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Equity Market-Neutral Strategy

When effectively managed, an equity market-neutral strategy should generate returns in excess of cash, while being largely independent of the market's performance.

What is Equity Market-Neutral?

Equity market-neutral hedge funds buy stocks (go long) and *sell stocks (go short)* with the goal of neutralizing exposure to the general stock market and capturing a positive return, regardless of the market's direction. Equity market-neutral is a term that includes different equity strategies with varying degrees of volatility, and an emphasis on maintaining neutrality to the equity markets. When effectively managed, an equity market-neutral strategy should generate returns in excess of cash (i.e., T-bills or *LIBOR*), while being largely independent of the market's performance. Thus, the returns captured from the stock selection process should be the value added by the manager.

An equity market-neutral strategy seeks to generate returns by exploiting equity market inefficiencies, and involves simultaneously holding long *and* short equity portfolios of approximately the same dollar amount.[1] Trades involve buying attractive stocks, the *long* portion of the portfolio, and selling unattractive stocks, the *short* portion of the portfolio. The spread between the performance of the longs and the shorts, and the interest earned from the *short rebate*, provides the primary return for this strategy. Equity market-neutral may be viewed as a natural extension of long-only equity management, as it typically focuses on the fundamental factors associated with stock picking.

The variety of global equity markets and sectors creates many possible permutations and combinations of universes for equity market-neutral managers to explore. Also, since data for equities in developed markets are readily available, managers can use advanced mathematical algorithms and rigorously back-test models.

Note on Key Terms: There is a "Glossary of Key Terms" at the end of the strategy paper on Page 10. The key terms are italicized and underlined in the text.

[1] AIMA Canada's paper *An Overview of Short Stock Selling* summarizes the mechanics of selling stocks short. Also, refer to AIMA Canada's paper *Long/Short Equity Strategy* for a detailed discussion of this strategy.

What are the Nuts and Bolts of Equity Market-Neutral?

An equity market-neutral strategy usually involves simultaneously holding matched long and short stock positions to take advantage of relatively under-priced and over-priced stocks. The strategy strives to provide positive returns in both bull and bear markets by selecting a large number of long and short positions with no net exposure to the market. An equity market-neutral strategy can be established in terms of neutrality based on the following factors: dollar amount, beta, country, currency, industry or sector, market capitalization, style (value/growth), and other factors or a combination thereof.

There are three basic steps in an equity market-neutral strategy:

1. **Select the Universe:** The universe consists of all equity securities that are candidates for the portfolio in one or more industry sectors, spanning one or more stock exchanges. Selecting a universe must be consistent with the manager's core competencies. For example, if the manager has extensive experience in the energy sector, then a large portion of the universe would likely be energy stocks. The stocks in the universe should have sufficient liquidity so that entering and exiting positions can be done quickly, and it should be feasible to sell stocks short (i.e., must be possible to short the stock and the stock borrowing cost must be reasonable).

2. **Generate a Forecast:** Equity market-neutral hedge funds typically have a proprietary trading model that generates potential trades. The algorithms should indicate each trade's expected return and risk, and implementation costs should be included when determining the net risk-return profile.

3. **Construct the Portfolio:** In the portfolio construction process, the manager assigns weights (both positive and negative) to each security in the universe. There are different portfolio construction techniques, which are typically a blend of art and science. The portfolio construction phase should dovetail with risk management issues, such as maximum exposure to any single security or sector, and the appropriate amount of leverage to be employed.[2]

What are the Different Approaches to Equity Market-Neutral?

There are two basic approaches to equity market-neutral: *statistical* arbitrage and *fundamental* arbitrage. Many successful managers blend the two techniques, depending on market conditions and/or their expertise.[3]

Statistical Arbitrage

Statistical arbitrage involves model-based, short-term trading using quantitative and *technical analysis* to detect profit opportunities. Normally, a particular type of arbitrage opportunity is hypothesized, formalized into a set of trading rules and back-tested with historical data. In this manner, the manager hopes to discover a persistent and statistically significant method to detect profit opportunities. Critics refer to this strategy as "black box" investing, given its lack of process transparency.

