

# PERFORMANCE PERSPECTIVES

with David Spaulding



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## USING THE ABSOLUTE VALUE IN THE DENOMINATOR FOR MODIFIED DIETZ

Modified Dietz is usually shown in the following form:

$$R = \frac{EMV - BMV - C}{BMV + WC}$$

where:

- EMV = ending market value
- BMV = beginning market value
- C = net cash flows
- W = weighting factor,



and where the weighting factor is derived by:<sup>1</sup>

$$W = \frac{CD - D}{CD} \text{ (or) } \frac{CD - D + 1}{CD}$$

where:

- CD = number of calendar days in the period
- D = the day of the cash flow.

I first encountered a slightly different version of this formula almost 25 years ago, when I had a discussion with a colleague, Bob McAllister,<sup>2</sup> formerly of Belvedere Financial Systems and now DST Global, about how to calculate returns on short positions. We concluded that it was best to simply take the absolute value<sup>3</sup> of the denominator:

$$R = \frac{EMV - BMV - C}{|BMV + WC|}$$

Let's say that you sold short 100 shares of a stock which traded at \$10 per share. Your value is \$1,000. The stock price has dropped to \$8, which is what you probably hoped for, since by holding a short position you're betting that the price will drop. Your value is

1 The version on the left is for cases where cash flows are treated as if they occurred at the end of the day; the one on the right is for start-of-day treatment.

2 Bob was my first teacher of performance measurement, when he consulted to me when I was responsible for technology and, oddly enough, performance measurement for a NYC-based investment advisor.

3 The absolute value of a number always results in a positive number. That is, if the number is positive, it stays positive; however, if it's negative, it becomes positive. The absolute value of +4 = +4; the absolute value of -5 = +5.

# The Journal of Performance Measurement®:

## UPCOMING ARTICLES

**Performance Outsourcing  
2010 – Broadening the  
Debate**

– *Mark Goodey and Jim Trotter*

**GIPS 2010: Highlights of  
Forthcoming Changes**

– *Todd Juillerat*

**Extreme Risk Analysis**

– *Lisa Goldberg, Michael Hayes,  
Jose Menchero, Indrajit Mitra*

**Determining the Optimal  
Benchmark Indices for a  
Domestic Equity Returns-Based  
Style Analysis**

– *David Blanchett*

**Advocating a Trade/Strategy  
Approach to Attribution**

– *Jem Tugwell*

now \$800. If we calculate the return using the standard formula we get:

$$R = \frac{EMV - BMV}{BMV} = \frac{-800 - (-1,000)}{-1,000} = -20\%$$

Our return shows that we have suffered a loss. However, aren't we actually better off? If we take the absolute value, our return is:

$$R = \frac{EMV - BMV}{|BMV|} = \frac{-800 - (-1,000)}{|-1,000|} = +20\%$$

Doesn't this number make more sense?<sup>4</sup> And so, it's not uncommon for firms who use Modified Dietz to derive their returns on short positions to take the absolute value of the denominator.

Lately, though, we've had a few clients who employ the absolute value ALL THE TIME! That is, their standard approach is to use the absolute value. Is this a problem? To be quite candid, we're not completely sure. Peter Dietz didn't present the formula with the absolute value, and I have not encountered its form in articles, and so am a bit perplexed when I see its universal employment.

In general, I believe that it's "proper" to use the absolute value form only when dealing with short positions and avoid its use with positive value, but cannot find a reason to say that this should be a formal rule. If you have thoughts about this, please let us hear them.

## NEGATIVE VALUES CAUSE OTHER ISSUES FOR US

In a recent blog post<sup>5</sup> I gave an example of how standard linking can create problems when we have short positions. In the example I provided we have a rather unusual case where a position went from positive to negative and then back to positive. It was a real life situation though, not a contrived one, and so deriving the return was a necessity and standard linking failed. We normally link returns using the following formula:



$$R_{Linked} = \prod_{i=1}^n (r_i + 1) - 1$$

For example, in the following table we see how a market value changed over a few day period:

	BMV	EMV	Daily ROR	Linked ROR
31-May		1,000		
1-Jun	1,000	1,200	20.00%	
2-Jun	1,200	1,100	-8.33%	10.00%
3-Jun	1,100	1,000	-9.09%	0.00%

<sup>4</sup> I should mention that in case this return doesn't make sense to you, you're not alone, as there are some who argue that this approach is invalid, making this yet another example of controversy in our industry.

