



# Alternative Thinking

## Relaxed-Constraint Portfolios: Ignored but Not Forgotten

We discuss how active equity managers can raise expected returns of their portfolios by relaxing the long-only constraint. Active managers' main task is to identify good stocks with high expected returns and bad stocks with low expected returns, but managers can only partially take advantage of these insights in a long-only portfolio. Allowing managers to short the bad stocks gives them more "elbow room" to express their negative views and in turn the ability to take larger positions in the favored stocks, giving rise to better overall performance. Based on simulations and historical evidence we confirm that this effect has allowed so-called 120/20 and 130/30 strategies to meaningfully improve returns. We show that the investment community has largely turned away from these strategies, but our findings suggest that they should take a renewed look.

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**AQR Capital Management, LLC**  
One Greenwich Plaza  
Greenwich, CT 06830

p: +1.203.742.3600  
f: +1.203.742.3100  
w: [aqr.com](http://aqr.com)



## 1. Relaxed constraints: A largely forgotten concept

To generate excess returns, active equity managers take deviations from the benchmark (tracking error, or TE). Allocators and consultants hope that these deviations generate both an attractive risk-reward ratio<sup>1</sup> and a high level of excess returns. However, increased focus on the latter may lead to an undesirable tradeoff between the two goals. For instance, in a low return environment, investors hoping to earn particularly high excess returns may push their managers to increase active risk to levels where there is a diminishing benefit to doing so, leading to inferior risk-adjusted returns.

About a decade ago the investment community embraced a powerful approach that helps alleviate this tradeoff: relaxing the long-only constraint, for example in a 130/30 or a 120/20 format. These strategies had their heyday in the mid-2000s, but their popularity has all but disappeared since then. This is unfortunate. The concepts behind these

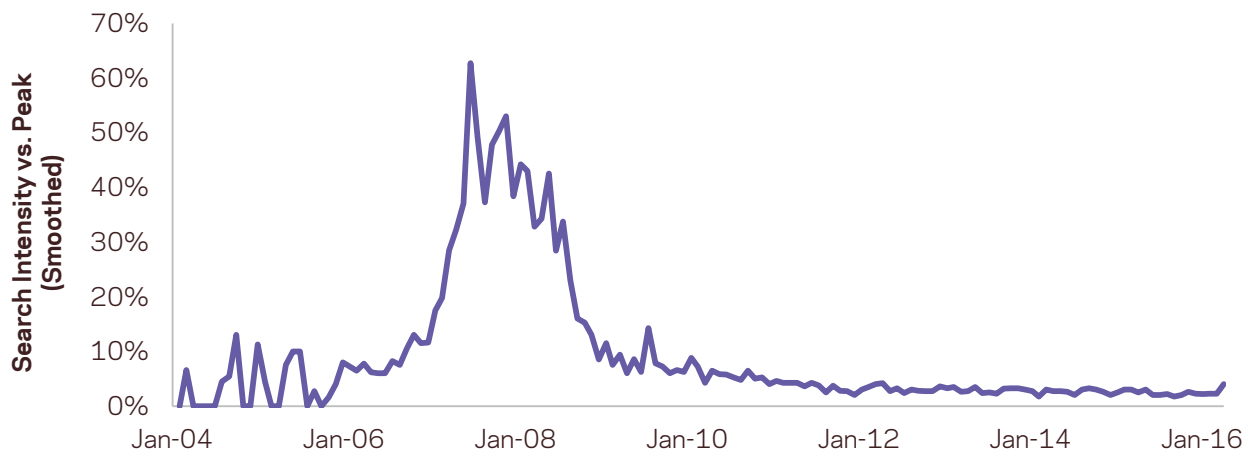
strategies remain as valid as ever, even if the investment community no longer talks about them.

Exhibit 1 is a telling illustration of the decline in investor interest. It presents the incidence of the “130/30” search term in Google queries. After the initial spike in popularity, the interest dropped to almost zero, with nothing but crickets for the past few years.

