Vanguard®

ETF Perspectives

Vanguard insights for financial advisors™

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Indexes map world markets differently

CRSP, S&P, and Russell indexes are similar, but distinctions matter

When cartographers make a flat map of a round world, they must choose how to best represent the Earth's surface. Some map projections better illustrate populous areas; others are more accurate for directions. Each approach has its fans.

Likewise, indexes represent global stock and bond markets. Major index providers—such as CRSP (Center for Research in Security Prices), S&P Dow Jones Indices, and Russell Investments—employ similar methodologies, and their indexes have been fairly accurate in tracking markets. But some financial advisors may not know that, as with maps, there are important differences between index providers' methodologies that they should consider when choosing index-based ETFs and mutual funds.

Carefully mix and match

The most important rule of thumb is that advisors should not mix products based on different index providers, said Rodney Comegys, the head of the Index Analysis and ETF Trading Teams and who led the initiative to change the benchmark indexes for 22 Vanguard funds in 2013. Such selections can potentially leave gaps or overlaps in a portfolio.

For example, a portfolio that tries to capture the U.S. market with a fund based on the Standard & Poor's 500 Index and another fund based on the Russell 2000 Index or the CRSP US Small Cap Index would be missing about 500 mid-capitalization stocks.

"You would have made an inadvertent decision that caused a securities gap," Comegys said. "That's a major hole in the middle."

On the other hand, a portfolio with both S&P 500 and CRSP US Mid Cap Index holdings would result in an overlap since many of the CRSP index's mid-cap stocks are also in the S&P 500.

"It's best to make a consistent choice among index providers," Comegys said.

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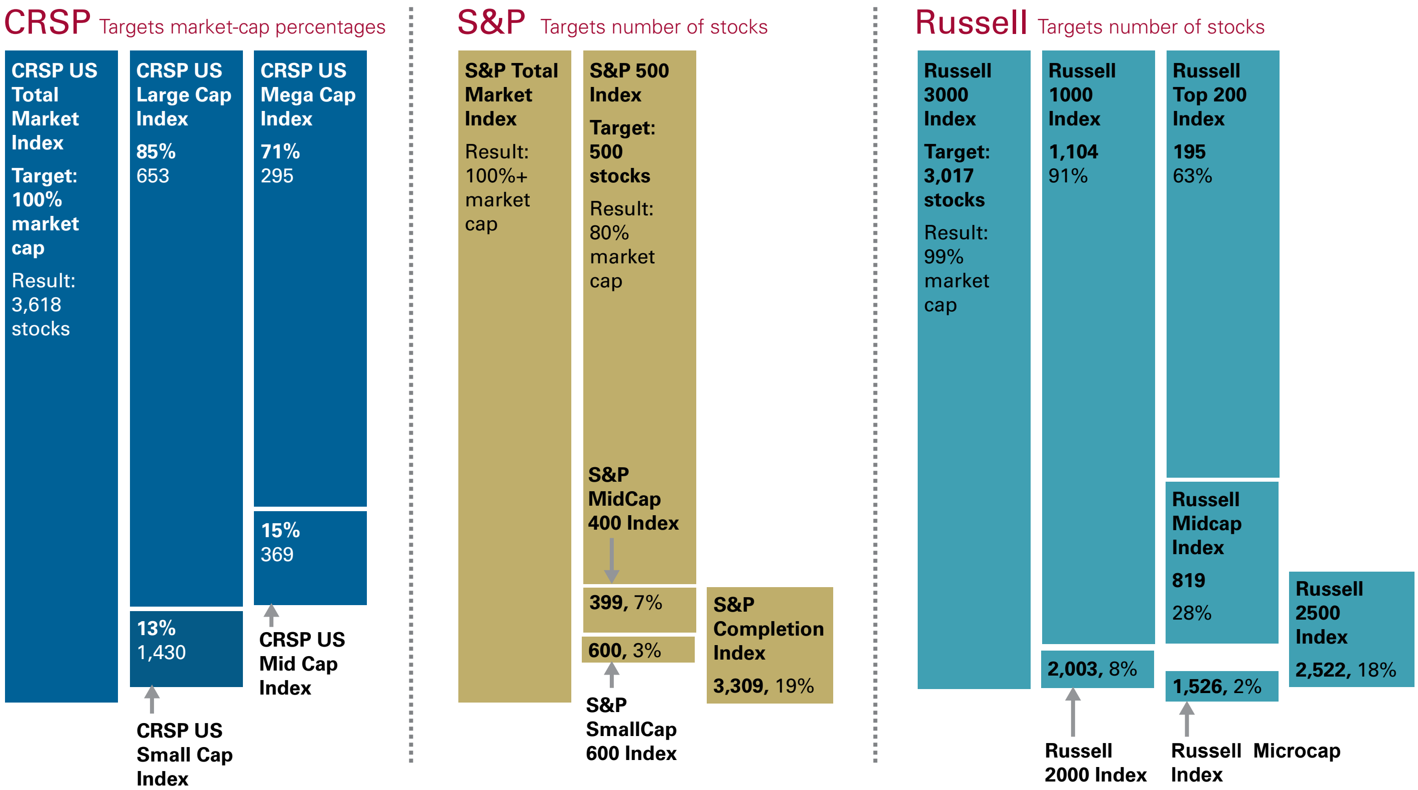


