

An Empirical Analysis of 130/30 Strategies: *Domestic and International 130/30 Strategies Add Value Over Long-Only Strategies*

GORDON JOHNSON, SHANNON ERICSON, AND VIKRAM SRIMURTHY

GORDON JOHNSON is a senior portfolio manager, international investments, at Lee Munder Capital Group in Boston, MA.
gjohnson@leemunder.com

SHANNON ERICSON is a portfolio manager, international investments, at Lee Munder Capital Group in Boston, MA.
sericson@leemunder.com

VIKRAM SRIMURTHY is a portfolio manager, international investments, at Lee Munder Capital Group in Boston, MA.
vsrimurthy@leemunder.com

There is growing interest in the marketplace for enhanced active equity strategies as investors search for higher alpha in an era of lower expected returns. Evidence of just how popular these strategies have become is apparent in the tremendous growth in assets over the last year. Investment industry periodicals estimate that assets in these strategies may be as high as \$60 billion by mid 2007 and could reach \$500 billion within five years.¹ An enhanced active strategy partially removes the long-only constraint, allowing managers to short a portion of their portfolio to enhance active returns. Enhanced active strategies, also referred to as *constrained long-short*, *active extension*, and *short enabled*, are often identified by their long and short target weights. For example, a portfolio that can short 20% and go long an additional 20% for a total of 120% long is known as a 120/20 portfolio. Similarly, a portfolio that can short 30% is called a 130/30, and so on. Although the percentage that can be sold short typically ranges from 20% to 50%, 30% seems to be emerging as the most widely used in the industry. Consequently, in this article, we focus specifically on the 130/30 variation.

A traditional long-only strategy invests 100% in securities and is managed to a benchmark. Because a long-only strategy is prohibited from shorting, the most a portfolio manager can underweight a stock is its weight

in the benchmark. With a 130/30 strategy, 100% is invested in equities and the manager is allowed to short up to 30% of the portfolio. Proceeds from the shorts are then used to purchase 30% of additional securities, so that the net market exposure of the portfolio remains 100% as in a long-only portfolio.² The ability to short allows managers to underweight unattractive stocks in a more meaningful way that more accurately reflects negative return expectations. In contrast to a long-only strategy, an enhanced active strategy levels the playing field, allowing managers to overweight and underweight positions by the same magnitude. Even modest amounts of shorting can dramatically improve performance results since a manager's expectations for outperformance as well as underperformance are now better represented in the portfolio. In fact, not only does an enhanced active strategy increase expected return, it is achieved without dramatically increasing active risk.

Conversations with Wall Street firms indicate that between 60% and 80% of the 130/30 strategies currently in the marketplace are quantitatively run. This is largely because such strategies are particularly well suited to quantitative management. Quantitative models rank stocks from best to worst on a variety of factors. The lower tail of unattractive stocks is already being identified as part of a quantitative long-only process. However, the information in the lower tail is not fully incorporated into the portfolio.

Removing the long-only constraint allows a manager to underweight the lower tail of stocks by amounts that are comparable to portfolio overweights in the upper tail. In addition, quantitative managers are often heavy users of risk models and portfolio construction tools. Thus, they are already well equipped to run this type of strategy in a highly risk controlled manner. Conversely, traditional managers may require additional analysts to identify short recommendations or may need to revise their investment philosophy or existing tools to look for short opportunities. This article focuses on 130/30 portfolios from the quantitative manager's perspective, as quantitative managers dominate the 130/30 marketplace and the strategy lends itself well to this style of management.

In this article, we provide further evidence that an enhanced active strategy can add value over a long-only strategy, but examine it from an empirical perspective. We develop a quantitative alpha (stock selection) model and use it to test historical performance over a 13-year period for 130/30 and long-only large-cap strategies in both domestic and international universes. The 130/30 strategies, using the illustrative alpha model, substantially outperform their respective long-only portfolios. The portfolio tracking errors also increase versus their respective benchmarks but proportionally by much smaller amounts.

Finally, we provide details on calculating performance attribution for the long and short portions of a 130/30 strategy given that no industry norms have yet evolved. One of the key elements of our perspective on performance attribution is based on the belief that a 130/30 strategy is more similar to a long-only strategy than a hedge fund strategy. Thus, its performance should be measured and evaluated versus the benchmark against which it is managed. We compute long and short performance attribution for the 13-year historical 130/30 tests. We find that both the longs and shorts contribute to performance relative to the benchmark in most of the years of the test period.

PREVIOUS EVIDENCE ON THE BENEFITS FROM RELAXING THE LONG-ONLY CONSTRAINT

Grinold and Kahn [2000] show that a portfolio's efficiency, measured by the information ratio (IR), increases when the long-only constraint is removed. They find that fully leveraged long-short strategies offer

the most improvement over long-only strategies when the universe of assets is large, the asset volatility is low, or the strategy has high active risk. Their analysis also highlights that the long-only constraint induces negative size bias because the manager can only underweight large-cap stocks by a meaningful amount. This size bias affects active long as well as short positions. They conclude that the most important argument for long-short investing is the enhanced portfolio efficiency that results from being able to short stocks where the manager has negative views.

Clarke, de Silva, and Sapra [2004] evaluate information loss related to portfolio constraints relative to the benchmark on: market capitalization, industry, sector, and stock positions—as well as the long-only constraint. They measure the impact on performance from relaxing each portfolio constraint. They measure the impact by the change in portfolio transfer coefficient, where the transfer coefficient is the degree of information transfer from a security-ranking signal into active portfolio weights.³ Their analysis indicates that the long-only constraint is the most significant in terms of information loss. In addition, they find that 130/30 strategies achieve 90% of the transfer coefficient that can be obtained with a fully unconstrained 200/100 strategy—where a 200/100 strategy is 200% long, 100% short, and has 100% net exposure to the market. Thus, much of the benefits of relaxing the long-only constraint can be achieved with moderate levels of shorting. They note that, in practice, the investor will need to make trade-offs between the tracking error, the level of shorting, and the improvement in transfer coefficient as not all can be controlled simultaneously.

