

# How to Overcome Overcrowding in Low Volatility Investing



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## Executive Summary

- Part of a broader class of ‘absolute-risk strategies,’ low and managed volatility strategies are seeing substantial asset growth as investors recognize the value of downside protection and its impact on outcomes through market cycles.
  - But history has been unkind to strategies that have attracted significant capital inflows, as the ‘crowd’ drives higher valuations and depletes capacity. Therefore, many investors are concerned about overcrowding in absolute-risk strategies.
  - This paper attempts to dispel the concern that absolute-risk strategies – including low volatility strategies – are at risk of overcrowding by demonstrating that they are not all the same. We show that they are not a homogeneous class of strategies subject to the same risks.
  - Investors who appreciate the differences in strategy design can circumvent overcrowding in their absolute-risk implementations by avoiding oversubscribed low volatility strategies or diversifying their exposure within this popular class of investing.
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In the last five years, absolute-risk investing has gained in popularity among plan sponsors and individual investors alike.<sup>1</sup> While academics and practitioners continue to debate hotly about the underlying performance drivers of absolute-risk strategies, most industry participants generally agree on the value of absolute-risk investing due to the much needed downside protection it can provide during market drawdowns.

Consequently, the industry is seeing substantial asset growth in these strategies and a large number of asset management firms are launching absolute-risk strategies in order to capitalize on the investor expectation that these portfolios may outperform the broad market index with considerably less risk.

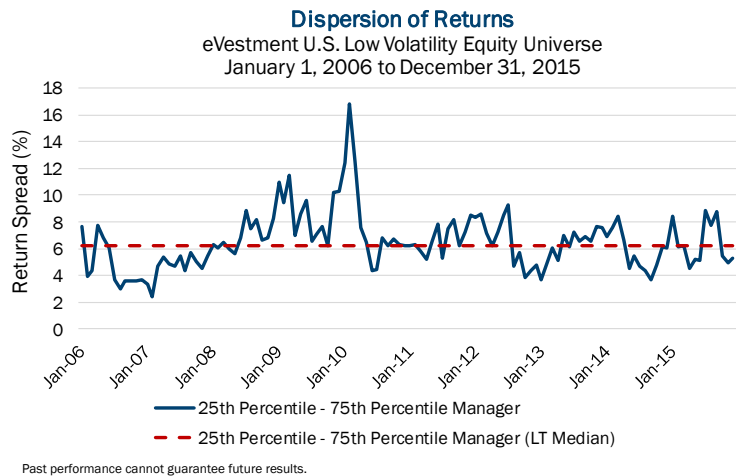
Investors, however, are becoming increasingly concerned that the growth in absolute-risk strategies will negatively impact the future performance of these strategies by potentially resulting in an overcrowded trade – which can, in turn, cause rising valuations and factor crashes as the category capacity is used up. In this context, a crowded position occurs when there are substantial assets tied to overlapping security holdings that pursue similar investment strategies, amounting to a significant combined share of a stock’s free-float market capitalization. History has many examples where substantial capital inflows into linked investment strategies caused crowding. Given this risk, academics and practitioners have attempted to evaluate the extent to which overcrowding is present by using various metrics based on returns (e.g., pairwise stock correlations, valuation dispersion) and holdings (e.g., short interest, trading activity).

In an upcoming paper, we explain why absolute-risk strategies have a net benefit even in the presence of realistic levels of overcrowding; however, in this paper, we simply seek to dispel the misunderstanding that absolute-risk strategies form a homogeneous class of portfolios, whose holdings and trades must necessarily overlap. We demonstrate that absolute-risk portfolios are not all equally exposed to overcrowding risk, allowing investors to circumvent implementation risk, especially mitigating exposure to overcrowding. The concern that all absolute-risk strategies are at risk of being affected by crowded trades is based on an unjustified over-generalization.