Sources: CRSP, Russell, and S&P. Note: CRSP, Russell, and S&P market-capitalization ranges calculated by FactSet as of December 31, 2013.

Investment beliefs

The easiest way to avoid gaps or overlaps is to choose a product that covers the majority of the U.S. stock market, such as the CRSP US Total Market Index. With more than 3,600 securities as of January 31, 2014, this index includes 99.5% of U.S. equities by market cap, Comegys said.

But advisors often use multiple products to capture the market, usually for tactical asset allocation or tax-harvesting reasons. In the latter case, advisors can sell losing positions to offset capital gains elsewhere in portfolios.

The most basic decision for such advisors is whether to cover the U.S. equity market with three funds—mega-, mid-, and small-cap—or simply with a large- and a small-cap fund, Comegys said.

Sometimes, advisors choose products to express investment beliefs, such as a conviction that small-cap value or dividend-paying stocks will outperform over time.

When choosing products based on the various indexes, advisors should be aware of how the indexes are put together and what sections of the market they represent.

This is not as much of a choice based on quality as it was 12 years ago, when former Vanguard Chief Investment Officer Gus Sauter wrote a seminal article in the *Journal of Indexes*[1] that outlined what became the best practices in the industry.

Now, most larger index providers follow such principles. They include using float-adjusted indexes (that is, indexes that include only shares available to the general public), providing objective definitions for value and growth stocks as well as for large- and small-cap stocks, and defining market capitalization with bands so stocks can drift gradually from small- to large-cap status.

1 Sauter, Gus, 2002. *Index Rex: The Ideal Index Construction.* Journal of Indexes, 2d. quarter.

"There's been convergence around basic procedures. Indexes are more equal, more commoditylike these days," said Walter Lenhard, a senior investment analyst in Vanguard Equity Investment Group.

Nonetheless, some variations are notable. S&P, for instance, uses a committee system, along with a set of rules, to choose stocks in its ubiquitous S&P 500 Index. One rule employed by S&P is the requirement that a company be profitable for a year after it goes public. For instance, Facebook was not added to the index until 19 months after its initial public offering.

"The committee structure can be viewed as subjective," Comegys said. "Committees don't have computers or models decide. They have humans do it, and they do a good job."

Where providers draw the lines

The S&P 500, S&P MidCap 400, and S&P SmallCap 600 Indexes together still leave out about 10% of the U.S. stock market, by market cap. But the S&P Completion Index, which Vanguard Extended Market Index Fund seeks to track, complements the S&P 500, so the two combined provide full market coverage.

