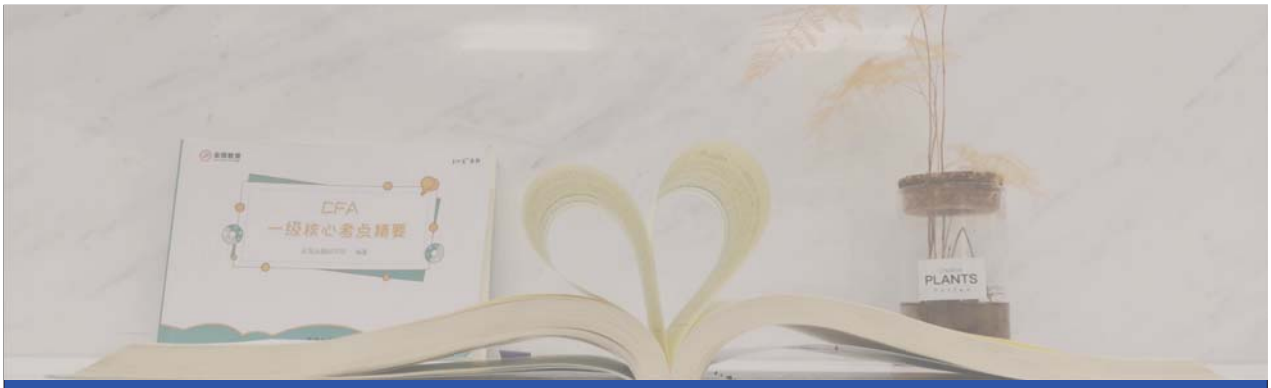



# Portfolio Management

## CFA一级培训项目

讲师：Irene

## 师资介绍

### 1. 基本介绍

**金程教育资深培训师、上海财经大学经济学学士、美国约翰霍普金斯大学金融学硕士、CFA、FRM、ESG investing持证人**

### 2. 工作背景

**多家知名机构内训项目授课，参与出版CFA相关系列丛书教材。本科毕业于上海财经大学，研究生毕业于约翰霍普金斯大学，一次性通过CFA一二三级考试，对于考试重点和应试技巧有自己的心得。**

### 3. 服务客户

**中国工商银行、中国银行、建设银行、农业银行、杭州银行、兴业证券、南京证券、湘财证券、兴业银行、中国人寿、人保资产管理、中国平安、民生银行、华夏基金、中邮基金、富国基金、中国再保险、中国进出口银行等。**

## *Topic Weightings in CFA Level I*

| Topics | Weights (%) |
|---|---|
| Quantitative Methods | 8-12 |
| Economics | 8-12 |
| Financial Statement Analysis | 13-17 |
| Corporate Issuers | 8-12 |
| Equity | 10-12 |
| Fixed Income | 10-12 |
| Derivatives | 5-8 |
| Alternative Investments | 5-8 |
| Portfolio Management | 5-8 |
| Ethical and Professional Standards | 15-20 |

## 课件使用说明

- **强化班知识点说明和使用指南**

| 序号 | 课件元名称（知识点） | 必考 | 高频 | 低频 |
|---|---|---|---|---|
| 1 | Modern Portfolio Theory | **1** | **0** | **0** |
| 2 | CAL & CML | **1** | **0** | **0** |
| 3 | Systematic & Nonsystematic Risk | **1** | **0** | **0** |
| 4 | CAPM and SML | **1** | **0** | **0** |
| 5 | Other Return Generating Models | **0** | **0** | **1** |
| 6 | Performance Evaluation Indicator | **0** | **1** | **0** |

- **必考**知识点指的是近10年考试中考试频率大于等于75%的考点，在强化班中重点讲解，必须掌握；
- **高频**知识点指的是近10年考试中考试频率介于25%到75%的考点，在强化班中重点讲解，必须掌握；
- 低频知识点指的是近10年考试中考试频率小于25%的考点，在基础班中重点讲解，学员可以根据自己的掌握情况在基础班中巩固学习；
- 本学科知识点合计17个，其中必考知识点4个，高频知识点7个，低频知识点6个，掌握必考和高频考点覆盖了近10年93.98%的题目。

# Portfolio Management

1. Portfolio Risk and Return: Part I
2. Portfolio Risk and Return: Part II
3. Portfolio Management: An Overview
4. Basics of Portfolio Planning and Construction
5. The Behavioral Biases of Individuals
6. Introduction to Risk Management

*Framework*

# Module

## Portfolio Risk and Return: Part I

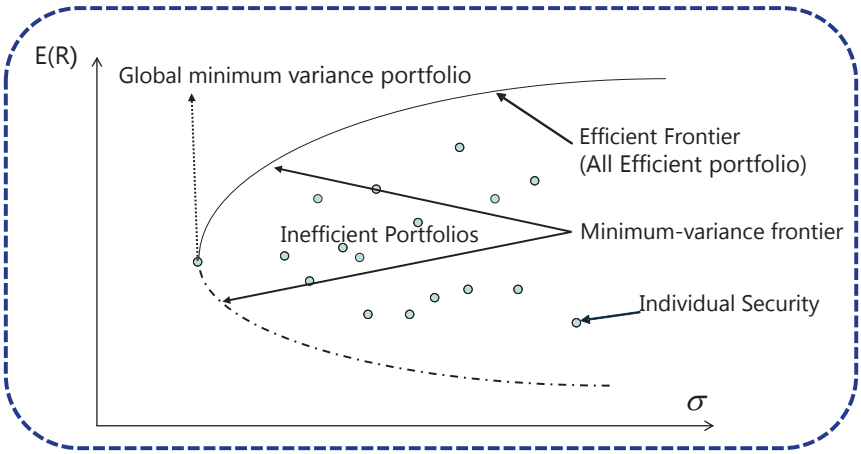
1. Modern Portfolio Theory

# Modern Portfolio Theory

- Modern Portfolio Theory
- Utility Theory

## Modern Portfolio Theory

- **Markowitz efficient frontier**




## Modern Portfolio Theory

- **Minimum variance frontier**
  - **Minimum-variance portfolio** is the portfolio available that has the lowest standard deviation with a given expected return.
  - **Minimum-variance frontier** is the entire collection of minimum-variance portfolios.
- **Global minimum-variance portfolio:** The portfolio with the *minimum variance* among all portfolios of risky assets, which is the *left-most* point on the minimum-variance frontier.
- **Efficient frontier**
  - The curve that *lies above and to the right* of the global minimum-variance portfolio is referred to as the **Markowitz efficient frontier.**
  - Those portfolios that have the greatest expected return with a given level of risk make up the efficient frontier.
  - All portfolios of risky assets that rational, risk-averse investors will choose.
  - **Efficient portfolio**: well-diversified or fully-diversified.

## Utility Theory

- **Utility theory**
  - Assumptions
    - ✓ Investors are risk averse;
    - ✓ They always prefer more to less (greater return to lesser return);
    - ✓ They are able to rank different portfolios in the order of their preference.

