If investors have learned anything from the markets in recent years, it is that unexpected threats and volatility can quickly erase their hard-won equity gains.

Other than hiding out in cash, there is no easy way for investors to protect their portfolios from every conceivable danger. As a result, some investors are moving to managers who, through the use of shorting and options, are able to reduce portfolio risk without sacrificing significant equity exposure.

This paper provides a broad overview of these equity hedging strategies and insight on what to consider when evaluating different types of equity hedges, as well as an examination of the roles these strategies can play in asset allocation and investor portfolios.

Too much beta, or not enough?

Since the market lows of March 2009, the S&P 500 Index has gained 173% through December 31, 2013. During that time, investors have experienced some of the sharpest swings in global equity market history. Although volatility and correlations among
The hedging edge: How much beta do you want?

stocks have recently declined—providing a boon to fundamental stock picking—many investors, recalling the pain of the last downturn, are still sitting in cash and are only slowly increasing their equity allocations.

Other investors, however, are looking to decrease their equity exposure. With the equity markets’ gains in 2013 and the rise in interest rates, the funded status of pension plans of U.S. public companies has improved, prompting many corporations to consider de-risking strategies.

Regardless of whether investors have too much, or too little, exposure to equities, equity hedging strategies can make sense as part of a long-term strategic asset allocation. Because these approaches can systematically shelter portfolios from volatility, they can serve as a liquid alternative to hedge funds or as a fixed income substitute for investors who are looking to de-risk their portfolios. They also offer investors another way to ease back into equities, with fewer bumps along the way.

Exhibit 1 provides an example of one type of equity hedging strategy that uses both put and call options as a low-cost way to protect stocks. The strategy, broadly known as hedged equity or options overlay, outperformed more tactical hedge fund managers, many of whom reduced their net equity market exposure in 2008 and 2009 and, as a result, missed out on the S&P 500 Index’s subsequent rebound. Simply by staying invested and not trying to time the markets, investors in the options overlay strategy would have reaped a nearly 80% gain since the market bottomed in 2009.

The growing use of options by asset managers

While options may be viewed by some as a speculative investment, more asset managers are employing hedging and option strategies to dampen volatility and enhance risk-adjusted returns. Asset managers are estimated to account for about 16% of trading in U.S. listed options in 2013, up from 5% in 2007 (Exhibit 2).

Asset managers’ use of options has tripled since 2007

Equity approaches that employ hedging techniques have been predominantly available to institutional and high-net-worth investors through hedge funds, separate accounts, limited partnerships and structured notes. Meanwhile, assets in mutual funds that use similar hedging strategies have climbed in recent years amid investors’ desire for yield and safety. Assets in long/short mutual funds (the broader category that includes equity strategies that employ hedging) have climbed to about $48 billion as of October 2013, up from nearly $2 billion at the end of 2000.2

1 In contrast to the previous five years, each of which had been worse than the last, the aggregate funded status of the Russell 3000 improved by more than 17% to 94% from year-end 2012 through November 2013. It is expected to rise to 96% by the end of December 2013, according to J.P. Morgan’s Pension Pulse, Fall/Winter 2013.

