Efficient Market Advisors,

A Business of Cantor Fitzgerald Investment Advisors (EMA)

Presentation of investment performance in compliance with Global Investment Performance Standards (GIPS®)

Manual

Contents

1. Introduction to GIPS

Global Investment Performance Standards (GIPS) is a global standard for the calculation and presentation of asset managers' investment results. GIPS was created by CFA Institute in the later 1990's. CFA Institute is a global association of investment professionals with a mission to develop the investment profession through the highest standards of ethics, education, and professional excellence.

GIPS is an ethical and voluntary standard to be used by investment managers for creating performance presentations that ensure fair representation and full disclosure. Global standardization of investment performance reporting will allow investors to compare investment managers and will allow managers to compete for new business.

When presenting investment performance in compliance with GIPS, an investment management firm must state how it defines itself as a "Firm". In other words, for which part (s) of the firm the performance presentation is relevant and representative.

Firms must follow the required elements of GIPS to claim compliance with GIPS. Firms are strongly encouraged to adopt and implement the recommendations to ensure that the firm fully adheres to the spirit and the intent of GIPS. To further increase the level of confidence of EMA's claim of compliance a qualified, independent third party, Orion Advisor Services provides monthly independent composite calculations and The Spaulding Group, has performed an independent verification.

Compliance Statement
EMA claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. EMA has been independently verified for the periods November 1, 2004 through September 30, 2021. The verification reports are available upon request.

Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific GIPS report.

A copy of the verifier's policies for maintaining independence will be requested annually to coincide with the verification frequency. Additionally, the verifier's assessment of independence will also be requested and reviewed.

GIPS-compliant firms are required to notify the CFA Institute of their claim of compliance with the GIPS standards on an annual basis. Prior to June 30th of each year, the EMA will submit the necessary information via the form on the GIPS standards website. EMA will retain the email confirmation of registration each year.

To maintain compliance, EMA is responsible for:

- Complying with all applicable requirements of the GIPS standards, including any Guidance Statements, Interpretations, and Questions & Answers (Q&As) published by the CFA Institute and the GIPS standards governing bodies.
- Complying with all applicable laws and regulations regarding the calculation and presentation of performance.
- Monitor and identify changes and additions to the GIPS standards and/or laws and regulations regarding the calculation and presentation of performance. The firm will do this through such activities as:
    - Subscribing to newsletters,
    - Attending seminars, webinars, and conferences, and
    - Reviewing materials, such as white papers, blogs, distributed by our firm's consultants and verifier.
- Ensuring that the records and information provided by any third party on which ABC relies meet the requirements of the GIPS standards.

2. Definitions and Fundamental Information

Firm Definition

Cantor Fitzgerald Investment Advisors, L.P. acquired Efficient Market Advisors, LLC on February 28, 2017 to form Efficient Market Advisors a division of Cantor Fitzgerald Investment Advisors, L.P. (EMA). Prior to being acquired, Efficient Market Advisors, LLC was an independent, SEC-registered investment advisor. Cantor Fitzgerald Investment Advisors, L.P. is an SEC-registered investment advisor.

EMA constructs investment portfolios using Exchange-Traded Funds (ETFs). Founded in 2004 for the sole purpose of managing ETF based separate accounts, EMA serves high net-worth investors, trusts, foundations, retirement plans and institutions. EMA has one of the longest pure-ETF investment track records in the investment management industry. EMA utilizes proprietary and third-party research to construct ETF portfolios that offer investors highly-diversified asset class exposure that is transparent, liquid, low-cost and tax-efficient. EMA's mission is to deliver superior investment returns over full market cycles through the implementation of propriety asset allocation processes.

Definition of firm assets

Total firm assets are defined as the aggregate fair value of all discretionary assets managed by the firm, including both fee-paying and non-fee-paying portfolios. EMAs total assets at year-end are presented in the table below. Firm and composite assets are truncated to the $100,000 level.

Year	Firm assets (USD million)
2004	34.3
2005	50.7
2006	63.9
2007	70.7
2008	78.8
2009	102.9
2010	143.8
2011	176.9
2012	226.9
2013	347.6
2014	405.9
2015	489.5
2016	746.6
2017	886.0
2018	644.0
2019	678.9
2020	738.1
9/30/2021	793.5

Definition of discretion

Discretion is the ability of EMA to implement its intended strategy. All portfolios are defined as GIPS discretionary and included in a composite. Any restricted holdings (due to tax or other considerations) are included in performance calculations through 12/31/2012. As of 1/1/2013, all restricted holdings are excluded from performance calculations.