Sorensen, Hua, and Qian [2007] examine the added costs associated with running constrained long-short portfolios, including leverage costs related to borrowing shares and higher transaction costs generated from increased turnover. They conclude that the enhanced performance that can be obtained from these strategies outweighs the added costs under reasonable assumptions. They note that portfolio mandates will have different tracking error targets and benchmarks, which suggest that the optimal IR can be quite varied, depending on the mandate and the associated costs of implementation. Jacobs and Levy [2006] illustrate the mechanics of the prime brokerage structure underlying 130/30 strategies as well as operational issues and portfolio construction.

HOW A 130/30 PORTFOLIO WORKS

Exhibit 1 gives an illustration of the mechanics of a 130/30 strategy. For a \$100 investment, the long-only manager purchases \$100 worth of stocks that are expected to outperform based on an alpha model. The net investment is \$100, the portfolio beta is at or close to 1.0 and the market exposure is 100%. For a 130/30 strategy, the manager purchases \$100 of stocks expected to outperform, but then shorts \$30 worth of stocks that are expected to underperform. The proceeds from the shorts are used to purchase \$30 of additional stocks that are expected to outperform. The net investment is still \$100, the beta remains at or close to 1.0 and the net market exposure is 100%. The gross market exposure, however, is now 160% (130% long + 30% short). Despite this higher gross investment of 160%, the 130/30 portfolio maintains portfolio and risk characteristics similar to those of a long-only portfolio. This is of particular interest to investors since a 130/30 strategy can be used in an overall plan allocation much like a long-only strategy because it is managed to a benchmark and provides 100% market exposure.

WHY THE ABILITY TO SHORT IS SO CRITICAL

One of the key benefits of the 130/30 strategy is the ability to short securities in order to underweight

them by a meaningful amount. In a long-only strategy, the manager is not able to short stocks so the only way to underweight a stock versus the benchmark is not to hold it. This is an important point because the typical benchmark weight for a given stock is generally quite small, as shown in Exhibit 2. The columns labeled "All" in the exhibit show the counts of all the stocks in the Russell 1000 and MSCI EAFE indices by GICS sector. The columns to the right of the totals are the counts of stocks in each benchmark by sector that are greater than 0.25% and greater than 0.50%. For the Russell 1000 and MSCI EAFE indices, respectively, only 37 out of 987 and 35 out of 1174 stocks have weights in excess of 0.50%. Hence, a long-only manager's ability to underweight stocks by more than 0.50% is limited to just 5% of the stocks in either index. In addition, some sectors have fewer stocks with large benchmark weights than others. Therefore, the long-only manager's ability to underweight securities will also vary across sectors depending on the stock weights in that sector.

Exhibit 3 further delineates the benchmark data by showing weights for stocks in a particular sector, sorted by alpha into quintiles. The sector chosen, for illustrative purposes, is the Russell 1000 Materials Sector. Stocks with lower alphas (Quintile-5) are the ones that a manager would most want to underweight because they are expected to underperform the most. Stocks that a

EXHIBIT 1

How a 130/30 Portfolio Works

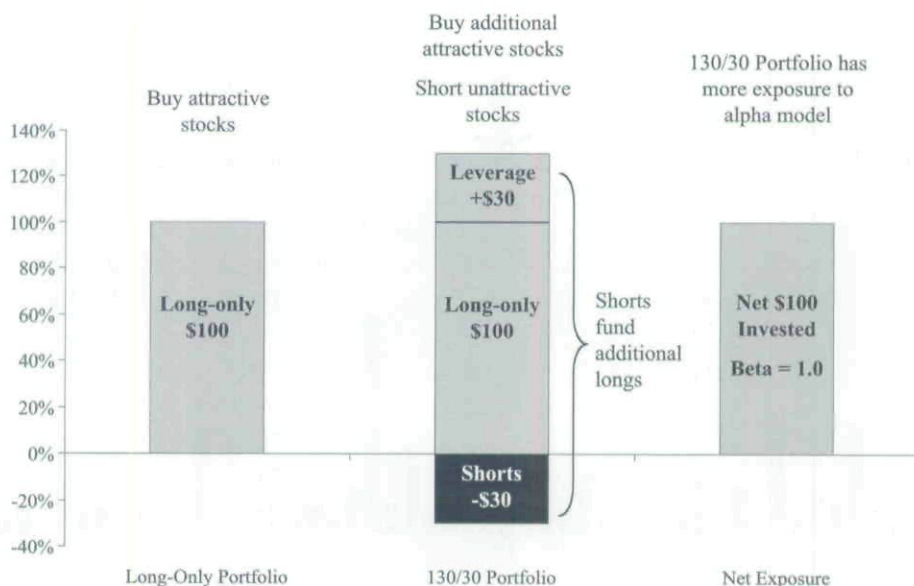


EXHIBIT 2

Benchmark Counts by Sector

	All		Wt > 0.25%		Wt > 0.50%	
	R1000	EAFE	R1000	EAFE	R1000	EAFE
Energy	67	41	4	6	3	5
Materials	60	116	2	7	0	2
Industrials	122	245	8	2	1	1
Consumer Discretionary	170	213	8	7	4	1
Consumer Staples	53	90	7	8	5	1
Health Care	102	55	12	6	6	5
Financials	204	240	18	32	9	16
Information Technology	132	98	14	5	6	1
Telecommunication Services	19	32	4	6	3	2
Utilities	58	44	2	8	0	1
Total	987	1174	79	87	37	35

The Russell 1000 (R1000) and EAFE benchmarks are as of December 1, 2006. Counts are the number of total stocks (All) in each sector as well as those with benchmark weights greater than 0.25% and 0.50%.

manager would most want to overweight have the highest alphas (Quintile-1) and are expected to outperform the most. Stocks with the largest benchmark weights in Quintile-5 have weights of 0.20%, 0.13%, and 0.14%. Not owning those three stocks results in very modest underweights equal to their benchmark weights. Not owning any of the stocks in Quintile-5 results in a cumulative underweight of -0.77% to Quintile-5 stocks, which is unlikely to have much impact on portfolio performance.