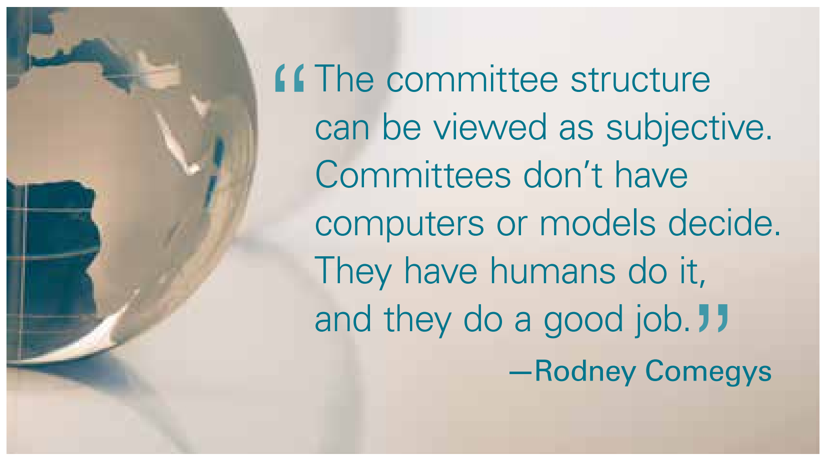
Russell's indexes capture the entire market, but Russell makes a sharp division between large- and small-cap stocks. Each June, Russell ranks stocks based on market capitalization. The Russell 1000 Index encompasses the top 1,000 stocks in the broad-market Russell 3000 Index, while the Russell 2000 Index captures the other 2,000, which include even micro-cap stocks.

Yet between value and growth stocks, both S&P and Russell provide a middle ground for issues that do not fit neatly into either category.

CRSP, based at the University of Chicago, is a relatively new index provider. But Comegys said CRSP had the benefit of using its ample library of historical stock data and the practices of other index providers to help undergird its methodology.

As a result, CRSP is thorough in using proportional, float-adjusted market-cap weighting. CRSP also distinctly delineates across the value-growth spectrum, Comegys said.

"What advisors like about CRSP methodology is that there tends to be more of a pure break; there's not a lot of stocks that sit in the middle," Comegys said. "CRSP makes a determination that a security is either value or growth. The only time it lies in between is when it's moving across. There's a little more purity. S&P and Russell have techniques that, if a stock is hard to define, they split parts of it in both."



Nonetheless, Vanguard research has shown that there is no empirical evidence that any ETF or fund based on a particular index provider will outperform over time (*Determining the appropriate benchmark: A review of major market indexes*, Philips and Kinniry, 2012).

Therefore, advisors who want to make tactical allocations in clients' portfolios should feel free to decide which product best fits their needs.

"That's why we've gone to an unbridled multiple benchmark lineup," Lenhard said. "We offer widely used U.S. equity indexes—Russell, S&P, CRSP—and let the advisor decide."

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Equity methodology for major U.S. index providers

	S&P	Russell	CRSP
Weighting methodology	Float-adjusted market capitalization.	Full market capitalization, adjusted for free float only after inclusion in index.	Float-adjusted market capitalization.
Construction methodology	Based on criteria established by S&P committee.	Rules-based.	Rules-based.
Rebalancing methodology	Changes made on as-needed basis. No annual or semiannual reconstitution.	Annual rebalancing in June, subject to capitalization banding (+/– 2.5%) as of 2007.	Quarterly rebalancing, with security migration subject to "packeting."[1]
Securities makeup	Securities that reflect the U.S. equity markets and, through the markets, the U.S. economy.	Publicly traded companies in the United States with market caps greater than $30 million.	U.S. equities traded on NYSE, Nasdaq, or NYSE Arca.
Growth criteria	Trailing three-year earnings per share (EPS) growth. • Three-year sales growth. • Momentum—12-month percentage price change.	• I/B/E/S forecast medium-term growth (two years). • Sales per share historical growth (five years).	• Consensus long-term growth forecast from I/B/E/S. • Consensus one-year forecast from I/B/E/S. • Three-year growth in EPS. • Three-year growth in sales per share. • Current investment-to-assets ratio. • Return on assets.
Value criteria	• Price/book ratio. • Price/earnings ratio. • Price/sales ratio.	• Price/book ratio.	• Book/price ratio. • EPS consensus forecast one year ahead divided by stock price. • Most recent EPS divided by stock price. • Dividend/price ratio. • Sales/price ratio.
Growth and value crossover	Style indexes—limited overlap between growth and value indexes. Pure style indexes—stocks placed in either growth or value index.	Securities may be classified proportionately in both growth and value indexes.	Securities may be classified proportionately in both growth and value indexes.

