

#### 2

#### **Market Structure Arbitrage**

Fast trading techniques that are making some investors furious.

#### 7

#### Quant Corner: Updating Monte Carlo Simulation for the 21st Century.

How new technology presents a solution to investment forecasting.

#### 11

#### Morningstar Product Spotlight: The Morningstar Rating™ for Hedge Funds

A better way to evaluate hedge fund returns.

#### 13

#### **Industry Trends: Alternative Mutual Funds** The return of absolute return mutual funds.

#### **Fund Reports**

- 14 EAS Genesis Fund
- 16 Incline Capital Trend Following
- 18 UBS Multi-Strategy Market Neutral
- 20 Quarterly Data Review: 03 2010
- 27 Hedge Fund Database Overview

# M RNINGSTAR®

# **Market Structure Arbitrage** Fast trading techniques that are making some investors furious.



Nadia Papagiannis, CFA Alternative Investments Strategist

The trading world has changed demonstrably over the past decade. Gone are the days of New York Stock Exchange specialists and market makers pocketing \$0.08 spreads. The U.S. stock market is no longer one dominant, floor-based exchange, but rather a network of competing electronic-trading venues with lightning-fast executions. As a result, U.S. stocks have the lowest bid-ask spreads in the world, less than 10 basis points on average.<sup>1</sup> According to Credit Suisse, the U.S. equity markets also enjoy rock-bottom commissions and market-impact costs, totaling less than 23 basis points per \$100 million trade.<sup>2</sup> This is the result of increased competition and technological innovation that largely precludes the need for human involvement.

High-frequency traders, those who use automated-trading programs to quickly trade in and out of many securities with the hopes of making small profits, now represent 60% of total U.S. stock-trading volume.<sup>3</sup> In 2008, these traders netted \$21 billion in profits,<sup>4</sup> while the average investor, and even the average hedge fund investor, lost his shirt. High-frequency trading first attracted media attention in early 2009 but gained notoriety as a result of the May 6, 2010, flash crash. Now, politicians are steamed and regulators are scurrying to find a solution, which no one seems to agree upon. Proponents of high-frequency trading believe that the practice provides much needed liquidity to the markets, while protestors believe that these rapid traders have trampled capital formation and stolen from the long-term investor. The truth lies somewhere in between.

The fact of the matter is that not all high-frequency trading has the potential to be destructive or manipulative, but there are indications of some less-than-legitimate practices. One such practice relates to trading ahead or front-running institutional investors for liquidity rebates provided by exchanges. Yet another involves "latency arbitrage," the ability of certain market participants to profit from the relatively slow quotation system informing the rest of the market. Although the evidence of these practices is hard to ignore, the total impact on investors is difficult to quantify. Nevertheless, public confidence in the equity markets is eroding, and the SEC and industry participants should attempt to stamp out these manipulative practices before the damage is irreversible.

#### **High-Frequency Trading**

First, a word on high-frequency trading in general: Not all high-frequency traders are created equal. There are distinct factions of high-frequency traders. First, there are the "statistical arbitrageurs"-hedge funds and mutual funds that take long and short positions in two similar securities in an attempt to make a small profit from the price differential. These funds tend to buy and sell large quantities of securities through computer models, which select multiple instruments with similar quantitative characteristics, as opposed to the traditional stock-picker who creates a story behind each of his long or short bets. Related to security selection is the holding period. The stock-picker may wait for long periods of time for his story to play out, while the statistical arbitrageur will hold an instrument only as long as certain quantitative characteristics persist and as long as the overall risk in the portfolio (longs versus shorts) remains balanced.

But despite the vastly different investment techniques, both the stock-picker and the statistical arbitrageur share a common bond: Economic theory drives each strategy, which contributes to price discovery in the traded securities. Just look at the exchange-traded fund market. By one study, ETFs with more than 25,000 shares of daily trading volume tracked the net asset value, or NAV, of the underlying CONTINUED ON NEXT PAGE securities within 0.5% at least 98% of the time.<sup>5</sup> Statistical arbitrageurs make up 50% of the volume in SPDR S&P 500 **SPY**, one of the most heavily traded and price efficient ETFs available.<sup>6</sup> This is a boon for the retail investor seeking low-cost broad stock market exposure. In stark contrast to statistical arbitrageurs, true high-frequency traders ignore both economic theory and the underlying characteristics of the instruments they trade, instead gleaning profits from the structure of the markets they trade in at the expense of retail investors or the institutions trading on their behalf.

When the equity markets fragmented by SEC decree in 1998 (Regulation Alternative Trading System) and technology improved, a host of competing exchanges, electronic communication networks, and dark pools sprang up. According to the SEC, there are now more than five registered U.S. stock exchanges, as opposed to just one, and numerous unregistered or offline exchanges such as electronic communications networks or dark pools (those that do not publish quotes) that represent more than 35% of total trading

volume. (See Exhibit 1.) To attract business in a highly competitive market, many exchanges now offer "low-latency" or high-speed order executions, some less than one millisecond, with the ability to mask all or part of an order. Furthermore, to attract sufficient liquidity, many alternative trading systems provide liquidity rebates (also adopted by the options markets in recent years) and the ability to view exchange data faster than other market participants<sup>7</sup>, giving birth to some questionable high-frequency trading tactics.

#### **Liquidity-Rebate Trading**

Trading venues reward liquidity rebates to any trader who submits a buy (sell) limit order in which the limit price is below (above) the current market price (national best bid or offer), paid for by the counterparty taking liquidity.<sup>8</sup> Rebate trading has been so successful at attracting order volume that Direct Edge, BATS, and NYSE exchanges are engaging in a "fee war," sometimes taking a loss by offering more than the allowed \$.003 rebate per the SEC's Regulation NMS.<sup>9</sup> But higher volume does not necessarily mean liquidity, especially in times of volatility, according to the SEC's Sept. 30 flash crash report.<sup>10</sup>

#### Exhibit 1: Trading Centers and Estimated % of Share Volume in NMS Stocks: September 2009



Source: Securities and Exchange Commission 17 CFR Part 242 Concept Release on Equity Market Structure Release No. 34-61358.

A common high-frequency trading strategy involves collecting rebates from large institutional orders, broken into small 100- or 500-share lots by computerized algorithms designed to minimize market impact. Unfortunately, high-frequency rebate trading is likely increasing the transaction costs incurred by institutions using these algorithms. According to Themis Trading LLC, a typical rebate-trading strategy works as follows: An institutional algorithm bid is identified, and the high-frequency trader outbids the institution by a penny. When the order is filled, the high-frequency trader turns around and offers those same shares to the institution at the inflated price, collecting a rebate on both the buy and sell orders. A more predatory tactic involves pumping up the price until the institutional algorithm reaches its limit and then dumping or selling the stock short. Pinging, or sending and then immediately canceling orders, helps to determine this limit. Inflating volume is a common high-frequency trading tactic, as many institutional algorithms will buy or sell more shares as volume increases.<sup>11</sup> The fateful May 6 E-mini S&P 500 sell order that the SEC believes triggered the flash crash was one such volume-driven algorithmic trade.12

#### Latency Arbitrage

Typical high-frequency traders physically locate their trading systems near exchange servers in order to minimize the latency at which they send and receive trade data. This is no small business. The NYSE Euronext recently built a 400,000 square foot "liquidity center" in Mahwah, N.J., and a similarly large facility in Basildon, England, to house computer servers of traders seeking direct, real-time data feeds from the exchange servers. Although these facilities will cost the exchange more than \$500 million to build, it plans to build 40 more in the next few years, as the demand for co-location far exceeds the supply. The NYSE Euronext expects annual revenues of \$1 billion from these co-location facilities.13 CONTINUED ON NEXT PAGE

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There are no restrictions on co-location, other than a new rule that requires the NYSE to publish co-location fees and to give all co-locators equal access.<sup>14</sup> Other trading venues have no such requirements.

Co-location allows high-frequency traders to effectively calculate a real-time National Best Bid and Offer before the exchange's bids and offers are incorporated into the publicly available quotation system, which can take up to 200 milliseconds.<sup>15</sup> This creates an arbitrage opportunity, allowing the high-frequency trader, who can trade in microseconds (one thousandth of a millisecond) to trade ahead of an institution and pocket the difference.

TFS Capital, a \$1.2 billion mutual fund firm, routinely conducts tests to see which trading venues enable this behavior. For example, in March 2010, it placed a 100 share buy limit order at the \$69.845 midpoint of the NBBO of a stock (\$69.81 bid and \$69.88 offer) in a dark pool. Eight seconds later, TFS placed a short sell limit order of \$69.82 in a displayed market venue, which changed the NBBO to \$69.81 bid and \$69.82 offer. Before the publicly available quotation system updated, it's likely that a high-frequency trader saw both the buy and short sell orders (not knowing that TFS was behind both trades), calculated the new NBBO, and took advantage of the situation. While TFS executed the sell order at \$69.82 in the displayed market venue, reflecting the current bid-ask spread, the buy limit order was simultaneously filled in the dark pool at \$69.845—the midpoint of the stale, much wider spread. Conversely, the high-frequency trader likely bought at \$69.82 and sold at \$69.845 against TFS, pocketing 2.5 cents.<sup>16</sup>

#### **Mixed Messages**

Despite this anecdotal evidence of highfrequency high jinks, several studies have found that the impact of high-frequency trading is either benevolent or insignificant. For example, Hasbrouck and Saar (2010) looked at NASDAQ trades in October 2007 and June 2008 in millisecond time intervals in the top 500 market-capitalization stocks. The study claims that high-frequency traders, as identified by strings of trades, lowered volatility, reduced spreads, and increased the depth or the volume of shares, offered at each price.<sup>17</sup> Brogaard (2010) analyzed 26 high-frequency traders, as identified by the NASDAQ exchange, trading 120 stocks between January 2008 and early 2010, including the fateful week of Sept. 15, 2008. He failed to find evidence that high-frequency traders systematically front-run nonhigh-frequency traders, flee in volatile times, or earn exorbitant profits.<sup>18</sup>

Others have arrived at entirely different conclusions, which are hard to ignore, perhaps because of access to better trade data. For example, Kirilenko, Kyle, Smadi, and Tuzun (2010), employees or contractors of the Commodities Futures Trading Commission, studied the flash crash of May 2010. They found that high-frequency traders accounted for more than one third of total trading volume in the E-mini S&P 500 futures contract but did not provide the much needed liquidity and served only to exacerbate the volatility and drop in prices created by fundamental traders.<sup>19</sup> Nanex, a data feed provider, supports these claims, reporting that the flash crash was in fact caused by high-frequency traders who overloaded the system with thousands of orders in a 50 to 100 millisecond time frame.<sup>20</sup> Nanex has discovered thousands of similar, but milder, flash crashes over the past five years, with a concentration of flash crashes in 2008.21

Furthermore, Quantitative Services Group, an independent equity research provider and consultant, routinely studies the trade execution costs of its institutional clientele. QSG finds that high-frequency traders, which exit positions after exhausting the profit potential from institutional algorithms, cause subsequent price reversals in the stocks they trade in, a trading cost that traditional measures generally miss. The firm also discovered that equity trades resulting in the highest market impact ("liquidity charge") also suffered the largest post-trade price reversals, a double-execution-cost whammy to institutional investors.<sup>22</sup>

#### **Much Ado About Nothing?**

While the evidence of some unscrupulous high-frequency trading is tough to disregard, it's difficult to quantify the total impact on other market participants and investors in general.

