

Loosening the Long-Only Leash

Relaxed Constraint Strategies

Offer a Practical Alternative to Portable Alpha

- Some investors are not yet ready to embrace portable alpha, but want to generate more alpha in their equity portfolios.
- The long-only constraint imposed by many institutional investors creates distortions in portfolio holdings that detract from performance.
- Relaxing the long-only constraint improves portfolio efficiency, so managers can deliver more alpha.
- Relaxed constraint (“130/30”) strategies can be implemented across a range of benchmarks (including small cap and international) and at various degrees of active risk.

Institutional investors seeking additional return have increasingly moved to separate their alpha (active management) and beta (passive market exposure). Many have turned toward hedge funds. Some have incorporated the concept of “portable alpha” into their portfolio design, enabling them to combine unconstrained active management strategies with global market exposures. Portable alpha will undoubtedly play a key role in the future of institutional investing, but it’s not for everyone. These active strategies may not be practical for certain investors, especially those with larger portfolios or cautious oversight boards. Are there other options?

In many cases, investors can enhance expected performance by relaxing their traditional active managers’ constraints. In particular, loosening the long-only constraint enables investors to reap many of the benefits of alpha-beta separation without being forced to radically restructure their entire portfolios. This approach goes by many names: 130/30, 120/20, active extension. We prefer “relaxed constraint” (so far we are the only adopters of this new terminology), a name which better distinguishes the strategy from traditional, long-only active management. Whatever the name, we believe relaxed constraint strategies represent a valuable construct in institutional portfolio management.

Portable Alpha: Opportunities and Limitations

The basic advantage of portable alpha is that it allows investors to seek higher returns by combining pure market risk exposure (e.g. S&P 500 index) and pure active risk exposure (e.g. market-neutral hedge funds). The active risk exposure in portable alpha tends to be unconstrained, and thus investors generally expect a high risk-adjusted return. By contrast, the active exposure of traditional active management is burdened by numerous constraints, including limitations on permissible investments, short sales, leverage, and tracking error versus the benchmark. Traditional management can be seen as a “tie-in” sale that pairs passive market exposure with highly-constrained, and therefore sub-optimal, active management. Portable alpha offers basically the same beta as traditional management but with greater expected alpha – and therefore higher expected returns (see sidebar, “The Magic of Portable Alpha”).

So why haven’t many investors embraced portable alpha? There are a number of reasons. First, portable alpha involves significant re-allocation of investors’ assets. Second, it often involves the use of leverage, derivatives, and hedge funds, all of which require specialized skills and exposures to different kinds of risk. Third, investors must overcome educational hurdles. For example, investors who recognize portable alpha’s advantages may still have to convince their oversight boards that this is a prudent approach.

Finally, implementing portable alpha requires sourcing a substantial number of managers who are expected to deliver pure alpha over the long term. For example, suppose an investor seeks to replace a \$10 billion US equity portfolio with a comparable portable alpha program. The investor might begin with a \$2 billion derivatives-based completion strategy designed to maintain the same US equity market exposure. But the investor must now source \$8 billion in alpha-generating market-neutral strategies, a portfolio as big as some of the largest hedge funds of funds.

The Magic of Portable Alpha

A typical investor pursuing portable alpha would begin by replacing a traditional active manager. As an example, let’s say this traditional manager was running a \$100 million active equity program, benchmarked against the S&P 500, taking 4% active risk (tracking error) and trying to generate 1.6% of active return (alpha) net of fees. The investor might replace this traditional manager with two distinct investments.

The beta program would be a futures overlay strategy that gives the investor the same \$100 million notional exposure to the S&P 500, but uses only \$20 million of capital. The remaining \$80 million could then be invested in a pure alpha program. This might take the form of a portfolio of hedge funds, targeting 5% volatility and a net return of 4%. Relative to the traditional program, this portfolio should yield the same S&P 500 return (minus the incremental cost of implementing the futures program), but with an additional active return of more than 3% instead of 1.6% and at the same tracking error.

Why does this work? The hedge fund manager’s lack of constraints provides a critical advantage: a more efficient use of risk. The hedge fund can potentially take views in any asset class: US stocks, global stocks, global bonds, currencies, you name it. The traditional manager is often confined not just to US stocks, but to those US stocks already in the S&P 500. The hedge fund portfolio can use leverage and short-selling, options not available to the traditional manager. In our example, the hedge fund manager delivers a greater return by using risk more efficiently, realizing a net information ratio (active return/active risk) of 0.8, compared to 0.4 for the traditional manager.¹

Relaxed Constraint: A Practical Alternative

For many investors, therefore, portable alpha is not a realistic option. But as the title of this paper suggests, relaxed constraint strategies often can be. Relaxed constraint strategies offer many of portable alpha’s benefits and far fewer of its practical impediments, particularly for investors who already use traditional active management – which is to say, almost every institutional investor. In seeking to improve their returns from active management (that is, in seeking more alpha), these investors can tap their existing active management strategies without seeking out more exotic alpha sources.

