TOPIC 4 - OVERVIEW

1.   OVERVIEW OF THE INVESTMENT MANAGEMENT PROCESS

- The investment management cycle is a structured process that ensures investment objectives are achieved through a fund's performance

- See below for an illustration of the process:

Investment Management Cycle

	Define:	1. Liquidity
1. Return requirements	• investment objectives	2. Investment horizon
2. Risk tolerance	• constraints	3. Tax considerations
		4. Legal restrictions
		5. Unique preferences and needs

Strategic asset allocation	Set the investment strategy	Investment management style

Select manager	Implement and manage portfolio	Tactical asset allocation

Performance	Monitor and review	Comparison with benchmarks

2.   SETTING THE INVESTMENT OBJECTIVES

2.1   Identifying the Investment Objectives and Constraints

- A fund's investment objectives and constraints should reflect those of its underlying investors

- A **fund's objectives** must take into account the following **constraints**:

    ➢ *Cash flows*: forecasts are required for redemptions or purchasing/selling securities

    ➢ *Liabilities*: include dividends and fee payments to trustees, advisers, investment managers and auditors among others

    ➢ *Legal requirements*: important that fund managers comply with rules, including Code on Unit Trusts and Mutual Funds. Trustees must adhere to explicit duties as set out in the legislation

    ➢ *Investment horizon*: Must be explicit for closed-end funds and will be considered when determining realistic investment objectives

    ➢ *Tax considerations*: tax payable by the fund on assets/income

    ➢ *Downside risk*: Fund managers should understand the maximum loss that investors/client will tolerate

2.2   Setting the Investment Objectives

- A fund manager usually sets a fund's **investment objective** around one or more of the following:

    ➢ Outperform inflation or cash deposit rates by a certain percentage over a specified time period

    ➢ Outperform a relevant benchmark over a specified time period (eg outperform the HSI by 2% per annum over a 5 year period)

- An **investment policy statement** sets out the general investment goals and describes the investment strategies to meet these objectives. The major sections of such a statement include:

    1. Statement of purpose or overview

    2. Investment objectives

    3. Roles and responsibilities of investment manager

    4. Investment guidelines and boundaries

- The **major reasons** for compiling an investment policy statement include:

    ➢ To state goals of the investment plan

    ➢ To provide a benchmark and an evaluation system for performance

    ➢ To set boundaries for strategies and products

    ➢ To provide clear communication and better understanding of the investment policy

3.   FORMULATING THE INVESTMENT STRATEGY

3.1   Matching Investment Objectives with Manager Skills

- When selecting an appropriate fund manager, research can be purchased from a fund research house, a ratings agency or asset consultant

- When a client's investment strategy is confirmed, either a specialist or a discretionary manager (or a combination of both) will be appointed

- The two approaches to implementing Strategic Asset Allocation in a portfolio of funds are **discretionary** and **specialist**

Discretionary Approach

- The trustee or client authorises a fund manager to make and implement asset allocation decisions

- This requires the fund manager to make short-term asset allocation decisions within the set SAA

- The fund manager may have to rebalance the portfolio from time to time to remain within the SAA

Specialist Approach

- The trustee or client decides the asset allocation

- Several specialist fund managers may be appointed to manage different parts of the portfolio

3.2   Asset Modelling

- To ensure investment objectives and constraints are realistic, asset models can be constructed

- Asset models are highly relevant when some **investment objectives are conflicting** (eg protect capital while growing capital)

- When a fund has actuarial liabilities to meet (eg life insurance with a savings component), an **asset-liability model** should also be built to test various investment strategies

- Both types of models mathematically estimate the risk of not achieving particular investment objectives

- Fund managers use **sensitivity analysis** to test asset models

- Generally, asset models and asset-liability models should be interpreted with caution

3.3   Active or Passive Approach

- **Passive managers** generally view markets as efficient and believe they cannot consistently outperform the market, net of fees

- The most important objective for passive managers is to minimise **tracking error** (see section 6.3.3 below)

- Passive investment management can be implemented **in-house or outsourced**

- **Active managers** believe that the market does not fully reflect true value, creating opportunities to produce excess returns

- Active managers aim to outperform a particular benchmark, however **empirical evidence** shows that on average, they are not very successful

- With both passive and active management, portfolio balancing will occur to maintain original SAA weightings

4.   ASSET ALLOCATION STRATEGIES

4.1   Strategic Asset Allocation (SAA)

- SAA is portfolio management using a constant set of asset weights (policy or target weights) based on a **longer-term investment policy**

- Unlike active asset allocation strategies, **SAA requires**:

  ➢ Less frequent changes to the portfolio

  ➢ Rebalancing assets back to the benchmark

  ➢ Lower transaction costs

- SAA adopts **a top-down approach** weighting funds between fixed income securities and equities, before choosing individual securities

- SAA is often implemented under a set of pre-determined ranges. For example, the table below shows approved ranges for a conservative fund:

SAA for a Conservative Fund

Asset Class	Approved Ranges (%)
Cash	5 - 20
Fixed income	55 - 85
Equities	10 - 35

- The following should be considered by the fund manager when **setting approved ranges**:

  ➢ Ranges that are too narrow can be very constraining

  ➢ Ranges that are too broad can increase short-term volatility

  ➢ Measurement of the fund's net exposure to each asset class

4.2   Passive Asset Allocation using Indexing

- The passive approach using index funds assumes that the fund manager cannot consistently outperform the benchmark returns (net of fees)