There is a wide range of estimates as to the profits of high-frequency traders. For instance, one academic study bounded the trading profits in 2008 U.S. equities between \$21 million and \$25 billion annually, depending on how long stocks are held. The study also reports that such estimates of trading profits may not be achievable in real time, and that even the largest reasonable profit estimates are likely immaterial in relation to the total annual \$50 trillion equity trading volume.<sup>23</sup> Furthermore, proponents of highfrequency trading believe that multibillion dollar estimates of the industry's profits (for example, the TABB Group's \$21 billion figure for 2008) are confounded and inflated by arbitrage hedge funds, which engage in dissimilar, albeit faster, strategies.

According to Morningstar's database, however, arbitrage strategies lost money in 2008 (see Exhibit 2), along with almost every other trading strategy and asset class. So billions of dollars in high-frequency trading profits that year should raise eyebrows. Even more important than an exact tally of high-frequency trading profits, though, is the lack of investor confidence in the equities market. Investors pulled more than \$209 billion from U.S. stock mutual funds since mid-2007. and \$15 billion in May 2010 alone. (See Exhibit 3.) Therefore, despite the lack of evidence as to the total cost of high-frequency traders to investors, the investment management industry and regulators should still take action. CONTINUED ON NEXT PAGE





The high-frequency trading of today is not the first time short-term traders have taken advantage of market structure inefficiencies at the expense of investors. In the late 1980s and early 1990s, "SOES Bandits," professional day traders posing as retail investors, executed large volumes of trades through the NASDAQ exchange's Small Order Entry System, which gave execution priority to retail customers' trades of up to 1,000 shares. One study found that some of these "bandits" could have been raking in up to \$5 million annually, using strategies such as "picking off market makers who are slow to update quotes," similar to latency arbitrage strategies used today. While the cumulative effect of the SOES bandits was not known, the National Association of Security Dealers (now FINRA) believed that SOES bandits spooked market makers and widened spreads, and therefore moved to ban the practice.<sup>24</sup>

After the SOES bandits came mutual fund late trading and market-timing. While late trading was clearly illegal, market-timing was more of a gray matter. Market-timing involved trading ahead of stale prices informing mutual funds' NAVs, which by regulation are calculated once per day. One study estimated the dilution of market-timing trades to be 14 basis points per year between 1996 and 2001 for the average fund, or a total of \$3,740 for the typical American family.<sup>25</sup> While not an astronomical sum, the mutual fund timing scandal also eroded investor confidence, as evidenced by the title of a bill proposed in 2003 to remedy the situation, the "Mutual Fund Investor Confidence Restoration Act."

#### **Restoring Confidence to the U.S. Markets**

In summary, it's unlikely that high-frequency traders taking advantage of our current market structure inefficiencies are benefiting investors. Even the TABB Group, which characterized the role of high-frequency trading as "benign," acknowledged that the current market structure may not be optimal for investors, but there is little incentive for the industry to change that structure.<sup>26</sup> The exchanges make too much money from co-location, and they will certainly avoid anything that could cannibalize their trading volume, such as eliminating liquidity rebates. The solution requires an industrywide recognition of the problems bolstered by regulators' efforts to bring transparency.

This year the SEC has taken significant steps in attempting to improve the equity market structure. It recently eliminated "naked access" to the markets—namely, proprietary traders masking their identity through registered broker dealers, who do not impose any risk controls on those traders. It also imposed minimum quoting standards on market makers. In addition, the SEC is evaluating proposals to require a consolidated audit trail system to track orders and executions across the many securities markets, which if studied by academics, would go a long way in evaluating the issues and identifying the culprits.

Still, more needs to be done. On the investment side, mutual funds should be forced to publicly report and evaluate different types of transaction costs, which, as QSG's studies have pointed out, include the impact of other CONTINUED ON NEXT PAGE traders and could occur postexecution. On the trading front, FINRA should require broker dealers to disclose where trades are executed (including trades that are internalized and not sent to any market venue) and any liquidity rebates (or any payment for directing order flow) associated with those executions to all clients on a regular basis. Exchanges or dark pools should be required to institute and disclose practices, such as "antigaming logic," to prevent front-running associated with latency. And finally, the latency of each marketplace, or the time it takes for the bid-ask quotes to update, as well as information regarding co-locating activities, which could enable latency arbitrage, should be publicly available. Armed with the correct information, the marketplace of institutional investors, as well as the retail investors they serve, will opt to transact with the more ethical participants. Transparency is answer to the high-frequency trading dilemma.

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# Quant Corner: Updating Monte Carlo Simulation for the 21st Century

# How new technology presents a solution to investment forecasting.



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*A shorter version of this article appeared in the Nov. 19, 2010, edition of Investment Week.* 

In 1946, Stanislaw Ulam, a Poland-born mathematician and member of the Manhattan Project, was whiling away the time during his recovery from an illness by playing solitaire and began to wonder about the likelihood of success. So, he stopped playing with the cards and returned to his profession of mathematics to try to calculate the percentage of successful games out of all possible shuffles. This turned out to be harder than he thought. So, he came up with an alternative method using the power of an early computer to simulate 100 card shuffles and then simply count the number of winning hands. Thus was born a computational technique now known as Monte Carlo Simulation, so named because the basic building block was none other than a computerized version of a roulette wheel with many billions of numbers around the edge. Although it took decades to work out all the kinks in the computerized roulette wheel, Monte Carlo Simulation has become a standard tool of risk management. Its latest incarnations offer several bold advances.

#### An Early Application of Monte Carlo Simulation to Asset Allocation

In 1976, Roger Ibbotson, then an assistant professor at the University of Chicago, and Rex Sinquefield published a paper in the *Journal of Business* called "Stocks, Bonds, Bills, and Inflation: Simulations of the Future (1976– 2000)" as a companion piece to their historical study of asset class returns. In "Simulations," they used the Monte Carlo method developed by Ulam to make probabilistic predictions of the form "there is an X percent chance that \$1 invested in the portfolio will grow to \$Y or more in Z years." Putting together past history with the forecasts, they generated "tulip" or "fan" charts similar to Exhibit 1.

Like Harry Markowitz's 1952 mean-variance model, the Ibbotson-Sinquefield simulation model was an early attempt to cure what Savage has dubbed the "flaw of averages.<sup>1</sup>" In general, the flaw of averages is a set CONTINUED ON NEXT PAGE



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of systematic errors that occurs when peopleuse single numbers (usually averages) to describe uncertain future quantities. For example, if you plan to rob a bank of \$10 million and have one chance in 100 of getting away with it, your average take is \$100,000. If you described your activity beforehand as "making \$100,000," you would be correct, on average. But this is a terrible characterization of a bank heist! Yet this very mistake is made all the time in business practice. It helps explain why everything is behind schedule, beyond budget, and below projections, and it was an accessory to the economic catastrophe that culminated in 2008.

Ibbotson and Singuefield simulated each future month's return on a portfolio from historical monthly returns over the period 1926-74, a period of 588 months. Like Ulam, Ibbotson and Singuefield used a computer program to "spin" a roulette wheel with 588 spots 300 times for each simulated future. By running only a few thousand possible futures, they were able to complete the calculations on a mainframe computer of the era in time for publication.

#### Ibbotson and Sinquefied "Made Easy"

While there was interest in the lbbotson-Singuefield simulation model at the time of its publication, the technology for running a Monte Carlo Simulation was not readily available to many in the investment community. But four years later in 1980, four researchers published a paper in the Journal of Business that showed that, to a large degree, the results of the lbbotson-Singuefield simulations could be replicated without Monte Carlo Simulation<sup>2</sup>. Titled "The Ibbotson-Singuefield Simulation Made Easy," this paper showed that by making a number of simplifying assumptions and applying the Central Limit Theorem<sup>3</sup>, probabilistic forecasts of cumulative wealth can be made using mathematical formulas<sup>4</sup>.

The "Made Easy" model became the standard method for probabilistic forecasting and is in wide use today.

However, as powerful as the "Made Easy" model is, it is not up to the task of forecasting problems other than simple wealth accumulation with no inflows or outflows. Consider the problem of forecasting how long a retiree can make a given amount of wealth last before going broke, assuming that she invests her unspent wealth in a portfolio of risky assets. If we were to assume a fixed rate of return on investments during retirement and solve for the year in which the retiree runs out of money, we would run afoul of the Flaw of Averages because there are many plausible scenarios in which poor returns in the early years cause the retiree to go broke well before the time forecasted. Except under highly simplified assumptions, the only practical way to approach this problem is Monte Carlo Simulation<sup>5</sup>. Hence, the Monte Carlo approach has become the most common method for modeling drawing down wealth during retirement.

Furthermore, the capital markets do not always behave in the way that the simplified models assume. As Kaplan discusses, history is replete with "fat tail" events that are captured by models based on the bell curve (as all of the simplified models are)<sup>6</sup>. This is another reason why Monte Carlo Simulation is usually the most practical approach to investment forecasting.

This is not to say that Monte Carlo Simulation is a silver bullet. There are a number of practical issues when implementing Monte Carlo model that must be taken into consideration. Michele Gambera summarizes a number of these issues<sup>7</sup>, namely:

- 1 The accuracy of the results is limited by the number of simulated histories. Hence, there is a tradeoff between the accuracy of the model and the time it takes to run it.
- 2 The amount of time needed to run enough simulated histories might be too long to be practical to obtain enough accuracy to make the model useful.
- **3** The amount of computer storage needed to run a model might be impractically large. For example, to store 1,000 simulated histories over a 25-year period of monthly returns requires storing 300,000 numbers per asset class.