Unfortunately, the lack of interest is not consistent with the strategies’ potential. We believe that it is, instead, the result of (short-term) performance during the Global Financial Crisis. We believe that, ironically, the strategies fell out of favor because they did precisely what they were supposed to do: increase investors’ exposure to managers’ views and models. By doing so, they amplified any negative performance such models experienced — and many of these models had at least one bad year between 2007 and 2009.<sup>2</sup>

Despite these difficult years, relaxed-constraint strategies have performed strongly over time. There

**Exhibit 1 | Relaxed-constraint portfolios — still relevant even though people stopped looking for them.** The exhibit quantifies how often the search term “130/30” has been entered over time. Google Trends reports weekly search activity relative to total search volume, scaling data so that the highest week = 100. We then smooth the series and display the average search intensity per month.



Source: Google Trends ([www.google.com/trends](http://www.google.com/trends)), accessed 4/13/2016.

<sup>1</sup> Information ratio is a commonly-used measure of risk-adjusted returns relative to a benchmark. It is the ratio of active return (alpha) over active risk (tracking error).

<sup>2</sup> For a more detailed discussion of the history of relaxed-constraint strategies, see for example D.E. Shaw (2012). For a more detailed discussion of relaxed-constraint strategies based on our investors’ experience, see the upcoming Reflections whitepaper by Aghassi, Feghali, McQuinn, and Villalon (2016).

**Exhibit 2 | High TE managers are relatively more exposed to currency and country risks, but relatively less exposed to stock-specific risks.** We use December 31, 2015 holdings of all mutual funds benchmarked to MSCI World, as reported in the Thomson Reuters holdings database, to run a risk decomposition analysis. The risk decomposition is based on Barra's GEM2L risk model, and highlights the contribution to active risk from currency, country, industry, styles, and stock specific risks. We present the average contributions (expressed as the fraction of the tracking error) for five groupings of funds sorted on their overall tracking error.

	Percentage contribution from:					
	Average TE	Systematic Risks				Stock-Specific Risks
		Currency	Country	Industry	Style	Concentration
1 (lowest TE)	0.3%	8%	12%	6%	7%	68%
2	1.1%	7%	19%	11%	16%	46%
3	2.1%	17%	22%	13%	22%	26%
4	3.0%	19%	34%	10%	16%	20%
5 (highest TE)	5.3%	31%	27%	12%	14%	16%

Source: Thomson Reuters, Barra. Past performance is not a guarantee of future performance.

are no generic relaxed-constraint equity indices so we collected a composite of managers from the eVestment Alliance database, searching for all managers with matching relaxed-constraint and long-only mandates on the global equity universe and at least eight years track record (from early 2008 to early 2016).<sup>3</sup> These relaxed-constraint portfolios have had attractive performance on a standalone basis and relative to the overall benchmark, despite some early underperformance. They have realized similar information ratios (IRs) as matching long-only portfolios (averaging 0.8 across managers) while achieving much higher active risk levels (averaging 4.5% TE compared to long-only portfolios' average TE of 2.5%). Consequently, they also realized considerably higher excess of benchmark returns (3.2% average for relaxed-constraint, 1.5% for long-only).<sup>4</sup>

<sup>3</sup> To construct our sample we started with the list of all USD denominated global relaxed-constraint (Investment Focus category "extended equity") managers in the eVestment Alliance database (there were 12) and then matched them with long-only global equity strategies run by the same firm. Of those strategies, we only retained the ones where the names of the long-only and relaxed-constraint versions matched, for example, "Global Equity" and "Global Equity 130/30." We require eight years of data, from March 2008 through March 2016. The resulting sample is five strategy pairs from five different managers.

<sup>4</sup> Requiring an eight-year long track record gave us five managers with