<sup>5</sup> See: <http://investmentperformanceguy.blogspot.com/2010/07/be-careful-when-negative-market-values.html>

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I discovered a few years ago that the traditional linking approach doesn't work with short positions. For example:

	BMV	EMV	Daily ROR	Standard Linking
31-May		(1,000)		
1-Jun	(1,000)	(1,200)	-20.00%	-20.00%
2-Jun	(1,200)	(1,100)	8.33%	-13.33%
3-Jun	(1,100)	(1,000)	9.09%	-5.45%

As you can see, as with our long position example, we started and ended at the same place,<sup>6</sup> which means our linked return across the period should be zero; while it is in the case of the long position, it isn't with the short. I developed an approach to deal with these problems. If there are an even number of periods, we use the following:

$$\left[ \prod_{i=1}^n (r_n - 1) - 1 \right] \times (-1)$$

and if there are an odd number, we use:

$$\left[ \prod_{i=1}^n (r_n - 1) + 1 \right]$$

And since we have three time periods in our example, we use the second form to derive:

	BMV	EMV	Daily ROR	Standard Linking	Alternative Linking
31-May		(1,000)			
1-Jun	(1,000)	(1,200)	-20.00%	-20.00%	-20.00%
2-Jun	(1,200)	(1,100)	8.33%	-13.33%	-10.00%
3-Jun	(1,100)	(1,000)	9.09%	-5.45%	0.00%

which produces the result we expect.

Short positions often require special handling, so be wary when dealing with them.

## FROM OUR READERS

Last month's writeup on the aggregate method resulted in a record number of responses from readers who commented on this topic. We'll share a few with you.

Mike Stevens from Prudential offered the following:

*David -*

*Hello, I hope all is well.*

*I've just read your most recent newsletter with the item on the aggregate method for composite returns. I would imagine you'll receive quite a bit of feedback on this one. I had to read through it a couple of times, and work through the calculations in a spreadsheet. Then I realized that I was coming at the issue from a different perspective and not having a problem with the calculations. The basis of all your assumptions,*



<sup>6</sup> Also note that there are no cash flows.

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*stated towards the end of the article, is that “the composite is not an account.” I assume this was held off to the end because the thought was everyone already held this point of view. But this is really the crux of the matter in the article, isn’t it? Is the composite an account or not? Once you accept one of these positions, the calculations are not difficult to support the viewpoint. But is that really the right question to ask?*

*I’ve viewed the three methods of calculating a composite return in order of accuracy as asset weighted, then asset weighted plus weighted flows and finally the aggregate method, with the aggregate method being the most accurate. In fact I assumed that the industry would eventually move in that direction with many firms currently using the asset weighted method to eventually using the aggregate method. I think I brought this question up at the last forum, that is whether anyone used the cashflow or aggregate method, and if folks thought that the next edition of GIPS would include stronger language or a recommendation to use the cashflow weighted or aggregate method as the preferred method.*

*To me, the question of whether a composite is an account or not is not the right question to ask. The question is what is the appropriate time period to calculate a composite return? It used to be quarterly, its now monthly, why not daily? Portfolio returns have moved toward increased accuracy, going from Dietz to modified Dietz to revaluing for large flows; quarterly to monthly to daily. Why wouldn't we see the same with composite calculations?*

*If you look in your examples, you are using monthly returns as your basis. But why? Isn’t this an arbitrary time period? If you changed your examples to two monthly periods with the flow at the end of the first month, instead of one month with a mid-month flow, I believe you’d look at the results very differently. So why should the length of time matter? I think you’d agree that the change from calculating composites quarterly to monthly improved accuracy. I think moving to daily will improve accuracy as well. And then the question “is the composite an account or not?” changes. It’s not whether the composite is an account, its that the length of time for the periods you’re calculating composite returns changes, and the returns are more accurate. Your argument for the table 5 examples that the composite return has to be 4 percent doesn’t make sense to me. I say look at it as two periods, and then you’ll see that 4.43% does make sense.*

*I think perhaps looking at this situation from a different point of view is in order. I look forward to more on this in the future.*

*Regards,  
Mike*

I responded:

The choice of a month is because monthly reporting is typically done; we use monthly to link to quarterly, etc. Monthly composite returns is the minimum for a composite going forward (in the past it was a quarter).