2 Morningstar, Inc.; data as of November 2013.
Exploring the spectrum of equity hedging strategies

EXHIBIT 3: CHARACTERISTICS OF EQUITY STRATEGIES ALONG THE BETA CONTINUUM

<table>
<thead>
<tr>
<th>Strategic approach</th>
<th>130/30</th>
<th>Long only</th>
<th>Tactical beta</th>
<th>Covered calls/ buy-write</th>
<th>Long/ short</th>
<th>Hedged equity/ options overlay</th>
<th>Market neutral</th>
<th>Tail risk/ negative correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark</td>
<td>Equity index</td>
<td>Equity index</td>
<td>Equity index</td>
<td>Equity index</td>
<td>Equity index</td>
<td>Equity index</td>
<td>Cash</td>
<td>Cash</td>
</tr>
<tr>
<td>Objective</td>
<td>Provide above-market returns (beta plus alpha)</td>
<td>Provide full exposure to market (beta)</td>
<td>Use active management to adjust the beta exposure as the market changes</td>
<td>Generate income or partial cushion against losses, or both</td>
<td>Provide attractive risk-adjusted returns by creating alpha on long and short positions</td>
<td>Provide downside protection by applying an options-based hedging strategy</td>
<td>Neutralize equity beta exposure and deliver total returns solely from stock selection alpha</td>
<td></td>
</tr>
<tr>
<td>Risk profile</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Advantages</td>
<td>Can generate above-market returns with greater exposure to best ideas</td>
<td>Offers full participation to alpha and beta</td>
<td>Offers the greatest flexibility in market exposure</td>
<td>Provides potential premium income and dampens volatility</td>
<td>May offer some downside protection by reducing overall market exposure</td>
<td>May provide systematic downside protection by using options to protect capital, while providing long exposure through underlying equities</td>
<td>Can provide uncorrelated market returns</td>
<td>May provide short-term hedges against sharp market declines</td>
</tr>
<tr>
<td>Limitations</td>
<td>May introduce incremental idiosyncratic risk into the portfolio</td>
<td>Only benefits when stock prices rise</td>
<td>Returns may be less predictable than other equity strategies</td>
<td>Tends to underperform in sharply rising markets</td>
<td>Does not fully participate in up markets; may also introduce incremental idiosyncratic risk into the portfolio</td>
<td>Forgoes some upside participation in return for downside protection</td>
<td>Can be difficult for managers to maintain beta of zero; limited upside in bull markets, May introduce incremental idiosyncratic risk into the portfolio</td>
<td>Can be less reliable as a hedge if correlations break down; can be expensive</td>
</tr>
</tbody>
</table>

| Beta exposure | 1.0 | 1.0 | Flexible, 0.0 to 1.0 | Flexible, 0.6 to 0.9 | Flexible, 0.3 to 0.7 | Flexible, averages 0.5 | 0.0 | -1.0 |

Source: J.P. Morgan; data as of December 31, 2013.

Exploring the equity hedging spectrum

Seeking to improve on their lackluster returns in recent years, some investors have turned to equity hedging strategies that have more flexibility and less risk than traditional long-only portfolios. Exhibit 3 compares equity strategies along a continuum of their beta exposure. In the following section, we explore some of these hedging strategies, starting with those that have a one-for-one beta exposure.

130/30

Among equity hedging approaches, 130/30 strategies are a way for investors to seek greater flexibility, diversification and return potential in their equity holdings. These professionally managed strategies typically short 30% of assets and use the proceeds to increase long positions to 130% of portfolio value. The advantage is that it frees skilled managers from long-only constraints to enable them to add portfolio value.

A 130/30 approach is also known as an “equity extension” strategy because it extends long portfolios to include more of a manager’s strongest investment ideas. Shorting 30% of assets generates cash to increase long positions to 130%, which means that for every $100,000 invested, $130,000 goes toward stocks considered to be most attractive (Exhibit 4). This additional long exposure is generally offset by an equal amount of shorting in unattractive securities that have the potential to underperform.

An expanding opportunity

EXHIBIT 4: AN EXAMPLE OF 130/30 EQUITY EXTENSION

Source: J.P. Morgan. Diagram is for illustrative purposes only.
The result is that the manager is able to give fuller expression to his or her strongest views on stocks, both positive and negative. Investors can receive a broadly diversified portfolio of stocks representing more research insights and greater exposure to market opportunities. While these strategies have specific limits on how much can be shorted, managers may short less based on current market conditions and future outlooks.

- **Pros:** A 130/30 approach may offer higher return potential in up and down markets.
- **Cons:** Since outperformance comes from stock selection, the strategy does not offer significant downside protection in a bear market.

When it makes sense: A 130/30 strategy may make sense for investors seeking to achieve more attractive relative returns, or to outperform the benchmark in up and down markets.

