Portfolio Management

1° Overview

[Process]

1° Planning:
- Understanding client's needs
- Developing IPS

2° Execution
- Asset allocation
- Security Analysis
- Portfolio construction

3° Feedback:
- monitoring & rebalancing
- measurement & reporting

[Investors' Preference]

	Horizon	Liquidity	Risk Tolerance
DB	long	low	High
Endowments & foundations	long 最长	low	High & high income
Banks	Short	high	low.
Insurance Companies	Life: long P&C: short	P&C: high	P&C: low

(相似: DB / Endowments & foundations)

[Pooled Investments]

1° Mutual Funds ← investment companies

① open-end
- NAV
- 只发部分. 留一部分给赎回

② closed-end
- 不对 new investment 开放
- fully invested
- premium or discount to NAV

2° ETF → 无 capital gain

① basket of shares: buy/redeem/trade in 2nd market

② close to NAV

③ tax advantages to mutual Funds

④ lower transaction costs

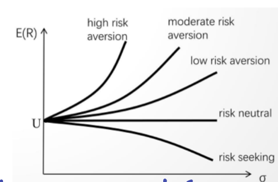
3° Hedge funds: lower amount of regulation

4° PE: few large investments

2. Return & Risk

- $HPR = \frac{P_1 - P_0 + D_1}{P_0}$
- $EAR = (1+HPR)^{\frac{365}{n}} - 1$ → 套算 annual, semi-annual, weekly, daily
- Time-weighted return (TWR)
  ① 几何平均 ② 不受 CF 大小的影响
  ③ 每一期长度可以不一致.
- Money-weighted return (MWR)
  ① 本质是 IRR.
  ② 受 CF 大小影响. ③ 每期长度要一致

[Utility Function]



$U = E(R) - 0.5 \times A \times \sigma^2$

A>0. Averse   A=0. neutral   A<0 seeking

risk-free Assets 对 U 函数的影响相同

- indifference curve

  risk Adverse → slope efficient ↑

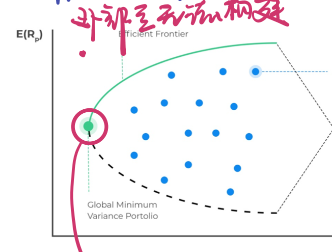
[Risk]

$\sigma_p = \sqrt{w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1w_2\sigma_1\sigma_2\rho_{12}}$

等分时: $\sigma_p^2 = \frac{1}{n}\sigma^2 + \frac{n-1}{n}\,cov = \frac{1}{n}\sigma^2 + \frac{n-1}{n} \times \rho \times \sigma^2$

[Effective frontier]

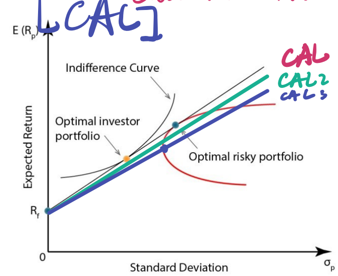
外部 是 有效构建



内部 是 不一定有效

→ Global Minimum Variance Portfolio

[CAL]



$E(R) = r_f + \frac{r_A - r_f}{\sigma_A} \times \sigma_p$.

多条 CAL 中选 sharpe ratio 最大的一条

① optimal risk portfolio →

② optimal investor portfolio → 受 investor risk reference 影响

③ global minimum variance portfolio

[CML] → 本质是一条特殊的CAL

1) Assumption: investors have a Homogeneous Expectation

↳ 延伸: 说明投资者有相同的 {efficient frontier, optimal risk portfolio (Bm)}

该optimal risk portfolio.

* 由市场上所有(risky) Assets组成

$$R_p = r_f + \frac{r_m - r_f}{\sigma_m} \times \sigma_p.$$

[Systematic risk] ↗ 会被完全消除 nonsystematic 是定价的

- 由于 idiosyncratic risk 可以通过 diversification 降低

所以 对 portfolio 的定价本质上是对 systematic risk 定价

- Total VAR = systematic VAR + nonsystematic VAR

↳ 组合的可加性 并不意味着 risk 的可加性

$$\beta_i = \rho_{i,m} \times \frac{\sigma_i}{\sigma_m} \qquad \beta_{portfolio} = \sum w_i \beta_i$$

[CAPM]

前提: ① homogeneous expectation

② no market friction (short selling 没有) ③ 单阶段.

$$E(R_i) = r_f + \beta_i \times [E(R_m) - r_f]$$

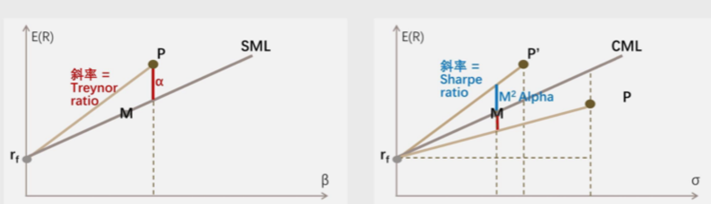
① 詹森α (Jensen's α_p) = $R_p - [R_f + \beta_i \times (E(R_M) - R_f)]$

② 特雷诺比率 (Treynor ratio) = $(R_p - r_f) / \beta_p$

③ $M^2 = (R_p - R_f)\frac{\sigma_M}{\sigma_p} + R_f$

M^2 Alpha = $(R_p - R_f)\frac{\sigma_M}{\sigma_p} - (R_M - R_f)$

④ 夏普比率 (Sharpe ratio) = $(R_p - r_f) / \sigma_p$



SML: Jensen's $\alpha = r_p - [r_f + \beta_p \times (E(R_m) - r_f)]$

Treynor ratio $= \frac{r_p - r_f}{\beta_p}$

CML: $M^2 = \frac{r_p - r_f}{\sigma_p} \times \sigma_m + r_f$

Sharpe ratio $= \frac{r_p - r_f}{\sigma_p}$

3. Management

[IPS]

① objectives: Risk & return → ability / willingness

Absolute vs. relative

② constraints: TTLLU. [Time, Tax, Liquidity, Legal, Unique]

③ Statement of duties & responsibilities

distinctive needs ← ④ Investment Guidlines ⑥ rebalancing

⑤ performance monitoring ⑦ Appendix

[Asset Allocation]

{ SAA - Strategy {同一资产大类 correlation高, 不同资产大类间 correlation低}

TAA - tactical → 短期调整

4. Behavioral Biases

1° Cognetive Errors.

I. Belief Perseverance Biases.

- conservatism
- confirmation
- illusion of control → underdiverify
- Hindsight. 事后诸葛
- Representativeness [base-rate neglect. / sample-size neglect.] → underdiverse.
  Halo effect

II Processing Errors.

- Anchoring & Adjustment 只看历史
- Mental Accounting 资金不打通
- Framing 表述差异
- Availability bias 只搭大事记忆 → momentum

2° Emotional Biases

- Loss-aversion
- overconfidence.
- self-control 朝三暮四
- Status quo
- Endowment
- regret-aversion → momentum

5. Risk Management