Below are three typical statistical arbitrage techniques:

1. **Pairs or "Peer Group" Trading:** Involves simultaneously buying and selling short stocks of companies in the same economic sector or peer group, as defined by the manager. Typical correlations are measured and positions are established when current prices fall *outside* of a

[2] In an equity market-neutral portfolio, the *gross market exposure* is typically 200% (i.e., $1 long exposure + $1 short exposure = $2 of exposure), while the net exposure is zero. This portfolio is deemed to use no leverage. However, if the portfolio has *gross market exposure* of 300% (i.e., $1.50 long + $1.50 short), leverage is employed. AIMA Canada's paper *An Overview of Leverage* summarizes the key definitions and types of leverage used in the different hedge fund strategies.

[3] The basic approaches here focus on *technical* vs. *fundamental*, although approaches may differ. For example, some managers focus on factor neutrality and try to predict stock price reversion to the mean (statistical arbitrage), while other managers focus on exploiting predictability of factors (equity market-neutral). Both of these approaches may be done technically or fundamentally.

normal band. Position sizes can be weighted to achieve dollar, beta or volatility neutrality. Positions are closed when prices revert to the normal range or when stop losses are breached. Portfolios of multiple pair trades are blended to reduce stock specific risk.

2. **Stub Trading:** Involves simultaneously buying and selling short stocks of a parent company and its subsidiary(ies), depending on short-term discrepancies in market valuation versus actual stock ownership. Position sizes are typically weighted by percentage ownership.

3. **Multi-class Trading:** Involves simultaneously buying and selling short different classes of stocks of the same company, typically voting and non-voting or multi-voting and single-voting share classes. Much like pairs trading, typical correlations are measured and positions are established when current prices fall *outside* of a normal band.

The leverage used for statistical arbitrage tends to be higher than for fundamental arbitrage, and typically depends on the number of positions in the portfolio, the desired liquidity and the risk budget.

Fundamental Arbitrage

Fundamental arbitrage consists mainly of building portfolios in certain industries by buying the strongest companies and selling short companies showing signs of weakness. The analysis is mainly fundamental and is *less* quantitative than statistical arbitrage. However, some managers use technical and price momentum indicators (e.g., moving averages, relative strength and trading volumes) to help them in their decision making.

Fundamental factors used in the analysis include valuation ratios (e.g., price/earnings, price/cash flow, price/earnings before interest and tax [EBIT], price/book), discounted cash flows, return on equity, operating margins and other indicators. Portfolio turnover is generally lower than in statistical arbitrage as the signals are stronger but change less frequently. As stated, more modest leverage is used in fundamental arbitrage as the number of stocks is generally fewer than in statistical arbitrage.

What are the Sources of Return of Equity Market-Neutral?

Equity market-neutral managers use their skill and experience to detect equity market inefficiencies, in direct opposition to the ***efficient market hypothesis***. The basic assumption is that anomalies in relative stock valuation occur in the short term, and that these anomalies correct themselves in the long term. Since an equity market-neutral strategy often uses complex models to detect pricing inefficiencies, it may earn a "complexity" premium. Good models earn consistent returns, provided others in the market cannot replicate them.

The following factors contribute to the different sources of return for an equity market-neutral strategy:

1. **No Index Constraint:** Equity market-neutral removes the index constraints that limit buy-and-hold market participants. Selling a stock short is different from not owning a stock in the index, since the weight of the short position is limited only by the manager's forecast accuracy, confidence and ability to offset market risk with long position(s).

2. **Inefficiencies in Short Selling:** Significant inefficiencies are available in selling stocks short. Despite the phenomenal growth of hedge funds, the total stocks sold short on the Toronto Stock Exchange (TSX) remains at 1-2 days trading and 1.25% of market capitalization.[4]

3. **Time Arbitrage:** Equity market-neutral involves a time arbitrage for short-term traders at the expense of long-term investors. With higher turnover and more frequent signals, the equity market-neutral manager can often profit at the expense of the long-term equity investor.

[4] Source: Toronto Stock Exchange (December 2005).