The relaxed constraint approach has numerous potential advantages (see Table 1), but the key advantage is its ease of implementation. Asset allocations generally remain untouched and, since changes to the roster of active managers are minimized, the transition costs are appealingly low. To fully appreciate the advantages of

¹ This example is purely hypothetical in nature. Please see important hypothetical disclosures on the last page.

relaxed constraint strategies, let us first examine the disadvantages of the constraints themselves.

Table 1: Advantages of Relaxed Constraint Strategies vs. Portable Alpha

- Maintenance of existing asset allocation
- Low transition costs
- Minimal manager turnover
- Potentially lower total fees
- Little or no derivatives usage
- Minimal leverage with clear limits

Active Management and the Long-Only Constraint

Fundamentally, active managers add value by overweighting securities they expect to perform well while underweighting those they expect to perform poorly. The information ratio² is often used by institutional investors as a measure of this skill. According to the fundamental law of active management, an active manager's skill can also be calculated by the product of three simple inputs: stock-picking ability, breadth of opportunity, and portfolio-construction skill.³ This third component, portfolio-construction skill, is gauged by the transfer coefficient. The transfer coefficient measures the degree to which the manager's views are reflected in the final portfolio; a higher transfer coefficient means that more of the manager's views have been incorporated. Assuming the manager has skill, a higher transfer coefficient leads to a higher information ratio.

For a manager who considers a range of stocks and distinguishes the most attractive from the least attractive, a long-short portfolio is likely to be the purest expression of that manager's views. As a result, this portfolio will have the highest transfer coefficient.

This is why portable alpha strategies generally include long-short portfolios. It is also why, by comparison, a long-only portfolio will almost always be sub-optimal.

Long-Only Problem #1: Unimplementable Shorts

To illustrate this point, consider a portable alpha portfolio that combines a long-short, market-neutral equity strategy with passive equity market exposure. (This long-short portfolio is an optimal or near-optimal expression of the active manager's views.) Figure 1 shows each of these two component portfolios as well as the sum of the two, the portable alpha portfolio. An investment portfolio created using traditional, long-only active management cannot have the optimal position weights of the portable alpha portfolio. Why? Because the portable alpha weights include net short positions, and a traditional mandate precludes net shorting. These unimplementable shorts are shown in red in Step 3 of Figure 1.

One unimplementable short is the individual security labeled "Stock A." Based on the manager's view (Step 1), the portfolio ideally should have a 1.9% underweight in that stock. However, Stock A actually has a 0.5% weight in the benchmark portfolio (Step 2). The traditional manager's only recourse is not to hold any shares of Stock A in the active portfolio, but this represents just a 0.5% underweight relative to the benchmark. The remaining 1.4% is an unimplementable short. Next, consider the individual security labeled "Stock B." In this case, the manager has a negative view on a stock that is not merely underweighted in the benchmark, but not represented in the benchmark at all. In this case, the *entire* negative view will be unimplementable.

Long-Only Problem #2: Warped Portfolios

The unimplementable shorts also have negative repercussions on the manager's desired overweight positions. Suppose the manager, faced with unimple-

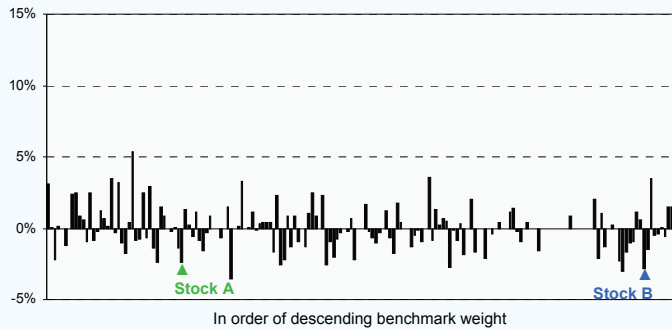
² Information ratio is a measure of portfolio efficiency. It represents the expected alpha of an active portfolio relative to the tracking error (risk) of the portfolio. Portfolios with higher information ratios are expected to deliver more alpha for the same level of risk.

