

Forwards, Futures and Money Market Hedging

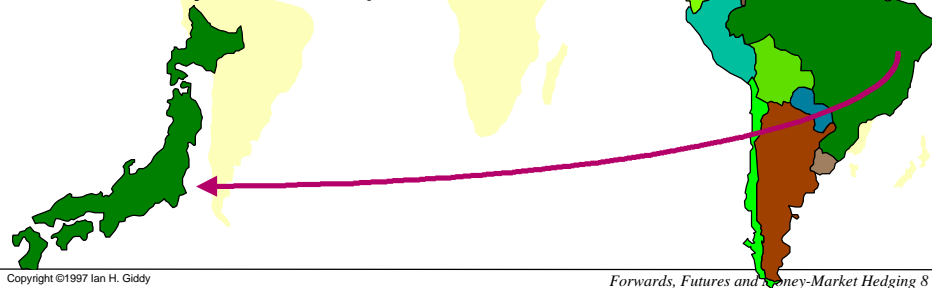
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Hedging Transactions Exposure

- 
- Types of exposure
 - One-shot exposure
 - Hedging approaches:
 - ◆ Open
 - ◆ Forward
 - ◆ Money market
 - ◆ Futures
 - ◆ Options
 - Ongoing transactions exposure

Tools for Hedging

- Petrobras has to pay for equipment from Japan, in Japanese yen, in 3 months
 - ◆ Borrow and pay now?
 - ◆ Use a forward contract/FX swap?
 - ◆ Pay later at spot?



Forward Contracts, Futures and Money Market Hedging

- Money market hedging: match currency of assets and liabilities
- Forwards: OTC agreement to exchange currencies at certain exchange rate in the future
- FX swap: simultaneous spot sale and forward purchase of a currency
- Futures: Exchange-traded contracts for notional future delivery, minimizing default risk via marking-to-market

Forward Contracts

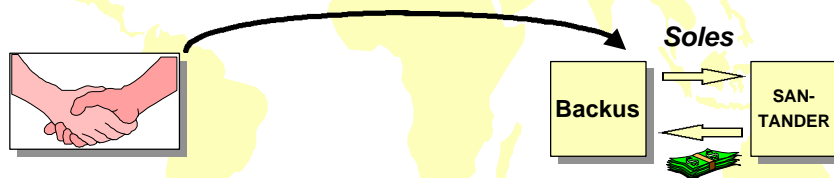
- Agreement to exchange currencies at certain exchange rate in the future
- *Default risk* in forward contracts arises because such a contract is a commitment for future performance, and one or other party may be unwilling or unable to honor that commitment.
- On the settlement date, one party in effect owes the other party a *net amount*.

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A Typical Forward Contract

- We agree today to pay a certain price for a currency in the future



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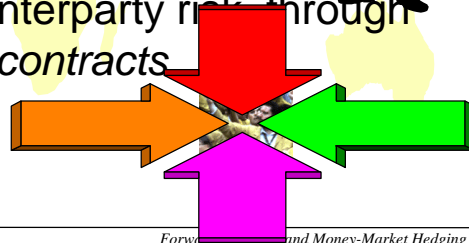
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Customization, Performance Risk and Liquidity

- Customization implies *bilateral contracts*, which carry performance risk



- Liquidity implies standardization and freedom from counterparty risk through *exchange-traded contracts*



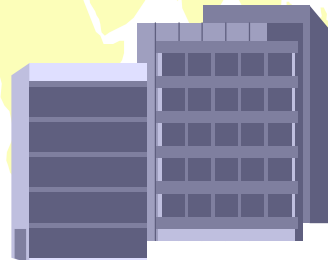
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How Does the Bank Hedge a Forward Contract?

Hedging approaches:

- ◆ Open
- ◆ Forward
- ◆ Spot plus swap
- ◆ Rollover
- ◆ Money market



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Foreign Exchange Quotations

		SPOT	1M	3M	6M	12M
1615	DEM	152 40/50	31.8/5	94.5/94	193.5/2	397/394.0
1615	CHF	125 40/50	45.5/45	129/128	254/252	509/504.0
1618	FRF	516 00/30	91/89.5	269/265	531/526	1098/1083
1618	NLG	170 93/03	39.4/1.1	118/7.5	239.5/8	475/472.0
1618	BEF	31 37/40	6.9/6.6	20/19.3	40.5/39	83.0/80.0
1619	ITL	1522 /1524	376/384	950/970	1640/70	2475/2525
1618	JPY	111 35/45	52/51.7	151/0.5	288/287	572/569.0
1626	CAD	136 7/22	17/16.5	56/54.5	107/104	192/187
1619	GBP	156 4/55	6.3/6.1	1/10.5	16.5/15	31.5/27.5
1651	XEU	124 99/09	RATES	AT	CLOSE	MONDAY

