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INVESTMENT PERFORMANCE COUNCIL (IPC)

Country-Specific Taxation Provisions and Guidance for the GIPS Standards

Introduction

The purpose of the GIPS standards is to ensure accurate and consistent reporting of investment performance in a fair, comparable format that provides full disclosure. The GIPS standards create an ethical framework whereby investment performance results are calculated and presented according to fundamental principles based on the principles of fair representation and full disclosure.

The GIPS standards do not address every aspect of performance measurement, valuation, attribution, or coverage of all asset classes. However, the IPC anticipates that the GIPS standards will evolve over time to include additional aspects of investment performance, which include developing some basic principles to broadly address the effects of taxation on investment performance.

Background

Historically, the IPC endorsed two Country Version of GIPS that included additions relating to taxation issues – the AIMR-PPS standards and Italian Performance Presentation Standards (IPPS). The AIMR-PPS standards include a section related to the calculation and presentation of after-tax performance results. The IPPS standards include a section related to grossing up performance for Italian withholding taxes.

Topic

The IPC has questioned whether or not it would be possible to entirely eliminate the need for Country Versions of GIPS (CVG) and has determined to approach the subject by creating a guidance statement that initially incorporates the two country-specific sets of guidance relating after tax performance reporting in a Guidance Statement under the GIPS standards. This initial approach will allow to eliminate the CVGs in the US and Italy.

Future development

Beyond this initial guidance statement, the IPC is also considering developing some basic principles to broadly address the effects of taxation on investment performance. These tax-related provisions and/or guidance for the GIPS standards will be applicable to all firms that claim compliance with the GIPS standards and choose to present pre-tax or after-tax composite returns, regardless of the firm's domicile.

Because tax regulation is extremely divergent from country to country, the IPC presumes that these provisions and guidance will only consist of some basic, worldwide accepted principles with the topic of comparability of performance results among managers from different countries. At the same time the IPC acknowledges that some countries have a longer history in after-tax performance presentation and therefore have developed detailed provisions and/or guidance relating to the topic. Based on the principles of GIPS, the IPC fosters the notion of worldwide best practice and will aim to adjust and include these pre-tax or after-tax performance presentation provisions in a global framework.

Attachments:

- I. United States After-Tax Guidance (Applicability, GIPS Requirements and Recommendations); pages 3-7
- II. Italian “Grossing-up” Taxation Guidance (Explanation, GIPS Requirements and Recommendations); page 8
- Appendix A. Additional Guidance on United States After-Tax Calculation and Presentation; pages 9-48
- Appendix B. Assogestioni formula for calculating the gross-of-tax value of the shares of an Italian open-end fund; pages 49-53

I. GIPS United States After-Tax Guidance

Effective Date: 1 January 2005

Retroactive: No

Applicability

Firms that previously claimed compliance with the AIMR-PPS standards and chose to present their composite performance results after the effect of taxes were required to comply with the modified after-tax provisions and guidance as of 1 January 2005. They were developed giving consideration to U.S. tax codes and regulations.

As of 1 January 2005, if a firm:

- (1) Previously claimed compliance with the AIMR-PPS standards, and/or claims compliance with the GIPS standards; and
- (2) chooses to present after-tax performance results to a client subject to U.S. taxation (except when reporting to an existing client the performance of his portfolio),

the firm must abide by the GIPS Country-Specific Taxation Issues Guidance requirements outlined below.¹

The GIPS Country-Specific Taxation Issues Guidance supplements all of the required and recommended elements of the GIPS standards. They were developed giving consideration to U.S. tax codes and regulations available in 2002.

The effective date of the GIPS Country-Specific Taxation Issues Guidance is 1 January 2005. Until that time, firms are strongly encouraged to follow these provisions but may still calculate and report their after-tax performance according to the previous AIMR-PPS after-tax provisions (1994 provisions).

When reporting after-tax performance to an existing client, firms that are compliant with the GIPS Country-Specific Taxation Issues Guidance may choose to include a claim that the existing client's portfolio return was calculated "in accordance" with the after-tax calculation methodology of the GIPS Country Specific Taxation Issues Guidance – provided the return satisfies the minimum requirements of the Standards. Firms that choose to include such a claim must include the following statement alongside it:

¹ *The calculation and presentation of after-tax mutual fund performance is regulated in the US by the SEC – this guidance is not intended to replace those requirements when a firm is advertising after-tax performance solely for a mutual fund.*

“The after-tax returns shown are subject to the limitations of the specific calculation methodology applied. Since the client’s actual circumstances and tax rates determined after the fact may differ from the anticipated tax rates used in this process, the reported returns may not equal the actual after-tax returns for specific clients.”

Requirements

A.1 Calculation Methodology

- A.1.a. Firms must utilize a realized basis “pre-liquidation” calculation methodology, namely a methodology equivalent to the After-Tax Modified Dietz Method, the After-Tax Modified BAI (Linked Internal Rate of Return) Method or the After-Tax Daily Valuation Method.

Modified Dietz Method for Calculating “Pre-Liquidation” After-Tax Return

$$\text{"Pre-Liquidation" After-Tax Return} = \frac{(\text{End Value} - \text{Start Value} - \text{Sum of Portfolio Flows} - \text{Realized Taxes})}{(\text{Start Value} + \text{Sum of Day-Weighted Portfolio Flows})}$$

Modified BAI (Linked Internal Rate of Return) for Calculating “Pre-Liquidation” After-Tax Return

The “Pre-Liquidation” After Tax Return is the value of R that satisfies the following equation:

$$\text{End Value} - \text{Realized Taxes} = [F_i(1 + R)^{w_i}]$$

Daily Valuation Method for Calculating “Pre-Liquidation” After-Tax Return

$$\text{"Pre-Liquidation" After Tax Return} = \frac{(\text{End-of-Day Market Value} - \text{Start-of-Day Market Value} - \text{Realized Taxes})}{\text{Start-of-Day Market Value}}$$

- A.1.b. The tax liability or benefit must be recognized in the same period that the taxable event occurs. Managers who use daily valuation methods may account for taxes either on the day when a taxable event occurs or at the end of the month.
- A.1.c. Taxes calculated on income must be recognized on an accrual basis.
- A.1.d. Taxes calculated on income and realized capital gains or losses must be taken into account regardless of whether taxes are paid from assets outside the account or from the account assets.
- A.1.e. After-tax returns must consistently utilize over time and within each composite either the “anticipated tax rates” or the maximum federal (or federal/state/local/city) tax rate(s) applicable to each client.

- A.1.f. Firms must utilize the tax rates in effect for the period to which the after-tax return calculation is applicable.
- A.1.g. The before-tax returns for composites that hold tax-exempt securities must be presented without “grossing-up” tax-exempt income.
- A.1.h. Each portfolio in the composite must be given full credit for net realized losses, as it is assumed these losses will be offset by gains at a later date or from other assets.
- A.2. **Composite Construction**
- A.2. All fee-paying discretionary portfolios **that are managed on a tax-aware basis** (i.e., taking into account the client’s tax profile when conducting security buy and sell decisions) must be included in at least one of the firm’s after-tax composites.
- A.3. **Disclosures** – Firms must disclose the following:
- a. If applicable, the name of the before-tax composite from which the portfolios that comprise the after-tax composite were drawn.
 - b. The after-tax composite as a percentage of the taxable portfolios that are included the before-tax composite (from which the portfolios that comprise the after-tax composite were drawn).
 - c. The accounting convention used for the treatment of realized capital gains (e.g. highest cost, lowest cost, FIFO, LIFO, specific identification, etc.).
 - d. A disclosure to read, “The after-tax returns shown are subject to the limitations of the specific calculation methodology applied. Since the client’s actual circumstances and tax rates determined after the fact may differ from the anticipated tax rates used in this process, the reported returns may not equal the actual after-tax returns for specific clients.”
 - e. The tax rate methodology (“anticipated tax rates” or maximum federal (or federal/state/local/city) tax rates) utilized for the composite and the benchmark.
- A.4. **Presentation and Reporting**
- A.4.a. All before-tax input data, calculation, composite construction, disclosure and presentation requirements as prescribed in the GIPS standards must be followed for each after-tax composite (i.e., for each after-tax composite, the firm must create a presentation that includes both the required before-tax and after-tax performance returns and disclosures).

- A.4.b. If the after-tax composite is drawn from a before-tax composite that includes taxable and tax-exempt portfolios, firms must report both the after-tax composite presentation and the presentation of the before-tax composite (from which the after-tax composite was drawn).
- A.4.c. After-tax returns must be reported on at least an annual basis for the composite. The effective date of the GIPS Country-Specific Taxation Issues Guidance is 1 January 2005; therefore, after 2004, firms must present additional annual performance so that by 31 December 2014, at the latest, firms that choose to present after-tax results will have the required 10-year track record that complies with the GIPS Country-Specific Taxation Issues Guidance .
- A.4.d. Firms must report a measure of the dispersion of individual component portfolio returns around the aggregate composite return on an after-tax basis (and a before-tax basis) for each annual period that after-tax returns are presented. The measure of dispersion must be calculated using the same method for both the after-tax and before-tax performance returns.
- A.4.e. Firms must report the percentage of unrealized capital gains as compared to total after-tax composite assets as of the end of each reporting period.
- A.4.f. Firms must report the dollar-weighted “anticipated tax rate” on ordinary income for each composite or the maximum federal tax rate on interest and dividend income of the portfolios in the composite.
- A.4.g. Firms must not link “non-compliant” after-tax performance results to performance that meets the requirements of the GIPS Country-Specific Taxation Issues Guidance, except to present it as information supplemental to a compliant after-tax composite presentation.

Recommendations

B.1. Calculation Methodology

- B.1.a. It is recommended that after-tax performance be calculated based on each client’s “anticipated tax rates” for interest, dividends, short- and long-term capital gains, etc. However, if the “anticipated tax rates” are unknown, use of the maximum federal (or federal/state/local/city) tax rate for the specific investor category is permissible.
- B.1.b. Additional non-discretionary supplementary return information may be provided for those withdrawals that are client directed and are beyond the control of the manager that force the realization of non-discretionary capital gains.
- B.1.c. If after-tax returns are reported for benchmarks, adjustments should be made for the actual or approximate Net Realized Gains incurred during the period. When an approximation is used, a description of the method and the assumptions should be disclosed.

B.1.d. The accrued interest should include the amortization of premiums and the accretion of discounts on all bonds if required by the client's tax situation. Firms should take into account the tax consequences of such items as the original issue discount (OID), the market discount and the de minimus rules.

B.1.e. Whether using the "anticipated tax rates" or the maximum federal tax rate, firms are encouraged to apply tax rates to at least the first decimal place (e.g., 38.6%).

B.2. **Composite Construction**

B.2.a. In addition to investment objective or style, portfolios may be grouped into composites based on client type, tax rate, and/or vintage year (or similar proxy to associate portfolios with similar unrealized capital gains).

B.3 **Disclosures**

B.3.a. If employing a calculation methodology other than "pre-liquidation," firms may provide these returns as Supplemental Information. Firms must provide a disclosure with an appropriate list of key assumptions used in calculating the supplemental returns.

B.3.b. If realized losses are greater than realized gains during the period, firms are recommended to disclose the percentage benefit of tax-loss harvesting for the composite.

B.3.c. Firms should disclose their policies relating to the amortization of premiums and accretion of discounts.

B.4. **Presentation and Reporting**

Firms are recommended to present the following:

- a. Firms that present returns in accordance with the previous after-tax provisions (1994 provisions) may continue to present those returns for periods prior to 1 January 2005. These results may also be linked to the after-tax performance calculated under the restated after-tax provisions, provided all after-tax performance shown after 1 January 2005 adheres to the restated after-tax provisions.
- b. Any Supplemental Information the firm deems valuable.
- c. Annual after-tax benchmark returns.

II. GIPS Italian “Grossing-up” Taxation Guidance

Effective Date: March 2002

Retroactive: No

In view of the specific features of Italian tax legislation, this document has been developed to provide guidance that managers must comply with if they intend to present performance of composites including Italian open-end funds grossed-up for Italian withholding tax.

Funds governed by Italian law are subject to a full-settlement withholding tax of 12.5% that is applied to the difference between the value of the fund’s investments at the beginning and end of the year. In the case of corporate investors this withholding tax is reclaimable. Moreover, taxation has an impact on the calculation of the net share price introducing a money weighted bias.

Firms which claim compliance with the GIPS standards and present the performance of composites including funds governed by Italian law that have been grossed up must comply with the GIPS Country-Specific Taxation Issues Guidance described below.

- 6.A.1 *Grossing-up of performance.*** *Firms which present the performance of composites including grossed-up portfolios (portfolios whose gross performances have been calculated based on net official performances) must use a grossing-up formula consistent with the tax regime in force in the reference period and must show the effects that the tax regime has on the net performance and how the formula applied takes them into account. If the grossing-up formula is not widely adopted and accepted, the firm must give a detailed description of the analytical model on which it is based and specify the hypotheses adopted and its manner of working;*
- 6.A.2 *Construction of composites.*** *No composite may contain portfolios whose performance depends on different tax regimes unless the various performances are suitably grossed up. If the grossing-up formula used is based on specific hypotheses regarding the effects of the tax regime on the way the portfolio is managed, they must be described. Portfolios managed on the basis of different hypotheses regarding the effects of the tax regime may not belong to the same composite;*
- 6.A.3 *Grossed-up performances as supplementary information.*** *Firms which present the performance of composites including grossed-up portfolios must present net performance of grossed-up portfolios as well;*

6.B.1. *Grossing-up of Italian open-end funds.* It is recommended that portfolios made of Italian open-end funds be grossed up using the widely adopted and accepted Assogestioni formula, which is shown in Appendix B.

APPENDIX A.

Additional Guidance on United States After-Tax Calculation and Presentation

The purpose of the following Interpretive Guidance is to provide insight on the requirements and recommendations of the AIMR-PPS standards and to ensure continuity for those firms dependent on this Guidance. All references to AIMR-PPS are simply to preserve historical compliance documentation and do not conflict with GIPS standards compliance.

- A. Applicability and Scope of the AIMR-PPS After-Tax Provisions**
- B. Effective Date of Provisions and Historical After-Tax Performance Record**
- C. Calculation Methodology**
 - i. Definitions of After-Tax Return**
 - ii. “Anticipated Tax Rates”**
 - iii. Retroactive Tax Changes**
- D. Composite Construction**
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 - ii. Presenting Net-of-Fees After-Tax Returns (Expensing Investment Management Fees)**
- G. Treatment of Non-Discretionary Capital Gains**
- H. After-Tax Benchmarks**
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- I. Supplemental Return Calculation Methodologies**
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- L. Model Request-For-Proposal Questions**
- M. Challenges**
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A. Applicability and Scope of the AIMR-PPS After-Tax Provisions

The after-tax provisions are voluntary, as investment management firms that follow the AIMR-PPS standards are not required to present after-tax composite performance results. Under the current after-tax rules (1994 rules), firms are only required to follow the after-tax provisions outlined in the AIMR-PPS standards when including the claim of compliance on an after-tax composite presentation. In other words, if a firm chooses to present after-tax performance results that do not include the claim of compliance, the AIMR-PPS standards are not explicitly clear and do not mandate that firms follow the after-tax provisions in those situations.