³ Clarke, de Silva and Thorely. "Portfolio Constraints and the Fundamental Law of Active Management," *Financial Analysts Journal*, Sept/Oct 2002, pp. 48-66.

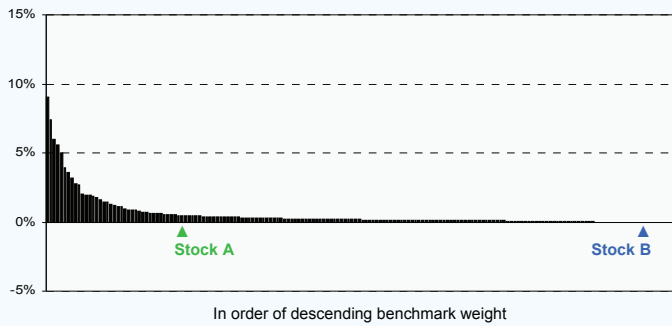
Figure 1: Portable Alpha Portfolios

A simple portable alpha portfolio can be thought of as a long-short portfolio combined with a benchmark portfolio. A long-only portfolio cannot hold the same security mix because of unimplementable shorts (the areas in red).

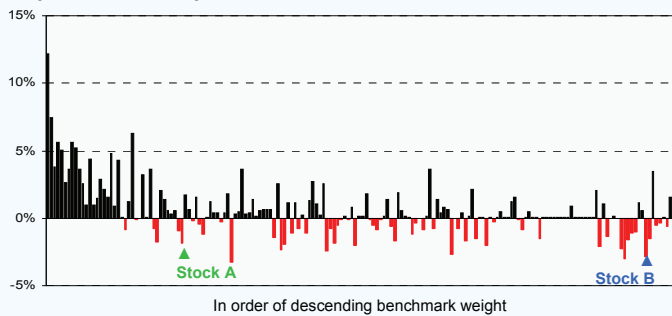
Step 1: Long-Short Portfolio



Step 2: Benchmark Portfolio



Step 3: Portable Alpha Portfolio Combines the 2 Portfolios Above



Benchmark used in this example is the Morgan Stanley Capital International (MSCI) UK® Index. This index was chosen because it contains a relatively small number of individual securities, which makes it simpler to view active weight changes in this exercise. It was not chosen because it is partial in any way to relaxed constraint strategies; that is, we are not data mining here.

mentable shorts, chooses to simply not implement them. Now, the resulting portfolio is no longer evenly balanced between long and short positions (relative to the benchmark), but instead contains disproportionately more overweight positions. The exposure is now significantly greater than 1.0, and the portfolio’s beta is generally much greater than 1.0 as well.

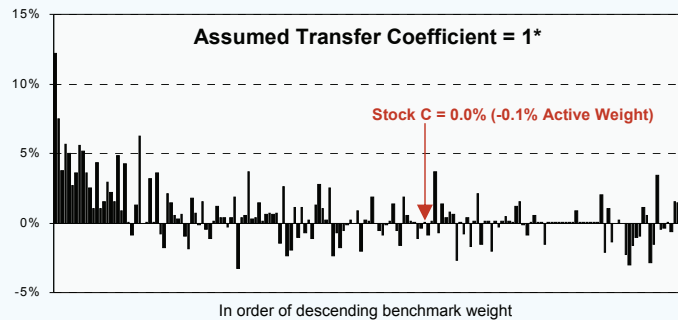
What if the manager seeks to resolve this problem by reducing the long position weights? This approach causes further trouble. Remember that the manager’s overall goal was to create an active portfolio that reflects overweight and underweight views, not one that simply mimics the index. By first reducing the unimplementable shorts and then by reducing some offsetting overweights, the manager has created a portfolio with fewer and smaller views than the original, a portfolio that will almost certainly not realize the intended level of tracking error.

As an alternative to cutting back the magnitude of overweight positions, the manager can decide to maintain some or all of the original overweight positions. To offset these overweights, however, the manager must find new stocks to underweight. The natural candidates will be stocks with larger market capitalizations, where the manager has more flexibility to underweight without going short. Some of these stocks may be negatively viewed, others may be stocks with a neutral view, and still others may be stocks the manager actually likes. In order to construct a balanced portfolio, the overweight and underweight positions will have to be adjusted so that the final portfolio a) has equal overweight and underweight positions relative to the benchmarks; b) includes a sufficient number of the manager’s active views; and c) meets any portfolio construction guidelines (e.g. sector exposure, capitalization weight, etc.) The problem with this approach is that at the end of this process, the resulting portfolio will often look quite different than what the manager had hoped to achieve.