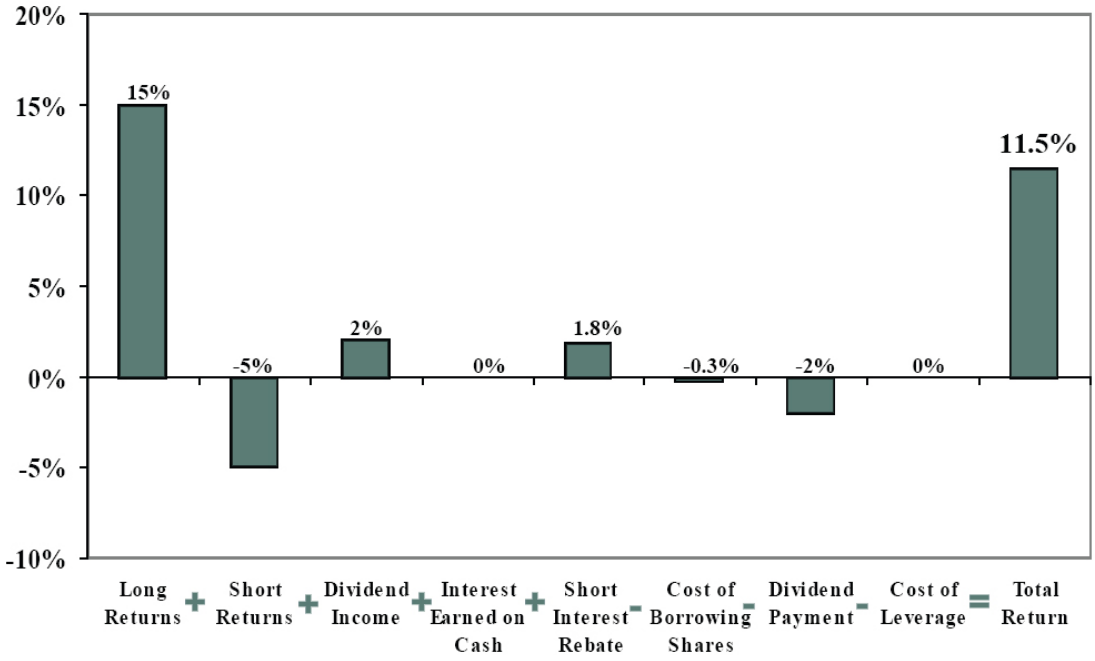
4. **Additional Active Return Potential:** Equity market-neutral involves double the market exposure by being both long *and* short stocks. At a minimum, two dollars are at work for every one dollar of invested capital ($1 long + $1 short = *gross market exposure* of $2 [or 200%], with net market exposure close to zero). Therefore, an equity market-neutral manager has the potential to generate more than the active return of a long-only equity manager.

5. **Managing Volatility:** Through an integrated optimization, the co-relationship between all stocks in an index can be exploited. Depending on the dispersion of stock returns (high being better), risk can be significantly reduced by systematically re-weighting positions to profit from offsetting volatility (i.e., the portfolio volatility can be customized and managed within a risk budget, given the volatility of long stocks and short stocks, and their respective co-variances.). Therefore, an equity market-neutral manager can add significant value by reducing and/or customizing volatility. Reducing volatility allows for leverage to be used, which is a source of return.

6. **Profit Potential in All Market Conditions:** By managing a relatively "fixed-volatility" portfolio, an equity market-neutral manager may have an advantage over a long-only equity manager. One could argue that a long-only equity manager is primarily a *risk taker*, subject to the vagaries of equity market volatility and returns, while an equity market-neutral manager is primarily a *risk manager* with flexible models, and can stay fully invested in all market conditions.

Figure 1 highlights the typical sources of return for an equity market-neutral strategy, which are derived from the above factors. (The sources of return in Figure 1 can be cross-referenced with the respective explanations on Page 5.)

