

FOREX RISK



Confederazione degli Imprenditori Italiani nel Mondo



Allargare il sistema Paese per fare piú forte l'Italia

Foreign Exchange Risk

- What are foreign exchange (forex) rates?
- What determines forex rates?
- How forex rates affect corporations?
- What can corporations do to hedge against forex volatility?
- What are the effects of a change in forex rates on banks?
- What can banks do to protect against forex volatility?
- What are the forex risks with respect to the market trend?
- What are the expectations for EUR/USD forex rate?



Foreign Exchange Rate

- A forex rate is the price of a currency in terms of another currency
- "Foreign Exchange" is the simultaneous buying of one currency and selling of another. Currencies are traded in pairs, for example Euro/US Dollar (EUR/USD) or US Dollar/Japanese Yen (USD/JPY).
- The forex market has a daily turnover of US\$1.9 trillion
- The FX market is considered an Over The Counter (OTC) or 'interbank' market, due to the fact that transactions are conducted between two counterparts over the telephone or via an electronic network. Trading is not centralized on an exchange, as with the stock and futures markets.



Examples of Quotes

	USD	EUR	JPY	GBP	CHF	CAD	AUD	HKD
HKD	7.785	9.968	0.0663	14.8656	6.2475	6.9032	6.0404	
AUD	1.2888	1.6502	0.011	2.461	1.0343	1.1428		0.1656
CAD	1.1278	1.444	0.0096	2.1534	0.905		0.875	0.1449
CHF	1.2461	1.5955	0.0106	2.3794		1.1049	0.9668	0.1601
GBP	0.5237	0.6705	0.0045		0.4203	0.4644	0.4063	0.0673
JPY	117.44	150.3702		224.2517	94.246	104.1366	91.1217	15.0853
EUR	0.781		0.0067	1.4913	0.6268	0.6925	0.606	0.1003
USD		1.2804	0.0085	1.9095	0.8025	0.8867	0.7759	0.1285

- $\text{EUR/USD} = 1.2804 \rightarrow$ I NEED 1.2804 USD TO BUY 1 EURO
- $\text{USD/JPY} = 117.44 \rightarrow$ I NEED 117.44 YEN TO BUY 1 USD
- $\text{GPB/USD} = 1.9095 \rightarrow$ I NEED 1.9095 USD TO BUY 1 BRITISH POUND
- $\text{USD/CHF} = 1.2461 \rightarrow$ I NEED 1.2461 SWISS FRANCS TO BY 1 USD



What determines forex?

- In the long-run (20 years), foreign exchange rates are determined by inflation (supply and demand concept)
- In the medium term (3-5 years), foreign exchange rates are determined by trade balance (import-export, investments, dividends, ecc.)
- In the short-term (1 year), there is a strong correlation between the traders' expectations and the forex movements.
- Traders are influenced by: inflation, interest rates, economic growth, trade balance.



How forex rates affect corporations?

- Corporations export products abroad. Customers require to be billed in domestic currency. Exporters thus bears forex risk
- **Example:**
Company A (Italian Exporters) receive an order from a US buyer. Price is set at the time of the contract. Invoice is issued at the time of delivery. Payment is after 90 days.



How forex rates affect corporations?



- **4/1/2006** → The Company sells its product at €100 in Italy. The cost of the product is €80. The margin is €20 (25%). The Company decides to sell the product at \$120 (100×1.20)
- **5/1/2006** → At the time of the invoice, the Company needs to translate the USD invoice in EUR at the prevailing market rate (1.25). Recorded Sales: €96 ($120/1.25$). Margin: €16 (20%). This is only accounting!!!!
- **8/1/2006** → At the time of the payment, the Company finally gets the money. Cash Inflow: €92.31. Margin: €12.31 (15.38%). This is real.



What can Company A do?