## Utility Theory

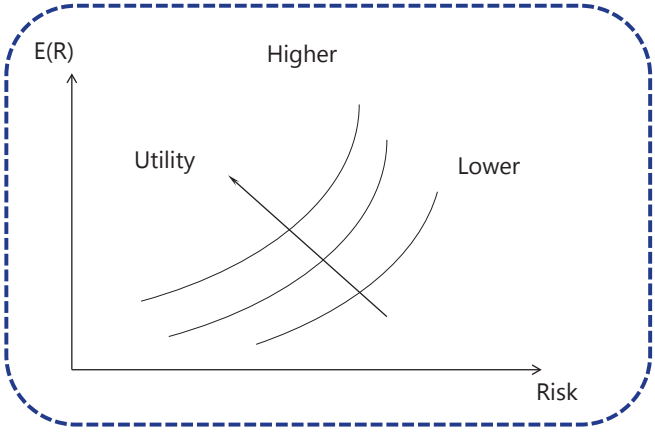
- **Utility function:**

$$U = E(r) - \frac{1}{2} A\sigma^2$$

  - U: the utility of an investment
  - E(r): the expected return
  - $\sigma^2$: the variance of the investment
  - A: a measure of risk aversion, which is measured as the marginal reward that an investor requires to accept additional risk.
    - ✓ A is higher for more risk-averse individuals.
    - ✓ Risk-aversion: A>0
    - ✓ Risk-neutral: A=0
    - ✓ Risk-seeking: A<0

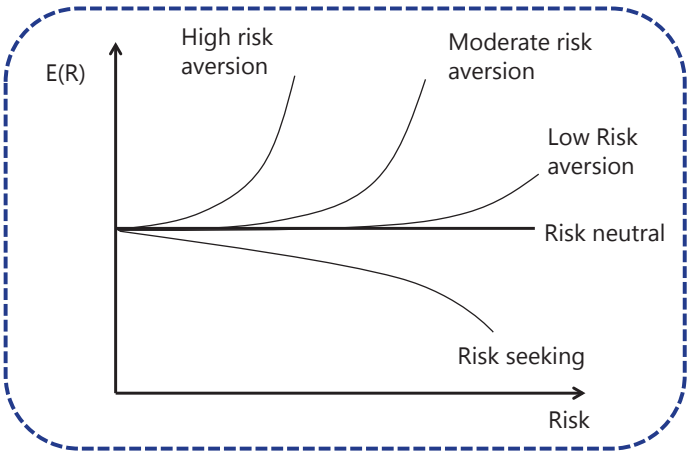
## Utility Theory

- **Indifference curve:** plots combinations of risk (standard deviation) and expected return among which an investor is indifferent.



## Utility Theory

- **Indifference Curve for various types of investors**




# Summary

## Portfolio Risk and Return: Part I

**Modern Portfolio Theory**

Modern Portfolio Theory

Utility Theory

# Module

## Portfolio Risk and Return: Part II

1. CAL, CML
2. Systematic Risk and Non-Systematic Risk
3. CAPM and SML
4. Other Return Generating Model
5. Performance Evaluation Indicators

# CAL & CML

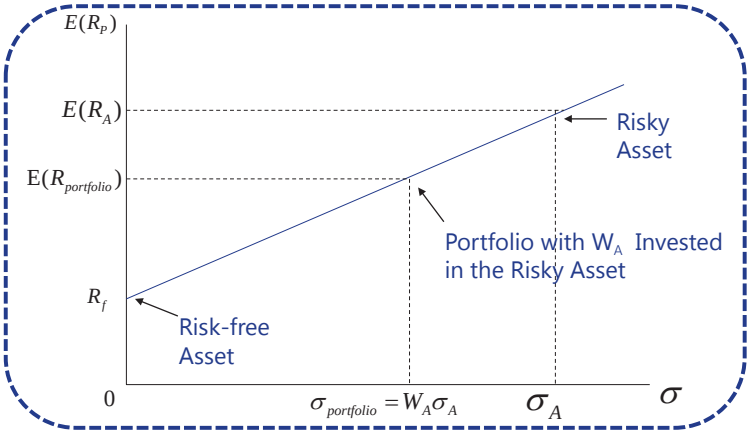
- CAL: Capital Allocation Line
- Optimal CAL
- Portfolio Selection
- Capital Market Theory
- CML: Capital Market Line

## CAL: Capital Allocation Line

- If a risky asset is combined with a risk free asset, the relationship between the portfolio risk and return **is linear.**

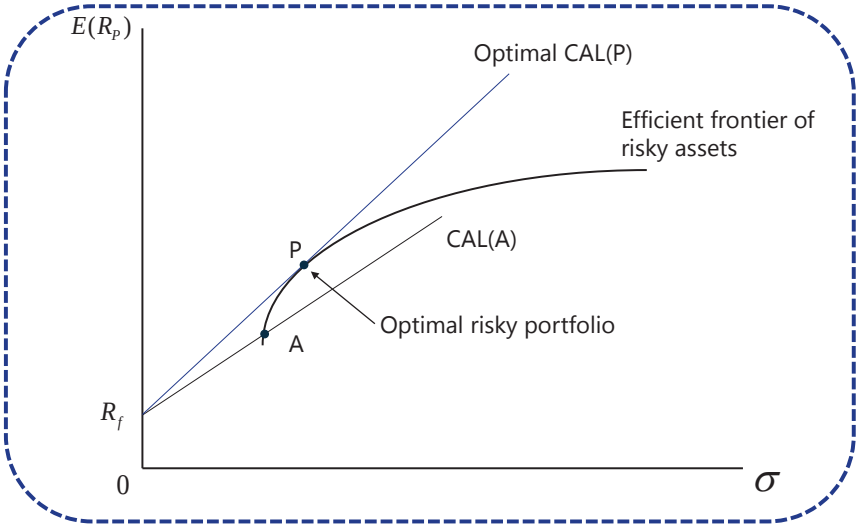
$$E(R_P) = W_A E(R_A) + W_B E(R_B)$$

$$\sigma_P = \sqrt{W_A^2\sigma_A^2 + W_B^2\sigma_B^2 + 2W_A W_B \rho_{AB}\sigma_A\sigma_B} = W_A\sigma_A$$




## Optimal CAL

- **Optimal risky portfolio**

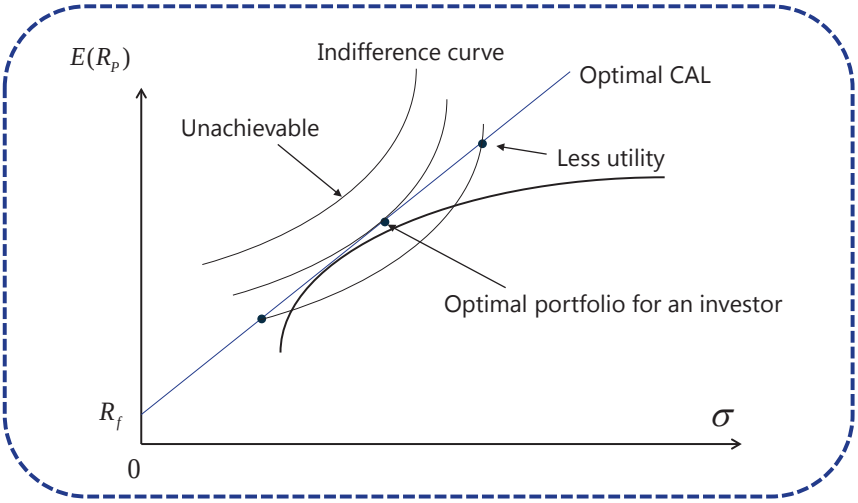


## Optimal CAL

- **Optimal CAL**
  - The optimal capital allocation line connects the risk-free assets and **the optimal risky asset portfolio**.
  - The optimal risky portfolio is at the tangent of CAL and the efficient frontier of risky assets.
- **Two-fund separation theorem**
  - All investors will hold a combination of two portfolios or funds: **a risk-free asset** and **an optimal portfolio of risky assets**.