3. Composites

The composite return is the asset-weighted average of the performance results of all the portfolios in the composite based on monthly beginning of period market value. The Standards require that firms include all discretionary fee-paying portfolios in at least one composite that is managed according to a particular strategy or style. The return formula is indicated on page 15 of this document.

Composite	Benchmark	Composite inception and creation date	Composite assets 9/30/2021 (USD million)
Taking Income Conservative	18% MSCI ACWI/74% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	4/1/2006	14.1
Taking Income Moderate	18% MSCI ACWI/74% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	6/1/2005	13.7
Taking Income Aggressive	18% MSCI ACWI/74% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	1/1/2006	5.9
2 -5 Years Conservative	27% MSCI ACWI/65% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	4/1/2006	13.6
2 -5 Years Moderate	27% MSCI ACWI/65% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	1/1/2006	42.0
2 -5 Years Aggressive	27% MSCI ACWI/65% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	4/1/2005	16.2
6 – 10 Years Conservative	46% MSCI ACWI/46% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	7/1/2005	66.5
6 – 10 Years Moderate	46% MSCI ACWI/46% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	11/1/2004	134.7
6 – 10 Years Aggressive	46% MSCI ACWI/46% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	9/1/2005	74.7
11 – 19 Years Conservative	65% MSCI ACWI/27% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	4/1/2006	91.8
11 – 19 Years Moderate	65% MSCI ACWI/27% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	6/1/2005	95.6
11 – 19 Years Aggressive	65% MSCI ACWI/27% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	2/1/2005	26.7

20 Plus Years Conservative	74% MSCI ACWI/18% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	5/1/2006	28.9
20 Plus Years Moderate	74% MSCI ACWI/18% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	1/1/2005	48.8
20 Plus Years Aggressive	74% MSCI ACWI/18% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	11/1/2004	30.7
ESG Taking Income	18% MSCI ACWI/74% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	6/1/2020	1.3
ESG 2 -5 Years	27% MSCI ACWI/65% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	3/1/2019	3.8
ESG 6 – 10 Years	46% MSCI ACWI/46% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	1/1/2019	1.9
ESG 11 – 19 Years	65% MSCI ACWI/27% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	7/1/2019	0.4
ESG 20 Plus Years	74% MSCI ACWI/18% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	6/1/2019	0.6
Total Return	Barclays US Aggregate Bond Index	7/1/2016	2.2

Minimum asset level
Not applicable.

Significant cash flow policy
Not applicable.

Inclusion policy
A new account is included in the relevant composite beginning on the first day of the third month after it was funded (E.g. an account funded 11/6/2012 would be included in the composite starting 2/1/2013) for all composites except the composite for the Dynamic Volatility Strategy. For Dynamic Volatility Strategy, a new account is included in the composite beginning on the first day of the first month after it was funded (E.g. an account funded 11/6/2012 would be included in the composite starting 12/1/2012).

Exclusion policy
A discontinued account is included in at least one composite up to and including the last month it is fully invested. From the time the liquidation has started, the portfolio is no longer included in any composite. However, the discontinued portfolio's historic performance remains with the composite.

Change of composite
An account is included in the relevant composite beginning on the first day of the first month after a change of composite occurred. The account's historical performance remains with the previous composite up to and including the last month it is fully invested in that composite.

Carve-outs
Not applicable.

GIPS Reports
EMA provides GIPS reports to all prospects. EMA defines a prospect as anyone who requests new account paperwork. An individual ceases to be a prospect if they do not return the completed new account paperwork within three months.

4. Input Data

Consistency of input data is critical to effective compliance with GIPS and establishes the foundation for full, fair, and comparable investment performance presentations. The Standards provide the blueprint for a firm to follow in constructing this foundation.

All data and information necessary to support a firm's performance report and to perform the required calculations must be captured and maintained.

EMA has the underlying data necessary to recreate the performance of our composites for all periods for which performance is presented, including beginning and ending period fair values and cash flows for composites.

Portfolio valuations based on fair values
GIPS requires the use of a fair value methodology in order to best identify the fair economic value of the firm's portfolios. The standards detail a recommended valuation hierarchy and firms need to disclose if the composite's valuation hierarchy materially differs from the recommended hierarchy.