1 CRSP's methodology introduces the concept of "packeting," which cushions movements between adjacent indexes and allows holdings to be shared between two indexes of the same family. At reconstitution, if a company has moved significantly through a breakpoint to the core of an adjacent index, a packet of 50% of the total holdings of the company is moved between the indexes. The objective is to maximize style purity and minimize turnover.

The folly of following the herd

Brandon Clark is head of the ETF Capital Markets Team at Vanguard. His team works with Vanguard sales executives to help advisors obtain best execution on large orders. The team also works with market makers to ensure they understand Vanguard ETFs®.

Timing the market is a tricky—and mostly fruitless—pursuit. That's why Vanguard stresses the importance of staying the course. That approach also makes sense from a trading perspective.

One of the beauties of ETFs is that they most often trade inside the cost of trading the underlying basket of stocks, saving investors the cost of assembling the basket of stocks on their own. And traders have the unique advantage of choosing whether to trade the ETF or the underlyings, which can save on execution costs, assuming the order size is sufficiently large.

For example, let's say everyone is selling small-capitalization stocks. The choice of whether to trade individual stocks or a small-cap ETF is driven by cash flows into or out of the ETF. If it's selling at a premium, it's better to buy the underlyings if you are placing a sufficiently large order. If it's selling at a discount, it's better to buy the ETF. Understanding these multiple layers of liquidity can help you adjust your trade execution as premiums or discounts in the ETF widen.

Many of the outlier premium/discount events result when the herd is chasing performance, selling out of positions that are underperforming or reacting to short-term volatility in the financial markets. Cash flows push the ETFs to the boundaries of their premiums/discounts, only to have prices revert to their historical averages in a few days.

Advisors are often worried about getting best execution, and they should be, but when you are reacting with everyone else, you have to wonder, what does best execution look like?

Staying the course can offer trading advantages in two ways:

Rebalancing an account: If you are selling out of your winners as everyone else is buying them, you may receive a premium on your trade price. If you are reallocating into an asset that is selling off, you could receive a discounted price.

Recurring investments: While paying attention to premiums and discounts can benefit your clients when rebalancing, it is less important as recurring investments are made based on a client's long-term strategy. Generally speaking, the effect of market volatility tends to wash out over the long term.

Having the fortitude to rebalance can protect you and your clients from the folly of following the herd and paying the herd penalty, which can add up over time. By contrast, having a reactive investment approach can mean getting bruised by the stampede into or out of any asset class.

Market pulse, smart beta, global strategies—Our panel answers your questions

We gathered a number of Vanguard leaders together in February to get their take on some of the questions we most often field from advisors. On the panel were Joseph Brennan, head of Vanguard Equity Index Group; Joel Dickson, a senior investment strategist in Vanguard Investment Strategy Group; and Gregory Davis, the new head of Vanguard Fixed Income Group.

What did you tell clients who were concerned that the stock market was overvalued early this year?

Brennan: Two things. First, we discussed how price/earnings (P/E) ratios[1] contracted for most of the prior decade. Prices came down faster than earnings early in the decade, and when earnings finally stabilized, prices didn't respond. It wasn't until this decade that P/E ratios finally began to expand, meaning we've been in a catch-up phase. People often wait until a stock market recovery is obvious before they respond, which often makes P/E contractions last longer than is justified. In short, I'd say the market was more fully valued than in recent years in January, but it wasn't in bubble territory.

Second, trying to time market cycles is a hard way to make a living. Very few investors have successfully timed the market at the macro level. I counsel advisors to stick to long-term allocations based on their clients' risk tolerance, needs, and time horizons. Peeling off some equity holdings to rebalance periodically into other asset classes is the better discipline rather than trying to ride the market's ebbs and flows.

> "If a client is invested in a total bond index fund with an intermediate duration, there's nothing to be afraid of if the client's horizon is longer term."

