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AIMC logo

**Notification of the Association of Investment Management Companies**

**No. SorJorKor. Ror. 1/2566**

**Mutual Fund Performance Measurement and Presentation Standards**

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This notification sets standards, rules and procedures for measuring the performance of mutual funds and comparing against benchmarks that correspond to the investment policy and type of assets invested, and ensure compliance with clause 6 of the Notification of the Capital Market Supervisory Committee, ThorNor. 11/2564 regarding Guidelines for the Management of Funds for Retail Investors, Funds for Accredited Investors, Funds for Institutional Investors, and Private Funds, dated 29 January 2021 and subsequent amendments. By virtue of clause 25 of the Regulations of the Association of Investment Management Companies, the board of directors of the Association of Investment Management Companies hereby prescribe mutual fund performance measurement standards below, except if the Securities and Exchange Commission prescribes otherwise.

Clause 1 Repeal previous guideline.

Notification of the Association of Investment Management Companies SorJorKor. Ror. 1/2561 Re: Mutual Fund Performance Measurement and Presentation Standards dated 11 June 2018 shall be repealed.

Clause 2 This notification shall apply to the performance measurement of mutual funds, but excludes Property Funds (Type 1), Property Fund for Resolving Problems in the Financial Institution System (Type 2), Mutual Fund for Resolving Financial Institution Problems (Type 3), Property and Loan Fund (Type 4), Infrastructure Funds, Real Estate Investment Trusts (REIT), and Infrastructure Trusts (Infra Trust).

Clause 3 In this Notification,

"Management company" refers to a securities company licensed to operate a securities business involving fund management.

"Association or AIMC" refers to the Association of Investment Management Companies.

"Member" refers to a company which is a member of the Association of Investment Management Companies licensed to operate a securities business involving fund management.

"Board of directors" refers to the board of directors of the Association of Investment Management Companies.

"Mutual fund" refers to closed-end fund and open-end fund.

"Closed-end fund" refers to a non-redeemable fund managed by a fund management company.

"Open-end fund" refers to a redeemable fund managed by a fund management company.

"Money market fund" refers to money market fund pursuant to the notification of the Capital Market Supervisory Board Re: Investments of Funds.

"ETF" refers to ETF fund pursuant to the notification of the Capital Market Supervisory Board Re: Investments of Funds.

"Feeder fund" refers to feeder mutual fund pursuant to the notification of the Capital Market Supervisory Board Re: Investments of Funds.

"Index fund" refers to index fund pursuant to the notification of the Capital Market Supervisory Board Re: Investments of Funds.

"Active fund" refers to a fund where investments are manually selected to generate a return that exceeds the benchmark.

"Passive fund" refers to a fund whereby investments are structured for the purpose of generating a return that tracks the benchmark as closely as possible. Such funds are mostly Exchange Traded Funds or Index Funds.

"Fully or predominantly hedged against foreign exchange risks" refers to the fund's policy to hedge against potential loss from exchange rate fluctuations for the currency of the underlying investment, where at least 90% of the investment assets are covered (or at any other level that regulations stipulate).

"SEC" refers to the office of Securities and Exchange Commission.

"Advertising" means informing the public, through any means, about information and services of the business, capital market product, or sale of product in the capital market via text, image, sound, symbol, or any other form, either through public media or other tools.

## **I. Regulatory Objectives**

Clause 4 The requirements prescribed by this notification set standards regarding the measurement and presentation of mutual fund performance, which aims to ensure that member companies present mutual fund performance that is fair, accurate, and complete in accordance with international standards to serve as supporting information for investors' investment decisions. Aforementioned performance presentation requirements shall also be applicable when member companies display such data in prospectuses, semi-annual reports, fiscal accounting periods, websites, documents, and other media, etc., including data submitted to the AIMC.

## **II. Performance Measurement and Presentation Standards for Mutual Funds**

Clause 5 For fund performance measurements and presentations, member companies must be thorough and careful when preparing and reviewing the mutual fund performance measurement data that are ultimately published and distributed to investors, customers, potential customers, various media and general public. This also applies to information submitted to the AIMC in accordance with prescribed guidelines. The member shall report mutual fund performance with impartiality, accuracy, and thoroughness. Furthermore, members shall not give a misleading sense of the risk and expected returns from the investment. Members shall be responsible for ensuring the accuracy of the information.

For a Passive Fund whose aim is to generate the same returns as an index or benchmark, the member must specify the target benchmark. Furthermore, the benchmark must possess the qualities described in this notification. The benchmark must be disclosed and historical performance comparison against the benchmark must comply with requirements prescribed by this notification, SEC regulations, and any other relevant regulations.

For an Active Fund which references a benchmark index for portfolio structure or performance comparison, the benchmark must possess the qualities described in this notification; the benchmark must be disclosed along with the justification for selecting this benchmark. Historical performance comparison against the benchmark must comply with requirements prescribed by this notification, SEC regulations, and any other relevant regulations.

For an Active Fund that does not intend to compare with any benchmark index for portfolio structure or performance comparison, or if the fund is unable to prescribe a benchmark that meets the requirements described in this notification, the member may opt not to select a benchmark for the fund.

The member must clearly disclose information about the benchmark, or lack of benchmark, in the fund prospectus. For cases where a benchmark is used, the member must select a benchmark that meets the qualifications described in this notification. Disclosure of the benchmark and historical performance comparison against the benchmark must comply with requirements prescribed by this notification, SEC regulations, and any other relevant regulations.

### **III. Data Used to Measure Performance (Input Data)**

Clause 6 The valuation of the fund's investments used in the fund performance measurement must be determined according to regulations described in the notification of the Association Re: Rules and Procedures for Determining the Fair Value for Calculating Net Asset Values of Mutual Funds, and other relevant AIMC notifications.

Clause 7 The valuation of the fund's investments must be booked according to applicable accounting standards. If the fund has investments in debt securities or other instruments that generate a similar type of financial return, the value of such assets used in the performance measurement must adopt accrual accounting principles.

Clause 8 Members must keep supporting documents on the data used in the calculation of the fund performance for auditing purposes.

### **IV. Calculation methodology**

Clause 9 The calculation methodology for mutual fund performance shall be as follows:

(1) Calculation is based on total returns.

(2) Calculation is based on time-weighted rates of return between the dates of cash inflows and outflows from the mutual fund. Cash inflows or outflows shall be adjusted to ensure fund performance measurement is not distorted; members shall use a geometrically linked method to derive mutual fund performance for the period. (For details on calculation methodology, refer to Section A of the Appendix).

## **V. Benchmark Index**

Using general principles for performance measurements and presentations of funds described in Section II above, funds with a designated benchmark must use a benchmark that complies with the following.

Clause 10 Members shall designate a benchmark index to compare fund performance that possess these characteristics:

(1) Must be aligned with the investment policy, objective, or investment strategy of the mutual fund

(2) Based on total returns, if the benchmark index is available based on total returns.

(3) Shall be designated and disclosed to investors before the mutual fund is offered for subscription.

(4) The benchmark index's constituents can be invested in, or an investment exposure can be created.

(5) Calculation methodology meets generally accepted standards and the benchmark index is regularly disclosed.

Members can refer to guidelines in Section B of the Appendix to determine the benchmark applicable to the type of investment assets for the performance comparison presentation.

Clause 11 To meet the qualifications required by clause 10(1) above, for a mutual fund with a policy to invest in multiple types of assets where allocation is at the discretion of the fund manager, the member shall use a composite benchmark constructed from the various individual benchmarks applicable to each type of asset invested by the mutual fund. Those individual benchmark components must comply with qualifications described in clause 10(2) to clause 10(5), and combined by using a weighted-average of the proportion of investments reflected in the fund's target investment plan. The member must also disclose the composition of asset types in the benchmark; the weightings of those constituents must reflect the fund's target investment plan (ex ante). Also clearly state how frequently the weightings will be adjusted (rebalanced) in the fund prospectus to inform investors in advance.

Clause 12 For Feeder Funds or Fund of Funds, the member may use the following benchmark.

## 12.1 Feeder Funds

- (1) Benchmark used by the master fund which is widely disclosed to investors; or
- (2) The past performance of the master fund; or
- (3) Other benchmarks compatible with the fund's investment policy, objectives, and investment strategy.

12.2 Fund of Funds. Member may use the following in a benchmark composed of the weighted-average of target funds, where weightings reflect the Feeder Fund's target investment plan.

- (1) Benchmarks used by the target funds as widely disclosed to the public; or
- (2) Performance of target funds; or
- (3) Other benchmarks compatible with the fund's investment policy, objectives, and investment strategy.