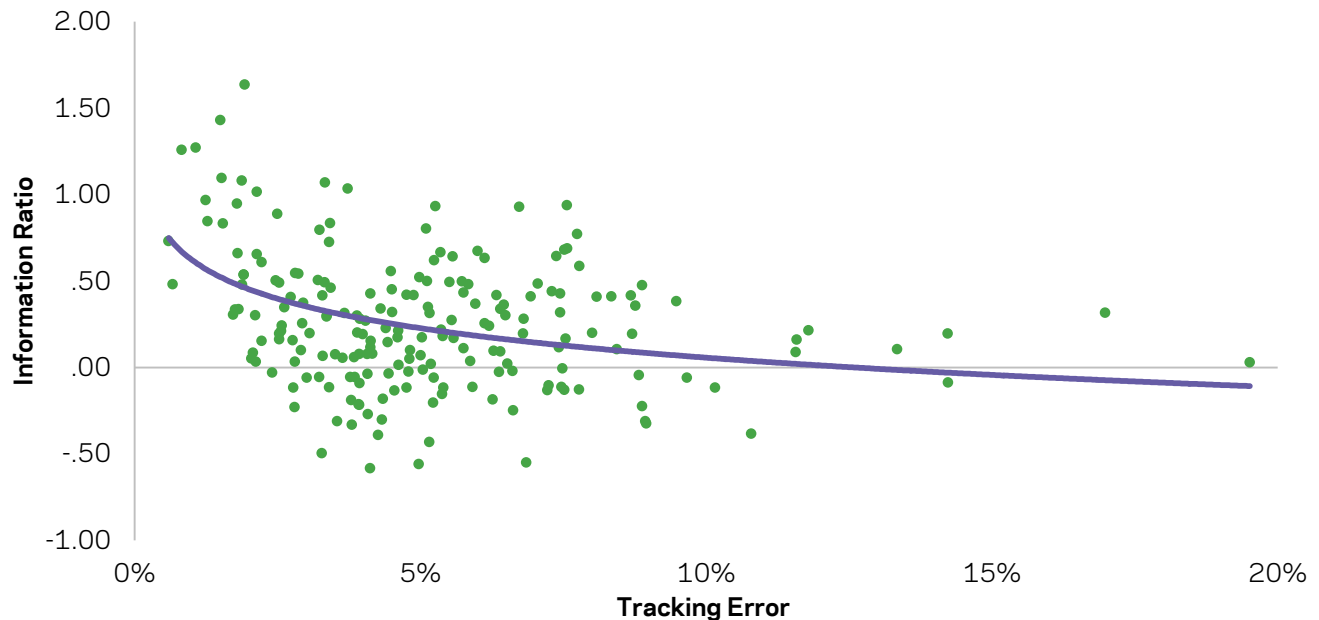
Simply raising the active risk of long-only strategies may not help investors limited to long-only investments match the excess returns of relaxed-constraint strategies. As alluded to earlier, there can be meaningful degradations in IR at higher levels of TE in long-only portfolios. For instance, a pure stock selection strategy that is long-only and neutralizes systematic risks like market beta, country, and industry exposures will tend to offer a highly diversified collection of active tilts and may thereby have difficulty achieving a high TE. Concentration and systematic exposures are easy ways to increase active risk, but as shown in Frazzini et al. (2016), managers may not necessarily get higher active returns merely by taking on more risk.

To illustrate this point, we ran a Barra risk decomposition on holdings data of the global mutual funds in the Thomson Reuters database. Exhibit 2 shows the contributions to active risk from various types of risk for funds at different TE levels (based on TEs estimated from their holdings as of

matching relaxed-constraint and long-only global equity portfolios. Requiring a ninth year (to include 2007) would have reduced the manager universe from five to three. When we studied a seven-year track record (dropping 2008), results were similar to those of the eight-year track record with the one difference that the relaxed-constraint portfolios had higher IRs than long-only portfolios. Returns are gross of fees.



**Exhibit 3 | Higher TE tends to result in lower IR in long-only funds' returns.** We present the relationship between the TE and IR, computed using 10 years of data (January 2006–December 2015). The figure shows funds managed to MSCI World family of benchmarks (including MSCI World ND, MSCI World GD, as well as the variants of the benchmark that exclude smaller regions: ex Australia, ex UK, ex Canada, and ex Switzerland), excluding those with TE below 50bps, as of the end of 2015.



Source: eVestment Alliance. Past performance is not a guarantee of future performance.

