

Risk

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Outline

- 1. Exchange Rate Risk and Hedging**
2. Transaction Exposure
3. Operating Exposure
4. Translation Exposure
5. Other types of risk



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Foreign exchange exposure

- Definition

Foreign exchange exposure is a measure of **the potential** for a firm's profitability, net cash flow, and market value **to change because of a change in exchange rates.**

ESM (2001, p. 152)



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Types of Foreign Exchange Exposure

- **Transaction exposure** refers to gains or losses that arise from the settlement of transactions whose terms are stated in foreign currencies. Such transactions include imports and exports that are valued in foreign currencies; foreign currency loans and investments, etc.
- **Operating exposure** (also called economic exposure, competitive exposure, or strategic exposure) refers to sensitivity of a firm's market value to exchange rate movements.
- **Translation exposure** arises from the need to report financial statements in a consolidated account denominated in one single currency.



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Transaction Exposure

Measures how greatly exchange rate fluctuations may affect cash transactions

- It measures the changes in the value of transactions already done or initiated but not yet settled that result from a change in exchange rates.
- It is limited as it focuses solely on **known, contractual** cash flows.
- Therefore it generally only includes cash flows of short horizon, financial instruments for hedging them will be easily available and quite inexpensive.



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Asset positions

- Examples
 - Sold on credit goods or services when payment has to be received **in foreign currencies (export – current account)**
 - Lent funds when repayment is to be made **in a foreign currency (investment)**
 - To receive foreign currency payment from an unperformed **foreign exchange forward contract (financial transaction)**



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Liability exposure

- Examples:
 - Purchased on credit goods or services when payment has to be made **in foreign currencies (import)**
 - Borrowed funds when repayment is to be made **in a foreign currency (financing)**
 - To pay foreign currency payment from an unperformed **foreign exchange forward contract (financial transactions)**



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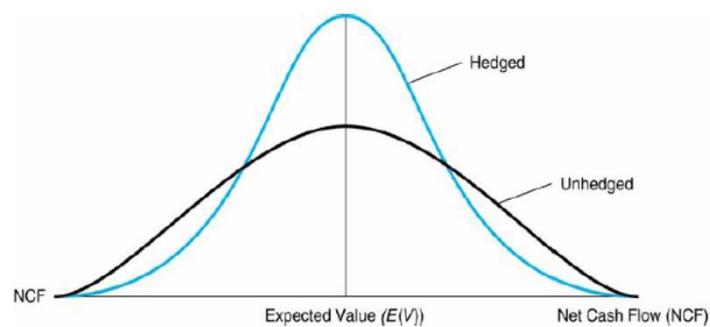
Hedging

- Definition:
Hedging is the taking of a position, acquiring either a cash flow, an asset or a contract (including a forward contract) that will rise (fall) in value and offset a fall (rise) in the value of an existing position.
- Hedging therefore protects the owner of the existing asset from loss.
(Eiteman, Stonehill and Moffett 2013)



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Impact of Hedging on the Expected Cash Flows of the Firm



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Hedge or Not to Hedge?

- What is your expectation of the exchange rate in three months?
- Why does your expectation matter?
- What is your attitude toward risk?
 - Risk averse
 - Risk neutral
 - Risk loving
- How much risk can you tolerate?



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Why to hedge?

- Allows the company to exploit valuable investment opportunities using internal funds
- Reduces probability of bankruptcy and financial distress
- Avoids paying tax if there are losses
- Benefits certain shareholder clienteles
- Makes it easier for investors to understand the share price
- Improves the measures of corporate performance
- Sends a signal to the market



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Why not to hedge?

- It is costly
- It alters shareholders' optimal portfolio composition
- It can alter cash flows providing them when you do not need them



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Managing transaction exposure

- Natural hedge
 - Matching operating cash inflows and outflows in the same currency
- Managing transaction exposure internally
 - Currency diversification and multinational netting
 - Leading and lagging
- Financial markets
 - Currency forwards
 - Currency futures
 - Money market hedges
 - Currency options
 - Currency swaps