Clause 13 For a mutual fund in which the member does not designate a performance benchmark, including a fund that was previously paired with a benchmark but subsequently does not (for example, the index provider decided to discontinue the benchmark index, leaving the fund without a benchmark that qualifies), the member shall clearly disclose to investors why that mutual fund does not have a benchmark. Also explain the absence of historical performance comparisons for periods prior to the day of transition from fund with benchmark to fund without benchmark. If the member specifies a minimum performance target, or hurdle rate, presentation performance should also include an explanation of the suitability of using such hurdle rate and clearly point out key differences between the hurdle rate used and the investment assets of the fund.

Clause 14 A member may change the benchmark for a mutual fund if the new benchmark complies with clause 10 or clause 12, or if circumstances prevent continuation of the use of the old benchmark, or done for the general benefit of all unitholders or the fund itself. The member must clearly disclose and inform investors in advance of the benchmark adjustment date. Explain the adjustment and justification through appropriate channels as specified in the fund prospectus, such as making the announcement on the website, etc. Complete this within a reasonable period of time to allow investors to take action. The member must not use the new benchmark to retroactively compare with periods prior to the new benchmark's effective date unless the new benchmark also reflects the fund's investment policy, objectives or investment strategies in the period before the effective date and the new benchmark is more relevant than the prior

benchmark. Other reasons include circumstances that prevent the continued use of the old benchmark, or if the change is for the general benefit of all unitholders or the fund itself. But there must be no ulterior motif to simply make the fund appear to perform better. In the case of a Feeder Fund, if the benchmark of the master fund has been changed, the member shall provide the same level of disclosure as the master fund to widely inform investors.

For a mutual fund with multiple types of assets with an investment policy that gives the fund manager discretion to set investment allocation across various assets as described in clause 11, if the member changes the weightings of the composition of the benchmark (rebalance) at the scheduled interval, the member shall adhere to requirements described in the first paragraph, *mutatis mutandis*.

## **VI. Performance Presentation**

Clause 15 The member shall produce fund performance reports and post on the member's website at least once a month, within 10 working days after the last business day of each month according to formats described in (1) and (2). If a fund performance report is presented in other published documents, such as newspapers, etc., the member may show performance report according to either one of the formats described in (1) or (2), unless there is a specific notification to require otherwise.

(1) Historical performance covering at least the last 10 calendar years. If any mutual fund has been operating for less than 10 calendar years, show historical performance data since inception date (examples of such disclosure available in Section D of the Appendix).

For the year of inception, if a mutual fund's performance data since inception date is less than 1 full calendar year, show the first year's performance as the period from the inception date to the last business year of the year. In the year that the mutual fund dissolves, the member shall show performance in the last calendar year as the period from the last working day of the previous calendar year until the dissolution date.

(2) Past performance in the form of trailing returns for various periods up to date of fund performance report shall cover past period of 3 months, 6 months, 1 year, 3 years, 5 years, and 10 years. If a mutual fund's track record is shorter than any period being measured, the member shall only show past performance for periods where data exists. Also show past performance since inception date up to date of fund performance report. The member may additionally show past performance for period between last business day of previous calendar year to reporting date (year-to-date).

Note that the beginning and ending dates for periods in fund performance calculations described in the first paragraph shall hinge on the last business day of each month. If the month happens to be the end of the mutual fund's fiscal year, the member shall use the final day of the fiscal year as the ending date in a fund performance calculation. If the date is a public holiday, the member shall use the previous business day (examples of such disclosure available in Section E of the Appendix).

Clause 16 When presenting mutual fund performance according to clause 15, the member shall show performance as an annualized rate of return. If the fund has less than 1 year performance, the member shall show the actual performance from inception date until the date of mutual fund performance report; do not annualize the return rate in this case (details of calculation described in Section C of the Appendix).

Clause 17 To provide investors with sufficient information to evaluate a fund's performance, members shall provide the following information along with the mutual fund's performance data in accordance with clause 15.

(1) Performance and risk measurement data for the benchmark index that correspond to the risk of the mutual fund according to (2), covering the same periods shown in the mutual fund's performance presentation.

The member may show performance and risk data for the benchmark in currencies that differ from the fund's own currency. If the fund is not fully (or nearly-fully) hedged, the member must provide additional remarks to explain to investors about the differences in currencies. Also include remarks to properly advise and strengthen investor's understanding about using such statistics when comparing performances of the fund and benchmark. For example:

“Statistical data on the benchmark is based on ..... currency which differs from the fund's currency shown in ..... When comparing the fund's return or risks against the benchmark, always translate the figures into the same currency for a meaningful comparison to avoid exchange rate distortions. Investors may inquire or seek further advice from the asset management company or selling agent ..... (mention contact details) .... ”

(2) The risk of a mutual fund operating for more than 1 month shall be represented by its standard deviation and any other applicable measurements, for the same corresponding periods that the mutual fund's performance is being measured. When calculating the standard deviation for a mutual fund established for more than 3 years, the member shall measure performance by using the available data frequency which should not be less than



monthly figures. For a mutual fund in operation for at least 1 month, but less than 3 years ago, use daily performance data (details as described in Section F of the Appendix).

(3) For a mutual fund that has a passive management strategy such as index funds or ETF mutual fund, etc., the member is required to disclose the Tracking Difference (“TD”) and Tracking Error (“TE”), which measures the deviation and the volatility of the average return of the mutual fund and reference index for the past 1 year. The calculation of TD and TE shall be based on daily data; show the information in annualized TD/ TE (details as stated in Section F of the Appendix).

Clause 18 In a Fund Factsheet, the member shall provide the following statistics (if applicable):

- (1) The following statistical data required by SEC regulations
  - (a) Maximum Drawdown (magnitude of largest actual loss) (%)
  - (b) Recovering Period (time period for recovery)
  - (c) FX Hedging (portion of investments that are hedged against currency risk) (%)
  - (d) Trading frequency or Churning Rate (Portfolio Turnover Ratio: PTR) (x)

A fund that adopts a buy-and-hold investment strategy may opt not to show data described in (a) – (d).

(2) Equity funds are required by SEC regulations to disclosed additional statistics which must be displayed as annualized figures and based on historical data of at least 1 year or more. For funds in operation for more than 1 year, but less than 3 years, show data since inception date. For funds in operation for more than 3 years, show data for 3 years back (details in Section E of the Appendix).

(a) Sharpe Ratio. This is the difference between the fund’s return and the fund’s risk-free rate of return, compared to the fund’s risk (Standard Deviation). The risk-free rate in the calculation should be the ThaiBMA Short-term Government Bond Index.

(b) Alpha. This is excess return compared to the benchmark index over the same period.

(c) Beta. This is the volatility of the fund’s return compared to the benchmark over the same period.

(3) Fixed income funds are required by SEC regulations to disclosed additional statistics (details in Section G of the Appendix) described below.

(a) Portfolio Duration. This can be shown as year / month / day or as a decimal number as appropriate.

(b) Yield to Maturity (YTM). This is determined from the weighted-average YTM of all fixed income instruments in the fund.

For feeder funds or fund of funds, disclosure of statistical data described in (a)-(b) shall be at the discretion of the member based on benefit to unitholders in general.

Clause 19 If a member went through a merger or acquired the duty to manage a mutual fund from a previous company, the member is permitted to use past performance data of such mutual funds prior to the merger or transfer, to present as the member's own performance if all requirements below are met.

(1) Persons responsible for all important investment decisions, such as research team, fund managers, others related employees, have also been employed by the member.

(2) The decision-making process for the fund has not changed significantly and maintains a degree of independence under the member's management.

(3) The member has information and evidence to justify the fund performance measurements.

The member shall disclose to investors that duty to manage the fund has been transferred from another company.

Clause 20 Members shall at least disclose the information below in the fund performance reports described in clause 15.

(1) A statement that "this fund performance measurement report is prepared in accordance with the Mutual Fund Performance Measurement and Presentation Standards of the Association of Investment Management Companies."

(2) Information about the mutual fund, inception date, investment policy, objectives, and investment strategies of the mutual fund.

(3) Details about the benchmark, such as benchmark name, constituents, important characteristics, etc.

(4) Mutual fund performance shown is after deduction of management fees, custodian fees or other expenses.

(5) If the fund has investments where dividend income, interest income, and capital gains are subjected to a significant withholding tax (for example, foreign investment), the member shall disclose details about the withholding tax as well. Also specify whether the benchmark of the fund is net of withholding tax or not (if information is available).