December 31, 2015). In principle, higher TE may come either from stock-specific risk by increasing concentration (making fewer bets), or it may come from taking on more systematic risks. In practice, the second driver tends to be more dominant, generally increasing with TE. High TE funds tend to be most exposed to currency and country risks, with the two dimensions contributing almost three times as much to the active risk for funds in the top TE quintile than for funds in the bottom TE quintile. At the same time, the contribution of stock-specific risks is substantially smaller for high TE funds. This *may be* an issue if stock-specific risks are better compensated than country or industry tilts, which is a reasonable assumption to make for the following reasons: two stocks within the same industry tend to be more comparable than two industries or two countries, and there are more individual stocks available for comparison than there are individual industries or countries. If this is the case, we would

expect excess returns per unit of active risk to deteriorate, as higher TE strategies get more and more of their risk from less compensated risks.

To check whether excess returns per unit of active risk do indeed deteriorate, we again turn to the data. We look at the 10-year TE and IR for global equity portfolio returns reported in the eVestment Alliance database. Exhibit 3 presents the relationship between the two quantities. Empirically, high-TE global equity managers tend to earn lower IRs than low-TE managers. That is, even though the level of excess returns may be higher for the former, their risk-adjusted returns are somewhat lower. The relationship flattens beyond TEs of about 10%, but at that stage IR is relatively close to zero anyway.

## 2. The relaxed-constraint value proposition

As discussed, we think investors interested in higher active returns could do better with relaxed-



constraint, say 130/30, strategies. Relaxing the long-only constraint may help investors attain higher active risk without necessarily having to reduce diversification or take large bets on countries, currencies, or industries. Compared to Exhibit 2, relaxed-constraint strategies could perhaps be expected to have risk contributions similar to low-to-medium TE funds, while achieving active risks in line with those of the high TE funds.

This argument is backed by strong economic intuition. Benchmark-relative portfolios should be constructed to reflect both a manager's positive and negative views on attractive and unattractive stocks, respectively. For portfolios that seek low active risk, the translation of these views into active portfolio weights is fairly efficient. Low risk requires only small active weights, which may be comfortably implemented in a long-only portfolio where negative views can only go to a maximum underweight of zero holding (and conversely positive views can be implemented only up to an offsetting amount). However, as desired active risk increases, the magnitude of desired negative tilts increases. The zero floor eventually becomes a binding constraint as desired tilts become larger than stocks' benchmark weights, causing distortions in the portfolio.

In contrast, relaxed-constraint portfolios are capable of representing the manager's view more faithfully, even as TE increases. Allowing some shorting means that the portfolio can increase the size of its underweights beyond each stock's weight in the benchmark.<sup>5</sup> In other words, relaxing the long-only constraint can substantially improve the portfolio's transfer coefficient, that is, the correlation between the actual active portfolio and the manager's view (desired active weights). To the extent that the view works (i.e., leads to higher returns in the future) this will improve investment results. Of course, if the

view underperforms, the relaxed-constraint portfolio will likely suffer more.

To illustrate these arguments in a simple and fairly generic setting, we construct hypothetical long-only and relaxed-constraint 130/30 portfolios that will help us understand the consequences of deploying more active risk. We use the same model and the same data to build the two portfolios. We combine two well-known styles, value and momentum,<sup>6</sup> as in Asness et al. (2015) using a developed stock universe, similar to MSCI World index constituents, over the period of 1995-2015. We account for the estimated trading costs using a transaction costs model, based on live trading data, similar to Frazzini, Israel, and Moskowitz (2015). For the 130/30 portfolio, we also account for the cost of shorting and the funding costs for the long extension (the additional 30% of long exposure). We believe the assumed shorting/funding costs are conservative relative to the actual costs of 130/30 strategies.

Exhibit 4 presents a frontier of these long-only and 130/30 portfolios with increasing TE.<sup>7</sup> Panel A shows how much relaxing constraints helps, both ex ante (using transfer coefficient, or TC, as defined above) and ex post (realized net IR, which illustrates excess return earned per unit of active risk). The results overall confirm our first principles discussion, but also allow us to highlight some nuances. Targeting higher active risk indeed makes it more difficult to align the portfolio with the model (TC drops) and generally leads to lower realized IRs. The drop in IR, apparent for both long-only and 130/30 portfolios, is entirely driven by taking on more active risk. Excess returns do go up mildly when TE increases (although for the long-only strategy excess returns flatten once TE exceeds 5%), but not enough to keep

<sup>5</sup> The portfolio is then also able to hold larger overweights as well — such overweights can now be balanced by larger underweights and short positions, such that the portfolio remains risk controlled and well diversified. Diversification does not eliminate the risk of experiencing investment losses.

