

A wide-angle photograph of a city skyline viewed from across a body of water. In the foreground, there's a dark, rippling surface of water. A low-lying strip of land with several multi-story brick buildings, some with gabled roofs, sits between the water and the city. Behind these brick buildings is a dense cluster of modern skyscrapers of various architectural styles, including glass facades and unique geometric shapes. The sky is a clear, pale blue. Two construction cranes are visible on the right side of the skyline.

Andreas Krause

Chapter 12
Asset management

Outline

- Problem and model assumptions
- Clients investing directly
- Delegated investment
- Clients with equal information
- Summary

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Delegated portfolio management

- ▶ Investment banks also manage funds on behalf of clients
- ▶ They do not only give advice on investments, but instead make investment decisions themselves
- ▶ Clients delegate the decision-making to the investment bank
- ▶ The reason for delegation is the superior information and skills investment banks have

Value of asset management

- ▶ Asset management provides a stable source of income to investment banks
- ▶ Can be used to maintain personal contacts to key decision-makers in companies
- ▶ The market is fiercely competitive with private banks and investment consultancies seeking access to the same investors

Investment banking fees

- ▶ Investment banks are rewarded by a management fee f_0 on the wealth invested
- ▶ They also charge a performance fee f_1 on the profits above a benchmark return r
- ▶ They invest a fraction ω in a risky asset and the remainder in an asset yielding the benchmark return
- ▶ Fee income: $F = f_0 W_0 + f_1 \omega (R - r) W_0$

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Investment returns and risks

- ▶ The information clients have, suggests the expected return of the risky asset is μ_C and its variance σ_C^2
- ▶ After investing, the wealth will be the return on the amount invested in the benchmark asset and the return on the risky asset
- ▶ $W_1 = (1 - \omega) (1 + r) W_0 + \omega (1 + R) W_0$
- ▶ Expected value: $E [W_1] = (1 + r) W_0 + \omega (\mu_C - r) W_0$
- ▶ Variance: $Var [W_1] = \omega^2 \sigma_C^2 W_0^2$

Optimal portfolio

- ▶ Clients maximize expected utility $U_C = E[W_1] - \frac{1}{2}zVar[W_1]$ and the first order condition $\frac{\partial U_C}{\partial \omega} = 0$ gives
- ▶ $\omega^* = \frac{\mu_C - r}{z\sigma_C^2} W_0$
- ▶ Utility is then $U_C = (1 + r)W_0 + \frac{(\mu_C - r)^2}{2z\sigma_C^2}$

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Maximizing fee income

- ▶ Investment banks have different information and assess the asset as having expected return μ_B and variance $\sigma_B < \sigma_C$
- ▶ Investment banks maximize fee income
- ▶ Expected fees: $E[F] = f_0 W_0 + f_1 \omega (\mu_B - r) W_0$
- ▶ Variance: $Var[F] = f_1^2 \omega^2 \sigma_B^2 W_0^2$

Optimal delegated portfolio

- ▶ Investment banks maximize expected utility $U_B = E[F] - \frac{1}{2}zVar[F]$ and the first order condition $\frac{\partial U_B}{\partial \omega} = 0$ gives
- ▶ $\omega^{**} = \frac{\mu_B - r}{zf_1\sigma_B^2 W_0}$
- ▶ Investment bank utility: $U_B = f_0 W_0 + \frac{(\mu_B - r)^2}{2z\sigma_B^2}$
- ▶ Perfect competition sets management fee such that $U_B = 0$, hence $f_0 = -\frac{(\mu_B - r)^2}{2z\sigma_B^2 W_0} < 0$
- ▶ Investment banks charge a negative management fee

Optimal performance fee

- ▶ Client wealth: $W_1 = (1 + r) W_0 + \omega^{**} (R - r) W_0 - F$
- ▶ Client utility: $\hat{U}_C = (1 + r) W_0 + 2 \frac{(\mu_B - r)^2}{2z\sigma_B^2} - \frac{(\mu_B - r)^2}{2z\sigma_B^2} \left(\frac{1 - 2f_1}{f_1} \right)^2$
- ▶ Investment banks extract all surplus from clients and set the performance fee such that $\hat{U}_C = U_C$
- ▶ $f_1 = \frac{1}{2 + \sqrt{2 - \frac{\sigma_B^2}{\sigma_C^2} \left(\frac{\mu_C - r}{\mu_B - r} \right)^2}} < \frac{1}{2}$

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Optimal portfolio

- ▶ To compare the optimal portfolios, assume that $\mu_B = \mu_C$ and $\sigma_B^2 = \sigma_C^2$, clients and investment banks have the same information

- ▶ Client utility:

$$\hat{U}_C = (1 + r - f_0) W_0 + (1 - f_1) \omega (\mu_B - r) W_0 - \frac{1}{2} (1 - f_1)^2 \omega^2 \sigma_B^2 W_0^2$$

- ▶ First order condition for the optimal portfolio is then $\frac{\partial \hat{U}_C}{\partial \omega} = 0$

- ▶ $\omega^{***} = \frac{\mu_B - r}{z(1 - f_1)\sigma_B^2 W_0}$

Excess risks taken

- ▶ As $f_1 = \frac{1}{3}$, we have $\omega^{**} = 2\omega^{***}$
- ▶ Investment banks invest a too high fraction into the risky asset
- ▶ The reliance on the performance fee drives this result
- ▶ As only the fee is exposed to risk, not their investment, investment banks seek higher risks

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Distorted asset allocation

- ▶ Investment decisions being delegated to investment banks lead to more risky portfolios than is optimal
- ▶ This may seem even more risky to clients if they assess the risk based on their own information
- ▶ The informational advantage of investment banks may, however, increase the utility of clients, despite the distorted allocation into risky assets

Consequences of biased asset allocation

- ▶ Larger exposure of clients to more risky assets makes the portfolio performance more sensitive to the assessment of the investment bank
- ▶ This makes the skills of the investment bank more apparent
- ▶ Investment banks have to invest more into these skills to remain competitive



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