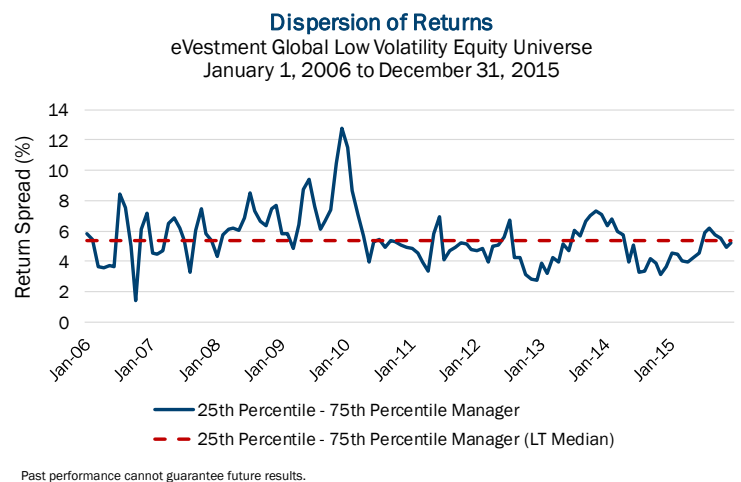
### Returns-Based Analysis

Absolute-risk strategies have a common objective: exposure to equity markets while concurrently mitigating the portfolio’s downside risk. While they all tend to effectively reduce the beta and/or the volatility compared to the market, the return patterns between absolute-risk managers can differ substantially. For example, the returns between the top- and

**Figure 1: Dispersion of Returns in U.S. Low Volatility Equity Universe**



**Figure 2: Dispersion of Returns in Global Low Volatility Equity Universe**



bottom-performing active absolute-risk managers are quite different over time. Figure 1 illustrates this difference as measured by the rolling 12-month dispersion of the returns between the 75th percentile manager and the 25th percentile manager in the eVestment U.S. Low Volatility Equity Universe from 2006 through 2015.<sup>2</sup> The differences in returns ranged between 2.5% and 16.8% during the 10 years with a median difference of 6.3%.<sup>3</sup> We see similar outcomes in the eVestment Global Low Volatility Equity Universe (Figure 2), where the differences in returns ranged between 1.4% and 12.8% during the 10 years with a median difference of 5.4%.<sup>4</sup>

Such a high degree of dispersion of returns among absolute-risk strategies implies that they are sufficiently distinct from each other; as a result, the overcrowding risk should be quite low. Yet, it may be worth shedding some more light on how it is possible to pursue the same objective of reducing total risk in an all-equity portfolio, and still exhibit such substantially different returns. In the next section, we explore a simple example that demonstrates just how different the underlying holdings and potential trades can be.

### Holdings-Based Analysis

There are many different ways to construct an absolute-risk, all-equity portfolio, even when targeting a particular level of volatility reduction.

As an illustrative example, we consider three hypothetical cap-weighted portfolios of 100 stocks each constructed in the following manner. We select a benchmark, which can be either the Russell 1000 or the MSCI World indexes. Then, every quarter, we rank stocks by their historical volatility so the first ranked security has the lowest volatility, the second ranked security has the next lowest volatility, and so on.<sup>5</sup> Finally, the hypothetical portfolios are constructed as follows:

- Absolute-Risk Portfolio 1 consists of stocks ranked #1, #4, #7, ..., #298;
- Absolute-Risk Portfolio 2 consists of stocks ranked #2, #5, #8, ..., #299;
- Absolute-Risk Portfolio 3 consists of stocks ranked #3, #6, #9, ..., #300.

By design, these three absolute-risk portfolios have no securities in common at any point of time.

For comparison with realistic absolute-risk strategies, we also include the simulated returns of the INTECH U.S. Low Volatility/Global Low Volatility strategies and the INTECH U.S. Managed Volatility/Global Managed Volatility strategies.<sup>6</sup>

In table 1, we observe that all five absolute-risk portfolios have lower volatility and beta than that of the Russell 1000 Index. The INTECH U.S. Managed Volatility portfolio – an alpha seeking strategy designed to minimize total risk – has the highest return and least volatility reduction of the five portfolios. The three hypothetical portfolios as well as the INTECH U.S. Low Volatility strategy have considerably lower volatility with returns comparable to the index. In table 2, the