#### A 21st-Century Update

Fortunately, 21st-century technology addresses these issues not only making Monte Carlo Simulation practical, but also interactive and highly flexible. This is due to three computer technologies that have recently come together-Interactive Simulation, the DIST Distribution String, and Cloud Computing:

#### Interactive Simulation

The central processing unit in today's iPhone is hundreds of times more powerful than the machine used by Ibbotson and Singuefield and many times faster than in 2002, the date of Gambera's publication. Furthermore, several recent software breakthroughs have focused specifically on the speed of Monte Carlo Simulation. Risk Solver Platform, for example, from Nevada-based Frontline Systems, can simulate 100,000 spins of the roulette wheel in Microsoft Excel before the user's finger has left the Enter key of his computer. The resulting "interactive" simulation provides a new level of intuition into uncertainty. And more speed is on the way. Not only are CPUs getting faster, but machines are being fitted with parallel processors. Many applications cannot be programmed to take advantage of multiple processors. Monte Carlo Simulation is a notable exception and is known in the trade as "embarrassingly parallel." It may not be long before specialized machines are developed for the sole purpose of running simulations. CONTINUED ON NEXT PAGE

**Exhibit 2: The DIST Distribution String** 

...0.756, 0.927, 0.873, 0.253, 0.070, 0.705, 0.665, 0.427, 0.375, 0.708, 0.733, 0.769, 0.405...Thousands of Scenarios... 0.094, 0.715, 0.829, 0.012, 0.848, 0.008, 0.024, 0.174, 0.745, 0.253, 0.242, 0.273, 0.517, 0.446, 0.630, 0.564, 0.929, 0.129, 0.285, 0.615, 0.629, 0.188, 0.253, 0.745...

1	A	В	C	D	E	F	G
1							
2		9					1
3		<dist name="&lt;/td"><td>"Large Cap" a</td><td>avg="7.02855</td><td>199E-002"</td><td></td><td></td></dist>	"Large Cap" a	avg="7.02855	199E-002"		
4							

-30

#### The DIST Distribution String

The Distribution String is a new standard for packaging thousands of Monte Carlo scenarios into a single data element. (See Exhibit 2.) It was developed by Savage, in collaboration with Oracle Corp., SAS Institute, and Frontline Systems, and along with interactive simulation, addresses the issues raised by Gambera. If interactive simulation is a new light bulb for illuminating uncertainty, then the Distribution String is the AC current that lights the bulb. The 300,000 data elements required to store a 25-year simulation is reduced to 300 DIST elements. And when people say that size does not matter, this does not apply to factors of 1,000.

#### **Cloud Computing**

The DIST standard is so compact that thousands of Monte Carlo trials may be downloaded over the Web in seconds. This provides a collaborative network in which specialists in financial statistics can produce probability distributions, for immediate consumption by a wide array of investors, worldwide. Hence, it may unleash an industry in the distribution of distributions.

#### Implications for Tomorrow

These recent technological advances in Monte Carlo Simulation allow for a probability power grid, which can drive asset allocation, retirement models, and valuations on everything from laptop computers to Blackberries and iPads.

Furthermore. Monte Carlo models built with DISTs are also highly flexible, allowing for almost any type of return distribution or underlying probability model. Today, in light of the recent global financial crisis, there is much debate about how to best model the probability distributions of asset class returns.



Some researchers are proposing that we replace models based on the bell curve or normal distribution (which are tractable from a theoretical perspective), with fat tail models in which extreme events occur (which require simulation to analyze). Others argue that the models based on the normal distribution are adequate. Distribution Strings are agnostic regarding this debate.

Similarly, there is debate about the usefulness of correlation matrixes to represent the co-movements of asset class returns, with many arguing that during down markets. asset classes become more correlated. Again, the DIST approach allows any pattern of co-movements to be modeled. As an extreme, the scatter plot in Exhibit 3 of asset classes HAP and PY is a "happy face," which is certainly a type of relationship. Although the CONTINUED ON NEXT PAGE

50

Morningstar Alternative Investments Observer 10 Fourth Quarter 2010

correlation coefficient between HAP and PY is almost zero, compressing the underlying data into a pair of DISTs preserves the relationship in its entirety.

The ability to model nonlinear relationships between return distributions has important real-life applications. Consider Exhibit 4, which is a scatter plot of returns on a stock index and a call option on the index. The DIST approach allows us to preserve the exact "hockey stick" relationship among the returns of these two assets which cannot be captured by a correlation coefficient. This is important if options are being considered as part of the portfolio.

These examples illustrate the importance of preserving underlying relationships among assets when creating a Monte Carlo model out of DISTs. Sets of DISTs that preserve such relationships are said to be "coherent." The creation of coherent DIST libraries is one of the most important functions of Probability Management, a field devoted to managing databases, not of numbers, but probability distributions. (See www.Probability Management.org.)

#### Where to Find It

The power of DIST technology is beginning to appear in several programming tools for the computer-savvy investment professional. It is currently supported by three software add-ins: Risk Solver (Solver.com), and XLSim (VectorEconomics.com). The last is a multidimensional modeling tool: Analytica, (Lumina.com). For those who want ready-to-use interactive asset-allocation software with Monte Carlo models, Morningstar is in the



process of creating new tools based on the DIST technology. In the near future, it will be possible to include many types of distributions, including those that model the occasional financial crisis, in an interactive environment on the desktop or laptop.

#### References

- 1 Sam Savage, The Flaw of Averages, John Wiley & Sons, 2009.
- 2 Alan L Lewis., Sheen T. Kassouf, R. Dennis Brehm, and Jack Johnston, "The Ibbotson-Sinquefield Simulation Made Easy," Journal of Business, vol. 53, 1980.
- 3 The Central Limit Theorem states that when a large number of statistically independent variables with the same distribution are added, the result is a normal (bell-shaped) distribution, regardless of the distribution of the underlying variables. An exception to the theorem occurs with the sort of fat tail distributions discussed in Paul D. Kaplan, "Déjà Vu All Over Again," Morningstar Advisor, February/March 2009.
- 4 For a description of the model and the formulas, see pp. 113-118 in the 2010 Ibbotson Stocks, Bonds, Bills, and Inflation Classic Yearbook published by Morningstar, Inc.
- 5 In "A Sustainable Spending Rate without Simulation," (Financial Analysts Journal, November/ December 2005), Moshe Milevsky and Chris Robertson present a probabilistic formula for sustainable spending rate, which they derive under a set of assumptions, one of which is that the spending rate is constant. However, for other spending patterns, such as including occasional lump-sum amounts to finance, say, a child's wedding, a grandchild's education, or a vacation home, in addition to regular spending, Monte Carlo Simulation remains the only practical option.
- 6 See note 4.
- 7 Michele Gambera, "It's a Long Way to Monte Carlo," Business Economics, July 2002.

# Morningstar Product Spotlight: The Morningstar Rating<sup>®</sup> for Hedge Funds

# A better way to evaluate hedge fund returns.



by Benjamin N. Alpert, CFA Research Analyst

Since the summer of 2002, the Morningstar Rating<sup>™</sup> for mutual funds has employed expected utility theory to risk-adjust and rank returns across Morningstar categories. Expected utility theory, as applied to modern portfolio theory, models the desirability of various risky portfolios through a utility function. Like all models, this utility function makes several assumptions, such as the risk-averse nature of investors. Just as important as what the utility function assumes, though, is what it does not: a particular distribution of returns. As such, the Morningstar Rating lends itself well to hedge funds, whose returns may not conform to the standard bell curve.

By incorporating expected utility theory, the Morningstar Rating for both mutual funds and hedge funds avoids the pitfalls of traditional statistical measures such as standard deviation or the Sharpe ratio. First, by not assuming a normal (or lognormal) return distribution, the Morningstar Rating accounts for tail risk. Furthermore, by penalizing losses more than rewarding gains, the Morningstar Rating effectively ranks investments with negative excess (of risk-free) returns. In contrast, the Sharpe ratio produces counterintuitive results. For example, when ranking two investments with the same negative excess return, the fund with higher volatility (or standard deviation) receives a better Sharpe ratio.

The Morningstar Rating for hedge funds differs from the Morningstar Rating for mutual funds in two important ways. Notably, Morningstar removes the effect of positive serial correlation, or the positive correlation of hedge fund returns from one period to the next, which manifests in a smoother. or less-risky, return stream. A number of articles and academic papers hypothesize that the smoothed returns of hedge funds result from illiquidity, or investments that trade infrequently. Alternatively, smooth returns can indicate the manipulation of reported returns. Therefore, Morningstar seeks to "unsmooth" hedge fund returns or increase the apparent risk based on the magnitude of the estimated serial correlation.

The second difference in the hedge fund rating is the degree of risk-aversion assumed. Hedge fund investors expect absolute (positive) returns at any level of risk, implying a higher level of risk-aversion than mutual fund investors. Moreover, hedge fund returns in any particular category are far less homogenous than mutual fund returns (as evidenced by much larger cross-sectional standard deviations) due to factors such as leverage. Leverage does not appear risky in up markets, but it is dangerous when credit tightens and markets turn. A higher risk-aversion factor for hedge funds accounts for this.

#### The Morningstar Rating in Practice

To illustrate the various features of the Morningstar Rating for hedge funds, Exhibit 1 exhibits 36-month average risk and return statistics for the Oct. 31, 2010, Morningstar ratings of funds in three Morningstar hedge fund categories: distressed securities, global trend, and U.S. equity. The table demonstrates that no single dimension of a return distribution (mean, standard deviation, skew, or kurtosis) dominates the Morningstar Rating. (If any return-based statistic dominated the expected utility function, the statistics would grow in line with the Morningstar rating.) This exemplifies the distribution-neutral nature of the Morningstar Rating.

