PERFORMANCE PERSPECTIVES
with David Spaulding

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Our involvement with the industry isn't limited to consulting. We're actively involved as members of the CFA Institute (formerly AIMR), the New York Society of Security Analysts (NYSSA), and other industry groups. Our president and founder regularly speaks at and/or chairs industry conferences and is a frequent author and source of information to various industry publications.

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For additional information about The Spaulding Group and our services, please visit our web site or contact Chris Spaulding at

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RETURNS ON EMPLOYEE STOCK PURCHASES

I blogged about this topic earlier this month,[1] and will briefly repeat the key points here. Here's the scenario as presented to me:

We have a discount stock plan at our firm. You can buy discounted stock at the end of each quarter and can sell it immediately for a 15% profit. The question arises about what your annual return would be.

"Many of my colleagues argue that 15% a quarter sums to 60% annually (ignoring geometric linking which cannot apply since there is no compounding). I have a problem with this because the money invested is four distinct unrelated transactions and if you divide the total gain by the sum invested you would get 15%"

I suggested that we might simply link the four quarterly returns, which yields a 74.90% return. An observant reader[2] chimed in that he found this objectionable, and this was quite a valid challenge.

My colleague, John Simpson, did a fantastic job of analyzing this situation and presenting a series of alternative returns, depending upon one's perspective. What now follows is his.

I am going to assume what they say: they can buy the asset on one day (end of the quarter) and sell it immediately for a 15% gain. Presumably "immediately" means on the same day.

So, I am going to model this as follows:

- *12/31/2008: Initial funding of $1000; market value = 1000*
- *3/31/2009: purchase 1 share of stock at $1000; market value = 1000*
- *3/31/2009: sell 1 share of stock at $1150; market value = 1150*
- *6/30/2009: purchase 1 share of stock at $1000; market value = 1150*
- *6/30/2009: sell 1 share of stock at $1150; market value = 1300*
- *9/30/2009: buy 1 share of stock at $1000; arket value = 1300*
- *9/30/2009: sell 1 share of stock at $1150; market value = 1450*
- *12/31/2009: buy 1 share of stock at $1000; market value = 1450*
- *12/31/2009: sell 1 share of stock at $1150; market value = 1600*

There are no external cash flows in this case, and the assumption is that it is a manager's decision to not reinvest the money made.

The TWR in this case is 1600/1000 -1 = 60%. The IRR is also 60%. A Modified Dietz calculation for the whole year would also give 60%.

1 http://investmentperformanceguy.blogspot.com/2010/11/annualizing-and-linking-returns-case.html

2 Steve Campisi is that reader and his comments can be found at
http://investmentperformanceguy.blogspot.com/2010/11/getting-returns-right.html

If the client is dictating the decision to not to reinvest the gains, then the set of transactions would be:

- *12/31/2008: Initial funding of $1000; market value = 1000*
- *3/31/2009: purchase 1 share of stock at $1000; market value = 1000*
- *3/31/2009: sell 1 share of stock at $1150; market value = 1150*
- *3/31/2009: withdrawal of $150*
  market value = 1000
- *6/30/2009: purchase 1 share of stock at $1000; market value = 1000*
- *6/30/2009: sell 1 share of stock at $1150; market value = 1150*
- *6/30/2009: withdrawal of $150*
  market value = 1000
- *9/30/2009: buy 1 share of stock at $1000; market value = 1000*
- *9/30/2009: sell 1 share of stock at $1150; market value = 1150*
- *9/30/2009: withdrawal of $150*
  market value = 1000
- *12/31/2009: buy 1 share of stock at $1000; market value = 1000*
- *12/31/2009: sell 1 share of stock at $1150; market value = 1150*
- *12/31/2009: withdrawal of $150*
  market value = 1000

The withdrawals require that the year be broken into four subperiods (quarters) for purposes of calculating TWR. The subperiod return in each case is (1000-1000-(-150)) / 1000 = 15%. The geometric linking of the subperiod returns results in a TWR for the year of 74.9%. In this scenario, I get an IRR of 75.0%

A Modified Dietz calculation could be applied to the year in the above case, as an approximation of IRR.

That would give (1000 - 1000 - (-600)) / (1000 + 275/365H(-150) + 184/365H(-150) + 92/365H(-150)) = 77.56%. Or, if quarters are used rather than days, the Modified Dietz return is 77.42%.

