Norges Bank Investment Management (NBIM)

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

Manual

Laid down: **31st January 2010**

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. In January 2010, the 2010 edition of the GIPS standards was adopted with an effective date 1 January 2011.

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 NBIM's claim of compliance a qualified, independent third party, The Spaulding Group, has performed an independent verification.

Compliance Statement

NBIM claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. NBIM has been independently verified for the periods 31 December 1997 through 31 December 2011. 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 composite presentation.

2. Definitions and Fundamental Information

Firm Definition

Norges Bank Investment Management (NBIM), as the firm, is a separate part of the Norwegian Central bank (Norges Bank) and is responsible for investing the international assets of the Norwegian Government Pension Fund.

NBIM also manages the major share of Norges Bank's foreign exchange reserves and until December 31 2010 the Government Petroleum Insurance Fund.

NBIM invests in international equities and fixed income instruments, money market instruments and derivatives. NBIM includes all mandates managed by NBIM including "The Government Pension Fund Global", "The investment portfolio of Norges Bank's foreign exchange reserves " and "The Government Petroleum Insurance Fund". The verification includes the history as defined below:

- o The Government Pension Fund Global:

    - o Fund   31 December 1997

    - o Fund ex Real Estate   31 December 1997

    - o Equity   31 December 1998

    - o Fixed Income   31 December 1997

    - o Real Estate   31 March 2011

- o The investment portfolio of Norges Bank's foreign exchange reserves:

    - o Fund   31 December 1997

    - o Equity   31 December 2001

    - o Fixed Income   31 December 1997

- o The Government Petroleum Insurance Fund:

    - o Fund   31 August 1998

Definition of Firm Assets

Total firms assets are defined as the sum of the Government Pension Fund Global, the investment portfolio of the foreign exchange reserves, the Government Petroleum Insurance Fund, and the Petroleum Buffer portfolio of the foreign exchange reserves. The money market portfolio of the foreign exchange reserves is managed by the Market Operations and Analysis Department of the Norges Bank Monetary Policy division and is not part of firm assets. On close of 31 December 2010 the Insurance Fund was terminated and its assets were moved to the Pension Fund since the Pension Fund is able to buffer large and unexpected claims arising from petroleum activities on its own. The termination of the Insurance Fund was approved by the Norwegian Parliament after proposal from the Ministry of Finance. The termination was treated as an inflow to the Pension Fund and an outflow from the Insurance Fund and the Insurance Fund's assets are therefore zero at year-end 2010.

NBIMs total assets at year-end are presented in the table below:

Year	Firm assets (NOK million)
1997	244 299
1998	279 205
1999	340 855
2000	522 544
2001	739 116
2002	743 670
2003	1 044 264
2004	1 236 653
2005	1 648 874
2006	2 047 074
2007	2 261 368
2008	2 498 961
2009	2 851 020
2010	3 317 700
2011	3 539 396

Definition of Discretion

Discretion is the ability of NBIM to implement its intended strategy. If documented restrictions significantly hinder the firm from fully implementing its intended strategy NBIM will determine that the portfolio is non-discretionary.

The following situations are judged by the NBIM to entail significant restrictions that cause a portfolio to be classified as non-discretionary:

- Portfolios which are advisory in nature where the client in co-operation with NBIM carries out asset allocation (this mean that the underlying portfolios are discretionary, while the total account is not) and/or where assets in the portfolio (e.g. strategic investments or "old" assets that the client wishes to keep due to tax reasons) hinder the Firm from managing the portfolio in line with relevant composites' intended strategy;

- Cash flow requirements that significantly hinder the implementation of the intended strategy (e.g. the client requires large cash distributions on a regular basis);

- New portfolios during establishment or portfolios under liquidation as a result of being closed;

- The lack of quoted market prices (e.g. private equity);

- Portfolios where the sole purpose is to invest in units of a single "parent" account, where the portfolio would consist of a holding of only one unit fund and a minimum cash balance (used to handle in/out-flows of the account).

