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15.997 Practice of Finance: Advanced Corporate Risk Management
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Strategic Hedging

MIT Sloan School of Management
15. 997 Advanced Corporate Risk Management
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Basic Story

- Hedging strategy starts with the firm's investment program and the value produced there.
- What is the contingency that we are worried about? A shortage of internal cash flow.
- Why? Causes a cut back in positive NPV capital investments, undermining shareholder value.
  - Premise: external capital is not a complete substitute for internal capital. There are "frictions" in the debt and equity markets.
- Hedging should be targeted to assuring the internal cash flow necessary to fund the investment program.

- Froot, Scharfstein & Stein, Journal of Finance & HBR.

Example: Omega Drug

- R&D yields value – calculate the optimal R&D level

Payoffs from Omega Drug's R&D Investment

R&D level*	Discounted cash flows*	Net present value*
100	160	60
200	290	90
300	360	60

**In millions of dollars*

Image by MIT OpenCourseWare. Adapted from Froot, Kenneth A., David S. Scharfstein, and Jeremy C. Stein. "A Framework for Risk Management." *Journal of Applied Corporate Finance* 7, no. 3 (1994): 22-32.

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Example: Omega Drug (cont.)

- firm faces exchange rate risk and therefore volatile internal cash flows
- this translates into cutbacks in valuable R&D expenditures

The Effect of Hedging on Omega Drug's R&D Investmentand and Value

The Dollar	Internal funds*	R&D without hedging*
Appreciation	100	100
Stable	200	200
Depreciation	300	200

**In millions of dollars*

Image by MIT OpenCourseWare. Adapted from Froot, Kenneth A., David S. Scharfstein, and Jeremy C. Stein. "A Framework for Risk Management." *Journal of Applied Corporate Finance* 7, no. 3 (1994): 22-32.

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Example: Omega Drug (cont.)

- hedging smooths the internal cash flow
- and this assures funding for R&D
- which generates shareholder value

The Effect of Hedging on Omega Drug's R&D Investment and Value

The Dollar	Internal funds*	R&D without hedging*	Hedge proceeds*	Additional R&D from hedging*	Value from hedging*
Appreciation	100	100	+100	100	+130
Stable	200	200	0	0	0
Depreciation	300	200	-100	0	-100

**In millions of dollars*

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Image by MIT OpenCourseWare.

the hedge is NPV 0

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Image by MIT OpenCourseWare.

the value of hedging is produced by the R&D

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When NOT to Hedge

- Complicate the basic story…
- Need for cash may ALSO be "risky", i.e., contingent on the same variables
- Omega Oil example
  - low oil price means low cash flow, but also means low profitability of capital investments
  - the demand for funds rises and falls with the oil price
- Use a much smaller hedge, sufficient to assure the lower funds needed when the price is low

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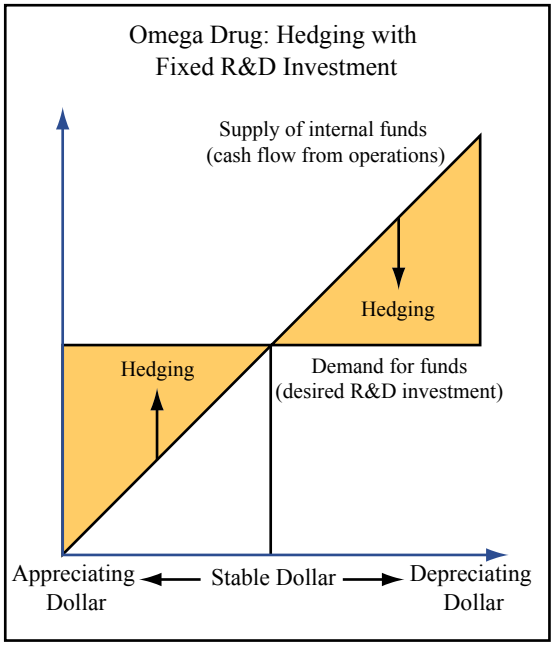

