

Comprehending Risk

Equilibrium-based investing capitalizes on opportunities that are lost on indexing strategies

BY WESTON WELLINGTON

In our previous article (*"Equilibrium-Based Investing,"* Advisor's Edge Report, Feb. 2007) we presented a brief history of passive investing and observed that this approach, once dismissed by many professionals as guaranteed mediocrity, has instead permanently reshaped the world of investing and what it means to be a successful investor. We also introduced the idea of "equilibrium-based investing" as an improvement over both actively managed and indexed investment strategies.

If the key factors determining investment results consist of identifying broad systematic risks and their related returns, equity investors should focus on two principal issues:

- ① What are the risk factors explaining differences in average returns among stocks? Which readily available criteria distinguish safer low-expected-return stocks from riskier high-expected-return stocks?
- ② What is the best way to engineer portfolio strategies to exploit these risk/return differences?

Most investors accept the idea that equity securities are priced to deliver higher returns as a reward for bearing additional risk than what riskless investments provide. The most reliable way to capture this expected equity premium is to hold a broadly diversified portfolio of stocks.

Is this the best that equity investors can hope for? Or are there other alternative strategies that offer the potential to achieve a premium relative to a straightforward broad-market strategy?

Researchers have found that additional factors explain differences in returns between one diversified equity portfolio and another. To date, the clearest manifestations involve size characteristics (market capitalization) and price characteristics (market value relative to fundamental measures such as earnings, dividends, or book value).

Although subject to misinterpretation, strategies focusing on low-priced stocks are often described as "value" while those emphasizing high-priced stocks are described as "growth." Evidence from markets around the world suggests that small-company stocks and value stocks, appropriately defined, have higher realized returns than large-company stocks or growth stocks.

RISK OR STYLE?

The distinction between value and growth or large cap and small cap is often positioned as a matter of style rather than as a risk/return tradeoff. In this view, the various styles wax and wane in popularity with investors, with little or no difference in expected return. Investors are tempted to enhance returns by periodically over-weighting one style at the expense of another ("now is the time to buy large-cap growth").

Conventional index benchmarks reinforce this explanation since they often show insignificant differences in realized returns over long periods between one style and another. As an example, the annualized return for the 28-year period ending Dec. 31, 2006 (the longest available) was 13.3% for the Russell 2000® Index (US small-cap stocks) and 13.47% for the Russell 1000® Index (US large cap stocks). Terminal wealth for the small-cap strategy was 4% lower than for the large-cap strategy.

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An alternative measure of U.S. small company performance tells a different story. For the same 28-year period, the Dimensional US Small Cap Index had an annualized return of 14.63% and terminal wealth was 33% greater than for the Russell 1000® index.

We are not suggesting that indices constructed by Russell or other index sponsors are improperly constructed; they are designed to achieve different objectives. Index benchmarks are designed to offer comprehensive representation of market behaviour and provide a performance standard for active money managers. They are not necessarily intended as blueprints for optimal investment strategies. Rather than isolating risk factors in a more concentrated form, they are representative of a broad equity universe.

A RISK-BASED ALTERNATIVE

If the risks that investors care about are captured only loosely

by conventional market benchmarks, then alternative strategies that target these dimensions of risk with greater precision offer the potential to improve portfolio performance without sacrificing the virtues of passive investing. An additional benefit is greater precision in analysis of both active strategies and conventional passive strategies.

This is where equilibrium-based investing begins to part company with conventional indexing. Popular benchmarks generally identify an eligible equity universe whose constituents meet certain minimum standards for trading liquidity and other factors. The universe is then divided into sub-indices (large cap, small cap, etc.) that equal the entire universe when added back together.

This approach is appealing for its simplicity and comprehensive coverage. Equilibrium-based investing strategies approach the issue from a different perspective, seeking to target the risk factors that drive returns by distinguishing riskier high-expected-return stocks from safer lower-expected-return stocks with greater precision.

This is a subtle but important

distinction. Building on research by finance professors Eugene Fama and Kenneth French, alternative indices reflecting this engineering approach identify greater return differences among broad groups of stocks, providing a sharper definition of the factors driving performance.

The data below shows returns for various Russell indices since their inception in 1979 compared to alternative Dimensional indices.

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TRACKING ERROR: VICE OR VIRTUE?