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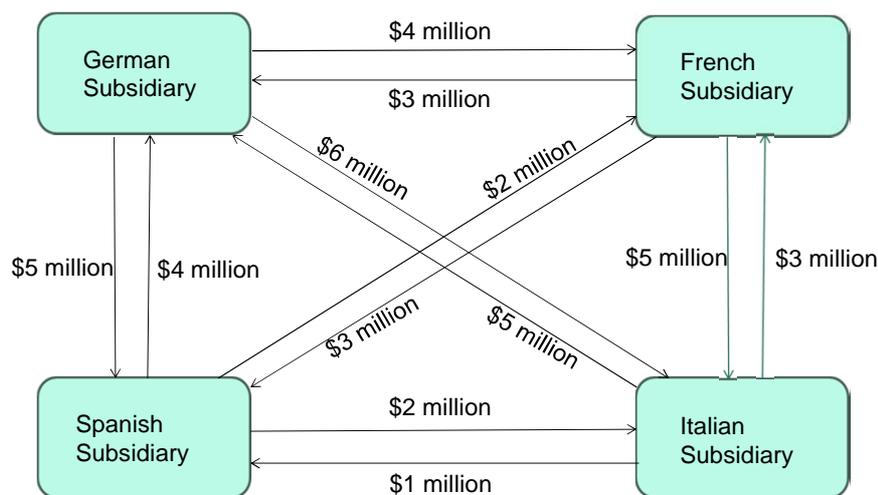
Currency diversification and multinational netting

- Currency diversification
 - A benefit of internationally diversified operations is that cash inflows and outflows occur in many currencies and not in just one or a few currencies. Diversified multinational operations provide a natural hedge of transaction exposure - when one currency is down, another currency is up.
- Multinational netting
 - In the multinational corporation, one business unit's exposure to currency risk can often be offset by the exposure of another unit within the corporation. The exposure of the corporation as a whole is found by consolidating and then netting the exposures of the firm's individual assets and liabilities. Framework for internal accounting and coordination is needed.

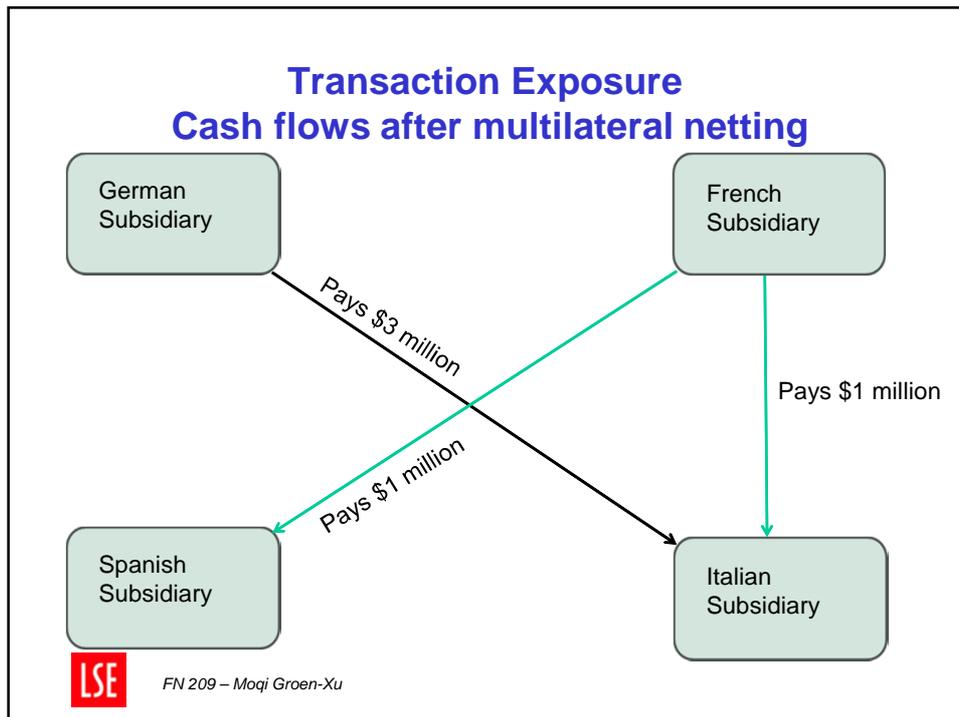


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Cash flows before multilateral netting



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Example: Global treasury management at Proctor & Gamble