This example shows that the long-only manager's ability to underweight stocks in a particular sector depends not only on whether there are large stock weights in that sector but also where those stocks rank on alpha. Hence, the long-only manager's ability to reflect negative return expectations by substantially underweighting poorly ranked stocks in the portfolio is severely restricted.

Exhibit 4 continues the Russell 1000 Materials Sector example, except that it compares active weights

EXHIBIT 3

Russell 1000 Materials Sector Weights by Alpha Level

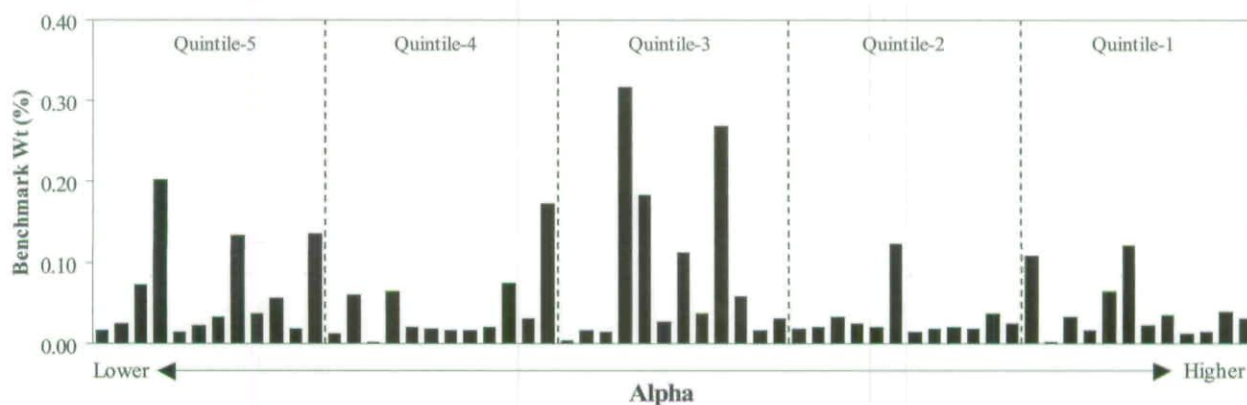
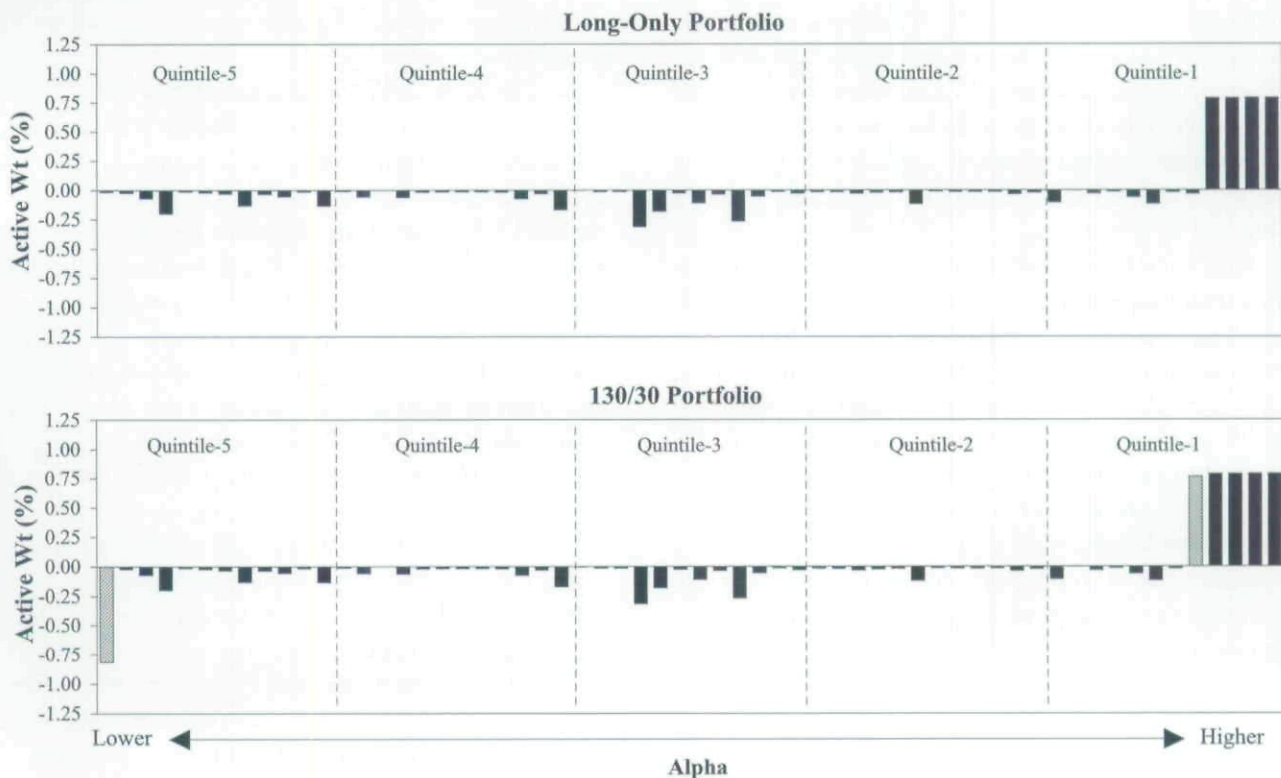