While no particular statistic drives the Morningstar Rating, it's evident that risk is penalized to a greater extent than returns are rewarded. In each of the three hedge fund categories, 5-star funds have the highest average monthly returns, as one might assume, but the second-highest average monthly return is found among 1-star funds for both CONTINUED ON NEXT PAGE

Exhibit 1 · 36-Month	Statistics of Select	Morningstar Hed	ne Fund Categori	es (as of Oct 31 2010)
Exhibit 1.00 month	01110100 01 001001	morningotar nou	go runu outogon	00 (00 01 000. 01, 2010)

	Average Monthly Return	Average of Monthly Std Dev	Average of Kurtosis	Average of Skewness	Average of Sharpe Ratio
HF Distressed Securities	0.34	4.48	3.25	-0.67	0.31
*	0.65	12.45	1.05	0.01	0.00
**	-0.32	5.57	2.75	-0.91	-0.35
***	0.48	3.98	4.97	-1.14	0.33
****	0.45	2.01	1.70	0.05	0.65
****	0.75	2.32	3.45	-0.66	1.09
HF Global Trend	0.98	6.22	1.32	0.25	0.56
*	1.36	15.69	1.59	0.06	0.23
**	0.82	7.11	1.73	0.12	0.30
***	0.69	4.35	1.10	0.24	0.40
****	0.99	3.88	0.98	0.36	0.81
****	1.94	4.96	1.63	0.54	1.50
HF U.S. Equity	0.26	5.83	1.22	-0.26	0.22
*	0.08	13.01	2.58	-0.61	-0.06
**	-0.16	7.33	1.43	-0.58	-0.13
***	0.16	5.13	0.65	-0.34	-0.01
****	0.53	3.15	0.87	0.05	0.50
****	1.22	3.22	2.17	0.42	1.58

#### **Looking Ahead**

Despite its drawbacks, however, the Morningstar Rating provides a straightforward, single-point estimate with which to screen and compare the past performance of hedge funds. The Morningstar Rating is superior to common single-point estimates, such as the Sharpe ratio. Just like all risk-adjusted performance measures, the Morningstar Rating is purely backward-looking. Any potential hedge fund investment still requires extensive investment and operational due diligence. Morningstar is dedicated to providing tools to help investors in these areas, as well. Stay tuned.

the distressed-securities and global-trend categories, which can employ significant leverage. These 1-star funds are so ranked due to their riskiness—their standard deviations are more than twice that of the category average. Morningstar's risk adjustment outweighs the Sharpe ratio's risk adjustment, which ranks the 1-star funds over the 2-star funds.

#### **Drawbacks of Rating Hedge Funds**

While the Morningstar Rating for Hedge Funds is a useful tool to rank similar hedge funds, it is far from perfect. The rating is subject to the self-reporting biases that plague all hedge fund databases, as hedge funds report returns voluntarily. The Morningstar Rating for hedge funds requires 38 months of consecutive returns (36 months plus two months to adjust for serial correlation). It is not recalculated when additional funds report returns or enter the database. Funds fail to receive ratings when there are missing returns or the returns are received late. In a typical month, approximately 20% of funds within the Morningstar hedge fund database do not self-report returns in a timely manner. This 20% includes funds that may report returns only on a quarterly basis, funds that are closing, as well as funds opting out of the database for other reasons.

Database turnover poses additional rating issues. An examination of the fund rating changes between the September 2009 and September 2010 ratings shows that in each period approximately 2,200 funds were rated, but there is nearly a 30% turnover in the composition of funds rated. A high dropout rate can leave too few funds in a category to result in meaningful rankings. Furthermore, high turnover leads to lower persistence in the star rating—5-star funds that remain 5-star funds, for example. Typically, Morningstar Ratings for mutual funds show persistence, due to relatively low fund turnover and public- reporting requirements.

# Industry Trends: Alternative Mutual Funds

# The return of absolute return mutual funds.



by **Nadia Papagiannis, CFA** Alternative Investments Strategist

#### **Alternative Mutual Funds**

Absolute return is not dead—in name, anyway. In the fourth guarter of 2010, at least 11 new "absolute return" mutual funds launched, three in Morningstar's alternative categories: Loomis Sayles Absolute Strategies LABAX, GRT Absolute Return GRTHX, and Eaton Vance Option Absolute Return Strategies EOAAX. The Loomis Sayles offering follows a global-credit, currencies, and interest-rate strategy with a mandate to mitigate downside risk. GRT aims to achieve absolute returns through long and short bets in individual equity and fixed-income securities. And the Eaton Vance fund will write call spreads and put spreads on the S&P 500 Index. All three funds target "absolute returns," yet all three funds hope to achieve positive returns in very different ways. Herein lies the problem with categorizing or allocating to "absolute return" funds: Absolute return is simply a return goal, not a strategy that produces a particular risk/return profile.

Even the return goals of these three funds vary. The Eaton Vance fund's prospectus defines its absolute return goal as one that is "benchmarked against short-term cash instruments" and "substantially independent of movements in the stock and bond market." The first characterization lacks substance. When a fund benchmarks itself against such a low hurdle as short-term cash (especially in the current zerointerest-rate environment), positive performance of any magnitude appears spectacular. Achieving positive returns with a low correlation to stocks or bonds, however, is more difficult.

The GRT fund's prospectus defines absolute return differently, hoping to "produce positive returns under most market conditions." Most investors would agree, however, that positive returns are most needed in the worst of market conditions. And last but not least, the Loomis Sayles fund plans to achieve positive returns over a full market cycle. Unfortunately, a full market cycle is hard to define and never known in advance. Also, because this fund, like most absolute return funds, launched very recently, the "full market cycle" will never include the fateful 2008. So investors are left not knowing what to expect.

This drawback hasn't stopped the flows into absolute return funds. Investors poured about \$1.5 billion in to Putnam's 100, 300, 500, and 700 series absolute return funds (ticker symbols **PARTX, PTRNX, PJMDX**, and **PDMAX**, respectively), for example, in the first 11 months of 2010. Total assets under management in these funds, launched just two years ago, exceed \$2.5 billion. Returns since inception indicate that some of the funds have fallen short of achieving their stated goals of 100, 300, 500, and 700 basis points above inflation (through Nov. 30 using the Ibbotson Associations SBBI U.S. Inflation rate), although the prospectus gives management at least one more year to catch up. Only time will tell if investors' current fascination with absolute return is justified.

Besides absolute return, another apparent trend in alternative mutual funds emerged in the fourth guarter. Event-driven funds-those which take advantage of corporate events (mergers, restructurings, and spin-offs, and index arbitrage, for example)—are on the rise. Water Island Capital, the advisor to the Arbitrage fund ARBFX (which closed to new investors in July 2010) launched the Arbitrage Event Driven fund AEDFX in October. Like its predecessor, this fund will engage in merger arbitrage (traditionally a long position in the target's stock and a short position in the acquirer's stock), but it will also dabble in convertible arbitrage (long a convertible bond and short a stock of the same issuer, for instance) and capital structure arbitrage (senior secured versus unsecured debt, for example) for a 1.69% expense ratio.

The Water Island Capital fund follows the June launch of the Rydex|SGI Event Driven and Distressed Strategy **RYDOX** and a new share class of Quaker Event Arbitrage **QEAIX**.

#### **Fund Reports**

### EAS Genesis Fund

#### by Nadia Papagiannis, CFA

Advisor

Emerald Asset Advisors LLC

Advisor Location Weston, Florida

Assets Under Management \$98.4 million (fund)

Inception Date Aug. 14, 2008

**Investment Type** Mutual Fund

Morningstar Category

Long-Short

#### Management

Robert Isbitts serves as the chief investment officer of the advisor. Isbitts co-founded Emerald Asset Advisors in 1998 after managing portfolios for Fuji Bank & Trust, Morgan Stanley, and DLJ. He is supported by an investment team of six people, including portfolio managers Allan Budelman and Matthew MacEachern, as well as a sales and market team headed by Medon Michaelides.

#### Strategy

EAS Genesis is a fund of mutual funds and exchange-traded funds that combines the advisor's three substrategies: hybrid, concentrated equity, and global cycle. The hybrid strategy strives to provide positive returns with a low net equity exposure. Most funds in the hybrid portfolio take long and short positions and can include asset classes such as high-yield or convertible bonds, as well as commodities (Calamos Market Neutral Income **CMNIX**, for example). The concentrated equity portfolio combines managers who invest in fewer than 30 stocks (such as FBR Focused Investor **FBRVX**). Finally, the global cycle strategy takes more aggressive and global equity positions (Prudential Jennison Health Sciences **PHSZX**, for example). Management tactically allocates to the three underlying strategies based on its macroeconomic outlook. For example, if management is bearish, it will allocate most of the portfolio's assets to the hybrid strategy and to cash. As of Sept. 30, 2010, 47% of the fund's assets were dedicated to the hybrid strategy, while the concentrated equity strategy comprised 24% of the portfolio and 21% of fund assets were allocated to cash, representing a bearish stance.

#### Process

Management meets twice weekly, once to discuss individual underlying funds, and once to discuss the top-down themes in the portfolio. Analysts must pitch any new funds to the investment committee at these meetings. Once management approves a new fund for further research, analysts begin the due diligence process. The analysts look at quantitative metrics, such as alpha and beta trends, and qualitatively assess the investment process, organizational structure, and compensation incentives of each fund. Not all of the funds on the research list make it into the portfolio. For example, the investment team follows approximately 150 funds (including ETFs) for the global cycle strategy, but it invests in roughly two funds for each of the 12 or 13 themes in the strategy. After investing in a fund, the research team conducts ongoing due diligence, looking for red flags such as organizational changes, dramatic increases in assets under management, style drift, or performance outliers.

#### **Risk Management**

Management reassesses the equity beta risk in the portfolio on a weekly basis. If the beta is too high, management will short or hedge at the portfolio level. Currently, the fund employs ETFs such as ProShares Short S&P 500 **SH**, ProShares Short Russell2000 **RWM**, ProShares Short MSCI Emerging Markets **EUM**, and ProShares Short MSCI EAFE **EFZ** to hedge. Management targets an average overall portfolio beta of approximately 0.5, but at times it has reduced the fund's equity exposure significantly below this level. In late 2008 and early 2009, for example, management attempted to neutralize the portfolio's overall equity exposure. On a 36-week rolling weekly basis since inception, the fund's beta has ranged between 0.22 and 0.37.

In addition to beta, management considers expenses and taxes. Management may choose to access strategies (REITs or high-quality corporate bonds, for example) through passive management if it cannot find active managers with sufficient alpha. Management also manages taxes to a certain degree, for example by selling and capturing tax losses on the ProShares Short S&P 500 ETF while replacing it with ProShares Short Dow30 **DOG**.

### **EAS Genesis A (USD)**

Performance	12-31-20	010			
Quarterly Returns	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total %
2008	_	_	_	-10.23	_
2009	-1.15	5.61	5.20	1.68	11.66
2010	0.21	-4.33	4.96	3.37	4.01
Trailing Returns	1 Yr	3 Yr	5 Yr	10 Yr	Incept
Load-adj Mthly	-1.71	_	_	_	-1.84
Std 12-31-2010	-1.71	_	_	_	-1.84
Total Return	4.01	_	_	_	0.52
+/- BofAML	3.68	—	—	—	—
+/- S&P 500 TR	-11.05	_	_	_	_
% Rank Cat	47	—	—	—	
No. in Cat	—	—	—	—	
7-day Yield	—				

#### Performance Disclosure

The Overall Morningstar Rating is based on risk-adjusted returns, derived from a weighted average of the three-, five-, and 10-year (if applicable) Morningstar metrics.