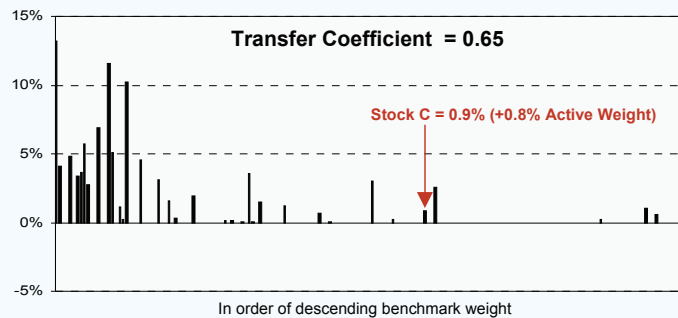
Figure 2: The Impact of the Long-Only Constraint

A portable alpha portfolio contains the best expression of the manager's views. Introducing the long-only constraint moves the portfolio's holdings away from the original portable alpha portfolio. The long-only portfolio (middle chart) has many fewer views and thus more concentrated bets. Simply relaxing the long-only constraint results in a portfolio that is much closer to the original portable alpha portfolio.

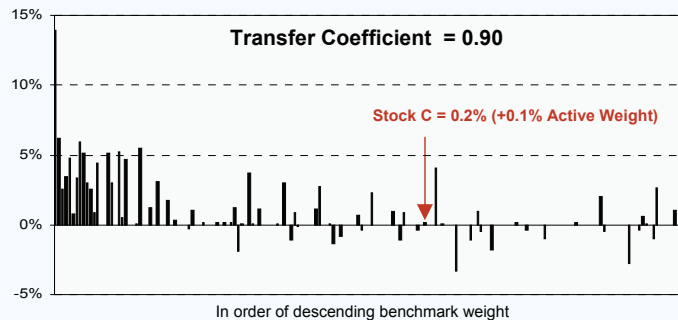
Portable Alpha



Long-Only



Relaxed Constraint



*In practice certain market frictions and risk control measures limit managers from reaching the theoretically optimal transfer coefficient of one. Benchmark used in this example is the Morgan Stanley Capital International (MSCI) UK® Index. This index was chosen because it contains a relatively small number of individual securities, which makes it simpler to view active weight changes in this exercise. It was not chosen because it is partial in any way to relaxed constraint strategies; that is, we are not data mining here.

A Portfolio Only a Mother Could Love

Figure 2 shows how severely the manager's optimal portfolio is compromised by the long-only constraint. Many desired views from the portable alpha portfolio are eliminated in the long-only portfolio (or even reversed!), while others are distorted. The long-only portfolio may also include active views in which the manager doesn't really have conviction (e.g. overweight stocks that would be neutral or underweight in an unconstrained portfolio). For instance, Stock C in Figure 2 represents a security for which the manager has a slightly negative view. While it is an active underweight (-0.1%) in the portable alpha portfolio, it is a large active overweight (+0.8%) in the long-only portfolio. In the relaxed constraint portfolio Stock C's active weight is much closer in line with that of the portable alpha portfolio.