EMA uses fair value in valuation of all assets and values all portfolios daily. The pricing hierarchy is well aligned to the recommended hierarchy in the standards (see below for pricing sources).

Pricing sources

- Price sources should be independent from EMA and those who make the investment decisions.
- Closing exchange prices should be used for securities that are traded in an active market.
- In the absence of transactions, quoted (or alternatively independently evaluated) bid prices should be used.
- EMA does not invest in securities for clients unless those securities are priced each business day and quoted on a recognized public exchange.

Trade-date accounting
Trade-date accounting determines the correct economic value of the portfolio assets as of the transaction date. Because of the lengthy settlement periods of some markets, GIPS strongly recommends the use of trade-date accounting to achieve accurate performance results.

EMA uses trade-date accounting.

Interest income
Accrual accounting must be used for fixed-income securities and all other investments that earn interest income. When determining what fair value to report, firms must include the income that would have been received had the security actually been sold at the end of the performance period. Accrued interest income must be included in the beginning and ending portfolio fair values.

EMA uses accrual accounting for all investments that earn interest income and the reported fair values include the accrued income.

Dividends
Accrual accounting is recommended for dividends (as of the ex-dividend date). Dividends are payable if the stock was owned on the ex-dividend date. Therefore, dividends should be accrued as income on the ex-dividend date.

EMA uses accrual accounting for dividends.

5. Calculation Methodology

Achieving comparability among investment management forms' performance presentations requires uniformity in methods used to calculate returns. The Standards mandate the use of certain calculation methodologies.

Portfolio
In calculating the performance of the portfolios within a composite, GIPS require firms to use a total rate of return. A total return includes income and realized and unrealized gains and losses.

EMA includes income and realized and unrealized gains and losses when calculating performance.

The Standards require firms to use a time-weighted rate of return using a minimum of monthly valuations and adjusting for cash flows. Interim returns must be geometrically linked. Methods that include adjustments to remove the effect of cash flows from the performance return are called time- weighted rate-of-return.

EMA uses time-weighted rate of return based on daily valuations and calculation of net asset value adjusted for cash flows.

Returns for cash and cash equivalents held in portfolios must be combined with the returns of other assets to calculate the total portfolio return.

EMA includes cash and cash equivalents in total-return calculations.

Performance must be calculated after the deduction of all actual trading expenses. Trading expenses refer to the direct transaction costs incurred in the purchase or sale of securities. These costs must be included when calculating performance because these are costs that must be paid in order to implement the investment strategy. Trading expenses can be direct, as in the case of brokerage commissions, or indirect, as in the case of a bid/ask spread.

EMA calculates performance after deduction of all actual trading expenses.

Gross-of-fee performance

GIPS recommends that firms present gross-of-fee performance. The Gross-of-fees return is defined to be the return on assets reduced by any actual trading expenses incurred and non-reclaimable withholding taxes paid during the period. Because the Gross-of-fees return includes only the return on assets and the associated cost of buying and selling those assets, it is the best measure of the firm's investment management ability and can be thought of as the "investment return". The Net-of- fees return is defined to be the Gross-of-fee return reduced by the Investment Management Fees paid by clients.

EMA presents gross-of-fee performance after deductions of actual trading expenses and non-reclaimable withholding taxes paid during the period but before deduction of custodian fees.

Taxes

Returns should be calculated net of non-reclaimable withholding taxes on dividends, interest, and capital gains. Reclaimable withholding taxes should be accrued. GIPS require recognition of the tax consequences of investing in different countries. Some countries allow certain investor types to reclaim a portion of the withholding taxes that are paid when transactions or payments occur. GIPS recommend that reclaimable withholding taxes to be recognized when incurred.

EMA recognizes withholding taxes when incurred. The actual amount of withholding tax may differ slightly from the estimated figure. This difference is posted as an income/cost when the actual figure is known. All portfolios are calculated net of non-reclaimable withholding tax.

Internal Dispersion

The dispersion measure is the equal-weighted standard deviation for all accounts in the composite for the entire year. The calculation is based on the gross-of-fee portfolio returns. It is not presented when the composite has five or fewer accounts in the composite for the full annual period.

External Dispersion

The three-year ex-post annualized standard deviation is calculated using 36 monthly composite gross returns.

