Performance Reporting Overview

axos ADVISOR SERVICES

This document is intended to be a high-level review of methods used to measure investment returns, why Axos Advisor Services uses the time-weighted return (TWR) measure, and the tools Axos Advisor Services offers to investment advisors (IAs) and their clients for tracking returns.

Methods of measurement

The following are some of the common methods of calculating returns.

Total Return

Total return (TR) is a basic measure and is one that investors will likely think of when reviewing their portfolio's return. The total return calculation is:

$$R_{TR} = \frac{EMV - BMV}{BMV}$$

where EMV is the ending period market value, and BMV is the beginning period market value

This is a valid way to review a portfolio's return—particularly when no cash flows are present—but it is a very simplified measure, and it is not a method accepted in the Global Investment Performance Standards (GIPS/Standards) for calculating returns because it does not exclude the effects of external cash flows. Cash contributions and withdrawals, along with additions of securities to the portfolio, can distort the total return. Using a time-weighted rate of return measurement responds to this shortcoming.

Time Weighted Rate of Return

The time-weighted rate of return (TWR) excludes external cash flows to isolate investment returns, reflecting a firm's ability to manage the portfolio's assets. It can be calculated on a daily basis (known as daily valuation) or on a monthly basis (known as modified dietz), where cash flows are weighted by the amount and length of time they are invested during the month. The monthly portfolio returns are then geometrically linked to arrive at a quarterly, annual, or x period return. The formula for estimating the time weighted rate of return using the modified dietz method is:

$$R_m = \frac{MVEcob^1 - MVBcob^1 - CF}{MVBcob^1 + CFW}$$

MVEcob[1]	Market value of the portfolio at the end of the period at the close of business
MVBcob[1]	Market value of the portfolio at the beginning of the period at the close of business
CF	The sum of cash flows, both inflows and outflows, within the period
CFW	The sum of cash flow CFi multiplied by its weight W_i
R_m	Period return

[1] Close of Business

The formula for Wi is $W_i = \frac{CD - D_i}{CD}$, where CD is the total number of calendar days in the period and Di is the number of calendar days since the beginning of the period in which external cash flow, CFi, occurred.

Beginning January 1, 2010, the Global Investment Performance Standards (GIPS/Standards) require portfolios to be valued on the date of all large external cash flows. The Standards define a large external cash flow as one that is at "the level at which a client-initiated external flow of cash and/or securities into or out of a portfolio may distort performance if the portfolio is not revalued." E*TRADE Advisor Services considers all cash flows, no matter their size.

The formula used for returns calculated January 1, 2010 and beyond is:

$$R_m = \frac{MVEcob^1 - MVBpost - CF}{MVBpostCF}$$

$MVEcob^1$	Market value of the portfolio at the end of the period at the close of business
MVBpostCF	Market value of the portfolio at the beginning of the period at the close of business post CF
R_m	Period return

Money – Weighted Return

Money-weighted return (MWR), also known as internal rate of return (IRR) or dollar-weighted return (DWR), is another method of calculating time-weighted returns and is very different from the TWR method. The IRR is that value of RIRR that satisfies the following equation:

$EMV = \sum_{i=0}^{n} CF_i (1 + R_{IRR})^{W_i}$ where EMV is the value of investment at the end of the measurement period, CFi is the sub-period cash flow, RIRR is the period IRR of the portfolio, and Wi is the proportion of the period that the external cash flow was held in the period.

It is important to note that the market value at the start of the period is also treated as an external cash flow.

In general, there is no closed-form solution for IRR. Solving for RIRR is a time-consuming iterative process: pick a rate, plug it into the formula, and see how close the result is to zero. Based on that, select another rate and repeat until the NPV is as close to zero as desired.

It is clear from the calculation that the MWR measurement is heavily influenced by the size and timing of cash flows. MWR does not isolate an investment's return from its cash flows. Instead, the cash flows become an integral part of the investment's returns. The obvious consequence is that investors can affect their portfolio's MWR with contributions and withdrawals. In addition, contributions during times of greater price appreciation will also influence MWR. Unless a money manager can control every cash flow in or out of an investment, MWR is not the best measure of a manager's investment skill.

TWR or MWR

The Standards are primarily based on the concept of presenting a firm's composite performance to a prospective client rather than presenting the performance of an individual account to the account holder. In support of this, one of GIPS's governing tenets for measuring a manager's performance is that managers are not rewarded or penalized by decisions outside of their control. As such, the most appropriate calculation depends on what is being measured. In situations where a manager has complete control over contributions and distributions, as is the case with private equities, MWR is an appropriate measure. The investment manager of a limited partnership, for example, has complete control of when contributions are accepted and when distributions are posted, and determines the size of each distribution. Calculating MWR will report a measure of return that incorporates the manager's cash flow decisions with the performance of the underlying investment. In this case, MWR provides a good method for measuring the investment manager's performance.