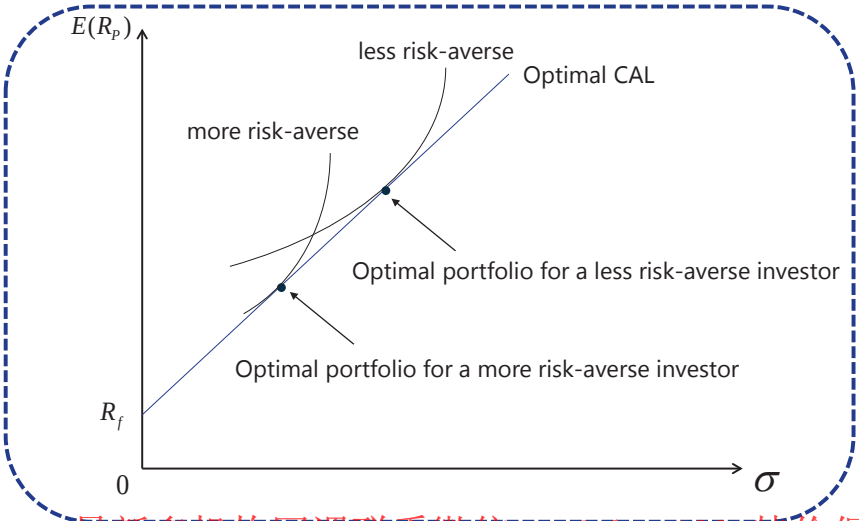
## Portfolio Selection

- **Optimal portfolio for an investor**



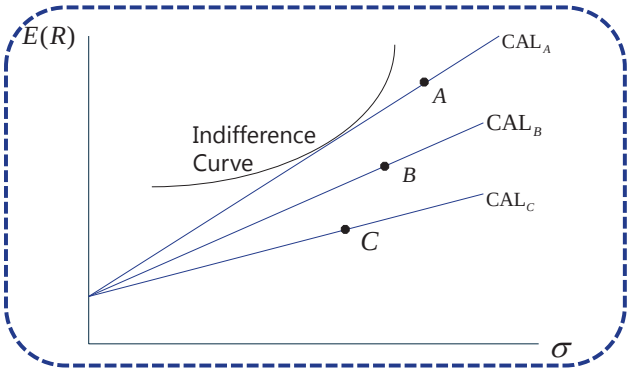

## Portfolio Selection

- **Optimal portfolio for different types of investors**



## Capital Market Theory

- Risky portfolios and their associated capital allocation lines for different investors.




- If each investor has *different expectations* about the expected returns of, standard deviations of, or correlations between risky asset returns, each investor will have a *different optimal risky asset portfolio* and a different CAL.

## CML: Capital Market Line

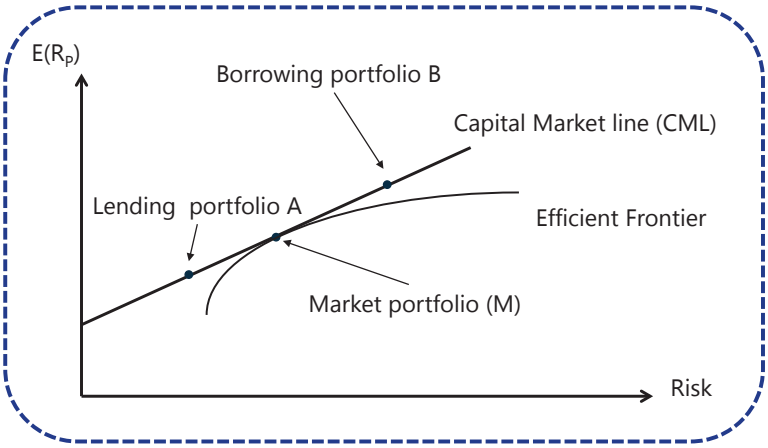
- **Capital market line (CML): homogeneity of expectations**
  - Difference between the CML and the CAL.
  - **Market Portfolio**
    - ✓ Is the **tangent point** where the CML & efficient frontier.
    - ✓ Consists of every **risky assets**.
    - ✓ The **weights** on each asset are equal to the percentage of the **market value** of the asset to the market value of the entire market portfolio.
  - Formula

$$E(R_P) = R_F + \frac{E(R_M) - R_F}{\sigma_M}\sigma_P$$

  - Passive investment strategy

## CML: Capital Market Line

- **Borrowing portfolio and lending portfolio**
  - If $\sigma_p > \sigma_m$, borrow money at risk free rate and invest the proceed in market portfolio.
  - If $\sigma_p < \sigma_m$, sell a portion of market portfolio and deposit the proceed in bank.



Example

## CML: Capital Market Line

- The capital market line, CML, is the graph of the risk and return of portfolio combinations consisting of the risk-free asset and:
  A. Any risky portfolio.
  B. The market portfolio.
  C. The leveraged portfolio.

- **Solution: B.**

## Summary

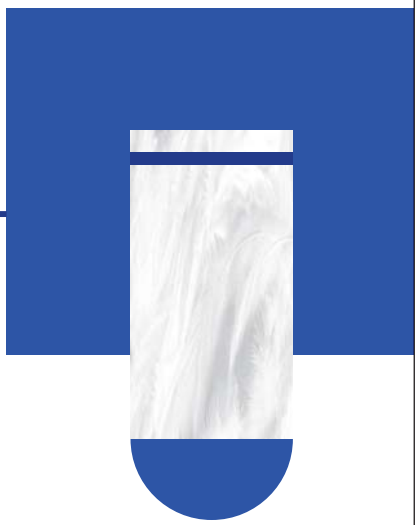
### Portfolio Risk and Return: Part II

**CAL, CML**

CAL: Capital Allocation Line
Optimal CAL
Portfolio Selection
Capital Market Theory
CML: Capital Market Line

## Systematic and Nonsystematic Risk

- Nonsystematic risk
- Systematic risk
- Security Characteristic Line



## Systematic and Nonsystematic Risk

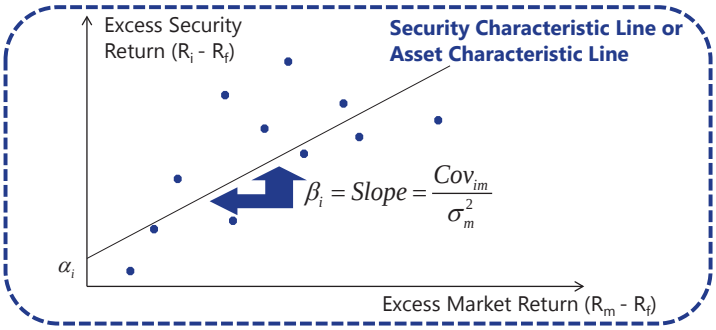
- **Nonsystematic risk (or idiosyncratic, diversifiable, company-specific risk):**
  - Nonsystematic risk is local or limited to a particular asset or industry.
  - The risk that disappears in the portfolio construction process.
- **Systematic risk (or non-diversifiable, market risk):**
  - The risk that cannot be diversified away.
  - Total variance = systematic variance + nonsystematic variance, or
  - Total risk = systematic risk + nonsystematic risk
- **Since nonsystematic risk can be eliminated through diversification, only systematic risk is compensated.**

## Security Characteristic Line

- **Beta:** a measure of how sensitive an asset's return is to the market as a whole. A standardized measure of systematic risk.

$$\beta_i = \frac{Cov_{i,mkt}}{\sigma^2_{mkt}} = (\frac{\sigma_i}{\sigma_{mkt}}) \times \rho_{i,mkt}$$

- **Estimation of Beta with Security Characteristic Line**(regression of excess security returns with excess market returns).