Benchmarks

Effective April 18, 2016, EMA changed the composite benchmark to a blend of the MSCI All Country World Index, Barclays US Aggregate Bond Index, HFRX Global Hedge Fund Index and Barclays US 1-3 Month Treasury Bill Index. From March 11, 2015 to April 18, 2016 EMA used a blended benchmark consisting of the MSCI All Country World Index and the Barclays US Aggregate Bond Index. Prior to that,

the benchmark was the Morningstar US Separate Account Conservative Allocation (Taking Income Conservative, Moderate & Aggressive), Morningstar US Separate Account Conservative Allocation (2-5 Years Conservative, Moderate & Aggressive), Morningstar US Separate Account Moderate Allocation (6-10 Years Conservative, Moderate & Aggressive), Morningstar US Separate Account Moderate Allocation (11-19 Years Conservative, Moderate & Aggressive) and Morningstar US Separate Account Aggressive Allocation (20 Plus Years Conservative, Moderate & Aggressive). The change in the benchmark was made to more accurately reflect the composite's investment characteristics. The blended benchmark is calculated daily and rebalanced monthly.

Composite Name	Benchmark	Type
Taking Income Conservative	18% MSCI ACWI/74% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
Taking Income Moderate	18% MSCI ACWI/74% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
Taking Income Aggressive	18% MSCI ACWI/74% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
2 -5 Years Conservative	27% MSCI ACWI/65% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
2 -5 Years Moderate	27% MSCI ACWI/65% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
2 -5 Years Aggressive	27% MSCI ACWI/65% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
6 – 10 Years Conservative	46% MSCI ACWI/46% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
6 – 10 Years Moderate	46% MSCI ACWI/46% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
6 – 10 Years Aggressive	46% MSCI ACWI/46% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
11 – 19 Years Conservative	65% MSCI ACWI/27% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
11 – 19 Years Moderate	65% MSCI ACWI/27% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
11 – 19 Years Aggressive	65% MSCI ACWI/27% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
20 Plus Years Conservative	74% MSCI ACWI/18% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
20 Plus Years Moderate	74% MSCI ACWI/18% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark
20 Plus Years Aggressive	74% MSCI ACWI/18% Barclays US Aggregate Bond Index/6% HFRX Global Hedge Fund Index/2% Barclays US 1-3 Mo Treasury Bill Index	Blended Benchmark

Relative return

EMA calculates the excess return as the arithmetical difference between the returns on the actual portfolio and the benchmark portfolio for the period to be presented.

6. Error Correction Guideline

The purpose of the error correction guideline is to ensure a transparent error correction framework applied in all EMA GIPS reports. The error correction guideline includes the framework for assessing the materiality of errors and for recalculation, documentation and correction of errors. EMA aims to proactively respond to errors in accordance with GIPS requirements in order to maintain the quality and integrity of EMA performance measurement and reporting.

Defining error

Errors may arise in a previously verified GIPS report and corrections need to be made. For GIPS reports errors exist when any component of the GIPS report is inaccurate or missing. In the GIPS report, errors may be related to fair values, return numbers, risk/return numbers as well as the qualitative notes supporting the composites. EMA strives to minimize the probability of errors through robust processes and independent controls.

Assessing materiality of error

When evaluating quantitative errors EMA will review the following:

- Composite Returns
- Benchmark Returns
- Composite Assets
- Firm Assets
- Internal Dispersion
- External Dispersion
- Number of Portfolios
- Written Disclosures

If the error occurred on the benchmark side the benchmark return is evaluated.

The assessment of materiality for all items being reviewed will depend on the following three error categorizations:

Immaterial error: ± [≤ 1 basis point]

In the case of an immaterial quantitative error, the error does not significantly affect returns meaning there is no significant effect on the one year composite return, benchmark return, internal dispersion, external dispersion or percentage of non-fee paying portfolios. No significant effect means within a ± 0.01% (1 basis point) tolerance range. In the case of an immaterial qualitative error such as in the written disclosures, the error does not alter the common understanding of the current disclosures. In the case of firm assets or composite assets a threshold for immateriality is an error < $2 million dollars. In the case of number of portfolios a threshold for immateriality is an error < 2. This categorization applies to all composites.