The performance data quoted represents past performance and does not guarantee future results. The investment return and principal value of an investment will fluctuate; thus an investor's shares, when sold or redeemed, may be worth more or less than their original cost.

Current performance may be lower or higher than return data quoted herein. For performance data current to the most recent month-end, please call 877-327-0757 or visit www.easfunds.com.

Fees and	Expenses			
Sales Charge Front-End L Deferred Lo	s oad % oad %			5.50 NA
Fund Expense Managemen 12b1 Expens Gross Expe	es t Fees % e % nse Ratio %			1.00 0.25 <b>2.67</b>
Risk and	Return Profile			
		3 Yr	5 Yr	10 Yr
Morningstar	Rating™	_	_	_
Morningstar	Risk	_	—	_
Morningstar	Return	—	—	_
		3 Yr	5 Yr	10 Yr
Standard De	viation	—	—	_
Mean		_	_	
Sharpe Ratio	)		—	—
MPT Statistics	Standard BofAML USD LI	Index BOR 3	Bes	t Fit Index
Alpha		_		—
Beta		_		_
R-Squared		—		_
12-Month Yi	eld	_		
30-day SEC	Yield	_		
Potential Cap	p Gains Exp	11.45% /	Assets	
Operations				
Family: Manager: Topuro:	EAS Genesis Multiple			

	-	-	-	-	-	-	-	-	7	6	7	Investment Style Fixed-Income Bond %
			· · · · · · · · · · · ·								10 80 60	00k 1k EAS Genesis A 10,123
											40	K Cat Avg: US OE Long-Short 9,889
											20	<ul> <li>Index: BofAML USD LIBOR 3 Mon CM 10,267</li> </ul>
									· · · · <b>~</b>		10	lk
											• • • • • • • 4k	
												Performance Quartile (within category)
1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	12-10	History
_	_	_	_	_	_	_	_	_	8.66	9.67	9.92	NAV/Price
-	—	_	_	—	—	_	_	_	_	11.66	4.01	Total Return %
—	—	—	—	—	—	—	—	—	—	10.67	3.68	+/- BofAML USD LIBOR 3
										-14.80	-11.05	+/- S&P 500 TR
_	—	—	—	—	—	—	—	—	_	42	47	% Rank Cat

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Incept

08-14-2008

Туре

MF

Total Assets

\$98.35 mil

Morningstar Cat

US OE Long-Short

No. of Funds in Cat

#### Portfolio Analysis 10-31-2010

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Asset Allocation %	Net %	Long %	Short %	Sh
Cash	32.52	32.55	0.03	sir 08
US Stocks	42.61	44.77	2.16	æ
Non-US Stocks	11.30	20.67	9.37	4
Bonds	7.35	7.98	0.64	e G
Other/Not Clsfd	6.18	6.51	0.33	ত
Total	99.96	112.48	12.53	ŧ
Equity Style	Portfolio Statistics	Port Avg Ind	Rel Rel dex Cat	$\in$
	P/E Ratio TTM	15.3	— 1.04	
Large	P/C Ratio TTM	9.4	— 1.03	
Mid	P/B Ratio TTM	1.9	— 0.82	Ð
Cmall	Geo Avg Mkt	8919	— 0.28	Ð
Silidii	Cap \$mil			G

ixed-Income Style							
		Ext	Mod	Ltd			
	High						
	Med						

F

	Avg Eff Duration
gh	Avg Eff Maturity
	Avg Credit Quality
ed	Avg Wtd Coupon
w	Avg Wtd Price

Credit Quality Breakdown 09-30-2010	Bond %		
AAA		1.50	
AA		1.84	
A		4.49	
BBB		4.99	
BB		33.51	
В		34.29	
Below B		4.93	
NR/NA		14.46	
Regional Exposure	Stocks %	Rel BofAML USD LIBOR 3	
Americas	72.7	_	
Greater Europe	11.5	_	
Greater Asia	15.8	—	

USD

EASAX

\$2,500

\$2,500

Share Chg since 08-2010	Share Amount	1,852 Total Stocks 918 Total Fixed-Income 144% Turnover Ratio	% Ne Asset
Ð	187,000	ProShares Short S&P500	8.40
Ð	240,336	FPA Crescent	6.06
Ð	482,487	Hussman Strategic Growth	6.03
	370,568	Longleaf Partners International	5.33
Ð	514,541	Leuthold Asset Allocation Instl	5.04
Θ	126,855	Ariel Appreciation	4.75
	89,097	FBR Focus Investor	4.05
	307,717	Winslow Green Growth Instl	4.00
Ð	351,824	Calamos Market Neutral Income I	3.97
٠	161,690	Gateway Y	3.97
•	93,940	Permanent Portfolio	3.95
$\Theta$	175,219	Prudential Jennison Health Sciences	3.82
Ð	402,223	Gabelli ABC Advisor	3.82
	315,320	Merk Hard Currency Inst	3.70
٠	150,783	Greenspring	3.4

Sect	or Weightings	Stocks %	Rel BofAML USD LIBOR 3	
δ	Information Economy	14.4	_	
k	Software	3.3	_	
	Hardware	5.1		
<b>ů</b>	Media	2.6	_	
	Telecommunication	3.4		
C∎	Service Economy	55.4	_	
•0	Healthcare Services	16.3		
	Consumer Services	12.8		
Ē	Business Services	4.0	_	
\$	Financial Services	22.3	_	
۳1	Manufacturing Economy	30.2	_	
A	Consumer Goods	8.8	_	
¢	Industrial Materials	12.3	_	
0	Energy	6.3	_	
	Utilities	2.8		

Tenure: 2.4 Years Objective: Growth and Income

#### Base Currency: Ticker: Minimum Initial Purchase: Min Auto Investment Plan:

3.88 5.44

6.46

154.88

Purchase Constraints:

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#### **Fund Reports**

#### by Nadia Papagiannis, CFA

Advisor Incline Capital LLC

Advisor Location Reno, Nevada

Assets Under Management \$23.6 million (fund)

Inception Date March 30, 2009

Investment Type Mutual Fund

Morningstar Category Long-Short

#### Management

Mike Hurley is the managing member and chief investment officer of the advisor with 25 years of investment experience. Prior to founding the advisor in November 2008, he managed the Fusion Global Long/ Short fund and served as the chief technical strategist for several broker dealers. Hurley is supported by Kurt Ohlson, managing member and head of distribution. Ohlson joined Incline Capital in August 2009, after holding a regional vice president position at ING.

### Incline Capital Trend Following

#### Strategy

This fund applies trend-following or momentum strategies to liquid exchange-traded funds, covering U.S. and international stocks, U.S. bonds, and commodity asset classes. As of Sept. 30, 2010, the fund allocated 60% of assets to long U.S. stocks, 30% of assets to foreign stocks, 20% of assets to long U.S. bonds, and 10% of assets to long commodities. The fund does not always hold long positions, however. The fund is governed by the firm's proprietary "Smart Switch Index<sup>®</sup>," a rules-based model that determines long, short, or neutral positions in approximately 14 ETFs based on various indicators of upward or downward price trends. The fund's total net asset exposure can range from 50% short to 130% long, although the Smart Switch Index's average position is only 40% net long.

#### Process

While management executes trades manually, the fund's buy and sell signals are automated. The signals work similarly to the popular Moving Average Convergence-Divergence, or MACD, trend-following indicator, where the monthly exponential moving average closing price in a security is subtracted from the weekly exponential moving average. A positive and increasing MACD indicates a long position, while a negative and increasing MACD indicates a short position. The Smart Switch Index evaluates trends on both a weekly and monthly time frame, as does the MACD indicator. If an ETF exhibits an upward (downward) trend over both time frames, the fund will take a maximum positive (negative) exposure in that ETF. If the longer-term indicator disagrees with the shorter-term signal, the fund takes a neutral position. If the model is very bullish on U.S. stocks in particular, the fund will emphasize the style exhibiting the best relative strength (the iShares Russell 1000 Value or the iShares Russell 2000 Growth ETFs, for example).

#### **Risk Management**

Exposure to the four asset classes is banded as follows: negative 20% to positive 60% of assets for U.S. stocks, 0% to 20% for U.S. bonds, negative 30% to positive 30% for overseas stocks, and negative 20% to positive 20% for commodities. If all indicators are neutral, the fund will invest in 20% U.S. stocks and 10% U.S. bonds, holding the rest of the portfolio in cash. This is to avoid taking an incorrect position in a trend while maintaining a very low but positive market exposure.

The risk of trend-following strategies in general is that they may experience losses or low positive returns when markets experience frequent reversals. The fund's maximum drawdown (using monthly returns) since inception occurred between May 2010 and July 2010. The fund lost 6.1%, slightly less than the Morningstar Global Trend Hedge Fund Index, an index of trend followers using primarily futures contracts. Similarly, the maximum drawdown of the Smart Switch Index since its September 2006 inception was 10.6%, similar to the drawdown of trend-following hedge funds.

### **Incline Capital Trend Following A (USD)**

Performance 12-31-2010 Quarterly Returns 1st Qtr 2nd Qtr 3rd Qtr 4th Qtr Total % 2008 \_ \_ \_ 2009 0.70 4.37 2.38 \_ 2010 1.12 -5.07 0.39 8.23 4.29 Trailing Returns 1 Yr 3 Yr 5 Yr 10 Yr Incept Load-adj Mthly -1.71 3.24 Std 12-31-2010 -1.71 \_ \_ 3.24 **Total Return** 4.29 6.79 +/- BofAML USD LIBOR 3 3.96 +/- S&P 500 TR -10.77 % Rank Cat 43 No. in Cat 7-day Yield

#### Performance Disclosure

The Overall Morningstar Rating is based on risk-adjusted returns, derived from a weighted average of the three-, five-, and 10-year (if applicable) Morningstar metrics.

The performance data quoted represents past performance and does not guarantee future results. The investment return and principal value of an investment will fluctuate; thus an investor's shares, when sold or redeemed, may be worth more or less than their original cost.

Current performance may be lower or higher than return data quoted herein. For performance data current to the most recent month-end, please call 866-994-5729 or visit www.inclinefunds.com.