EXHIBIT 4

Russell 1000 Materials Sector Active Weights



for a long-only portfolio versus a 130/30 portfolio. The long-only portfolio has a total of 110 holdings, resulting in typical individual active weights of 0.80% for stocks held. For the Materials Sector, active stock weights of this magnitude amount to four holdings, as shown in the upper panel, by active weights of the four highest ranked stocks. Clearly, the positive active weights for the stocks held in Quintile-1 dwarf the negative active weights that can be achieved from the stocks not held in Quintile-5 in a long-only strategy.

Active weights for the Materials Sector of an equivalent 130/30 portfolio are shown in the lower panel. The worst ranked stock is shorted, resulting in an underweight position of -0.82% . The proceeds are used to purchase an additional long holding. The two new positions are shaded for easier identification. In this case, the manager is able to increase the portfolio's exposure from a cumulative underweight of -0.77% of Quintile-5 stocks not held in the long-only portfolio to -1.59% cumulative underweight in the 130/30 portfolio. Even though only one stock has been shorted in this particular sector, the exposure to the bottom tail of the alpha model has been

doubled. By employing this strategy, poorly ranked stocks have the opportunity to contribute more to performance if they underperform because they make up a greater proportion of the entire portfolio. On the long side, additional attractive stocks can be purchased for a gross investment of 130%, which provides greater diversification among top ranked stocks and more exposure to the alpha model.

HISTORICALLY 130/30 STRATEGIES OUTPERFORM EQUIVALENT LONG-ONLY STRATEGIES

Of considerable interest to investors is the magnitude of outperformance that can be expected from a quantitatively-based 130/30 portfolio over a comparable long-only portfolio. In this section, we present results from historical back tests for long-only and 130/30 portfolios in the large-cap domestic and international universes. An alpha model with six widely used factors is used for the portfolio back tests. Full details and performance for this alpha model are in Appendix A.

Back tests cover the period from January 1, 1994, through December 31, 2006. Returns are before fees or transaction costs.⁴ This period includes the Technology and Telecom bubble of the late 1990s and the subsequent burst in mid-2000. This should not hinder our conclusions, since there are a reasonable number of years included in the sample period before and after the bubble. In addition, this time period provides a good test of 130/30 strategies and the effectiveness of shorting during a market bubble and its aftermath.

Strategies are rebalanced at the end of each month within their respective domestic and international universes. The strategy returns are compared to those of the actual Russell 1000 and MSCI EAFE benchmarks. For the 130/30 portfolios, weights are targeted to be 130% long and 30% short and are rebalanced back to those weights at the end of each month. Sector, industry, and country active weights are all kept within 5% of their respective universes. Predicted beta is targeted to be as close to 1.0 as possible, relative to the respective universes. Strategies tested are for reasonably active portfolios with the long-only portfolios holding an average of 110 stocks and 130/30 portfolios holding approximately 143 long positions and 42 short positions.

Long positions are selected from the top quintile of stocks within each GICS sector. A sell discipline is used that requires a stock to be liquidated when it falls to the fourth or fifth quintile and no longer ranks well versus its GICS sector peers. Proceeds from the sale are rotated up into a Quintile-1 stock in that sector that is not already held. Shorts are selected from the lowest ranked stocks, or the bottom quintile of each sector. The cover discipline requires that a short position be covered when the stock's alpha rank improves versus its peers and ranks in the second quintile or above, or when the stock experiences strong up performance in excess of +20% since being shorted. Proceeds from the cover are used to initiate another short position among the lowest ranked stocks in the sector not already held short in the portfolio.

Exhibit 5 shows cumulative returns for the Russell 1000 Index, the MSCI EAFE Index, and the corresponding long-only and 130/30 domestic and international strategies. For both asset classes, the long-only and 130/30 portfolios outperform their respective benchmarks over the 13-year test period. In both cases, the domestic and international 130/30 portfolios outperform their respective long-only portfolios by a considerable margin. These results provide additional evidence that

allowing a reasonable amount of shorting and reinvesting those proceeds in additional long positions can substantially enhance investment returns. The results also indicate that an enhanced active strategy works well in a quantitative framework.