**Tactical beta**

In tactical beta approaches, managers use derivatives to tactically raise or reduce equity market exposure. One consideration for this approach is that it offers the greatest flexibility in market exposures. Some strategies, for example, can have net exposure over 100%. While these strategies seek to benefit from price gains on stocks, they also seek to protect capital during volatile periods by using hedging strategies to vary the exposure to general market fluctuations.

Managers look at various factors—valuation, market action and other measures—to decide how much to vary the market exposure. Specific strategies to increase stock market exposure may include buying call options on individual stocks or market indices and writing put options on stocks that the investor seeks to own. Specific strategies to reduce (or hedge) market exposure may include buying put options on individual stocks or stock indices or writing covered call options on stocks that the fund owns.

Because the strategy’s exposure to market fluctuations will vary depending on the manager’s assessment of current stock market conditions, the investment returns may fluctuate or deviate from the overall market returns to a greater degree than other funds that do not employ this strategy. Losses can be greater than expected if, for example, the strategy has put a high degree of leverage in place and stock prices decline. Conversely, if the manager has hedged a portion of the portfolio and stock prices advance, then the strategy won’t make as much money as long-only strategies. But tactical beta also depends on finding managers who can generate alpha in all market environments. During the trough of the financial crisis, for example, many tactically oriented hedge funds sharply reduced their equity market exposure and, as a result, missed out on the market’s subsequent rebound.

- **Pros:** Managers have the greatest flexibility to raise or reduce market exposure.
- **Cons:** Returns can be less predictable and more volatile than other equity hedging strategies.

When it makes sense: In highly volatile markets, tactical beta may provide a source of alpha.

**Covered calls/buy-write**

In a covered call (sometimes known as a buy-write strategy), managers sell call options on stocks held in a portfolio. The manager of the strategy sells options to generate cash, thereby guaranteeing a modest return from them. (The option buyers get the right to “call away” the underlying shares if they hit or exceed agree-upon prices.) In sum, the investor is essentially selling to other investors the right to buy these stocks at a certain price. The profit/loss profile of the strategy can be seen in *Exhibit 5*, which is an illustration of the option and stock strategy’s profit and loss at expiration, respective to the stock value when the call is sold. The advantage of this strategy is that the option premium received from selling the options can help reduce portfolio volatility and enhance income.

**Selling options to enhance income**

*Exhibit 5: Covered Calls*

![Exhibit 5: Covered Calls Diagram](source)

Break-even point: stock price at expiration

Break-even point: stock price at expiration

Profit = Strike price - Premium

Loss = Premium

Source: J.P. Morgan. Diagram is for illustrative purposes only.

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1. If the underlying asset’s price falls below the strike price of the option at expiration, the manager keeps the money he or she received for selling the option. If the underlying asset’s price is above the strike price of the option, the asset is called away, and the manager is paid the strike price.
The trade-off, however, is that the strategy limits the possibility of big gains. Investors are also still exposed to the downside risk from owning the underlying stock, which may potentially lose its value. The approach typically outperforms equities in bear markets, as the option premium helps to offset losses, and underperforms in sharply rising markets. Depending on the calls’ strike prices, covered calls may also outperform when markets rise more modestly, as the premium income enhances less-than-strike-price gains.

Though the covered call or buy-write strategy can be used in any market condition, it is most often employed when the manager, while bullish on the underlying stock, feels that the stock’s market value will experience little range over the lifetime of the call contract. The manager seeks to generate additional income (over dividends) from shares of the underlying stock, and/or provide a limited amount of protection against a decline in the underlying stock value.

- **Pros:** Covered call or buy-write approaches can help generate income and reduce portfolio volatility.
- **Cons:** Investors may miss out on big market gains and may still lose money from losses on the underlying stock.

When it makes sense: The strategy may make sense for conservative investors seeking income-oriented strategies or for investors looking for added returns in a sideways market.