- 60% of P &G's revenues from international sales products sold in 130 countries
- P&G centralized global treasury management function
 - manages all foreign exchange transactions
 - trades currency between subsidiaries, cutting out banks and saving on transaction costs
 - pools foreign exchange risks and buys an umbrella option to cover risks associated with various currency options
 - subs can invest in and borrow money from other P&G entities instead of dealing with banks

Leading and Lagging

- Timing of cash flows within the corporation to offset underlying currency exposures.
 - **Leading** - If a U.S. parent is short euros, the parent can accelerate euro repatriations from its European affiliates.
 - **Lagging** - If a U.S. parent is long euros, the parent can accelerate euro payments to its European affiliates.
- Like multinational netting, leading and lagging works best when the currency needs of the individual units within the corporation offset one another.
- Leading and lagging for external transactions if possible.



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Contractual Hedge

- **Currency forward contracts**
 - Definition**
 - An agreement to exchange currencies of different countries at a specified future date and at a specified forward rate
 - Advantages**
 - Currency forwards can provide a perfect hedge of transactions of known size and timing.
 - Disadvantages**
 - Bid-ask spreads can be large on long-dated contracts or infrequently traded currencies.
 - A pure credit instrument, so currency forward contracts have credit risk.



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Contractual Hedge

- **Currency futures contracts**

Definition

- Exchange-traded agreements calling for future delivery of a standard amount of foreign exchange, at a fixed time, place, and price

Advantages

- Low cost if the currency and maturity match the underlying exposure
- Low credit risk because of daily mark-to-market

Disadvantages

- Exchange-traded futures come in limited currencies and maturities
- Daily mark-to-market can cause a cash flow mismatch



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Contractual Hedge

- **Money market hedges**

Definition

- The use of foreign currency borrowing to reduce transaction or accounting foreign exchange exposure.

Advantages

- Forward positions can be built in currencies for which there are no forward currency markets

Disadvantages

- Relatively expensive hedge
- Might not be feasible if there are constraints on borrowing or lending



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Contractual Hedge

- **Currency option contracts**

Definition

- A contract that gives the option purchaser (the buyer) the right, but not the obligation, to buy or sell a given amount of foreign exchange at a fixed price per unit for a specified time period (until the maturity date).

Advantages

- Disaster hedge insures against unfavourable currency movements

Disadvantages

- Option premiums reflect option values, so option hedges can be expensive in volatile currencies and at distant expiration dates



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Contractual Hedge

- **Currency swap contracts**

Definition

- A transaction in which two counterparties exchange specific amounts of two different currencies at the outset, and then repay over time according to an agreed-upon contract that reflects interest payments and possibly amortization of principal. In a currency swap, the cash flows are similar to those in a spot and forward foreign exchange transaction.



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Contractual Hedge

- **Currency swap contracts**

Advantages

- Quickly transforms liabilities into other currencies or payoff structures (e.g., fixed vs. floating)
- Low cost for plain vanilla swaps in actively traded currencies
- Able to hedge long-term exposures

Disadvantages

- Not the best choice for near-term exposures
- Innovative or exotic swaps can be expensive



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Operating Exposure

Measures how greatly the present value of future cash flows is affected by unexpected exchange rate fluctuations

- It can be measured by the sensitivities of:
 - I) Future home currency values of the firm's assets and liabilities
(**Asset exposure**).
 - II) Firm's operating cash flows to random changes in exchange rates (**Operating exposure**).



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Operating Exposure vs. Transaction Exposure

- Operating exposure and transaction exposure are related in that they both deal with future cash flows.
- **Transaction exposure**: mostly contractual with known horizon in the future.
Operating exposure: longer-term cash flow impact of unanticipated exchange rate change; subjective, depending on estimates; involving interaction of strategies in finance, marketing, purchasing, and production.



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Measuring the impact of operating exposure

- Short run:
On expected cash flows in the one year operating budget: difficult to change currency denomination, sales prices, or factor costs → realized cash flows will differ from expected in the budget.
- Medium run
On expected medium-run cash flows, such as those expressed in two- to five-year budgets: may not be able to adjust prices or cost, or other operating factors → realized cash flows will differ from expected in the budget.
- Long run
On expected long-run cash flows, meaning those beyond five years. Cash flows will be influenced by the reactions of existing and potential competitors to exchange rate changes.