# Summary

## Portfolio Risk and Return: Part II

**Systematic Risk and Non-Systematic Risk**

Nonsystematic risk

Systematic risk

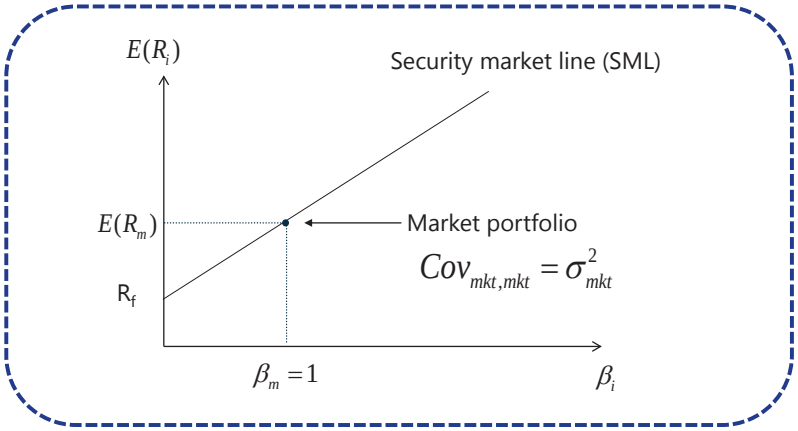
Security Characteristic Line

# CAPM and SML

- SML: Security Market Line
- Application of CAPM
- SML vs. CML

## SML: Security Market Line

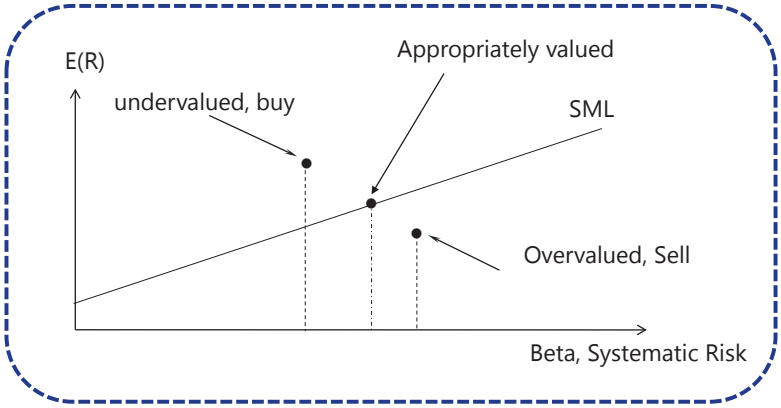
- **Security market line (SML):** Graphical representation of CAPM.




- **The Equation of SML:** $E(R_i) = R_f + \beta_i[E(R_m) - R_f]$

## Application of CAPM

- **How to judge if a stock is properly valued**



## SML vs. CML

- **Differences between the SML and the CML**

| | SML | CML |
|---|---|---|
| Measure of risk | Uses systematic risk (non-diversifiable risk) | Uses standard deviation (total risk) |
| Application | Tool used to determine the appropriate expected (benchmark) returns for securities | Tool used to determine the appropriate asset allocation (percentages allocated to the risk-free asset and to the market portfolio) for the investor |
| Definition | Graph of the capital asset pricing model | Graph of all the combinations of the risk-free asset and the market portfolio |
| Slope | Market risk premium | Market portfolio Sharpe ratio |

## Summary

### Portfolio Risk and Return: Part II

**CAPM and SML**

Assumptions of the CAPM

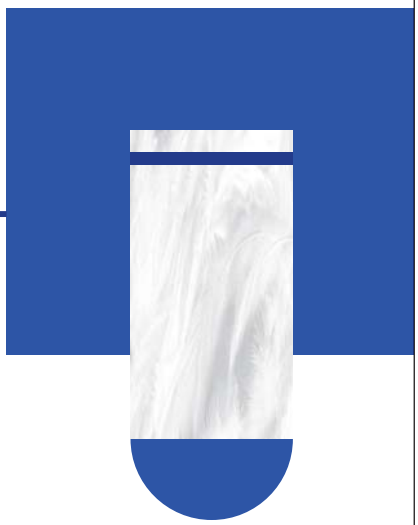
SML: Security Market Line

Application of CAPM

SML vs. CML

## Performance Evaluation Indicators

- Sharpe ratio
- $M^2$ alpha
- Treynor Ratio
- Jensen's Alpha



## Performance Evaluation Indicators

- **Comparisons**

| Ratio | Sharpe Ratio | Treynor Ratio | $M^2$ alpha | Jensen's Alpha |
|---|---|---|---|---|
| **Definition** | The excess return for each unit of total risk. | The excess return for each unit of systematic risk | The difference between $E(R_{p'})$ and the market return $R_m$ under same total risk | The difference between the actual portfolio return and the calculated risk-adjusted return |
| **Risk** | Total risk | Systematic risk(β) | Total risk | Systematic risk(β) |
| **Formula** | $[E(R_p)-R_f)]/\sigma_p$ | $[E(R_p)-R_f)]/\beta_p$ | $[E(R_p)-R_f]\sigma_m/\sigma_p-(R_m-R_f)$ | $\alpha_p[\widehat{ex\ ante}] = E(R_P) - \{R_f + \widehat{\beta_p}[E(R_m) - R_f]\}$ |
| **Application** | Not fully diversified | Well-diversified | Not fully diversified | Well-diversified |
| **Evaluation** | Indirect (compared with another) | Indirect (compared with another) | Direct(>0,=0,<0) | Direct (>0,=0,<0) |

## Example

## Performance Evaluation Indicators

- Which of these return metrics is defined as excess return per unit of systematic risk?

  A. Sharpe ratio.

  B. Jensen's alpha.

  C. Treynor measure.

- **Solution: C.**

  The Treynor measure is excess return (return in excess of the risk-free rate) per unit of systematic risk (beta). The Sharpe ratio is excess return per unit of total risk (portfolio standard deviation). Jensen's alpha is the difference between a portfolio's actual rate of return and the equilibrium rate of return for a portfolio with the same level of beta (systematic) risk.

# Summary

## Portfolio Risk and Return: Part II

**Performance Evaluation Indicators**

Sharpe ratio

$M^2$ alpha

Treynor Ratio

Jensen's Alpha

# Summary

## Module: Portfolio Risk and Return: Part II

**CAL, CML**
**Systematic Risk and Non-Systematic Risk**
**CAPM and SML**
**Performance Evaluation Indicators**

# Module

## Portfolio Management: An Overview

1. Portfolio Perspective
2. Portfolio Management Process
3. Types of Investors and Pooled Investment Products

## Types of Investors and Pooled Investment Products

- Characteristics of Different Types of Investors

## Characteristics of Different Types of Investors

- **Characteristics of different types of investors**

| Investor | Time Horizon | Risk Tolerance | Liquidity Needs | Income Needs |
|---|---|---|---|---|
| Individuals | Varies by individual | Varies by individual | Varies by individual | Varies by individual |
| **DB plan** | Long | High | Quite low | High for mature funds; Low for growing funds |
| **Banks** | Short | Quite low | High | Pay interest and operational expenses |
| **Endowments and Foundations** | Very long | High | Quite low | Meet spending commitments |
| **Insurance** | Long - life Short - P&C | Quite low | High | Low |
| Mutual funds | Varies by fund | Varies by fund | High | Varies by fund |
| Sovereign wealth funds | Varies by fund | Varies by fund | Varies by fund | Varies by fund |

## Summary

### Module：Portfolio Management: An Overview

**Types of Investors and Pooled Investment Products**

Characteristics of Different Types of Investors

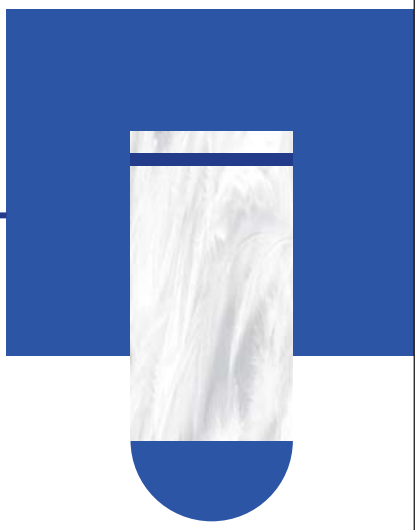
# Module

## Basics of Portfolio Planning and Construction

1. Components of IPS, Risk and Return
2. Investment Constrains, Asset Allocation, ESG

# Components of IPS, Risk and Return

- Investment Policy Statement
- Risk Objective
- Return Objective



## Investment Policy Statement

- **The need for a policy statement**
  - Understand and articulate realistic investor's goals, needs and risk tolerance;
  - Ensure that goals are realistic;
  - Provide an objective measure of portfolio performance.
- **Major components of IPS**
  - Introduction;
  - Statement of purpose;
  - Statement of duties and responsibilities;
  - Procedures: the steps taken to keep the IPS updated in a timely manner and respond to various situations;
  - Investment objectives;
  - Investment constraints;
  - Investment guidelines;
  - Evaluation and Review;
  - **Appendices**: (A) Strategic Asset Allocation, (B) Rebalancing Policy.