<sup>6</sup> We use book-to-market for value and prior year's returns, skipping the most recent month, for momentum.

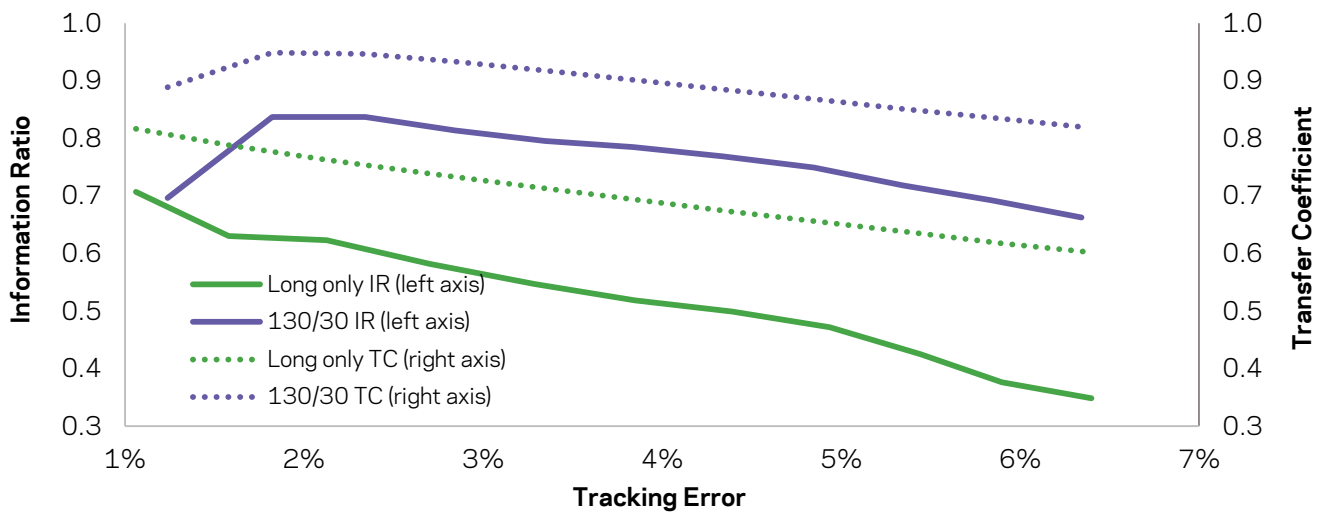
<sup>7</sup> We focus on 130/30 portfolios here (that is, holding 130% of NAV in long positions and 30% in short positions; netting to the same 100% as a long-only portfolio), but our points generalize also for other relaxed-constraint portfolios, say 120/20 or 140/40. Prior research (e.g., Grinold and Kahn, 2000) suggests that even a mild relaxation could go a long way toward improving performance. We find the greatest improvements come from the first 20-30% of shorting; beyond that, we see a lesser impact.