However, after 1 January 2005, firms that claim compliance with the AIMR-PPS standards and choose to report after-tax performance results (except when reporting an existing client's portfolio performance) must comply with all of the after-tax requirements. This volunteerism is consistent with the overall AIMR-PPS standards and the hope is that firms will embrace the after-tax provisions with the expectation that they will be increasing the credibility of the information that they are providing to clients and prospects.

The after-tax provisions apply to firms that claim compliance with the AIMR-PPS standards and choose to present their performance results after the effect of taxes. These after-tax provisions (Section II.9. of the AIMR-PPS standards) supplement all of the required and recommended elements of the AIMR-PPS standards (outlined in Section II of the AIMR-PPS standards). Firms that comply with the AIMR-PPS standards are also reminded that compliance requires adherence to all applicable laws and regulations.

The after-tax provisions were developed giving consideration to U.S. tax codes and regulations available in 2002. The AIMR-PPS Implementation Committee recognizes that firms who manage assets on a tax-aware basis for clients subject to Canadian tax regulation may not be able to apply the after-tax requirements as specified.

Therefore, to avoid potential conflicts between the after-tax provisions and Canadian tax codes and regulations, firms managing these "Canadian taxable portfolios" are exempt from the requirements of the after-tax provisions. They are encouraged to adopt the after-tax requirements whenever possible. Meanwhile, the Implementation Committee is working to develop specific guidance that considers Canadian tax codes.

B. Effective Date of Provisions and Historical After-Tax Performance Record

The effective date of the "restated after-tax provisions" is 1 January 2005. Until the restated provisions become effective, firms should begin to commit resources and design performance software to incorporate these future changes to the after-tax provisions. Firms are strongly encouraged to implement the restated after-tax provisions prior to their effective date. Firms may choose to retroactively apply these restated after-tax provisions on or before their effective date of 2005 in order to develop a longer historical track record.

On 1 January 2005, firms may but are not required to produce a 10-year history of compliant after-tax returns, as required by the AIMR-PPS standards for before-tax composites. Instead, from 1 January 2005, going forward, firms that choose to show after-tax results must build a cumulative year-to-year compliant after-tax track record so that by 31 December 2014, at the latest, firms that choose to present after-tax results will have the 10-year record required under the AIMR-PPS standards.

To facilitate the transition from the previous after-tax provisions to the restated after-tax provisions, firms who chose to present their after-tax results in compliance with the AIMR-PPS standards and calculated after-tax returns according to the previous after-tax provisions (1994 provisions) may continue to present their compliant historical after-tax performance results (under the previous provisions) alongside their ongoing after-tax performance results (under the restated provisions) for periods up to the end of 2004. However, performance for periods after 1 January 2005 must be calculated and presented according to the restated after-tax provisions. Further, the performance results under the previous provisions (1994 provisions) up to the end of 2004 may also be linked with the results under the restated provisions beginning in (or before) 2005.

Firms must not link “non-compliant” after-tax performance results to performance that meets the requirements of the AIMR-PPS standards (either the 1994 after-tax provisions or the restated after-tax provisions), except to present it as information supplemental to a compliant after-tax composite presentation.

C. Calculation Methodology

i. Definitions of After-Tax Return

The AIMR-PPS provisions require that all returns, including after-tax returns, be time-weighted returns. This enables the evaluation of a manager’s performance over time and permits the comparison of different managers who have different patterns of portfolio inflows and outflows during the measurement period.

The before-tax return measures the rate of change in value, with appropriate adjustment for any portfolio inflows and outflows. The after-tax return subtracts a measure of net taxes incurred during the period from the before-tax return. Taxes might not be paid in the period when they are incurred. There are a number of methods for computing an after-tax return, and they differ primarily in the way they measure taxes incurred during the measurement period.

The two principal methods of computing after-tax returns on portfolio accounts are known as the “Pre-Liquidation” (or “Realized Basis”) and the “mark-to-liquidation” methods. A third method, the “post-liquidation” approach, is also sometimes used in the context of mutual fund reporting, although it does not generalize well to other settings. It is a special case of the “mark-to-liquidation” approach.

The “pre-liquidation” method has two aspects. First, it calculates the before tax return on a portfolio using the total market value at the beginning and at the end of the measurement period, as well as information on any intervening inflows or outflows from the portfolio. Second, it subtracts any taxes that the taxpayer must pay when he files his tax return for the measurement period. These taxes would include taxes on dividends and interest income, as well as taxes on net capital gains realized from security sales. The "pre-liquidation" method does not include any charge for taxes that may be incurred in the future, even if those taxes are ultimately attributable to changes in security prices during the measurement period. In particular, there is no accounting for the future capital gains taxes that may be due on capital gains that Accrue, but are not realized, during the measurement period. By ignoring such future taxes, the "pre-liquidation" method may understate the total tax burden on security returns during the measurement period.

The “mark-to-liquidation” method uses a different approach. It computes the after-tax value of the portfolio at the beginning of the measurement period, net of taxes, under the hypothetical assumption that all securities in the portfolio are liquidated. It also computes the end-of-period value of the portfolio, once again net of taxes, in this case assuming that all securities are liquidated at the end of the measurement period. Any portfolio inflows or outflows are valued on a net-of-tax basis. If cash is contributed, the after-tax value of the portfolio inflow equals its before-tax value. If appreciated securities are contributed to the account, however, the after-tax value of the portfolio inflow equals the value of these securities net of any capital gains tax that would be due if the securities were sold. The "mark-to-liquidation" after-tax return equals the change in the after-tax liquidation value of the portfolio, plus the net after-tax value of the portfolio inflows or outflows to the account, as a percentage of the start-of-period net-of-tax liquidation value. Although the “mark-to-liquidation” method would appear to be more conservative by taking into account all capital gain taxes (i.e., all Unrealized Gains are taxed), even on unrealized profits, it may be distorted by using a smaller denominator since the amount assumed to be invested in later periods is only the original cost, not the full amount of assets under management.

The so-called “post-liquidation” return that is discussed in the mutual fund context is a special case of the "mark-to-liquidation" return. It corresponds to the "mark-to-liquidation" return for a single measurement period, in which the portfolio is created with cash at the beginning of the period. The "mark-to-liquidation" starting value of the portfolio is therefore equal to the before-tax value in this case. The "post-liquidation" approach also assumes that the portfolio is completely liquidated at the end of the measurement period, and that any taxes due at that point are paid. The end-of-period portfolio value for the "post-liquidation" return is therefore the same as that in the "mark-to-liquidation" return. The difficulties with the "post-liquidation" return are (1) it cannot be linked for multiple periods because doing so would create duplicate taxation of the same events, and (2) it cannot sensibly be applied in situations in which the portfolio is created with securities rather than cash. Applying it in this case will overstate the tax burden on returns during the measurement period. Some of the Tax Liability that will be associated with liquidating the portfolio at the end of the measurement period will be attributable to Unrealized Capital Gains that were included in the value of the securities at the beginning of the measurement period.

The AIMR-PPS after-tax provisions require that after-tax returns be reported on a “pre-liquidation” basis. The "pre-liquidation" approach captures the fact that taxes deferred to the future have a smaller present discounted value than taxes paid today. The “mark-to-liquidation” method makes no distinction between managers who do, and who do not, realize capital gains as they Accrue, despite the fact that a manager who defers realization will typically generate a higher after-tax return for taxable investors. It is possible, however, that “mark-to-liquidation” or “post-liquidation” returns may also be needed as supplemental information, for example to satisfy local regulations or to provide useful portfolio information for taxable clients.

Taxable clients may also be interested in the after-tax internal rate of return generated by investment managers. Internal rate of return measures can be generated either under the assumptions used to calculate "pre-liquidation" returns, or under the assumptions that lead to "mark-to-liquidation" returns. Single-period internal rate of return measures calculated using the "mark-to-liquidation" methodology, and using the "pre-liquidation" methodology, can be compounded over time to compute a cumulative internal rate of return. Such compounding would not be feasible with returns calculated using the "post-liquidation" methodology.

To provide more specific guidance on the calculation of after-tax returns, the formulae below describe the calculation of “pre-liquidation” and "mark-to-liquidation" returns. In these expressions, "taxes" refers to “net taxes” – they can be either positive or negative. Negative taxes would be associated with situations in which capital losses exceeded capital gains, and the value of the tax reduction associated with the net capital loss was also larger than the Tax Liability for dividends and interest income. Similarly, portfolio flows can be either positive or negative. These flows may consist of cash or of securities. Finally, the terms “capital gains tax rate” and “income tax rate” should be interpreted as a series of tax rates depending on the length of holding period and/or the type of security providing the income.

Pre-Liquidation Methods

Modified Dietz Method for Calculating “Pre-Liquidation” After-Tax Return

$$\text{"Pre-Liquidation" After-Tax Return} = \frac{(\text{End Value} - \text{Start Value} - \text{Sum of Portfolio Flows} - \text{Realized Taxes})}{(\text{Start Value} + \text{Sum of Day-Weighted Portfolio Flows})}$$

This expression is equivalent to:

$$\text{"Pre-Liquidation" After-Tax Return} = \text{Before-Tax Return} - \frac{\text{Realized Taxes}}{(\text{Start Value} + \text{Sum of Day-Weighted Portfolio Flows})}$$

In this expression, $\text{Realized Taxes} = (\text{Realized Gains}) * (\text{Capital Gains Tax Rate}) + (\text{Taxable Interest and Dividend Income}) * (\text{Income Tax Rate})$. Realized taxes are an expense, but the formulae assume that cash is not withdrawn from the portfolio in order to pay the taxes. For this reason, taxes are not included in the portfolio flow adjustment in the denominator.

Modified BAI (Linked Internal Rate of Return) for Calculating “Pre-Liquidation” After-Tax Return

The “Pre-Liquidation” After Tax Return is the value of R that satisfies the following equation:

$$\text{End Value} - \text{Realized Taxes} = [F_i(1 + R)^{w_i}]$$

Where the portfolio flows, F_i , are the same as those used in the Modified Dietz Method with one important exception: the market value at the start of the period is also treated as a cash flow, that is, $\text{Start Value} = F_0$. The weight, W_i , is the proportion of the total number of days in the period that cash flow F_i has been held in (or out of) the portfolio. The formula for W_i is

$$W_i = \frac{CD - D_i}{CD}$$

where CD is the total number of calendar days in the period and D_i is the number of calendar days since the beginning of the period in which cash flow F_i occurred.

Daily Valuation Method for Calculating “Pre-Liquidation” After-Tax Return

With the daily valuation method, it is possible to simplify by accounting for net portfolio flows at the end of the day.

$$\text{“Pre-Liquidation” After Tax Return} = \frac{(\text{End-of-Day Value} - \text{Start-of-Day Value} - \text{Realized Taxes})}{\text{Start-of-Day Value}}$$

Mark-To-Liquidation Methods (as supplemental information only)

The “mark-to-liquidation” returns are calculated very similarly, but substitutes “Liquidation Value” for “Value”, where

$$\text{Liquidation Value} = \text{Market Value} - (\text{Unrealized Gain}) * (\text{Capital Gains Tax Rate})$$

Modified Dietz Method for Calculating “Mark-To-Liquidation” After-Tax Return

$$\text{“Mark-to-Liquidation” After-Tax Return} = \frac{(\text{End-of-Period Liquidation Value} - \text{Start-of-Period Liquidation Value} - \text{Sum of Liquidation Value of Net Flows} - \text{Realized Taxes})}{(\text{Start-of-Period Liquidation Value} + \text{Sum of Day-Weighted Portfolio Flows at Liquidation Value})}$$

Daily Valuation Method for Calculating “Mark-To-Liquidation” After-Tax Return

$$\text{“Marked-to-Liquidation” After Tax Return} = \frac{(\text{End-of-Day Liquidation Value} - \text{Start-of-Day Liquidation Value} - \text{Realized Taxes})}{\text{Start-of-Day Liquidation Value}}$$

EXAMPLE 1

The methodology for calculating after-tax returns is illustrated by this example, which assumes the measurement period is one month and that the distribution of gains and income is made on the 10th day.

Starting Market Value	\$10.00
Starting Cost Basis (long-term holding period)	\$5.00
Realized Long-term Capital Gains Distributions	1.75
Realized Short-term Gains and Income Distributions	0.75
Change in Market Value	0.50
Ending Market Value	10.50
Ending Cost Basis (long-term holding period)	\$5.00
Maximum Federal Tax Rate on Long-term Gains	20.0%
Maximum Federal Tax Rate on Dividends and Short-term Gains	39.6%
Before-tax Return	36.0%
After-tax “Pre-liquidation” Return	28.2%
After-tax “Mark-to-liquidation” Return	30.7%

In this example, since the distributions are made on the 10th day of a 30-day month, the market value needs to be adjusted, and the weighting factor in the denominator is $20/30 = 0.667$. The before-tax return is $3/[10 - (1.75 + 0.75) * 0.667] = 36.0\%$. (If the distributions had been reinvested at month end, there would have been no cash flows during the period and the before-tax return would have been $(1.75 + 0.75 + 0.5)/10 = 3/10 = 30.0\%$.)

The “pre-liquidation” after-tax return subtracts the taxes that are associated with capital gain realizations and income. The realized taxes amount to $(0.20 * 1.75) + (0.396 * 0.75) = 0.647$. The “pre-liquidation” return is $(3.00 - 0.647)/(10.00 - 1.667) = 28.2\%$.

For the “mark-to-liquidation” after-tax return, the liquidation values at the start and end of period are needed. The unrealized taxes at the start are $0.2 * (10 - 5) = 1.0$ and the starting liquidation value is 9.0. The unrealized taxes at the end are $0.2 * (10.5 - 5) = 1.1$ and the ending liquidation value is 9.4. The change in liquidation value is 0.4. The “mark-to-liquidation” after-tax return is $(1.75 + 0.75 + 0.4 - 0.647)/(9 - 1.667) = 30.7\%$.

ii. “Anticipated Tax Rates”

The AIMR-PPS after-tax provisions are based on the client’s “Anticipated Tax Rate(s)” for interest, dividends and short- and long-term capital gains or losses. The “Anticipated Tax Rates” should be the tax rates that an investment manager expects a taxable client to face on returns generated during the prospective reporting period for each applicable asset class (“Anticipated

Tax Rates” = federal tax rate + [state tax rate * (1 – federal tax rate)] + [local tax rate * (1 – federal tax rate)]. These tax rates should include the impact of applicable state and local income taxes for each portfolio. The “Anticipated Tax Rates” should be determined at the beginning of the reporting period as they should be the tax rates that guide the investment manager in the decision-making process throughout the period. Since actual client circumstances and tax rates may differ from those anticipated at the beginning of the year, the “Anticipated Tax Rates” are not necessarily equal to the client's actual tax rate. The “Anticipated Tax Rates” (including those for state and local levels) should be readily known from client specific investment policy guidelines, and therefore easily applied in determining after-tax returns. Obviously, these “Anticipated Tax Rates” should also have had a significant impact on the investment strategy that was utilized in managing the portfolio to maximize tax efficiency. However, if the “Anticipated Tax Rates” are not known, which may be the case in situations such as wrap accounts, use of the Maximum Federal Tax Rate for the specific investor category is permissible (or federal/state/local/city tax rates). Use of the “Anticipated Tax Rates” allow firms to use the same after-tax returns when reporting to individual clients and constructing composites.