- Most index funds utilise passive asset allocation in its purest form

- Index fund managers will use a **sample portfolio** that reflects an index

- Empirical evidence shows that, on average, **fund managers cannot beat the market**

- Passive fund managers argue that **passive funds are more commercially viable** because of:

  ➢ Lower fees

  ➢ Less frequent trading, therefore lower transaction costs

  ➢ Less risk of underperformance relative to an index

4.3   Active Asset Allocation

- Aims to **achieve a greater return** than if the assets were to remain at their benchmark weightings

- **Process of planning and implementing** the optimal asset mix for a fund at a given point in time to maximise opportunities in the current market

- Involves a series of short-term decisions

- Attempts to exploit market mispricing. Market mispricing can arise from:
  - ➢ Uncertainty about future growth
  - ➢ Inflation
  - ➢ Interest rate policy
  - ➢ Fiscal policy
  - ➢ Exchange rates
  - ➢ Business confidence

4.3.1   How Economic Factors Affect Asset Allocation

- Economic factors can affect the **financial markets** and, in turn, the expected returns of asset classes

- **Economic growth** can particularly influence the outlook for equity and property returns

- **Inflation** prospects have a significant impact on the fixed income asset class. As inflation rises, long-term fixed income securities will lose purchasing power

4.3.2   Use of Derivatives

- The purchase of underlying assets incurs **trading costs** and can be relatively **illiquid**

- Derivatives provide a **cheaper and quicker** alternative in many situations

- In Hong Kong, the **Code on Unit Trusts and Mutual Funds** restricts how derivatives may be used by fund managers

- **Disadvantages** of using derivatives as an asset allocation tool include:
  - ➢ Difficulty of achieving an **optimal spread** of derivatives
  - ➢ **Additional risk** of holding derivatives must be acceptable given a fund's risk profile
  - ➢ Exchange traded derivatives may not be accessible requiring the **use of OTC derivatives**, with their heightened risk profile

- For unit trusts and mutual funds, there are usually **regulatory** (CUTMF) and/or **self-imposed restrictions** on the use of derivatives

- Synthetic ETFs make use of derivative products to replicate the performance of the underlying indices

- Many hedge funds make extensive use of derivatives to implement their investment strategies

- Derivative products can be used with respect to the following **trading or investment strategies**:

    1. Investment or speculation

    2. Hedging and risk management

    3. Arbitrage

1. INVESTMENT OR SPECULATION

- A fund manager may use derivatives to make risk-adjusted returns subject to a **high leverage effect** – if the manager's view is correct, a substantial profit may be made, however the reverse can also arise

- There are two views that can be taken regarding future price movements of an underlying asset – one relates to **direction** and the other to **volatility**

- If an asset manager believes an underlying asset price may rise, he can **buy a futures-based contract or a call option-based contract**

- If an asset manager believes an underlying asset price may fall, she can **sell a futures-based contract or buy a put option-based contract**

- An asset manager, who expects **high volatility** in an underlying asset price, can buy a call option and a put option on the underlying asset with the same exercise price and the same maturity – known as **buying a straddle**

- If the future/forward price of an underlying asset is higher than the spot price, an asset manager can buy short-dated futures contracts on the underlying asset and sell long-dated futures contracts if he expects the spread between the two prices to narrow – known as **buying the spread**

- If the price of a portfolio of underlying assets is expected to remain within a particular range, the fund manager may sell call options on the underlying assets, thereby enhancing portfolio income – known as a **covered call strategy**

2. HEDGING AND RISK MANAGEMENT

- Hedging is used by a portfolio manager who is **exposed to downward price risk** but is unable to liquidate investments. To reduce, or even eliminate, this risk, the manager can take an opposite position in futures contacts on the portfolio (ie **sell futures**)

- An asset manager who wants to **protect an investment portfolio** by restricting the maximum possible loss to a specified level may buy a stock market index put option – known as **portfolio insurance**. Maintains the upside potential, if portfolio value increases

- To reduce or eliminate **currency risk**, a portfolio manager may enter into **currency forward contracts** to sell the currency of the underlying assets and buy the currency of the managed fund

3. ARBITRAGE

- If the pricing relationship between a derivative and the underlying asset breaks down, an **arbitrage opportunity** will arise

- An asset manager can take advantage of an arbitrage opportunity by simultaneously buying the undervalued and selling the overvalued components

- Any price difference can be earned without bearing any risk

- **Factors that may compromise** the use of this strategy include:

  ➢ Transaction costs

  ➢ Mark-to-market loss as the arbitrage profit takes a long time to materialise

  ➢ Regulatory and market restrictions on trading

  ➢ Market liquidity

  ➢ Actions of uninformed traders

- The Securities and Futures (Amendment) Ordinance 2014 expanded the scope of the Type 9 Asset Management license to include the **management of portfolios of OTC derivative products** or transactions

4.3.3 The Active Return

- The return of a managed fund is made up of two components:

  ➢ **Strategic return**: attributable to the long-term strategies set for the fund

  ➢ **Active return**: only applicable to managers practising active asset allocation

- **Active return** is made up of three components:

  1. **TAA (market timing)**: short-term investment decisions designed to profit from sectors or markets that are expected to outperform

  2. **Security selection**: choosing securities with higher expected returns

  3. **Interaction**: how security selection interacts with TAA

4.3.4 Tactical Asset Allocation (TAA)

- Active strategies to enhance performance by **shifting asset mix** of a portfolio as opportunities arise