## Risk Objective

- **Investment objectives: risk and return**
- **Risk objective**
  - The risk objective limits how high the investor can set the return objective
  - Risk measurement:
    - ✓ Absolute: variance or standard deviation
    - ✓ Relative: relate risk relative to one or more benchmarks perceived to represent appropriate risk standards (tracking risk),
    - ✓ Downside risk: VaR
  - Risk tolerance: willingness and ability

| | **Ability to bear risk** | |
|---|---|---|
| **Willingness to take risk** | Below average | Above average |
| Below average | **Below-average risk tolerance** | **Resolution needed** |
| Above average | **Resolution needed** | **Above-average risk tolerance** |

## Return Objective

- **Return objectives: absolute or relative basis**
  - **Return measurement**
    - ✓ **Absolute basis**
      - percentage rate of return: total return(balance between capital gains and income), inflation-adjusted return(real).
    - ✓ **Relative basis**
      - Relative to a benchmark return: Some institutions also set their return objective relative to a peer group or universe of managers.
  - Stated return desire vs. Required return
  - Consistent with risk objective

# Summary

## Basics of Portfolio Planning and Construction

**Components of IPS, Risk and Return**

Investment Policy Statement

Risk Objective

Return Objective

## Investment constrains, asset allocation, ESG

- Investment Constraints
- Strategic Asset Allocation
- Active Portfolio Management

## Investment Constraints

- **Investment constraints**
  - **Liquidity**—for cash spending needs (anticipated or unexpected).
  - **Time horizon**—the time between making an investment and needing the funds.
  - **Tax concerns**—the tax treatments of various accounts, and the investor's marginal tax bracket.
  - **Legal and regulatory factors**—restrictions on investments in retirement, personal, and trust accounts.
  - **Unique circumstances**—investor preferences or other factors which has not been considered before.
    - ✓ E.g. religions, ethical behavior, ESG consideration.

## Strategic Asset Allocation

| Asset Class | Target |
|---|---|
| Cash | 0% |
| U.S. large-cap equity | 12% |
| U.S. small-/mid-cap equity | 6% |
| International (developed) equity | 12% |
| Emerging market equity | 6% |
| U.S. bonds | 18% |
| Global bonds | 8% |
| High –yield bonds | 5% |
| Emerging market debt | 3% |
| Inflation-protected bonds | 3% |
| Real estate | 5% |
| Hedge funds | 5% |
| Private equity | 2% |
| Commodities | 0% |
| Tactical asset allocation and other | 15% |
| TOTAL | 100% |

- **Strategic asset allocation:**
  - The set of exposures to IPS-permissible asset classes that is expected to achieve the client's **long-term objectives** given the client's investment constrains.
  - Correlations within the class is **higher** than correlations between asset classes.

## Active Portfolio Management

- **Active portfolio management**
  - **Tactical asset allocation** is the decision to **deliberately deviate** from the policy exposures to systematic risk factors with the intent to add value based on forecasts of the **near-term returns** of those asset classes.
    - ✓ The manager's ability to identify shot-term opportunities in specific asset classes;
    - ✓ The existence of such short-term opportunities.
  - **Security selection** is an attempt to generate higher returns than the asset class benchmark by **selecting securities with a higher expected return**.
    - ✓ The manager's skill;
    - ✓ The opportunities within a particular asset class.

# Summary

## Basics of Portfolio Planning and Construction

**Investment Constrains, Asset Allocation, ESG**

Investment Constraints
Strategic Asset Allocation
Active Portfolio Management

# Summary

## Module: Basics of Portfolio Planning and Construction

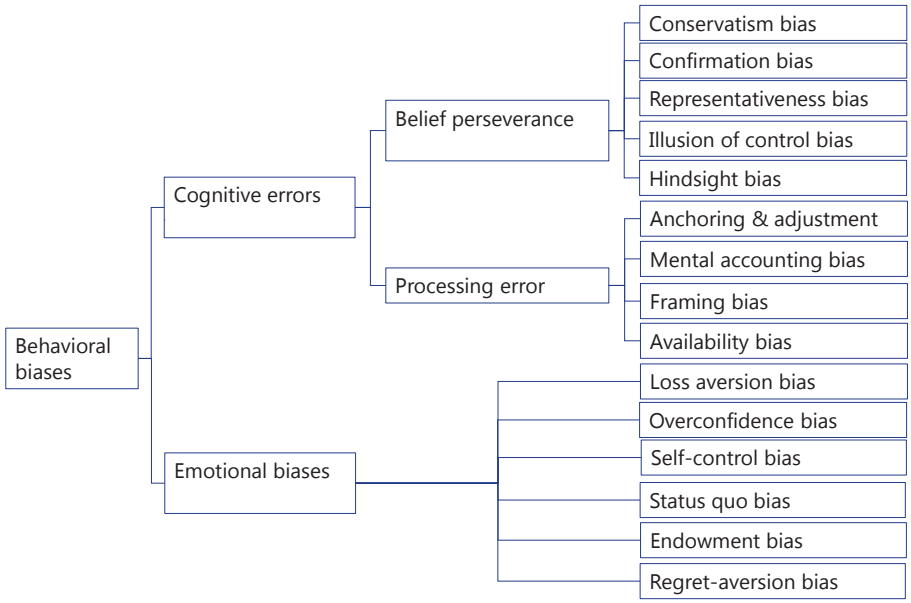
**Components of IPS, Risk and Return**
**Investment Constrains, Asset Allocation, ESG**

# Module

## The Behavioral Biases of Individuals

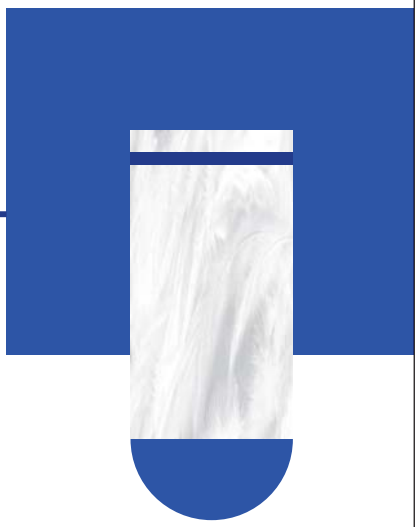
1. Basics of Behavioral Finance
2. Cognitive Errors
3. Emotional Biases
4. Anomalies

## Basics of Behavioral Finance




## Cognitive Errors

- Belief Perseverance Biases
- Processing Errors



## Belief Perseverance Biases

- **Conservatism bias** occurs when people maintain their *prior views* or forecasts by *inadequately incorporating new, conflicting information*.
  - **Consequences:**
    - ✓ Maintain or be slow to update a view or a forecast, even when presented with new information;
    - ✓ Maintain a prior belief rather than deal with the mental stress of updating beliefs given complex data. This behavior relates to an underlying difficulty in processing new information.
  - **Detection of and Guidance for Overcoming:**
    - ✓ Properly analyzing and weighting new information.