When compared to conventional indexed strategies, equilibrium-based investing employs a different approach not only to risk-factor engineering, but also to trading and reconstitution.

Index funds are often evaluated on their ability to minimize tracking error relative to a stated benchmark. Some investors assume that once the decision is made to pursue a passive investment strategy, successful implementation involves selecting managers who can deliver the return of a selected benchmark at minimal explicit cost and with as little tracking error as possible. In a

frictionless world, minimizing tracking error would be a costless effort and might be a worthwhile pursuit. But in practice, reducing tracking error can be an expensive exercise, even though the costs may not be directly observable.

Index sponsors establish reconstitution rules specifying how and when securities are added or deleted from the index. Some indices are reconstituted on a specific calendar cycle (annually for Russell indices) while others are adjusted periodically throughout the year (Standard & Poor's). In all cases, however, index sponsors announce the additions or deletions in advance of a specified reconstitution date.

Index fund managers seeking to minimize tracking error will place "market-on-close" orders (facilitated by brokerage firms eager for the business) assuring them of a trade price that matches the closing price on reconstitution day.

Trading volume in these stocks generally surges on reconstitution day, reflecting the temporary demand from index fund managers who are obligated to purchase or sell the stock if they seek to match the return of the index.

Researchers and arbitrageurs have identified a "price pop" effect subsequent to reconstitution announcements: Prices for stocks identified as index additions (deletions) tend to have an up-pop (down-drop) just after the

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PERCENT ANNUALIZED RETURN

	Period Ending December 31, 2006			
	5 YEARS	10 YEARS	25 YEARS	28 YEARS
Russell 3000® Index (broad US equity market)	7.16	8.64	13.06	13.40
One-Month US Treasury Bills	2.32	3.60	5.33	6.08
Equity Premium	4.84	5.04	7.73	7.32
Russell 2000® Index (US small companies)	11.39	9.44	11.85	13.30
Russell 1000® Index (US large companies)	6.82	8.64	13.25	13.47
Size Premium	4.57	0.80	-1.40	-0.17
Dimensional US Small Cap Index	13.17	12.08	13.38	14.63
Dimensional US Large Cap Index	6.50	8.41	13.19	13.45
Size Premium	6.67	3.67	0.19	1.18
Russell 1000® Value Index	10.85	11.00	14.56	14.60
Russell 1000® Growth Index	2.69	5.44	11.48	11.89
Value Premium (large cap)	8.16	5.56	3.08	2.71
Dimensional US Large Cap Value Index	11.15	12.25	16.26	16.51
Dimensional US Large Cap Growth Index	1.17	1.51	9.94	9.92
Value Premium (large cap)	9.98	10.74	6.32	6.59
Russell 2000 Value Index	15.38	13.27	14.89	15.92
Russell 2000 Growth Index	6.93	4.88	8.40	10.32
Value Premium (small cap)	8.45	8.39	6.49	5.60
Dimensional US Small Cap Value Index	20.14	18.08	17.97	18.76
Dimensional US Small Cap Growth Index	4.87	2.53	5.82	7.87
Value Premium (small cap)	15.27	15.55	12.15	10.89

Source: Frank Russell Company is the source and owner of Russell data. Dimensional data provided by Dimensional Fund Advisors. Indices not available for direct investment. Their returns do not reflect the expenses associated with the management of an actual portfolio. Returns data represents past performance and does not predict future performance.

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announcement, followed by a rise (fall) between announcement day and reconstitution day as market participants bid the price up or down in anticipation of the temporary spike in demand from numerous index fund managers.

In trading sessions subsequent to reconstitution day, prices for newly added securities tend to unwind their previous temporary gains. The same phenomenon works in reverse for stocks about to be deleted.

Relaxing the importance of tracking error not only sidesteps the reconstitution problem.

In this sequence of events, index fund managers succeed in minimizing tracking error since their portfolio holdings match those of the index sponsor as closely as possible. But at what cost? To the extent prices for index additions and deletions are temporarily distorted to meet the demand of index fund managers, the returns of the index itself are penalized. Investors who make low tracking error a priority bear the costs of this activity.

PATIENCE REWARDED

Relaxing the importance of tracking error not only sidesteps the reconstitution problem but may also provide benefits for day-to-day portfolio trading. Total transaction costs include brokerage commissions as well as the price impact of making trades, and costs for the latter may be significantly greater.