Gregory Davis
Vanguard Fixed Income Group

Many investors have reduced or shifted their bond exposure because of concerns over rising interest rates. Your thoughts?

Davis: Rising rates are already priced into the market, based on the shape of the yield curve. The question is whether rates rise more or less than the consensus view. If an investor's time horizon is longer than the duration[2] of his or her bond portfolio, the investor will benefit from rising rates as coupon payments and principal are reinvested at higher rates. If an investor's time horizon is less than the duration of the bond investment, the investor will be worse off because he or she won't have time to generate sufficient income to make up for lost principal.

For example, if a client is invested in a total bond index fund with an intermediate duration, there's nothing to be afraid of if the client's horizon is longer term.

Advisors need to keep in mind the critical role that bonds play in diversifying a portfolio, regardless of the interest rate environment. In the event of a stock market correction, you want to make sure clients have a portion of their portfolios in high-quality[3] bonds to provide some downside protection.

Dickson: When people discuss rising rates, I often find they are thinking in terms of the yield curve moving up in parallel fashion, as opposed to a change in the yield curve's shape.

Let's say an investor moved to a shorter duration in fear of rising rates. If rates move up evenly along the yield curve but it takes several years for that scenario to play out, the investor would have given up significant income because of the steepness of the yield curve. That could

1. A valuation ratio of a company's current share price compared with its per-share earnings.
2. A measure of the sensitivity of the price (the value of principal) of a fixed income investment to a change in interest rates. Duration is expressed as a number of years. Rising interest rates mean falling bond prices, while declining interest rates mean rising bond prices.
3. A bond whose credit quality is considered to be among the highest by independent bond-rating agencies.

be a significant opportunity cost. Alternatively, if short rates go up more than anticipated, the investor actually would have done better to remain at the long end of the yield curve.

Interest rates, like stock prices, can move based on unexpected information. Because we don't know what will happen, it's important to maintain exposures to U.S. Treasury, corporate, and mortgage-backed securities. They all can help with the range of scenarios that can occur.

Do you think factor-based indexing and smart beta[4] have changed the conversation around indexing?

Brennan: There have always been investment fads, and there always will be as long as investment managers compete for dollars. Marketing takes pure investment ideas, repackages them, and tries to get people to buy them. What some providers are calling indexing we consider active management. Any time you invest in a way that deviates from what the market has priced in using market capitalization—that's an active tilt. It's not bad or evil; it's just not indexing.

Our main caution to investors in these products is to pay attention to price and to methodology. Know what you are buying.

Dickson: The development and growth of ETFs have blurred the lines between active and passive. Indexing has expanded to include the tracking of indexes that represent rules-based active management strategies. What we have seen is an evolution of what people seek to track in terms of indexes and how people are using index-tracking funds in portfolio strategies.

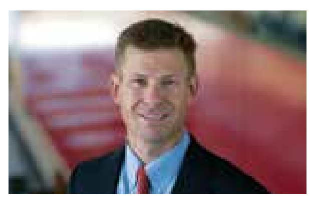
The main concern with alternatively weighted indexes is that investors are giving up control and consistency in their exposures, often at a higher cost than could be achieved through similar exposures in market-cap-weighted index vehicles.

Has the popularity of alternative indexes complicated the rules of portfolio construction?

Brennan: Advisors combine these different exposures because they are seeking to pull out volatility and return streams that might not be correlated with each other or the rest of the portfolio. One problem with the due diligence on these products is that you need historical returns and volatility to mock up the history; however, there isn't much history on these products and much of the "history" is based on hypothetical data.

Second, advisors using a core-satellite structure should not consider an alternative index product as a replacement for the core investment. Alternative indexes have the components of a satellite (concentrated beta, future alpha[5] opportunity, volatility reduction), not of a core, investment. We don't see them as an alternative to indexing. We don't even see them as indexing.

> "Marketing takes pure investment ideas, repackages them, and tries to get people to buy them."