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Regression analysis of operating exposure

$$CF_t = a + bEX_t + \mu_t$$

CF: The dollar value of total affiliate (parent) flows in period *t*.

EX: The average exchange rate during period *t*.

The output from such a regression includes three key parameters:

- (1) the foreign exchange rate beta, which measures the sensitivity of dollar cash flows to exchange rate changes;
- (2) the t-statistic, which measures the statistical significance of the beta coefficient; and
- (3) the R^2 , which measures the fraction of cash flow variability explained by variation in the exchange rate.

The regression should be run in real terms.

- The cash flows should be deflated by the home currency inflation.
- The exchange rate should be the real exchange rate.



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Example

- **Example:** The Pound-Dollar real exchange rate is constant.
- US Inflation = 10%
- UK Inflation = 0%
- Dollar must depreciate by 10% per year to maintain the constant real exchange rate.
- If a nominal regression is run,
 - dollar cash flows will be increasing at 10% per year
 - spot exchange rate will be rising at 10% per year reflecting the nominal depreciation of the dollar.
- **b** will pick up the fact that each side of the regression is increasing at 10% per year - which will be misattributed to exposure.
- Run in real terms, the regression correctly delivers **b** = 0.



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Managing operating exposure

- Diversifying operations
 - Sales, location of production facilities, and raw material sources
- Diversifying financing
 - Raising funds in more than one capital market and in more than one currency
- Pricing strategies
 - Pricing to market
 - Exchange rate pass-through



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Pricing to market

- The corporate pricing behavior in which product prices are to a large extent determined by local market conditions, rather than by exchange rates and production costs or market prices in the home country. This concept is important because it implies that a company's profit margin is dependent on the exchange rate. For example, if US consumer goods prices tend to be determined locally, then profit margins for Japanese firms will fall with yen appreciation and rise with yen depreciation.



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Exchange rate pass-through

- It describes the extent to which exchange rate changes are “passed through” into prices charged to local stores or distributors. This concept is important in that it helps the firm to understand how much operating exposure it carries. If there is 100% pass-through of exchange rate changes, then we would conclude that the product is really being priced in the exporter's currency – and as such the exchange rate risk has been passed along to the consumer. If the pass-through is 0%, then we have “pricing-to-market (PTM)” – the good is really being priced in the importer's currency and the exporter's profit margin is completely exposed to exchange rate changes



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Translation Exposure

Measures impact that exchange rate fluctuations have upon company' consolidated financial statement

- It refers to the effect that an unanticipated change in exchange rates will have on the consolidated financial reports.
- It results when an company translates each subsidiary's financial data to its home currency for consolidated financial reporting.
- It does not **directly** affect cash flows, but some firms are concerned about it because of its potential impact on reported consolidated earnings.



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Translation Exposure

In general, firms should not need to worry about translation exposure.

- It does not affect cash flows.
- Weak foreign currency may be retained or invested in foreign country
- If converted, it becomes a transaction exposure.

It should be dealt with accounting methods.

There are 4 methods to account for it.



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Dealing with Translation Exposure

- **Current Rate Method:** all accounts are translated at the current exchange rate except equity.
- **Current/Noncurrent Method:** assets should be translated according to their maturity.
- **Monetary/Nonmonetary Method:** all monetary balance sheet accounts (cash, accounts receivable, accounts payable, marketable securities) should be translated at the current exchange rate.
- **Temporal Method:** all monetary accounts are translated at the current rate, the other accounts are translated at the current rate if they are carried on the books at the current value. If they are carried at historical costs, they are translated at the rate of the exchange on the date the item was recorded.



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1. The current rate method

- All assets and liabilities **except common equity** are translated at the current exchange rate.
- Common equity is translated at historical exchange rates.
- Income statement items are translated at the current exchange rate.



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2. The current/noncurrent method

- Current assets and liabilities are translated at the current exchange rate.
- Noncurrent assets and liabilities are translated at historical exchange rates.
- Most income statement items are translated at the average exchange rate over the reporting period.
- Depreciation is translated at historical exchange rates.



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3. The monetary/nonmonetary method

- Monetary assets and liabilities are translated at the current exchange rate.
- All other assets and liabilities are translated at historical exchange rates.
- Most income statement items are translated at the average exchange rate over the reporting period.
- Depreciation and COGS are translated at historical exchange rates.