It may be necessary to consult with a qualified accountant to calculate the “Anticipated Tax Rates.” Also, care should be taken in combining the various tax rates. Since state and local income taxes are typically deductible in the process of calculating federal taxes, the total Anticipated Tax Rate is slightly lower than that implied by simply summing the federal, state, and local tax rates. Moreover, applying the combined “Anticipated Tax Rates” is most appropriate for fixed income accounts, especially when accounts in the composite are subject to less than the Maximum Federal Tax Rate, as taxable bonds may be purchased by portfolio managers to achieve optimal after-tax returns for such investors.

The following table shows the “Anticipated Tax Rates” (including the adjustment for the deductibility of state income taxes) on various asset components of a portfolio in the year 2000 for an individual that is subject to tax rates of 39.6% on federal income and short-term capital gains, 20.0% on federal long-term capital gains and 9.0% on all state income, with state income tax being deductible for federal purposes. The total Tax Liability or Benefit for the portfolio would simply be the sum of the individual Tax Liability or Benefits for each of the respective asset classes shown.

ASSET CLASS	ANTICIPATED TAX RATE	EXPLANATION
Taxable Income and Dividends	45.0%	$39.6\% + (9.0\% * (1 - 39.6\%)) = 45.0\%$
Short-term capital gains	45.0%	$39.6\% + (9.0\% * (1 - 39.6\%)) = 45.0\%$
Long-term capital gains	25.4%	$20.0\% + (9.0\% * (1 - 39.6\%)) = 25.4\%$
Treasuries	39.6%	Taxed at federal level only
State deductible municipals	0.0%	No federal or state taxes incurred
State non-deductible municipals	5.4%	Taxed at state level only; deductible from federal $9.0\% * (1 - 39.6\%) = 5.4\%$

The next two examples (Example 2 and Example 3) demonstrate acceptable methods for calculating a Dollar-Weighted Anticipated Tax Rate for the composite. Example 2 dollar-weights the individual portfolio Anticipated Tax Rates to determine a monthly tax rate while

Example 3 dollar-weights the monthly composite Anticipated Tax Rates to determine an annual tax rate.

EXAMPLE 2

Example 2 provides a detailed calculation of a composite Anticipated Tax Rate for a specified reporting period.

Tax Rates for After-Tax Return Reporting for *Tax-Efficient Balanced Composite* January 20XX

<u>Portfolio</u>	Client <u>State</u>	Tax Rates				<u>Anticipated</u>	Beginning	%	<u>Contribution</u>
		<u>Federal</u>	<u>State</u>	<u>Local</u>			of Period	<u>Assets</u>	
ABC	Michigan	35.0%	4.4%	1.0%	38.9%	\$ 2,013,970	18.1%	7.0%	
DEF	Iowa	38.6%	9.0%	0.0%	44.1%	\$ 2,500,334	22.5%	9.9%	
GHI	Illinois	30.0%	3.0%	0.0%	32.1%	\$ 1,516,973	13.7%	4.4%	
JKL	California	38.6%	9.3%	0.0%	44.3%	\$ 2,967,458	26.7%	11.8%	
MNO	New York	38.6%	6.9%	2.0%	44.8%	<u>\$ 2,111,325</u>	19.0%	<u>8.5%</u>	
Total						\$ 11,110,060	100.0%		
Dollar-Weighted Anticipated Tax Rate:								41.7%	

iii. Retroactive Tax Changes

Incorporating retroactive changes in tax rates for calculation purposes will depend on what rates the portfolio manager believes are in effect at the time portfolio decisions are made. Typically, if Anticipated Tax Rates are used, retroactive tax changes should not be reflected in the return calculation. However, if the firm uses the Maximum Federal Tax Rates, retroactive tax changes should be reflected in the return calculation.

EXAMPLE 3

Calculation of Annual Tax Rate With change in the Federal Tax Rate Effective 1 June

<u>Month</u>	<u>Composite Anticipated Tax Rate</u>	<u>Assets</u>	<u>Contribution</u>
Jan	41.7%	\$ 11,110,060	3.0%
Feb	41.6%	\$ 11,329,786	3.1%
Mar	41.8%	\$ 11,739,064	3.2%
Apr	41.7%	\$ 11,254,069	3.1%
May	41.5%	\$ 11,361,798	3.1%
Jun	39.6%	\$ 11,467,425	3.0%
Jul	39.7%	\$ 14,500,467	3.7%
Aug	38.5%	\$ 14,579,342	3.7%
Sep	39.7%	\$ 13,900,678	3.6%
Oct	39.8%	\$ 14,263,007	3.7%
Nov	39.4%	\$ 14,006,392	3.6%
Dec	39.6%	<u>\$ 14,139,672</u>	<u>3.6%</u>
Total		\$ 153,651,760	
Dollar-weighted Anticipated Tax Rate:			40.3%

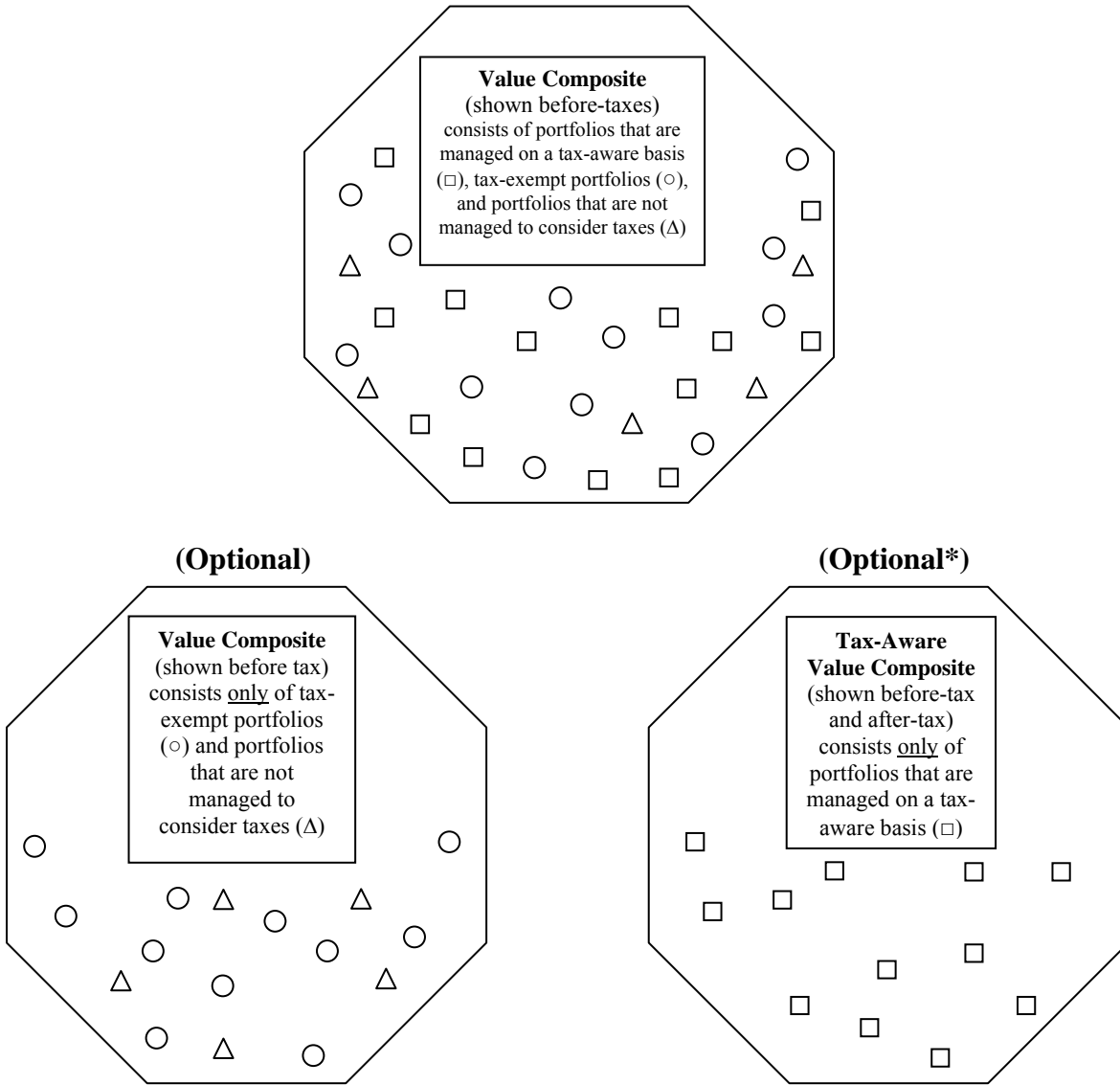
D. After-Tax Composites

According to the before-tax provisions of the AIMR-PPS standards, all fee-paying discretionary portfolios must be included in at least one of the firm's composites. Similarly, firms that choose to present their performance results after the effect of taxes must include all fee-paying discretionary portfolios **that are managed on a tax-aware basis** (taking into account the client's tax profile when conducting security buy and sell decisions) in at least one of the firm's after-tax composites.

For the purposes of the AIMR-PPS standards, an after-tax composite is conceptually a sub-set of portfolios from a before-tax composite that is created to represent a specific tax-efficient investment mandate. Due to the unique circumstances surrounding taxable accounts, it may be necessary to separate the portfolios within a before-tax composite (that represents a broad investment mandate) into several smaller after-tax composites in order to accommodate clients' different tax structures and risk tolerances. In the same way, a before-tax composite may already be constructed to take into account the different tax-related issues and cannot be further separated; therefore, the before-tax and after-tax composite will consist of the same member

portfolios. (See **Example 4** for graphical representation of the relationships that can exist between before-tax and after-tax composites.)

EXAMPLE 4 – Relationships Between Before-Tax and After-Tax Composites



* If a firm that manages portfolios on a tax-aware basis chooses to create an after-tax composite and show after-tax results, the firm must include all of the portfolios that are in the after-tax composite also in a before-tax composite.

All firms must follow the Guidance Statement on Composite Definition, which outlines several guiding principles and interpretive guidance for defining discretion and determining the construction of composites (www.aimr.org/standards).

Since nuclear decommissioning trusts, corporate funds, post retirement medical trusts, property and casualty insurance company investment portfolios, and portfolios for high net worth individuals have differing objectives with respect to funding liabilities as well as different tax rates, they are likely also to require different investment strategies in terms of emphasizing tax-exempt versus taxable income and/or income versus long-term capital appreciation. Therefore, depending on the applicable circumstances, firms are encouraged to construct separate composites appropriate to the different strategies. In addition, even when after-tax performance is adjusted for Non-Discretionary Capital Gains, multiple composites may be necessary within the same strategy to accommodate clients' different tax structures and risk tolerances. The unique circumstances of taxable accounts, therefore, necessitate careful construction of composites. In addition to the fundamental composite definition criteria (e.g., investment mandate, asset class, style or strategy, risk/return characteristics), firms should consider the following tax-related criteria when defining after-tax composites:

- the tax rate(s),
- the client class or type (individual, property & casualty, corporate, nuclear decommissioning, etc.),
- the inception dates of the portfolios in the composite (a composite should include portfolios with similar starting dates so that Realized and Unrealized Capital Gains are somewhat similar),
- the separation of portfolios that have substantial net Unrealized Capital Gains from those that have limited net Unrealized Gains, and
- the state of domicile or residence.

The methodology for calculating after-tax composites is the same as for before-tax returns; namely, calculating the asset-weighted return for the portfolios that comprise the composite within each period and then calculating the time-weighted rate of return by geometrically linking returns over time.

i. Applications Demonstrating Relationships Between Before- and After-Tax Composites

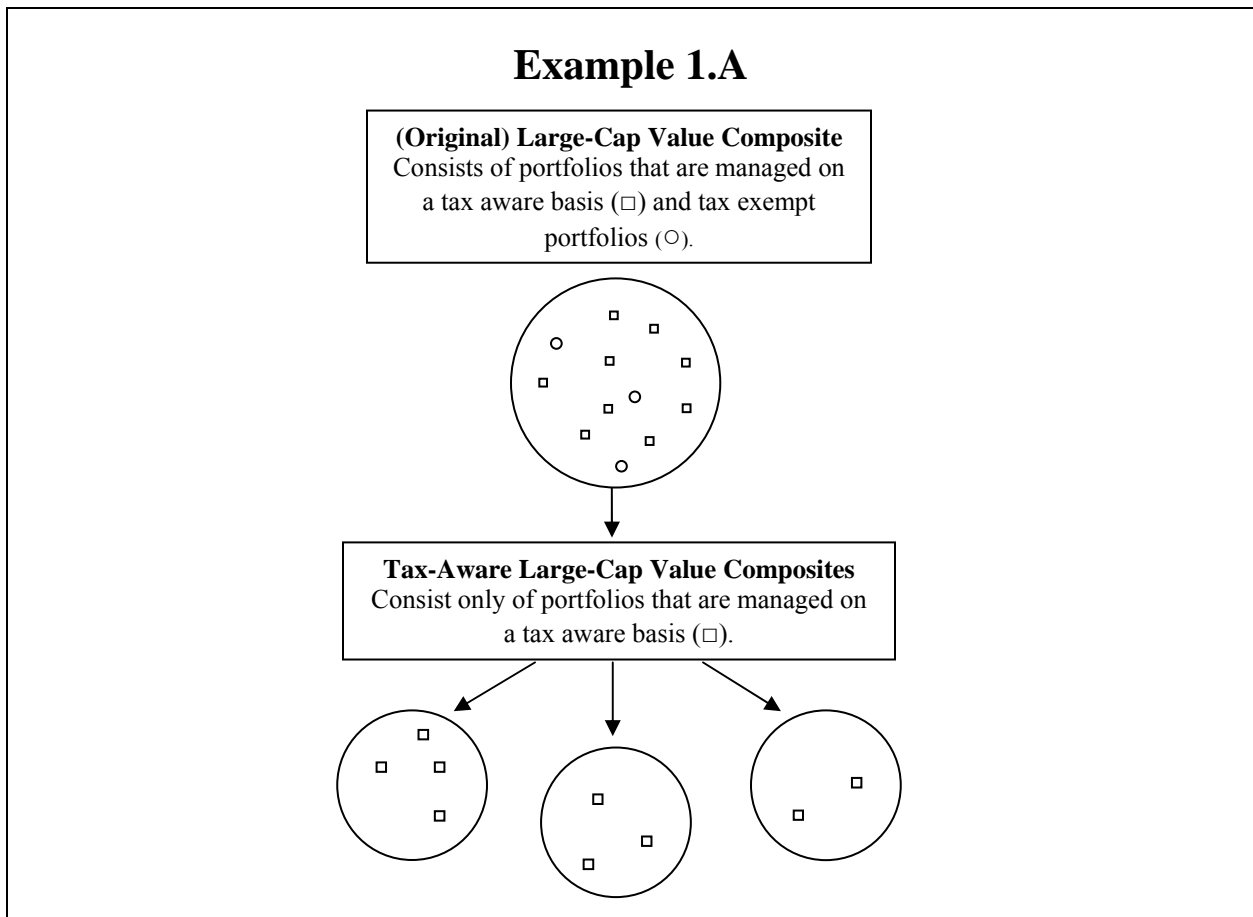
The following applications provide examples of the concepts and principles underlying the relationships between before and after-tax composites and demonstrate potential ways to deal with each situation. (Some of the examples below represent only possible solutions to the issues presented based on the information provided. Other solutions may also be possible.)