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How Banks Hedge

SHORT LONG

Today

T+2

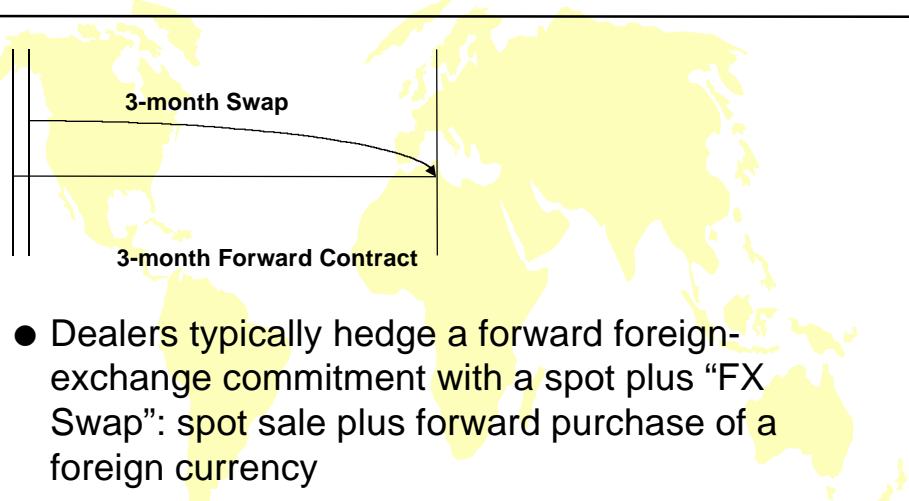
T+90

Methods:

- Spot + swap
- Spot + rollover swap
- Money market
- Outright forward

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The FX Swap Hedge

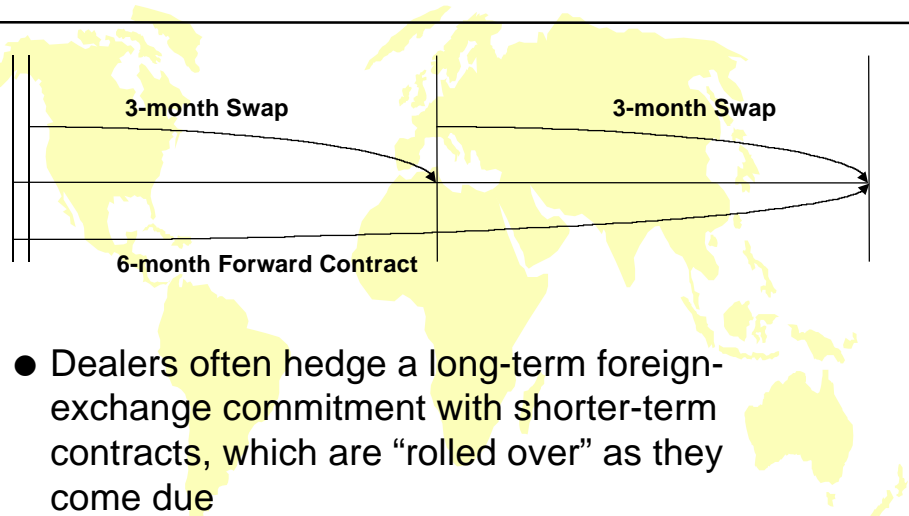


- Dealers typically hedge a forward foreign-exchange commitment with a spot plus “FX Swap”: spot sale plus forward purchase of a foreign currency
- The FX swap rate is determined by the interest differential

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The Roll-Over Swap Hedge

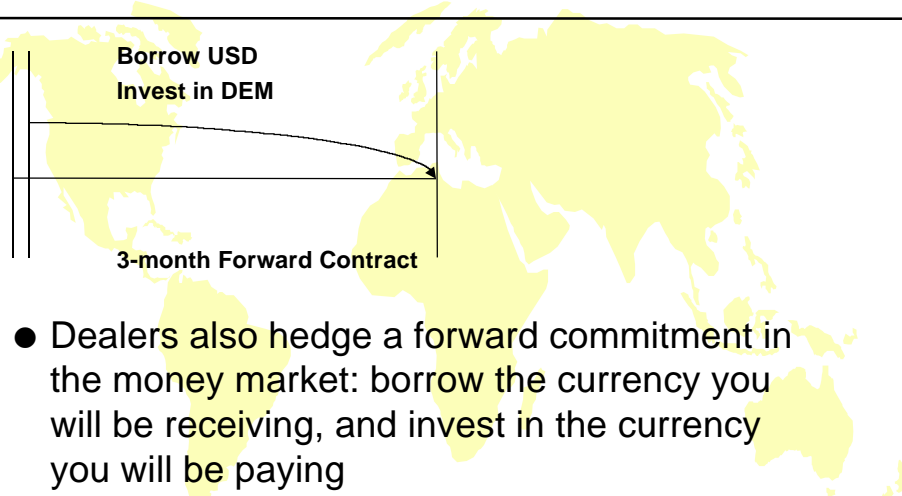


- Dealers often hedge a long-term foreign-exchange commitment with shorter-term contracts, which are “rolled over” as they come due
- Corporations themselves do this too.