Fees and Expenses			
Sales Charges Front-End Load % Deferred Load %			5.75 NA
Fund Expenses Management Fees % 12b1 Expense % Gross Expense Ratio %			1.80 0.25 <b>4.04</b>
<b>Risk and Return Profi</b>	le		
	3 Yr	5 Yr	10 Yr
Morningstar Rating <sup>™</sup>	_	_	_
Morningstar Risk	_	_	_
Morningstar Return	—	—	_
	3 Yr	5 Yr	10 Yr
Standard Deviation	_		_
Mean		_	_
Sharpe Ratio	—	-	_
MPT Statistics Stand BofAML US	lard Index D LIBOR 3	Bes	t Fit Index
Alpha	_		—
Beta	—		
R-Squared	—		
12-Month Yield			
30-day SFC Yield			
Potential Cap Gains Exp	6.47% A	ssets	
Operations			
Family: Incline Capi Manager: Michiel Hu	ital, LLC		

1.8 Years

Growth

Tenure: Objective:

										9	10	Investment Style Fixed-Income Bond %
											100k	Growth of \$10,000 Incline Capital Trend Following A 11,222 Cat Avg: US OE Long-Short 11,849 Index: BofAML USD LIBOR 3 Mon CM 10,096
											4	Performance Quartile (within category)
1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	12-10	History
_	_	_	_	_	_	_		_	_	10.72	11 18	NAV/Price
_	_	_	_	_		_	_	_			4.29	Total Return %
—	_	_	_	—	—	—	_	_	—	—	3.96	+/- BofAML USD LIBOR
			<del></del>								-10.77	+/- S&P 500 TR
—	—	_	—	—	—	—	—	—			43	% Rank Cat
_		I _	I _	_	_		_	_	I	I	212	No. of Funds in Cat

#### Portfolio Analysis 04-30-2010

Asset Allocation %	Net %	Long %	Short %	S
Cash	-5.83	24.25	30.08	si 0
US Stocks	42.85	42.85	0.00	ž
Non-US Stocks	49.73	49.73	0.00	ź
Bonds	13.19	13.19	0.00	7 4
Other/Not Clsfd	0.03	0.03	0.00	7 
Total	99.97	130.04	30.08	2
Equity Style Value Blend Growth	Portfolio Statistics	Port I Avg Inc	Rel Rel lex Cat	(
	P/E Ratio TTM			(
Large	P/C Ratio TTM			e
Mid	P/B Ratio TTM	2.0 -	— 0.83	0
Small	Geo Avg Mkt Cap \$mil	17788 -	— 0.56	*

Fixed-Income Style									
Ltd	Mod	Ext							
			Hig						
			Me						

Base Currency:

Minimum Initial Purchase:

Min Auto Investment Plan:

Ticker:

Avg	Eff Duration
Avg	Eff Maturity
Avg	Credit Quality
Avg	Wtd Coupon
Avg	Wtd Price

15.39

4 59 101.04

Credit Quality Breakdown 05-31-2	2010	Bond %
AAA		98.32
AA		0.00
A		0.00
BBB		0.00
BB		0.00
В		0.00
Below B		0.00
NR/NA		1.68
Regional Exposure	Stocks %	Rel BofAML USD LIBOR 3
Americas	59.9	
Greater Europe	22.1	
Greater Asia	18.0	

USD ICTAX

\$2,500

\$2,500

Minimum	IRA	Purchase:
Purchase	Cons	straints:

US OE Long-Short

ong % 24.25	Short % 30.08	Share Chg since 01-2010	Share Amount	4,680 Total Stocks 15 Total Fixed-Income 626% Turnover Ratio
12.85	0.00	袋	30,000	iShares Barclays 20+ Year Trea
19.73	0.00	袋	50,000	iShares MSCI EAFE Index
0.03	0.00	数	60,000	ProShares Ultra S&P500
0.05	0.00	從	37,000	ProShares Ultra QQQ
30.04	30.08		20,000	iShares Russell 2000 Growth Ir
ort F	Rel Rel	Θ	28,000	iShares Russell 1000 Growth Ir
wg mu		$\Theta$	1 mil	AIM STIT Liquid Assets Cash N
		$\Theta$	1 mil	Fifth Third Institutional MMkt S
.0 -	— 0.83	$\Theta$	1 mil	AIM Short Term Inv Prime Cash
- 88	— 0.56	斑	30,000	iShares MSCI Emerging Marke

30,000	iShares Barclays 20+ Year Treas Bon	13.19
50,000	iShares MSCI EAFE Index	12.98
60,000	ProShares Ultra S&P500	12.38
37,000	ProShares Ultra QQQ	12.04
20,000	iShares Russell 2000 Growth Index	7.29
28,000	iShares Russell 1000 Growth Index	7.01
1 mil	AIM STIT Liquid Assets Cash Mgmt	6.16
1 mil	Fifth Third Institutional MMkt Sele	6.16
1 mil	AIM Short Term Inv Prime Cash Mgmt	6.16
30,000	iShares MSCI Emerging Markets Index	6.02
 17,000	iShares Russell 2000 Value Index	5.53
17.000	iShares Russell 1000 Value Index	5.08

% Net

Assets

Sect	or Weightings	Stocks %	LIBOR 3
δ	Information Economy	19.0	_
N	Software	3.8	_
	Hardware	7.7	_
Ŷ	Media	1.5	_
	Telecommunication	5.9	—
Œ	Service Economy	43.4	_
20	Healthcare Services	9.9	_
F	Consumer Services	7.7	_
iii)	Business Services	5.8	_
\$	Financial Services	20.1	—
۳	Manufacturing Economy	37.6	_
A	Consumer Goods	12.3	_
¢	Industrial Materials	13.8	_
0	Energy	8.1	_
<b>9</b>	Utilities	3.3	

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Incept Type Total Assets Morningstar Cat

03-30-2009 \$23.57 mil MF

#### **Fund Reports**

### UBS Multi-Strategy Market Neutral

#### by Nadia Papagiannis, CFA

#### Advisor

UBS Global Asset Management (Americas) Inc.

Advisor Location Chicago, Illinois

Assets Under Management \$26 million (fund)

**Inception Date** July 1, 2010

**Investment Type** Mutual Fund

Morningstar Category Market-Neutral

#### Management

This multimanager fund's lead portfolio manager is Arthur Gresh, Ph.D., head of the Systematic Alpha team at UBS. Gresh joined UBS in 2004, having led the international structured equity team at JP Morgan Fleming Asset Management in London. Ian Paczek, Ph.D., is a director of UBS Global Asset Management in the United Kingdom, responsible for global, European, and U.K. equity strategies. Paczek worked with Gresh at JP Morgan Fleming. Scott Bondurant serves as the global head of Long/Short Equity strategies and is a managing director of UBS Global Asset Management. Bondurant joined UBS in 2005, having spent 15 years as an executive director for Morgan Stanley's institutional equities business.

#### Strategy

UBS Multi-Strategy Market Neutral seeks to generate annual returns of 2.25 to 4.25 percentage points above Treasury bills with less than 5% annualized standard deviation over a full market cycle (three to five years) by combining four different internal market-neutral equity strategies: U.S. fundamental, European fundamental, global quantitative, and event-driven. As of Nov. 30, the four strategies received 25%, 16%, 45%, and 14% weights, respectively. Strategy weights, which have not varied significantly since inception, are based on performance outlook and correlation to the other strategies. The fund's investment universe is composed of primarily large company stocks in the Russell 1000, MSCI Europe, and MSCI World stock indexes. The fund will typically hold 600–800 stocks both long and short. Gross long and short exposure will range between 80% and 100% of net assets, with a target net equity beta of zero.

#### Process

The U.S fundamental process employs the same bottom-up, price/intrinsic value selection approach used in UBS' long-only and long-short domestic-equity strategies. Analysts rank securities in each sector, while management weights sectors. Management purchases what it deems to be the most underpriced securities in each sector and sells short the most overpriced, holding positions for about 18 months and rebalancing monthly. Ian McIntosh and Tom Cole head the U.S. equity research team, but security selection is largely driven by the team of approximately 20 analysts. In contrast, portfolio manager Neil Mears controls security selection for the European fundamental strategy, which is more concentrated than its U.S. counterpart (25-50 long and short holdings) and incorporates a quantitative process to its qualitative security selection. The global quantitative equity investment strategy is based on a global multifactor model, with factors such as valuation, growth, capital use, profitability, and momentum. Of the four market-neutral strategies, the global quantitative strategy experiences the highest turnover and holds the largest number of positions. Patrick Zimmermann, a member of the quantitative equity team, runs the event-driven portfolio, the smallest slice of the fund, which attempts to exploit opportunities such as the change in the price of a stock related to its inclusion or deletion from an equity index. This strategy tends to hold smaller-capitalization stocks as well as more cash than the other three market-neutral sleeves.

#### **Risk Management**

At both the portfolio and individual strategy level, the fund targets an equity beta of zero and volatility of between 3% and 5%. Since inception, the fund has achieved market neutrality with a lower volatility (using weekly returns). Besides exposure to the overall equity markets, management attempts to neutralize risk factors, such as sector, style, currency, and region through futures contracts. At times, the underlying portfolio managers may also be required to adjust their portfolios. Management has discretion to add or remove underlying strategies, which are selected on the manager's ability to execute long/short equity strategies, as well as the strategies' correlations to each other. Each underlying strategy must adhere to its own set of parameters in terms of investment universe, concentration, and net and gross equity market exposure, as well as country, sector, and factor exposures.

### **UBS Market Neutral Multi-Strategy A** (USD)

Performance	12-31-20	)10			
Quarterly Returns	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total %
2008	—	—	—	—	—
2009	_		_	_	_
2010	—	—	_	-0.10	—
Trailing Returns	1 Yr	3 Yr	5 Yr	10 Yr	Incept
Load-adj Mthly	_		_	_	-6.92
Std 12-31-2010	_		_		-6.92
Total Return	—	—	—	—	-1.50
+/- BofAML	—	—	—	—	
+/- IA SBBI US 30 Day	—	—	—	—	—
% Rank Cat	—	—	—	—	
No. in Cat	—	—	—	—	
7-day Yield	—				

											49	Investment Style Equity Stock %
			· · · · · · · · · · · · · · · · · · ·								100k	Growth of \$10,000 UBS Market Neutral Multi-Strategy A 9,840 Cat Avg: US OE Market Neutral 9,854 Index: BofAML USD LIBOR 3 Mon CM 10,017
											4k	Performance Quartile
1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	12-10	History
											9.85 	NAV/Price Total Return % +/- BofAML USD LIBOR 3 +/- IA SBBI US 30 Day
—	—	—	—	—	—	—	—	—	—	—		% Rank Cat
												No. of Funds in Cat

#### Performance Disclosure The Overall Morningstar Rating is based on risk-adjusted

returns, derived from a weighted average of the three-, five-, and 10-year (if applicable) Morningstar metrics.