Clause 21 If a member wishes to present aggregate fund performance for the various funds under its management, by showing the combined performance of funds of the same type (composite return) in addition to the presentations described in clause 15, the member shall proceed as follows:

(1) Classification of mutual fund (composite) must comply with these rules:

(a) The member shall define the fund type that is based on the investment policy or investment strategy. Every mutual fund under the member's management must be classified into at least one of the mutual fund types. If the member revises the definition of a mutual fund type, the member must not cite that the change will subsequently make it necessary to retroactively change the historical performance data of that mutual fund type.

(b) If a member has just established a mutual fund which contains an investment policy, objective, or investment strategy that meets a mutual fund classification type specified by the member, the member shall add that newly-established fund into the mutual fund type promptly.

(c) If a member dissolves a mutual fund, the member shall continue to retain the dissolved mutual fund in the performance data of that mutual fund type up until the last reporting period where the dissolved fund's data is still fully present throughout the period.

(d) The member shall not transfer a mutual fund from one mutual fund type to another, unless the mutual fund has changed its investment policy, objective, investment strategy, or definitions of mutual fund types have been changed. The member must keep supporting documents regarding the transfer of the mutual fund for auditing purposes.

(2) To measure the performance of a mutual fund type (composite return), the member shall obtain the result by using the weighted average method based on the net asset of funds belonging to that mutual fund type (composite) as of the beginning of the performance presentation period (details of such calculation as stated in Section H of the Appendix).

(3) The member shall disclose at least the following information in fund performance reports:

(a) Information about the definition of the mutual fund type (composite) and the date of its classification.

(b) Information on all types of mutual funds under management of the member, if requested by an investor. The member shall disclose to investors how such information may be obtained.

(c) If a member amends the definition of a fund type (composite), the member shall disclose the date of the amendment and the reasoning. If the member changes

the name of the fund type (composite), the member shall inform investors details about the name change.

(d) The number and value of mutual funds included within the same mutual fund type. Also show total assets of all funds under management, or show percentage breakdown of mutual fund types relative to total assets of all funds under management, as of the date of the fund performance report.

(e) In the event that a certain mutual fund type contains more than 5 mutual funds, the member shall disclose information about the distribution of the individual fund's performance within that mutual fund type (Internal Dispersion) using measurements such as high-low range, standard deviation, etc. This will enable investors to understand the consistency of the performance of mutual funds within the same mutual fund type. The member must clearly specify the method used to show distribution information.

Clause 22 If the member wishes to disclose information about rankings or awards related to the past performance of mutual funds or other funds that a mutual fund will invest in, or already invested in, the member must present the information in accordance with SEC notification Re: Detailed Guidelines for Advertisements and Sales Promotions of Securities and Derivatives Businesses.

## **VII. Performance Comparison**

Clause 23 If a member wishes to show a performance comparison of its mutual funds with other mutual funds, or with the same mutual fund category within the industry, the member must follow these guidelines:

(1) If the member wants to compare fund performance, the mutual fund classification type must be the same.

(2) If the member wants to compare the performance of its mutual funds with the performance of the same mutual fund category within the industry, the member must be comparing funds of the same type as defined by the AIMC. The calculation must contain the performance of every mutual fund that belongs under that fund type.

(3) The period used to show performance comparisons between mutual funds or comparisons against the same mutual fund category within the industry, must match and be sufficiently long. Presentation format must comply with clause 15(1) or clause 15(2), mutatis mutandis.

## **VIII. Information Presentation Ethics**

Clause 24 When presenting information on mutual fund performance, members shall not distort information nor present the information in such a way that may mislead the public or new customers, and subsequently distort their investment decisions.

Clause 25 A member may choose to provide additional information about mutual fund performance beyond requirements set by the association, but must at least meet the association's standards described earlier in this notification. If a member decides to show additional information, the member shall present such information that is fair, accurate and thorough. Furthermore, the member shall clearly state assumptions applied and consistently present mutual fund performance in the same method that the member had previously used to present supplementary data every time.

## **IX. Disciplinary Measure**

Clause 26 For case where a member publishes mutual fund performance in a way that the association deems unethical and breaches performance measurement standards prescribed by the notification of the association, the board of directors may issue punishment in accordance with the regulation of the association.

## **IIX. Other Matters**

Clause 27 The member must disclose statistical data described in clause 17 and clause 18 according to AIMC requirements within 180 days after this notification becomes effective.

This notification shall be effective 27 March 2023 onwards.

Notification issued 23 March 2023

-signature-

(Mrs. Chavinda Hanratanakool)

Chairman

Association of Investment Management Companies

## APPENDIX

### A) Calculation of cumulative return for a fund where there are dividend payments and cash inflows and outflows from the fund

Where there are dividend payments, cash inflows and outflows from the fund during the period that the fund's performance is being calculated, use the Time-Weighted Return method to estimate the rate of return for that period as shown below.

$$R = \left[ \frac{NAV_{(e)}}{NAV_{(b)}} \times \left( 1 + \frac{F}{NAV_{(f)}} \right) \right] - 1$$

Whereby

$NAV_{(b)}$  is the net asset value per unit at the beginning of the period.

$NAV_{(f)}$  is the net asset value per unit on the date when there is a cash inflow or outflow from the fund.

F is the amount of cash inflow per unit or cash outflow per unit from the fund during the period. The F will be positive for a dividend payment or cash outflow from the fund; F will be negative for a cash inflow into the fund.

$NAV_{(e)}$  is the net asset value per unit of the end of the calculation period.

For an ETF fund, simply use the Closing Price for the fund and benchmark's performance calculation.

#### Sample Calculation

The fund's NAV is calculated at the end of every business day (February designated as having 28 days).

- Net asset value, as of 31 January, is equal to 10.00 Baht
- Net asset value, as of 10 February, is equal to 11.00 Baht
- As of 10 February, dividends payment is equal to 0.50 Baht
- Net asset value, as of 28 February, is equal to 12.00 Baht

Time-Weighted Return is calculated according to the cumulative return method for fund that pays dividends, and has cash inflows or outflows from the fund:

$$\begin{aligned} \text{Performance in February} &= \left[ \frac{12}{10} \times \left( 1 + \frac{0,50}{11} \right) \right] - 1 \\ &= 25.45\% \end{aligned}$$

## B) Examples of benchmarks for different types of mutual funds

(1) **Portion of fund's investment assets which are equities:** If a benchmark index is available that is based on total return, the standard practice is to use the benchmark index that corresponds to the fund's investment policy. Examples include SET Total Return Index (SET TRI), SET50 Total Return Index (SET50 TRI), SET100 Total Return Index (SET100 TRI), mai Total Return Index (mai TRI), Industry Total Return Index (Industry TRI), etc.

(2) **Portion of fund's investment assets which are debt securities:** Select benchmark index for performance comparison according to sub-classification of debt securities as follows:

**(a) Portion of fund's investment assets which are government debt securities**

- If the mutual fund **does not specify the time-to-maturity of government bonds** earmarked for investment, use the Total Return of the ThaiBMA Government Bond Index as benchmark index for performance comparison.

- If the mutual fund **specifies the time-to-maturity of government bonds** earmarked for investment, use the Total Return of ThaiBMA Government Bond Index - Maturity Sub Group with tenor similar to the duration of the invested assets as benchmark index for performance comparison.

However, for a mutual fund that is **required to invest in government debt securities with time-to-maturity less than or equal to 1 year**, use the Total Return of ThaiBMA Short-term Government Bond Index as the benchmark index for performance comparison

- For a mutual fund that **specifies a target duration for government debt securities** earmarked for investment, use the Total Return of ThaiBMA Zero Rate Return Index with tenor similar to the target duration of the invested assets as benchmark index for performance comparison.

**(b) Portion of fund's investment assets which are corporate debt securities**

- If the mutual fund **does not specify time-to-maturity of corporate debt securities** earmarked for investment, use the Total Return of ThaiBMA MTM Corporate bond Index (BBB up) as benchmark index for the performance comparison.

- If the mutual fund **specifies the time-to-maturity of corporate debt securities** earmarked for investment, use the Total Return of ThaiBMA MTM Corporate Bond Index - Maturity Subgroup having similar credit rating and tenor as the invested assets as benchmark index for performance comparison

However, for a mutual fund that is **required to invest in corporate debt securities with time-to-maturity less than or equal to 1 year**, use the ThaiBMA Commercial Paper Index with the credit rating that corresponds to the invested assets as the benchmark index for performance comparison.

- For a mutual fund that **specifies a target duration for corporate debt securities** earmarked for investment, use the Total Return of ThaiBMA Corporate Zero Rate Return Index with tenor similar to the target duration of the invested assets as benchmark index for performance comparison.

If the mutual fund **specifies a target duration for corporate debt securities less than or equal to 1 year** for investment, use the ThaiBMA Commercial Paper Index with the credit rating that corresponds to the invested assets as the benchmark index for performance comparison.

