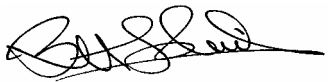


Professional Standards and Advocacy
AIMR
PO Box 3368
Charlottesville, VA 22903
USA

August 31, 2002

RE: Global Investment Performance Standards
Guidance Statements on Calculation Methodology

Please find attached some comments on the proposed GIPS Guidance Statement.

A handwritten signature in black ink, appearing to read 'Bruno Solnik', with a long horizontal flourish extending to the right.

Professor Bruno Solnik
Finance and Economics Department
HEC Paris

Guidance Statement on Calculation Methodology: A Comment

It is hard to write a short comment on a technical text without sounding overly critical. I apologize if I seem too provocative, as this is not my intent. I am just trying go to the point directly. Unfortunately, time is short to smooth the wording of my comment and the issue important.

I find the discussion of the calculation methodology for time-weighted rate of return very misleading. The Executive Summary states "This Guidance Statement provides clarification on the various methodologies for calculating rates of return...". Unfortunately, the Guidance Statement could instead potentially lead to a misinterpretation of the concept that AIMR tries to implement through GIPS. It could also allow some manipulation of the calculated performance, which would be acceptable under the Guidance Statement.

Everyone agrees that, for performance comparison purposes, one should use time-weighted rates of returns (TWRR) not money-weighted rates of return (MWRR), or dollar-weighted rates of return as they are called in the US.

The desired method is clear and requires valuation of the portfolio each time a cash flow occurs: this is described on page 7 of the Statement. Unfortunately what you refer to as approximate TWRR on pages 4, 5 and 6 are conceptually not TWRR but are rather approximations to the MWRR. It is not just a question of terminology, it is also that your discussion could be very misleading for the "novice" or a firm trying to develop a performance calculation system (and giving this Statement to their computer analysts). In the absence of daily valuation, one resorts to a mixed methodology. First, one computes the MWRR over the *measurement period* (say one month), Second, one chain-links those, which is a proper time-weighting method, to calculate return over longer *performance periods* (say one quarter or one year). Your pages 4 to 6 only discuss various approximations to calculating the **MWRR, not the TWRR**, over a given measurement period (say one month). But the problem with using a MWRR method for the measurement period should be stressed.

Summary of the different methods

Most financiers aware of discounting and present value calculations would calculate the MWRR over the period using the internal rate of return formula that you list on page 6. The IRR is the appropriate definition of the "true" MWRR. It is hard to understand why you call it "*Modified IRR method*", as the formula is the *standard* IRR calculation that can be found in all finance textbooks (e.g. to value the IRR of an investment projects with multiple cash flows)¹.

For ease of calculation it is convenient to use approximations. So instead of calculating an actuarial rate of return, it is convenient to use an "accounting ratio" equal to the net profit over the period divided by the average invested capital.

$$\text{MWRR} = \frac{\text{Profit}}{\text{Average invested Capital}}$$

Everyone agrees on the profit over the period (capital gain minus net cash flows); the only question remaining is how we compute the "average invested capital". A poor

¹ Your statement that using the proper daily timing of cash flows transforms the IRR from a money-weighted calculation to a time-weighted calculation is incorrect. Actually, this is just the standard IRR textbook method, and it is obviously a money-weighted method. Hopefully the fact that exponents are fractional rather than integer should not pose conceptual problems, nor computational problem for a spreadsheet or a computer.

approximation is to assume that all cash flows took place at the middle of the measurement period as done in the Original Dietz Method. A better approximation is to compute an average cash flow with daily count of the cash flows, as done in the Modified Dietz Method. It is still an accounting ratio that does not take into account discounting; but if the measurement period is short, say one month, the two methods to calculate a MWRR (IRR and Modified Dietz) will not yield very different results, in most cases. So the approximation is not too bad, and the calculation much easier. To summarize, all three methods give a MWRR over the period of measurement. They are conceptually very different from a TWRR and can potentially lead to serious difference with a true TWRR calculated over the period. The longer the period of measurement, the larger the potential difference.

Magnitude of errors: a simple example

The potential for significant errors should be stressed. Let's take a simple example of a portfolio where a client brings 100 at the start of the month. Let's further assume that the manager closely tracks an assigned benchmark index. After 20 days the portfolio gained 10% (value 110), just like the index, and the client added an extra 50 (total portfolio value 160). From day 20 to 30, the portfolio, and the index, lost 9.09% (final value of $160 \times (1 - 0.0909) = 145.45$).