APPLICATION 1: Tax Aware and Non-Tax Aware Portfolios Combined in One Composite Historically

Firm XYZ has claimed compliance with the AIMR-PPS standards since its inception in 1995. Firm XYZ has managed its large-cap value strategy since that date and has annual before-tax returns for the Large-Cap Value Composite from 1994 through 2002.

Regarding after-tax composite returns, Firm XYZ has been asked to present them on occasion, but it has chosen never to comply with the AIMR-PPS after-tax provisions. In 2003, Firm XYZ reviewed the modifications to the after-tax provisions of the AIMR-PPS standards and interpretive guidance and determined it would need to calculate and present after-tax performance results according to the AIMR-PPS standards after 2005 in order to maintain compliance.

Instead of waiting until 2005 to implement the changes, the firm took the original Large-Cap Value Composite (which consisted of both portfolios that are managed on a tax aware basis and tax exempt portfolios) and in 2003 created three Tax-Aware Large-Cap Value Composites according to the after-tax guidance to reflect different tax-related criteria. From 2003, going forward, the firm decided to maintain the original Large-Cap Value Composite as well as the three Tax-Aware Large-Cap Value Composites. See **Example 1.A** for a schematic representation.



Two years later, in 2005, Firm XYZ receives a request from a prospective client to see their Tax-Aware Large-Cap Value Composite. **Example 1.B.** demonstrates a sample presentation of one Tax-Aware Large-Cap Value Composite with the accompanying original Large-Cap Value Composite presentation.

Example 1.B

Tax-Aware Large-Cap Value Composite Presentation*

	2003	2004
After-Tax Return	X.XX%	X.XX%
Before-Tax Return	X.XX%	X.XX%
...		
...		

Large-Cap Value Composite Presentation*

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Before-Tax Return	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%
...										

* Not a complete presentation.

Application 2: Only Tax-Aware Portfolios Included in the Composite Historically

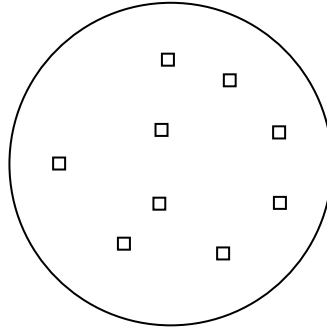
Firm ABC has claimed compliance with the AIMR-PPS standards since its inception in 1996. Firm ABC has managed its core equity strategy for taxable clients since that date and has annual before-tax returns for its Core Equity Composite from 1996 through 2002. In the past, it was not able to satisfy the requirements of the AIMR-PPS standards for reporting after-tax composite returns.

In 2003, Firm ABC decides to implement the newly modified after-tax provisions of the AIMR-PPS standards. They determine their composites are created according to the after-tax guidance and have the infrastructure in place to present after-tax composite results from 2003 going forward to 2005. See **Examples 2.A and 2.B** for graphical representations of Firm ABC's Core Equity Composite and a sample presentation.

Example 2.A

(Original) ABC Core Equity Composite

Consists only of portfolios that are managed
on a tax aware basis (□)



Since Firm ABC’s Core Equity Composite consists of only portfolios that are managed on a tax-aware basis, there is not generally a need to create a new “after-tax” composite. However, the firm may determine to change the name of the composite to more appropriately reflect the tax awareness of the mandate.

Example 2.B

ABC Tax-Aware Core Equity Composite Presentation*

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
After-Tax Return								X.XX%	X.XX%	X.XX%
Before-Tax Return	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%	X.XX%
...										

Note: No accompanying composite report is required, since the historical before-tax returns are captured in this composite’s presentation.

* Not a complete presentation.

E. Disclosures

i. Tax-Loss Harvesting

One method that is commonly used to improve after-tax returns is the process of “Tax-Loss Harvesting.” It involves intentionally harvesting a loss in a portfolio – i.e., purposely selling a security and incurring a loss that is used to offset a gain (either within the same portfolio or elsewhere). In most cases, if the sum of the losses is greater than the total amount of gains for the tax year, the residual amount of the loss can be carried forward to the next tax year. Most managers attempt to harvest losses at the end of the tax year, but some specialize in continually harvesting losses throughout the year.

The benefits of “Tax-Loss Harvesting” can be substantial, especially during significant market corrections, and may result in the need for additional disclosure to explain the impact of harvesting. Specifically, firms are recommended to disclose the percentage benefit of Tax-Loss Harvesting for the composite if realized losses are greater than realized gains during the period (see example 5).

EXAMPLE 5

Recommended Disclosure – Percentage Benefit Received For Tax-Loss Harvesting For the Year 2000

	Accounts	Assets (\$'s)
Beginning Market Value:	5	\$ 25,000,000
Contributions/Withdrawals:	10	50,000,000
Ending Market Value:	15	68,250,000
Total Short-Term Losses Realized		11,250,000
Total Short-Term Gains Realized		10,000
Total Long-Term Losses Realized		1,000,000
Total Long-Term Gains Realized		357,500
Net Short-Term Losses/Gains X 42.6%*		4,788,240
Net Long-Term Losses/Gains X 23.0%*		147,775
Benefit of Tax-Loss Harvesting:		\$ 4,936,015
% Benefit:		10.59%

Tax-Loss Harvesting (taking losses purposely to offset current or future capital gains by this or other portfolios) plays a meaningful role to enhance after-tax returns. This strategy is most beneficial in periods of higher than normal market volatility and declining markets. When this occurs and there is significant growth of new accounts to the composite results may be achieved that may not be representative of future after-tax returns. The percentage benefit (dollar benefit of Tax-Loss Harvesting/((beginning market value + ending market value)/2)) for the year 2000 was 10.59%.

*Anticipated Tax Rates for the composite were 42.6% for ordinary income/short-term capital gains/losses and 23.0% for long-term capital gains/losses. This assumes a federal tax rate of 39.6% and a 5.0% state tax rate.

F. Presentation and Reporting

Additional information may be required to analyze a manager's ability to add value on an after-tax basis. When both before-tax and after-tax returns are provided, investors can analyze both the investment performance, as well as the impact of taxes.

Professionals evaluating taxable managers should realize that after-tax performance analysis is both a science and an art. The “scientific” aspects are manifested in the discrete requirements and details, while the “artisan” aspects recognize that cash flows, substantial Unrealized Capital Gains, and composite definitions can have a significant impact on after-tax results. Thus, firms should be very careful and thoughtful in determining the parameters and assumptions for composites. Also, evaluators are encouraged to consider supplemental information to gain an appreciation for a manager's ability to add value on an after-tax basis.

Another area requiring careful evaluation of after-tax performance is the dispersion or variability of returns of accounts in a composite. For taxable accounts, a taxable manager may act in the best interests of clients to achieve superior after-tax returns, but beneficial actions may lead to a greater level of dispersion than an evaluator would feel comfortable with if applying standards appropriate for tax-exempt account composites. This would be especially true when the manager, who inherits a portfolio with a large Unrealized Capital Gain position, immediately sells security positions to conform to a model portfolio which would create an excessive tax burden. Even after taking careful steps, practitioners must realize the dispersion of returns is likely to be much greater for taxable accounts than for tax-exempt accounts.

The specified requirements must be followed in order to state compliance with the AIMR-PPS standards. However, the specific format of the attached sample presentation is not required. It serves as one example of a presentation that meets the requirements of the AIMR-PPS standards. Managers are encouraged to provide the additional information listed as recommendations to fully satisfy the needs of current clients and prospects.

**i. Sample AIMR-PPS Compliant Presentation for an After-Tax Composite
XYZ U.S. Equities After-Tax Composite**

	2004	2005	2006	2007	2008
Required: (if compliant with AIMR-PPS standards and showing after-tax performance)					
After-Tax Total Return (%)	21.99	31.03	25.02	22.02	-6.17
After-Tax Composite Dispersion (%)	3.1	5.1	3.7	3.2	2.4
Before-Tax Total Return (%)	24.31	34.02	27.33	24.03	-8.44
Before-Tax Benchmark Total Return (%)	22.95	33.35	28.58	21.04	-9.01
Before-Tax Composite Dispersion (%)	2.9	3.3	2.6	1.8	1.5
% of Unrealized Capital Gains to Composite Assets	9	25	37	43	19
% of Taxable Portfolios Included in Both the U.S. Equities After-Tax & Before-Tax Composites	75	78	81	79	82
Dollar-Weighted Anticipated Tax Rate	44.2	44.3	44.5	44.1	43.9
Number of Portfolios	26	32	38	45	48
Total Assets at End of Period (US \$millions)	165	235	344	445	420
Percentage of Firm Assets	33	36	39	43	37
Total Firm Assets (US \$millions)	500	653	882	1,035	1,135
Recommended:					
After-Tax Return Adjusted for Non-Discretionary Capital Gains (%)	21.99	31.07	25.25	24.12	-5.99
After-Tax Benchmark Return (%)	21.78	32.05	27.78	20.21	-9.37
Percentage Benefit from Tax Loss Harvesting	0.00	0.00	0.00	0.00	3.51

XYZ Investment Firm has prepared and presented this report in compliance with the Performance Presentation Standards of the Association for Investment Management and Research (AIMR-PPS[®]), the U.S. and Canadian version of the Global Investment Performance Standards (GIPS[®]). AIMR has not been involved with the preparation or review of this report.

Notes:

1. XYZ Investment Firm is a global portfolio investment manager that invests in U.S. and Non-U.S. Equities and Fixed Income securities. XYZ Investment Firm is defined as an independent investment management firm that is not affiliated with any parent organization.
2. Results for the full historical period are time weighted.
3. The “XYZ U.S. Equities After-Tax Composite” was drawn directly from the “XYZ U.S. Equities Composite” (before-tax).
4. Valuations are computed and returns are based on US Dollars.
5. The dispersion of annual before-tax and after-tax returns is measured by the range between the highest- and lowest- performing portfolios in the composite.
6. Performance results are presented before management and custodial fees but after all trading commissions.
7. A management fee schedule for this product is as follows:

\$500,000-\$2,500,000	0.65%
\$2,500,000-\$5,000,000	0.45%
\$5,000,000 – and above	0.30%
8. The composite was created in September 2003.
9. After-tax returns are computed using “Anticipated Tax Rates.”

10. The benchmark is the Vanguard U.S. 500 Stock Index Fund. After-tax performance on the benchmark is computed using a 37.6%* tax rate on net short-term realized capital gains and dividend income. From May 2005-December 2008, a 20.0% tax rate on net long-term capital gains is used. Prior to May 2005, a 28.0% tax rate on net long-term realized capital gains is used.
11. The after-tax returns shown are subject to the limitations of the specific calculation methodology applied and are not to be used for tax reporting purposes. Since the client's actual circumstances and tax rates determined after the fact may differ from the anticipated tax rates used in this process, the reported returns may not equal the actual after-tax returns for specific clients.
12. Highest cost is the accounting convention used for treatment of realized capital gains.
13. A complete list of firm composites and performance results is available upon request.

* 37.6% is the proposed maximum federal tax rate for 2004

ii. Presenting Net-of-Fees After-Tax Returns (Expensing Investment Management Fees)

It is important to note that while a separate account and a mutual fund can have the same before-tax return, tax rates, amount of capital gains and level of income generated during the period, a different net-of-fees after-tax return can be calculated for the two types of accounts. This is a result of the fact that the mutual fund can offset income by the investment management fee paid on the portfolio whereas the separate account cannot offset any income. If portfolios within a composite are able to offset some or all of the income earned by the amount of the investment management fee paid (as is the case with some pooled funds or mutual funds), firms are encouraged to disclose this practice to prospective clients.

EXAMPLE 6		
	Mutual Fund	Separate Account
Before-tax Gross-of-Fees Return:	10.00	10.00
Investment Management Fees	1.00	1.00
Net-of-Fees Return	9.00	9.00
<u>Taxes:</u>		
Short-term Capital Gains	1.00	1.00
Tax at 38.6% (rate for 2002)	-0.39	-0.39
Long-term Capital Gains	1.00	1.00
Tax at 20.0% (rate for 2002)	-0.20	-0.20
Dividends (ordinary income)	2.00	2.00
Offset of Expenses	1.00	0.00
Taxable Dividends	1.00	2.00
Tax at 38.6% (rate for 2002)	-0.39	-0.77
Total Tax	-0.97	-1.36
Net-of-Fees After-Tax Return	8.03%	7.64%

G. Treatment of Non-Discretionary Capital Gains

The equations used to calculate the pre-liquidation after-tax return assumes that all capital gain realizations were at the discretion of the manager. When returns are combined into a composite, it may be necessary to make an adjustment to the return for those capital gains taxes that were incurred because of client-initiated withdrawals. This will allow comparability among managers.

This equation can be modified to include an adjustment term that removes the effect of client-initiated gain realizations. The adjustment term credits the manager for taxes that were not at his discretion. By reducing the tax payments, the adjustment factor should always have the effect of raising the measured after-tax return.

One way to adjust the after-tax return for client-initiated withdrawals would be to add back the capital gains Tax Liability associated with the precise set of asset sales that were used to satisfy the client's withdrawal. This approach to measuring after-tax returns, however, would create perverse incentives for managers. They would have an incentive to liquidate highly appreciated assets whenever clients requested withdrawals. By lowering the stock of Unrealized Gains in the client's portfolio, such sales would tend to raise the manager's subsequent after-tax return performance by reducing future capital gain realizations.