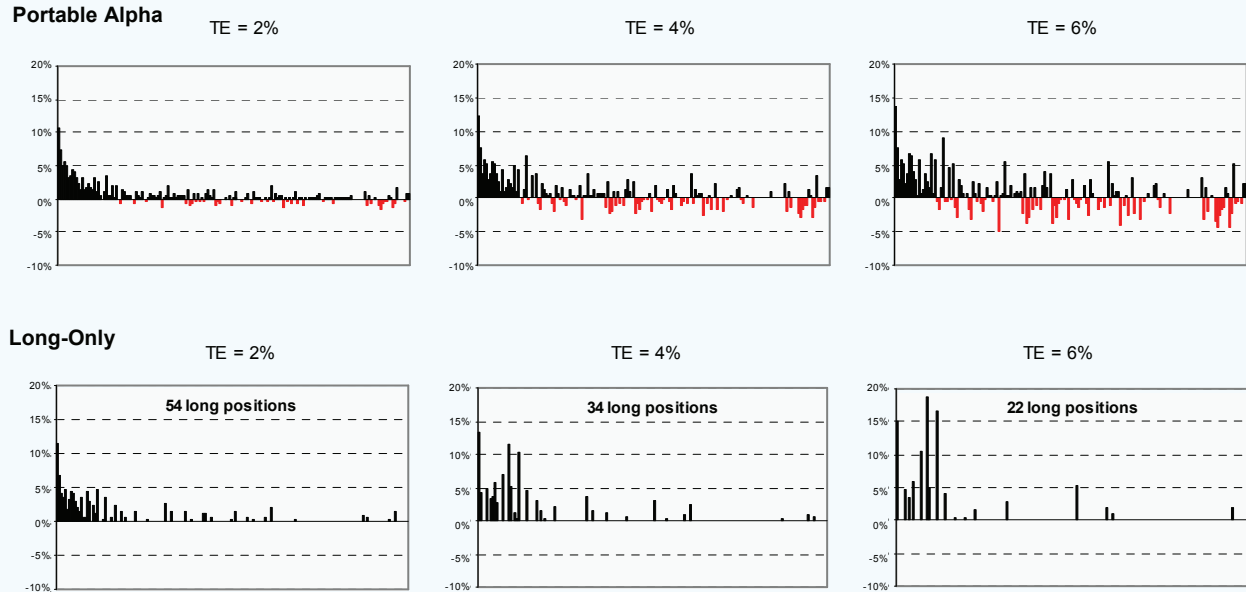
This deterioration is particularly vexing for investors seeking significant active risk and commensurate alpha. These investors generally want their managers to put more weight on their views, which translates into larger overweights and underweights. Unfortunately, as the desired overweights and underweights get larger and larger, the long-only constraint becomes more and more binding. Figure 3 shows a manager's views as over- and under-weights in portfolios targeting 2%, 4% and 6% tracking error. The top row of charts shows the optimal portable alpha portfolio, with unimplementable shorts in red; the second row shows the long-only portfolio resulting from the same views. Comparing these two rows demonstrates the severe effect the long-only constraint imposes as the targeted tracking error (and expected alpha) increases.

The Effect of Relaxed Constraints

If the long-only constraint is the primary obstacle between traditional active managers and their ideal portfolios, it will surprise no one that relaxing this constraint will have profound positive effects: more accurate reflection of managers' views (higher transfer coefficients) and better overall performance (higher

Figure 3: The Long-Only Constraint Becomes More Binding with Higher Tracking Error

The first row of charts below shows **portable alpha portfolios** under three different tracking error assumptions (2%, 4% and 6%). The second row of charts shows **long-only portfolios** based on the same set of views, under the same three tracking error levels. The distortion and concentration of the portfolio increases as tracking error levels are increased.



Benchmark used in this example is the Morgan Stanley Capital International (MSCI) UK® Index. This index was chosen because it contains a relatively small number of individual securities, which makes it simpler to view active weight changes in this exercise. It was not chosen because it is partial in any way to relaxed constraint strategies; that is, we are not data mining here.

information ratios). In fact, even slightly loosening the long-only constraint can have a powerful impact.

Back to our example. Instead of giving the manager free rein to take on unlimited short position weights, suppose the investor simply allows the manager to include short positions equivalent to 30% of the capital in the portfolio. Of course, simply adding this 30% short exposure to the portfolio would lead to an overall exposure of much less than 1.0 and often a total portfolio beta of much less than 1.0. (With 30% of the portfolio’s equity short, the portfolio’s exposure and its beta would be in the neighborhood of 0.7.)

To offset this effect, the investor allows the manager to take a corresponding series of additional long positions, which can be used to increase the already overweight exposures in the manager’s most favored stocks (see sidebar, “Implementing Relaxed Constraint Portfolios,” page 8). The resulting portfolio will have, for every \$100 invested, \$30 of shorts and \$130 of longs, for a

net portfolio exposure of \$100 to the appropriate benchmark, and hence the name “130/30.” The result is a portfolio that is much closer to the unconstrained portfolio (see Figure 2). Some shorts will remain unimplementable and the final 130/30 portfolio will suffer some distortion relative to a portable alpha portfolio. However, the views expressed in this portfolio end up being quite similar to those of the portable alpha portfolio – and a vast improvement to the long-only portfolio.

Figure 4 presents another perspective on the benefits of relaxed constraints: improvement in the expected information ratio. Note that the diminishing marginal returns to shorting mean investors can capture much of the potential improvement by allowing even limited shorting in the portfolio. The top chart in Figure 4 also demonstrates that portfolios benchmarked to different indices (in this case, Japan, UK, Europe and US benchmarks) react differently to the long-only constraint. This figure also demonstrates the viability

of relaxed constraints across a range of possible benchmarks around the world.