Figure 1: Example of Equity Market-Neutral Return Attribution (No Leverage Used)



Notes to Figure 1: Example of Equity Market-Neutral Return Attribution (No Leverage Used)
Note: *The return attribution for an equity market-neutral portfolio has been simplified to highlight the key concepts. We assume the portfolio is $1 long and $1 short, and that the market return is 10%. Note that no leverage has been used in the example. The volatility of this type of equity market-neutral portfolio is typically lower than that of a long-only equity portfolio.*
Returns Generated on Long Positions + Short Positions: Capital gains/losses either realized or unrealized generated on long and short positions in various equity securities. **+ Dividend Income (on Long Positions):** Dividend income earned on long equity positions. **+ Interest Earned on Cash:** If a manager has low *gross market exposure*, interest is earned on excess cash balances (e.g., long exposure of $0.80 and short exposure of $0.80 results in *net market exposure* of zero, gross market exposure of $1.60, and a cash balance of $0.20). **+ Short Interest Rebate:** A short stock sale is typically executed with the following steps: borrow shares, sell shares short, receive cash in return for stock sale, earn interest on cash proceeds from short sale (i.e., the *short interest rebate*), buy back shares, and return shares to stock lender. The rebate varies depending on prevailing market interest rates (i.e., typically the broker "call rate," which is the prime rate minus 50-75 bps). **- Cost of Borrowing Shares:** When a short stock sale is executed, the equity market-neutral fund must borrow shares to facilitate the transaction. The fund typically pays the stock lender a nominal rate based on the total value of the shares borrowed and the period of the stock loan. The available supply of a particular stock impacts the borrowing cost with tightly held, illiquid stocks often commanding a premium borrow rate. **- Dividend Payment (on Short Positions):** When an equity market-neutral fund holds a short position in a dividend-paying stock, that fund must pay the stock lender the value of any dividends that would have been received on the shares. **- Cost of Leverage (Margin Loans):** If the manager uses leverage (through margin loans) to increase long positions beyond $1, the fund must pay interest on the loan to its prime broker.[5] (Note: 1-3 times leverage may be applied to the entire position, depending on the desired volatility. Therefore, the total return will depend on the amount and cost of leverage employed. The general cost of margin loans often differs by jurisdiction.) **= Total Return (i.e., Gross Return Before Fees)**

[5] AIMA Canada's paper *The Role of a Prime Broker* provides an overview of the general prime brokerage functions.

What are the Key Risk Factors of Equity Market-Neutral?

The key risk factors of an equity market-neutral strategy are as follows:

1. **Unintended Beta Mismatch:** Long and short equity portfolios can easily be dollar neutral, but *not* beta neutral. Reaction to large market movements is therefore unpredictable, as one side of the portfolio will behave differently than the other.

2. **Unintended Factor Mismatch:** Long and short equity portfolios can be both dollar neutral and beta neutral, but severely mismatched on other important factors (e.g., liquidity, turnover, value/growth, market capitalization). Again, large market moves will affect one side of the portfolio differently from the other. Risk management tools can assist the manager in controlling factor mismatches.

3. **Leverage:** Extended periods of low volatility or positive returns may encourage the manager to use leverage in excess of the strategy's risk parameters. Position sizes greater than 5% of capital, low turnover, and/or lack of a risk management framework all have the potential for large negative drawdowns. However, using leverage by itself is *not* a risk factor. Most equity market-neutral portfolios have *gross market exposure* of 200%, although large global market-neutral portfolios spread across hundreds of positions may use leverage with *gross market exposure* of 300-400% (i.e., $1.5-$2 long + $1.50-$2 short).

4. **Model Risk:** All risk exposures of the model (within reason) must be assessed to prevent bad forecast generation. Also, practical implementation issues should be considered. For example, even if the model indicates that a certain stock should be shorted at a particular instant in time, this may *not* be feasible due to the "*uptick rule*." Finally, the effectiveness of the model may diminish as the market environment changes.

5. **Changes in Volatility:** The total volatility of an equity market-neutral position depends on the volatility of each position. Therefore, the equity market-neutral manager must carefully assess the volatility of each long and short position and the relationship between them, and also assess the trade in the context of the total portfolio.

6. **Low Interest Rates:** Part of the return from an equity market-neutral strategy is the interest earned on the proceeds from a short sale (i.e., the *short interest rebate*). Thus, a lower interest rate environment places more pressure on the other return sources of this strategy.[6]

7. **Higher Borrowing Costs for Stock Lending:** Higher borrowing costs cause friction on the short stock side and decreases the number of equity market-neutral opportunities available.