One prominent consultant who conducts trading-cost analysis for institutional investors has likened trading costs to an iceberg: The visible portion (brokerage commissions) represents only a small percentage of the total mass – the rest is hidden beneath the surface. Market impact is a zero-sum game: to the extent one party is penalized, someone else is reaping the benefit.

Where does equilibrium-based investing fit in? Like an index strategy, equilibrium-based investing targets a broad group of eligible securities and avoids the costs and uncertainty of security selection and market timing (holding cash when “predicting” a market downturn) associated with conventional active management.

Unlike an index strategy, minimizing trading costs receives greater attention than rigid adherence to mechanical portfolio rules. Index strategies are liquidity seekers, since in their eagerness to

minimize tracking error they are forced to buy securities to match a target security weight. Without the constraints imposed by tracking error concerns, equilibrium-based investing strategies are free to pursue a patient and opportunistic approach to trading that offers the potential to enhance net returns.

Ideal portfolio weights are established for eligible securities, but these are long-run targets, not mandates that call for immediate action.

To minimize transaction costs, securities are purchased or sold gradually over a period of weeks or months to approach target weights. Trading flexibility includes the freedom to negotiate large block purchases at below-market prices to earn extra compensation as a liquidity provider. Reconstitution is done on a dynamic basis, with new stocks entering or leaving the eligible universe on a daily basis.

A patient trading approach seeks to shift the burden of transaction costs to those most eager to trade; in any negotiated transaction, the party in a hurry to complete the deal is at a disadvantage.

A THIRD WAY

A belief that markets price securities incorrectly leads traditional active managers to seek out “mispriced” stocks and industries. A belief that markets are unbeatable leads traditional passive managers to mimic established indices. Neither approach is likely to discover the uncharted dimensions of capital markets that reward investors over time or to find effective ways to harness them.

In seeking a more comprehensive explanation for the risk factors driving capital market returns and greater flexibility to engineer strategies to capture them, equilibrium-based investing offers not only a potentially more rewarding experience for investors, but also a sturdier foundation for advisors seeking to develop a sustainable business regardless of how securities markets behave.

In our final instalment, we will explore what equilibrium-based investing means for the financial practitioner. **AER**

Weston Wellington is a vice-president of Dimensional Fund Advisors. Dimensional applies academic research to the practical world of investing. Headquartered in Santa Monica, Dimensional manages more than \$140 billion in assets worldwide as of Dec. 31, 2006 for institutional investors and the clients of selected financial advisors. Dimensional was founded in 1981 and opened its Vancouver office in 2003 to provide Canadian investors with access to a broad range of equity and fixed income strategies.

Investing Evolved Continued from page 11

in a typical factor model, simple matching of past exposures to risk factors cannot explain out-of-sample data behavior.

Another clever approach has been proposed by Harry Kat, Gaurav Amin and Helder Palaro. In a series of recent papers, Kat and collaborators have developed a derivatives-based approach that helps in capturing the nonlinear nature of hedge fund returns.

The cleverness comes from specifying a “reserve asset,” an asset which becomes the source of the returns distribution. By specifying complex multivariate processes, a replication methodology is produced that purportedly accounts for optionality and nonlinearity in hedge fund returns.

Investors should care only about what happens at ‘maturity’ of the investment, at the time horizon, although returns can fluctuate wildly over the investment period.

It is also claimed that both hedge fund of fund returns and single-strategy hedge fund returns can be accurately replicated, dispensing investors from complex and costly due diligence, manager fees, low liquidity and low transparency.

Kat and partners now offer this approach commercially under the FundCreator name.

Other replication approaches have recently been propounded and made commercially available, in addition to FundCreator: JP Morgan and its Alternative Beta Index; Goldman Sachs and its Absolute Return Index; Lars Jaeger and Partners Group; and Merrill Lynch and its Factor Index.

Interestingly, these approaches are based on factor-based replication, whereas Kat and his associates stand out with their payoff distribution approach.

Nature abhors a vacuum, and a good controversy. There is some trepidation in professional circles as to what method is preferable. EDHEC researchers, such as Noël Amenc, Jean-Christophe Meyfredi, and Lionel Martellini, whom I interviewed recently, have recently taken the position of arbiters in this debate in producing research purporting to reproduce the research done by the different replicators.

More precisely, they have used published research to reconstruct factor-based approaches and payoff distribution approaches.