- TAA can be categorised as:

  ➢ **Discretionary** or qualitative; and

  ➢ **Quantitative**

- **Discretionary approaches** normally relate to a global theme, such as macro-economic or political events

- **Quantitative approaches** use econometric or statistical models

- TAA can be introduced in one of three ways:

  - ➢ *TAA overlay*: an asset allocation fund manager outsources TAA to a specialist TAA manager – usually a large institution. Does not interfere with daily operations of asset allocation fund manager

  - ➢ *TAA fund*: specialist asset allocation fund with a wide range of approved asset classes

  - ➢ *Asset consultant*: may be employed to advise the asset allocation fund manager on the appropriate short-term asset class mix

5.   INVESTMENT MANAGEMENT STYLES

5.1 Overview

- **Investment management style is defined by** the philosophy, the rationale for selecting securities and the general performance patterns of a manager

Main Forms of Investment Management Style

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                        ┌──────────────────────────────┐
                        │  Investment Management Style   │
                        └──────────────────────────────┘
                 ┌───────────────┴────────────────┐
          ┌────────────┐                    ┌────────────┐
          │  Passive   │                    │   Active   │
          └────────────┘                    └────────────┘
                               ┌────────────────┴──────────────────┐
                        ┌─────────────┐                      ┌──────────────┐
                        │ Fundamental │                      │ Quantitative │
                        └─────────────┘                      └──────────────┘
                ┌───────────┼───────────┐              ── Use of historical data
          ┌────────┐  ┌──────────┐  ┌────────┐
          │ Value  │  │  Growth  │  │ Income │         ── Technical analysis
          └────────┘  └──────────┘  └────────┘
                                                        ── Behavioural finance
```
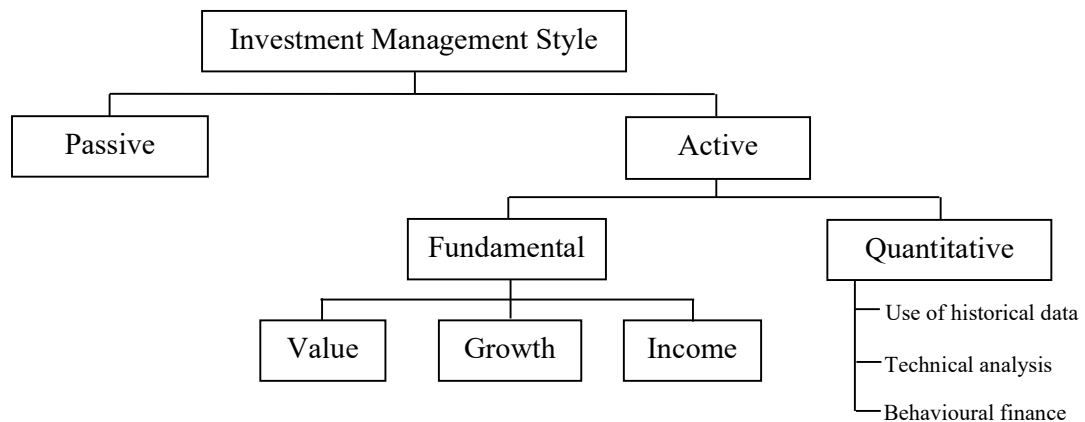
5.2 Equity Management Styles

5.2.1   Value vs Growth Investing

Value Investing	Growth Investing
• Based on stocks that are 'cheap' or undervalued relative to earnings potential	• Based on stocks that have solid future growth in earnings relative to stock price
• Low P/E stocks preferred	• Return comes from growth in earnings, leading to an increase in stock price
• Based on concept that markets overreact to bad news	• Risks are that forecast earnings may be unrealistic and share price may not rise as P/E ratio declines
• Risks are that stock is cheap because price reflects a poor future earnings stream and/or market may take longer than expected to return to fair value	

- Choice of style may be dependent upon **stage of business cycle**
  - ➤ **Value investor** will begin buying if a recession occurs
  - ➤ **Growth investor** will begin buying as a recession ends when earnings growth is expected

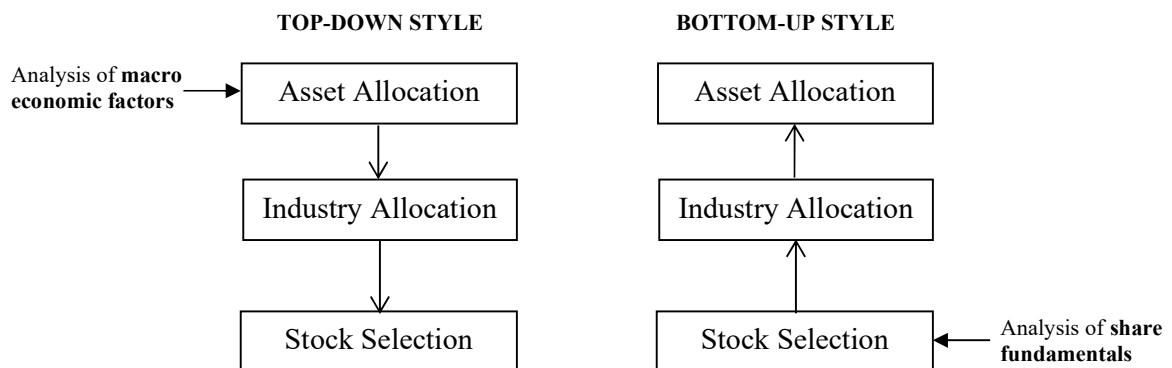- **Portfolio characteristics** have following attributes:

Attribute	Value	Growth
P/E ratio	Lower	Higher
Dividend yield	Higher	Lower
Sectors	Energy, finance and capital equipment	Consumer goods, technology, services, internet, pharmaceutical and healthcare

5.2.2   Income Investing

- Both growth and value investing focus on capital appreciation
- Income investing tends to focus on **steady dividend income flow** generated by a stock; ie intermittent income
- Income stocks tend to be those that **exceed average market dividend** yield
- **Income stocks** can include:
  - ➢ REITs
  - ➢ Energy sector stocks
  - ➢ Utilities stocks
  - ➢ Natural resources stocks
  - ➢ Preferred stocks with high dividend yields

5.2.3   Top-down vs Bottom-up Styles

- One directional approaches in allocating funds across different asset classes, industries and stocks

TOP-DOWN STYLE **BOTTOM-UP STYLE**

Analysis of **macro economic factors** →

TOP-DOWN STYLE	BOTTOM-UP STYLE
Asset Allocation	Asset Allocation
↓	↑
Industry Allocation	Industry Allocation
↓	↑
Stock Selection	Stock Selection ← Analysis of **share fundamentals**

- It is common for active managers to use both methods, with the top-down approach being used for asset allocation and the bottom-up approach being used for stock selection and industry allocation

5.2.4   Other Equity Management Styles

1. QUANTITATIVE MANAGEMENT STYLE

- A quantitative fund is an investment fund that picks securities based on **quantitative analysis**