To avoid such opportunities for gaming the performance results, the recommended adjustment term does not depend on the actual ratio of realized gains to assets sold, but rather on the ratio of total portfolio Unrealized Gains to the entire value of the portfolio. This "gain ratio" is defined below. It equals the sum of realized gains (during the measurement period) and Unrealized Gains (at the end of the measurement period), divided by the sum of net client withdrawals (during the measurement period) and total portfolio value (at the end of the measurement period).

$$\text{Gain Ratio} = \frac{(\text{Realized Gains} + \text{End-of-Period Unrealized Gains})}{(\text{Net Client Withdrawals} + \text{Ending Asset Value})}$$

The adjustment factor equals the capital gains tax that would be due if the manager responded to the client's withdrawal request by proportionately liquidating all securities in the portfolio. This Tax Liability depends on the capital gains tax rate, the amount of the client-initiated withdrawal, and the gain ratio. It can be written as:

$$\text{Adjustment Factor} = \text{Capital Gains Tax Rate} * \text{Net Client Withdrawal} * \text{Gain Ratio}$$

The net client withdrawal in the adjustment factor equation is defined as the net withdrawal after subtracting both taxable and tax-free income, as well as any other positive cash inflows actually received during the measurement period. The income measures used to define the net withdrawal should be measured on an "as-paid" basis which excludes Accruals or income not

remaining in the portfolio since those amounts would not be available to meet client cash withdrawals.

The adjustment factor can be combined with the foregoing measure of after-tax returns to construct a modified after-tax return that reflects only the tax effects that were within the manager's control. The Adjusted After-Tax Return equation below shows this after-tax performance measure:

$$\text{Adjusted After-Tax Return} = \frac{(\text{End Value} - \text{Start Value} - \text{Sum of Net Cash Flows} - \text{Taxes} + \text{Adjustment Factor})}{(\text{Start Value} + \text{Sum of Day-Weighted Cash Flows})}$$

This equation does not describe the client's results after the payment of actual taxes. Those results would depend on the precise assets that the manager sold to meet the client's withdrawal.

Investment managers should always act in accordance with the best interests of their clients. The procedure for calculating after-tax returns outlined in the Adjusted After-Tax Return equation (above) does not offer managers any benefit from selling positions with meaningful gains when such selling may prove detrimental to the client's tax burden. Since the adjustment factor depends on the capital gains taxes that would be generated by selling a fractional component of the entire portfolio, and not on the actual capital gains taxes associated with the assets actually sold.

H. After-Tax Benchmarks

There are currently no after-tax benchmarks for evaluating the after-tax performance of a portfolio. Some practitioners have devised customized ways to present such comparisons, but there is substantial variation both in the methods used and in the details of implementation. AIMR encourages the industry to conduct more research in developing after-tax benchmarks and to disclose the methods that are used to construct these benchmarks.

At the outset, one must recognize that benchmarks for after-tax reporting need to strike a balance between simplicity and flexibility for application in a wide range of contexts. True after-tax performance depends on the investor's sequence of investment flows. After-tax returns depend on when the cost basis was established and how the cash flows evolve. Two portfolios that have precisely the same current holdings will have different after-tax returns if they were initiated at different points in time and if they had different cost bases or cash flows. It is therefore impossible to envision a precise after-tax benchmark return each period that is applicable to all portfolios, even if they are managed the same. This is an important conceptual issue, since before-tax benchmarks are not subject to adjustments for tax basis and cash flows.

This customization to the investor is what sets after-tax performance evaluation apart from before-tax evaluation. Like before-tax performance evaluation, the evaluator begins with a benchmark that is appropriate for the manager being evaluated. This means that the benchmark

should reflect the investment approach, or style, of the manager. For example, customized blends of commonly available style indexes make reasonably good benchmarks for most equity managers. Similarly, bond manager benchmarks should capture the quality and duration of the portfolio, sector allocations and the use of derivatives. Once an appropriate before-tax benchmark is established for the manager, the job of incorporating taxes and client effects into the benchmark can begin. In other words, a good after-tax benchmark will have all of the properties of a good before-tax benchmark, plus one more important property: it will reflect the tax status and actions of the client.

There are two broad approaches to constructing after-tax benchmarks. The first tries to develop and report an after-tax version of standard benchmark indices. Such after-tax returns would be easy to use, since practitioners could simply look them up in a table. Using such indices requires strong (and, for some taxable clients, potentially inappropriate) assumptions about the investor's returns and cash flows. The second approach, which involves the development of a "Shadow Portfolio," abandons the goal of a single benchmark return that can fit all situations. Instead, it develops a benchmark return that is tailored to the manager's style and the individual investor's cash flows and cost basis and tax rates. This approach allows for more complex modeling of the investor's returns and flows. However, it is probably not useful for a composite because of the difficulty in creating a Shadow Portfolio covering multiple client portfolios at once. These two approaches to benchmark computation can be complementary, and in many cases both approaches will be useful.

i. After-Tax Return Indices

The first conceptual approach to benchmarking is to publish an after-tax version of standard benchmark indexes, for example those currently published by Standard and Poor's. Using historical data on capital gains, dividends, and the weights of different securities in various indices, it is possible to simulate the evolving after-tax value of an indexed portfolio and hence its returns. In such a simulation, taxes would be withdrawn, and dividends re-invested, each month. Published tables following such an approach would presumably assume a single initial investment left to appreciate over time from different starting dates. If tables of such benchmark returns were used to evaluate performance, it would be necessary to aggregate across styles and over different sets of returns for a given measurement period. These returns would correspond to portfolio investments at different historical dates, and the styles would represent the style blend the manager is implementing. In this way, the benchmark calculation would reflect the manager's approach, or style, and the historical cash flow experience of an investor's specific portfolio. In addition, after-tax performance measures of this type would need to be adjusted for non-discretionary cash flows both into, and out of, the portfolio.

The principal attractions of this approach are that it relies on published, standardized data for computing benchmark returns, and that several portfolio managers who are benchmarked to the same index can be easily compared. The difficulties with this approach are the multiplicity of tables that might be needed to compute the appropriate benchmarks (one would need tables for different tax rates, and for different dates of portfolio inception), the complexity of the calculations that underlie the benchmark returns (and the associated difficulty of "checking" these calculations for individual practitioners), and the need to continually maintain historical

data on stock prices and returns. Again, all of these complexities are in addition to those confronted in before-tax calculations.

The guidelines for after-tax returns for actual benchmarks of securities are the same as presented for separate account composites.

ii. Shadow Benchmark Portfolios

The second approach to computing after-tax benchmark returns uses “Shadow Portfolios” to estimate what an investor would have achieved, after taxes, if he had invested passively in his benchmark index. Shadow portfolios begin by identifying the appropriate before-tax benchmark, i.e. “the index”. This approach then computes the after-tax returns on the index by replicating the investor’s cash flows, cost basis, and tax rate. This “benchmark portfolio” approach could be implemented by tracking a simulated paper portfolio that corresponds to the index. Calculating the return on the Shadow Portfolio requires information and assumptions on several aspects of the portfolio. With respect to accounting data, these include information on the beginning of period market value and cost basis for the portfolio, the tax rates applicable to income from the portfolio, as well as portfolio cash flows. For the benchmark portfolio, one needs to know the capital gain realization rate, the portfolio’s income receipts, and the total return.

Choosing a Shadow Portfolio that is a real mutual fund may be problematic if the fund incurs fees and tracking deviations from the index. In general, taxes incurred by a mutual fund are affected both by the actions of the investors, through deposits and withdrawals, and by the actions of the portfolio manager, through turnover and stock selection.

The rationale for creating a customized Shadow Portfolio rather than using a mutual fund benchmark is that customized portfolios can today generally be created on demand. Such Shadow Portfolios could be created as a custom mutual fund, or constructed as blends of exchange traded securities, that offer the returns on the benchmark portfolio. In such cases, the returns on these securities could be adjusted for taxes and these returns could be used for the benchmark return.

The appeal of the Shadow Portfolio approach is that the investor obtains a measurement of his actual after-tax performance that closely approximates what he would have achieved after taxes in a passive benchmarked index. Procedures for computing Shadow Portfolio returns could be standardized so results can be replicated by others with access to the relevant data on cash flows and tax rates. AIMR expects the use of the Shadow Portfolio approach to take time and effort by the industry, but believes that the effort is worth it.

One downside to the Shadow Portfolio approach is that it requires relatively complex computations and assumptions. Another is that investors who are benchmarked to the same index can have different after-tax benchmark returns for a given period. This could create some confusion among clients and managers.

When evaluators develop their own customized measures of benchmark returns, many different assumptions are needed, and these assumptions can affect the ultimate returns. AIMR suggests

that in computing after-tax returns on a benchmark portfolio, the capital gain realization rate (as defined above) for the benchmark portfolio should be used to determine capital gains tax liabilities. Although the capital gain realization rate is not always available for broad market indices, it is currently reported for mutual funds. It is possible to approximate the gain realization rate for benchmark portfolios using the gain realization rate for equity index mutual funds that track the same benchmark.

iii. Potential Uses of Marked-to-Liquidation Return Benchmarks

When the separate income and capital gain information necessary to calculate an after-tax benchmark return is not available, the alternative approach of computing the marked-to-liquidation return may provide comparative information that is useful for taxable fixed income clients. This method assumes that both the portfolio and the index are fully taxed on both their Realized and Unrealized Capital Gains. If this method is used, its inaccuracies must be disclosed.

I. Supplemental Return Calculation Methodologies

As with measures of tax efficiency, there are a number of ways of measuring the after-tax return of a portfolio. Some of these, such as the pre-liquidation and marked-to-liquidation measures, have been considered and compared in the foregoing discussion. There are other approaches as well.

To develop a general approach for comparing different approaches to calculating after-tax returns, it is helpful to recognize that rates of return measures are all based on measures of changes in portfolio value. This change in value, for the special case in which there are no cash flows, is defined as:

$$\text{Change in Value} = \frac{V(t_1) - V(t_0)}{V(t_0)}$$

Where $V(t_0)$ and $V(t_1)$ are the beginning-of-period and end-of-period values of the portfolio, respectively. There are three ways to measure each of these values: the current market value on a pre-liquidation basis, the current market value net of the Tax Liability associated with Unrealized Gains (marked-to-liquidation), and the “true economic value” (TEV) that is defined as the pre-liquidation value of the portfolio less the Contingent Tax Liability (CTL). This is similar to the subtraction of the entire Unrealized Gain/Loss from market value in the marked-to-liquidation method. The CTL is the present value of future tax payments embodied in the current Unrealized Gain/Loss. Several authors have commented on methodologies to calculate the CTL, but there is not as of yet one accepted methodology, hence the partial-liquidation method is presented as supplemental information. Unlike the marked-to-liquidation method which subtracts only from ending market value, the partial liquidation method views all market values, both beginning and end, as net of the CTL. This in essence acknowledges the free leverage that is employed by

deferring taxes. The pre- and marked-to-liquidation methods are summarized and the “True Economic Value” method is detailed below.

Pre-liquidation method

Omitting the contingent tax liability, the value of V_m is the current market value of the portfolio. This value overstates true value if there are Unrealized Capital Gains in the portfolio. At such time as a security is sold for a gain and taxes withdrawn, V_m will be reduced.

Marked-to-liquidation method

At the other extreme, if the portfolio were to be liquidated immediately and the simplifying assumption was made that all gains, long- and short-term, are taxed at the tax rate t_g , then the marked-to-liquidation value would be $V_l = V_m - t_g(V_m - V_c)$. This liquidation value would be used as the ending wealth measure in the return calculation. In the case of an investor with no desire to liquidate, the liquidation value understates true value.

"True Economic Value" Method

Both of the foregoing definitions fall short because in general they over-simplify the Tax Liability. In general the “true” economic value (TEV) of the portfolio – a market value net of the contingent tax liability (CTL) – will depend on many factors, including the investment horizon, the final disposition of the assets, future tax rates, future returns, and the rate at which capital gains are expected to be realized. It can be useful to think of the TEV (V_f) as a simple weighted average of the two extremes, V_l and V_m , i.e., $V_f = (f * V_l) + ((1 - f) * V_m)$. The weighting factor in this expression, f , is between zero and one (see article “Measuring and Evaluating Portfolio Performance After Taxes”, Journal of Portfolio Management, vol. 24 no. 2, (Winter 1998) by David Stein, PhD for further justification). Substituting for V_l using the expression from the marked-to-liquidation case allows one to restate the true economic value as if it were a partial-liquidation value with the partial liquidation measured by $f t_g$, when there are no cash flows, as

$$V_f = V_m - (f * t_g (V_m - V_c))$$

It is possible for a firm to compute the TEV value, V_f , in this simplified form, as long as it discloses the choice of weighting factor f that is being used. This represents an approximation to what one would obtain from a calculation of the CTL. This framework is submitted as a temporary substitute and crosscheck for an accepted CTL calculation methodology. In general, either the manager or the investor might choose f .

For example, a simple choice of $f = 0.5$ splits the difference between, the two extremes V_l and V_m . Note that $f = 0$ corresponds to the pre-liquidation value, and $f = 1$ corresponds to the marked-to-liquidation value of the portfolio. Using a simple present value model, it can be shown that this corresponds to a choice, using one of the contemplated CTL calculation methodologies, of a horizon at 20 years, a 10% rate of realization of capital gains, a 10% market return environment, and liquidation at the horizon. Other methodologies would encompass the use of different assumptions.

The typical range of f is between 0.4 and 0.9. The value of f is higher than 0.8 when the gain realization rate is above 60%, or when the horizon is less than about 5 years. In general, with a high rate of gain realization: use a high f ; with a long horizon: use a low f ; with a high return expectation on the market: use a low f . Different methodologies for calculating the CTL will result in different ranges of the partial-liquidation function, f . Most would produce a varying f value over time.

J. Comparison of After-Tax Return Measures

Different results can be calculated when there is a large imbedded Unrealized Capital Gains position, which requires different calculation approaches. What are the pros and cons of the pre-liquidation, marked-to-liquidation and partial-liquidation approaches? Note that they are all straightforward to compute, given AIMR-PPS after-tax computations. The partial-liquidation return requires a more complex explanation and the requirement to specify a factor f . However, it adds to the understanding of after-tax performance.

The following table compares the after-tax performance of three managers using the three different after-tax return measures – the pre-, marked-to- and partial- liquidation returns. The initial portfolio is the same in each case: an initial market value of \$100.00, with a cost-basis of \$50.00. Each manager achieves the same 10.00% before-tax return over one year with no dividends, and the capital gains tax rate is 20.00%. Manager 1 liquidates the initial portfolio and re-invests the proceeds for one year, manager 2 holds the initial portfolio unchanged for one year, and manager 3 realizes \$10.00 of losses.

Numbers in italics are inputs to the calculation, while other numbers are calculated.