### Long/Short

In long/short equity strategies, managers have the ability to buy (go long) securities they expect to outperform the stocks within their sector and sell (go short) borrowed securities they expect to underperform. The net long exposure may help capture a portion of the positive stock performance when the market is moving higher, while the portfolio short position helps lower market risk and offer protection during difficult equity periods. Total return, therefore, is a combination of the return from market exposure (beta), plus any added value from stock-picking or market-timing (alpha).

Long/short equity strategies use short positions to offset much, but not all, of their long holdings to reduce exposure to market risk. In rising markets, long/short equity strategies are typically expected to deliver slightly less upside potential than long-only portfolios, but are likely to outperform long-only portfolios in difficult markets (Exhibit 6). The goal is to limit losses and protect assets during declining markets, while still capturing much of the market’s upside potential.

Some managers rely on fundamental bottom-up research to make long and short directional bets. When a portfolio uses short positions to hedge its long exposure, stock selection can become a greater factor behind performance. Although hedging market exposure completely would enable investors to focus on the gains available from individual investment decisions (alpha), long/short can be a more practical form of active management. Success depends on selecting long positions that are likely to appreciate more rapidly in rising markets and short positions that are likely to increase less than the long positions. As a result, long/short equity managers rely heavily on an intensive research effort to gather insights into stocks and generate sound investment ideas.
The hedging edge: How much beta do you want?

**Pros:** Long/short equity strategies seek to produce higher risk-adjusted returns with lower volatility when compared with long-only equity strategies. Managers can adjust to changing market conditions by varying their short exposures within an approved range.

**Cons:** In rising markets, long/short equity strategies may deliver less upside than long-only portfolios.

When it makes sense: In difficult markets, long/short equity strategies may offer higher risk-adjusted returns than long-only portfolios.

**Hedged equity/options overlay**

Unlike the process used with shorting securities, hedged equity strategies (sometimes known as options overlay strategies) reduce risk by trading put and call options around an underlying stock index. In some cases, the manager may implement an equity collar by buying put options to protect an underlying equity portfolio and offsetting the cost of the put by selling call options. (For more information on options, see our recently published “Options 101: The Building Blocks” and the related interactive presentation.)

Applying an options-based hedging strategy to an existing portfolio has several benefits:

- Provides consistent downside protection, especially during large, negative market moves.

- Provides a range of investment outcomes that is more defined and predictable than other long/short strategies because the limits are set by the exercise prices of the put and call options.

- Reduces investors’ exposure to the idiosyncratic or takeover risks that can come from shorting securities, since the option positions serve as the hedging component to reduce the portfolio’s exposure to beta.

- Provides a more cost-effective way to hedge an equity portfolio than shorting borrowed securities. With an options overlay strategy, the costs of buying put options on the underlying equities to provide downside protection are offset by income from the sale of call options.

When properly implemented, these strategies are designed to produce higher risk-adjusted returns than long-only equity strategies, while minimizing the impact of market disruptions or downturns. Some hedged equity strategies may also provide investors with full exposure to alpha from an underlying actively managed equity index strategy, as well as dividends. In return for providing significant downside protection, investors forego some upside potential. If stocks go up, investors still participate in some of the market’s gains. If stocks are flat or move sideways, the underlying portfolio construction, depending on the approach, can still generate positive equity returns. Many option-based strategies take a disciplined approach to employing and actively managing their put and call options, which can provide investors with a more predictable range of investment outcomes in their overall portfolio.