The bottom chart in Figure 4 shows that the long-only constraint generally impairs higher tracking error portfolios more than lower tracking error portfolios. Note that, for a given portfolio and benchmark, the lower the tracking error, the smaller the long-only constraint's impact on the information ratio. Why? Because, as we saw in Figure 3, low tracking error portfolios tend to have fewer unimplementable shorts. In general, increasing risk while maintaining the long-only constraint will lead to progressively less efficient portfolios. Conversely, increasing risk while relaxing the constraint allows investors to maintain, or even improve, the efficiency of their portfolios, capturing even greater alpha over the long term.

While the bottom chart in Figure 4 shows greater information ratio improvement from relaxing constraints in a 6% tracking error portfolio versus a 4% tracking error portfolio, the exact relationship depends largely on the composition of the benchmark. In some cases loosening the long-only constraint even in low tracking error portfolios can lead to a meaningful improvement in the information ratio.

Portable Alpha or Relaxed Constraints?

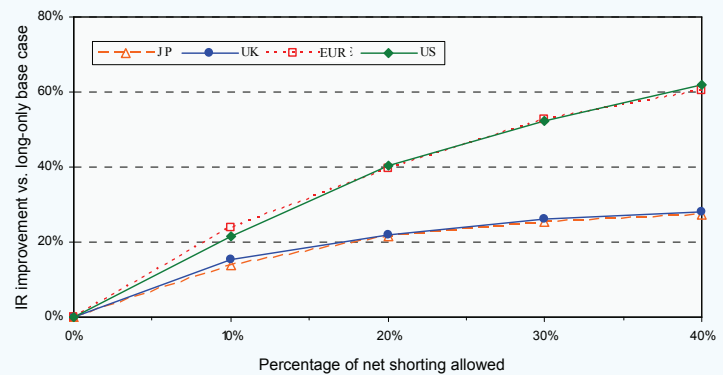
It is important to remember that relaxed constraint strategies are not perfect portable alpha substitutes. Portable alpha strategies have more degrees of freedom in their alpha-seeking approaches. Managers are not bound by 120/20- or 130/30-type short-sale restrictions; indeed, they have virtually unlimited shorting flexibility. More importantly, they can use leverage to target the desired amount of active risk – and, as a result, the desired amount of alpha – precisely. Finally, they can take active views in almost any asset class, not just equities.

By contrast, relaxed constraint strategies usually have a much more limited investment set and greater portfolio

Figure 4: The Benefits of Relaxing the Long-Only Constraint

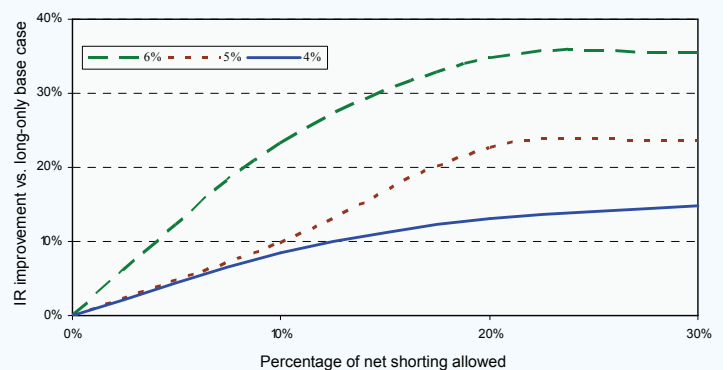
The benefits of relaxed constraint portfolios vary depending on the benchmark and the targeted tracking error. As shown on the top, allowing more shorting increases the information ratio, but the effect varies across countries. At 4% tracking error (shown), improvements tend to level out at around 30-40% net shorting allowed. On the bottom we see the information ratio improvement from relaxing the long-only constraint more pronounced as tracking error increases.

Relaxed Constraint Strategies Across Different Benchmarks



Benchmarks: JP – MSCI Japan, UK – MSCI UK, EUR – MSCI Europe-Ex UK, US – MSCI US

Relaxed Constraint Strategies Across Different Tracking Errors



constraints. A relaxed constraint strategy on the S&P 500, for example, would generally take only long and short positions in individual US stocks. However, multi-national relaxed constraint strategies do enjoy more flexibility. An EAFE relaxed constraint strategy, for example, could potentially take long and short positions in stocks, country indices (like the FTSE in the UK or the DAX in Germany) and currencies. But even this type of strategy will not offer the alpha diversification possibilities of portable alpha.