8. **Short Squeeze:** A sudden increase in the price of a stock that is heavily shorted, will cause short sellers to scramble to cover their positions resulting in a further increase in price.

9. **Counterparty Risk:** As with any hedge fund strategy, high quality global service providers are essential. For an equity market-neutral strategy, an effective prime broker well suited to the manager's particular market helps to ensure sound trade execution and secure stock loans. Using a large and well-capitalized prime broker assists an equity market-neutral manager in minimizing counterparty risk.

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[6] The equity market-neutral investor should always assess returns relative to T-bills; however, higher or lower rates should not affect the manager's *active* risk and return.

10. **Currency Risk:** Buying and selling stocks in multiple countries may create currency risk for an equity market-neutral fund.[7] The cost of hedging, or not hedging, can significantly affect the fund's return.

11. **Lack of Rebalancing Risk:** Finally, the success of an equity market-neutral fund is contingent on constantly rebalancing the portfolio to reflect current market conditions. Failure to rebalance the portfolio is a primary risk of the strategy.

What is the Historical Performance of Equity Market-Neutral?

Table 1 highlights that for the period January 1990 to December 2005, equity market-neutral hedge funds enjoyed returns similar to equities with volatility similar to bonds. One could argue that on a risk-adjusted basis (using standard deviation as a measure of risk), the performance of equity market-neutral hedge funds has been better than both equities *and* bonds. Some analysts argue that an equity market-neutral strategy has had superior risk-adjusted performance relative to other hedge fund strategies, and also exhibits the "best-behaved" return distribution by being closest to a normal distribution.[8]

Of the statistics in Table 1, only two, the *Sharpe Ratio* and the *Omega Ratio* reflect information about both return *and* risk. The Omega Ratio is similar to the Sharpe Ratio in that it is a ranking function (higher being better), but it does *not* penalize for upside volatility, and also captures all moments of the distribution including *skew* and *kurtosis*. In simple terms, the Sharpe Ratio is the excess return per unit of volatility and the Omega Ratio is a ranking of different investment returns at, or above a desired threshold level (in this case 0.4% monthly). With a normal distribution, the Omega and Sharpe Ratios are equivalent at the risk-free rate. The values for both the Sharpe and Omega Ratios in Table 1, highlight that an equity market-neutral strategy (i.e., both fundamental arbitrage *and* statistical arbitrage) exhibit superior risk-adjusted returns relative to U.S. stock and bond indices.

Table 1: Equity Market-neutral (EMN) Performance Comparison (in US$) (Jan-1990 to Dec-2005)

Key Statistics	HFR EMN Index *(Fundamental)*	HFR EMN Index *(Statistical Arbitrage)*	S&P 500 Index	Lehman Aggregate Bond Index
Annualized Compound Return	9.1%	8.6%	10.5%	7.4%
Annualized Standard Deviation	3.1%	3.9%	14.4%	3.9%
Maximum Drawdown	-2.7%	-5.4%	-44.7%	-5.1%
1-month Maximum Gain	3.6%	4.5%	11.4%	3.9%
1-month Maximum Loss	-1.7%	-2.7%	-14.5%	-3.4%
Annualized Sharpe Ratio	**1.5**	**1.1**	0.5	0.8
Omega Ratio at 0.4% Monthly Threshold	**2.9**	**2.0**	1.4	1.6

Source: Hedge Fund Research Inc. (HFRI); Note that all hedge fund returns are net of all fees.
Note: Sharpe Ratio uses the 91-day U.S. T-bill rate for the period.

[7] In certain situations, currency risk can be minimized. For example, if an equity market-neutral portfolio is in C$, and the manager buys and sells U.S. stocks, the short sale proceeds in US$ will generally finance the purchase of the long positions in US$, so currency risk may be minimal. Some US$ may be needed for margin, but C$ collateral could be posted. The only currency risk in this situation would be the portfolio's profit/loss.

[8] Refer to *An Approach to the Non-normal Behavior of Hedge Fund Indices using Johnson Distributions*, Pedro Perez (September 2004) presented to Finance Department, ESSEC in Paris and submitted for publication.

What is a Practical Example of Equity Market-Neutral?