One key advantage of the strategy is that it protects capital during market troughs so investors have less ground to make up. This relationship becomes more pronounced with larger losses because the gain required to get back to even increases at a faster rate (Exhibit 7). A 40% portfolio loss, for example, will require a 67% gain to get back to breakeven. And by minimizing the impact of market volatility, the strategy helps investors stay invested, allowing their assets to grow over the long term. That’s important because the stock market, on average, goes up. Since 1928, the S&P 500 has gone up in about two-thirds of the quarters during that period, according

**A beneficial payoff of reduced downside exposure**

**EXHIBIT 7: PERCENTAGE GAINS REQUIRED TO OFFSET LOSSES**

<table>
<thead>
<tr>
<th>Percentage loss (%)</th>
<th>Percentage gain to get back to even (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10</td>
<td>11</td>
</tr>
<tr>
<td>-20</td>
<td>25</td>
</tr>
<tr>
<td>-30</td>
<td>43</td>
</tr>
<tr>
<td>-40</td>
<td>67</td>
</tr>
<tr>
<td>-50</td>
<td>100</td>
</tr>
<tr>
<td>-60</td>
<td>150</td>
</tr>
<tr>
<td>-70</td>
<td>233</td>
</tr>
</tbody>
</table>

Source: J.P. Morgan. Diagram is for illustrative purposes only.

---

4 Buying put options gives the buyer the right to sell the underlying security at a stated exercise price, providing the investor with known downside protection. To offset the cost of the put, a call option is sold. With the call option, the investor must sell the underlying shares at a predetermined price. Therefore, the equity collar refers to the stated range set by the put and call in which the return on the underlying stock can move.
to J.P. Morgan analysis. The problem, however, is that in the periods when the market is down, the market goes down more than it goes up. Having consistent protection in place during those periods can help investors recoup their losses more quickly. This can be especially relevant for people close to or in retirement, as they may not have a lot of time to recover from big losses.

- **Pros:** Hedged equity or options overlay strategies can provide higher risk-adjusted returns over broad-based equity indices. The strategies provide long exposure through underlying equities and use options to protect capital during volatile markets.
- **Cons:** In return for providing significant downside protection, investors may forego some returns in rising markets.

**When it makes sense:** Hedged equity or options overlay strategies can be appropriate for investors looking to de-risk, re-risk or minimize volatility in portfolios.

**Market neutral**

Market neutral strategies and other absolute return investments pursue positive returns no matter what happens to the economy, interest rates or financial markets. This approach to capturing non-correlated performance has the potential to increase returns, reduce risk and expand diversification when added to a portfolio of traditional assets. Professionally managed market neutral portfolios implement short and long positions in an effort to eliminate market risk exposure. This can produce positive returns independent of the broad market if the portfolio’s long positions outperform its short positions. For example, returns would be positive in rising markets if longs rise more than shorts. In declining markets, returns would be positive if longs fall less than shorts (Exhibit 8). In a market neutral strategy, the manager needs to maintain zero beta exposure to the overall market to avoid introducing any added risk or volatility into the portfolio.

One of the most common market neutral strategies involves investing equal dollars in long (buy) and short (sell) positions. In a typical market neutral portfolio, the goal is for total returns to exceed prevailing money market rates by anywhere from 2% to 5%. Compared with long-only stock investing, these strategies have the potential to generate relatively attractive returns with significantly less volatility, since they can benefit from both rising and declining stock positions. In general, returns from market neutral strategies are based on the actively managed long and short positions, as well as the cash positions.

- **Pros:** Market neutral approaches seek to reduce overall portfolio risk and enhance return potential by neutralizing exposure to broad market movements, or beta.
- **Cons:** Such strategies are almost completely dependent on the manager’s skill in neutralizing market movements.

**When it makes sense:** The strategies can be appropriate when investors are unsure where to invest, when they have reduced risk tolerance or when they want to lower overall portfolio risk by adding non-correlated assets.

**Positive return potential in any market environment**

**EXHIBIT 8: POSITIVE RETURNS WHEN LONGS OUTPERFORM SHORTS (HYPOTHETICAL $100 INVESTMENT IN VARIOUS MARKETS)**

<table>
<thead>
<tr>
<th>Market Type</th>
<th>Longs</th>
<th>Shorts</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rising</strong></td>
<td>$15</td>
<td>$10</td>
<td>$5</td>
</tr>
<tr>
<td><strong>Declining</strong></td>
<td>Longs $18</td>
<td>Shorts $25</td>
<td>Profit $7</td>
</tr>
<tr>
<td><strong>Flat</strong></td>
<td>Longs $3</td>
<td>Shorts $2</td>
<td>Profit $5</td>
</tr>
</tbody>
</table>

Source: J.P. Morgan. Diagram is for illustrative purposes only.