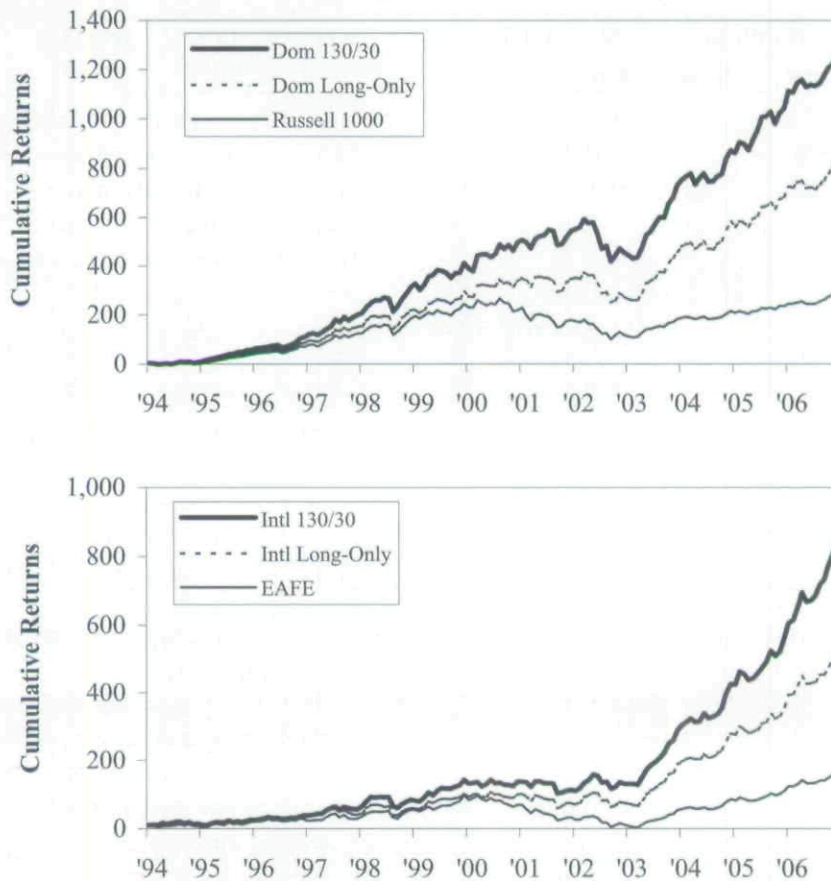
Exhibit 6 shows annualized excess return and various risk and performance summary statistics for the domestic and international long-only and 130/30 strategies relative to their benchmarks. The domestic and international long-only strategies generate similar annualized active returns of 7.6% and 7.3%, respectively. The 130/30 strategies also produce similar active returns of approximately 11%, which is roughly 1.5x the return of their corresponding long-only strategies and is shown as a ratio. The proportionate increase in risk of the 130/30 strategy is substantially less. Risk, as measured by tracking error, for the 130/30 strategies is only 1.2x for the domestic and 1.1x for the international, relative to the corresponding long only portfolio tracking errors. The information ratio, a measure of the excess return relative to active risk, also moderately increases—1.2x for the domestic 130/30 and 1.3x for the international 130/30. This exhibit shows that the 130/30 strategy in both domestic and international asset classes provides considerably higher return without substantial added risk. The batting average column shows the percentage of months that the strategy outperforms its benchmark. For both the domestic and international 130/30's, the batting average remains very close to that of the long-only strategies. The turnover column represents annualized turnover and shows that a 130/30 strategy generates roughly double the turnover of a long-only strategy.

PERFORMANCE ATTRIBUTION

Since 130/30 strategies are new to the market, standards have not yet been developed for performance attribution. For a long-only strategy, the portfolio is managed to a benchmark, so clearly the portfolio's performance should be evaluated versus its benchmark. Regardless of whether the absolute return for the portfolio is positive or negative, if the relative performance is positive, the portfolio is considered to be outperforming. For an equity hedge fund, the universe of stocks that the fund can invest is often broad and undefined. Therefore, hedge funds are generally not evaluated versus an equity benchmark and absolute return, rather than relative return, is most relevant when measuring performance.

EXHIBIT 5

Cumulative Returns of 130/30 and Long-Only Strategies



We argue that a 130/30 strategy is more like a long-only strategy because it is managed to a benchmark and has 100% exposure to the market. Therefore, a 130/30 strategy's performance should be evaluated similar to a long-only strategy and compared to its benchmark. Since the strategy incorporates some amount of shorting, investors will want to know how the long and short portions of a 130/30 portfolio contribute to overall performance versus the benchmark. To measure this properly, the performance attribution between the longs and shorts needs to account for the fact that the long and short portions of the portfolio are 130% and 30%, respectively, of invested capital. It is also important to understand that if the long and short portions produce the same excess returns versus the benchmark, the active contribution from the shorts will always be less than the longs because it represents only 30% of the portfolio rather than 130% for the longs. Thus, the contribution to the overall portfolio's excess return from the long positions would be

their excess return multiplied by 1.3. Similarly, the contribution to the overall portfolio's excess return from the short positions would be the *negative* of their excess return (which we calculate as the benchmark return *minus* the return from the shorts) multiplied by 0.3. The point is that the long and short portions of a 130/30 portfolio should be evaluated versus the benchmark like a long-only portfolio, not on an absolute basis as for a hedge fund. However, a slight modification is required to scale the performance of the long and short portions of the 130/30 strategy by their proportions of invested capital.

We will use the domestic 130/30 strategy results from Exhibit 7 to illustrate how to calculate the performance contributions for the long and short portions of the portfolio. The domestic 130/30 strategy returns a compounded average of 22.3% for the entire 13-year period versus the Russell 1000 return of 11.0%. Therefore, the strategy outperforms the benchmark by 11.3% over the period.

EXHIBIT 6

Strategy Performance Summary

	Holdings		Avg. Act Wt %		Excess Return	Info. Ratio	Tracking Error	Batting Average	Turn-Over
	Long	Short	Long	Short					
Domestic									
Long-Only	110		0.88		7.61	1.25	5.43	61	52
130/30	143	42	0.85	-0.76	11.27	1.51	6.48	65	106
Ratios					1.48x	1.21x	1.19x	1.06x	2.04x
International									
Long-Only	111		0.88		7.28	1.25	5.32	67	56
130/30	143	41	0.86	-0.78	11.06	1.64	5.99	68	108
Ratios					1.52x	1.31x	1.12x	1.01x	1.93x

Excess returns are the annualized compounded return of the strategy minus the annualized compounded return of the respective benchmark. Information ratios are the arithmetic mean excess return divided by the tracking error versus the benchmark. Holdings are the number of stocks held long or short. Average active weights are the corresponding active weights for long and short holdings. Stocks not held are not included in the average short active weight. Ratios are 130/30 portfolio statistics divided by the corresponding long-only portfolio statistics. All portfolio statistics are annualized. Returns represent model-driven results.