From an individual investor perspective, MWR may not be the best measure of return. GIPS has commented that although they have identified MWR as the most accurate measure of returns for an individual private equity manager, that may not be the case at higher levels of aggregation. A money manager does not typically tell an individual investor when they can

make contributions, when they can take distributions, or the amount of either. Since the manager cannot control cash flows nor control the total amount invested by an investor, MWR would not be an appropriate measure of returns and is less useful for comparing one firm/manager to another. TWR is more appropriate because it removes the effect of cash flows when calculating a return. It is a more direct measure of the investment manager's skill. This also shows the investor how well their money was managed, whether the portfolio was worth $1,000 or $1,000,000. Investors can then use the TWR for a direct comparison across a variety of managers with similar management objectives.

This is not to say MWR does not provide value to an individual investor. MWR may provide additional valuable insight related to the impact of the timing and size of external cash flows on an investor's account. When MWR is provided, the investor needs to be aware that MWR measures the performance of the specific client's portfolio (cash flows and all) rather than the performance of the investment manager.

What we offer

Axos Advisor Services offers returns calculated using the TWR method. It can be reported at the account and model (aggregate and composite) levels. Returns can be reported for predefined periods (prior quarter, prior year, year to date, etc.) back to an account's inception. Returns while at a previous custodian may be seamlessly incorporated into the returns at Axos Advisor Services when market values and cash flows from the previous custodian are provided. Liberty also allows the following:

- Calculation of returns back to the first cash flow, back to the first day of the month following the first cash flow, or back to the first day of the month following a quarter end
- Calculation of returns gross of the advisor's fees and Axos Advisor Services' fees (IA and Axos Advisor Services fees treated as cash flows), net of IA fees (IA fees treated as changes in market value and Axos Advisor Services fees treated as cash flows), and net of IA fees and net of Axos Advisor Services fees (IA and Axos Advisor Services fees treated as changes in market value)
- Inclusion of net gain on statements
- Exclusion of the null model from calculating performance
- Calculation of performance on a cumulative or annualized basis
- Model-level performance reporting

Liberty

Performance on Liberty provides a graphical representation of performance and summary portfolio information. The raw data used to plot the graphs is also available for viewing in Liberty. A variety of standard reports are offered on Liberty that create comma separated (CSV) files that can be imported into Excel. Both applications offer the ability to combine accounts. The market values and cash flows of the accounts will be aggregated together, and the cumulative and annualized returns will be calculated for the group. If an IA sells through representatives, this feature would allow them to view the performance of one representative's or firm's accounts as one return number.

Models

The GIPS standard allows the calculation of model performance using two methods: composite and aggregate. The aggregate method combines all the model's assets and external cash flows across all the accounts in the model to calculate returns. In essence, one big account is made of the model's assets and external cash flows from which returns are calculated. Liberty currently offers the aggregate method of calculating model level TWR. When viewing model returns using the aggregate method, IAs may limit the aggregation to a predefined list of accounts, create a custom list at run time, or have the system only include accounts that were active in the model on the from and through dates for the period being interrogated. This method is also used any time a return is calculated for multiple accounts such as when accounts are combined.

Liberty also offers a model-level return calculation using the composite method. This method represents the asset-weighted average of the returns of all the discretionary accounts' model returns. Calculating a composite requires only including accounts' model returns for which an IA had discretion for the entire month. In support of tracking when discretion is lost or gained over a model, IA's will need to utilize model closure tracking and will be required to review and approve model-level returns monthly. The approved monthly returns can then be geometrically linked to provide period returns.

Example Performance Calculation

Raw market value and cash flow data

Market Value Data	Market Value COB[1]	Cash Flow Date	Cash Flow (CF)	Market Value COB[1] Post CF
12/31/21	200,000			
1/31/22	208,000			
2/15/22	217,000	2/16/22	+40,000	257,000
2/28/22	263,000			
3/21/22	270,000	3/22/22	-30,000	240,000
3/31/22	245,000			

$$R_m = \frac{MVEcob^1 - MVBpostCF}{MVBpostCF}$$

MVEcob[1]	Market value of the portfolio at the end of the period at the close of business
MVBpostCF	Market value of the portfolio at the beginning of the period at the close of business post CF
R_m	Period return

January 2022:

$$R_{jan} = \frac{(208{,}000 - 200{,}000)}{200{,}000} = 4.00\%$$

February 2022:

$$R_{feb\ 1\text{-}15} = \frac{(217{,}000 - 208{,}000)}{208{,}000} = 4.33\%$$

$$R_{feb\ 16\text{-}28} = \frac{(263{,}000 - 257{,}000)}{257{,}000} = 2.33\%$$

$$R_{feb} = ((1 + 0.0433)*(1 + 0.0233)) - 1 = 6.76\%$$

March 2022:

$$R_{mar\ 1\text{-}21} = \frac{(270{,}000 - 263{,}000)}{263{,}000} = 2.66\%$$

$$R_{mar\ 22\text{-}31} = \frac{(245{,}000 - 240{,}000)}{240{,}000} = 2.08\%$$

$$R_{feb} = ((1 + 0.0266)*(1 + 0.0208)) - 1 = 4.80\%$$

First Quarter 2022:

$$R_{qt1} = ((1 + 0.0400)*(1 + 0.0676)*(1 + 0.0480)) - 1 = 16.36\%$$

[1] Close of Business