	Manager 1	Manager 2	Manager 3
Initial market value	100.00	100.00	100.00
Initial cost basis	50.00	50.00	50.00
Initial liquidation value	90.00	90.00	90.00
Initial CTL value ^a	95.70	95.70	95.70
Investor taxes	-10.00	0.00	2.00
Expected flows	10.00	0.00	-2.00
Final market value	110.00	110.00	110.00
Final cost basis	100.00	50.00	40.00
Final liquidation value	108.00	98.00	96.00
Final CTL value ^a	109.14	104.84	103.98
Pre-liquidation return	0.00%	10.00%	12.00%
Marked-to-liquidation return	8.89%	8.89%	8.89%
Partial-liquidation return	3.59%	9.55%	10.74%

^a The CTL value here is calculated as a weighted average of the liquidation and market values, with the weight on liquidation value being 0.43, and the weight on the market value being 0.57.

Since the returns of all three final portfolios are the same, most would agree that manager 3 has the best after-tax return, followed by manager 2 and then by manager 1. Let us compare how the three after-tax return measures assess the managers.

The pre-liquidation return puts the managers in the right order. By realizing the capital gain, manager 1 has eliminated the before-tax return of 10.00%; this is the high cost of turnover for this taxable portfolio. Manager 2 has preserved the before-tax return, while manager 3 has added value through tax management. However, returns based on pre-liquidation value penalize manager 1 too heavily – although he has realized gains of \$10.00, he has increased the cost basis of the portfolio, and future liquidations will be less costly. Similarly, too much credit has been given to manager 3 who has reduced the cost basis of the final portfolio and has made future turnover more costly.

The marked-to-liquidation return suggests that all three managers have performed equally well. It assumes that the tax penalty on realized gains is the same as that on Unrealized Gains, and it gives no credit to a manager who accelerates the realization of losses and defers capital gains.

The partial-liquidation return recognizes the realized Tax Liability (or credit) as well as the future Tax Liability on Unrealized Gains.

Comparing partial-liquidation returns to pre-liquidation returns for each manager, Manager 1 has a higher partial-liquidation return (3.59%) than pre-liquidation return (0.00%), reflecting the higher cost basis of the final portfolio. Similarly, manager 3 has a lower partial-liquidation return than pre-liquidation return, because the Unrealized Capital Gain is higher in the final portfolio.

K. Measures of Tax Efficiency

The tax burden on a taxable investor's returns depends both on the investor's characteristics and the choices made by the investment manager. The investor's marginal tax rates on both ordinary income and on realized capital gains, as well as specific features of the investor's tax situation such as the presence of loss-carry forwards or the applicability of the alternative minimum tax, affect the tax burden. The manager's decisions about whether to invest in securities that generate dividends and interest or capital gains, and when to realize Accrued capital gains, also affect the investor's tax burden. Because managers do affect the tax burdens faced by their clients, there is substantial demand for quantitative measures that describe the manager's contribution to the investor's tax burden.

The heterogeneity of investors makes it difficult to develop a measure that would apply in all circumstances and to all investors, but there are many statistical measures that are currently used to summarize tax-related aspects of investment performance. These measures are often described as measuring a portfolio's "tax efficiency." This is a difficult term, because in discussions of efficiency (for example in thermodynamics) one usually thinks of measuring the

performance of something relative to an idealized benchmark. In the absence of an after-tax benchmark portfolio return, however, it is hard to judge whether a manager has done well, or done badly, with respect to tax management.

This point can be illustrated with a simple example. Consider a portfolio with substantial Unrealized Losses on individual securities, with a before-tax return of 10.00% during the measurement period. Assume that the manager realizes no gains, and that none of the underlying securities pays a dividend, so that the investor does not face any Tax Liability associated with the 10.00% before-tax return. Does this mean that the manager was extremely tax efficient? Not necessarily, since it might have been possible to realize losses that would have reduced the investor's tax burden on other investments. This example underscores the difficulty of judging the quality of tax management simply from information on measured returns.

There are many different approaches to measuring the “tax efficiency” of a portfolio. The most attractive ones are based on comparisons of the before-tax and after-tax returns on a portfolio, although even those measures are not ideal. There are a number of other measures, that are based on summary statistics about the portfolio or the manager's behavior, that are less informative about tax management issues.

i. Tax Efficiency Measures Based on After-Tax and Before-tax Returns

The most informative measures of how managers are affecting their client's after-tax returns are based on comparison of the before-tax and after-tax returns. Such comparisons can be based on the tax rates facing a hypothetical taxable investor - for many purposes an investor facing the highest federal marginal tax rates might be used. The difference between the before-tax return (R_{bt}) and the after-tax return (R_{at}) is one measure that provides some insight on how the manager's actions affect investor Tax Liability. This difference is likely to be most informative when it is used to compare the actions of managers with similar investment mandates, for example with respect to style or sector allocation.

One simple summary statistic is just the tax burden on the portfolio, which is defined as the difference in before-tax and after-tax returns:

$$\text{Tax Burden} = R_{bt} - R_{at}$$

Returns in this case are measured in percentage points, i.e. as 8 percent. This difference embodies all of the information on how taxes affect returns, but for some presentation purposes it may be less attractive than other measures. The difference will tend to be larger, for example, during periods of high returns, even though the tax management of a portfolio may be independent of the level of returns.

A second summary measure that partially moves toward avoiding this problem is the relative wealth ratio. This is defined as:

$$\text{Relative Wealth Measure}_1 = \left[\frac{(1+R_{at})}{(1+R_{bt})} - 1 \right] * 1000$$

This measure shows the amount of after-tax wealth that an investor who invested one dollar at the beginning of the period would have at period-end, relative to the before-tax wealth at the end of the period. When returns are measured in decimal percentage terms, for example with $R = .10$, then $1 + R$ describes the end-of-period wealth that an investor will have, per dollar of initial wealth invested. The relative wealth measure is the calculation of two such relative wealth measures, re-scaled by subtracting unity to make it easier to present. The measure can be rewritten as:

$$\text{Relative Wealth Measure}_2 = \left[\frac{(R_{at} - R_{bt})}{(1+R_{bt})} \right] * 1000$$

Notice that the Relative Wealth Measure₂ depends on the tax burden measure as outlined above, i.e. on the difference between before-tax and after-tax returns.

One appealing feature of the relative wealth measure is that by scaling the difference between pre- and after-tax returns by a factor that depends on the portfolio's before-tax return, it makes it easier to compare the tax burden on portfolios with different before-tax returns. As defined in the Relative Wealth Measure₁ or Relative Wealth Measure₂, however, this calculation will often be negative in periods with positive before-tax returns, since the after-tax return is likely to fall below the before-tax return. Additionally, the relative wealth measure is an accurate calculation for tax efficiency when using the “post liquidation” method, as adopted by the SEC for mutual fund after-tax reporting.

Both the tax burden and the relative wealth measure are more useful statistics of tax burdens than the “capture ratio”, which is defined as:

$$\text{Capture Ratio} = \frac{R_{at}}{R_{bt}}$$

The logic of the capture ratio is that it describes the after-tax return received by the investor, as a fraction of the before-tax return. However, when the before-tax return is negative, this measure is poorly defined. While the capture ratio may work well in rising markets, it is less versatile than either the tax burden or the relative wealth measure.

Neither the tax burden nor the relative wealth measure provides a completely satisfactory calculation of the degree to which a manager has managed a portfolio to achieve the best possible after-tax returns. Neither takes account of the potential losses that the manager might have realized, or of the investment options that the manager might have pursued but did not.

These are difficult problems to surmount, however, and these measures do offer some insight on a manager's tax performance.

To illustrate the use of these measures, consider the following two examples:

<u>Concept</u>	<u>Example 1</u>	<u>Example 2</u>
Before-Tax Return	+25.0%	-10.0%
After-Tax Return	+21.0%	- 8.0%
Tax Burden	- 4.0%	+ 2.0%
Relative Wealth Measure	- 32.0	+22.0
Capture Ratio	84.0%	80.0%

Note that the capture ratio reflects quite different information in the two cases. When both before-tax and after-tax returns are positive, a lower value of the capture ratio reflects a poorer performance on the part of the manager. When both values are negative, however, a lower value is beneficial to the investor, since it indicates that he has not shared in as much of the loss on an after-tax basis as on a before-tax basis.

ii. Tax Efficiency Measures That Are Not Return-Based

There are many other measures that are sometimes suggested as indicators of tax efficiency. None is completely satisfactory, and AIMR does not suggest that any of these measures be used to gauge the quality of tax management for taxable clients. Nevertheless, it is useful to catalogue these measures and to note their potential drawbacks.

The “turnover ratio” is often cited as an indicator of a manager's attention to tax management issues. This ratio is calculated by dividing the lesser of purchases or sales by the average value of portfolio assets during the period. The turnover ratio suffers from several drawbacks, including the lack of information on whether sales were designed to realize losses that could actually improve the portfolio's after-tax return. It also makes no attempt to control for factors in the marketplace that might induce higher or lower levels of turnover, such as the level of corporate control transactions. There are many variants of the turnover rate, with different modifications, but all suffer from the absence of a link between turnover and investor after-tax returns.

Many measures of tax efficiency focus on the manager's realization of capital gains. The “Capital Gain Realization Rate” is a more attractive measure of tax efficiency than turnover is, since it focuses on the extent to which asset sales result in taxable capital gains. The capital gain realization rate (CGRR) is defined as total gains realized during a measurement period, divided by the potential gains that could have been realized during the period. It is only well defined in cases where the underlying portfolio has potential realizable gains. A related concept, the capital loss realization rate (CLRR), can be defined for cases in which a portfolio has Net Unrealized Losses rather than Gains.

Potential gains in a given measurement period are the average of two terms: (1) the amount of outstanding gains (or losses) at the start of the period and (2) the sum of realized net gains during

the period and the amount of outstanding gains (or losses) at the end of the period. When this sum is positive, the capital gain realization rate (CGRR) is defined as:

$$\text{CGRR} = \frac{\text{Net Realized Gains During Measurement Period}}{\left[\frac{(\text{Amount of Unrealized Gains/Losses at Start of Period} + \text{Net Realized Gains During Period} + \text{Amount of Unrealized Gains/Losses at End of Period})}{2} \right]}$$

To illustrate the use of this ratio, consider a case in which a portfolio is worth \$10,000 at the beginning of the measurement period, with a purchase basis of \$7,500. During the measurement period, the assets appreciate in value, so that they are worth \$12,000 just before the period-end, at which point the manager sells \$2,000 worth of securities and generates a capital gain of \$1,000. The proceeds from the sale are re-invested in assets with a basis of \$2,000, so the end-of-period basis is \$8,500. In this case, the Net Realized Gain is \$1,000, the start-of-period amount of Unrealized Gains is \$2,500, the end-of-period amount of Unrealized Gains is \$3,500, and the capital gain realization ratio is:

$$\text{CGRR} = \left[\frac{\$1,000}{\frac{(\$2,500 + \$1,000 + \$3,500)}{2}} \right] = 0.286 \text{ or } 28.6\%$$

The manager chose to realize 28.6% of the portfolio's Unrealized Gains during the measurement period.

The capital gain realization rate is only a useful concept in situations when the portfolio being analyzed has potential Unrealized Capital Gains. This will be the case whenever the denominator (i.e. the sum of net gains realized during the period and the amount of Unrealized Gains at the beginning and end of the period) is greater than zero. (In the unlikely case of this sum being precisely equal to zero, the capital gain realization rate would involve a division by zero, and therefore would be undefined.) It is possible for the capital gain realization rate to be negative, since a manager might realize losses even when a portfolio has Net Unrealized Capital Gains. This is an artifact of heterogeneity in the returns on different securities. Even when a portfolio has Net Unrealized Gains, there can be some securities with Unrealized Losses, and vice versa.

When the potential gain realization for a portfolio takes a negative value, then rather than computing the capital gain realization rate, it is appropriate to compute the capital loss realization rate (CLRR). This ratio is defined in the same way as the CGRR above. If the manager realizes net losses during the period, and the portfolio has Net Unrealized Losses, then the CLRR will be positive. A negative value of the CLRR will indicate that the manager has realized gains on a portfolio with Net Unrealized Losses.

The capital gain realization rate and the capital loss realization rate provide some information on the extent to which manager actions are affecting the tax burden on taxable clients. In most cases, higher values of the CGRR will translate into higher tax burdens, and lower after-tax

returns, for taxable investors. This pattern is reversed when using the capital loss realization rate: higher values of the CLRR indicate that the manager has realized a larger fraction of the losses on a portfolio with net losses, and that will usually be associated with lower taxes and higher after-tax returns for taxable investors. These simple statements may not apply in all cases, and the manager must be aware of that possibility. For example, a taxable investor might have tax loss carry-forwards that postpone the utilization of tax losses realized during the current period. The capital gain realization rate is preferable to turnover as an indicator of how a manager's actions affect investors' tax burdens, since a manager could have high turnover either as a result of loss harvesting or as a result of trading stocks with Accrued gains.

Three variants of the capital gain realization rate are sometimes used in practice. One divides capital gain realizations during the measurement period by the amount of portfolio assets. This is less informative than the gain realization rate, since it takes no account of the amount of gains or losses in the portfolio that might have been realized. A second variant known as the “Capital Gains Ratio” divides capital gains realized during the measurement period by the maximum amount of capital gains that could have been realized. This ratio also becomes uninformative when the portfolio has Unrealized Losses rather than Unrealized Gains. It is also based on comparing actual experience with a “liquidation based” measure of the portfolio's return, even though the portfolio management problem is explicitly an ongoing, multi-period problem. Finally, there is a “Modified Capital Gains Ratio” that is defined as:

$$\text{Modified Capital Gains Ratio} = \frac{1 + \frac{(\text{Net Realized Gains})}{\text{Total Asset Value}}}{1 + \frac{(\text{Net Realized Gains} + \text{Unrealized Gains})}{\text{Total Asset Value}}}$$

This ratio has many of the same drawbacks as the Capital Gains Ratio, since it is in effect comparing actual realizations with a liquidation scenario.

Yet another tax efficiency measure based on capital gain realizations is sometimes known as the “accountant's ratio”. It equals the ratio of short-term capital gains realized during the measurement period to total capital gains realized during the period. The logic behind this measure is that if a manager is realizing many short-term gains, the manager may not be considering the tax consequences of trading decisions. While there may be some information in this measure, it does not consider the broader question of the level of capital gain realizations. It therefore provides only a partial perspective on the portfolio manager's sensitivity to tax management issues.