- The return on the index zero, as is the properly-calculated TWRR of the portfolio: TWRR=0%.
- The correct MWRR, using an Excel spreadsheet, is an IRR of -3.89%.
- The original Dietz method gives an approximation to the MWRR of:

$$MWRR_1 = \frac{\text{Profit}}{\text{Average invested Capital}} = \frac{145.45 - 100 - 50}{100 + 0.5 \times 50} = \frac{4.55}{125} = -3.64\%$$

- The Modified Dietz method gives an approximation to the MWRR of:

$$MWRR_2 = \frac{\text{Profit}}{\text{Average invested Capital}} = \frac{145.45 - 100 - 50}{100 + \frac{10}{30} \times 50} = \frac{4.55}{116.67} = -3.86\%$$

Note that the Dietz method gives a poor approximation of the true MWRR (the difference is 25 bp). The Modified Dietz calculation is much closer (a difference of 3 bp) and generally yields acceptable approximations to the IRR for short measurement periods. **Much more importantly**, the MWRR is very different from the TWRR which is equal to 0%. All three MWRR give the false indication that the manager underperformed the index by more than 300 bp.

This is a once-for-all, or *permanent*, difference that will never get corrected when we chain-link monthly returns. This permanence is particularly bothersome.

Further risks with the Original Dietz method

The Statement should also take into account that there are risks of manipulation of performance numbers when the original Dietz method is used, with its arbitrary assumption that the net cash flow takes place in the middle of the measurement period. I give below an example of possible manipulation using the Original Dietz method. This is not a practical example, but it illustrates the bias in the method and the direction in which it can be mischievously used.

At the end of a measurement period when the return is strongly positive, make a big negative cash flow on the last day² of the measurement period and offset it exactly the next day (start of the new period) by an equal positive cash flow. In the equation:

$$R = \frac{\text{Profit}}{\text{Average invested Capital}}$$

The numerator is not affected. Because the cash flow is arbitrarily assumed by the Original Dietz method to take place at the middle of the period, the average invested capital will be reduced by 50% of that cash flow, therefore artificially inflating the rate of return for that measurement period. Note that we will need to have a big positive cash flow next period, but because we do not know what the market will do in the next period (except that there is little chance that it will repeat this large return), it does not bias next period return in a systematic direction.

Of course, the reverse could be done at the end of a period with a negative return, thereby reducing its reported magnitude.

Conclusions

The best we can do in the absence of daily valuation of the portfolio is to calculate a MWRR between valuation periods (say a month) and then chain-link over several valuation periods (say 12 months). The chain-linking itself is a time-weighted rate method. So the annual return is a TWRR of a mixture of MWRR over the monthly valuation periods. But MWRR can differ significantly from the true TWRR over the measurement period and such differences will not disappear in the chain-linking process. Of course using a more frequent valuation period, say weekly, will reduce the impact of the error. And the ideal is a daily valuation.

As you can guess, I feel that the appellations of TWRR should be changed in the Statement. It should be made clear that there are *two* approximations in using the methods proposed on your pages 4 to 6:

- First there is a conceptual and practical problem in using a MWRR, instead of a proper TWRR, and the error can be large in practice (over 300 bp in the example above).
- Second, there is another approximation when the Dietz methods are used instead of the true MWRR which is the IRR; the problem is more acute for the Original Dietz method.

The first type of problem (confusing a MWRR for a TWRR) is the most serious.

Practical suggestions

This kind of discussion was already common 20 years ago.³ It is a bit surprising that the proposed Guidance Statement is not more precise and directive in inducing firms to generate true TWRR. There has been a huge progress in computing ability and in quality of information since the first writings on this topic.

It is trivial to compute an average cash flow weighted by the timing of cash flows for each portfolio and portfolio segment. It can even be done on a hand calculator. The Original

² I am not detailing how a cash flow is "transferred", but creative situations can be imagined.

³ It can already be found in the 1968 Bank Administration Institute document.

Dietz method has no reason to exist anymore; it is surprising that GIPS allows it to be used until 2005. Some small management firms have noticed its potential biases and how to exploit them while complying with GIPS.

The problem of using a MWRR over the measurement period, until 2010 and possibly beyond, is even more serious. In a world where clients increasingly focus on alphas relative to passive benchmarks, the magnitude of the potential discrepancy between a MWRR and a true TWRR over a month has significant importance. Such discrepancies subsist when chain-linked over longer performance periods. I believe that it is AMIR mission to require proper calculation of the TWRR as soon as possible. We do not face the same data transmission and computing power problems that existed twenty years ago. If a firm is not able to generate such TWRR numbers, it casts doubt on the quality of its accounting system. At the very least, GIPS should require a shorter measurement period (say a week). Waiting another eight years to get a true TWRR is not reasonable.