## Belief Perseverance Biases

- **Confirmation bias** refers to the tendency to look for and notice what *confirms prior beliefs* and to *ignore or undervalue whatever contradicts* them.
  - **Consequences:**
    - ✓ Consider only the positive information while ignoring any negative information;
    - ✓ Develop screening criteria while ignoring information that either refutes the validity of the criteria or supports other criteria;
    - ✓ Inadequately diversify (under-diversified) portfolios;
    - ✓ Hold a disproportionate amount of their investment assets in investors' employing company's stock, with convinced favorable prospects;
  - **Detection of and Guidance for Overcoming:**
    - ✓ actively seeking out information that challenges existing beliefs;
    - ✓ Corroborate an investment decision with research from another perspective or source.

## Belief Perseverance Biases

- **Representativeness bias** refers to the tendency to *classify new information based on past experiences and classifications*, e.g., halo effect.
  - **Consequences:**
    - ✓ Base-rate neglect;
    - ✓ Sample-size neglect.
  - **Detection of and Guidance for Overcoming:**
    - ✓ Adopt a view or a forecast based almost exclusively on individual, specific information or a small sample;
    - ✓ Update beliefs using simple classifications rather than deal with the mental stress of updating beliefs given the high cognitive costs of complex data.

## Belief Perseverance Biases

- **Illusion of control** refers when people tend to believe that they can control or influence outcomes when, in fact, they cannot.
  - **Consequences:**
    - ✓ Inadequately diversify (under-diversified) portfolios;
    - ✓ Trade more than is prudent;
    - ✓ Construct financial models and forecasts that are overly detailed.
  - **Detection of and Guidance for Overcoming:**
    - ✓ Recognize an investment as a probabilistic activity;
    - ✓ Seek contrary viewpoints and keep record.

## Belief Perseverance Biases

- **Hindsight bias** refers to believing past events as having been predictable and reasonable to expect.
  - **Consequences:**
    - ✓ Overestimate the degree to which they correctly predicted an investment outcome, or the predictability of an outcome generally;
    - ✓ Unfairly assess money manager or security performance.
  - **Detection of and Guidance for Overcoming:**
    - ✓ Carefully record their investment decisions and key reasons for making those decisions in writing at or around the time the decision is made.

## Processing Errors

- **Framing bias** occurs when person answers a question differently based on the way in which it is asked or framed.
  - **Consequences:**
    - ✓ Misidentify risk tolerances because of how questions about risk tolerance were framed, becoming more risk-averse when presented with a gain frame of reference and more risk-seeking when presented with a loss frame of reference.
    - ✓ Focus on short-term price fluctuations, which may result in long-run considerations being ignored in the decision-making process.
  - **Detection of and Guidance for Overcoming:**
    - ✓ Asking such questions as, "Is the decision the result of focusing on a net gain or net loss position?"

## Processing Errors

- **Anchoring and adjustment bias** refers to relying on an initial piece of information to make subsequent estimates, judgments, and decisions.
  - **Consequences:**
    - ✓ FMPs may stick too closely to their original estimates when learning new information with both downside adjustments and upside adjustments.
  - **Detection of and Guidance for Overcoming:**
    - ✓ The primary action FMPs can take is consciously asking questions that may reveal an anchoring and adjustment bias, e.g., "Am I holding onto this stock based on rational analysis or am I trying to attain a price that I am anchored to, such as the purchase price or a high-water mark?".

## Processing Errors

- **Mental accounting bias** refers to mentally dividing money into "accounts" that influence decisions, even though money is fungible.
  - **Consequences:**
    - ✓ Neglect opportunities to reduce risk by combining assets with low correlations;
    - ✓ Irrationally distinguish between returns derived from income and those derived from capital appreciation;
    - ✓ Irrationally divide wealth or a portfolio into investment principal and investment returns.
  - **Detection of and Guidance for Overcoming:**
    - ✓ Recognize its drawbacks and focus on total returns. For example, FMPs should go through the exercise of *combining all* of their assets *onto one spreadsheet* (without headings or account labels) to see the holistic asset allocation.

## Processing Errors

- **Availability bias** occurs when people estimate the probability of an outcome or the importance of a phenomenon based on how easily information is recalled**.**
  - **Consequences:**
    - ✓ Limit their investment opportunity set;
    - ✓ Choose an investment, investment adviser, or mutual fund based on advertising or the quantity of news coverage;
    - ✓ Fail to diversify.
  - **Detection of and Guidance for Overcoming:**
    - ✓ Develop an appropriate investment policy strategy, e.g., carefully research and analyze investment decisions before making them, and focus on long-term historical data.

# Summary

## The Behavioral Biases of Individuals

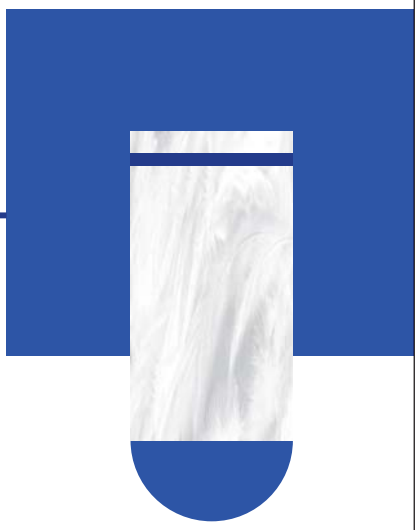
**Cognitive Errors**

Belief Perseverance Biases

Processing Errors

# Emotional Biases

- Loss Aversion
- Overconfidence Bias
- Self-control Bias
- Status Quo Bias
- Endowment Bias
- Regret-Aversion Bias



## Emotional Biases

- **Loss aversion** refers to the tendency to strongly prefer avoiding losses to achieving gains;
  - **Consequences:**
    - ✓ Hold investments in a loss position longer than justified by fundamental analysis, in the hope that they will return to breakeven.
    - ✓ Sell investments in a gain position earlier than justified by fundamental analysis, out of fear that the gains will erode.
  - **Detection of and Guidance for Overcoming:**
    - ✓ A disciplined approach of analyzing investments and realistically considering the probabilities of future losses and gains may help guide the FMP to a rational decision.

## Emotional Biases

- **Overconfidence bias** refers to people demonstrate unwarranted faith in their own abilities.
  - **Illusion of knowledge bias:** *overestimating knowledge levels, abilities and access to information.*
    - ✓ *Prediction overconfidence* occurs when the confidence intervals that FMPs assign to their investment predictions are too narrow.
    - ✓ *Certainty overconfidence* occurs when the probabilities that FMPs assign to outcomes are too high. This certainty is often an emotional response rather than a cognitive evaluation.
  - **Self-attribution bias:** describe people's propensity to take credit for successes and assign responsibility for failures.
    - ✓ *Self-enhancing*: people take too much credit for successes.
    - ✓ *Self-protecting*: people assign responsibility to others for failures.
  - **Consequences:**
    - ✓ Underestimate risks and overestimate expected returns;
    - ✓ Hold poorly diversified portfolios, which may result in significant downside risk.
  - **Detection of and Guidance for Overcoming:**
    - ✓ Review their trading records, identify both the winners and losers, and calculate portfolio performance over at least two years.

## Emotional Biases

- **Self-control bias** occurs when people fail to act in pursuit of their long-term, overarching goals in favor of short-term satisfaction.
  - **Consequences:**
    - ✓ Save insufficiently for the future, which may, in turn, result in accepting too much risk in portfolios in an attempt to generate higher returns;
    - ✓ Borrow excessively to finance present consumption.
  - **Detection of and Guidance for Overcoming:**
    - ✓ ensure that a proper investment plan is in place
    - ✓ have a personal budget.