The performance data quoted represents past performance and does not guarantee future results. The investment return and principal value of an investment will fluctuate; thus an investor's shares, when sold or redeemed, may be worth more or less than their original cost.

Current performance may be lower or higher than return data quoted herein. For performance data current to the most recent month-end, please call 800-647-1568 or visit www.ubs.com.

Fees and	Expenses			
Sales Charge Front-End L Deferred Lo	s oad % oad %			5.50 NA
Fund Expense Managemen 12b1 Expens Gross Expe	es t Fees % e % <b>nse Ratio %</b>			1.25 0.25 <b>4.13</b>
Risk and	Return Profil	e		
		3 Yr	5 Yr	10 Yr
Morningstar	Rating™		_	_
Morningstar	Risk	_	_	_
Morningstar	Return	—	—	—
		3 Yr	5 Yr	10 Yr
Standard De	viation	_	_	_
Mean				_
Sharpe Ratic	I	—	—	—
MPT Statistics	Standa BofAML USD	ard Index LIBOR 3	Bes	t Fit Index
Alpha		_		—
Beta		_		—
R-Squared		—		
12-Month Yi	eld	_		
30-day SEC	/ield	_		
Potential Ca	o Gains Exp	—		
Operations				
Family:	UBS			
Manager:	Multiple			
Tenure: Objective:	U.5 Year Growth and	Incomo		
onlective;	drowur and	ncome		

### Asset Allocation %

Cash	83.20	83.Zt	5 0.00
US Stocks	6.26	25.52	2 19.26
Non-US Stocks	-5.35	69.90	) 75.25
Bonds	0.00	0.00	0.00
Other/Not Clsfd	15.83	16.08	3 0.25
Total	100.00	194.75	5 94.76
Equity Style Value Blend Growth	Portfolio Statistics	Port Avg I	Rel Re Index Ca
Large	P/E Ratio TTM	12.4	- 0.83
Laige	P/C Ratio TTM	_	
Mid	P/B Ratio TTM	1.7	- 0.88
Small	Geo Avg Mkt Cap \$mil	8926	— 0.89

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Fixed-Income Style								
Mod	Ext	_	Avg Eff Duration					
		High	Avg Eff Maturity					
			Avg Credit Qualit					
		Med	Avg Wtd Coupon					
		Low	Avg Wtd Price					
	Mod	Mod Ext	H-Income Style Mod Ext High Med Low					

Credit Quality Breakdown		Bond %
AAA		
AА		
4		_
3BB		
3B		
3		
Below B		
Below B NR/NA		
Below B NR/NA		_
Below B NR/NA Regional Exposure	Stocks %	Rel BofAML USD LIBOR 3
Below B NR/NA Regional Exposure Americas	Stocks % 49.0	Rel BofAML USD LIBOR 3
Below B NR/NA Regional Exposure Americas Greater Europe	Stocks % 49.0 37.9	Rel BofAML USD LIBOR 3

 	_ _ _	_ 						_  			+/- BofAML USD LIE 3 +/- IA SBBI US 30 D % Rank Cat
Portfolio Apoly		20.2010	_				· ·		·		NO. OF FUILUS III GAL
FULLUITU Allary	<b>515</b> 09-3	0-2010									
Asset Allocation %		Ne	t% Lo	ng % Sh	ort %	Share Chg since —	Sha Amou	re 3,12 nt	8 Total Sto 0 Total Fix	ocks ed-Income	Ĩ

Chg	Share Amount	3,128 Total Stocks 0 Total Fixed-Income — Turnover Ratio	% Net Assets
	4 mil	Ubs Cash Management Prime Relations	15.65
	13,500	iShares S&P SmallCap 600 Index	3.11
	8,500	iShares Russell 2000 ETF	2.23
	1,474	Wacker Chemie Ag	-1.06
	4,797	Reckitt Benckiser Group Plc	1.03
	7,198	Hennes& Mauritz Ab, Classb	-1.02
	12,547	DSV	-1.00
	3,853	Wartsila	-0.98
	1,996	Kuehne& Nagel International Ag	-0.93
	820	Apple, Inc.	0.91
	222	Givaudan Sa	0.88
	9,818	Suedzucker Ag	-0.86
	4,900	Exelon Corporation	0.81
	7,856	Jcdecaux Sa	-0.81
	4,400	Illinois Tool Works, Inc.	0.81

Sect	or Weightings	Stocks %	Rel BofAML USD LIBOR 3
$\circ$	Information Economy	15.6	_
k	Software	2.7	_
₽	Hardware	6.9	
<b>ů</b>	Media	2.2	—
e	Telecommunication	3.8	—
Œ	Service Economy	37.2	—
•0	Healthcare Services	4.5	
	Consumer Services	8.5	
Ē	Business Services	10.2	—
\$	Financial Services	14.0	_
۳1	Manufacturing Economy	47.1	_
A	Consumer Goods	13.8	_
Q	Industrial Materials	18.3	
0	Energy	9.4	_
2	Utilities	5.6	_

Base Currency: Ticker: Minimum Initial Purchase: Purchase Constraints:

USD BMNAX \$1,000



Incept Type Total Assets Morningstar Cat

US OE Market Neutral

07-01-2010 MF \$25.76 mil

#### Flows and Assets Under Management: Alternative Mutual Funds

#### Quarterly Alternative Mutual Fund Flows

During the third quarter of 2010, alternative mutual funds showed significant inflows, a 35% increase from the previous quarter. From July through September, total inflows reached \$6.1 billion, with \$4.6 billion flowing into funds in Morningstar's long-short category. Funds in the bear-market category received net inflows of \$1.1 billion, more than in the past five quarters. Funds in the currency category reversed the impact of outflows in the past two quarters, with a third quarter net inflow of \$365 million.



#### Quarterly Alternative Mutual Fund Assets Under Management

Assets under management of all alternative mutual funds increased by 10% during the third quarter to a high of \$58.0 billion. All fund categories showed an increase in assets under management, but currency funds experienced the largest quarterly increase (28%) as a result of positive performance and inflows. Assets in the bear-market category continued to trend upward with a 5.9% increase over the third quarter. Total assets in the long-short category stood at \$49.9 billion at the end of September, a 9.8% improvement over the previous quarter.



#### Flows and Assets Under Management: Hedge Funds

#### **Quarterly Hedge Fund Flows**

During the third quarter of 2010, single-manager hedge funds in the Morningstar database experienced outflows of \$268 million. Funds in the global debt and corporate actions categories suffered the largest outflows, of \$649 million and \$622 million, respectively. The categories with the largest third quarter inflows were global non-trend and convertible arbitrage, taking in \$1.3 billion and \$612 million, respectively.



#### Quarterly Hedge Fund Assets Under Management

Single-manager hedge fund assets in Morningstar's database declined by 2.1% in the third quarter of 2010. Year on year, assets under management of single-manager hedge funds increased by 5.1%. Hedge fund of funds assets declined over both periods, however. As of Sept. 30, 2010, hedge funds of funds within Morningstar's database managed 2.7% less than in the previous quarter and 14.7% less than one year ago.



## Alternative Investment Performance

#### Growth of a \$10,000 Alternative Investment

Hedge funds in Morningstar's database, as proxied by the Morningstar 1000 Hedge Fund Index, and the average long-short mutual fund returned 6.7% and 3.9%, respectively, in the third quarter, while the MSCI World NR Index jumped by 13.8%. Over the past 18 months, global stocks significantly outperformed hedge funds. The MSCI World NR Index rose by 51.4%, while the Morningstar 1000 Hedge Fund Index increased 25.2%. Hedge funds in Morningstar's database dramatically outperformed their mutual fund equivalents over the past 18 months, as hedge funds were able to employ more leverage and invest in less-liquid securities.



#### Performance of Alternative Investments Over Time

During the third quarter of 2010, the Morningstar 1000 Hedge Fund Index increased by 6.7%, less than half of the 13.8% increase in global equities. Over the past year, global stocks (as proxied by the MSCI World NR Index) have provided the best returns relative to global bonds, cash, alternative mutual funds, hedge funds, and hedge funds of funds. Despite their double layer of fees, hedge funds of funds slightly outpaced single-manager hedge funds in the third quarter. The Morningstar Hedge Fund of Funds Index also outperformed the long-short mutual fund category average over the past one year and five years ended Sept. 30, 2010.



#### **Q2 Performance by Category**

#### **Alternative Mutual Funds**

A third-quarter 2010 equity market rally hurt mutual funds in the bear-market category. These funds lost 15.5% on average. In addition, long-short mutual funds only managed moderate gains of 4.2% on average, while the S&P 500 Index improved by 11.3%. Currency funds gained 1.1% on average for the quarter ended Sept. 30, 2010, less than half the return of U.S. bonds.

#### Morningstar Alternative Mutual Fund Category Averages: Q3 2010 Total Returns %



#### **Hedge Funds**

In the third quarter, all hedge fund categories in Morningstar's database experienced gains. However, only one category index, Europe equity, slightly outpaced the S&P 500 Index with an increase of 11.4%. Equity hedge funds trading across geographies and market capitalizations saw substantial gains in the third quarter, as did trend-following or momentum strategies. Short-equity strategies underperformed both stocks and bonds, however.

#### Morningstar Hedge Fund Category Indexes: Q3 2010 Total Returns %

Europe Equity						
S&P 500 TR Index						
EM Equity						
Global Trend						
Developed Asia Equity						
Convertible Arbitrage						
Global Equity						
US Small Cap Eqty						
Corporate Actions						
Multi-Strategy						
Debt Arbitrage						
Equity Arbitrage						
US Equity						
Global Debt						
Distressed Securities						
Global Non-Trend						
BarCap US Agg Bond Index						
Short Equity						
	0 2	٨	c	0	10	10

#### **Risk Versus Return: Alternative Mutual Funds and Hedge Funds**

**Three-Year Standard Deviation and Return** Eight alternative investment category indexes and averages provided positive returns over the three years ended September 2010. Both the global trend and global non-trend hedge fund category indexes experienced growth of 6.4% and 4.3%, respectively, as funds in both of these categories profited from global macroeconomic bets. The Morningstar Debt Arbitrage Hedge Fund Index also saw an increase of 4.7%, helped by gains in long-term U.S. Treasury bonds. In terms of risk-adjusted returns, these three hedge fund category indexes also produced the best results over the last three-year period. The U.S. bear-market mutual fund category average saw an 11.9% decline over the three-year period ended September 2010, larger than all other alternative categories. In terms of risk-adjusted return, bear-market mutual funds, long-short mutual funds, and global-equity hedge funds fared the worst on average over the last three years.