Not material error: ± [> 1 basis point but ≤ 100 basis points]

In the case of a not material quantitative error, the error leads the one year composite return, benchmark return, internal dispersion, external dispersion or percentage of non-fee paying portfolios to change by less than ± 1.00% (100 basis points) but more than ± 0.01% (1 basis point). In the case of a not material qualitative error such as written disclosures, the error does not alter the common understanding of the current disclosures but the informational content is deemed to be important for the evaluation of the composite. In the case of firm assets or composite assets a threshold for not material is an error > $2 million dollars but < $5 million dollars. In the case of number of portfolios a threshold for not material is an error > 2 but > 5. This categorization applies to all composites.

Material error: ± [> 100 basis points]

In the case of a material quantitative error, the error leads the one year composite return, benchmark return, internal dispersion, external dispersion or percentage of non-fee paying portfolios to change by more than ± 1.00% (100 basis points). In the case of a material qualitative error such as the written disclosures, the error alters the common understanding and/or the evaluation of the composite and may specifically be associated with the omission of a required disclosure. In the case of firm assets or composite assets a threshold for materiality is an error > $5 million dollars. In the case of number of portfolios a threshold for materiality is an error > 5. This categorization applies to all composites.

Procedures for recalculating, documenting and correcting errors

Errors are corrected retrospectively in the period where the error occurred. The actions taken will depend on the categorization of the error which is determined for:

- Quantitative errors after a recalculation of returns. The one year composite return or benchmark return will be calculated for the year in which the error occurred in order to identify the materiality. For example, if today an error is discovered in the month of September 2007, the yearly composite or benchmark return for 2007 will be measured. The original composite or benchmark return will then be compared to the recalculated number. A correction will then be made accordingly in September 2007 and hence for 2007 in total. For potential systematic errors persisting over a year, yearly returns will be calculated for all years affected and the errors will be assessed on a per year basis. A systematic not material error across several years may be corrected as a material error.

- Qualitative errors after an evaluation of the disclosures. Potential errors of calculation for example with regards to the calculation of standard deviation or information ratio are assessed as qualitative errors.

Recalculation of returns is performed within the performance calculation system in EMA.

Immaterial error

Whether the error is quantitative or qualitative the report will be corrected. However, no further actions beyond this are required. An incident describing the error will be formally recorded according to EMA's framework for operational risk.

Not material error

Whether the error is quantitative or qualitative the report will be corrected. A note will be included in the disclosure section for the impacted composites stating the change. This note will be maintained for a 12 month period after the change has been made. An incident describing the error will be formally recorded according to EMA's framework for operational risk and the EMA CEO, the Chief Risk Officer (CRO) and the Chief Compliance Officer (CCO) and the asset owner will be notified. EMA's third party GIPS verifier will be informed and consulted.

Material error
Whether the error is quantitative or qualitative the Report will be corrected. A note will be included in the disclosure section for the impacted composites stating the change. This note will be maintained for a 12 month period after the change has been made. Efforts to redistribute the corrected report will be made to all existing clients, prospective clients and verifiers that received the erroneous report. An incident describing the error will be formally recorded according to EMA's framework for operational risk and the EMA CEO, CRO and CCO and the asset owner will be notified. EMA's third party GIPS verifier will be informed and consulted.

7. Formulas

Absolute Performance (Portfolio Return)

Time Weighted Rate of Return (TWRR):

$$R_t = \frac{V_{E(t)} - V_{S(t)} - C_{(t)}}{V_{S(t)}}$$

Where:
R_t = Percentage performance in period
$V_{E(t)}$ = Value at the end of period t, fair value
$V_{S(t)}$ = Value at the start of period t, fair value
$C_{(t)}$ = Total Net Cash flow within period t
t = period <1, 2>

EMA has the ability to value the portfolio at any day. Fair values are determined on the day of an external cash flow. Transfers to the funds and between portfolios are normally made on the last business day of each month, but can also take place intra-month. When there is only one transfer done on a monthly basis the period, denoted t above, is irrelevant. When there are two transfers in a month, period 1 becomes last month-end to first transfer while period 2 is first transfer to month- end (second transfer). V_E in period 1 ($V_{E(1)}$) is then the closing fair value on the first transfer day.

Monthly Return:

$$R_M = [(1+R_t) \times (1+R_t)] - 1$$

Where:
R_M = Monthly percentage performance
R_t = Percentage performance in period t
t = period <1, 2>

This is a geometric linking of the periodic returns in order to obtain the total return for the month. If there is only one transfer within the month this linking is irrelevant and the monthly return becomes R.