- Quant fund managers (or 'quants') often build computer-based models using **algorithms and rules**, which can be proprietary or based on empirical studies

- The **investment process** can be broken down into **three components**:

  1. **Input system** involving data and rules

  2. **Forecasting engine**, generating price forecasts, returns and risk parameters

  3. **Portfolio construction engine**, producing portfolio construction advice

- **Possible investment strategies used by quant fund managers** include:

  (i) Behavioural finance

  (ii) Fundamental analysis

  (iii) Technical analysis

  (iv) Proprietary models

  (v) Big data analysis

(i) BEHAVIOURAL FINANCE

- This investment management style uses analytical and empirical results of cognitive and social psychological studies to set investment strategies

- Investors are known to use mental rules of thumb, known as heuristics, to make investment decisions

- Two investment strategies arising from behavioural financial studies are:

  ➢ *Momentum strategy*: assumes that past price trends will continue in the future. Best results tend to be over the short-term

  ➢ *Contrarian strategy*: assumes market involves a herd mentality with collective crowd action being wrong in the long-term. An investment manager would make investment decisions contrary to those of the general public. Asset managers should sell winner stocks and buy loser stocks

(ii) FUNDAMENTAL ANALYSIS

- Some quant fund managers use fundamental factors to develop factor models for selecting securities and optimising portfolios

- Empirical studies show that small firms tend to outperform large firms and low P/E stocks outperform high P/E stocks

(iii) **TECHNICAL ANALYSIS**

- This management style uses technical analytical tools such as charts, volumes and trend lines

- Underlying assumption is that historical returns are repeated in the future and that stock price market data and trading volumes can be used to predict future price movements

(iv) **PROPRIETARY MODELS**

- Some quant fund managers develop their own proprietary models and trading algorithms using statistical analysis, research and data mining

- Can lead to high frequency trading and algorithmic trading

(v) **BIG DTA ANALYSIS**

- Technology-driven quantitative asset management based on independent trading signals generated from big data combined with artificial intelligence algorithms

- Some fund managers combine opinions of millions of people, market sentiment and historical price movements to provide predictions and make investment decisions

2. **THEMATIC MANAGEMENT STYLE**

- Identifies prevailing themes, such as social, geographical or demographic, which can impact stock prices

- Thematic funds can focus on sectors, countries or regions and can cover the likes of:
  - ➢ Greening of the environment
  - ➢ Corporate social responsibility
  - ➢ Biotechnology
  - ➢ Mobile apps
  - ➢ Internet
  - ➢ Robot technology

5.3   Fixed Income Management Styles
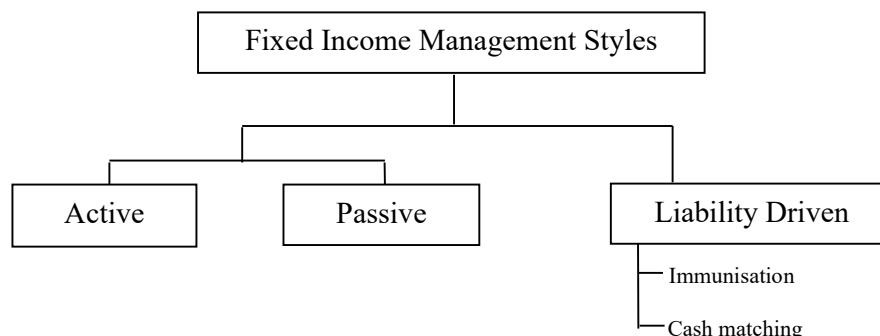
5.3.1   Active or Passive

- When using a fixed income **passive** management style, underlying securities are matched to a stated performance benchmark – the portfolio must have the same sensitivity to changes in interest rates, yield curve spread and sector spreads as the benchmark portfolio

- Returns of a **passive** portfolio should closely follow the benchmark

- An **active** portfolio management style seeks to add value by actively adjusting the portfolio according to forecasts for:

  - ➢ Interest rates

  - ➢ Shape of the yield curve

  - ➢ Sector spread; and

  - ➢ Currencies

- **Interest rate forecasts** will determine how a fixed income manager modifies **portfolio duration**:

  - ➢ **Duration** is the price sensitivity of fixed income securities to changes in interest rates

  - ➢ When interest rates are expected to rise, portfolio duration will be reduced to lessen impact of lower bond prices

  - ➢ When interest rates are expected to fall, portfolio duration will be increased to benefit from higher bond prices

- **Yield curve strategy** is important as the slope of the yield curve can vary greatly:

  - ➢ When the yield curve is expected to **move from positive to negative**, the portfolio manager would be expected to move to long-dated securities

  - ➢ When the yield curve is expected to **move from negative to positive**, the portfolio manager would be expected to move to short-dated securities

- **Sector spread strategy** focuses on margins offered by different governments and other institutions' fixed income securities