Table 2: Example of Equity Market-neutral Trade (No Leverage Used)

Background to the Trade: The trade involves a long position of $1,000,000 in Mining Co. A with a beta of 1.2, and a short position of $1,200,000 in Mining Co. B with a beta of 1, assuming $1,000,000 of capital. Both Mining Co. A's and B's dividend yield is 1%. The trade is designed to be "beta-neutral." The manager holds the positions for 1 year, where Mining Co. A's stock rises by 30% resulting in a gain of $300,000, and Mining Co. B's stock rises by 12.5% resulting in a loss of $150,000. It is assumed that margin costs are 3% p.a.

I. Determining Total Return				
Return Source	**Cost Base**	**Exit Proceeds**	**Return ($)**	**Assumptions/Notes**
Long Position: Mining Co. A	$1,000,000	$1,300,000	$300,000	50,000 shares purchased @ $20/sh.; Beta = 1.2
Short Position: Mining Co. B	($1,200,000)	($1,350,000)	($150,000)	80,000 shares shorted @ $15/sh.; Beta = 1
Dividend Income (on Long Position)			$10,000	Dividend yield of 1% on Mining Co. A
Interest Earned on Cash			$0	No excess cash
Short Rebate (on Short Position)			$18,000	Rate of 1.5% earned on short proceeds of $1,200,000
Cost of Borrowing Shares			($3,600)	Rate of 0.3% paid on initial stock loan, with a borrow value of $1,200,000
Dividend Payment (on Short Position)			($12,000)	Dividend yield of 1% on Mining Co. B
Margin Costs (on Short Position)			($10,800)	$1,000,000 Capital; Long Cost = ($1,000,000); Short Cost = Margin of $360,000 @3%, which is calculated as follows: = ($1,560,000)[9] + $1,200,000 proceeds = ($360,000); Net margin used = ($1,000,000) + ($360,000) + $1,000,000 in capital = ($360,000) in margin @ 3% rate
				Note on Leverage: No leverage has been employed in this trade.
Total Return			**$151,600**	
% Return			**15.2%**	$151,600/Initial capital of $1,000,000

[9] $1,200,000 X 130% short margin = $1,560,000

II. Assessing Net Exposure			
Details	**At Trade Inception**	**At Trade Exit**	**Notes**
Long Exposure	100.00%	130.0%	**Note on Beta-adjusted Net Exposure:**[10]
Short Exposure	-120.00%	-135.00%	▪ **Trade Inception:** (Long exposure of 100% X beta of 1.2) + (short exposure of 120.00% X beta of 1) = (120% - 120%) = **0%**
Net Exposure	**-20.00%**	**-5.00%**	▪ **Trade Exit:** (Long exposure of 130% X beta of 1.2) + (short exposure of 135% X beta of 1) = (156% - 135%) = **21%**
Gross Exposure	**220.00%**	**265.00%**	
Beta-adjusted Net Exposure	**0%**	**21%**	

III. Analyzing Return Sources	
Return Source	**Contribution**
Long Position: Mining Co. A	30.0%
Short Position: Mining Co. B	-15.0%
Dividend Income (on Long)	1.0%
Interest Earned on Cash	0.0%
Short Rebate	1.8%
Cost of Borrowing Shares	-0.3%
Dividend Payment (on Short)	-1.2%
Margin Costs (on Short)	-1.1%
Total Return	**15.2%**

Conclusion

Equity market-neutral managers recognize that the markets are dynamic and take advantage of sophisticated mathematical techniques to explore new opportunities and improve their methodology. The fact that there are many different investment universes globally makes this strategy less susceptible to alpha decay. The abundance of data lends itself well to rigorous back testing and the development of new algorithms. While advanced techniques may be used to generate an "edge," the underlying strategy typically focuses on fundamental factors associated with stock picking. Also, the liquidity of the underlying stocks, the valuation of the portfolio and the transparency of the strategy, are all strengths of an equity market-neutral strategy.

Written by Chris Guthrie, CFA, President, Hillsdale Investment Management Inc.[11]

[10] An equity market-neutral manager would adjust the net exposure of the trade on an ongoing basis to ensure that it remains beta-neutral. In fact, the process of rebalancing the entire portfolio to ensure neutrality of all factors, is critical to the success of an equity market-neutral strategy.