25 Morningstar Alternative Investments Observer Fourth Quarter 2010

### **Correlations by Alternative Fund Strategy**

Thre	e-Year Correlations: Alternative Mutual Fund Categories	1	2	3	4
1	US OE Long-Short Category Average	1.00			
2	US OE Bear Market Category Average	-0.93	1.00		
3	US OE Currency Category Average	0.48	-0.42	1.00	
4	Morningstar 1000 HF Index	0.92	-0.78	0.49	1.00

Thre	e-Year Correlations: Hedge Fund Category Indexes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Morningstar Convtbl Arbitrage	1.00															
2	Morningstar Corporate Actions	0.89	1.00														
3	Morningstar Debt Arbitrage	0.94	0.90	1.00													
4	Morningstar Distressed Sec	0.68	0.77	0.79	1.00												
5	Morningstar Dvlp Asia Equity	0.81	0.86	0.82	0.62	1.00											
6	Morningstar EM Equity	0.84	0.94	0.87	0.74	0.89	1.00										
7	Morningstar Equity Arbitrage	0.79	0.81	0.76	0.47	0.81	0.80	1.00									
8	Morningstar Europe Equity	0.80	0.86	0.80	0.59	0.86	0.87	0.92	1.00								
9	Morningstar Global Debt	0.93	0.89	0.92	0.80	0.76	0.85	0.75	0.77	1.00							
10	Morningstar Global Equity	0.87	0.95	0.86	0.67	0.92	0.95	0.90	0.93	0.84	1.00						
11	Morningstar Global Non-Trend	0.62	0.73	0.63	0.37	0.73	0.73	0.87	0.76	0.59	0.80	1.00					
12	Morningstar Global Trend	0.07	0.26	0.07	0.01	0.31	0.27	0.51	0.41	0.04	0.37	0.68	1.00				
13	Morningstar Multi-Strategy	0.92	0.97	0.92	0.77	0.89	0.94	0.85	0.88	0.90	0.96	0.75	0.28	1.00			
14	Morningstar Short Equity	-0.46	-0.32	-0.47	-0.27	-0.22	-0.22	-0.34	-0.25	-0.42	-0.29	-0.24	0.02	-0.33	1.00		
15	Morningstar US Equity	0.86	0.92	0.84	0.77	0.85	0.90	0.74	0.82	0.84	0.92	0.60	0.15	0.94	-0.23	1.00	
16	Morningstar US Small Cap Eqty	0.82	0.90	0.84	0.76	0.89	0.93	0.74	0.82	0.81	0.93	0.65	0.22	0.94	-0.23	0.96	1.00

1.00 to 0.76	0.75 to 0.51	0.50 to 0.25	0.25 to 0.00
0.00 to -0.24	-0.25 to -0.49	-0.50 to -0.74	-0.75 to -1.00

# Correlations of Alternative Funds to Traditional Asset Classes

Correlation of Hedge Funds to U.S. Stocks and Bonds	S&P 500 Correlation (USD	))		BarCap US Agg Correlation	on (USD)	
	3-Year	5-Year	10-Year	3-Year	5-Year	10-Year
US OE Long-Short	0.95	0.94	0.77	0.29	0.20	0.12
US OE Bear Market	-0.97	-0.97	-0.95	-0.33	-0.28	0.04
US OE Currency	0.50	0.42	0.10	0.09	0.08	0.27
Correlation of Hedge Funds to U.S. Stocks and Bonds S&P 500 Correlation (USD)				BarCap US Agg Correlati	on (USD)	
	3-Year	5-Year	Since Index Inception 01-01-2003	3-Year	5-Year	Since Index Inception 01-01-2003
Morningstar 1000 HF USD	0.80	0.78	0.77	0.34	0.22	0.19
Morningstar Convtbl Arbitrage HF USD	0.72	0.70	0.64	0.48	0.39	0.31
Morningstar Corporate Actions HF USD	0.74	0.73	0.72	0.31	0.21	0.15
Morningstar Debt Arbitrage HF USD	0.73	0.69	0.66	0.44	0.36	0.34
Morningstar Distressed Sec HF USD	0.65	0.65	0.65	0.08	0.01	0.00
Morningstar Dvlp Asia Equity HF USD	0.81	0.73	0.69	0.38	0.26	0.13
Morningstar EM Equity HF USD	0.80	0.76	0.74	0.28	0.18	0.18
Morningstar Equity Arbitrage HF USD	0.63	0.59	0.57	0.42	0.25	0.23
Morningstar Europe Equity HF USD	0.76	0.73	0.72	0.34	0.22	0.18
Morningstar Global Debt HF USD	0.71	0.69	0.67	0.41	0.32	0.30
Morningstar Global Equity HF USD	0.81	0.78	0.78	0.34	0.22	0.15
Morningstar Global Non-Trend HF USD	0.46	0.43	0.42	0.40	0.25	0.29
Morningstar Global Trend HF USD	0.06	0.13	0.18	0.04	-0.03	0.10
Morningstar Multi-Strategy HF USD	0.77	0.75	0.73	0.28	0.17	0.17
Morningstar Short Equity HF USD	-0.17	-0.15	-0.12	-0.47	-0.40	-0.25
Morningstar US Equity HF USD	0.88	0.87	0.87	0.17	0.10	0.06
Morningstar US Small Cap Eqty HF USD	0.89	0.87	0.86	0.18	0.11	0.05

#### Morningstar Hedge Fund Database Overview as of 09-30-10

#### Net Fund Additions by Month

Morningstar's hedge fund database experienced a net addition of 15 funds during the second quarter of 2010. The database saw 417 additions and 402 fund withdrawals during the quarter. Funds drop out because they have liquidated or because they cease sharing performance data, typically due to poor performance. There has been a decline in the number of hedge funds reporting to the database since June 2009, but the total number of funds has stabilized since April 2010.



#### **Month-End Database Fund Levels**

As of Sept. 30, 2010, the Morningstar hedge fund database contained 7,599 funds with performance history and assets under management data. This figure includes both single-manager hedge funds and funds of hedge funds, which account for approximately 5,000 and 2,600 funds, respectively. As of the end of the third quarter of 2010, the number of funds in the database had dropped approximately 4% from June 2009 levels.



#### Morningstar Hedge Fund Database Overview as of 09-30-10

#### **Hedge Funds by Region**

Nearly 39% of hedge funds in the Morningstar database are domiciled in the North American/ Caribbean region, primarily in the United States and Canada. Many of the Caribbeanbased hedge funds are offshore feeder funds established for U.S. tax-exempt investors; 49% of funds in Morningstar's database are domiciled in Europe, including both EU and non-EU jurisdictions.



Region	# Funds
North America/Caribbean	2,928
Africa	15
Asia/Australia	887
Europe	3,716
South America	35
Total	7,581

#### **Hedge Funds by Location**

The United States, Canada, the United Kingdom, Switzerland, France, and China are home to more than 73% of hedge funds in Morningstar's database. The resolution of the Alternative Investment Fund Managers directive in Europe will not likely lead to hedge funds relocating to the EU.

North America and Surrounding	2,928
United States	2,365
Canada	251
Cayman Islands	111
Bermuda	80
British Virgin Islands	64
Bahamas	34
U.S. Virgin Islands	14
Netherlands Antilles	3
St. Kitts and Nevis	2
Barbados	2
Mexico	2
Africa	15
South Africa	8
Mauritius	4
Swaziland	2
Botswana	1
Asia and Australia	887
China	609
Hong Kong	101
Australia	67
Singapore	54
Japan	25
Afghanistan	12
Saudi Arabia	7
Malaysia	4
Vietnam	2
Indonesia	2
Samoa	1
Israel	1
New Zealand	1
United Arab Emirates	1

Europe	3,785
United Kingdom	1425
Switzerland	747
France	405
Sweden	203
Luxembourg	161
Italy	122
Ireland	108
Malta	83
Germany	81
Netherlands	67
Austria	47
Liechtenstein	40
Spain	38
Finland	30
Isle of Man	27
Norway	25
Channel Islands	18
Andorra	18
Denmark	13
Guernsey	9
Russia	9
Cyprus	8
Monaco	7
Jersey	6
Belgium	5
Portugal	5
Czech Republic	2
Gibraltar	2
Greece	2
Macedonia	1
Slovenia	1
Ukraine	1
South America	35
Brazil	31
Argentina	3

1

Chile

#### Morningstar Hedge Fund Database Overview as of 09-30-10

#### **Service Providers**

Morgan Stanley and Goldman Sachs are the largest prime brokerage service providers to hedge funds in Morningstar's database, serving a 27% share combined. This represents a 5 percentage-point decline over the previous quarter, however. The big four accounting firms are employed by approximately 74% of the hedge fund database. Citco Fund Services provides administration services to the largest number of funds in Morningstar's database, about 10% of funds. Maples and Calder, Seward & Kissel LLP, and Dechert LLP are the largest legal service providers to hedge funds in the database.

Туре	Rank	Service Provider	% of Database
Prime Broker	1	Morgan Stanley	14.51
	2	Goldman, Sachs & Co.	12.60
	3	UBS	7.33
	4	Credit Suisse AG	5.86
	5	JPMorgan	5.72
	6	Deutsche Bank.	5.01
	7	Newedge Group Inc.	3.25
	8	Banc of America Securities LLC	3.08
	9	Merrill Lynch	2.96
	10	Guosen Securities Co., Ltd.	2.70
Legal Counsel	1	Maples and Calder	7.36
	2	Seward & Kissel LLP	6.72
	3	Dechert LLP	6.20
	4	Walkers	6.15
	5	Simmons & Simmons	4.07
	6	Elvinger, Hoss & Prussen	3.94
	7	Schulte Roth & Zabel LLP	3.81
	8	Sidley Austin LLP	3.50
	9	Appleby	3.22
	10	Conyers Dill & Pearman	2.70
Auditor	1	Pricewaterhouse Coopers	23.68
	2	KPMG	18.79
	3	Ernst & Young	17.21
	4	Delloite	13.82
	5	Rothstein Kass	6.03
	6	Grant Thornton	2.74
	7	McGladery & Pullen	2.04
	8	BDO	1.96
	9	Eisner	1.44
	10	Cabinet Patrick Sellam	1.26
Administrator	1	Citco	9.86
	2	HSBC	5.22
	3	Citigroup	4.81
	4	Арех	3.44
	5	Bank of New York	2.84
	6	CACEIS Fastnet	2.82
	7	China Resources SZITIC Trust Co., Ltd	2.56
	8	State Street	2.49
	9	UBS	2.23
	10	Fortis Bank	2.06

# Alternative Investments

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