- Portfolio managers also have to consider expected **fluctuations in currencies** when making investment decisions

  - ➢ Securities in currencies that are expected to appreciate will be preferred to those in currencies that are expected to depreciate

5.3.2   Liability Driven

- Choosing a manager for a liability-driven fixed income portfolio will be dependent upon **nature of underlying fund** and its investment objective

- **Cash matching** aims to construct a bond portfolio so that expected cash outflows can be matched by cash inflows from coupon and principal payments

- An **immunisation strategy** can also be employed, matching the duration of assets and liabilities. In doing so, a target rate of return can be achieved, regardless of bond prices or interest rate variations

5.4   Asset Allocation Management Styles

- Asset allocation is performed using SAA, TAA or some other form of advanced asset allocation strategy

- Next, securities are selected for each identified asset class

- Choice of asset allocation strategy is determined by many factors, including:
  - ➢ Financial goals
  - ➢ Tax concerns
  - ➢ Investment horizon
  - ➢ Life-stage
  - ➢ Return expectation
  - ➢ Risk tolerance levels

6.   PERFORMANCE MEASUREMENT AND EVALUATION

6.1   What is Performance Measurement?

- The measurement of returns over a given **time period** for a given **level of risk**

- **Reasons for measuring performance** include:
  - ➤ Indicates a fund's success in achieving stated investment strategy
  - ➤ Monitors outcome of investment management decisions
  - ➤ Improves future investment management process
  - ➤ Ability to manage fund's financial position (assets vs liabilities)
  - ➤ Rebalancing portfolio to benchmark
  - ➤ Reporting to investors, trustees, management, research houses and regulators

- Past performance is not indicative of future performance and should be considered carefully

6.2   Qualitative Analysis

- Deals with people and organisation **backing the investment manager**

- Adviser groups generally outsource qualitative analysis to an external research house or asset consultant

- **Qualitative analysis criteria include**:
  - ➤ Ownership and capital structure
  - ➤ Staff and organisational strength
  - ➤ Investment philosophy and style
  - ➤ Asset allocation process (if applicable)
  - ➤ Risk control and compliance
  - ➤ Custody of assets
  - ➤ Reporting
  - ➤ Charges
  - ➤ Support services

- By reviewing the manager's qualitative factors, justifiable reasons for performance can be found

6.3   Quantitative Analysis

- Techniques usually focus on **past performance** and/or on actual portfolio holdings

- Qualitative findings are expected to be reflected in quantitative results

- **When assessing past performance**, researchers will look at:
  - ➤ Annual performance relative to market cycles/conditions
  - ➤ Annualised performance over 5 and 10 years to see if it reflects investment style

- ➢ Comparison of performance with **benchmark and peers**
- ➢ Attribution analysis: analysing performance across market timing, stock selection and interaction
- For an **equity portfolio**, the following should be reviewed:
- ➢ Stock fundamentals, including dividend yield and P/E ratio
- ➢ Tracking error
- ➢ Sector tilts and spread towards large vs small cap stocks

6.3.1 Peer Group Comparisons

- Managers measure their performance relative to that of their competitors
- Tables are produced showing the rankings of investment managers in the comparison universe
- **Disadvantages of using peer group comparisons** include:
  - ➢ Investment objectives may differ among managers
  - ➢ There may not be enough competitors to compare with when a new fund is introduced
  - ➢ New funds cannot be included due to lack of performance history
  - ➢ Surveys are only monthly or quarterly – not current
  - ➢ Performance is historical and may not be maintained in the future

6.3.2 Index Benchmarks

- Index benchmarks are commonly used to monitor performance
- The index selected must be **representative of the fund's investment objectives** with particular regard to the type and weight of securities the fund is permitted to hold
- The index must be **widely available**
- Active fund managers can use indices to judge performance by:
  - ➢ Taking the neutral asset allocation on the performance benchmark
  - ➢ Calculating the neutral asset allocation according to the relevant market index; and
  - ➢ Comparing the actual return to the benchmark
