Andreas Krause



Chapter 12 Asset management

Problem and assumptions	Direct investment	Delegated investment 0000	Clients with equal information	Summary 0000
Outline				

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



Problem and assumptions	Direct investment	Delegated investment	Clients with equal information	Summary
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Problem and model assumptions

Clients investing directly

Delegated investment

Clients with equal information



0000 000 0000 0000 0000 0000	Problem and assumptions	Direct investment	Delegated investment	Clients with equal information	Summary 0000
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Problem and assumptions	Direct investment	Delegated investment 0000	Clients with equal information	Summary 0000

Investment banks also manage funds on behalf of clients

Problem and assumptions	Direct investment 000	Delegated investment 0000	Clients with equal information	Summary 0000

- Investment banks also manage funds on behalf of clients
- They do not only give advice on investments

Problem and assumptions	Direct investment 000	Delegated investment 0000	Clients with equal information	Summary 0000

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	Problem and assumptions ○○●○	Direct investment 000	Delegated investment 0000	Clients with equal information	Summary 0000
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Problem and assumptions	Direct investment	Delegated investment	Clients with equal information	Summary 0000

Asset management provides a stable source of income to investment banks

Problem and assumptions	Direct investment	Delegated investment 0000	Clients with equal information	Summary 0000

- Asset management provides a stable source of income to investment banks
- > Can be used to maintain personal contacts to key decision-makers in companies

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- The market is fiercely competitive with private banks and investment consultancies seeking access to the same investors

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Problem and assumptions	Direct investment	Delegated investment	Clients with equal information	Summary 0000

Investment banking fees

Problem and assumptions	Direct investment	Delegated investment	Clients with equal information	Summary
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Investment ban	king fees			



 \blacktriangleright Investment banks are rewarded by a management fee f_0 on the wealth invested

Problem and assumptions	Direct investment	Delegated investment 0000	Clients with equal information	Summary 0000
Investment ban	king fees			

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- Fee income: $F = f_0 W_0 + f_1 \omega (R r) W_0$

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Problem and assumptions	Direct investment •00	Delegated investment 0000	Clients with equal information	Summary 0000

Problem and model assumptions

Clients investing directly

Delegated investment

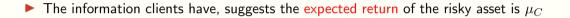
Clients with equal information



Problem and assumptions	Direct investment ○●○	Delegated investment 0000	Clients with equal information	Summary 0000

Investment returns and risks

Problem and assumptions	Direct investment ○●○	Delegated investment 0000	Clients with equal information	Summary 0000
Investment reti	Irns and risks			



Problem and assumptions	Direct investment ○●○	Delegated investment 0000	Clients with equal information	Summary 0000
Investment retu	rns and risks			

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$$W_1 = (1 - \omega) (1 + r) W_0 + \omega (1 + R) W_0$$

• Expected value: $E[W_1] = (1+r) W_0 + \omega (\mu_C - r) W_0$

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Optimal portfolio

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Optimal portfolio				

• Clients maximize expected utility $U_C = E[W_1] - \frac{1}{2}zVar[W_1]$

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Optimal portfolio

► Clients maximize expected utility U_C = E [W₁] - ¹/₂zVar [W₁] and the first order condition ^{∂U_C}/_{∂ω} = 0 gives

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Problem and model assumptions

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Clients with equal information



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Maximizing fee income

Problem and assumptions	Direct investment 000	Delegated investment 0●00	Clients with equal information	Summary 0000
Maximizing fee	income			



Investment banks have different information

Problem and assumptions	Direct investment	Delegated investment ○●○○	Clients with equal information	Summary 0000
Maximizing fee	income			

► Investment banks have different information and assess the asset as having expected return μ_B and variance $\sigma_B < \sigma_C$

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Problem and assumptions	Direct investment 000	Delegated investment ○○●○	Clients with equal information	Summary 0000
Optimal delegat	ed portfolio			