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**Tail risk/negative correlation**

On occasion, market shocks can occur that are so extreme and unexpected that they trigger widespread declines in portfolios. Hedging the “tails”—which refer to the end portions of distribution curves (the bell-shaped diagrams that show statistical probabilities for a variety of outcomes)—can help investors protect portfolios against outsized losses.

There are a number of ways investors can employ tail risk hedging. One is to limit the risk in one’s asset allocation by weighting portfolios to less volatile sectors. Another method is to complement one’s asset allocation with option strategies or strategies that introduce asymmetric return patterns. The most explicit and predictable method of hedging against tail risk has been the purchase of put options on indices such as the S&P 500, which can work effectively as an insurance contract against any dramatic event. Another way to hedge equity exposure is to invest in strategies or securities that are negatively correlated with equities. One such strategy attempts to leverage the negative correlation between the CBOE’s VIX Index and the S&P 500 Index (Exhibit 9). Since the VIX tends to spike when equities sell off and fall when equity markets rally, in theory, buying VIX call options can offset losses in an equity portfolio. Since investors cannot invest in the VIX itself, these strategies invest in derivatives (futures or options) linked to the VIX.

There are some caveats, however. Historical correlations can break down, making the hedge less reliable. While the S&P 500 and the VIX usually swing in opposite directions about 80% of the time, the VIX moved in the same direction as the S&P 500 for four straight days in late April 2013, the longest stretch of lockstep moves since February 2007. In addition, it can be difficult to make long-term gains when betting on volatility, making these investments more appropriate for short-term traders.

Long exposures to VIX futures and VIX-related products also tend to be costly and pose a drag on total returns. As a result, managers need to have impeccable market timing in order for the strategy to pay off. When markets are behaving normally, the strategy can miss out on a rising stock market. Or, if markets hold steady or rise for long periods, the cost of buying new options to replace old ones can add up and eat into returns. In general, the market will have to move up or down sharply in order to register enough of a move for investors to get paid.

- **Pros:** These strategies can provide short-term hedges against sharp declines in the stock market.
- **Cons:** Such strategies can also be expensive for long-term investors; the hedge tends to be less reliable when correlations break down.

When it makes sense: These strategies may make sense when there are sharp swings in volatility.

**Portfolio construction considerations**

Depending on investors’ objectives, equity strategies that use hedging techniques can be incorporated into portfolios in many ways. After the market gains in recent years, for example, many corporate pensions are looking to “de-risk” after an improvement in their plans’ funding status. These investors could move money out of traditional equities and into hedging strategies to limit potential drawdowns. Other investors, still scarred by recent market events and the

---

6 The VIX tracks the prices investors pay for options to protect themselves against swings in the S&P 500. An increase in those prices suggests an increase in investor anxiety and is also used as a short-term predictor of investor behavior.


8 In the VIX futures market, one factor that makes the trades costly, eating into returns, is a condition known as “contango,” a situation in which contracts farther along the futures curve are more expensive than the front-month contracts. Since many volatility-linked ETFs and ETNs must roll from month to month in order to get new contracts and avoid “delivery,” many VIX investors face a loss every roll period that the product is in contango.
global financial crisis, may be looking to ease back into the stock market. These investors could potentially move into lower volatility strategies by funding equity hedging positions out of other asset classes, such as fixed income. As a result, investors can gain greater equity exposure while maintaining a similar risk profile. Finally, investors looking to further diversify their investment lineup and reduce volatility could position equity hedging solutions as a fixed income substitute or as a liquid alternative by funding an allocation from their current fixed income investments. The caveat is that in times of severe market stress, investors may flee to fixed income for short periods as a defensive investment.