- The following are **disadvantages of using an index** to judge performance:
  - ➢ The assumption that the fund's risk is the same as the index's
  - ➢ Index may not be representative of the fund's investment objectives
  - ➢ There may not be an index for a new type of fund
  - ➢ Time period for comparison should be meaningful – a number of years
  - ➢ Managers may be tempted to exactly mirror the index
  - ➢ Historical data cannot indicate future performance

6.3.3　Risk Adjusted Performance Measures

- Fund performance can be more precisely measured using risk-adjusted measures which are consistent with modern financial theories

- Risk-adjusted measures consider both return and risk of a portfolio

- Risk-adjusted measures include:

  ➢ Sharpe ratio

  ➢ Treynor index

  ➢ Jensen's alpha

- The higher the measures, the better the fund performance

<u>Sharpe Ratio</u>

- The Sharpe ratio is derived directly from the Capital Market Line (CML), which shows the relationship between portfolio risk and portfolio return

- A portfolio lying on the CML will have an expected return equal to the risk-free rate plus the risk of the portfolio multiplied by the slope

- The Sharpe ratio measures the excess returns of a portfolio divided by the portfolio standard deviation, as shown below:

$$SR_p \ = \ (R_p - R_f)/\sigma_p$$

Where:

SR_p　=　Sharpe ratio for a portfolio

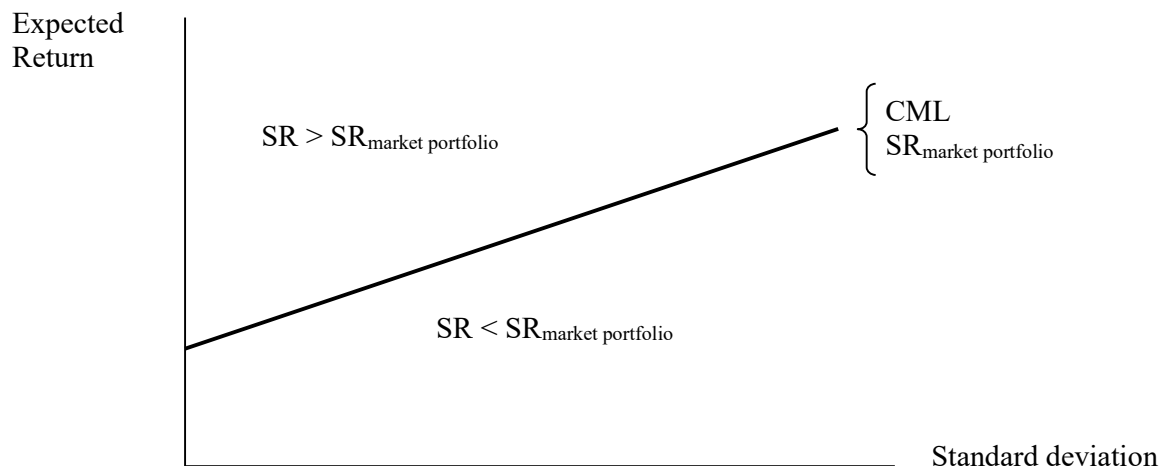R_p　=　portfolio return

R_f　=　risk-free return

σ_p　=　portfolio standard deviation

- A portfolio with a Sharpe ratio greater than the Sharpe ratio of the market portfolio is said to have beaten the market and will lie above the CML

- A portfolio with a Sharpe ratio less than the Sharpe ratio of the market portfolio is said to have underperformed the market and will lie below the CML

Sharpe Ratio - Example

From the following information:

1. Calculate the Sharpe ratio for each portfolio

2. Identify any portfolio that outperformed the market portfolio

Asset	Return	Std Dev
Risk free asset	0.0700	
Market portfolio	0.1977	0.31
Fund manager A	0.1400	0.17
Fund manager B	0.1600	0.17
Fund manager C	0.1800	0.28

Solution

1. Sharpe Ratio Calculations

Asset	Sharpe Ratio Calculation
Market portfolio	(0.1977 – 0.0700)/0.31 = 0.412
Fund manager A	(0.1400 – 0.0700)/0.17 = 0.412
Fund manager B	(0.1600 – 0.0700)/0.17 = 0.529
Fund manager C	(0.1800 – 0.0700)/0.28 = 0.393

2. Interpretation of Sharpe Ratios

-   Portfolio A has achieved the same performance as the market portfolio and lies on the Capital Market Line

-   **Portfolio B has outperformed the market portfolio** and lies above the Capital Market Line

-   Portfolio C has underperformed the market portfolio and lies below the Capital Market Line

<u>Treynor Index</u>

- The Treynor index is derived directly from the Security Market Line (SML), which shows the relationship between expected return of an investment and its systematic risk

- The Treynor index for the market portfolio is the market risk premium ($R_p - R_f$)

- A portfolio with a Treynor index greater than the market will lie above the SML

- A portfolio with a Treynor index less than the market will lie below the SML

- The portfolio with the highest Treynor index will be preferred as it will provide the best risk-adjusted performance

- The Treynor index measures the excess returns of a portfolio divided by the portfolio systematic risk, as measured by beta and shown below:

$$TI_p \; = \; (R_p - R_f)/\beta_p$$

Where:

TI_p = Treynor index for a portfolio

R_p = portfolio return

R_f = risk-free return

β_p = portfolio beta

Treynor Index - Example

From the following information:

1. Calculate the Treynor index for each portfolio
2. Identify any portfolio that outperformed the market portfolio

Asset	Return	Std Dev	Beta (β)
Risk free asset	0.0700		
Market portfolio	0.1977	0.31	1
Fund manager A	0.1400	0.17	1.1
Fund manager B	0.1600	0.17	0.9
Fund manager C	0.1800	0.28	0.8

Solution

1. Treynor Index Calculations

Asset	Treynor Index Calculation
Market portfolio	(0.1977 – 0.0700)/1.0 = 0.1277
Fund manager A	(0.1400 – 0.0700)/1.1 = 0.0636
Fund manager B	(0.1600 – 0.0700)/0.9 = 0.1000
Fund manager C	(0.1800 – 0.0700)/0.8 = 0.1375

2. Interpretation of Treynor Index

- Portfolio A has underperformed the market portfolio and lies below the Security Market Line

- Portfolio B has underperformed the market portfolio and lies below the Security Market Line

- **Portfolio C has outperformed the market portfolio** and lies above the Security Market Line

Jensen's Alpha