A final measure of tax efficiency is the “Capital Gains Tax Efficiency Measure”. This measure calibrates the capital gains taxes paid on the portfolio on a scale that ranges from the lowest amount of taxes that might have been paid, if all losses had been realized but gains had been deferred, to the highest amount of potential taxes, if all gains had been realized. To identify these two polar cases, define:

$$\text{Maximal Capital Gains Taxes} = \text{Capital Gains Taxes on All Unrealized Gains at Beginning of Period} + \text{Short-Term Capital Gains Taxes on All Gains Accruing During the Period}$$

The first term in this expression, capital gains taxes on unrealized beginning-of-period gains, would include both short-term and long-term gains if the beginning-of-period portfolio included assets with both types of gains. The second term would be calculated assuming that all gains accruing during the period were realized while they were short-term. These gains might be calculated on an aggregate basis for the portfolio, for example as the end-of-period market value of the portfolio, less the initial market value plus the sum of within-period cash flows, investment income, and realized gains. They could also be calculated, when record-keeping permits, by summing the gains on only those positions with accrued gains within the period. The second approach would provide a more accurate measure of maximal potential taxes, since it would not allow any offsetting of Unrealized Gains and Losses. If the two components of the “maximal capital gains tax” are greater than or equal to zero, the capital gains tax measure should also be greater than or equal to zero.

A parallel calculation can be done to assess the minimal potential capital gains taxes on a portfolio:

$$\text{Minimal Capital Gains Taxes} = \text{Deduction for Realizing All Unrealized Capital Losses at Beginning of Period} + \text{Deduction for Short-Term Capital Loss on All Losses Accruing During the Period}$$

Each of the deductions in the Minimal Capital Gains Tax equation should be negative or zero, so the minimal capital gains tax defined by this equation is less than or equal to zero.

The capital gains tax efficiency measure compares actual capital gains taxes with the maximal and minimal taxes. Actual taxes are defined as the short-term capital gains tax rate times any net short-term realized gains, plus the long-term capital gains tax rate times any net long-term realized gains. If a manager realizes net short-term losses or net long-term losses, it is possible for the actual capital gains tax liability to be negative. The capital gains tax efficiency measure is defined as:

$$\text{Capital Gains Tax Efficiency Measure} = \frac{(\text{Maximal Capital Gains Taxes} - \text{Actual Taxes})}{(\text{Maximal Capital Gains Taxes} - \text{Minimal Capital Gains Taxes})}$$

Since minimal capital gains taxes are less than or equal to zero, the denominator of this expression is a positive number at least as great as maximal capital gains taxes. This ratio indicates how much of the difference between the maximal and the minimal capital gains Tax Liability was actually incurred as a result of the manager's trading decisions.

L. Model Request-For-Proposal Questions

The following model request-for-proposal (RFP) questions may be used by consultants, plan sponsors, and others in soliciting after-tax investment results as well as by investment managers responding to such requests. Requesters may choose to use some or all of these questions.

1. Please provide the criteria employed to formulate after-tax composites.
2. Please provide the methodology for calculating after-tax returns or the source of the information for the benchmark. In addition, list all assumptions necessary to calculate the after-tax returns for the benchmark.
3. If employing a calculation methodology other than “pre-liquidation” as supplemental information, please provide a list of all assumptions.
4. Please include all taxable account composites for this particular investment strategy. Be sure to include relevant notes that distinguish the composites from one another.

M. Challenges

i. Systems and Software Issues

After-tax performance reporting and composite construction requires enhancements to the firm's systems and accounting software.

To accurately compute after-tax returns firms must take into consideration the tax implications in the next section “Accounting Issues.” The following accounting information is needed: acquisition dates of securities, cost basis of securities, the amount of distributable income, short- and long-term capital gains calculated for tax purposes.

Accounting systems are generally designed to serve a particular segment of the industry. For example, a mutual fund system provides net asset values (NAVs), taxable income and capital gains distributions. An insurance system emphasizes amortization and accretion of fixed income securities and provides regulatory reports. An investment management company selects an accounting system to satisfy their high priority needs. Unfortunately, tax-lot accounting is not always a functional option of a firm’s software. Since accounting is the heart of the daily operation, the costs of changing an accounting system include software, implementation and training, a lengthy conversion time, and reworked links to other systems such as trading, compliance, analytical, reporting, and performance.

Since a firm may use different tax elections for different clients, a performance system should be flexible enough to calculate after-tax returns based on various combinations of the tax requirements. Many current performance systems are not cost-of-transaction based. Certain systems that do incorporate tax-lot accounting may need to be enhanced to include acquisition dates, tax elections based on different security types, transaction based calculations, and calculations to take into account for the impact of taxes or tax credits.

ii. Accounting Issues

The items noted below are intended to assist firms in evaluating the tax implications associated with certain securities and securities transactions. The recognition and classification of ordinary income or realized gains and losses is determined by applicable tax regulations. Providing a comprehensive list of considerations would not be practical, and the discussion items listed below are not intended to supersede any regulations particular to specific situations or the environment in which a firm may operate. Firms should consult a qualified certified public accountant or a consultant with performance reporting and tax expertise in situations where the regulations require additional analysis or interpretation.

Interest and dividend income must be included in a portfolio's market value in the same manner for both before-tax and after-tax performance reporting. The amount of income and realized gains or losses should be determined based on the tax rules applicable to the client. One exception is that the AIMR-PPS standards recommend that dividend income be recorded on the ex-dividend date, which would generally be required for tax purposes. (Note: The AIMR-PPS standards state for periods beginning 1 January 2005, Accrual accounting must be used for dividends as of the ex-dividend date).

Interest income must be accounted for on an Accrual basis and should take into consideration adjustments to cost basis through Amortization and accretion. The cost basis of fixed income securities purchased at a price other than par value should be adjusted for Amortization and accretion as required by the applicable tax code when calculating after-tax returns.

Amortization of premiums on taxable bonds is elective. (Code Sec. 171) If elected, Amortization should be calculated using the yield-to maturity method for bonds issued after 27 September 1985. For tax-exempt bonds, Amortization of premiums is required. Usually, no deduction is allowed for tax purposes, but the tax basis of the bonds is still reduced. Special rules apply to debt securities that are callable or convertible. The effect of Amortization is a decrease in the security's tax basis with a corresponding increase in unrealized appreciation or a decrease to unrealized depreciation and a reduction to current income.

The rules relating to accretion of discounts are segregated between original issue discount ("OID") and market discount. OID is the excess of the stated redemption price at maturity over its issue price. The amount of OID recognized and the required methodology for accretion are determined based on the type of security and the date of issuance. In general, many securities will fall under the following requirements:

- Tax-exempt securities issued subsequent to 27 September 1985 use the yield to maturity method when calculating OID accretion.
- Taxable securities issued after 1 July 1982 accrete OID using the constant interest method.
- Special rules apply to non-government short-term obligations.

A debt instrument with a fixed maturity of greater than one year at the time of issuance and purchased in the secondary market after 30 April 1993, at less than par could include market discount. The amount of market discount is determined after taking into consideration any OID at the time of acquisition. Additional considerations are required for taxable securities issued on or prior to 30 April 1993. An investor can elect to accrete market discount using a ratable or

constant interest method (Code Sec. 1276(b) (1), (2)). Market discount may be accreted currently or deferred until the disposition of the related security. If the election is made to defer accretion of market discount, the impact is a recharacterization of capital gain to ordinary income upon disposition. No adjustment is made if the security is sold at a loss. Current accretion of OID and market discount will result in higher interest income with a corresponding increase to the cost basis of the security.

OID and market discount are considered to be zero, and therefore would not require accretion, if such amounts were deemed to be de minimus. A de minimus discount is defined as an amount less than one quarter of one percent of the stated redemption price at maturity, multiplied by the number of complete years to maturity. Special rules apply to certain securities that are subject to accelerated principal collection (i.e. REMICs and CMOs). The de minimus rule is not applicable to OID for tax-exempt securities.

The tax implications of interest income earned from (“tax-exempt”) municipal securities and U.S. government obligations must be taken into consideration when computing after-tax returns. In general, interest income from direct obligations of the U.S. Government is not subject to state income tax. In most instances, interest income from non-AMT “tax-exempt” municipal securities is tax-free at the federal level as well as in the issuing state but subject to applicable income tax in all other states. In some circumstances, interest income on “tax-exempt” municipal bonds classified as alternative minimum tax (AMT) bonds may be subject to state and federal income taxes. However, capital gains on both “tax-exempt” municipal bonds and U.S. Government obligations are subject to federal taxes as well as applicable state income taxes, regardless of the state of issuance.

There are several classifications of special situation securities, such as “taxable” municipal bonds, “triple tax-free” bonds issued by some agencies, protectorates, or other instrumentalities of the U.S. Government. Investors should consult qualified tax counsel for additional guidance if there is any uncertainty regarding the tax status of these securities.

The Dividend-Received Deduction may impact dividend income earned from domestic corporations. Since dividends have already been taxed at least once (as income to the issuing corporation), a C corporation may deduct 70% of the dividends received or Accrued from domestic corporations. (Code Sec. 243(a)(1)) The deduction is 80% for dividends received or Accrued from a 20% (or more) owned corporation. (Code Sec. 243(c)(2)) Finally, members of an affiliated group (as specially defined) that file separate returns may deduct 100% of the dividends received from other group members if certain requirements are met. (Code Sec. 243(a)(3), (b))

Dividends from registered investment companies (“RICs”) – mutual fund dividends – are eligible for the dividends-received deduction but only to the extent of the amounts the RIC received from domestic corporations that it would have been allowed to treat as dividends in computing its own dividends-received deduction if it had been a regular corporation. (Code Sec. 243(d)(2), Code Sec. 854(b)(4)) Dividends from otherwise qualifying stock, which has been held for less than 45 days, may not be eligible for the deduction.

Dividends received on certain public utility preferred stock are eligible for the dividends-received deduction, but the deduction is reduced if the utility was entitled to a dividends-paid deduction on those dividends. (Code Sec. 244(a))

Investment management firms should have the option to include the effect of foreign tax credits, as they can have a material effect on the calculation of after-tax returns. In the return calculation, the dividend should be reduced by the applicable tax rate and then increased by the amount of the tax credit.

Security dispositions will generally result in realized gains and losses that are taxed at differing rates depending on the amount of time such security was owned. Currently, holding periods of more than one year are considered long-term while those of one-year or less are considered short-term. (Code Sec. 1222(1), (2), (3), (4)) Holding periods are determined based on the trade date of investment transactions. They are computed in terms of calendar months, not days, and begin on the day after the acquisition and ends on the day of disposition. Various tax rules can impact the timing of when a gain or loss is recognized and the characterization of the gain or loss as long or short term.

Special rules apply to gains and losses incurred from certain transactions that involve a foreign currency. “Section 988” transactions require analysis of the gain or loss that is related to a fluctuation in exchange rates. Foreign currency gains and losses attributable to section 988 transactions are treated as ordinary income for tax purposes. Realized gains and losses from the sale of equity securities are not subject to the rules, however, complex rules are applicable when determining the nature of gains and losses associated with the sale of any debt security denominated in a foreign currency.

A short sale occurs when an investor borrows a stock (or other property) from a lender and simultaneously sells the security to a third party. At a later date, the investor provides a similar security necessary to “cover” the original transaction and closes the short position. A short sale results in a capital gain or loss only if the property used to close the sale is a capital asset, i.e. a hedging transaction results in ordinary income or loss.

Provisions enacted by the Taxpayer Relief Act of 1997 around “constructive sales”, have, for the most part eliminated the tax deferral benefits of short sales. Prior to the Act, certain hedging strategies such as short sales against the box, forward contracts, and notional principal contracts could be used to lock in gains on appreciated financial positions without immediate recognition of income. Subject to certain exceptions, a constructive sale of an appreciated financial position will require the taxpayer to recognize a gain as if the position were sold at its fair market value as of the date of the constructive sale and immediately repurchased.

Certain financial instruments which are traded and priced daily, e.g. regulated futures contracts (RFC’s), certain foreign currency contracts, non-equity options and dealer equity options, are referred to as section 1256 contracts and are subject to two specific rules:

- The mark-to-market rule which treats that instrument as sold on the last day of a taxpayer’s taxable year, and

- The 60-40 rule treats 60 percent of any capital gain or loss from such deemed sale or an actual sale as long term and 40 percent as short-term, regardless of how long the instrument has been held.

Then, when the section 1256 contract is actually terminated, it will also result in a taxable gain or loss. However, if delivery of the underlying property is taken, the tax basis of the property received is decreased or increased by the gains or losses already recognized. These instruments may also be subject to the straddle rules outlined in section 1256.

The tax treatment of nonlisted (primarily equity) purchased options, e.g. puts and calls, depends largely upon the holding period:

- If a put or call is sold or lapses, any gain or loss is long-term or short-term depending on the holding period of the option.
- If a call option is exercised, its cost is added to the taxpayer's basis of the securities purchased.
- If a put option is exercised, its cost reduces the amount of the proceeds received upon sale of the underlying securities.
- If, however, the put is acquired at a time when the underlying stock has been held for one year or less, then any gain upon termination of the put is short-term, and the holding period of the underlying stock may be forfeited through the date of termination of the put.
- Purchased options may be subject to the straddle rules.

The tax treatment of nonlisted (primarily equity) written options, e.g. puts and calls, is parallel to purchased options and depends largely upon the holding period:

- If a put or call is closed out or lapses, any gain or loss is short-term.
- If a call is exercised, the premium received is added to the sale proceeds and capital gain or loss is calculated based on the holding period of the stock.
- If a put is exercised, the premium received decreases the basis in the stock acquired. The holding period of the stock begins on the date of its purchase, not the date the put was written.
- Written options may be subject to the straddle rules.

Tax straddles are defined as offsetting positions for which the fair values are expected to fluctuate inversely to each other. An offsetting position results whenever holding one or more other positions has substantially diminished the risk of loss attributable to holding another position. Complex tax rules (Code Sec. 1092) must be considered when determining if any realized losses should be deferred and the resultant characterization of realized gains and losses between short and long term.

A wash sale loss is any loss sustained upon a sale (or other disposition) of stock or securities where within a period beginning 30 days before the date of the disposition and ending 30 days after that date (a total of 61 days), the taxpayer has acquired (or has entered into a contract or option to acquire) substantially identical stock or securities (Code Sec. 1091). Such losses are

deferred for tax purposes and increase the cost basis of the security that was purchased. Similarly, losses recognized from short sales are not allowed if identical securities are sold within the 61-day period referred to previously. Wash sales apply to all classes of taxpayers (individuals, corporations, etc.) except securities dealers where losses may be regularly sustained in the normal course of business. Finally, an acquisition by gift, bequest, inheritance, or tax-free exchange that is made within the 61-day period does not bring the wash sale rule into play.

The calculation of before-tax and after-tax performance depends largely on the tax treatment of income and gains or losses, as well as complex rules around Amortization and accretion requirements. As previously noted, the definitions and regulations associated with the items discussed above include general summaries of complex tax regulations. Qualified tax counsel should always be consulted regarding the treatment of specific transactions as they relate to the calculation of after-tax performance.