## Emotional Biases

- **Status quo bias** occurs when people choose to do nothing (i.e., maintain the "status quo") instead of making a change, even when change is warranted.
  - **Consequences:**
    - ✓ Unknowingly maintain portfolios with risk characteristics that are inappropriate for their circumstances;
    - ✓ Fail to explore other opportunities;
    - ✓ Indecision or inertia in which people prefer to not make changes even when changes are warranted (similar to endowment and regret aversion).
  - **Detection of and Guidance for Overcoming:**
    - ✓ Quantify the risk-reducing and return-enhancing advantages of diversification and proper asset allocation.

## Emotional Biases

- **Endowment bias** refers to people value an asset more when they own it than when they do not or people attributing additional, unwarranted value to things they possess versus things they do not.
  - **Consequences:**
    - ✓ Fail to sell certain assets and replace them with other assets;
    - ✓ Continue to hold classes of assets with which they are familiar;
    - ✓ maintain an inappropriate asset allocation.
  - **Detection of and Guidance for Overcoming:**
    - ✓ When an estimated "sell price" is far higher than any reasonable FMP's estimate of a "buy price" is to ask, "Would you buy this security today at the current price?".

## Emotional Biases

- **Regret-aversion bias** refers to people tend to avoid making decisions out of fear that the decision will turn out poorly.
  - **Two dimensions:**
    - ✓ Regret of commission: actions that people take:
    - ✓ Regret of omission: actions that people could have taken.
  - **Consequences:**
    - ✓ Be too conservative in their investment choices as a result of poor outcomes on risky investments in the past;
    - ✓ Engage in herding behavior.
  - **Detection of and Guidance for Overcoming:**
    - ✓ Quantify the risk-reducing and return-enhancing advantages of diversification and proper asset allocation.

## Summary

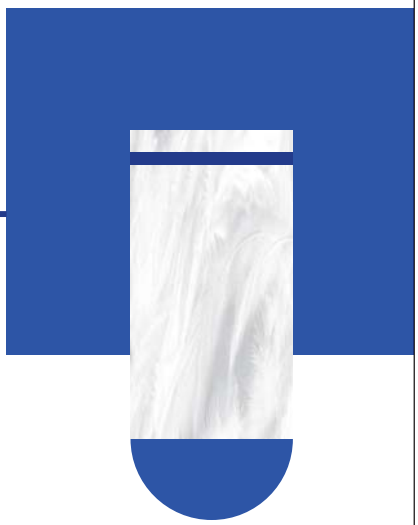
### The Behavioral Biases of Individuals

**Emotional Biases**

Loss Aversion
Overconfidence Bias
Self-control Bias
Status Quo Bias
Endowment Bias
Regret-Aversion Bias

## Anomalies

- Momentum
- Bubbles and Crashes
- Value and Growth



## Anomalies

- Market **anomalies** are *apparent deviations* from the *efficient market hypothesis*, identified by persistent *abnormal returns* that differ from zero and are predictable in direction.
- **Favor of** anomalies: **momentum, bubbles and crashes, value and growth.**
- **Object to** anomalies (not every deviation is anomalous):
  - **Asset pricing model**
    - ✓ Defining *abnormal & normal returns* depends on a model used. An anomaly is an illusion, if a reasonable change in model causes an anomaly to disappear due to factors compensations for excess risk.
  - **Statistical issues**
    - ✓ E.g., Small samples involved; selection or survivorship; data mining ; choices of benchmarks.
  - **Temporary disequilibria behavior**
    - ✓ Unusual features may survive for a period of years but ultimately disappear.

## Anomalies: Momentum

- Future price behaviors that are **correlated with the recent past** would be classified as a **momentum (trending) effect**.
  - **Availability bias** *(recency effect)* is the tendency to recall recent events more vividly and give them undue weight.
  - **Regret** is the feeling that an opportunity has been missed, and is typically an expression of *hindsight bias*, which reflects the human tendency to *see past events as having been predictable*. Faced with regret from not owning a mutual fund or stock when it performed well in the previous year, investors may be driven emotionally to remedy this regret.

## Anomalies: Bubbles and Crashes

- **Bubbles and crashes** are periods of *unusual positive or negative returns caused by panic buying and selling* with excess trading, not based on economic fundamentals.
  - Investment managers incentivized on, or accountable for, short-term performance *in past technology and real estate bubbles* may even rationalize their participation in the bubble in terms of *commercial or career risk*.
- **Symptoms** during bubbles:
  - Overconfidence (self-attribution bias);
  - Underestimation of risks;
  - Failure to diversify;
  - Confirmation bias: rejection of contradictory information;
  - Regret aversion & hindsight bias;
  - Overtrading.

## Anomalies: Value and Growth

- **Classification** of stocks：
  - **Value stocks** are typically characterized by low price-to-earnings ratios, high book-to-market equity, and low price-to-dividend ratios.
  - **Growth stocks** are generally the *opposite* characteristics.
- **Favor of value stock anomalies** (outperformance of value stocks relative to growth stocks for long terms):
  - The **halo effect** *(representativeness)* extends a favorable evaluation of some characteristics to other characteristics.
    - ✓ A firm, with a *good record of growth* and *share price performance*, is seen as a *good investment* with continued high expected returns.
  - The **home bias** *(emotional attraction)* means that portfolios exhibit a strong bias in favor of *domestic securities* in the context of global portfolios, e.g., favoring companies headquartered nearer the investor.
- **Object to value stock anomalies:**
  - Value stock anomaly disappears in Fama & French three-factor asset pricing model. Factors (size & BV/MV) represent compensation for *risk exposures* rather than mispricing.

## Summary

### The Behavioral Biases of Individuals

**Anomalies**

Momentum

Bubbles and Crashes

Value and Growth

## Summary

### Module: The Behavioral Biases of Individuals

**Cognitive Errors**

**Emotional Biases**

**Anomalies**

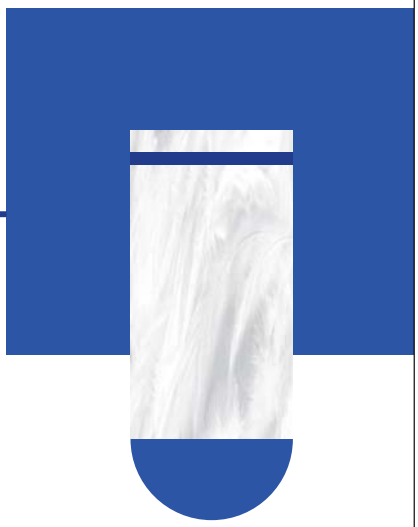
# Module

## Introduction to Risk Management

1. Define Risk Management
2. Types of Risks, Measure and Modify Risks

## Define Risk Management

- Risk Management: An Introduction
- Risk Management Framework
- Risk Governance
- Risk Tolerance
- Risk Budgeting