[11] Reviewed by Jeremy Evnine, Evnine & Associates, Inc. and Jeffrey L. Skelton, Symphony Asset Management.

Glossary of Key Terms

Efficient Market Hypothesis (EMH): The theory that all information is already accounted for in stock prices, making it impossible to beat the market.

Gross Market Exposure: Long exposure + (absolute value of) short exposure. Therefore, a typical equity market-neutral portfolio with $1 long + $1 short has gross market exposure of 200%, but net market exposure of zero. This portfolio is not deemed to use any leverage.

London Inter-Bank Offered Rate (LIBOR): The interest rate that the banks charge each other for loans in global capital markets (i.e., Eurodollar rates). This rate applies to the short-term international inter-bank market for large loans and is a benchmark for other short-term rates.

Kurtosis: A measures of the peakedness/flatness of the probability distribution. A normal distribution has a kurtosis of 3.0, which is often rescaled to 0.0 when it is known as "excess kurtosis." A kurtotic distribution has more observations clustered around the centre and tails, relative to a normal distribution. A high kurtosis distribution has more weight in the tails and less in the centre, and a low kurtosis distribution is the opposite. High kurtosis means that more of the variance is due to infrequent extreme deviations, as opposed to frequent modestly-sized deviations.

Omega Ratio: A ranking function based on the return distribution of an asset. It is calculated at a threshold and considers all of the moments of a distribution including skew and kurtosis. Most important, it distinguishes between upside and downside volatility. The Omega Ratio is a relative measure of the likelihood of achieving a given return (e.g., a minimum acceptable return [MAR]). The higher the Omega value, the greater the probability that a given return will be met or exceeded.

Sharpe Ratio: A ratio based on the first two moments of the return distribution (i.e., the mean and the variance), calculated as the ratio of the mean return minus the risk-free rate (excess return) to the standard deviation. The higher the Sharpe Ratio, the more favourable the risk/reward trade-off.

Short (Interest) Rebate: A portion of the interest in a T-bill account earned by a hedge fund from shorting a security. When selling a stock short, a hedge fund borrows the stock from a prime broker (who borrows it from an existing shareholder) and the short sale's proceeds are typically held in a T-bill account with the prime broker as collateral. Much of the T-bill interest is then rebated to the hedge fund. (Note: The hedge fund must pay dividends to the original shareholder.)

Short Selling Stock: Borrowing shares to sell in the open market with the goal of buying these shares back at lower prices in the future, and at that time, returning the shares to the lender.

Skewness: A measure of the asymmetry of the probability distribution. A distribution or data set is symmetric if the left and right side of the distribution at the mean are mirror images, and the distribution therefore has a skew measure of 0.0. A distribution has positive skew (right-skewed) if there are more observations on the right side than the left side, and negative skew (left-skewed) if the opposite is true.

Technical Analysis: A method of forecasting security prices and market direction by examining patterns of variables such as trading volume, price changes, rates of change, and changes in trading volume, without regard to underlying fundamental market factors.

Uptick Rule: A rule established by the securities commissions that selling a stock short can only be done on an uptick, that is, when the most recent movement in the stock's price has been an increase. In the U.S., a short sale can also be done on a "zero-plus tick" (i.e., at the same price as the previous board-lot price, but at a higher price than the last different price; also called a zero uptick). However, in Canada, short sales are also allowed based on a "flat-tick rule," where the price is not below the previous board-lot price. Hence, a short sale can also be done at any price other than a down tick (i.e., at an "up tick", a "zero-plus tick" and at a "zero-minus tick").

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Notes to Strategy Paper Series:

- **Educational Materials:** This document is designed solely for information and educational purposes. The examples used have generally been simplified in order to convey the key concepts of the hedge fund trading strategy.

- **Hedge Fund Strategy Performance Data:** The statistical data on the hedge fund strategy presented in this paper is both *end-date* sensitive and *period* sensitive. We have used the period and end date in this paper, as it reflects the overall performance of the hedge fund strategy for the longest period to date (at the time of writing), based on available data from Hedge Fund Research Inc. (HFRI). Different periods and end dates may result in different conclusions.

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