**Table 1: Performance Metrics for U.S. Strategies, 1/1/1979 – 12/31/2015.**

Strategy	Return*	Volatility	Sharpe Ratio	Relative Return	Volatility Reduction	Beta
Russell 1000 Index	6.35%	16.41%	0.39	0.00%	0.00%	1.00
Russell 1000 Absolute-Risk Portfolio 1**	7.08%	12.96%	0.55	0.73%	21.00%	0.71
Russell 1000 Absolute-Risk Portfolio 2**	6.97%	13.34%	0.52	0.62%	18.70%	0.74
Russell 1000 Absolute-Risk Portfolio 3**	6.24%	13.38%	0.47	-0.11%	18.50%	0.73
INTECH U.S. Low Volatility***	7.20%	12.19%	0.59	0.86%	25.70%	0.63
INTECH U.S. Managed Volatility***	9.79%	14.40%	0.68	3.44%	12.30%	0.80

**Table 2: Performance Metrics for Global Strategies, 1/1/1992 – 12/31/2015.**

Strategy	Return*	Volatility	Sharpe Ratio	Relative Return	Volatility Reduction	Beta
MSCI World Index	4.27%	16.46%	0.26	0.00%	0.00%	1.00
MSCI World Absolute-Risk Portfolio 1**	5.31%	12.34%	0.43	1.04%	25.00%	0.66
MSCI World Absolute-Risk Portfolio 2**	5.57%	12.29%	0.45	1.30%	25.30%	0.64
MSCI World Absolute-Risk Portfolio 3**	5.74%	12.27%	0.47	1.46%	25.40%	0.62
INTECH Global Low Volatility***	6.18%	10.04%	0.62	1.91%	39.00%	0.48
INTECH Global Managed Volatility***	7.99%	12.02%	0.66	3.72%	27.00%	0.66

\* Returns are annualized and are net of the risk-free T-Bill rate.

\*\*This illustration is hypothetical and does not represent the returns of any particular investment. Investment advisory fees, trading commissions and other transaction based costs have not been deducted. Data Sources: Russell, MSCI, CRSP and RemotePlus.

\*\*\*See Simulations Disclaimer at end of paper for additional information.

results are similar with the five absolute-risk global strategies when compared to the MSCI World Index.

By design, the 3 hypothetical Russell 1000 absolute-risk portfolios have no overlap and therefore an effective active share<sup>7</sup> of 100% among them (Table 3). Interestingly, INTECH U.S. Low and Managed Volatility portfolios have active shares of 85-89% with respect to the 3 hypothetical Russell 1000

absolute-risk portfolios. In other terms, these 5 absolute-risk portfolios, while they all exhibit lower volatility characteristics, have only 0% to 15% of their stock weights in common.

Similarly, INTECH Global Low and Managed Volatility portfolios have higher active shares of 89-93% with respect to the 3 hypothetical MSCI World absolute-risk portfolios; and an average active share of 45% with respect to each other (Table 4).

**Table 3: Average Active Share Between U.S. Strategies, 1/1/1979 – 12/31/2015.**

	Russell 1000 Absolute-Risk Portfolio 1	Russell 1000 Absolute-Risk Portfolio 2	Russell 1000 Absolute-Risk Portfolio 3	INTECH U.S. Low Volatility	INTECH U.S. Managed Volatility
Russell 1000 Absolute-Risk Portfolio 1 <sup>*</sup>	0%				
Russell 1000 Absolute-Risk Portfolio 2 <sup>*</sup>	100%	0%			
Russell 1000 Absolute-Risk Portfolio 3 <sup>*</sup>	100%	100%	0%		
INTECH U.S. Low Volatility <sup>**</sup>	85%	85%	86%	0%	
INTECH U.S. Managed Volatility <sup>**</sup>	88%	89%	89%	54%	0%

**Table 4: Average Active Share Between Global Strategies, 1/1/1992 – 12/31/2015.**

	MSCI World Absolute-Risk Portfolio 1	MSCI World Absolute-Risk Portfolio 2	MSCI World Absolute-Risk Portfolio 3	INTECH Global Low Volatility	INTECH Global Managed Volatility
MSCI World Absolute-Risk Portfolio 1 <sup>*</sup>	0%				
MSCI World Absolute-Risk Portfolio 2 <sup>*</sup>	100%	0%			
MSCI World Absolute-Risk Portfolio 3 <sup>*</sup>	100%	100%	0%		
INTECH Global Low Volatility <sup>**</sup>	90%	90%	89%	0%	
INTECH Global Managed Volatility <sup>**</sup>	93%	92%	92%	45%	0%

