

Chapter 12

Operating Exposure to Currency Risk

- 12.1 Managing Operating Exposures to Currency Risk
- 12.2 The Exposure of Shareholders' Equity
- 12.3 Managing Operating Exposure in the Financial Markets
- 12.4 Managing Operating Exposure through Operations
- 12.5 Pricing Strategy and the Firm's Competitive Environment
- 12.6 Summary

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Exposures to currency risk

- Economic exposure to foreign exchange risk
 - Transaction exposure
 - change in value of contractual cash flows
 - change in value of monetary assets & liabilities
 - Operating exposure
 - change in value of noncontractual cash flows
 - change in value of real assets
- Equity exposure to foreign exchange risk
 - Net monetary assets exposed to currency risk plus the operating exposure of real assets

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The law of one price revisited

- In an **integrated** market
 - purchasing power parity holds so that equivalent assets trade for the same price regardless of where they are traded
 - In a completely **segmented** market
 - prices are locally determined
- Real-world markets fall somewhere between these extremes

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Operating exposures to fx risk

		Revenues	
		Local	Global
Operating expenses	Local	Domestic firms (0)	Exporters (+)
	Global	Importers (-)	Global MNCs & importers/exporters in globally competitive markets (?)

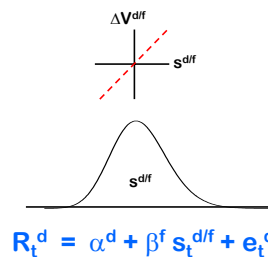
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The exposure of shareholders' equity

Foreign currency monetary assets (40€)	Foreign currency monetary liabilities (20€)	Net exposed monetary assets (20€)
	Domestic currency monetary liabilities (40€)	
Domestic currency monetary assets (25€)		
Real assets exposed to fx risk (35€)	Real assets (35€)	Equity (40€)

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Market-based estimates of currency risk exposure



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An example Ford Motor Company's exposures

$$r_t^{\$} = \mu^{\$} + \beta^{\$} s_t^{\$/\text{¥}} + \beta^{\text{€}} s_t^{\$/\text{€}} + \beta^{\text{£}} s_t^{\$/\text{£}} + e_t^{\$}$$

$$= 0.060 + 0.02 s_t^{\$/\text{¥}} + 0.01 s_t^{\$/\text{€}} + (-0.01) s_t^{\$/\text{£}} + e_t^{\$}$$

What is the expected return on Ford stock when...

$$s_t^{\$/\text{¥}} = +10\% \quad s_t^{\$/\text{€}} = +8\% \quad s_t^{\$/\text{£}} = +8\%$$

$$E[r_t^{\$}] = 0.06 + (0.02)(0.10) + (0.01)(0.08) + (-0.01)(0.08)$$

$$= 0.062$$

or 6.2 percent

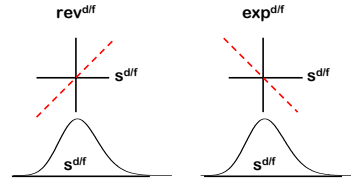
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Accounting-based estimates

> Sensitivities of revenues and expenses to foreign exchange rates

$$\text{rev}_t^d = \alpha_{\text{rev}}^d + \beta_{\text{rev}}^f s_t^{\text{diff}} + e_t^d \quad (22.9)$$

$$\text{exp}_t^d = \alpha_{\text{exp}}^d + \beta_{\text{exp}}^f s_t^{\text{diff}} + e_t^d \quad (22.10)$$



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Managing operating exposure in the financial markets

- > An **exporter's** hedging alternatives
 - Sell the foreign currency with long-dated forward contracts
 - Finance a foreign project with foreign debt capital
 - Use currency swaps to acquire financial liabilities in the foreign currency
 - Use a rolling hedge to repeatedly sell the foreign currency

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Managing operating exposure in the financial markets

- > An **importer's** hedging alternatives
 - Buy the foreign currency with long-dated forward contracts
 - Invest in long-dated foreign bonds
 - Use currency swaps to acquire financial assets in the foreign currency
 - Use a rolling hedge to repeatedly buy the foreign currency

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Financial market hedges of operating exposures

- > **Advantages**
 - Most financial market instruments are **actively traded** and **liquid**
 - If financial prices reflect true value, then financial market transactions are **zero-NPV transactions**

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Financial market hedges of operating exposures

- > **Disadvantage**
 - A financial market hedge provides an **imperfect hedge** of operating exposure to currency risk

The contractual cash flows of a financial market hedge cannot fully hedge the uncertain operating cash flows of the firm's real assets

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Managing operating exposure through operations

- Take advantage of the MNC's ability to respond to differences in real foreign exchange rates
 - **Plant location:** Gain access to low-cost labor or capital resources
 - **Product sourcing:** Shift production to countries with low real costs
 - **Market selection:** Shift marketing efforts toward countries with higher demand or "overvalued" currencies

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Operating hedges of operating exposures

- **Advantages**
 - Operating hedges create a fundamental change in the way the MNC does business and thus a long-lasting change to the company's currency risk exposure
 - With established international relations, the MNC is in a better position to take advantage of opportunities in international markets
- **Disadvantage**
 - Operating hedges are seldom zero-NPV transactions

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Pricing strategy in int'l markets

- **An example**
For the classic Japanese exporter, an appreciation of the euro increases the purchasing power of euro-zone customers

Pricing alternatives include

- Hold the euro price constant
 - Sell the same quantity
 - **Bigger yen profit margin per unit**
- Hold the yen price constant
 - Lower euro price
 - **Higher sales volume**

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The price elasticity of demand

- Optimal pricing depends on the **price elasticity of demand** = $-(\Delta Q/Q)/(\Delta P/P)$
- Measures the **sensitivity** of quantity sold to a percentage change in price
 - **price elastic demand** - a small change in price results in a large change in quantity sold, so lower the price
 - **price inelastic demand** - a small change in price results in an even smaller change in quantity sold, so hold the price constant

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