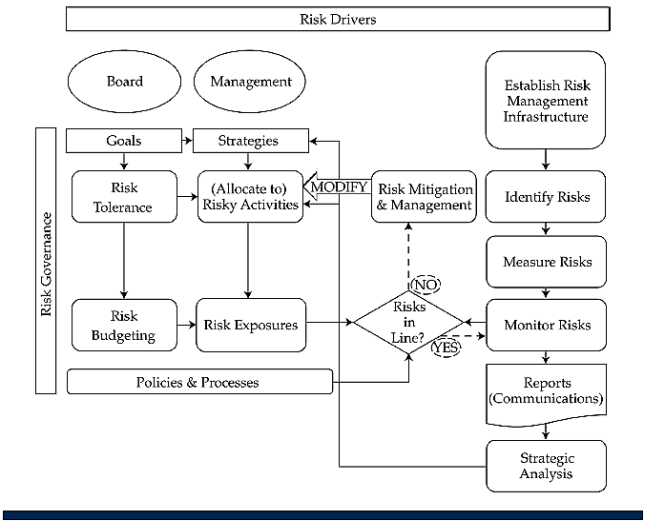


## Risk Management: An Introduction

- **Risk**
  - Exposure to uncertainty.
  - Many decision makers focus on return, which is not something that is easily controlled, as opposed to risk, or exposure to risk, which may actually be managed or controlled.
- **Risk exposure**
  - The extent to which an entity's value may be affected through sensitivity to underlying risks.
- **Risk management**
  - Risk management is the process by which an organization or individual *defines* the level of risk to be taken, *measures* the level of risk being taken, and *adjusts* the latter toward the former; with the goal of *maximizing* the company's or portfolio's value or the individual's overall satisfaction, or utility.
  - It is comprises all the decisions and actions needed to best achieve organizational or personal objectives while *bearing a tolerable level of risk*.
  - *Not about minimizing risk.*

# Risk Management Framework

**Exhibit 1. The Risk Management Framework in an Enterprise Context**




# Risk Governance

- **Risk governance**
  - Risk governance is the foundation for risk management.
  - **Risk governance** refers to senior management's determination of the **risk tolerance** of the organization, the elements of its optimal **risk exposure strategy**, and the framework for oversight of the risk management function.
  - Employing a risk management committee, along with a chief risk officer (CRO), are hallmarks of a strong risk governance framework.
    - ✓ **Risk management committee** provides top decision makers with a forum for regularly considering risk management issues.

# Risk Tolerance

- **Risk tolerance**
  - *At the governance level*, the duty is to *establish the organization's risk appetite.*
    - ✓ Certain risks or levels of risks may be deemed acceptable, other risks deemed unacceptable, and in the middle are risks that may be pursued in a risk-limited fashion.
    - ✓ Risk tolerance identifies the extent to which the entity is willing to experience losses or opportunity costs and to fail in meeting its objectives.
  - When analyzing risk tolerance, management should examine risks that may exist within the organization as well as those that may arise from outside *("inside" view and "outside" view).*
  - The risk tolerance should be chosen and communicated *before* a crisis, and will serve as the high-level guidance for management in its strategic selection of risks.
  - If a company has *the ability to adapt quickly to adverse events* may allow for a higher risk tolerance.

## Risk Budgeting

- **Risk budgeting** is any means of allocating investments or assets by their risk characteristics.
- A risk budget can be complex and multi-dimensional or it can be a simple, one-dimensional risk measure.
  - **Single dimension:** standard deviation, beta, VaR, and scenario loss
  - **Multiple dimensions**
    - ✓ **Identify risk classes:** equity, fixed income, commodity risk;
    - ✓ **Analysis risk factor:** exposure to various factors is used to attempt to capture associated risk premiums.
- **Benefits:** It forces risk trade-offs and supports a culture in which risk is considered as a part of all key decisions.
  - The budgeting of risk should result in an approach of choosing to invest where *the return per unit of risk is the highest*.
  - It should also result in *a market-benchmarked choice of risk intensity*, between possibly doing less of each risky investment or doing more, but with a risk-mitigating hedge.

Example

## Example

- Which of the following is not a goal of risk management?
  A. Measuring risk exposures.
  B. Minimizing exposure to risk.
  C. Defining the level of risk appetite.

- **Solution: B.**
  - The definition of risk management includes both defining the level of risk desired and measuring the level of risk taken. Risk management means taking risks actively and in the best, most value-added way possible and is not about minimizing risks.

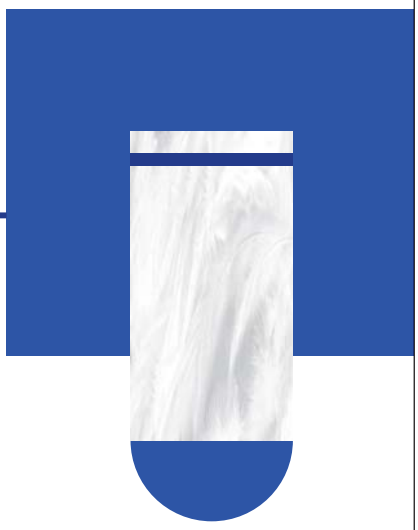
## Summary

### Introduction to Risk Management

**Define Risk Management**
Risk Management: An Introduction
Risk Management Framework
Risk Governance
Risk Tolerance
Risk Budgeting

# Types of Risks, Measure and Modify Risks

- Financial Risks
- Non-Financial Risks
- Risk Metrics



## Financial Risks

- **Financial risks** refer to the risks that arise from events occurring in the financial markets. Examples are
  - **Market risk**
    - ✓ Arises from movements in stock prices, interest rates, exchange rates, and commodity prices.
  - **Credit risk**
    - ✓ The risk that a counterparty will not pay an amount owed.
  - **Liquidity risk**
    - ✓ The risk that, as a result of degradation in market conditions or the lack of market participants, one will be unable to sell an asset without lowering the price to less than the fundamental value.
    - ✓ Liquidity risk could also be called transaction cost risk and is most associated with *a widening bid-ask spread.*

## Non-Financial Risks

- **Non-financial risks** consist of a variety of risks, including *settlement risk, operational risk, legal risk, regulatory risk, accounting risk, tax risk, model risk, tail risk, and sovereign or political risk*.
  - **Operational risk** is the risk that *human error, faulty organizational processes, inadequate security, or business interruptions will result in losses*. An example of an operational risk is **cyber risk**, which refers to disruptions of an organization's information technology.
  - **Solvency risk** is the that an entity does not survive or succeed because it runs out of cash to meet its financial obligations.
- **Interaction between risks**
  - Risks are not necessarily independent because many risks arise as a result of other risks; risk interactions can be extremely non-linear and harmful.

## Risk Metrics

- **Risk metrics**
  - Standard deviation or volatility;
  - Asset-specific measures, such as beta or duration;
  - Derivative measures, such as delta, gamma, vega, and rho;
  - Tail measures such as VaR, CVaR and expected loss given default.
    - ✓ **Value at risk (VaR)** is a measure of the size of the tail of the distribution of profits on a portfolio or for an entity, which
      - Three elements: *an amount stated in units of currency*, *a time period*, and *a probability.*
      - e.g. A VaR of $100 at 1% for one day means it is expected to lose a *minimum* of $100 in one day 1% of the time.
    - ✓ **Conditional VaR (CVaR)** is the *weighted average* of all loss outcomes in the statistical distribution that exceed the VaR loss.

## Summary

### Introduction to Risk Management

**Types of Risks, Measure and Modify Risks**

Financial Risks

Non-Financial Risks

Risk Metrics

## Summary

### Module: Introduction to Risk Management

**Define Risk Management**

**Types of Risks, Measure and Modify Risks**

## 问题反馈

- 如果您认为金程**课程讲义/题库/视频**或其他资料中**存在错误，欢迎您告诉我们**，所有提交的内容我们会在最快时间内核查并给与答复。
- **如何告诉我们？**
  - 将您发现的问题通过扫描右侧二维码告知我们，具体的内容包含:
    - ✓ 您的姓名或网校账号
    - ✓ 所在班级
    - ✓ 问题所在科目(若未知科目，请提供章节、知识点和页码）
    - ✓ 您对问题的详细描述和您的见解
- **非常感谢您对金程教育的支持，您的每一次反馈都是我们成长的动力。**

心有猛虎，细嗅蔷薇

In me the tiger sniffs the rose