Is traditional asset allocation enough?

Traditional portfolio construction techniques have long emphasized the role of asset allocation to determine optimal risk/return profiles. When constructing a portfolio, investors aim to include asset classes that have a low correlation to one another, thereby enhancing diversification and reducing volatility. Exhibit 10 shows the correlations between select asset classes from 1995 to 2013. The idea is to combine investments that don’t move up or down at the same time, or at least by the same degree. Doing so can smooth out returns, hedge portfolios against big losses on single investments and position investors to benefit if one corner of the market posts outsize gains.

Combining investments that don’t move in line with each other

**EXHIBIT 10: CORRELATIONS BETWEEN SELECT ASSET CLASSES FROM MAY 1995 TO SEPTEMBER 2013**

<table>
<thead>
<tr>
<th></th>
<th>Currency</th>
<th>Commodity</th>
<th>U.S. HY</th>
<th>Equity</th>
<th>U.S. IG</th>
<th>U.S. Treasury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currency</td>
<td>1.00</td>
<td>0.27</td>
<td>0.12</td>
<td>0.29</td>
<td>0.12</td>
<td>0.08</td>
</tr>
<tr>
<td>Commodity</td>
<td>1.00</td>
<td>0.22</td>
<td>0.31</td>
<td>-0.03</td>
<td>-0.15</td>
<td>-0.15</td>
</tr>
<tr>
<td>U.S. High Yield</td>
<td>1.00</td>
<td>0.51</td>
<td>0.39</td>
<td>-0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity</td>
<td>1.00</td>
<td>0.01</td>
<td>-0.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. InvestmentGrade Debt</td>
<td>1.00</td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Treasury</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: J.P. Morgan; data as of December 2013.

Correlation levels can also vary over time, however, depending on the market environment. Exhibit 11 shows the average correlation of equities to select asset classes (currencies, commodities, U.S. high yield, U.S. investment grade debt and U.S. Treasuries), as well as the maximum and minimum levels over the 18-year period.

A wide range of correlations during market crises

**EXHIBIT 11: AVERAGE, MAXIMUM AND MINIMUM LEVELS OF CORRELATIONS BETWEEN EQUITIES AND OTHER ASSET CLASSES**

<table>
<thead>
<tr>
<th></th>
<th>Equity/ Currency</th>
<th>Equity/ Commodity</th>
<th>Equity/ U.S. HY</th>
<th>Equity/ U.S. IG</th>
<th>Equity/ U.S. Treasury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>0.24</td>
<td>0.23</td>
<td>0.50</td>
<td>0.00</td>
<td>-0.17</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.78</td>
<td>0.80</td>
<td>0.78</td>
<td>0.61</td>
<td>0.60</td>
</tr>
<tr>
<td>Minimum</td>
<td>-0.35</td>
<td>-0.32</td>
<td>0.13</td>
<td>-0.44</td>
<td>-0.73</td>
</tr>
</tbody>
</table>

Source: J.P. Morgan; data as of December 31, 2013.

Diversification dilemma: Spreads between correlations vary widely in different regimes

**EXHIBIT 12: CORRELATIONS BETWEEN SELECT ASSET CLASSES FROM MAY 1995 TO SEPTEMBER 2013**

Source: J.P. Morgan; data as of December 2013.
A key assumption behind diversifying across asset classes is that correlations remain constant over any one investment horizon. But depending on the market and volatility regimes, the spreads can vary widely. Exhibit 12 (previous page) highlights the correlation levels across different periods of extreme market stress or euphoria, such as the Asian financial crisis (mid-1990s), the Internet bubble (late 1990s to early 2000s) and the recent Great Recession (2007 to 2008). The point is that correlations are dynamic and can rise or fall, raising concerns about relying solely on diversification across asset classes and highlighting the need to consider other hedges to further reduce risk. Diversifying within the same asset class through the use of equity hedges, for example, can reduce investors’ dependence on correlation levels and dampen volatility in a more systematic, controlled and cost-effective manner, resulting in returns that are slightly more certain and predictable than returns from traditional asset allocation.