We define R_L , R_S , and R_B as the returns for the long portion of the portfolio, short portion of the portfolio, and benchmark, respectively. Similarly, we define W_L and W_S as the proportions of the portfolio that are long and short, respectively. The contribution to portfolio excess return from the long portion, C_L , is calculated as follows:

$$\begin{aligned} C_L &= (R_L - R_B) \times W_L \\ &= (18.0\% - 11.0\%) \times 1.3 \\ &= 9.1\% \end{aligned}$$

The contribution from the short portion, C_S , is calculated as follows (note the reversal of benchmark and portfolio return to obtain the negative of excess returns):

$$\begin{aligned} C_S &= (R_B - R_S) \times W_S \\ &= (11.0\% - 4.1\%) \times 0.3 \\ &= 2.1\% \end{aligned}$$

Of the total 11.3% outperformance versus the benchmark, 9.1% comes from the long portion of the portfolio and 2.1% comes from the short portion. The remaining 0.1% is caused by the periodic rebalancing between the long and short portions of the portfolio in order to maintain them at 130% and 30%, respectively, of invested capital. We refer to this remaining portion as the "long-short

interaction." See Appendix B for further explanation of this interaction term.

In this example for the domestic 130/30 attribution, the long portion of the portfolio had a positive return that exceeded the benchmark return, so it contributed positively to the overall portfolio excess return for the period. The short portion of the portfolio also had a positive return over the period, but it was substantially less than the benchmark return. We argue that it also added value to the overall portfolio excess return in a 130/30 framework since performance should be measured versus the benchmark, as in a long-only strategy, rather than in absolute terms. This is no different from a long-only strategy adding value when it beats its benchmark, even though its absolute return was negative. If it is a down market period and the benchmark has a more negative return than the long-only portfolio, the long-only portfolio is said to outperform regardless of the fact that it declined in value.

SHORTS AND LONGS CONTRIBUTE TO PERFORMANCE IN MOST YEARS

Exhibit 8 presents the annual performance for the long-only and 130/30 strategies and their respective benchmarks. Annual active returns, long and short contributions, and long-short interactions are also given. Both 130/30 strategies outperform their long-only counterparts in 11

EXHIBIT 7

Benchmark and 130/30 Strategy Compounded Average Annual Returns

	Domestic	International
Benchmark	11.0	7.8
130/30 Strategy	22.3	18.9
Longs	18.0	15.0
Shorts	4.1	2.5

Returns are for the 1/1994–12/2006 period and represent model-driven results.

of the 13 calendar years. In addition, both the long and short portions of the 130/30 strategies generate positive performance contributions in most years. For the domestic strategy, long contributions are positive in 11 years and short contributions are positive in 10 years. For the international strategy, the long positions contributed positively in 10 years and shorts contributed positively in eight years. There are no years where the contribution from the longs and the shorts are both negative in either the domestic or international universes. This illustrates the diversification

potential for adding value from an alpha model both on the long side as well as the short side.

The 130/30 long-short interaction is small for most years. There are years, however, when it is large. The interactions were large in 1998 for the domestic strategy and in 1997 and 2002 for the international strategy. The long-short interaction is caused by the turnover required to keep the long and short portions of the portfolio at 130% and 30% of capital, respectively. Not surprisingly, the turnover required to maintain the 130/30 weights for the strategies is also high for the same years. High turnover between the long and short portions of a 130/30 strategy does not necessarily result in large interactions as interactions can cancel out within a given year. The year with the highest turnover between the long and short portions was 2001 for both the domestic and international strategies. Yet, the interaction terms in that year were not particularly high.

The latter years of the technology and telecom bubble as well as the Russian Financial Crisis occurred in 1998 and 1999. The aftermath of the technology and telecom bubble took place primarily in 2000 and 2001. Interestingly, the contributions from the longs were negative in 1998 and 1999, but the contributions from the

EXHIBIT 8

130/30 Long-Short Performance Contributions

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Avg
Domestic														
Russell 1000 Return	0.4	37.8	22.5	32.9	27.0	20.9	-7.8	-12.5	-21.7	29.9	11.4	6.3	15.5	11.0
Long-Only Return	3.4	41.3	27.2	35.9	26.1	24.0	10.8	2.3	-16.0	49.1	21.7	15.2	17.1	18.6
130/30 Return	8.1	46.6	33.2	42.1	38.0	23.8	16.9	7.5	-13.7	49.5	17.1	17.5	19.2	22.3
<i>Active Returns & Contributions</i>														
Long-Only Active Return	3.0	3.5	4.7	3.0	-1.0	3.1	18.6	14.8	5.6	19.2	10.3	8.9	1.6	7.6
130/30 Active Return	7.7	8.8	10.8	9.3	11.0	2.9	24.7	20.0	7.9	19.6	5.7	11.2	3.7	11.3
Long Contribution	4.1	3.0	7.9	1.5	-0.7	-2.4	22.7	24.2	6.4	23.7	8.8	10.1	2.5	9.0
Short Contribution	3.3	5.4	2.8	7.0	9.9	5.2	1.3	-3.6	1.6	-4.0	-3.3	0.7	1.3	2.1
Long-Short Interaction	0.3	0.4	0.1	0.7	1.7	0.1	0.7	-0.6	-0.1	0.0	0.2	0.5	-0.1	0.1
International														
EAFE Return	7.8	11.2	6.0	1.8	20.0	27.0	-14.2	-21.4	-15.9	38.6	20.2	13.5	26.3	7.8
Long-Only Return	17.0	9.1	9.2	0.0	14.5	27.3	-1.7	-12.2	0.0	63.7	31.7	21.2	36.1	15.1
130/30 Return	15.0	9.7	10.0	12.3	18.5	31.9	-2.5	-10.1	8.5	67.8	35.2	26.4	43.1	18.9
<i>Active Returns & Contributions</i>														
Long-Only Active Return	9.2	-2.1	3.1	-1.8	-5.5	0.4	12.4	9.3	16.0	25.1	11.4	7.6	9.8	7.3
130/30 Active Return	7.2	-1.5	3.9	10.6	-1.5	4.9	11.7	11.3	24.4	29.2	14.9	12.8	16.8	11.1
Long Contribution	6.6	-4.0	8.0	1.4	-6.4	-1.1	12.3	11.0	20.9	32.6	16.7	13.0	11.6	9.3
Short Contribution	0.6	2.9	-4.0	7.9	5.0	5.7	-0.6	0.2	2.4	-3.5	-1.8	-0.2	4.3	1.6
Long-Short Interaction	0.0	-0.4	-0.1	1.3	-0.1	0.3	0.0	0.1	1.1	0.0	0.0	0.0	0.9	0.1