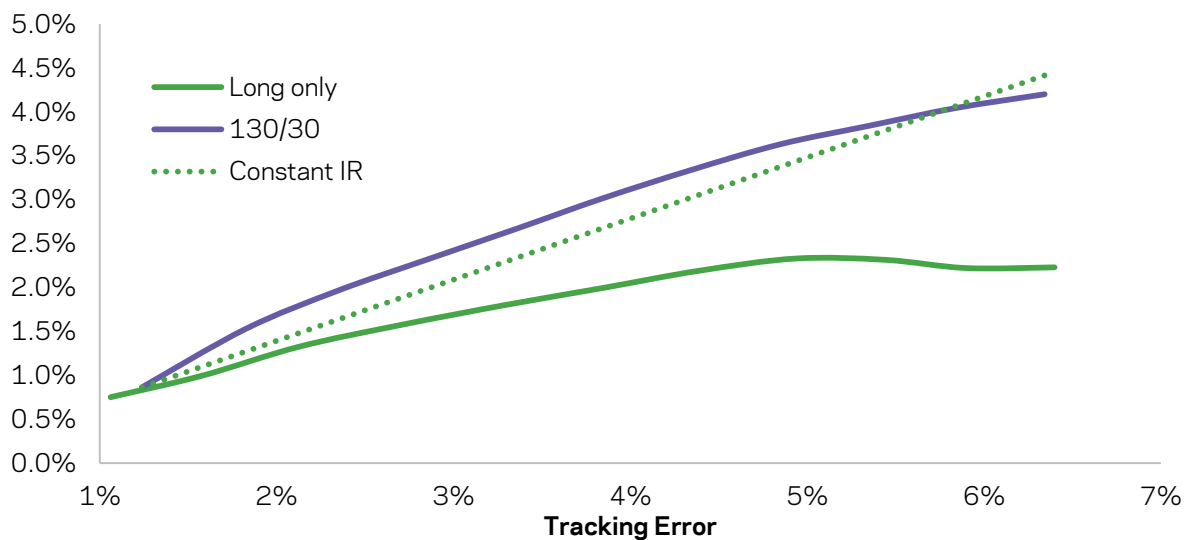
**Exhibit 4 | As TE increases, long-only portfolios become increasingly inferior to 130/30 ones.**

We construct hypothetical long-only and 130/30 portfolios based on value and momentum indicators (book-to-market and past year returns, respectively). Portfolios are built on a global equity universe similar to MSCI World, for a range of TEs. Panel A shows how ex ante portfolio attractiveness (Transfer Coefficient, capturing the similarity between the portfolio and its underlying model view, right axis) and realized net performance (IR net of estimated transaction costs and costs of shorting/financing for 130/30 portfolios, left axis) change as a function of the TE of the two portfolios. Panel B shows net returns in excess of the MSCI World benchmark, again as a function of the TE, and plots the 45-degree line that indicates the level of excess returns that the long-only portfolio would achieve if it could preserve the same IR for higher levels of TE.

**Panel A:** Information ratio and transfer coefficient as a function of tracking error.



**Panel B:** Excess returns as a function of tracking error.



Source: AQR. Based on hypothetical backtest run from January 1995 through December 2015. Hypothetical performance results have certain inherent limitations, some of which are disclosed in the back.



pace with active risk. Consequently, the risk-return tradeoff worsens.<sup>8</sup>

Importantly, the decay in excess returns per unit of active risk is much more pronounced for long-only strategies. Moreover, the difference between the two approaches widens as TE goes up. For TE of 2%, the 130/30 framework improves the TC by 20% and increases excess returns (and the realized IR) by about 30%, but for the highest TEs presented in Exhibit 4 these improvements jump to about 40% and 90%, respectively. Put differently, the long-only portfolio achieves its highest TC and IR at around 1% TE, but the 130/30 beats or matches these figures all the way to about 6% TE. Panel B translates this evidence into excess returns and shows that higher active risk makes the 130/30 portfolio increasingly more attractive than the long-only portfolio. These patterns generalize beyond our simple value-momentum example. Even with a more powerful model, the long-only constraint will eventually induce a distortion large enough to considerably handicap the long-only portfolio versus the relaxed-constraint one. This distortion will still allow investors to deploy more risk in a long-only framework, but unfortunately it will prevent them from earning much of the potential compensation from that active risk.<sup>9</sup>

### 3. Costs of relaxing the long-only constraint

Of course, the benefits of relaxed-constraint strategies are not a free lunch. These strategies entail more complexity than traditional long-only portfolios and may also expose investors and

managers to additional challenges. While a 130/30 strategy may be no more than 100% net invested, it will still have gross exposure of 160% of NAV, as opposed to 100% for a long-only strategy. The use of leverage and shorting poses additional risk management challenges for managers, such as being more exposed to deleveraging and forcing managers to monitor the stability of their counterparties or prime brokers.<sup>10</sup>

In addition, relaxed-constraint strategies require specific expertise. Managers of such portfolios must be able to identify not only promising companies but also poor prospects to underweight or short.