Evaluating equity hedging strategies

The requirements for success in this strategy start with an effective stock valuation and an investment process run by a capable and experienced manager. The complexities of managing the positions demand greater skills, however. Integrated and experienced operational resources, an established relationship with a responsive and well-networked trading desk and robust infrastructure are also essential components of managing complex hedging strategies.

Experience in actively managing equity and equity derivatives

Since shorting stocks and managing options have unique risks, it is important to invest with an experienced firm that has a track record with liquid alternative strategies. In many cases, managing an equity option strategy requires an active, disciplined investment approach that requires the manager to find the optimal balance between buying or selling the option and the costs of doing so.

Stock valuation processes

The guidelines for selecting a manager are basically the same as those used in picking any investment manager. The process of hedging strategies depends more on manager skills, however. Not only must managers have a process that reflects the unique risk profile and intrinsic nature of shorting and options valuation, they also need to demonstrate an ability to incorporate stock views and investment insights into a well-constructed portfolio that combines the efficiency of options trading with the potential for above-market gain inherent in active management. As a result, investors need to have confidence that the manager’s investment process will generate the expected performance.

Operational capabilities

Once investors are satisfied that a manager has the investment skills necessary to successfully run a hedged equity strategy, they still need to assess operational qualifications. Shorting stocks and running options strategies as an integral part of an active investment strategy require a set of unique and robust operational capabilities. Exhibit 13 illustrates a sample portfolio construction process that combines fundamental research and quantitative methods with the oversight of experienced managers.

Assessing manager and platform qualifications

EXHIBIT 13: AN ILLUSTRATION OF A HYPOTHETICAL PORTFOLIO CONSTRUCTION PROCESS

Source: J.P. Morgan. Diagram is for illustrative purposes only.
Conclusion

The experience of the last few years has reminded investors that risk is as much a part of investing as reward. It has also refined the tools that enable investors to take a calculated risk—either acceptable for the returns they seek or tolerable for the returns they can live with. By any measure, publicly traded equities have delivered a greater return than any other asset class over the long run. But as the markets have shown repeatedly, the difficulty for investors lies in the many short runs that make up the long run. Equity hedging strategies, which can include hedged equity or long/short strategies, help investors stay in the market during bouts of volatility. They do this, in part, by capturing gains when the markets are rallying and cushioning the falls when the markets are dropping. Given the variety of approaches to hedging equities, investors need to consider their objectives, risk profile and desired beta exposure when selecting an appropriate strategy. From there, investors will need to assess the manager’s skills and experience in trading derivatives and options, as well as the firm’s research and trading platforms and capabilities.

Appendix

Back-tested performance:
The back-tested calculations are shown for illustrative purposes only and are not meant to be representative of actual results achieved by J.P. Morgan Investment Management Inc. (JPMIM) while investing in the respective strategy over the time periods shown. The back-tested performance was derived from the retroactive application of a model with the benefit of hindsight. JPMIM only began to offer the given strategy after the performance period depicted (in July 2013). The back-tested calculations for the respective strategy are net of fees. Back-tested returns reflect the reinvestment of all dividends. The back-tested period is from January 1, 2003, to June 30, 2013. The back-tested performance results have certain inherent limitations. Unlike an actual performance record, they do not reflect trading, liquidity constraints, fees and other costs. Also, since the trades have not actually been executed, the results may have under- or overcompensated for the impact of certain market factors, such as lack of liquidity. Simulated trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. These back-tested results do not take into consideration the ongoing implementation of the manager’s proprietary investment strategies. No representation is being made that any portfolio will or is likely to achieve profits or losses similar to those shown.

Past performance is not indicative of future results. Returns will fluctuate, and an investment upon redemption may be worth more or less than its original value.
The hedging edge: How much beta do you want?

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