**Table 5: Average Overlap of Trading Between U.S. Strategies, 1/1/1979 – 12/31/2015.**

	Russell 1000 Absolute-Risk Portfolio 1	Russell 1000 Absolute-Risk Portfolio 2	Russell 1000 Absolute-Risk Portfolio 3	INTECH U.S. Low Volatility	INTECH U.S. Managed Volatility
Russell 1000 Absolute-Risk Portfolio 1 <sup>*</sup>	100%				
Russell 1000 Absolute-Risk Portfolio 2 <sup>*</sup>	0%	100%			
Russell 1000 Absolute-Risk Portfolio 3 <sup>*</sup>	0%	0%	100%		
INTECH U.S. Low Volatility <sup>**</sup>	17%	17%	17%	100%	
INTECH U.S. Managed Volatility <sup>**</sup>	15%	16%	15%	41%	100%

**Table 6: Average Overlap of Trading Between Global Strategies, 1/1/1992 – 12/31/2015.**

	MSCI World Absolute-Risk Portfolio 1	MSCI World Absolute-Risk Portfolio 2	MSCI World Absolute-Risk Portfolio 3	INTECH Global Low Volatility	INTECH Global Managed Volatility
MSCI World Absolute-Risk Portfolio 1 <sup>*</sup>	100%				
MSCI World Absolute-Risk Portfolio 2 <sup>*</sup>	0%	100%			
MSCI World Absolute-Risk Portfolio 3 <sup>*</sup>	0%	0%	100%		
INTECH Global Low Volatility <sup>**</sup>	11%	11%	11%	100%	
INTECH Global Managed Volatility <sup>**</sup>	8%	8%	8%	48%	100%

<sup>\*</sup> This illustration is hypothetical and does not represent the returns of any particular investment. Investment advisory fees, trading commissions and other transaction based costs have not been deducted. Data Sources: Russell, MSCI, CRSP and RemotePlus.

<sup>\*\*</sup> See Simulations Disclaimer at end of paper for additional information regarding INTECH simulations.

From a purely trading perspective (Table 5), the 3 hypothetical Russell 1000 absolute-risk portfolios have no trades in common given that these three portfolios have no common holdings by design.<sup>8</sup>

INTECH U.S. Low and Managed Volatility portfolios have 41% of trades on the same side in common. From a trading perspective, these 5 absolute-risk portfolios have little or no trades in common.

In table 6, the 3 hypothetical MSCI World absolute-risk portfolios also have no trades on the same side in common; and the INTECH Global Low and Managed Volatility portfolios have 48% of trades on the same side in common – relatively low commonality in trades even though both strategies are tied to the same investment process and have similar objectives of reducing total risk.

## Conclusion

Investors worldwide have discovered the benefit of absolute-risk strategies: equity market exposure with lower levels of total risk. Asset growth in such strategies, however, has many investors wondering if “the trade is overcrowded.” Certainly, conventional or naive implementations of absolute-risk strategies, such as those employed by some index providers, may result in concentrated and exposed positions. We have argued, however, that the specter of overcrowding risk is based on an over-generalization.

Today, investors can select from a variety of absolute-risk solutions, evidenced by the dispersion of performance results in the category and high active share between

implementations. Varying philosophies, investment insights, security selection disciplines, portfolio construction practices and/or trading processes all contribute to these differences in outcomes. The greater the quality of the insight and the degree of uniqueness that characterizes a manager, the smaller the overcrowding risk.

For investors who value the differences in absolute-risk strategy design, overcoming potential overcrowding risk is relatively straightforward. By avoiding oversubscribed low volatility strategies or diversifying exposure among absolute-risk managers, investors can prudently access the benefits of this popular category while meeting the risk objectives of their overall portfolio.

<sup>1</sup> We use the term ‘absolute risk’ to collectively refer to various strategies with the objective of offering downside protection without compromising long-term returns; this class includes so-called minimum-variance/volatility, low volatility, managed volatility, and defensive strategies. Also, we focus on long-only equity strategies, i.e., those not relying on derivatives and other financial instruments. Total assets have grown consistently year-over-year per the eVestment All Low Volatility Equity universe from \$21 billion and 44 products with institutional assets in 2010 to over \$155 billion and 129 products as of March 31, 2016.