- Use derivatives to hedge its currency risk exposure (forwards, options, swaps).
- Let's see an example with a forward.
- Company A decides to sell (short) dollar forward. Why? I have dollars (long dollars) and need Euros.
- Let's assume Company A can get a forward quote from a Bank of EUR/USD 1.22 with maturity 4 months. On August 1, 2006, the Company can sell USD and buy EUR at 1.22 no matter what happen to the spot rate.
- In a nutshell, I set the price today for a future date. At the future date I exchange USD for EUR at the price set at t_0



What happens if the rates have the opposite trend?



- **4/1/2006** → The Company sells its product at €100 in Italy. The cost of the product is €80. The margin is €20 (25%). The Company decides to sell the product at \$120 (100×1.20). The Company sells \$120 forward at 1.22.
- **5/1/2006** → At the time of the invoice, the Company needs to translate the invoice in USD in EUR at the prevailing market rate (1.15). Recorded Sales: €104.34 ($120/1.15$) → GAIN: €4.34. The Company records a loss on the forward. It can sell \$120 at 1.22 (€98.36) through the forward and buy \$120 at 1.16 (€103.44) → LOSS = -€5.08. Overall loss: -€0.74



What happens if the rates have the opposite trend?

- 8/1/2006 → At the time of the payment, the Company gets the money. Cash Inflow: €109.09. → GAIN: €9.09. The Company record a loss on the forward. It can sell \$120 at 1.22 (€98.36) through the forward and buy \$120 at 1.15 (€109.09) → LOSS = - €10.73. Overall loss: -€1.64



How forward rates are determined?

- Forward rates are determined by arbitrage
- Interest Rate differentials are key factors in the determination of the currency forward rate.
- $X_F = X_S \cdot (1 + r_{DOM} \cdot T/365) / (1 + r_{FOR} \cdot T/365)$
- If the foreign interest rate exceeds the domestic rate, the forward exchange rate X_F will be at a discount to the spot rate X_S .
- If the domestic rate exceeds the foreign interest rate, the forward exchange rate X_F will be at a premium to the spot rate X_S .
- Example: 1-yr Libor rate in the US is 5.37813%, while in Europe the Euribor rate is 3.93389%. The spot EUR/USD rate is 1.2766. If we apply the formula we get forward rate of 1.2943 vis-à-vis an actual rate of 1.2946.



What about Banks?

- Banks are subject to foreign exchange risk due to foreign investment and forex transaction
- Forex affects the values of the Bank's assets and liabilities
- If a Bank makes a loan to a US company in USD and the USD depreciates in value relative to the EUR, the principal and interest payments received by the Bank would be devalued in Euro terms.



Reclassified Balance Sheet

GRUPPO SANPAOLO IMI

	30/6/2005	31/12/2004	Change
ASSETS	(€/mil)	(€/mil)	(%)
A. Cash and liquidity	1.016	1.364	-25.5
B. Financial assets (other than loans/assets held to maturity)	91.190	78.230	+16.6
C. Financial assets held to maturity Credits due from banks	1.660	1.818	-8.7
D. Credit due from banks	26.165	24.908	+5.0
E. Loans to customers	132.443	126.280	+4.9
F. Dealing securities	855	1.569	-45.5
G. Value adjustment of financial assets	-	-	-
H. Shareholdings	796	839	-5.1
I. Reinsurance technical reserves	23	25	-8.0
L. Intangible assets	2.248	2.328	-3.4
M. Goodwill	762	766	-0.5
N. Other intangible assets	259	289	-10.4
O. Tax assets	3.299	3.789	-12.9
P. Non-current assets and other due for sale	-	-	-
Q. Other assets	6.910	6.186	+11.7
Total Assets	267.626	248.391	+7.7