NBIM has classified that the Petroleum Buffer portfolio of the foreign exchange reserves is a non-discretionary portfolio. The portfolio's purpose is to build up foreign exchange for the Pension Fund and to facilitate cost-effective transition of external inflow capital. The foreign exchange sourced to the portfolio comes from the Government's direct financial interest in petroleum activities and by Norges Bank's purchases in the market. The Petroleum Buffer portfolio does neither have a specific return target nor an assigned benchmark.

Irrespective of whether a portfolio is classified as discretionary or non-discretionary, its value will be included in the Firm's assets.

3. Composites

The composite return is the asset-weighted average of the performance results of all the portfolios in the composite. 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.

Composite	Category	Benchmark	Composite inception and composite creation date	Composite assets 2011 (NOKm)
The Government Pension Fund Global	Balanced	60% FTSE Global All-Cap, 40% (less Real Estate weight) Barclays Global Aggregate / Barclays Global inflation linked and European part (excluding Norway) IPD Global Property	31 December 1997	3 311 572
The Government Pension Fund Global, ex Real Estate	Balanced	60% FTSE Global All-Cap and 40% Barclays Global Aggregate / Barclays Global inflation linked	31 December 1997	3 300 444
The Government Pension Fund Global - Equity	Equity	FTSE Global All-Cap, developed, advanced emerging, secondary emerging markets	31 December 1998	1 944 722
The Government Pension Fund Global – Fixed Income	Fixed Income	Barclays Global Aggregate / Barclays Global inflation linked	31 December 1997	1 355 722
The Government Pension Fund Global – Real Estate	Real Estate	European part (excluding Norway) IPD Global Property	31 March 2011	11 129
The investment portfolio of Norges Bank's foreign exchange reserves	Balanced	40% FTSE Global All-Cap and 60% Barclays Global Aggregate	31 December 1997	221 869
The investment portfolio of Norges Bank's foreign exchange reserves - Equity	Equity	FTSE Global All-Cap, developed markets	31 December 2001	90 720
The investment portfolio of Norges Bank's foreign exchange reserves – Fixed Income	Fixed Income	Barclays Global Aggregate, treasuries	31 December 1997	131 149
The Government Petroleum Insurance Fund	Fixed Income	Barclays Global Aggregate Treasury and a money market deposit rate	31 August 1998 (Terminated 31 December 2011)	-

Minimum Asset Level
NBIM has not established a minimum asset level for a composite to identify portfolios that are too small to be representative of the intended strategy.

Significant cash flow policy
NBIM has not adopted a significant cash flow policy.

Inclusion Policy
A new mandate is included in the relevant composite from the first full month it is fully invested.

Exclusion Policy
A discontinued portfolio 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
Not applicable.

Carve-outs
The asset class composites constitute carve-outs from the total portfolio. Cash is allocated to each carve-out separately. For each annual period presented in the equity and fixed income composites (applies to Pension Fund and Reserves fund), the share of composite assets represented by carve-outs equals 100%.

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 presentation and to perform the required calculations must be captured and maintained.

NBIM 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 require the use of a fair value methodology in order to best identify the fair economic value of the firm's portfolios. The standards details a recommended valuation hierarchy and firms need to disclose if the composite's valuation hierarchy materially differs from the recommended hierarchy.

NBIM 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
The Valuation Policy is a separate document and outlines the methodologies governing the valuation process and is linked to the framework given by the Ministry of Finance. The ultimate prices will be used NBIM wide.

- Every asset and liability should be valued according to its fair value at the time of measurement.

- Fair value is defined as the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction.

- Price sources should be independent from NBIM and those who make the investment decisions.

- Holding constituents of the benchmark indices given by the Ministry of Finance should be valued in accordance with the prices provided by the index provider given the pricing methodology behind the index is pursuant to fair value.

- 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.