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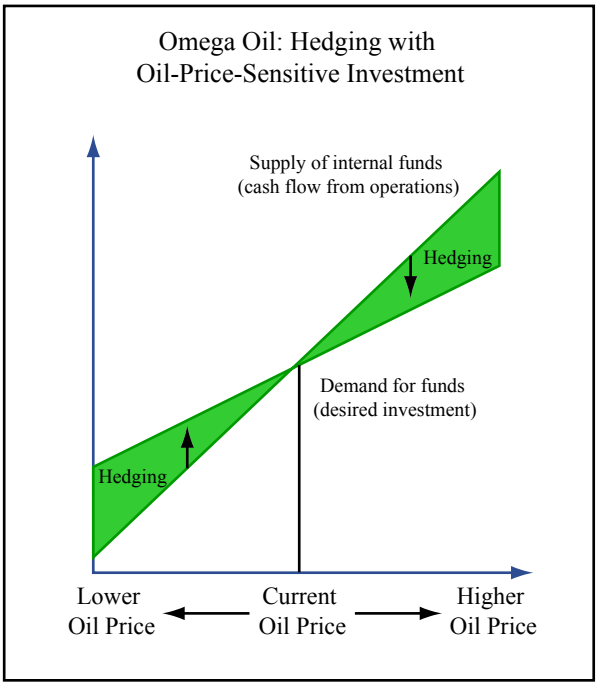

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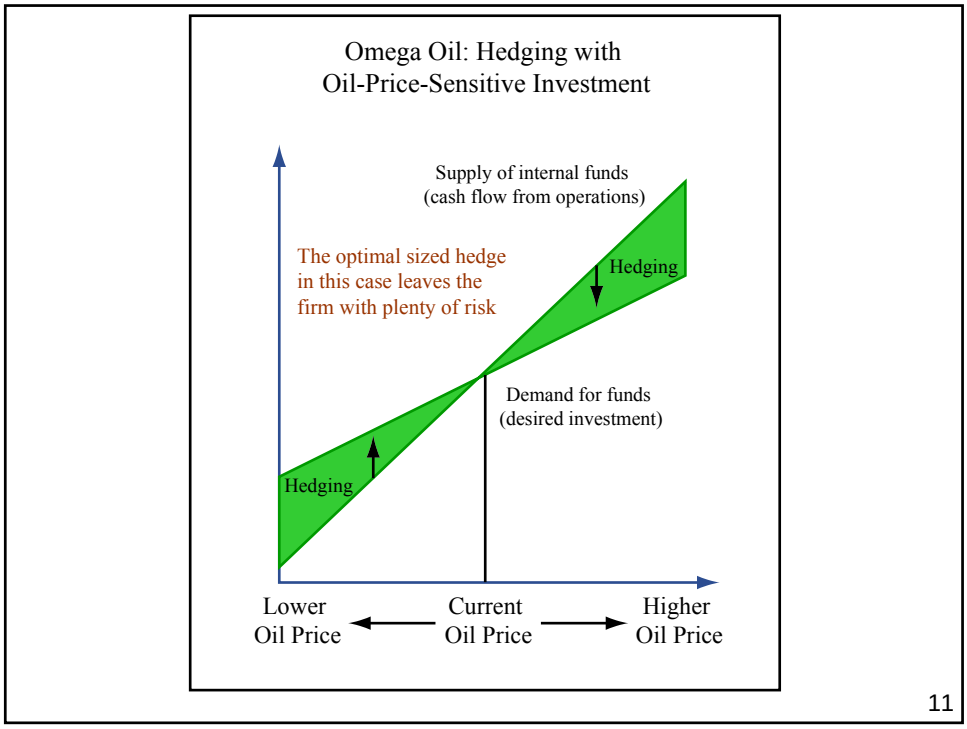