Relaxed constraint strategies do, however, enjoy some practical advantages. Consider that investors who want both benchmark exposure and a long-short equity portfolio (and who choose to implement the two portfolios separately) must borrow all of the stocks in their short equity portfolio in order to undertake the short sales, even as they hold long positions in the same stocks as part of their benchmark portfolio. As relaxed constraint investors, they would benefit from “free” shorting when they underweight stocks in the benchmark. That is, borrowing costs are lower since the manager only has to borrow the amount of stock for net short positions.⁴

Relaxed constraint strategies may also be more efficient users of leverage. Portable alpha strategies use leverage (inherent in futures) to achieve their desired beta exposures, and then likely more leverage (inherent in hedge funds) to achieve their alpha. But they may also hold a substantial part of the portfolio in cash, as collateral, and they will surely pay more for the funds they borrow than what they receive on the cash they hold.

Finally – and perhaps most importantly – the relaxed constraint investors may find themselves paying lower fees per unit of expected alpha. Lower fees may be temporary (as managers enthusiastically pursue relaxed constraint strategies), but they are an important advantage, at least for the time being.

Implementing Relaxed Constraint Portfolios

Implementation is a key issue in adopting any new strategy. At a simplified level, an investor who already has an actively managed, long-only equity portfolio will require two basic steps to move to a relaxed constraint portfolio (here we use a 130/30 mix): First, the manager shorts stocks with a value of 30% of the capital invested in the portfolio. This is accomplished by borrowing shares of stock that the manager views most negatively, then selling these shares in the market. Second, the manager uses the proceeds of the short sales to buy additional shares equivalent to 30% of the capital invested in the portfolio, which will of course be stocks the manager views most positively. The net effect of these two steps is a portfolio that is 130% long and 30% short, with net exposure of 1.0 and typically a beta of 1.0.

Relaxed constraint strategies can be thought of as using leverage, because every \$100 of capital is used to generate \$160 of active weights (130% long and 30% short). However, because the additional exposure is balanced between long and short positions, the incremental risk of this leverage should be low. Furthermore, since the proceeds of the short sales finance the additional longs, the cost of financing is relatively low (typically 25–50 basis points annually on \$30 long and short).

A prime broker facilitates these short-sale mechanics. The broker finds shares to borrow and then manages the short-sale proceeds, including financing the additional stock purchases. Unlike traditional long-only portfolios, which generally involve custodians holding the securities, relaxed constraint strategies require prime brokers to manage and hold all securities, long and short. In practice, the prime broker replaces the custodian. Investors using a commingled fund generally are not required to establish prime broker relationships; rather, the fund manager takes care of these arrangements as part of the portfolio management process. In contrast, separate account investors will have to select a prime broker, though they may lean on the expertise of their portfolio managers to do so.

There are a few other risks associated with shorting that should be considered. Investors often worry that although the risk they assume in buying stock is limited (to the total investment in that stock), their potential losses from short sales are theoretically unlimited. In practice, we do not think this is a major source of risk, for several reasons. First, explosive growth does not occur over such a short time-frame that action could not be taken to mitigate the additional risks. Second, the short positions in a relaxed constraint portfolio are offset by additional long positions, so the portfolio should not suffer if the market as a whole rises over time. Third and most importantly, a well-diversified relaxed constraint portfolio will not have enormous risk exposure to any individual stock, long or short. It is important to note that while long positions that detract from performance (decline in value) become smaller proportions of an overall portfolio, short positions that detract from performance (rise in value) become larger proportions of an overall portfolio. To that end, for risk control purposes it is prudent for managers to run very well diversified portfolios and not concentrate bets in any individual security.

⁴ Jacobs and Levy have also written about “joint optimization”, a second benefit to relaxed constraint strategies’ integrated approach. They argue that joint optimization, which simultaneously optimizes the benchmark and active portfolio weights, is more efficient than a portable alpha optimization approach. The authors contend that joint optimization affords more flexibility by considering the characteristics of all securities in the portfolio (not just those for stocks in the long-short basket). See Jacobs, Bruce I. and Kenneth N. Levy, “Enhanced Active Equity Strategies: Relaxing the Long-Only Constraint in the Pursuit of Active Return,” *The Journal of Portfolio Management*, Spring 2006, pp. 45-55.

The Future of Portfolio Management

Portable alpha and relaxed constraint strategies are only helpful if the active manager is skillful. Importantly, these strategies do not create new alpha; rather they help capture more of an active manager's existing alpha, especially that which is typically lost in the traditional long-only portfolio construction process. We continue to believe that portable alpha is a significant portfolio construction tool that more investors will embrace. Ultimately, many investors will seek to create portfolios that combine an optimal, diversified set of market exposures with a similarly diversified set of active management exposures.