N. Glossary of Terms

Amortization/Accrual Basis	the recognition of transactions ratably over the period to which they apply, without regard to the receipt or payment of related cash. For example, Amortization is applicable to the premium paid versus par on the purchase of a bond and accrual is applicable to the discount versus par on the purchase of a bond and also to the interest payments received on a bond.
Anticipated Tax Rates	the tax rates that an investment manager expects a taxable client to incur on returns generated during the prospective reporting period for each applicable asset class. These tax rates should include the impact of applicable state and local income taxes and should be determined at the beginning of the reporting period.
Dollar-Weighted Anticipated Tax Rate	the money-weighted average of the monthly composite Anticipated Tax Rates for a given period.
Maximum Federal Tax Rate	the highest income tax rate in effect for the applicable client according to the Federal tax code for a given measurement period.
Net Realized Gains	the net amount of realized gains and realized losses. References to net realized gains should be interpreted to mean the net amount of realized capital gains/losses.
Non-Discretionary Capital Gains	those realized capital gains/losses incurred as a result of a client-directed transaction.

Realized Basis Pre-Liquidation Return

the after-tax return that reflects the net Tax Liability or Benefit associated with the accrued taxable income and net realized gains that occurred during the measurement period (without considering the tax implications of unrealized gains).

Shadow Portfolio

a portfolio that replicates the cash flows and structure (e.g., cost basis, and tax rate(s)) of the respective index being used as a benchmark.

Tax Liability or Benefit

those taxes or benefits incurred in a given period resulting from the recognition of income and realized capital gains/losses, without regard to when (or if) the taxes will be paid. Also referred to as the tax burden or realized taxes.

Tax-Loss Harvesting

the process of intentionally realizing capital losses in order to offset realized capital gains in the portfolio in which the transaction took place or in another client portfolio.

Unrealized Capital Gains

the difference between market value and cost of securities owned, at a given point in time. If market value exceeds cost, the net amount will be positive (unrealized gains). If cost exceeds market value, the net amount will be negative (unrealized losses). References to unrealized capital gains should be interpreted to mean the net amount of unrealized capital gains/losses.

APPENDIX B.

Assogestioni formula for calculating the gross-of-tax value of the shares of an Italian open-end fund

This appendix contains a description of the Assogestioni formula for calculating the gross value of the shares of an Italian open-end fund, which makes it possible to gross up the net value of shares in order to eliminate the effects of Italian taxation.

1. Introduction

As regards the method of taxing open-end funds, it is worth noting that, apart from Italy, most countries do not tax the operating results of open-end funds directly but require the related income to be included in individual taxpayers' income tax returns. Other things being equal, this difference in the tax treatment of fund revenues influences the mechanisms for determining the net value of shares and hence the measures of performance based on that value. For this reason it is desirable to establish a method for grossing up the net values of the shares of Italian funds, so as to eliminate the effects of taxation on the performance of Italian open-end funds. Funds set up under Italian law are subject to a withholding tax of 12.5% on the difference between the initial and final values of the investments made during the year². Each fund's tax liability is calculated daily and an equivalent amount set aside in a tax provision until payment is made the following year. Fund shares are consequently quoted net of taxation.

The gross share price of an Italian open-end fund is defined as the price at which the shares would be quoted if all the effects of the taxation of the income the fund receives gross were eliminated³. This appendix contains a description of the formula used to obtain the gross share price and a series of notes on when and how it can be applied.

2. Option 1 - The Assogestioni formula

Consider the case of a generic Italian open-end fund that calculates its share value every day. Let N_i be the net share price and X_i the number of shares outstanding on day i . In addition, let T_i be the tax liability accrued. It should be noted that T_i is the amount that is set aside for tax purposes but which is still part of the fund's assets and therefore still available to the manager until the day set for settlement. The variable ST_i is defined as the sum of the tax liabilities accrued but not yet settled at the end of day i ⁴. Let P_i be the amount per share of any income distributed on day i . Lastly, let L_i be the gross share price of the fund at time i .

³The tax base is the increase in a fund's net assets, i.e. the sum of all the positive and negative changes that occur during the year (taxation of the net operating result). If the operating result is negative, the loss can be carried forward as a tax loss for four years.

³ Italian funds receive certain categories of income net of full-settlement tax. The grossing-up of such tax is forbidden by Recommendation 2.B.1.

⁴ $ST_{i+1} = ST_i + T_{i+1} - TL_{i+1}$ where TL_{i+1} denotes the tax liability settled at the end of day $i + 1$.

It can be shown that:

$$L_i = L_{i-1} \frac{x_i (N_i + P_i) + ST_{i-1} + T_i}{x_i N_{i-1} + ST_{i-1}} \quad (1)$$

2.1 The tax lever effect

If the fund receives only income subject to full-settlement withholding tax $\tau = 12.5\%$, it can be shown that:

$$T_i = \frac{\tau}{1-\tau} x_i (N_i - N_{i-1}).$$

(2)

Putting $g_i = \frac{L_i}{L_{i-1}} - 1$ gives:

$$N_i = \underbrace{N_{i-1} (1 + g_i)}_{\text{management eff.}} - \underbrace{N_{i-1} g_i \tau}_{\text{direct tax eff.}} + \underbrace{\frac{g_i ST_{i-1} (1-\tau)}{x_i}}_{\text{indirect tax eff.}}$$

(3)

which expressed in terms of the rate of change, $\frac{N_i}{N_{i-1}} = 1 + \pi_i$, becomes:

$$\pi_i = g_i - g_i \tau + g_i \frac{ST_{i-1} (1-\tau)}{N_{i-1} x_i}$$

(4)

Equation (3) shows that the net share price on day i is the previous day's net share price revalued at the gross rate of growth $N_{i-1} (1 + g_i)$ minus the *direct effect* of taxation on the operating result,

$N_{i-1} g_i \tau$, plus $\frac{g_i ST_{i-1} (1-\tau)}{x_i}$, which can be interpreted as the indirect effect of taxation produced

by the tax liability accrued but still to be settled on day $i-1$. The indirect tax effect is the result of the management of the tax liability/claim in the period preceding its settlement. The term ST_{i-1} in equation (1) corrects the indirect tax effects on the basis of the assumption that the manager manages a quantity of available assets given by the sum of the fund's net assets and the tax liability accrued but not yet settled⁵.

3. Option 2 - Modified Assogestioni formula

However, the Assogestioni formula can be modified and applied where the manager manages only the fund's net assets and invests the additional resources consisting of any outstanding tax

⁵ If the fund is in credit, the available assets are equal to the difference between the net assets and the tax claim accrued.

liability in a liquidity account⁶. In this case in fact it is sufficient to put $ST_{i-1} = 0$ in (1), giving, if $P_i = 0$:

$$\frac{L'_i}{L'_{i-1}} = \frac{N_i}{N_{i-1}} \left(1 + \frac{T_i}{x_i N_i} \right),$$

(5)

in other words, on the assumption that the manager manages only the fund's net assets (whether these are larger or smaller than the assets effectively available), the gross performance is equal to the net performance corrected for a tax factor equal to the *direct effect* of the full-settlement tax on the fund's net assets. If the fund receives only income subject to the full-settlement tax τ , it can be shown that:

$$g'_i = \frac{L'_i}{L'_{i-1}} - 1 = \frac{1}{1-\tau} \left(\frac{N_i}{N_{i-1}} - 1 \right) = \frac{1}{1-\tau} \pi_i \cong 1.143 \pi_i \quad (6)$$

Since the Assogestioni formula gives a gross share price that depends on the assumptions made regarding the way in which the funds concerned invest their tax liability/claim, **the manager defines its composites on the basis of a criterion of homogeneousness in this respect and calculates the gross share prices using the appropriate formula (with or without the ST term). Full information must be provided on this process.**

4. Examples

Some examples are given below of the application of the Assogestioni formula to a real fund, with a comparison of the results obtained with the various admissible assumptions (with or without the ST term) and a summary of the effects on the gross share prices.

i	N_i	χ_i	ST_i	T_i	$\frac{ST_{i-1}}{N_{i-1} \chi_i}$	L_i	L'_i	π_i	g_i	g'_i
0	15.354	107,238,499	104,910,713			15.354	15.354			
1	14.638	107,520,608	93,910,207	-11,000,506	0.064	14.585	14.536	-4.66%	-5.01%	-5.33%
2	13.981	108,167,138	83,766,409	-10,143,798	0.059	13.878	13.790	-4.49%	-4.84%	-5.13%
3	13.434	108,762,321	75,259,129	-8,507,280	0.055	13.290	13.173	-3.91%	-4.24%	-4.47%
4	13.697	108,593,174	79,336,650	4,077,522	0.052	13.573	13.468	1.96%	2.13%	2.24%
5	14.137	106,372,795	86,031,584	6,694,934	0.054	14.046	13.963	3.21%	3.48%	3.67%
6	14.190	706,689,691	86,837,669	806,086	0.057	14.103	14.023	0.37%	0.41%	0.43%
7	14.128	106,408,433	85,899,764	-937,906	0.058	14.036	13.953	-0.44%	-0.47%	-0.50%
8	14.440	107,151,308	90,671,107	4,771,344	0.057	14.371	14.305	2.21%	2.39%	2.52%
9	14.848	107,840,436	96,955,615	6,284,508	0.058	14.810	14.767	2.83%	3.05%	3.23%
10	15.198	108,345,644	102,370,059	5,414,444	0.060	15.186	15.164	2.36%	2.54%	2.69%

More generally, it can be shown that the following inequalities hold:

⁶ If the fund has a tax credit, the manager borrows a corresponding amount.

	$\frac{ST_{i-1}}{N_{i-1}x_i} \in (-1, 0)$	$\frac{ST_{i-1}}{N_{i-1}x_i} \in \left(0, \frac{\tau}{(1-\tau)}\right)$	$\frac{ST_{i-1}}{N_{i-1}x_i} > \frac{\tau}{(1-\tau)}$
$\pi > 0$	$0 < \pi < g' < g$	$0 < \pi < g < g'$	$0 < g < \pi < g'$
$\pi < 0$	$g < g' < \pi < 0$	$g' < g < \pi < 0$	$g' < \pi < g < 0$

Where the net performance of the fund is positive and there is an unsettled tax liability and the manager is assumed to invest these resources in the same way as the fund's net assets, the performance of the gross share price g is better or worse than that of the net share price π

depending on the relative size of the direct tax effect (measured by the relationship $\frac{\tau}{(1-\tau)} \cong$

0.143) with respect to the size of the indirect tax effect (measured by the relationship $\frac{ST_{i-1}}{N_{i-1}x_i}$).

If the direct effect prevails over the indirect effect (the first two columns), the performance of the gross share price g is better than that of the net share price π ⁷. Conversely, if as a result of large redemptions⁸, the indirect effect prevails over the direct effect (the last column on the right), the performance of the net share price is better than that of the gross share price owing to the preponderance of the tax lever effect. The other cells of the table complete the various possible combinations of net performance, tax position (debit or credit), and ways of managing the tax component (g and g') and provide an overall picture of the relationships between the different quantities.

The example that follows presents the case of the fund referred to above that acquires a tax credit ($ST < 0$) following a period in which the overall performance was negative:

i	N_i	x_i	ST_i	T_i	$\frac{ST_{i-1}}{N_{i-1}x_i}$	L_i	L'_i	π_i	g_i	g'_i
202	12.249	83,928,658	-47,252,978	-1,686,879	-0.044	11.720	11.808	-1.13	-1.35%	-1.29%
203	12.096	83,618,163	-49,079,242	-1,826,265	-0.046	11.544	11.639	-1.25	-1.50%	-1.43%
204	12.484	83,454,179	-44,452,499	4,626,743	-0.049	11.989	12.066	3.21	3.85%	3.67%
205	12.582	82,936,752	-43,287,143	1,165,356	-0.043	12.102	12.174	0.79	0.94%	0.90%
206	12.736	82,813,152	-41,466,486	1,820,658	-0.042	12.278	12.345	1.22	1.46%	1.40%
207	12.952	82,657,123	-38,914,844	2,551,642	-0.039	12.526	12.584	1.70	2.02%	1.94%
208	12.772	82,679,756	-41,045,077	-2,130,233	-0.036	12.319	12.384	-1.39	-1.65%	-1.59%
209	12.700	82,742,838	-41,898,670	-853,593	-0.039	12.237	12.304	-0.56	-0.67%	-0.64%
210	12.950	82,735,638	-38,936,391	2,962,279	-0.040	12.524	12.581	1.97	2.34%	2.25%
211	12.888	82,719,496	-39,670,805	-734,414	-0.036	12.452	12.512	-0.48	-0.57%	-0.55%
212	12.958	82,698,102	-38,848,916	821,889	-0.037	12.533	12.590	0.54	0.64%	0.62%

⁷ In this case the net share price "suffers" from the tax levied more than it benefits from the effects of the investment of the unsettled tax liability.

⁸ A sudden reduction in the number of shares x_i may push the ratio $\frac{ST_{i-1}}{N_{i-1}x_i}$ above the level given by $\frac{\tau}{(1-\tau)}$.

The last example shows the results of a simulation of the effects of a sudden withdrawal of resources on the net and gross measures of performance. The simulation was carried out keeping the data on gross share prices shown in the previous tables unchanged and imposing a rapid fall in the number of shares. From day 210 the ratio $\frac{ST_{i-1}}{N_{i-1}x_i}$ is equal to more than 1, so that the indirect tax effect prevails over the direct tax effect and the movements in the net share price are approximately twice as large as those in the gross share price.

i	N_i	x_i	ST_i	T_i	$\frac{ST_{i-1}}{N_{i-1}x_i}$	L_i	L'_i	π_i	g_i	g'_i
202	99.058	127,788,962	-11,414,402	-20,696,753	0.001	98.922	98.909	-1.13%	-1.29%	-1.29%
203	97.822	131,465,585	-34,629,595	-23,215,193	-0.001	97.510	97.499	-1.25%	-1.43%	-1.43%
204	100.951	131,694,530	24,246,418	58,876,013	-0.003	101.085	101.063	3.2%	3.67%	3.66%
205	101.746	132,274,844	39,255,347	15,008,930	0.002	101.992	101.972	0.79%	0.90%	0.90%
206	102.994	133,652,299	63,099,414	23,844,067	0.003	103.419	103.403	1.23%	1.40%	1.40%
207	104.749	133,757,018	96,631,506	33,532,092	0.005	105.423	105.416	1.70%	1.94%	1.95%
208	103.283	134,313,433	68,500,346	-28,131,160	0.007	103.749	103.730	-1.40%	-1.59%	-1.60%
209	102.698	140,972,585	56,715,084	-11,785,262	0.005	103.080	103.058	-0.57%	-0.64%	-0.65%
210	106.921	507,455	57,021,225	306,141	1.088	105.400	107.901	4.11%	2.25%	4.70%
211	105.868	504,734	56,945,292	-78,933	1.057	104.823	106.687	-0.98%	-0.55%	-1.13%
212	107.049	509,382	57,031,254	85,962	1.056	105.473	108.047	1.12%	0.62%	1.28%