Joseph Brennan
Vanguard Equity Index Group

Dickson: A lot of what we're seeing in ETFs today is the same as what we saw in the mutual fund industry 25 years ago, when investment managers and advisors were creating mutual fund wrap programs and wirehouses were building model portfolios of traditional mutual funds. We suggest that advisors considering adding fundamental indexes look at how the addition fits into their overall strategy. There are tools that can help you assess the total risks in the portfolio, which is more important than selecting individual ETFs based on a case-by-case approach.

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4. A measure of the magnitude of a portfolio's past share-price fluctuations in relation to the ups and downs of the overall market (or appropriate market index).
5. A measure of performance on a risk-adjusted basis. Alpha takes the volatility (price risk) of a mutual fund or ETF and compares its risk-adjusted performance with that of a benchmark index. The excess return of a fund relative to the return of the benchmark index is the fund's alpha.

“I’m encouraged by how investors responded to last year’s market surge. I remember when the question would always be “Why didn’t I make 32%?” if the S&P 500 Index was up 32%.”

Joel Dickson
Vanguard Investment Strategy Group

Vanguard transitioned 22 funds and their ETF Shares, if they had any, to new indexes last year. How did that go?

Brennan: All the transitions went incredibly well. We believe, based on many comments from the Street, that they were fairly undetected in the marketplace, which was the goal. It was a credit to our management teams that they chose venues where we could transact without disadvantaging our clients.

Joe, you spent four years in Australia as chief investment officer of the Asia Pacific region and a director of Vanguard Investments Australia. Any take-aways for advisors from this period?

Brennan: I was struck by how far global investing has come for all investors. People still have a home-country bias, but individual investors, advisors, and institutional asset managers have all become much more global in their thoughts and processes. It helps that the cost of investing globally has come down as the number of competitors, including Vanguard, has increased.

Investors have their own unique way of thinking about things, but at the end of the day, they are always interested in better advice and lower prices. I think Vanguard has had a strong entry into Canada, the United Kingdom, and Asia because we have worked well with advisors who are delivering on those essentials.

Greg, you took over Joe’s role in Australia before moving back to Pennsylvania. Any additional observations?

Davis: I’ve seen a prevalence of home bias in Australia and Asia. But all investors face the same challenge of how to generate additional yield. What we tell U.S. advisors applies equally in Australia: Understand your clients’ goals and risk tolerance, construct low-cost diversified portfolios, and take the long-term view. As part of that, we’ve been encouraging greater adoption of international exposures on both the equity and the bond sides and, specifically, a currency-hedged[6] approach to international bond indexing.

You recently took over from Vanguard legend Bob Auwaerter. Any changes afoot?

Davis: No. He assembled a very talented group with tremendous experience on the research side, the portfolio management team, and the trading side. We have investment processes on the index and active sides that have performed extremely well, so there’s no need for significant change.

Is there any advantage to indexing your international bond exposure, rather than having it actively managed?

Davis: The return distribution is much smaller for bonds compared with equities, and this is especially true in a low-yield environment. The drag of turnover and transaction costs is therefore more acute, especially when dealing with less liquid corporate and emerging market issues. We feel that active managers have a high hurdle to overcome in international bond markets, while an index product provides broad diversification across all sectors at a lower cost.

Are investors more realistic about future market returns?

Dickson: I’m encouraged by how investors responded to last year’s market surge. I remember when the question would always be “Why didn’t I make 32%?” if the S&P 500 Index was up 32%. Now investors accept the value of having bonds and emerging markets in their portfolios—and that means the full portfolio won’t necessarily produce the return of the better-performing asset class each year.

6. Currency hedging risk is the chance that currency hedging transactions may not perfectly offset a fund’s foreign currency exposures and may eliminate any chance for the fund to benefit from favorable fluctuations in those currencies.

Value add: Using Portfolio Analytics to introduce passive investments

Storytellers use many tools to convince their "clients"—that is, their listeners or readers—to view the world in a different way than they had previously. One such tool familiar to most of us is the old saw, show, don't tell.

When it comes to explaining abstract investing strategies to clients, the storyteller's axiom might be equally helpful advice for financial advisors. For instance, what better way to convey to a client the advantages of adding passive holdings to a portfolio than to create a model—and to let the client see the potential results—before committing?