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• Client wealth: $W_1 = (1+r) W_0 + \omega^{**} (R-r) W_0 - F$

Problem and assumptions	Direct investment 000	Delegated investment 000●	Clients with equal information	Summary 0000

• Client wealth: $W_1 = (1+r) W_0 + \omega^{**} (R-r) W_0 - F$

• Client utility:
$$\hat{U}_C = (1+r) W_0 + 2 \frac{(\mu_B - r)^2}{2z\sigma_B^2} - \frac{(\mu_B - r)^2}{2z\sigma_B^2} \left(\frac{1-2f_1}{f_1}\right)^2$$

Problem and assumptions	Direct investment 000	Delegated investment 000●	Clients with equal information	Summary 0000

- Client wealth: $W_1 = (1+r) W_0 + \omega^{**} (R-r) W_0 F$
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Problem and assumptions	Direct investment	Delegated investment 000●	Clients with equal information	Summary 0000

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- ▶ Investment banks extract all surplus from clients and set the performance fee such that $\hat{U}_C = U_C$

Problem and assumptions	Direct investment 000	Delegated investment 000●	Clients with equal information	Summary 0000

- Client wealth: $W_1 = (1+r) W_0 + \omega^{**} (R-r) W_0 F$
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- ▶ Investment banks extract all surplus from clients and set the performance fee such that $\hat{U}_C = U_C$

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$$f_1 = \frac{1}{2 + \sqrt{2 - \frac{\sigma_B^2}{\sigma_C^2} \left(\frac{\mu_C - r}{\mu_B - r}\right)^2}} < \frac{1}{2}$$

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Problem and assumptions	Direct investment	Delegated investment	Clients with equal information ●00	Summary 0000

Problem and model assumptions

Clients investing directly

Delegated investment

Clients with equal information



Problem and assumptions	Direct investment	Delegated investment	Clients with equal information	Summary
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Optimal portfolio				

Problem and assumptions	Direct investment	Delegated investment	Clients with equal information	Summary
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Optimal portfolio				



Problem and assumptions	Direct investment 000	Delegated investment	Clients with equal information ○●○	Summary 0000
Optimal portfolio				

• To compare the optimal portfolios, assume that $\mu_B = \mu_C$ and $\sigma_B^2 = \sigma_C^2$

Problem and assumptions	Direct investment	Delegated investment	Clients with equal information	Summary
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Optimal portfolio				

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Problem and assumptions	Direct investment	Delegated investment	Clients with equal information	Summary
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- ► 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: $\hat{U}_C = (1 + r - f_0) W_0 + (1 - f_1) \omega (\mu_B - r) W_0 - \frac{1}{2} (1 - f_1)^2 \omega^2 \sigma_B^2 W_0^2$

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

Problem and assumptions	Direct investment	Delegated investment	Clients with equal information	Summary
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Excess risks taken

Problem and assumptions	Direct investment 000	Delegated investment 0000	Clients with equal information	Summary 0000

• As
$$f_1 = \frac{1}{3}$$
, we have $\omega^{**} = 2\omega^{***}$

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Problem and assumptions	Direct investment	Delegated investment 0000	Clients with equal information ○○●	Summary 0000

- As $f_1 = \frac{1}{3}$, we have $\omega^{**} = 2\omega^{***}$
- Investment banks invest a too high fraction into the risky asset

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Problem and model assumptions

Clients investing directly

Delegated investment

Clients with equal information



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Problem and assumptions	Direct investment 000	Delegated investment 0000	Clients with equal information	Summary 0●00

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Problem and assumptions	Direct investment	Delegated investment 0000	Clients with equal information	Summary 0●00
Distorted asset	allocation			

Investment decisions being delegated to investment banks lead to more risky portfolios than is optimal

Problem and assumptions	Direct investment	Delegated investment	Clients with equal information	Summary 0●00

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- This may seem even more risky to clients if they assess the risk based on their own information

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- 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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