tend to increase their equities allocation following bad market performance and decrease it following good returns; and "optimistic" investors tend to increase their allocation in either scenario.

While the largest cluster of individual investors in our dataset corresponds to passive investors, there is also a significant number of risk avoiders and extrapolators. We find that most financial advisors and institutional investors employ a contrarian allocation strategy—that is, they change equity allocation in the direction opposite to recent returns on the S&P 500. This contrasts with the overall behavior of individual investors, who on average are extrapolators. The differences in the reactions across these three groups of market participants are significant and very large.

Our results have another important implication: advisors generally advise their clients to change their allocation in the opposite direction of the typical preference of the individual investor. It may be that advisors recognize the excessive tendency of investors toward extrapolation and try to mitigate this effect by giving "contrarian advice." Also, the proportion of advisors who suggest a significant decrease in equity allocation when observing large S&P 500 moves is much smaller than the proportion of individual investors who would implement such a change. As a result, advisors may also provide the significant benefit of ensuring their investors stay invested in the markets despite periods of high volatility, and hence earn higher returns in the long run.

Finally, we compare risk aversion across the three groups, as well as within investor demographic categories. Individual investors are significantly more risk averse than financial advisors, who are in turn more risk averse than institutional investors. We find that individual risk aversion increases with age, which is consistent with previous literature linking risk aversion to age, wealth, and education. There are also large differences in risk aversion across countries, with the U.K. and Canada consistently more risk averse than the global average and Hong Kong and Taiwan consistently among the least risk averse.

## IS SELL-SIDE RESEARCH MORE VALUABLE IN BAD TIMES? PAGE 51

*Roger K. Loh and René M. Stulz*

Sell-side research is an important input in institutional investors' portfolio allocation decisions. Little is known, however, about whether the value of sell-side research is different in bad times compared to good times. Because uncertainty is high in bad times, investors find it harder to assess firm prospects and hence should value analyst output more. However, higher uncertainty makes analysts' tasks harder, so it is unclear whether analyst output is more valuable in bad times. We find that in bad times, revisions of stock recommendations and earnings forecasts have larger stock-price impact. This shows that analyst research is indeed more valuable to investors in bad times.

We also find that the earnings absolute forecast errors of analysts increase during bad times, which makes it puzzling that analyst reports would have more impact on stock prices. We show that the traditional metrics of analyst precision are not appropriate to compare forecast precision across good and bad times. The relevant measure of precision is one that takes into account the underlying uncertainty. We find evidence that earnings forecast errors per unit of uncertainty fall in bad times. Analyst reports are

also more frequent and are longer. Overall, these results are consistent with analysts working harder and investors relying more on analysts in bad times.

## COMPARING ANOMALIES USING LIQUIDITY AND EARNINGS PAGE 75

*Robert Snigaroff, David Wroblewski and Sean Sehyun Yoo*

We show that liquidity is important in describing stock returns by constructing a liquidity-based model that outperforms leading benchmark models in describing the most well-known anomalies. We use both earnings and liquidity factors to construct this competing model, both of which are highly intuitive to practitioners. Stock trading volume, as a measure of liquidity has been reported in conjunction with stock prices in newspapers at least since the 1800's. Today, institutional investors and index providers adjust weights by free float; they already act according to their belief that market cap weighting should be adjusted by investors' ability to freely trade their positions. Unlike some other weighting schemes, earnings and liquidity factors are readily amenable to asset pricing theory; investors desire to hedge their own earnings and liquidity state risk along with Sharpe's (1964) market risk. Fama and French (1995) themselves have discussed their use of HML as a proxy for an earnings state variable. We use a direct earnings variable.

The notion of replacing market cap with a measure of liquidity such as trading activity has the potential to materially impact asset allocation. Much of the market is characterized by large and small relative to market capitalization. A more practical measure for an investor who wants to buy a or sell a position is the asset's liquidity, and we use the well-known measure of stock's trading volume. Existing retail products can be adjusted to better capture this measure and new products can be constructed with a better alignment to whether the stock is investible.

We also collect and demonstrate state-of-the-art statistical tests for practitioners to use to gauge model performance. These include comparisons of factor models in terms of GRS-statistics, cross-sectional *r-squared* statistics, and the maximum squared Sharpe ratio for the intercept's statistic, as well as the average over the absolute values of the intercepts. For fair comparison, we reconstruct and test three separate factor models on the same universe on their ability to explain a set of portfolio anomalies over a long time period, and over a rolling time period.

## CORRELATION SHRINKAGE: IMPLICATIONS FOR RISK FORECASTING PAGE 92

*Jose Menchero and Peng Li*

Asset covariance matrices are used for two basic purposes in quantitative investment management. The first is for predicting portfolio volatility; the second is for portfolio construction (i.e., mean-variance optimization). It is well known that using the sample covariance matrix for mean-variance optimization may result in portfolios with poor out-of-sample performance, high leverage, and high turnover. It is also recognized that shrinking asset correlations toward zero may mitigate many of these adverse effects in portfolio construction.

The focus of this paper is to study the implications of correlation shrinkage from a volatility-forecasting perspective. We show that due to sampling error in the correlations, volatility forecasts can be improved by shrinking correlations toward zero. However, we show that for any realistic length of look-back window (or half-life parameter), the potential error reduction in volatility forecasts is virtually *immaterial*. Moreover, we find that excessive shrinkage of correlations (as is often done in practice) may result in large errors in volatility forecasts. The conclusion is that while the sample correlation matrix is poorly suited for portfolio construction, it is close to optimal for risk-forecasting purposes.

## ATTRIBUTION OF EX-POST REALIZED SHARPE RATIO TO THE PREDICTABILITY OF THE EX-ANTE FORECAST RETURN AND RISK PAGE 109

*Masahito Shimizu*

Improving the Sharpe ratio is an important goal of sponsors and portfolio managers. This ratio is measured based on portfolio performance under an ex-post realized return distribution. However, investors construct portfolios based on ex-ante forecast return distributions for investable assets at the beginning of an investment period by using the mean-variance approach. As such, it is natural that the ex-ante forecast return distribution differs from the ex-post realized future return distributions.

We propose to use an attribution formula that enables the ex-post realized Sharpe ratio to be decomposed into realized market conditions, ex-ante predictability of the returns, risk magnitude, and risk factors. We compare the predictability of the ex-ante return and ex-ante risk directly, quantitatively identifying the main source of the reduction of the Sharpe ratio using the attribution. Furthermore, we use excess Sharpe ratio attribution analysis to simultaneously evaluate the qualities of the portfolio and benchmark. We additionally provide numerical examples of the attributions using sector indices.