Reclassified Balance Sheet

GRUPPO SANPAOLO IMI

	30/6/2005	31/12/2004	Change
	(€/mil)	(€/mil)	(%)
LIABILITIES AND NET CAPITAL			
A. Payables due to banks	39.963	28.293	+41.2
B. Payables due to customers	92.436	88.735	+4.2
C. Securities	51.496	53.061	-2.9
D. Financial assets for trading	11.685	11.270	+3.7
E. Financial assets at fair value	21.672	19.255	+12.6
F. Hedging derivatives	874	1.941	-55.0
G. Value adjustment of financial liabilities	34	18	+88.9
H. Tax liabilities	1.261	1.106	+14.0
I. Liabilities related to activities due for sale	-	-	-
L. Other liabilities	11.378	9.790	+16.2
M. Reserves for risks and charges	2.627	2.700	-2.7
N. Technical reserves	21.709	19.983	+8.6
O. Minority interests	196	204	-3.9
P. Group shareholder's equity	12.295	12.035	+2.2
Total Liabilities	267.626	248.391	+7.7



Example

- A Bank has \$100 million loans as assets.
- The Bank can fund this investment by borrowing \$80 million on the interbank market. The difference is funded through a €20 CD. → The Bank is net long \$20 in USD assets (more USD assets than USD liabilities)
- Let's assume that the dollar falls from 1.20 to 1.25. What happens to the Bank's long position?

$$\text{LOSS} = \$20/1.25 - \$20/1.20 = €16 - €16.87 = -.87\text{MM}$$

- If the dollar appreciates, the opposite is true.



How can a Bank manage the Forex Risk?

- Derivatives (options, futures and swaps)
- Let's see a fixed-fixed currency swaps
- A Euro Bank has all its assets denominated in Euros, but it decides to finance those assets with \$120MM issue of 4-years, medium term dollar notes with a fixed coupon of 10%
- A US Bank has all its assets denominated in dollars. It is financing part of its assets with a €100MM issue of 4-year, medium term euro notes with fixed coupon of 10%
- The US Bank is exposed to the risk that the dollar will depreciate over the next four years (more costly to pay interest and principal in Euros). The Euro Bank is exposed to the dollar appreciating against the Euro (more difficult to pay interest and principal in USD)

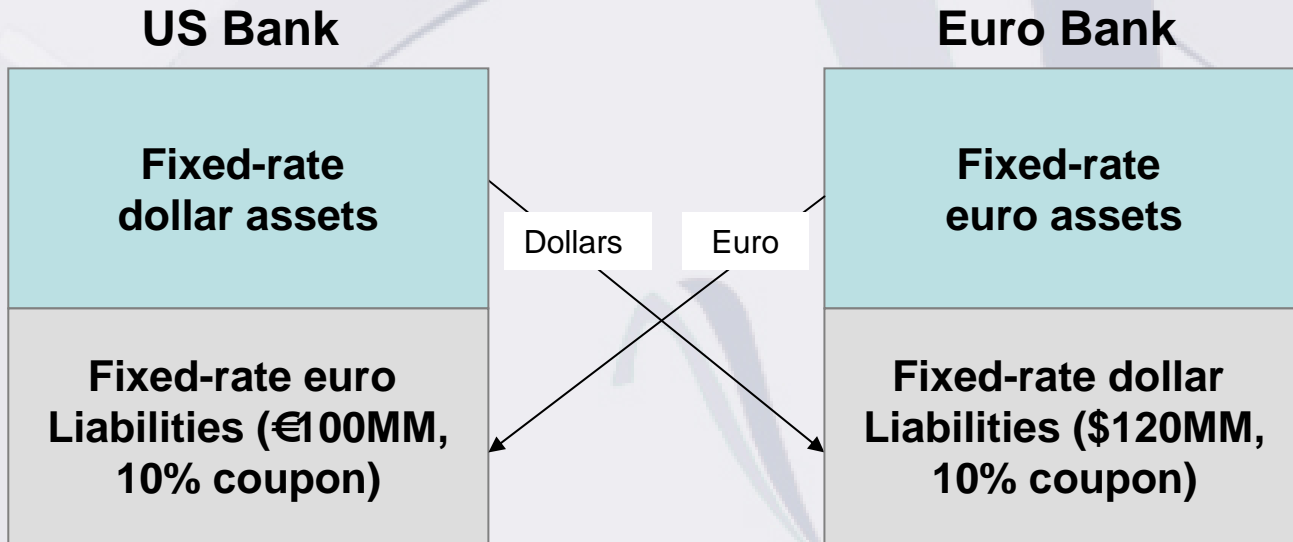


How can a Bank manage the Forex Risk?