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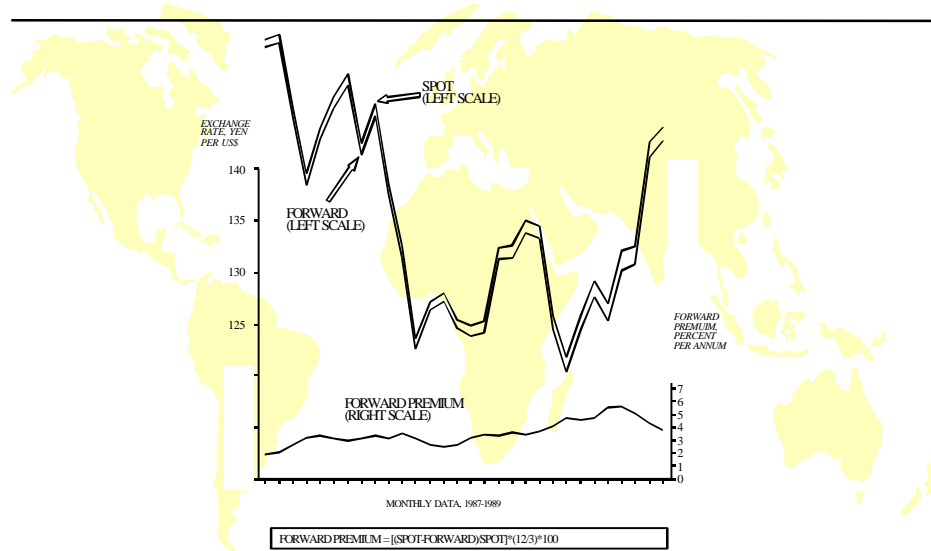
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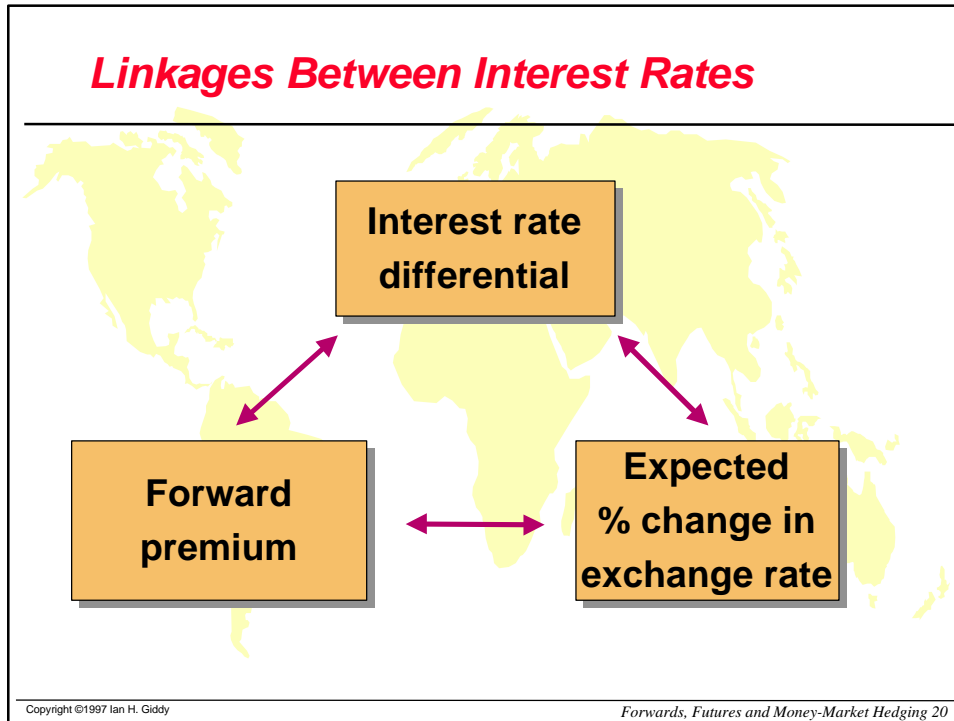
The FX Swap Hedge



- Dealers also hedge a forward commitment in the money market: borrow the currency you will be receiving, and invest in the currency you will be paying
- The FX swap rate is determined by the interest differential

The Forward Rate Tracks the Spot Rate





Cost of Hedging

Type of Hedge	Cost of Hedging
Forward	Forward premium
Money Market Hedge (Borrow to match assets)	Interest rate differential
Do nothing	Expected rate of change of exchange rate

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Corporate Hedging Decisions: Frutas Amazonas

Exporting bananas to Spain, get paid in Spanish pesetas. Funding is in U.S. dollars.