- Prices derived from models should be used in price hierarchies at levels lower than directly observable fair values. Where available, industry standard models should be used.

- The pricing hierarchies are maintained in a separate document.

- A situation where the Pricing Hierarchy is not applied is referred to as an override. An override takes place whenever a price source is considered inaccurate and is executed by NBIM or the Fund Accountant. Any overrides to the price hierarchies must be well documented.

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 recommend the use of trade-date accounting to achieve accurate performance results.

NBIM 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.

NBIM 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.

NBIM 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.

NBIM 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.

NBIM 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.

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

Performance must be calculated after the deduction of all 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.

NBIM calculates performance after deduction of all direct 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 direct 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.

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

Composite
The NBIM composite structure is based on asset classes. The Insurance Fund is only invested in fixed income assets and thus only composed of a single composite. The total number of composites is nine, however the Insurance Fund was terminated as of 31 December 2010.

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.

NBIM 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.

Benchmarks
NBIM measure the equity composites against custom benchmarks which are adjusted for tax on dividends according to NBIM's tax position in different markets and treats the portfolio and the benchmark equivalently. The funds managed by NBIM do not pay taxes on coupon payments, as such the fixed income benchmark is not adjusted for withholding tax. The return of the benchmarks is calculated daily on the respective indices' value at close. The conversion from the index's quotation currency to other currencies is based on WM Company's exchange rates (mid-rate 16:00 GMT).These exchange rates are the same as those used for the portfolio.

Relative Return
NBIM calculate 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 NBIM GIPS compliant presentations. The error correction guideline includes the framework for assessing the materiality of errors and for recalculation, documentation and correction of errors. NBIM aims to proactively respond to errors in accordance with GIPS requirements in order to maintain the quality and integrity of NBIM performance measurement and reporting.

Defining error
Errors may arise in a previously verified GIPS presentation and corrections need to be made. For GIPS compliant presentations 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. NBIM strives to minimize the probability of errors through robust processes and independent controls.

Assessing materiality of error
The one year composite return and the one year benchmark return are used as the relevant metrics when evaluating quantitative errors. If the error occurred on the composite side the portfolio return is evaluated. If the error occurred on the benchmark side the benchmark return is evaluated. The metrics capture the main quantitative aspects of the GIPS report. The assessment of materiality 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 or benchmark return. No significant effect means within a ± 0.01% (1 basis point) tolerance range. In the case of an immaterial qualitative error, the error does not alter the common understanding of the current disclosures. This categorization applies to all composites.

- **Not material error: ± [> 1 basis point but ≤ 5 basis points]**
  In the case of a not material quantitative error, the error leads the one year composite return or benchmark return to change by less than ± 0.05% (5 basis points) but more than ± 0.01% (1 basis point). In the case of a not material qualitative error, 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. This categorization applies to all composites.

- **Material error: ± [> 5 basis points]**
  In the case of a material quantitative error, the error leads the one year composite return or benchmark return to change by more than ± 0.05% (5 basis points). In the case of a material qualitative error, 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. 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 NBIM.

- **Immaterial error**

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

- **Not material error**

  Whether the error is quantitative or qualitative the presentation 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 NBIM's framework for operational risk and the NBIM CEO, the Chief Risk Officer (CRO) and the Chief Compliance Officer (CCO) and the asset owner will be notified. NBIM's third party GIPS verifier will be informed and consulted.

- **Material error**

  Whether the error is quantitative or qualitative the presentation 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 presentation will be made by announcing on www.nbim.no that an updated GIPS presentation is available. An incident describing the error will be formally recorded according to NBIM's framework for operational risk and the NBIM CEO, CRO and CCO and the asset owner will be notified. NBIM'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:
$\quad$ R_t $\quad$ = Percentage performance in period t
$\quad$ $V_{E(t)}$ $\quad$ = Value at the end of period t, fair value
$\quad$ $V_{S(t)}$ $\quad$ = Value at the start of period t, fair value
$\quad$ $C_{(t)}$ $\quad$ = Total Net Cash flow within period t
$\quad$ t $\quad$ = period <1, 2>

NBIM 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.