- The two Banks can enter into a currency swap at EUR/USD 1.20.
- The Euro Bank send annual payments in euros (that receive from its assets) to cover the coupon and principal repayments of the US Bank's euro note.
- The US Bank sends annual dollar payments (received from its USD assets) to the Euro Bank to cover the interest and principal payments on the dollar note issue.
- The Euro Bank transforms fixed-rate dollar payments into fixed rate euro payments → Receive Euros - PAY Euros
- The US Bank transforms fixed-rate euro payments into fixed rate dollar payments → Receive Dollars - PAY Dollars



How can a Bank manage the Forex Risk?



	US Bank	SPIMI
Cash outflow from balance sheet financing	$-10\% * \text{€}100 = -\text{€}10$	$-10\% * \$120 = -\12
Cash inflow from swap	$+10\% * \text{€}100 = +\text{€}10$	$+10\% * \$120 = +\12
Cash outflow from the swap	$-10\% * \$120 = -\12	$-10\% * \text{€}100 = -\text{€}10$
Net Cash Flow	-\$12	-€10



EUR/USD Forex Rate: Factors of Weakness

- Japanese Interest Rates

Recent economic growth in Japan is leading to hikes in short- and long term interest rates. Japan has had a zero yield curve for many years. Since Japan represents the country with the highest saving rates worldwide, holder of roughly 680 billion treasury IOUs issued by the US Government, higher yields could attract the attention of Japanese investors who could pull their investments out of the United States.

- US Deficit and Debt

The US Deficit is fast growing. Recently, the Senate has approved the possibility for the Government to issue additional debt up to a threshold of US\$ 9 trillion. Since about 60% of the US debt is held abroad by non-US investors, an increase in state deficit exposes the US Economy to high forex volatility.



EUR/USD Forex Rate: Factors of Weakness

- Chinese Forex Policy

The slow appreciation of the Chinese currency continues to favor imports from China. The trade deficit has reached \$800bn during last quarter. The increase in trade deficit will jeopardize the dollar value in the medium term, if China does not let its currency to fluctuate freely.

- Inflation

Inflation and ongoing oil cost rise in USA (fuel price soared by 300% in the last 6 years) risk to affect the US economic growth, leading to a US dollar decline. In the past, the FED was always prompted to increase interest rates in presence of inflationary pressures.

- Real Estate Bubble

Economists are currently revising down economic growth expectations in the United States. These perceptions mainly arise from the weak trend showed by the real estate sector (36% of GDP).



EUR/USD Forex Rate: Factors of Strengths

- Interest Rate Hikes

The US dollar could benefit in the short term from the increase in interest rates, especially if ECB decides not to increase the interest rates in Europe (very unlikely).

- Reserve Account Factor

The US dollar is a reserve account. Central Banks hold the dollar as a reserve independently of economic factors.

- Seasonality

The US dollar tends to appreciate during the summer.



Facts regarding the EUR/USD Forex Rate

- The daily percentage changes of the EUR/USD forex rate have a mean of zero.
- The daily volatility of the EUR/USD forex rate has increased steadily to 0.67% (10.7% on annual basis).
- It is not predictable how the EUR/USD will move in the short term. Given the high volatility, it is important to manage the risk by using hedging strategies.



Possible Trends

- The dollar may appreciate during the summer. Possible range: 1.25 - 1.27
- By the end of the year, the dollar will move toward 1.30
- It is likely that ECB will intervene to support the dollar in case the forex rate approaches to 1.35. In fact, a rate of 1.35 may jeopardize the European recovery.



Any Question?

Q&A



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