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Corporate Hedging Decisions: Frutas Amazonas

- Continue funding in U.S. dollars. The peseta might get stronger in the next three months, from \$1=128 pesetas to \$1=126 pesetas. This could be the cheapest
- Switch funding to pesetas, despite the slightly higher cost
- Borrow in dollars, but hedge the exchange risk in the forward market.

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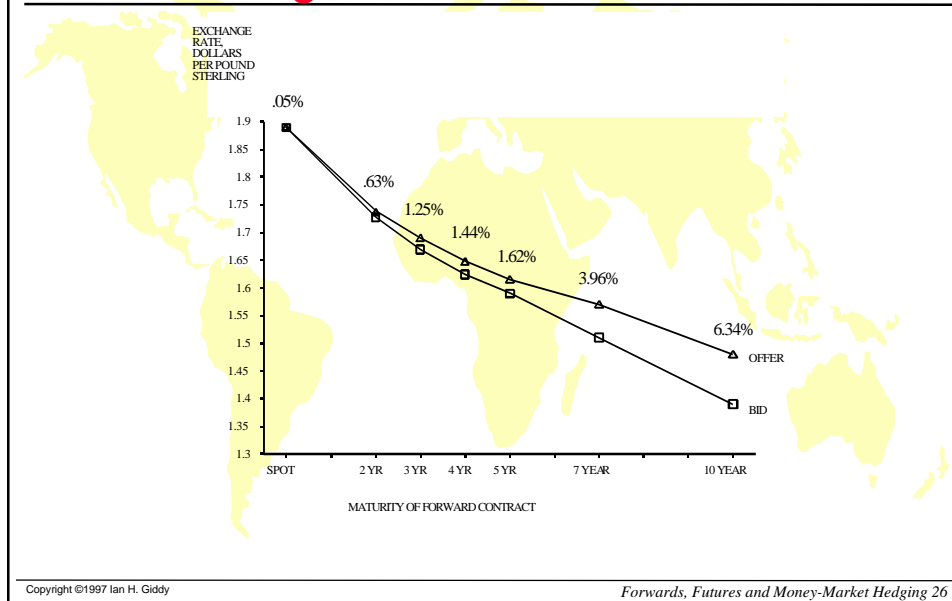
Frutas Amazonas

Eurodollar 3-month loan rate	5 9/16%
Europeseta 3-month loan rate	7 15/16%
Spot exchange rate today	Pta128.210 per USD
Forward exchange rate today	Pta129.005 per USD
Forward discount, % per annum	-2.5

Frutas Amazonas

Type of Hedge	Cost of Hedging
Forward	2.5%
Money Market Hedge (Borrow to match assets)	2.375%
Do nothing	$\frac{2}{128} \times 4$ = 6.25% gain (or 2.5% loss?)

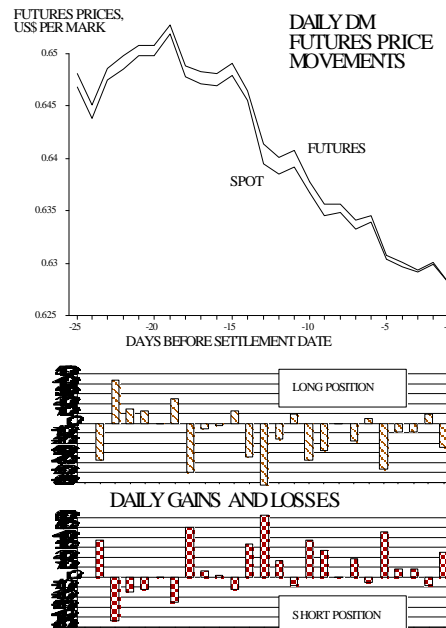
Bid and Offer Quotations in the Long-Dated Forward Market



Forwards, Money Market Hedging and Futures

- **Forward contracts:** OTC contracts for future delivery, often settled in cash
- Forwards can be used in
 1. Hedging
 2. Positioning
 3. Arbitrage
- Interest rate parity means that a forward hedge is, normally, the same as a *money market hedge*.
- **Futures** are free of default risk.

Marking-to-Market of a Futures Contract



Forwards vs Futures vs Options

- Good credit: Forward usually best
- Sometimes, Money Market Hedge better
 - ◆ Perfect market: same (covered int. arb.)
 - ◆ Imperfect market: MMH may be better
- Credit problem: Futures
 - ◆ But: limited and standardized
 - ◆ Requires margin and daily settlement
- Uncertain future cash flows:
 - ◆ Liquid instrument (futures/forwards to assure flexibility)
 - ◆ Options sometimes advisable