Returns represent model-driven results.

shorts were positive in both the domestic and international 130/30 strategies. In the aftermath period of 2000 and 2001, the short contributions in both the domestic and international strategies were nominal or slightly negative, whereas the long contributions were substantially positive in both universes.

SUMMARY AND CONCLUSION

Our findings provide further evidence that a 130/30 strategy is a viable strategy that can substantially add value over traditional long-only strategies without adding much incremental risk. We use an empirical approach to show that this strategy lends itself particularly well to quantitative management. For the time period tested, and in both large-cap domestic and international universes, 130/30 strategies perform considerably better than long-only strategies when using the illustrative alpha model. Thus, our empirical results indicate that removing the long-only constraint allows a quantitative manager to capitalize on both tails of their alpha model and substantially enhances their ability to outperform. Both the short portion and the long portion of the 130/30 strategies contribute to the overall outperformance over equivalent long-only strategies. There were no years where both the long and short portions of the portfolio detracted from performance. Importantly, the performance attribution shows that neither portion drives performance for the entire period or detracts from it over time. Hence, the results provide evidence that a quantitatively-based 130/30 strategy adds value from both the long and the short sides.

The enhanced active strategy's claim to fame is that it allows a manager to short a portion of the portfolio to

enhance returns. We examine this from the context of the quantitative manager who ranks stocks on a variety of factors from best to worst. Historically, long-only quantitative managers have purchased the best stocks and have not held stocks that rank the worst. In an enhanced active strategy, a manager can now underweight stocks with negative return expectations by the same magnitude that stocks with positive return expectations are overweighted.

We provide a framework for how to approach performance attribution for an enhanced active strategy. Performance of an enhanced active strategy such as a 130/30 should be measured versus its benchmark, rather than on an absolute basis. The relative performance is decomposed into contributions from the longs and shorts as well as a long-short interaction term. This decomposition of active returns will allow investors to evaluate whether a 130/30 manager is able to add value on both the long and short sides.

In summary, 130/30 strategies should be viewed as active extensions of a long-only strategy in a particular asset class and, therefore, may provide an alternative to a long-only product in an investor's portfolio. 130/30 strategies are managed to a benchmark, which allows them to be evaluated in a traditional long-only framework. They provide investors with equivalent exposure to the market as a long-only strategy, but with greater potential for excess return. In essence, 130/30 strategies are not that different from long-only strategies in terms of portfolio and risk characteristics. Therefore, investors should evaluate them in a similar fashion to long-only strategies.

APPENDIX A

In this Appendix, we present performance results and construction details for the alpha model used in the historical back tests. The factors chosen for the alpha model are widely used and well known by quantitative practitioners. For example, all factors except Sales/Price and Share-Decrease were used in Brush [2007]. We chose to use a straightforward equal-weighted alpha model with well-known factors, since details of factors and their weightings could not be revealed for a proprietary alpha model. That said, the illustrative alpha model contains many factors that are widely used in proprietary alpha models and provides realistic relative performance analysis for a 130/30 portfolio compared to a long-only portfolio when the same alpha model is used.

Security level information used to calculate the individual alpha factors are obtained from I/B/E/S, Compustat, Worldscope, and IDC. The alpha model is constructed using the following six factors:

- Estimate Revision is defined as the number of analyst estimates revised up over a month, minus the number revised down, divided by the total number of analysts. Estimate Revision for the trailing three months are weighted together 50/30/20 with the highest weight on the most recent month.
- Long-Term Momentum is 11-month total return in dollars, lagged one month.
- Cash-Flow/Price, Book/Price, and Sales/Price are each calculated from Compustat data for domestic stocks and Worldscope data for international stocks. In each case, the numerator is divided by shares outstanding and then divided by price per share.
- Share-Decrease is the 12-month change in common shares outstanding, from Compustat for domestic stocks and Worldscope for international stocks.

Each month, the factors for each stock are normalized within their respective domestic or international universe versus their GICS sector peers. The normalized factors are equally weighted to obtain an overall score, or alpha, for each stock.

The domestic universe consists of the largest 1000 stocks in the U.S. by market capitalization and is meant to approximate the Russell 1000 Index. The international universe is a proxy for the MSCI EAFE Index and consists of the largest 1000 stocks in the non-U.S. developed markets by market capitalization. Both stock universes are formed at the end of June each year.

Exhibit A shows the performance of the domestic and international alpha models over the entire 13-year test period.