Such a skill may not be obvious: a manager used to finding 100 stocks with some promise and identifying 30 truly worthy holdings may not have the experience necessary to select 100 potential duds and short 30 that are truly horrible.<sup>11</sup> Additional expertise is also required for implementing short positions. The cost of shorting means that subpar implementation may quickly erode potential benefits of relaxed-constraint strategies.

Trading expertise is in fact important beyond just shorting, as relaxed-constraint portfolios tend to have higher turnover than their long-only counterparts (e.g., if the typical holding period is one year, a 130/30 strategy will generate turnover of the order of 160% per year, versus 100% for a 100/0 portfolio). Thus, relaxed-constraint strategies will amplify differences in managers' ability to trade cheaply and efficiently, or to obtain cheap financing for the extended positions on the long side of the portfolio.

Not surprisingly, we believe that the benefits of relaxed-constraint strategies justify the added costs, risks and complexity. For example, our analysis presented in Exhibit 4 suggests that at 4% TE, the

<sup>8</sup> For very low values of TE, the IR of the 130/30 actually increases in active risk. This occurs because we are forcing the 130/30 portfolio to short 30% of NAV even at low levels of TE that could have been obtained without any shorting. For example, Clarke, de Silva, and Saprà (2004) explain this effect by stating that “for lower levels of tracking error, the optimization is dominated by the need to restrict tracking error at a forced level of shorting.”

<sup>9</sup> Differences in performance should be apparent over the long term, but not necessarily over a shorter period (quarter, year). Moreover, we expect excess returns of the two strategies to be highly, but certainly not perfectly correlated even if they share the same model. Distortions on both the short and long side will lead to differences in holdings and in performance between the two strategies. Past performance is not a guarantee of future performance.

<sup>10</sup> These risks are not insurmountable — managers may decide to use enhanced custody to alleviate counterparty issues, etc.

<sup>11</sup> One could perhaps argue that quantitative managers tend to think more symmetrically about stocks' attractiveness, such that their models lend themselves more naturally to the relaxed-constraint format. However, we believe that relaxed-constraint strategies will also benefit discretionary managers. Indeed, the patterns we documented in Exhibits 2 and 3 used data on all managers available in the database, including both quant and fundamental strategies.





130/30 strategy may deliver as much as 1% more in excess returns than the long-only strategy over the long term. This figure, which is net of estimated trading costs and costs of shorting/leverage, comfortably exceeds plausible differences in fees between long-only and relaxed-constraint strategies. We expect that many, although clearly not all, investors would be well positioned to adopt relaxed-constraint strategies and realize such benefits in practice.

#### 4. Conclusions

Investors who seek higher returns in their equity portfolios should be interested in relaxed-constraint strategies. Such strategies may achieve higher returns without unduly increasing active risk, and thus deliver higher risk-adjusted performance (e.g., IR) in the process.

Alongside potential benefits we also highlight the costs of a relaxed-constraint approach. We recommend each institution review whether relaxing constraints and shorting is a possibility, particularly if its risk budget allows for strategies that seek higher TE. Relaxed-constraint strategies appear to be a promising way to increase active risk, maintain or even improve IR and boost total returns.

Finally, why stop at only partial relaxation of the long-only constraint? Long/short portfolios have much to offer and we do find them useful across various asset classes.<sup>12</sup> However, they may clash too much with many investor constraints and could face capacity limits. Moreover, for most investors they belong in the alternatives allocation. In contrast, relaxed-constraint portfolios are designed to provide investors with full market exposure. As such, we believe they belong in investors' core equity allocations, and can be considered valid alternatives and potential replacements for long-only mandates.

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<sup>12</sup> Asness et al. (2015).



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## Appendix

### Backtesting Methodology:

- Universe: Liquid tradable universe roughly equivalent to the MSCI World Index
- Monthly rebalancing frequency for the backtesting period January 1995 to December 2015
- Risk Model: Barra Global Equity Model (GEM) from 1995 to 1998; Barra BIMDEV301L from 1999 to present
- We account for the estimated transaction costs using AQR’s transaction costs model, based on the data from AQR’s live experience.
- For the 130/30 portfolio, we also account for the cost of shorting (the shorting fee) as well as the funding costs for the long extension (the additional 30% of long exposure).