- Jensen's alpha is the average return of a portfolio over and above that predicted by CAPM

- Jensen's alpha for the market portfolio is zero

- A portfolio with a positive Jensen's alpha will have outperformed the market

- A portfolio with a negative Jensen's alpha will have underperformed the market

$$\alpha_p = R_p - [R_f + \beta_p \times (R_m - R_f)]$$

Where:

α_p = Jensen's alpha for a portfolio

R_p = portfolio return

R_f = risk-free return

β_p = portfolio beta

R_m = market portfolio return

Jensen's Alpha - Example

From the following information:

1. Calculate the Jensen's alpha for each portfolio
2. Identify any portfolio that outperformed the market portfolio

Asset	Return	Std Dev	Beta (β)
Risk free asset	0.0700		
Market portfolio	0.1977	0.31	1
Fund manager A	0.1400	0.17	1.1
Fund manager B	0.1600	0.17	0.9
Fund manager C	0.1800	0.28	0.8

Solution

1. Jensen's Alpha Calculations

Asset	Jensen's Alpha Calculation
Market portfolio	$0.1977 - 0.07 + 1(0.1977 - 0.07) = 0$
Fund manager A	$0.1400 - 0.07 + 1.1(0.1977 - 0.07) = -0.0705$
Fund manager B	$0.1600 - 0.07 + 0.9(0.1977 - 0.07) = -0.0249$
Fund manager C	$0.1800 - 0.07 + 0.8(0.1977 - 0.07) = 0.0078$

2. Interpretation of Jensen's Alphas

- Portfolio A has underperformed the market portfolio and lies below the Security Market Line

- Portfolio B has underperformed the market portfolio and lies below the Security Market Line

- **Portfolio C has outperformed the market portfolio** and lies above the Security Market Line

Tracking Error

- Performance of asset allocation managers can be measured by the **consistency of outperformance** in each period

- **Tracking error measures such consistency** by computing the volatility or dispersion of alphas

- Tracking error is a **popular performance indicator** among asset managers

Information Ratio

- Information ratio reflects an asset manager's ability in making profitable bets – the higher the better

- Defined as the ratio of alpha to tracking error, which is a measure of unsystematic risk

Annualised Information Ratio

= $12^{\frac{1}{2}}$ x (Average Monthly Alpha/Monthly Tracking Error)

Information Ratio - Example

For a particular portfolio, the average monthly alpha is 0.052 and the monthly tracking error is 0.163. What is the annualised information ratio?

Solution

Annualised information ratio   = $12^{\frac{1}{2}}$ x (0.052/0.163)

= 1.105

6.4   Attribution Analysis

- To monitor portfolio performance, attribution analysis identifies performance attributable to each set of **active decisions**

- **Performance** is broken down into **three components**:

  - ➢ Tactical asset allocation decisions

  - ➢ Sector (industry) selection decisions within each asset class

  - ➢ Security selection decisions within each sector

Performance Attribution
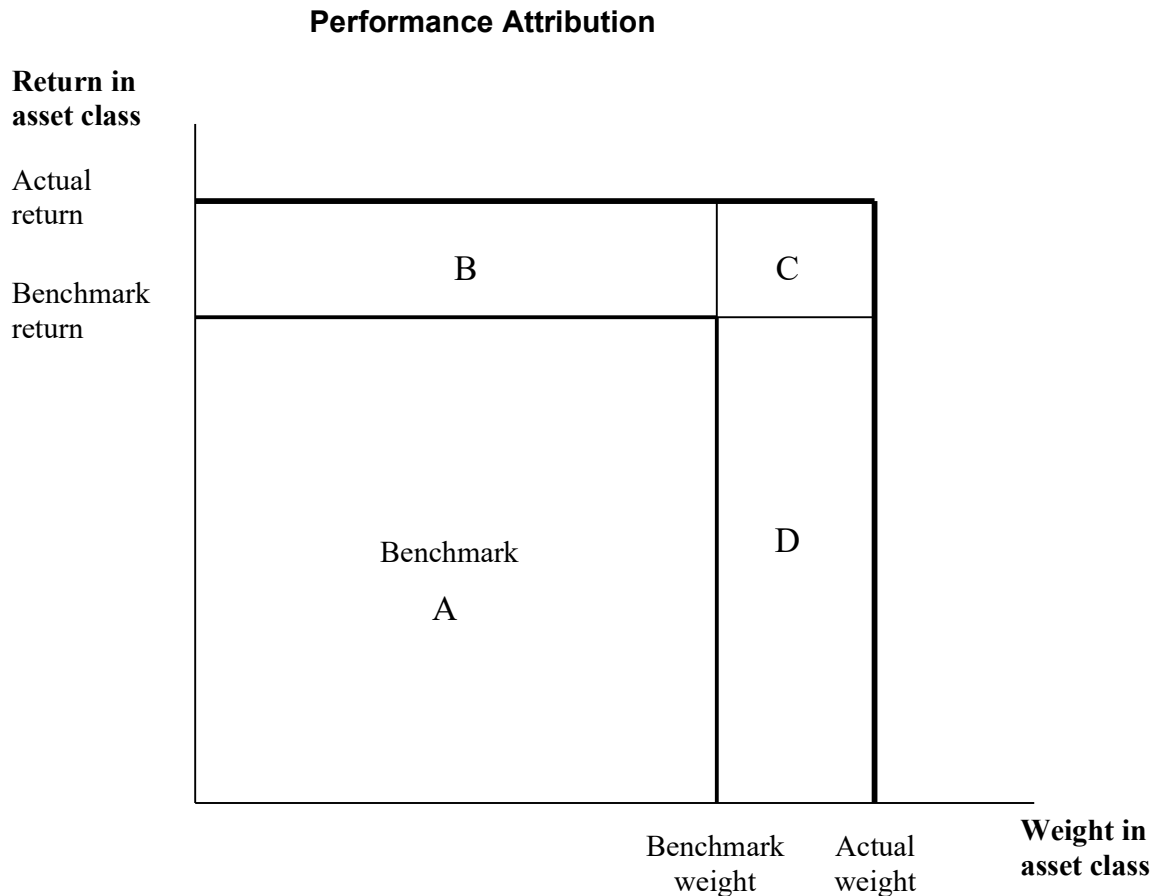
- **Actual total return** is the area A + B + C + D

- **Outperformance** is the difference between actual total return and the benchmark return: B + C + D

- The contribution from **sector and security selection** is the area B

- The contribution from **tactical asset allocation** is the area D

- Area C is attributable to both components, however usually included under **sector and security selection**

- While attribution analysis helps measure the effect of an active manager's decisions, **SAA** is generally the greatest influence on a portfolio's risk and return characteristics

Attribution Analysis - Example

From the following information, calculate:

1. Portfolio excess return
2. Tactical asset allocation (TAA) contribution
3. Sector and security selection contribution

	Benchmark		**Portfolio**	
	Weight	Return	Weight	Return
Stock	0.6	5.81%	0.70	7.28%
Bond	0.3	1.45%	0.07	1.89%
Cash	0.1	0.48%	0.23	0.48%

Solution

1. <u>Portfolio excess return</u>

Benchmark return	= (0.6 x 5.81%) + (0.3 x 1.45%) + (0.1 x 0.48%)
	= 3.97%
Portfolio return	= (0.70 x 7.28%) + (0.07 x 1.89%) + (0.23 x 0.48%)
	= 5.34%
Portfolio excess return	= 5.34% - 3.97%
	= 1.37%

2. <u>TAA Contribution</u>

Contribution	= [(0.7 – 0.6) x 5.81%] + [(0.07 – 0.3) x 1.45%]
	+ [(0.23 – 0.1) x 0.48%]
	= 0.31%

3. <u>Sector and Security Selection Contribution</u>

Contribution	= 0.7 x (7.28% - 5.81%) + 0.07 x (1.89% - 1.45%)
	+ 0.23 x (0.48% - 0.48%)
	= 1.06%

7. REVIEWING AND MONITORING THE INVESTMENT MANAGEMENT PROCESS

- As well as quantitative performance, the analytical process should answer the following questions:

  - Why did the fund underperform/outperform?

  - Is it likely the underperformance/outperformance will continue?

Investment Management Cycle