Their verdict is decidedly mixed. They claim that the ‘right’ way to model hedge fund returns is through a factor approach, as it is the only one that upholds the cause-and-effect linkage between observed returns and what triggers them.

CAVEATS

Two problems emerge, though: First, it is never easy to identify a priori the right factors, and the right number of factors; second, as noted above, out-of-sample robustness is not there yet.

They then look at Kat et al.’s payoff distribution approach, based on a S&P500 reserve asset. They conclude that the payoff distribution methodology is best at replicating certain types of hedge fund strategies, among which, those that show the greatest regularity.

Moreover, an inherent problem with this approach is that it is based on terminal values: Investors should care only about what happens at “maturity” of the investment, at the time horizon, although returns can fluctuate wildly over the invest-

ment period. In other words, this is a ‘buy and hold’ approach of sorts and thus may not be for all investors (*see Convertible Arbitrage Index and Fixed Income Arbitrage Index, below*).

In conclusion, hedge fund replication is seriously controversial from an academic standpoint. Kat has responded strongly to EDHEC’s analysis by indicating that it is not reasonably possible to reproduce proprietary methodologies from published research. I don’t disagree: the proof is in the numbers, so replicators will have to show they can deliver the goods consistently.

What are the takeaways of all this? First, the hedge fund industry is working hard to separate alternative beta from alternative alpha.

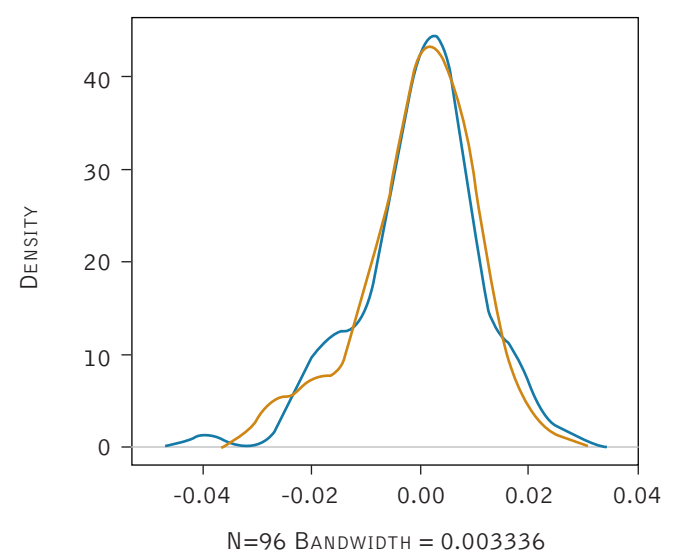
Second, attaining synthetic effective hedge fund replication could open hedge fund investing to a vast number of new investors.

And third, you can be sure you will hear more on this topic, as it is truly leading-edge.

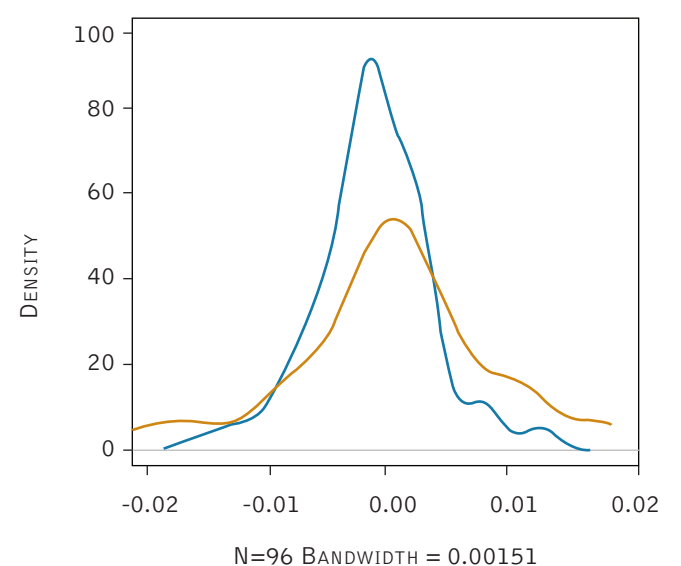
As usual, you’ve read it here first. **AER**

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CONVERTIBLE ARBITRAGE INDEX*



FIXED INCOME ARBITRAGE INDEX*



* Best and worst distribution fits, payoff distribution approach, EDHEC-Risk analysis.

Source: EDHEC-Risk