<sup>2</sup> The universe is comprised of U.S. equity strategies that attempt to achieve lower overall portfolio risk by focusing on minimizing the performance fluctuations of the portfolio and were compiled on 4/22/16.

<sup>3</sup> This is comparable to the eVestment US. Large Cap Core Equity Universe where the difference in manager returns ranged between 3.35% and 10.09% during the 10 years with a median difference of 4.62%.

<sup>4</sup> The global universe is comprised of global equity strategies attempting to achieve lower overall portfolio risk by focusing on minimizing the performance fluctuations of the portfolio and were compiled on 4/22/16. This is comparable to the eVestment Global Large Cap Core Universe where the difference in manager returns ranged between 3.40% and 11.79% during the 10 years with a median difference of 5.68%.

<sup>5</sup> For simplicity, the volatility of each stock is computed as the standard deviation of its total logarithmic returns over the previous month.

<sup>6</sup> The hypothetical Russell 1000 Low Volatility and the simulated INTECH U.S. Low Volatility/Managed Volatility portfolios start in 1979; the hypothetical MSCI World Low Volatility and the simulated INTECH Global Low Volatility/Managed Volatility portfolios start in 1992. All holdings are sampled on a quarterly basis for the portfolios. The simulated INTECH U.S. Low Volatility/Managed Volatility portfolios and the simulated INTECH Global Low Volatility/Managed Volatility portfolios include trading cost assumptions; the other portfolios do not. The addition of trading costs will cause returns to be lower over the long term for the latter portfolios.

<sup>7</sup> Active share is the percentage of the portfolio that differs from the reference portfolio. When there is no leverage or short positions, the active share will always be between 0% and 100%.

<sup>8</sup> In this context, common trades refers to buying or selling the same security, but does not include trading on opposite sides. The overlap of trading for two portfolios is the weight of common trades turnover divided by the sum of the turnover of the two portfolios.

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INTECH's simulated results have inherent limitations, including, among other things: 1) simulated results are prepared with the benefit of hindsight; 2) no price-based or volume-based deleted list; 3) no posted list; 4) index constituent changes done as a group at the beginning of the month (typically done once or twice a year based on the index changes); 5) simulated trades take place at the closing price (+80 bps for countries in the MSCI Emerging Markets Index and +40 bps for developed countries), while INTECH actually trades intra-day (historically, INTECH's domestic trading costs have been below the 40 bps used in the simulations); and 6) six trading tranches are simulated with the average of the six tranches being reported as the result for the period.

Past performance of simulated data is no guarantee of future results. Therefore, no current or prospective client should assume that future results will be profitable, or equal to either the simulated results shown or any corresponding historical index. In particular, simulations do not reflect actual trading in an account, so there is no guarantee that an actual account would have achieved the results shown. In fact, there may be differences between simulated results and the actual results subsequently achieved. In no circumstances should simulated results be regarded as a representation, warranty, or prediction that investors will achieve or are likely to achieve the results displayed, or that investors will be able to avoid losses. Investing involves risk, including fluctuation in value, the possible loss of principal and total loss of investment.

There are numerous other factors related to the markets in general or to the implementation of any specific trading strategy, which cannot be fully accounted for in the preparation of simulated results, all of which can adversely affect actual trading results. Any clients invested in the strategies shown may have experienced investment results during any relevant periods that were materially different from those portrayed in the simulations.

The simulated results include the reinvestment of all dividends, interest, and capital gains, but do not reflect deduction of investment advisory fees. Thus, simulated returns will be reduced by advisory fees and any other expenses that may be incurred in the management of an account, which will materially lower returns over time.

An index is unmanaged, is not available for direct investment, and does not reflect the deduction of management fees or other expenses.

Data Source: The Center for Research in Security Prices ("CRSP") Deciles are market value weighted benchmarks of common stock performance provided by the CRSP at the University of Chicago Booth School of Business. The CRSP universe includes common stocks listed on the NYSE, AMEX, and the NASDAQ National Market excluding the following: preferred stocks, unit investment trusts, closed-end funds, real estate investment trusts, Americus Trusts, foreign stocks and American Depositary Receipts.

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