EXHIBIT A

Alpha Model Quintile Performance

	Excess Return	Information Ratio	Batting Average
Domestic			
Quintile-1	7.83	1.68	75
Quintile-2	3.12	0.94	62
Quintile-3	-0.34	-0.14	51
Quintile-4	-2.34	-0.67	41
Quintile-5	-8.26	-1.58	33
International			
Quintile-1	7.94	1.94	73
Quintile-2	2.83	1.02	61
Quintile-3	0.58	0.23	53
Quintile-4	-4.03	-1.27	38
Quintile-5	-7.23	-1.87	30

Quintile-1 contains the highest alpha stocks each month, while Quintile-5 contains the lowest alpha stocks. Excess returns shown are calculated from that quintile's annualized equally weighted return minus the annualized equally weighted universe return for each period. The information ratio is the excess return divided by the tracking error versus the universe return. The batting average is the percentage of months that each quintile outperforms the universe return.

Exhibit A shows that the domestic and international models work well over the test period as excess returns for both models monotonically decline from Quintile-1 to Quintile-5. In addition, the model is equally effective in the upper and lower tails as both outperform by approximately the same magnitude. The top quintile in both the domestic and international universes outperforms 75% of the months whereas the bottom quintile outperforms roughly 30%. In other words, the bottom quintile underperforms roughly 100%-30% or 70% of the time. Given the positive results for the alpha model, we feel it is useful for the purpose of illustrating the performance differences between long-only and 130/30 portfolios.

APPENDIX B

Exhibit 8 in the performance attribution section of the article shows that the contribution of the longs and shorts to active return do not add up to the entire outperformance of the 130/30 portfolio relative to its benchmark. We call this remaining portion the "long-short interaction." In order to maintain the value of the longs and shorts at 130% and 30%

respectively of the portfolio, some turnover is required at the end of every period. We assert that this turnover causes the long-short interaction and prove this in the following paragraph.

Assume the long and short portions of the 130/30 strategy are run separately and available as the two ETF's, *L* and *S* respectively. The 130/30 strategy can be achieved by holding a two-stock portfolio (long *L* by 130% and short *S* by -30% of invested capital). However, to maintain the ratio at exactly 130/30, the portfolio would need to be rebalanced periodically to return the weights of *L* and *S* to 130% and -30%, respectively. Once the long and short portions of the portfolio have been rebalanced, the compounded return of the two-stock portfolio ceases to be the weighted-average compounded return of *L* and *S*, while the active return also ceases to be the weighted active return of *L* and *S*. This non-zero difference between the active return of the two-stock portfolio and the weighted active return of *L* and *S* is the long-short interaction.

ENDNOTES

¹See "130/30 Strategy Payday," *Pensions & Investments* (May 28, 2007).

²In practice, managers of enhanced-active products typically invest less in additional longs than they short. For example, the manager may short 30% but re-invest only 29% of the proceeds in additional long holdings. One of the reasons for this non-symmetric ratio of shorts to longs is that the ratio should adjust back toward the targeted symmetric ratio of 130/30 if the strategy works. When shorts underperform, the longs become a smaller portion in the portfolio. Conversely, when the longs outperform the shorts, they become a larger portion in the portfolio. For simplicity, our back tests keep the portfolio very close to the 130/30 target ratio. Some managers may allow the ratio to change, depending on market conditions. For example, a 130/30 manager following a very tight adherence to the target ratio might keep the ratio very close to 129/30 at all times, while a manager with a less stringent policy may allow wider swings in the ratio depending on market conditions.

³Clark, de Silva, and Thorley [2002] develop the transfer coefficient, which is an extension of the fundamental law of active management articulated by Grinold [1989]. It is calcu-

lated as the correlation between the risk-adjusted expected returns and the risk-weighted active exposures of securities in the portfolio.

⁴Back test results are not adjusted for transaction costs or borrowing costs for the shorts. However, as Sorensen, Hua, and Qian [2007] demonstrate, under reasonable assumptions, the benefits of a 130/30 type strategy outweigh the additional costs. Adjustments have also not been made for whether a particular stock could have been shorted at a given point in the back test period. Historical data on short availability is not readily available and could not be included in our analysis.

REFERENCES

- Brush, John S. "Value and Growth, Theory and Practice." *The Journal of Portfolio Management* (Spring 2007), pp. 22-30.
- Clarke, Roger, Harinda de Silva, and Steven Thorley. "Portfolio Constraints and the Fundamental Law of Active Management." *Financial Analysts Journal*, Vol. 58, No. 5 (September/October 2002), pp. 48-66.
- . "Towards More Information-Efficient Portfolios." *The Journal of Portfolio Management* (Fall 2004), pp. 54-63.
- Grinold, Richard C. "The Fundamental Law of Active Management." *The Journal of Portfolio Management*, Vol. 15, No. 3 (Spring 1989), pp. 30-37.
- Jacobs, Bruce I., and Kenneth N. Levy. "Enhanced Active Equity Strategies: Relaxing the Long-Only Constraint in the Pursuit of Active Returns." *The Journal of Portfolio Management* (Spring 2006), pp. 45-55.
- Sorensen, Ronald Hua, and Edward Qian. "Aspects of Constrained Long-Short Equity Portfolios." *The Journal of Portfolio Management* (Winter 2007), pp. 12-20.
- To order reprints of this article, please contact Dewey Palmieri at dpalmieri@iijournals.com or 212-224-3675*

©Euromoney Institutional Investor PLC. This material must be used for the customer's internal business use only and a maximum of ten (10) hard copy print-outs may be made. No further copying or transmission of this material is allowed without the express permission of Euromoney Institutional Investor PLC.

The most recent two editions of this title are only ever available at <http://www.euromoneyplc.com>