Quarterly Return:

$R_Q = [(1+R_{M1}) \times (1+R_{M2}) \times (1+R_{M3})] - 1$

Where:

R_Q = Quarterly percentage performance
R_{M1} = Percentage performance in month 1
R_{M2} = Percentage performance in month 2
R_{M3} = Percentage performance in month 3

This is a geometric linking of the monthly returns in the quarter in order to obtain the total return for the quarter. Geometrically linked returns are also known as cumulative returns.

Annual Return:

$R_A = [(1+R_{Q1}) \times (1+R_{Q2}) \times (1+R_{Q3}) \times (1+R_{Q4})] - 1$

Where:

RA = Annual percentage performance
RQ1 = Percentage performance in Q1
RQ2 = Percentage performance in Q2
RQ3 = Percentage performance in Q3
RQ4 = Percentage performance in Q4

This is a geometric linking of the quarterly returns in the year in order to obtain the total return for the year. Alternatively and equivalently, one could geometrically link the twelve monthly returns. These formulas can be extended to longer periods as well.

Annualized Absolute Performance (Portfolio Return):

$\text{Return} = [(1+R)^{(1/n)}] - 1$

Where:

R = Geometrically linked absolute return for a period exceeding 12 months
n = Number of periods, needs to be consistent with the linked return

For periods greater than 12 months absolute performance, benchmark performance and relative performance is annualized. For example, a cumulative return over exactly three years generates an *n* of 3. A cumulative return over 16 months should be scaled by *n = 12/16*. This formula is implemented for the benchmark performance as well.

Composite Performance

Monthly Composite Return:

$$R_{Composite} = \frac{\sum[\sum R_p \times MV_p]}{\sum MV_p}$$

Where:
$R_{Composite}$= Portfolio return on Composite
Rp = Portfolio return on individual portfolio
MVp = Fair value of individual portfolio

Each individual portfolio's return is weighted according to its ingoing fair value weight. The sum of the weighted individual portfolios returns is the total return on composite level. Each composite's return is weighted according to its ingoing fair value weight. The sum of the weighted composite returns is the total return on account level.

Benchmark Performance

Benchmark Return:

$$R_{BMK} = \frac{IV_t}{IV_{t-1}} - 1$$

Where:
R_{BMK} = Return on benchmark
IV_t = Benchmark value at time t
IV_{t-1} = Benchmark value at time t-1

Relative Performance (Relative Return)

Arithmetic Relative Return Methodology:

$$R_{REL} = R_{ACC} - R_{BMK}$$

Where:
R_{REL} = Relative performance, any period
R_{ACC} = Absolute performance, any period
R_{BMK} = Benchmark performance, any period

Risk Statistics & Risk-adjusted Performance

Population Standard Deviation:

The standard deviation reflects the level of risk in the composite. This statistical measure shows how much the return has varied during the measurement period. The larger the standard deviation, the larger the risk is estimated to be. The standard deviation is calculated using the following formula:

$$\sigma = \sqrt{\frac{\sum(r - r_{avg})^2}{n}}$$

Where:

σ = sample standard deviation of monthly portfolio returns
r = monthly portfolio returns
r_{avg} = average of monthly portfolio returns
n = number of months

The measure is annualized by multiplying with the square root of 12. When calculating standard deviation, EMA uses 36 months of returns. EMA uses the same formula and 36 months of returns for the benchmark external dispersion calculation as well.

Tracking Error ex post

Tracking error ex post measures to what extent the composite's return differ from the benchmark's return. The larger the difference is, the larger is the tracking error (also called active risk). The monthly tracking error is the standard deviation of the difference between the monthly returns of a composite and its associated benchmark. The tracking error ex post is calculated as follows:

$$TE = \sigma_{\text{relative return}}$$

Where:

TE = tracking error ex post
$\sigma_{relative\ return}$ = population standard deviation of monthly relative returns

The measure is annualized by multiplying with the square root of 12.

Information Ratio:

Information Ratio is a risk adjusted return measure. It measures a composite's monthly returns in excess of its benchmark divided by the standard deviation of the monthly excess returns (see tracking error). The higher the information ratio is, the greater is the return per unit of risk. The information ratio is calculated as follows:

$$IR = \frac{\text{Relative return}}{TE}$$

Where:

Relative return = annualized composite return less annualized benchmark return

TE = annualized tracking error