- For a general fixed-income fund or a flexible fund that **does not impose specific weighting requirements between government debt securities and corporate debt securities**, the member shall use the Total Return of ThaiBMA Composite Bond Index as the benchmark for performance comparison or use a Composite Benchmark comprising the Total Return of ThaiBMA Government Bond Index and Total Return of ThaiBMA MTM Corporate Bond Index (BBB up), weighted to match the fund's investment policy.

**(3) Portion of fund's investment assets which are money market instruments:**

Use the following benchmarks:

(a) For investment in money market instruments which are government debt instruments, use the Total Return of ThaiBMA Short-term Government Bond Index as benchmark for the performance comparison.

(b) For investment in money market instruments which are corporate debt instruments, use the ThaiBMA Commercial Paper Index with the credit rating that corresponds to the invested assets as the benchmark for performance comparison.

For a money market fund with no foreign-country risk exposure, the member may use the average 1-year fixed deposit rate for a 1 million Baht deposit quoted to individuals by Bangkok Bank Public Company Limited, Kasikorn Bank Public Company Limited, and Siam Commercial Bank Public Company Limited as additional reference for performance comparison. However, the member must state a risk warning about investment in unit trusts to alert investors that an investment in a money market fund is not equivalent to a cash deposit as there is investment risk



exposure; the investor may not fully receive back the entire sum invested. Such warnings must be displayed everywhere a deposit rate is presented as a benchmark.

(4) **Portion of fund's investment assets which are cash deposits:** Use the average 1-year fixed deposit rate for a 1 million Baht deposit quoted to individuals by Bangkok Bank Public Company Limited, Kasikorn Bank Public Company Limited, and Siam Commercial Bank Public Company Limited as benchmark for the performance comparison.

**C) Calculation of return or financial performance as an Annualized Return**

$$\text{Annualized Return} = (1 + \text{Cumulative Return})^{\frac{\text{Number of Periods per Year}}{\text{Total Number of Periods}}} - 1$$

**Sample Calculation**

NAV/Unit of a mutual fund with no dividend policy as of 30 December 2005 was 11.0491 and NAV/Unit as of 28 December 2007 was 11.9685. Performance as an Annualized Return is:

$$\begin{aligned} \text{Annualized return} &= \left[ 1 + \frac{11.9685 - 11.0491}{11.0491} \right]^{\frac{365}{728}} - 1 \\ &= 4.09\% \end{aligned}$$

**D) Presentation of mutual fund performance and risk (Standard Deviation or SD) on calendar year basis with comparison to benchmark**

**Example:**

Unit : % per annum

Year	2007 <sup>1</sup>	2008	2009	2010	2011	2012	2013	2014	2015	2016 <sup>2</sup>
Mutual fund return										
Benchmark return										
Standard Deviation of fund performance										
Standard Deviation of benchmark										

**Note:** The fund's performance is not required to be annualized in the following cases:

<sup>1</sup> If the mutual fund performance covers a period less than 1 calendar year since the inception date, show performance from the inception date until the last business day of the first calendar year.

<sup>2</sup> If the mutual fund performance covers a period less than 1 calendar year since the dissolution date, show the performance as of the last business day of the previous year until the dissolution date.

**E) Presentation of mutual fund performance and risk (Standard Deviation or SD) as trailing return compared to benchmark**

**Example:**

**In the case of an equity fund**

	<b>Year to Date</b>	<b>3 Mths</b>	<b>6 Mths</b>	<b>1 Yr<sup>1</sup></b>	<b>3 Yrs<sup>1</sup></b>	<b>5 Yrs<sup>1</sup></b>	<b>10 Yrs<sup>1</sup></b>	<b>Since Inception Return<sup>1</sup></b>
Mutual fund return								
Benchmark return								
Standard Deviation of fund performance								
Standard Deviation of benchmark								

**Note** <sup>1</sup>unit : % per year

## F) Measuring risk as Standard Deviation, Tracking Difference and Tracking Error

$$\text{Standard Deviation} = \sqrt{\frac{\sum (Rp - \bar{Rp})^2}{n-1}}$$

$$\text{Annualized Standard Deviation} = \text{Standard Deviation} \times \sqrt{252}$$

$$\begin{aligned} \text{Tracking Difference} &= \text{Cumulative Portfolio Return} - \text{Cumulative Benchmark Return} \\ &= \mathbf{Rp - Rb} = \mathbf{a} \end{aligned}$$

$$\text{Tracking Error} = \sqrt{\frac{\sum (\text{Sub Period Relative Returns} - \text{Average Relative Return})^2}{\text{Number of Sub periods} - 1}}$$

$$= \sqrt{\frac{\sum (a - \bar{a})^2}{n-1}}$$

$$\text{Annualized Tracking Error} = \text{Tracking Error} \times \sqrt{252}$$

$$\text{Sub Period relative return} = \text{Fund Sub Period return} - \text{Benchmark Sub Period return}$$

## G) Statistics such as Sharpe Ratio, Alpha, Beta and Yield to Maturity

$$\text{Sharpe ratio} = \frac{(Rp - Rf)}{\sigma}$$

: Rp = Portfolio return, Rf = Risk free rate (Short-term Government Bond Index),

$\sigma$  = Standard Deviation of Portfolio

$$\text{Alpha} = \text{Portfolio return} - \text{Benchmark return}$$

$$\text{Beta} = \frac{\text{Covariance} (Rp, Rb)}{\text{variance} (Rb)}$$

: Rp = Portfolio return, Rb = Benchmark return

### Yield to Maturity

$$PV = \sum_{i=1}^N \frac{C_i}{(1 + YTM)^i} + \frac{FV}{(1 + YTM)^N}$$

Where:

C = Coupon payment

PV = Bond Price

FV = Face Value

i = number of remain year  $\times$  frequency of payment in the year

YTM = Yield to maturity

## Sample Calculation

วันที่	NAV	Benchmark	Portfolio daily Return ( $R_p$ )	Benchmark daily Return ( $R_b$ )	Alpha ( $\alpha$ ) ( $R_p - R_b$ )	Deviation from average return ( $R_p - \bar{R}_p$ )	Deviation square ( $R_p - \bar{R}_p$ ) <sup>2</sup>	Deviation from average return ( $\alpha - \bar{\alpha}$ )	Deviation square ( $\alpha - \bar{\alpha}$ ) <sup>2</sup>
01/07/2564	10.5794	957.36							
02/07/2564	10.4902	949.27	-0.8431	-0.8450	0.0019	-0.8737	0.7633	-0.0126	0.0002
05/07/2564	10.5014	950.33	0.1068	0.1117	-0.0049	0.0666	0.0044	-0.0191	0.0004
06/07/2564	10.5723	956.78	0.6751	0.6787	-0.0036	0.6233	0.3885	-0.0175	0.0003
07/07/2564	10.4779	948.23	-0.8929	-0.8936	0.0007	-0.9351	0.8745	-0.0130	0.0002
08/07/2564	10.274	929.76	-1.9460	-1.9478	0.0018	-2.0013	4.0052	-0.0116	0.0001
09/07/2564	10.3229	934.18	0.4760	0.4754	0.0006	0.4161	0.1731	-0.0126	0.0002
12/07/2564	10.3009	932.24	-0.2131	-0.2077	-0.0054	-0.2672	0.0714	-0.0184	0.0003
13/07/2564	10.4339	944.31	1.2911	1.2947	-0.0036	1.2268	1.5049	-0.0168	0.0003
14/07/2564	10.3937	940.68	-0.3853	-0.3844	-0.0009	-0.4453	0.1983	-0.0139	0.0002
15/07/2564	10.4142	942.55	0.1972	0.1988	-0.0016	0.1379	0.0190	-0.0143	0.0002
16/07/2564	10.4119	942.35	-0.0221	-0.0212	-0.0009	-0.0857	0.0073	-0.0134	0.0002
19/07/2564	10.2803	930.44	-1.2639	-1.2639	-0.0001	-1.3142	1.7271	-0.0125	0.0002
20/07/2564	10.1694	920.4	-1.0788	-1.0791	0.0003	-1.1336	1.2850	-0.0119	0.0001
21/07/2564	10.1897	922.25	0.1996	0.2010	-0.0014	0.1416	0.0200	-0.0134	0.0002
22/07/2564	10.2671	929.3	0.7596	0.7644	-0.0048	0.7103	0.5046	-0.0167	0.0003
23/07/2564	10.2021	923.24	-0.6331	-0.6521	0.0190	-0.6833	0.4669	0.0074	0.0001
27/07/2564	10.1409	917.72	-0.5999	-0.5979	-0.0020	-0.6407	0.4105	-0.0135	0.0002
29/07/2564	10.1584	919.34	0.1726	0.1765	-0.0040	0.1331	0.0177	-0.0153	0.0002
30/07/2564	10.0643	910.61	-0.9263	-0.9496	0.0233	-0.9627	0.9268	0.0121	0.0001
02/08/2564	10.104	914.26	0.3945	0.4008	-0.0064	0.3639	0.1325	-0.0174	0.0003
03/08/2564	10.1931	922.36	0.8818	0.8860	-0.0041	0.8458	0.7153	-0.0150	0.0002
04/08/2564	10.2291	925.63	0.3532	0.3545	-0.0013	0.3207	0.1028	-0.0121	0.0001
05/08/2564	10.0735	911.53	-1.5212	-1.5233	0.0021	-1.5624	2.4410	-0.0084	0.0001
06/08/2564	10.04	908.5	-0.3326	-0.3324	-0.0001	-0.3732	0.1393	-0.0106	0.0001
09/08/2564	10.1838	921.51	1.4323	1.4320	0.0002	1.3919	1.9374	-0.0100	0.0001
10/08/2564	10.192	922.27	0.0805	0.0825	-0.0020	0.0403	0.0016	-0.0121	0.0001
11/08/2564	10.1435	917.24	-0.4759	-0.5454	0.0695	-0.5142	0.2644	0.0595	0.0035
13/08/2564	10.1556	917.54	0.1193	0.0327	0.0866	0.0807	0.0065	0.0767	0.0059
16/08/2564	10.218	922.42	0.6144	0.5319	0.0826	0.5766	0.3325	0.0728	0.0053
17/08/2564	10.3005	929.61	0.8074	0.7795	0.0279	0.7650	0.5852	0.0183	0.0003
18/08/2564	10.3484	933.97	0.4650	0.4690	-0.0040	0.4204	0.1767	-0.0135	0.0002
19/08/2564	10.2725	927.09	-0.7334	-0.7366	0.0032	-0.7776	0.6047	-0.0062	0.0000
20/08/2564	10.3294	932.27	0.5539	0.5587	-0.0048	0.5073	0.2574	-0.0141	0.0002
23/08/2564	10.5779	954.17	2.4058	2.3491	0.0566	2.3643	5.5899	0.0470	0.0022
24/08/2564	10.611	956.78	0.3129	0.2735	0.0394	0.2669	0.0712	0.0298	0.0009
25/08/2564	10.7066	965.45	0.9010	0.9062	-0.0052	0.8574	0.7351	-0.0147	0.0002
26/08/2564	10.7004	964.79	-0.0579	-0.0684	0.0105	-0.1030	0.0106	0.0011	0.0000
27/08/2564	10.7852	972.16	0.7925	0.7639	0.0286	0.7494	0.5616	0.0193	0.0004
30/08/2564	10.9552	987.31	1.5762	1.5584	0.0178	1.5594	2.4319	0.0085	0.0001
31/08/2564	11.0083	992.13	0.4847	0.4882	-0.0035	0.4821	0.2324	-0.0127	0.0002
01/09/2564	10.9647	988.2	-0.3961	-0.3961	0.0001	-0.3850	0.1482	-0.0092	0.0001
02/09/2564	11.0818	998.81	1.0680	1.0737	-0.0057	1.0657	1.1357	-0.0148	0.0002
03/09/2564	11.1101	1,000.64	0.2554	0.1832	0.0722	0.2531	0.0641	0.0632	0.0040
06/09/2564	11.0787	997.45	-0.2826	-0.3188	0.0362	-0.2808	0.0788	0.0272	0.0007
07/09/2564	11.0138	991.33	-0.5858	-0.6136	0.0278	-0.5981	0.3577	0.0190	0.0004
08/09/2564	11.0318	992.35	0.1634	0.1029	0.0605	0.1450	0.0210	0.0519	0.0027
09/09/2564	10.9168	981.86	-1.0424	-1.0571	0.0146	-1.0586	1.1207	0.0061	0.0000
10/09/2564	10.9545	985.29	0.3453	0.3493	-0.0040	0.3250	0.1056	-0.0124	0.0002
13/09/2564	10.9126	981.52	-0.3825	-0.3826	0.0001	-0.4067	0.1654	-0.0082	0.0001
14/09/2564	10.8357	974.58	-0.7047	-0.7071	0.0024	-0.7222	0.5215	-0.0059	0.0000
15/09/2564	10.8513	975.79	0.1440	0.1242	0.0198	0.1115	0.0124	0.0116	0.0001
16/09/2564	10.882	978.53	0.2829	0.2808	0.0021	0.2531	0.0641	-0.0060	0.0000
17/09/2564	10.8394	974.71	-0.3915	-0.3904	-0.0011	-0.4043	0.1635	-0.0091	0.0001
20/09/2564	10.6825	960.58	-1.4475	-1.4497	0.0022	-1.4634	2.1416	-0.0058	0.0000
21/09/2564	10.7578	967.39	0.7049	0.7089	-0.0041	0.6868	0.4717	-0.0119	0.0001
22/09/2564	10.7805	969.44	0.2110	0.2119	-0.0009	0.1838	0.0338	-0.0087	0.0001
23/09/2564	10.9164	981.73	1.2606	1.2677	-0.0071	1.2343	1.5235	-0.0148	0.0002
27/09/2564	10.8525	976.02	-0.5854	-0.5816	-0.0037	-0.6117	0.3742	-0.0113	0.0001
28/09/2564	10.8184	972.95	-0.3142	-0.3145	0.0003	-0.3463	0.1199	-0.0072	0.0001
29/09/2564	10.8365	971.85	0.1673	-0.1131	0.2804	0.1298	0.0168	0.2729	0.0745
30/09/2564	10.7532	964.35	-0.7687	-0.7717	0.0030	-0.8071	0.6514	-0.0043	0.0000
01/10/2564	10.76	964.99	0.0632	0.0664	-0.0031	0.0181	0.0003	-0.0103	0.0001
04/10/2564	10.8289	971.22	0.6403	0.6456	-0.0053	0.5930	0.3517	-0.0124	0.0002