But for many investors, this approach is not (yet) viable. Fully implementing a portable alpha portfolio requires a massive investment overhaul as well as the addition of a number of new and perhaps unfamiliar alpha strategies. Moreover, many of the building blocks required for an ideal portable alpha program are still not fully developed. Few institutional portfolios use derivatives to obtain any significant share of their market exposures. True sources of pure alpha without a systematic market exposure are still uncommon. Even investors who have found appropriate investments often use portable alpha on only a small portion of their overall portfolio, given the difficulty in sourcing alpha strategies and the relative novelty of the portable alpha concept. For now, the majority of institutional assets continue to be managed in a traditional long-only fashion.

We believe relaxed constraint strategies can enhance the expected returns of these assets with little change to the strategic asset allocation. For investors who are holding off on portable alpha, or who are implementing portable alpha on only part of their portfolios, relaxed constraint strategies represent a compelling alternative to increase their portfolio's risk-adjusted returns. Like portable alpha, relaxed constraint strategies allow investors to combine a more powerful alpha-generating engine with their existing beta exposures. Unlike portable alpha, relaxed constraint strategies can be incorporated fairly seamlessly into investors' existing portfolios.

Relaxed Constraint Strategies After August 2007

During August 2007, in the wake of a liquidity displacement of epic proportions, quantitative market-neutral stock selection managers lowered their overall exposure levels.[†] In the process, many 130/30 strategies suffered significant losses. Although these strategies generally rebounded by the end of the month (to various degrees), they clearly suffered some collateral damage as a result of the unusual market conditions.

It is important to note that this dislocation was liquidity-driven rather than fundamentals-driven. Liquidity events create both threats and opportunities, and highlight the need for innovative portfolio design in order to capture these opportunities.

At the same time, investors should be mindful that there are similar processes behind both relaxed constraint strategies and market-neutral hedge funds. While not all quant strategies are alike, during this brief period many appeared to be more correlated than longer-term evidence would suggest. We believe long-term investors should focus much more on the long-term correlations of their quant managers with the rest of their portfolio. In the long run, we are confident that quantitative equity strategies will profit from a range of behavioral and other biases that affect the mass of global stock investors. And in normal market environments – that is, most of the time – the results of individual managers will be relatively uncorrelated.

As the relaxed constraint market develops more offerings with different investment processes, plan sponsors will be able to create more diversified portfolios of relaxed constraint managers, portfolios that should be better behaved during liquidity events. Of course, one's ultimate long-term success is still predicated on a manager's skill to exploit market inefficiencies. Given that premise, adding relaxed constraint strategies, particularly in a portfolio that taps multiples managers, should give investors more efficient exposure to the underlying strategies, in good times and in bad.

[†] AQR has addressed many of these questions in other reports, including a working paper by AQR's Managing Principal Cliff Asness entitled, "The August of Our Discontent," which we would be happy to share upon request.

ACKNOWLEDGMENTS:

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DISCLOSURE:

There is a risk of substantial loss associated with trading commodities, futures, options and leverage. Before investing carefully consider your financial position and risk tolerance to determine if the proposed trading style is appropriate. Investors should realize that when engaging in leverage, trading futures, commodities and/or granting/writing options one could lose the full balance of their account. It is also possible to lose more than the initial deposit when engaging in leverage, trading futures and/or granting/writing options. All funds committed should be purely risk capital.

Hypothetical performance results (e.g., quantitative backtests) have many inherent limitations, some of which, but not all, are described herein. No representation is being made that any fund or account will or is likely to achieve profits or losses similar to those shown herein. In fact, there are frequently sharp differences between hypothetical performance results and the actual results subsequently realized by any particular trading program. One of the limitations of hypothetical performance results is that they are generally prepared with the benefit of hindsight. In addition, hypothetical trading does not involve financial risk, and no hypothetical trading record can completely account for the impact of financial risk in actual trading. For example, the ability to withstand losses or adhere to a particular trading program in spite of trading losses are material points which can adversely affect actual trading results. The hypothetical performance results contained herein represent the application of the quantitative models as currently in effect on the date first written above and there can be no assurance that the models will remain the same in the future or that an application of the current models in the future will produce similar results because the relevant market and economic conditions that prevailed during the hypothetical performance period will not necessarily recur. There are numerous other factors related to the markets in general or to the implementation of any specific trading program which cannot be fully accounted for in the preparation of hypothetical performance results, all of which can adversely affect actual trading results. Hypothetical performance results are presented for illustrative purposes only.