As for the “right question,” you’re right that others perhaps should be used. I guess my real question is “what does the composite return propose to measure?” We’re required to show it, so what does it represent? I agree that many thought the aggregate method was “the best,” but from my analysis it appears to be “the worse!” Quite a turn around (from first to worst).

From Nancy Burges:

*Dave, we read your thoughtful and interesting article about the aggregate calculation method for composite returns. Very thought-provoking. I have never been an advocate of the revaluation methodology for several reasons, but mainly because it is very impractical – most investment operations cannot retroactively revalue – it is a nightmare and virtually impossible for monthly valued accounts. It seems that the problems that you illustrated are much more attributable to the revaluation methodology than to the use of the Modified Dietz. And, as a final comment, investment firms have been calculating returns for decades without interference from the CFA. I repeatedly ran into anomalous return problems and solved them efficiently without using a revaluation methodology or mandates from the CFA when I was at Babson and AIG.*

*We'll be waiting for the next installment.*

*Regards,  
Nancy*

*Nancy Burges  
The Nowel Group*

And finally, Andre Mirabelli wrote:

*David,*

*Regarding your suggestion in your July 2010 Performance Perspectives newsletter, to abandon the aggregate method for calculating composite returns in favor of the “asset-weighted plus weighted flows” method:*

*The aggregate method answers the question: What return would I have obtained over the total period if I invested only at the start of the period and always market-value rebalanced across all accounts at the time of each cash flow and at the time of each introduction (or withdrawal) of each new account?*

*The “asset-weighted plus weighted flows” method with revaluing answers the question: What return would I have obtained over the total period if I invested at the start in all the accounts in proportion to their beginning assets and also in proportion to the portion of time in which the account exists during the period and, further, held the value entering or leaving each account in a zero- return asset during all periods in which the account did not exist?*

*Because of the artificialness of the question addressed by the “asset-weighted plus weighted flows” method and the reasonableness of the question addressed by the aggregate method, I would prefer the aggregate method in all cases, including the ones you discuss.*

*Case #3 that you consider seems most convincing to you. Here, a large inflow occurred when it would make the most return (9.47% during the later part of the period), avoiding being invested in the first period when there were only lower returns (-5% to 2%). Thus, it makes sense to me that the return of the composite would be significantly higher than the return of 4% achieved by each component account over the whole period. It is a familiar effect that well-timed cash flows can create returns that are outside the range of the returns of the components between which the cash flows occur.*

## KEEP THOSE CARDS & LETTERS COMING

*We appreciate the occasional e-mail we get regarding our newsletter. Occasionally, we hear positive feedback while at other times, we hear opposition to what we suggest. That's fine. We can take it. And more important, we encourage the dialogue. We see this newsletter as one way to communicate ideas and want to hear your thoughts.*

*Finally, I see no inconsistency in the GIPS statement that you quote to the effect that the aggregate method allots more impact to larger accounts since, between cash flows, it does exactly that by taking the weighted average of returns.*

*Regards,  
Andre Mirabelli*

I responded:

The question that is supposed to be answered is “how did you manage accounts in this strategy during the period being represented?” I don't see how you think the aggregate is superior. Again, the question shouldn't be about the composite, it's supposed to be about the accounts in the composite.



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September 22-24, 2010	CIPM™ Expert Exam Preparation Class	Edison, NJ (USA)
October 19-20, 2010	Fundamentals of Performance Measurement Training	San Francisco, CA (USA)
October 21-22, 2010	Performance Measurement Attribution Training	San Francisco, CA (USA)
November 16-17, 2010	Fundamentals of Performance Measurement Training	Chicago, IL (USA)
November 18-19, 2010	Performance Measurement Attribution Training	Chicago, IL (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)

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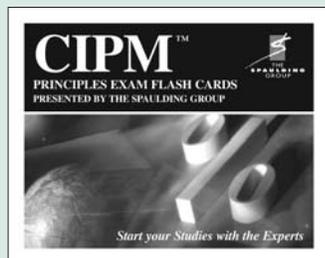
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