```
                                                    ┌─────────────────────┐
                                                    │ Define:             │   1. Liquidity
  1. Return requirements ──────────────────────────▶│  • investment       │   2. Investment horizon
  2. Risk tolerance                                  │    objectives       │   3. Tax considerations
                                                     │  • constraints ◀────│   4. Legal restrictions
                                                     └─────────────────────┘   5. Unique preferences
                                                               │                   and needs
                                                               ▼
                                                    ┌─────────────────────┐
  Strategic asset allocation                        │ Set the investment  │   Investment management style
                                                     │ strategy            │
                                                     └─────────────────────┘
                                                               │
                                                               ▼
                                                    ┌─────────────────────┐
  Select manager                                    │ Implement and manage│   Tactical asset allocation
                                                     │ portfolio           │
                                                     └─────────────────────┘
                                                               │
                                                               ▼
                                                    ┌─────────────────────┐
  Performance                                       │ Monitor and review  │   Comparison with benchmarks
                                                     └─────────────────────┘
```

7.1   Feedback Mechanism

- When reviewing investment objectives, two critical questions should be asked:
  - ➢ Based on analysis of the fund's performance, should the investment objectives be changed?
  - ➢ Have the client's objectives changed?
- Significant changes to investment objectives may require adjustment to SAA
- Reviewing the way a portfolio is implemented/managed may involve:
  - ➢ Placing a manager on watch
  - ➢ Switching manager
  - ➢ Retaining a manager but clarifying specifications and expectations
  - ➢ Reviewing TAA process
  - ➢ Taking no action

8.   ROLE OF FUND RESEARCH HOUSE OR RATING AGENCY

- Fund research houses/rating agencies **produce reports on funds and investment managers** to help investors select or monitor fund managers
- Most advising firms do not rely entirely on recommendations made by fund research houses/rating agencies – they will also consider their **own research**
- It is in their best interest for fund managers to work closely with fund research houses/rating agencies to ensure that they are portrayed accurately
- Successful reviews will help maximise fund managers' branding opportunities