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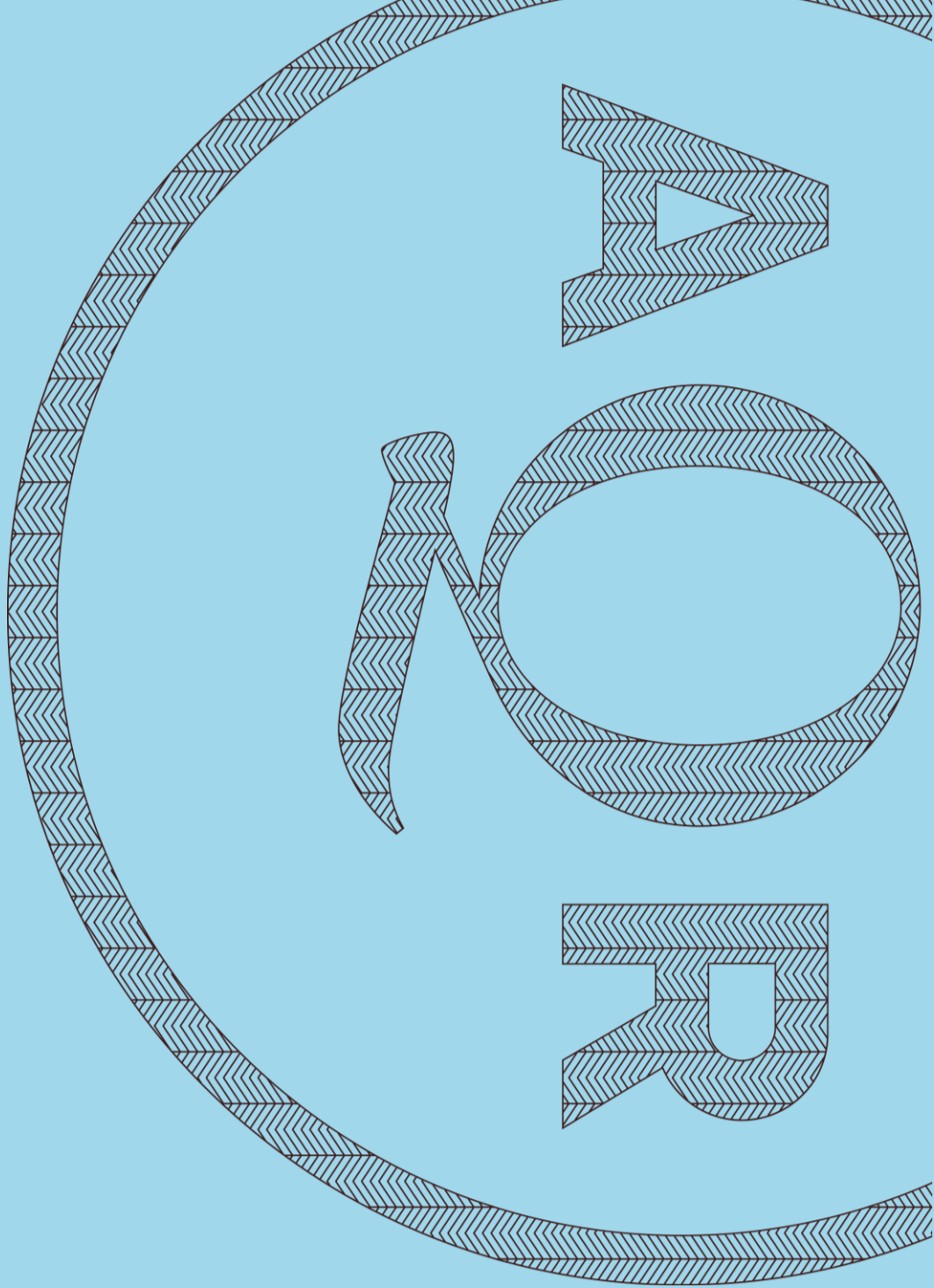
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**AQR Capital Management, LLC**

One Greenwich Plaza, Greenwich, CT 06830  
p: +1.203.742.3600 | f: +1.203.742.3100 | w: aqr.com