วันที่	NAV	Benchmark	Portfolio daily Return ( $R_p$ )	Benchmark daily Return ( $R_b$ )	Alpha ( $\alpha$ ) ( $R_p - R_b$ )	Deviation from average return ( $R_p - \bar{R}_p$ )	Deviation square ( $R_p - \bar{R}_p$ ) <sup>2</sup>	Deviation from average return ( $\alpha - \bar{\alpha}$ )	Deviation square ( $\alpha - \bar{\alpha}$ ) <sup>2</sup>
05/10/2564	10.9138	978.86	0.7840	0.7866	-0.0026	0.7521	0.5657	-0.0097	0.0001
06/10/2564	10.8514	973.25	-0.5718	-0.5731	0.0014	-0.6052	0.3663	-0.0057	0.0000
07/10/2564	10.9495	982.1	0.9040	0.9093	-0.0053	0.8710	0.7587	-0.0122	0.0001
08/10/2564	10.9894	985.71	0.3644	0.3676	-0.0032	0.3269	0.1069	-0.0100	0.0001
11/10/2564	10.9528	982.45	-0.3330	-0.3307	-0.0023	-0.3754	0.1409	-0.0091	0.0001
12/10/2564	11.0363	989.66	0.7624	0.7339	0.0285	0.7215	0.5205	0.0218	0.0005
14/10/2564	11.0096	987.28	-0.2419	-0.2405	-0.0014	-0.2802	0.0785	-0.0081	0.0001
15/10/2564	11.0112	987.44	0.0145	0.0162	-0.0017	-0.0255	0.0006	-0.0083	0.0001
18/10/2564	11.0511	991.07	0.3624	0.3676	-0.0053	0.3295	0.1086	-0.0118	0.0001
19/10/2564	10.9505	982.02	-0.9103	-0.9132	0.0028	-0.9441	0.8914	-0.0036	0.0000
20/10/2564	10.9931	985.86	0.3890	0.3910	-0.0020	0.3545	0.1257	-0.0084	0.0001
21/10/2564	11.0257	988.81	0.2965	0.2992	-0.0027	0.2648	0.0701	-0.0091	0.0001
25/10/2564	10.9584	982.81	-0.6104	-0.6068	-0.0036	-0.6405	0.4102	-0.0099	0.0001
26/10/2564	10.9719	984.04	0.1232	0.1252	-0.0020	0.0931	0.0087	-0.0082	0.0001
27/10/2564	10.8971	977.32	-0.6817	-0.6829	0.0012	-0.7165	0.5133	-0.0050	0.0000
28/10/2564	10.8898	976.67	-0.0670	-0.0665	-0.0005	-0.0988	0.0098	-0.0066	0.0000
29/10/2564	10.8674	974.67	-0.2057	-0.2048	-0.0009	-0.2387	0.0570	-0.0070	0.0000
01/11/2564	10.8197	970.42	-0.4389	-0.4360	-0.0029	-0.4737	0.2244	-0.0089	0.0001
02/11/2564	10.872	975.13	0.4834	0.4854	-0.0020	0.4454	0.1983	-0.0080	0.0001
03/11/2564	10.8441	972.64	-0.2566	-0.2554	-0.0013	-0.2955	0.0873	-0.0073	0.0001
04/11/2564	10.9269	980.11	0.7635	0.7680	-0.0045	0.7247	0.5251	-0.0104	0.0001
05/11/2564	10.926	980.03	-0.0082	-0.0082	-0.0001	-0.0490	0.0024	-0.0060	0.0000
08/11/2564	10.9278	980.22	0.0165	0.0194	-0.0029	-0.0260	0.0007	-0.0088	0.0001
09/11/2564	10.9311	980.53	0.0302	0.0316	-0.0014	-0.0156	0.0002	-0.0073	0.0001
10/11/2564	10.9172	979.27	-0.1272	-0.1285	0.0013	-0.1847	0.0341	-0.0044	0.0000
11/11/2564	10.9235	979.88	0.0577	0.0623	-0.0046	-0.0001	0.0000	-0.0110	0.0001
12/11/2564	10.9207	979.59	-0.0256	-0.0296	0.0040	-0.0821	0.0067	-0.0025	0.0000
15/11/2564	10.97	984.06	0.4514	0.4563	-0.0049	0.3994	0.1595	-0.0118	0.0001
16/11/2564	10.9971	986.51	0.2470	0.2490	-0.0019	0.1898	0.0360	-0.0087	0.0001
17/11/2564	10.9976	986.52	0.0045	0.0010	0.0035	-0.0562	0.0032	-0.0032	0.0000
18/11/2564	11.027	989.18	0.2673	0.2696	-0.0023	0.2064	0.0426	-0.0096	0.0001
19/11/2564	10.9786	984.39	-0.4389	-0.4842	0.0453	-0.4895	0.2396	0.0380	0.0014
22/11/2564	11.0314	989.18	0.4809	0.4866	-0.0057	0.4325	0.1870	-0.0131	0.0002
23/11/2564	11.0102	987.26	-0.1922	-0.1941	0.0019	-0.2437	0.0594	-0.0057	0.0000
24/11/2564	11.0315	989.19	0.1935	0.1955	-0.0020	0.1524	0.0232	-0.0098	0.0001
25/11/2564	11.0148	987.6	-0.1514	-0.1607	0.0094	-0.1970	0.0388	0.0016	0.0000
26/11/2564	10.7296	961.93	-2.5892	-2.5992	0.0100	-2.6375	6.9566	0.0018	0.0000
29/11/2564	10.5774	948.28	-1.4185	-1.4190	0.0005	-1.4696	2.1597	-0.0076	0.0001
30/11/2564	10.4306	935.08	-1.3879	-1.3920	0.0041	-1.4396	2.0725	-0.0039	0.0000
01/12/2564	10.5725	947.82	1.3604	1.3625	-0.0020	1.3060	1.7057	-0.0113	0.0001
02/12/2564	10.5725	947.84	0.0000	0.0021	-0.0021	-0.0449	0.0020	-0.0119	0.0001
03/12/2564	10.5275	943.76	-0.4256	-0.4305	0.0048	-0.4548	0.2069	-0.0051	0.0000
07/12/2564	10.6849	957.96	1.4951	1.5046	-0.0095	1.4664	2.1503	-0.0194	0.0004
08/12/2564	10.7568	964.44	0.6729	0.6764	-0.0035	0.6369	0.4056	-0.0136	0.0002
09/12/2564	10.7322	962.24	-0.2287	-0.2281	-0.0006	-0.2665	0.0710	-0.0105	0.0001
13/12/2564	10.7826	966.81	0.4696	0.4749	-0.0053	0.4276	0.1829	-0.0155	0.0002
14/12/2564	10.8303	971.13	0.4424	0.4468	-0.0045	0.3988	0.1591	-0.0146	0.0002
15/12/2564	10.7524	964.12	-0.7193	-0.7218	0.0026	-0.7571	0.5731	-0.0076	0.0001
16/12/2564	10.9347	980.51	1.6954	1.7000	-0.0046	1.6503	2.7235	-0.0146	0.0002
17/12/2564	10.9051	977.86	-0.2707	-0.2703	-0.0004	-0.3197	0.1022	-0.0104	0.0001
20/12/2564	10.6978	959.26	-1.9009	-1.9021	0.0012	-1.9474	3.7923	-0.0088	0.0001
21/12/2564	10.7373	962.82	0.3692	0.3711	-0.0019	0.3253	0.1058	-0.0118	0.0001
22/12/2564	10.7656	965.38	0.2636	0.2659	-0.0023	0.2190	0.0480	-0.0122	0.0001
23/12/2564	10.8829	975.92	1.0896	1.0918	-0.0022	1.0474	1.0971	-0.0121	0.0001
24/12/2564	10.874	975.13	-0.0818	-0.0809	-0.0008	-0.1257	0.0158	-0.0106	0.0001
27/12/2564	10.8777	975.51	0.0340	0.0390	-0.0049	-0.0078	0.0001	-0.0147	0.0002
28/12/2564	10.9551	982.48	0.7115	0.7145	-0.0030	0.6680	0.4463	-0.0126	0.0002
29/12/2564	11.0311	989.3	0.6937	0.6942	-0.0004	0.6481	0.4201	-0.0100	0.0001
30/12/2564	11.0466	990.75	0.1405	0.1466	-0.0061	0.0920	0.0085	-0.0155	0.0002
04/01/2565	11.1425	999.46	0.8681	0.8791	-0.0110	0.8215	0.6749	-0.0204	0.0004
05/01/2565	11.1775	1,002.61	0.3141	0.3152	-0.0011	0.2657	0.0706	-0.0104	0.0001
06/01/2565	10.9674	983.71	-1.8797	-1.8851	0.0054	-1.9274	3.7149	-0.0039	0.0000
07/01/2565	10.9922	985.96	0.2261	0.2287	-0.0026	0.1793	0.0322	-0.0119	0.0001
10/01/2565	10.9899	985.79	-0.0209	-0.0172	-0.0037	-0.0602	0.0036	-0.0135	0.0002
11/01/2565	11.0568	991.82	0.6087	0.6117	-0.0030	0.5696	0.3244	-0.0128	0.0002