The advantages of reducing active management risk by adding passive investments are well-known (see the Vanguard white paper *Enhanced practice management: The case for combining active and passive strategies,* Philips, Kinniry, and Schlanger, 2012):

- Reduced volatility relative to the market.
- Reduction of costs and potentially increased tax efficiency of the portfolio.
- Mitigation of the significant underperformance that historically has resulted from active management.

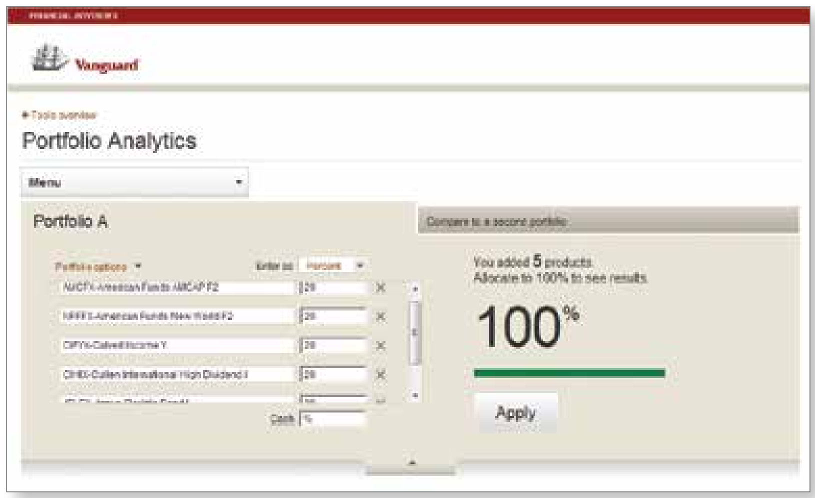
Intellectually, this makes sense. But how does an advisor illustrate the idea to clients convincingly, especially when choppy portfolio performance brought on by volatile markets may lead clients to question their advisors' strategy?

The Portfolio Analytics tool from Vanguard, launched this past winter, offers one data-driven, visually compelling approach to help advisors better tell their investing-strategy story.

In creating the tool, Vanguard called upon Morningstar, Inc., to provide the tool's comprehensive investment-portfolio data and metrics.

Kevin Loffredi, vice president of Integrated Web Tools for Morningstar, said, "The tool offers advisors a beautiful, robust, and streamlined interface that provides a detailed view of an investor's current and proposed portfolios."

The Portfolio Analytics tool main screen allows a user to enter up to 50 products per portfolio



Advisors weigh in

In developing the tool, we went straight to advisors to find out what they wanted most in analytics software. Among their responses: ease of use, versatility, and customization.

Advisors also shared what they'd rather do without: being constrained to use one company's proprietary financial products, limited functionality that makes it necessary to use multiple programs, and tools with a learning curve so intimidating that much of their capability goes unused.

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Value add: Using Portfolio Analytics to introduce passive investments *(continued)*

Adding passive funds, simplified

The tool can help an advisor identify portfolio gaps, evaluate risk, and more.

Adding passive holdings is simple: Copy the existing portfolio; type in the new, passive holdings; and adjust the weightings accordingly.

The click of a button delivers a near-instant, at-a-glance comparison of the original and modified portfolios.

After conducting extensive research, development, and, finally, testing, in the first quarter we unveiled our response to the advisors' feedback. The Portfolio Analytics tool is both simple to use and brimming with powerful features.

The tool's developers designed it to deal with common situations advisors face. For instance, advisors are typically working with portfolios that have already been built. It's a simple matter to type in an existing portfolio (with up to 50 holdings), run an analysis, and, if desired, save that analysis for later use.

It's also easy to modify a portfolio and view the differences in how it would have performed before and after the changes. Regarding the example of adding passive investments, some advisors would like to do just that with their clients' portfolios but aren't sure where or how to start. The tool provides a springboard by letting users compare the performance of an actively managed portfolio side by side with that of a portfolio that includes passive investments.