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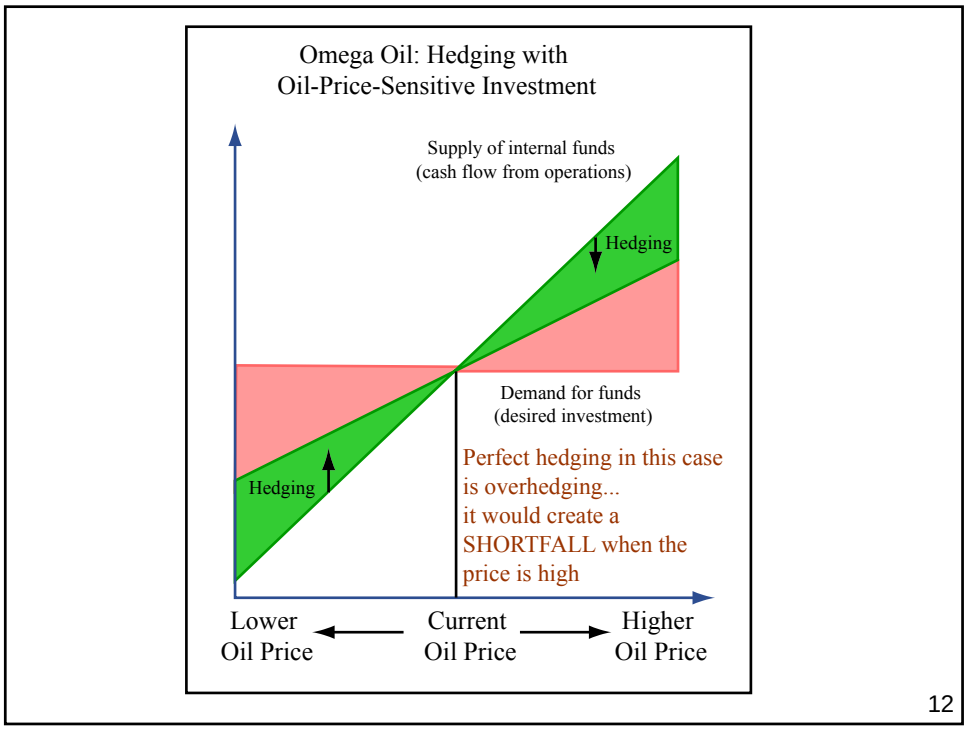

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Guidelines

- Companies in the same industry should not necessarily adopt the same hedging strategy…
- it depends on (1) how variable are their respective supplies of funds, and on (2) how variable are their respective demands for funds
- Epsilon Oil has higher cost fields and so, in the face of a falling price, shuts operations sooner…therefore has a greater need to have locked in the cash for new investments
- or Epsilon's prospects are in higher cost regions, and so cancels investments sooner …and therefore has less need

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Merton: Risk Balance Sheet

Premise: Equity Capital is Costly

- dividends are taxed while interest payments are not
- agency costs are higher
  - between who? …who is the agent, who the principal?
- thought experiment: loading up the firm with cash raised by equity
  - investing in riskless Treasuries
  - market price of equity would be below the book value!
- outside the frictionless MM world

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Equity is All-Purpose Risk Capital

- amount of traditional debt is limited by total risk, by the lower bounds
  - limited amount of quantifiable risk
  - role of security
  - lack of interest in future prospects
  - concern with worst case scenarios
- equity must be raised to cover the risk
  - no matter the sort of risk

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Role of Comparative Advantage

- asset side risks come bundled
- only some of the risks are related to the firm's comparative advantage
- return from risks related to comparative advantage is diluted by risks not related to comparative advantage

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Banks & Interest Rate Risk

- comparative advantage in origination, client evaluation, relationships
- interest rate risk comes bundles
- result is a constraint on scale

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Interest Rate Swaps Market

- decouples interest rate risk and client risk
- banks can sell off the interest rate risk
- can afford to grow to a larger scale using the same equity capital

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Questions

- to whom do they sell the interest rate risk?
- next comes credit risk
- what about Ameritrade and equity swaps?

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The End