วันที่	NAV	Benchmark	Portfolio daily Return ( $R_p$ )	Benchmark daily Return ( $R_b$ )	Alpha ( $\alpha$ ) ( $R_p - R_b$ )	Deviation from average return ( $R_p - \bar{R}_p$ )	Deviation square ( $(R_p - \bar{R}_p)^2$ )	Deviation from average return ( $\alpha - \bar{\alpha}$ )	Deviation square ( $(\alpha - \bar{\alpha})^2$ )
12/01/2565	11.1295	998.37	0.6575	0.6604	-0.0029	0.6204	0.3849	-0.0128	0.0002
13/01/2565	11.1137	996.96	-0.1420	-0.1412	-0.0007	-0.1775	0.0315	-0.0124	0.0002
14/01/2565	11.0795	993.89	-0.3077	-0.3079	0.0002	-0.3433	0.1178	-0.0140	0.0002
17/01/2565	11.11	996.67	0.2753	0.2797	-0.0044	0.2379	0.0566	-0.0208	0.0004
18/01/2565	11.0089	987.6	-0.9100	-0.9100	0.0000	-0.9476	0.8979	-0.0154	0.0002
19/01/2565	11.0262	989.16	0.1571	0.1580	-0.0008	0.1177	0.0139	-0.0159	0.0003
20/01/2565	11.0404	990.44	0.1288	0.1294	-0.0006	0.0905	0.0082	-0.0160	0.0003
21/01/2565	11.0026	987.06	-0.3424	-0.3413	-0.0011	-0.3755	0.1410	-0.0179	0.0003
24/01/2565	10.9811	985.15	-0.1954	-0.1935	-0.0019	-0.2277	0.0518	-0.0189	0.0004
25/01/2565	10.9841	985.44	0.0273	0.0294	-0.0021	-0.0033	0.0000	-0.0187	0.0004
26/01/2565	11.0586	992.13	0.6783	0.6789	-0.0006	0.6451	0.4162	-0.0175	0.0003
27/01/2565	11.0165	988.36	-0.3807	-0.3800	-0.0007	-0.4139	0.1713	-0.0177	0.0003
28/01/2565	11.0396	990.46	0.2097	0.2125	-0.0028	0.1788	0.0320	-0.0198	0.0004
31/01/2565	11.0703	993.29	0.2781	0.2857	-0.0076	0.2481	0.0616	-0.0248	0.0006
01/02/2565	11.126	998.15	0.5031	0.4893	0.0139	0.4785	0.2290	-0.0032	0.0000
02/02/2565	11.144	999.78	0.1618	0.1633	-0.0015	0.1434	0.0206	-0.0186	0.0003
03/02/2565	11.1484	1,000.18	0.0395	0.0400	-0.0005	0.0155	0.0002	-0.0175	0.0003
04/02/2565	11.1828	1,003.29	0.3086	0.3109	-0.0024	0.2865	0.0821	-0.0194	0.0004
07/02/2565	11.2161	1,006.16	0.2978	0.2861	0.0117	0.2815	0.0793	-0.0052	0.0000
08/02/2565	11.2753	1,011.50	0.5278	0.5307	-0.0029	0.5103	0.2604	-0.0198	0.0004
09/02/2565	11.4785	1,029.80	1.8022	1.8092	-0.0070	1.7759	3.1538	-0.0239	0.0006
10/02/2565	11.4903	1,029.88	0.1028	0.0078	0.0950	0.0735	0.0054	0.0783	0.0061
11/02/2565	11.4731	1,028.14	-0.1497	-0.1690	0.0193	-0.1740	0.0303	0.0026	0.0000
14/02/2565	11.4026	1,021.09	-0.6145	-0.6857	0.0712	-0.6437	0.4144	0.0546	0.0030
15/02/2565	11.4981	1,029.70	0.8375	0.8432	-0.0057	0.8038	0.6461	-0.0222	0.0005
17/02/2565	11.5673	1,035.94	0.6018	0.6060	-0.0042	0.5718	0.3269	-0.0206	0.0004
18/02/2565	11.5783	1,035.89	0.0951	-0.0048	0.0999	0.0662	0.0044	-0.0836	0.0070
21/02/2565	11.398	1,019.70	-1.5572	-1.5629	0.0057	-1.5887	2.5239	-0.0106	0.0001
22/02/2565	11.3655	1,016.55	-0.2851	-0.3089	0.0238	-0.3183	0.1013	0.0076	0.0001
23/02/2565	11.4271	1,021.68	0.5420	0.5046	0.0373	0.5049	0.2550	0.0212	0.0005
24/02/2565	11.2427	1,004.86	-1.6137	-1.6463	0.0326	-1.6536	2.7343	0.0165	0.0003
25/02/2565	11.3288	1,012.52	0.7658	0.7623	0.0035	0.7261	0.5273	-0.0125	0.0002
28/02/2565	11.3826	1,016.58	0.4749	0.4010	0.0739	0.4382	0.1920	0.0579	0.0034
01/03/2565	11.4394	1,021.67	0.4990	0.5007	-0.0017	0.4628	0.2142	-0.0176	0.0003
02/03/2565	11.4581	1,023.36	0.1635	0.1654	-0.0019	0.1315	0.0173	-0.0178	0.0003
03/03/2565	11.5137	1,026.15	0.4852	0.2726	0.2126	0.4523	0.2046	0.1969	0.0388
04/03/2565	11.3388	1,009.68	-1.5191	-1.6050	0.0860	-1.5539	2.4145	0.0703	0.0049
07/03/2565	11.049	983.58	-2.5558	-2.5850	0.0292	-2.5880	6.6978	0.0135	0.0002
08/03/2565	11.0437	982.97	-0.0480	-0.0620	0.0141	-0.0717	0.0051	-0.0015	0.0000
09/03/2565	11.1819	994.96	1.2514	1.2198	0.0316	1.2269	1.5054	0.0161	0.0003
10/03/2565	11.2204	998.41	0.3443	0.3467	-0.0024	0.3221	0.1037	-0.0179	0.0003
11/03/2565	11.3034	1,005.31	0.7397	0.6911	0.0486	0.7270	0.5285	0.0332	0.0011
14/03/2565	11.3384	1,008.36	0.3096	0.3034	0.0063	0.2969	0.0882	-0.0091	0.0001
15/03/2565	11.2312	998.72	-0.9455	-0.9560	0.0105	-0.9587	0.9191	-0.0047	0.0000
16/03/2565	11.378	1,011.95	1.3071	1.3247	-0.0176	1.2901	1.6644	-0.0328	0.0011
17/03/2565	11.4596	1,019.17	0.7172	0.7135	0.0037	0.7042	0.4960	-0.0114	0.0001
18/03/2565	11.4139	1,015.02	-0.3988	-0.4072	0.0084	-0.4106	0.1686	-0.0066	0.0000
21/03/2565	11.3686	1,010.88	-0.3969	-0.4079	0.0110	-0.4117	0.1695	-0.0040	0.0000
22/03/2565	11.3869	1,012.53	0.1610	0.1632	-0.0023	0.1425	0.0203	-0.0171	0.0003
23/03/2565	11.343	1,008.61	-0.3855	-0.3871	0.0016	-0.4083	0.1667	-0.0132	0.0002
24/03/2565	11.3844	1,012.34	0.3650	0.3698	-0.0048	0.3448	0.1189	-0.0196	0.0004
25/03/2565	11.3449	1,008.81	-0.3470	-0.3487	0.0017	-0.3619	0.1310	-0.0129	0.0002
28/03/2565	11.3848	1,012.43	0.3517	0.3588	-0.0071	0.3367	0.1134	-0.0218	0.0005
29/03/2565	11.4333	1,016.80	0.4260	0.4316	-0.0056	0.4111	0.1690	-0.0203	0.0004
30/03/2565	11.5004	1,022.83	0.5869	0.5930	-0.0062	0.5719	0.3271	-0.0208	0.0004
31/03/2565	11.4651	1,019.67	-0.3069	-0.3089	0.0020	-0.3219	0.1036	-0.0127	0.0002
01/04/2565	11.5093	1,023.66	0.3855	0.3913	-0.0058	0.3706	0.1373	-0.0205	0.0004
04/04/2565	11.4994	1,022.81	-0.0860	-0.0830	-0.0030	-0.1010	0.0102	-0.0177	0.0003
05/04/2565	11.4843	1,021.32	-0.1313	-0.1457	0.0144	-0.1463	0.0214	-0.0003	0.0000
07/04/2565	11.3288	1,006.38	-1.3540	-1.4628	0.1088	-1.3690	1.8741	0.0941	0.0089
08/04/2565	11.3296	1,006.33	0.0071	-0.0050	0.0120	-0.0079	0.0001	-0.0026	0.0000
11/04/2565	11.2894	1,002.47	-0.3548	-0.3836	0.0287	-0.3698	0.1367	0.0141	0.0002
12/04/2565	11.2609	996.54	-0.2524	-0.5915	0.3391	-0.2674	0.0715	0.3244	0.1052
18/04/2565	11.2641	991.8	0.0284	-0.4756	0.5041	0.0135	0.0002	0.4894	0.2395
19/04/2565	11.309	991.59	0.3986	-0.0212	0.4198	0.3837	0.1472	0.4051	0.1641
20/04/2565	11.3176	993.94	0.0760	0.2370	-0.1609	0.0611	0.0037	-0.1756	0.0308