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4. The temporal method

- The same as the monetary/nonmonetary method, except for Inventories and investments:
 - if they are carried at cost
 - historical rate
 - if they are carried at market value
 - current rate



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Translation gains and losses

- Accounting exposure (in foreign currency)
= exposed assets - exposed liabilities
- Translation gain (loss) (in U.S. dollars)
= accounting exposure
× change in exchange rate
change in exchange rate (expressed as\$/fc)
= new rate - old rate



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US translation practices

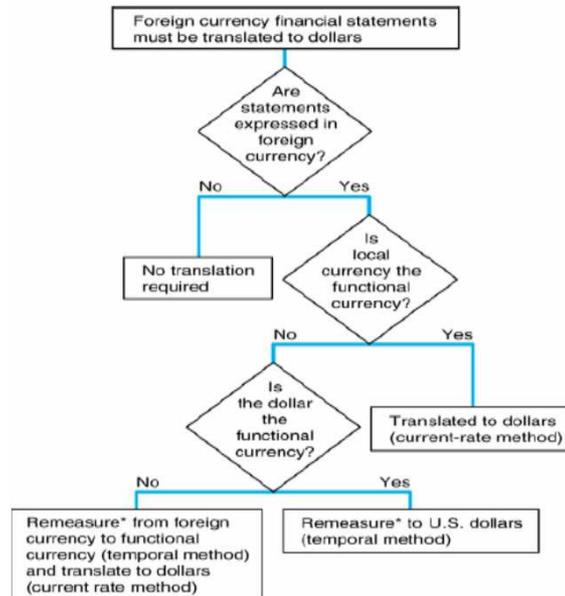
- The current/noncurrent method
 - used prior to 1976
- The temporal or monetary/nonmonetary method
 - used between 1975 to 1981 (FAS #8)
- The current or temporal method (choice)
 - used since 1981 (FAS #52)

FAS: Financial Accounting Standards



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A Procedure Flow Chart for United States Translation Practices



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Hedging translation exposure

- The main technique for managing translation exposure is a **balance sheet hedge**. It calls for having an **equal amount** of exposed foreign currency assets and liabilities on a firm's balance sheet.
- Even if management chooses to follow an active policy of hedging translation exposure, it is nearly impossible to offset both transaction and translation exposure simultaneously. If forced to choose, most managers will protect against transaction losses because these are **realized losses**, rather than protect against translation losses, which are only **book losses**.



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Proactive Management of Risk

Hierarchy of “troubles” (from worse to better)

- Transactions on capital accounts
- Interest payments and license fees
- Management fees
- Dividends



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Types of risk

- *Operational Risk*
- *Sovereign*
- *Institutional*
- *Force Majeure*
- *World Market Risk*



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Operational Risk

- Pre-completion
 - Resources available (quality/quantity)
 - Technological risk (proven technology?)
 - Timing risks (failure to meet milestones)
 - Completion risk
- Post-completion
 - Market risks (prices of outputs)
 - Supply/input risk (availability)
 - Operating cost



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Sovereign and institutional risk

Sovereign Risk

- Macroeconomic
 - Exchange rate changes
 - Currency convertibility and transferability
 - Hyperinflation risk

Institutional Risk

- Expropriation
 - Direct (seize assets)
 - Diversion (seize project cash flows)
 - Creeping (change taxation or royalty)
- Legal system
 - May not be able to enforce property rights



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Force Majeure and World Market Risk

Force Majeure

- Political events
 - Wars
 - Labor strikes
 - Terrorism
 - Changes in laws
- Natural catastrophes
 - Hurricanes/earthquakes/floods

World Market Risk

- Wars, Shocks to price of raw materials



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Risk and Tax Management

- If you don't plan to repatriate profits, profitable operations should be **subsidiaries**.
- Loss making foreign operations **should always** be branches so long as losses can be used to offset profits elsewhere
- Where profits aren't repatriated they should be reported in the lowest-tax jurisdiction by
 - allocating cost to the highest-tax jurisdiction or
 - setting transfer price as high as possible when $\pi^* > \pi$, and as low as possible when $\pi^* < \pi$, so long as profits are positive.

π is the tax rate on profits earned by the first subsidiary and π^* is the tax rate on profits earned by foreign subsidiary



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