Saving advisors time

"As an advisor, one challenge is to find tools that help me save time in conducting research and add value to our clients," said Steven A. Gattuso, a senior portfolio manager with Courier Capital Corporation in Buffalo, New York. Gattuso said Portfolio Analytics helps him on both fronts.

"It is a great product for analyzing prospective client portfolios, developing 'what-if' scenarios, and then presenting those in a very professional format that I can use in speaking with my clients," Gattuso said.

For all its outward simplicity, the tool provides an exquisite level of detail for those advisors who want and need deeper levels of analysis. In analyzing two portfolios of ETFs, mutual funds, and individual stocks side by side, the tool provides hypothetical performance, risk statistics, asset allocations, sector breakdowns, weightings by world regions, and other stock and bond characteristics (holdings-based analysis).

Produce, save, and share detailed analysis summaries

The "Generate Report" feature lets an advisor add a cover page, title, advisor and firm name, as well as client name.

Advisors can easily create reports of their analyses for clients and share them as print copies or e-mail attachments.

Compare and customize

Want to know what difference a few securities would make in a portfolio? Curious to see what effect adding passive investments will have on returns? The **Compare** feature allows you to test different scenarios and displays the results side by side. A convenient **Copy** feature even spares an advisor the hassle of retyping holdings into the second portfolio.

For instance, you might begin by entering an existing client portfolio consisting entirely of active investments, adjusting investment amounts and the time frame accordingly. The tool returns information you can use to identify portfolio gaps and evaluate risk, among other considerations.

It's then a simple matter to see how, hypothetically, that portfolio would perform with the addition of one or more strategically selected index funds or ETFs.

In addition, the tool recognizes many major benchmarks and lets users create and save their own custom benchmarks, all of which they can compare with their portfolios.

A number of investing assumptions, including initial investment, rebalancing, time period, fees, and taxes, are highly customizable.

Portfolio Analytics lets advisors tell their story to clients in two ways. They can present the information in client meetings by playing out scenarios directly on the screen, or they can present it in highly customizable, client-approved, professional-looking PDF reports.

Gattuso offered a verdict voiced by many who've used the tool so far: "It is a very comprehensive and valuable asset already in our firm, and I anticipate our use to increase as we find new ways to apply it."

To use the Portfolio Analytics tool, go to the **Tools** section of advisors.vanguard.com. You'll need to log in for access (registration is free).

Get the most out of Portfolio Analytics: Call **800-997-2798** to contact your Vanguard representative for a free guided tutorial of the tool.

Note: Neither Steven A. Gattuso nor Kevin Loffredi is affiliated with Vanguard, and Vanguard does not make any representation regarding their views.

Comments? Topics of interest?

Write to us at ETFPerspectives@vanguard.com

Connect with Vanguard® > advisors.vanguard.com

All investing is subject to risk, including possible loss of principal. Prices of mid- and small-cap stocks often fluctuate more than those of large-company stocks. Funds that concentrate on a relatively narrow market sector face the risk of higher share-price volatility.

The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

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Past performance is not a guarantee of future results.

Diversification does not ensure a profit or protect against a loss.

For more information about Vanguard ETFs, visit advisors.vanguard.com or call 800-997-2798 to obtain a prospectus. Investment objectives, risks, charges, expenses, and other important information about a fund are contained in the prospectus; read and consider it carefully before investing.

Tax-loss harvesting involves certain risks, including, among others, the risk that the new investment could perform worse than the original investment, and that transaction costs could offset the tax benefit. We recommend that you consult a tax or financial advisor about your individual situation.

Vanguard ETF Shares are not redeemable with the issuing Fund other than in Creation Unit aggregations. Instead, investors must buy or sell Vanguard ETF Shares in the secondary market with the assistance of a stockbroker. In doing so, the investor may incur brokerage commissions and may pay more than net asset value when buying and receive less than net asset value when selling.

Investments in bonds are subject to interest rate, credit, and inflation risk. Although the income from the U.S. Treasury obligations held in a fund is subject to federal income tax, some or all of that income may be exempt from state and local taxes. Investments in stocks issued by non-U.S. companies are subject to risks including country/regional risk and currency risk.

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