วันที่	NAV	Benchmark	Portfolio daily Return ( $R_p$ )	Benchmark daily Return ( $R_b$ )	Alpha ( $\alpha$ ) ( $R_p - R_b$ )	Deviation from average return ( $R_p - \bar{R}_p$ )	Deviation square ( $(R_p - \bar{R}_p)^2$ )	Deviation from average return ( $\alpha - \bar{\alpha}$ )	Deviation square ( $(\alpha - \bar{\alpha})^2$ )
21/04/2565	11.3618	998.37	0.3905	0.4457	-0.0552	0.3756	0.1411	-0.0698	0.0049
22/04/2565	11.3409	995.8	-0.1839	-0.2574	0.0735	-0.1989	0.0396	0.0588	0.0035
25/04/2565	11.2303	983.07	-0.9752	-1.2784	0.3031	-0.9902	0.9805	0.2885	0.0832
26/04/2565	11.2151	981.16	-0.1353	-0.1943	0.0589	-0.1503	0.0226	0.0443	0.0020
27/04/2565	11.1809	978.76	-0.3049	-0.2446	-0.0603	-0.3347	0.1120	-0.0896	0.0080
28/04/2565	11.2416	983.54	0.5429	0.4884	0.0545	0.5131	0.2633	0.0253	0.0006
29/04/2565	11.2469	983.56	0.0471	0.0020	0.0451	0.0174	0.0003	0.0159	0.0003
03/05/2565	11.1968	979.01	-0.4455	-0.4626	0.0171	-0.4752	0.2259	-0.0121	0.0001
05/05/2565	11.18	976.98	-0.1500	-0.2074	0.0573	-0.1798	0.0323	0.0281	0.0008
06/05/2565	11.0623	966.79	-1.0528	-1.0430	-0.0098	-1.0826	1.1719	-0.0390	0.0015
09/05/2565	10.922	954.33	-1.2683	-1.2888	0.0205	-1.2981	1.6849	-0.0087	0.0001
10/05/2565	11.0509	965.49	1.1802	1.1694	0.0108	1.1504	1.3234	-0.0184	0.0003
11/05/2565	11.0095	961.66	-0.3746	-0.3967	0.0221	-0.4044	0.1635	-0.0072	0.0001
12/05/2565	10.879	950.31	-1.1853	-1.1803	-0.0051	-1.2151	1.4765	-0.0343	0.0012
13/05/2565	10.9102	953.06	0.2868	0.2894	-0.0026	0.2570	0.0661	-0.0318	0.0010
17/05/2565	11.1122	970.51	1.8515	1.8309	0.0205	1.8217	3.3186	-0.0087	0.0001
18/05/2565	11.1855	977.01	0.6596	0.6698	-0.0101	0.6299	0.3967	-0.0393	0.0015
19/05/2565	11.0697	966.84	-1.0353	-1.0409	0.0057	-1.0651	1.1343	-0.0236	0.0006
20/05/2565	11.1902	977.36	1.0886	1.0881	0.0005	1.0588	1.1210	-0.0287	0.0008
23/05/2565	11.2999	986.94	0.9803	0.9802	0.0001	0.9505	0.9035	-0.0291	0.0008
24/05/2565	11.2153	979.56	-0.7487	-0.7478	-0.0009	-0.7785	0.6060	-0.0301	0.0009
25/05/2565	11.1913	977.46	-0.2140	-0.2144	0.0004	-0.2438	0.0594	-0.0288	0.0008
26/05/2565	11.2556	983.09	0.5746	0.5760	-0.0014	0.5448	0.2968	-0.0306	0.0009
27/05/2565	11.3011	987.08	0.4042	0.4059	-0.0016	0.3745	0.1402	-0.0308	0.0010
30/05/2565	11.4014	995.88	0.8875	0.8915	-0.0040	0.8577	0.7357	-0.0332	0.0011
31/05/2565	11.4762	1,002.24	0.6561	0.6386	0.0174	0.6263	0.3922	-0.0118	0.0001
01/06/2565	11.4765	1,002.24	0.0026	0.0000	0.0026	-0.0272	0.0007	-0.0266	0.0007
02/06/2565	11.4038	995.9	-0.6335	-0.6326	-0.0009	-0.6633	0.4399	-0.0301	0.0009
06/06/2565	11.3957	995.24	-0.0710	-0.0663	-0.0048	-0.1008	0.0102	-0.0340	0.0012
07/06/2565	11.2909	986.07	-0.9196	-0.9214	0.0017	-0.9494	0.9014	-0.0275	0.0008
08/06/2565	11.3203	988.66	0.2604	0.2627	-0.0023	0.2306	0.0532	-0.0315	0.0010
09/06/2565	11.3716	993.15	0.4532	0.4542	-0.0010	0.4234	0.1793	-0.0302	0.0009
10/06/2565	11.3083	987.61	-0.5566	-0.5578	0.0012	-0.5864	0.3439	-0.0280	0.0008
13/06/2565	11.0927	968.75	-1.9066	-1.9097	0.0031	-1.9363	3.7494	-0.0261	0.0007
14/06/2565	11.1148	970.69	0.1992	0.2003	-0.0010	0.1694	0.0287	-0.0302	0.0009
15/06/2565	11.0602	965.91	-0.4912	-0.4924	0.0012	-0.5210	0.2715	-0.0280	0.0008
16/06/2565	10.8203	944.9	-2.1690	-2.1752	0.0061	-2.1988	4.8348	-0.0231	0.0005
17/06/2565	10.8219	945.05	0.0148	0.0159	-0.0011	-0.0150	0.0002	-0.0303	0.0009
20/06/2565	10.8362	946.34	0.1321	0.1365	-0.0044	0.1024	0.0105	-0.0336	0.0011
21/06/2565	10.9318	954.71	0.8822	0.8845	-0.0022	0.8524	0.7267	-0.0314	0.0010
22/06/2565	10.8301	945.8	-0.9303	-0.9333	0.0030	-0.9601	0.9218	-0.0263	0.0007
23/06/2565	10.8029	943.42	-0.2512	-0.2516	0.0005	-0.2809	0.0789	-0.0287	0.0008
24/06/2565	10.8819	950.36	0.7313	0.7356	-0.0043	0.7015	0.4921	-0.0336	0.0011
27/06/2565	10.9768	958.71	0.8721	0.8786	-0.0065	0.8423	0.7095	-0.0357	0.0013
28/06/2565	11.091	968.73	1.0404	1.0452	-0.0048	1.0106	1.0213	-0.0340	0.0012
29/06/2565	11.0265	963.08	-0.5816	-0.5832	0.0017	-0.6113	0.3737	-0.0275	0.0008
30/06/2565	10.8891	951.07	-1.2461	-1.2470	0.0010	-1.2759	1.6278	-0.0283	0.0008

Average Portfolio return = 0.0150%

standard deviation (daily) = 0.7732%

Annualized standard deviation =  $0.7732\% \times \sqrt{252} = 12.2739\%$

Tracking Difference =  $3.6037\% - 0.0686\% = 3.5351\%$

Average Relative return = 0.0147%

Tracking Error (daily) = 0.0605%

Annualized Tracking Error =  $0.0605\% \times \sqrt{252} = 0.9609\%$

Sharpe ratio =  $\frac{(3.6037\% - 0.6517\%)}{12.2739\%} = 0.2405$

Alpha =  $3.6037\% - 0.0686\% = 3.5351\%$



$$\text{Beta} = \frac{(0.5992)}{(0.6049)} = 0.9905$$

### Yield to Maturity

A 10-year fixed income instrument pays a coupon of 6% per year, semi-annually, purchased at 950 Baht a unit, and par value is 1,000 Baht per unit. The Yield to Maturity is calculated as:

$$950 = \sum_{i=1}^{10 \times 2} \frac{(1000 \times (\frac{6\%}{2}))}{(1+YTM)^{20}} + \frac{1000}{(1+YTM)^{20}}$$

YTM = 3.35% per semi-annual period

Therefore, Yield to Maturity is  $3.35\% \times 2 = 6.69\%$  p.a.

### Portfolio Duration

For a fixed income fund with 3 debt securities in the portfolio as follows:

	Purchased Price	Duration
Fixed income instrument 1	12,000,000	3.0
Fixed income instrument 2	6,000,000	7.0
Fixed income instrument 3	6,000,000	6.0

Total Cost:  $12,000,000 + 6,000,000 + 6,000,000 = 24,000,000$

Weighted-Average Component of Each Debt Instrument in the Portfolio

Fixed income instrument 1 :  $(12,000,000 / 24,000,000) \times 3.0 = 1.5$

Fixed income instrument 2 :  $(6,000,000 / 24,000,000) \times 7.0 = 1.75$

Fixed income instrument 3 :  $(6,000,000 / 24,000,000) \times 6.0 = 1.5$

Portfolio duration =  $1.5 + 1.75 + 1.5 = 4.75$

**H. Calculation of the Composite Return of all funds within certain fund type, under a member's management**

**Calculate using Asset-Weighted Average**

$$C_{ASSET} = \frac{\sum(MVB_i \times R_i)}{MVB_{TOTAL}}$$

$MVB_i$  is the net asset value at the beginning of the period compared with fund i.

And  $R_i$  is the rate of return on the fund i.

**Sample Calculation**

Mutual Fund Name	Net Asset Value (MB)	Return (percent)
A	500	15
B	3,000	10
C	10,000	5
D	1,000	10
E	2,000	12

**Composite Return using asset-weighted average**

$$\begin{aligned} &= \frac{(500 \times 15\%) + (3,000 \times 10\%) + (10,000 \times 5\%) + (1,000 \times 10\%) + (2,000 \times 12\%)}{(500 + 3,000 + 10,000 + 1,000 + 2,000)} \\ &= 7.36\% \end{aligned}$$