The TWR in the last case is the same as it would be in the case where the manager decides to reinvest. In this case, the transactions could be:

- *12/31/2008: Initial funding of $1000; market value = 1000*
- *3/31/2009: purchase 1 share of stock at $1000; market value = 1000*
- *3/31/2009: sell 1 share of stock at $1150; market value = 1150*
- *6/30/2009: purchase 1 share of stock at $1150; market value = 1150*
- *6/30/2009: sell 1 share of stock at $1322.50; market value = 1322.50*
- *9/30/2009: buy 1 share of stock at $1322.50; market value = 1322.50*
- *9/30/2009: sell 1 share of stock at $1520.88; market value = 1520.88*
- *12/31/2009: buy 1 share of stock at $1520.88; market value = 1520.88*
- *12/31/2009: sell 1 share of stock at $1749.01; market value = 1749.01*

Note that I assume that the stock does not change value between sale and next purchase date. This does not affect the return calculation, given their assumption that the stock appreciates after purchase by 15%.

The TWR would be 74.9%. The IRR would also be 74.9%. As there are no external cash flows in this case the IRR and the Modified Dietz returns would equal the TWR of 74.9%.

And so, what <u>is</u> the return? As you can see, it depends on the perspective and assumptions that are made. But I'd say 60% makes the most sense since we're not compounding.

FROM OUR READERS…

Recall that in our September 2010 newsletter[3] we touched on the subject of negative Sharpe ratios, and I attempted to justify the results. Bill Sharpe responded with the following:

Dave:

Your example is different from mine. The problem that I have with it is that when standard deviation is on the horizontal axis all fund must plot on or to the right of the y-axis (since a negative standard deviation is not possible). Even with beta, a fund that falls when the market goes down will have a positive beta. While the intuition may be good, the mechanics seem inappropriate.

My argument is simply based on the original idea that a fund with a higher Sharpe Ratio plus borrowing or lending can give a higher expected (or average) return for any given level of risk than one with a lower Sharpe Ratio. Thus in your example a 50/50 combination of Fund B and a riskless security would have had a standard deviation of 5% and an excess return of -4.5% which would be preferable to the index with a standard deviation of 5% and an excess return of -9%.

Thanks for sending me your piece. It is a complicated issue, to be sure.

Bill

Bill, of course, is correct that standard deviation cannot be negative as suggested in my graphic. I used the graphic in a somewhat metaphorical fashion to put one's thinking into perspective. That is, if we expect higher risks to generate higher positive returns, when they don't occur our Sharpe ratios are lower. The inverse would also seem to hold. That is, if we are in a down market our higher risks should result in lower returns, but if they aren't as low as predicted, it isn't unreasonable to see a higher Share ratio.

I think Bill's final statement is the key: "it is a complicated issue, to be sure."

SURVEY TIME…

By now you should be aware of our risk survey. And, if you haven't participated, we urge you to, as we believe the results will be quite valuable and insightful.[4] (Oh, and you can complete the survey anonymously!).

We would also like to hear from you about the newsletter. What are your thoughts? Is the length a good one, or should it be lengthened or shortened? Do you like the topics? Please visit www.spauldinggrp.com and complete the brief survey to let us know your thoughts. Thanks! (Oh, and your responses can be anonymous here, too!). Deadline December 3, 2010.

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3 http://www.spauldinggrp.com/images/stories/PDF/newsletters/sep10.pdf

4 To do so, please go to our firm's website (http://www.spauldinggrp.com/) and click on the "2010 Risk Survey" button; you'll be taken to the survey which can be completed online.

THE SPAULDING GROUP'S 2010 INVESTMENT PERFORMANCE MEASUREMENT CALENDAR OF EVENTS

DATE	EVENT	LOCATION
December 2-3, 2010	Performance Measurement Forum	Dallas, TX (USA)
December 7-8, 2010	Fundamentals of Performance Measurement Training	New Brunswick, NJ (USA)
December 9-10, 2010	Performance Measurement Attribution Training	New Brunswick, NJ (USA)

For additional information on any of our 2010 events, please contact Christopher Spaulding at 732-873-5700

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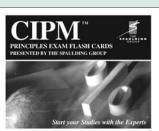
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