In earlier days (to and including 1999), the Modified Dietz return calculation was implemented.

Modified Dietz Method:

$$RMDietz_t = \frac{V_{Et} - V_{St} - C_t}{V_{St} + \sum(C_i \times W_i)}$$

Where:
$\quad$ $RMDietz_t$ $\quad$ = Modified Dietz Return
$\quad$ V_{Et} $\quad$ = Value at the end of period t
$\quad$ V_{St} $\quad$ = Value at the start of period t
$\quad$ C_t $\quad$ = Cash flow in period t
$\quad$ C_i $\quad$ = Cash flow i
$\quad$ W_i $\quad$ = $\dfrac{\text{Calendar days in month} - \text{day of cash flow i}}{\text{Calendar days in month}}$

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: R_A = Annual percentage performance
           R_{Q1} = Percentage performance in Q1
           R_{Q2} = Percentage performance in Q2
           R_{Q3} = Percentage performance in Q3
           R_{Q4} = 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.

Component Returns (Real Estate)

Component returns are calculated monthly. Income returns measure the effect of rental income on the change in the real estate value (property value + cash position). Capital returns measure the effect of revaluations of the properties and the effect of transaction costs and operating costs. Further, the capital return component will include the FX return between the NOK and the currencies in the real estate composite.

Income Return:

$$RI_M = \frac{\sum RI_t}{V_{t-1}}$$

Where: RI_M = Monthly income return in %
           $\sum RI_t$ = Sum of rental income, in month t, in NOK
           V_{t-1} = Real estate value, previous month-end, in NOK

Capital Return:

$$RC_M = \frac{V_t - V_{t-1} - \sum RI_t - C_{(t)}}{V_{t-1}}$$

Where: RC_M = Monthly capital return in %
           $\sum RI_t$ = Sum of rental income, in month t, in NOK
           V_t = Real estate value, month-end, in NOK
           V_{t-1} = Real estate value, previous month-end, in NOK
           $C_{(t)}$ = Total Net Cash flow within period t

Annualized Absolute Performance (Portfolio Return)

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.

Returns Measured in International Currency (in the following CCY for currency)

Absolute Return in CCY:

$$R_{ACC(CCY)} = [(1+R_{ACC(NOK)}) / (1+R_{CCYBASKET})] - 1$$

Where: $R_{ACC(CCY)}$ = Absolute performance in CCY, any period
                 $R_{ACC(NOK)}$ = Absolute performance in NOK, any period
                 $R_{CCYBASKET}$ = Absolute performance of currency basket, any period

This is a geometrical difference. The currency basket corresponds to the currency weights in the benchmark portfolio, and the return on the currency basket indicates how much the NOK has appreciated/depreciated against the currencies in the benchmark portfolio. This formula is implemented for the benchmark performance in CCY as well.

Composite Performance

Composite Return:

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

Where: $R_{composite}$ = Portfolio return on Composite
                 R_p = Portfolio return on individual portfolio
                 MV_p = Fair value of individual portfolio

$$R_{Fund} = \sum \left[\frac{\sum R_{composite} \times MV_{composite}}{\sum MV_{composite}} \right]$$

Where: R_{Fund} = Portfolio return on Fund
                 R_p = Portfolio return on composite
                 MV_p = Fair value of composite

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 Fund 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

3.1.1 Sample 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:

$$\sigma = \sqrt{\frac{\sum (r - r_{avg})^2}{n-1}}$$

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 annualised by multiplying with the square root of 12.

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:

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

Where: *TE*   *= tracking error ex post*
             $\sigma_{relative\ return}$ *= sample standard deviation of monthly relative returns*

The measure is annualised 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:

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

Where: *Relative return = annualized composite return less annualized benchmark return*
            TE   = annualized tracking error