Corporate Finance

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TRANSLATION AND ECONOMIC RISK AND EXCHANGE RATE DETERMINATION

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Translation and economic risk and exchange rate determination

- Managing translation risk
- Managing economic risk
- Exchange rate determination
  - Purchasing power parity
  - Interest rate parity
  - Expectation theory
  - Current account and capital flows
  - Efficiency of currency markets

Managing translation risk

- Matching the currency of assets and liabilities
- Graft plc has decided to go ahead with a US$190m project in the USA - One way of financing this is to borrow £100m and exchange this for dollars at the current exchange rate of US$1.9/£

Opening balance sheet

Liabilities		Assets	
Loan	£100m	US assets	£100m

- The dollar depreciates against sterling to US$2.30/£

Year-end balance sheet

Liabilities		Assets	
Loan	£100m	US assets	£82.61m
	£100m		£82.61m
Forex loss	–£17.39m		

Graft plc

- Finance dollar assets by obtaining a dollar loan

Opening balance sheet

Liabilities		Assets	
Loan	£100m	US assets	£100m

- If forex rates move to US$2.30/£

Year-and balance sheet

Liabilities		Assets	
Loan	£82.61m	US assets	£82.61m

Managing economic risk

- Economic exposure is concerned with the long-term effects of forex movements on the firm's ability to compete, and add value
- The hedging techniques for transaction risk are of limited use
- The matching principle could be employed
- The main method of insulating the firm from economic risk is to position the company in such a way as to maintain maximum flexibility
  - Production facilities in numerous countries
  - Flexibility in sourcing supplies
  - Allow for forex changes when deciding in which countries to launch an advertising campaign
  - Plan in advance response to a forex movement with regard to the pricing of goods
  - Notion of the real option

Exchange-rate determination

- **Purchasing power parity**
  - Basket of goods should cost the same regardless of the currency in which it is sold
  - If a basket of goods sold for £10,000 in the UK and an identical basket sold for US$15,000 in the USA then the rate of exchange should be US$1.50/£
  - If the rate of exchange was US$3.00/£ British consumers can buy a basket of goods in the US market half the price they would pay in the UK market (£5,000 can be exchanged for US$15,000)
  - Exchange rates will be in equilibrium when their domestic purchasing powers at that rate of exchange are equivalent

Price of a basket of goods in UK in sterling	×	US$/£ exchange rate	= Price of a basket of goods in USA in dollars
£10,000	×	1.50	= US$15,000

PPP theory over a period of time

- Sterling and the US dollar are at PPP equilibrium at the start of the year with rates at US$1.50/£
- Over the year the inflation rate in the UK is 15 per cent so the same basket costs £11,500 at the end of the year
- US prices rose by 3 per cent the US domestic cost of a basket will be US$15,450
- If the exchange rate remains at US$1.50/£ there will be a disequilibrium and PPP is not achieved
- A UK consumer is faced with a choice of either buying £11,500 of UK produced goods or exchanging £11,500 into dollars and buying US goods.
- The consumer's £11,500 will buy US$17,250 at US$1.50/£

Purchasing power parity (PPP)

$$\frac{1 + I_{US}}{1 + I_{UK}} = \frac{US\$/£_1}{US\$/£_0}$$

I_{US} = US inflation rate

I_{UK} = UK inflation rate

$US\$/£_1$ = the spot rate of exchange at the end of the period

$US\$/£_0$ = the spot rate of exchange at the beginning of the period

$$\frac{1 + 0.03}{1 + 0.15} = \frac{US\$/£_1}{1.50}$$

$$US\$/£_1 = \frac{1 + 0.03}{1 + 0.15} \times 1.50 = 1.3435$$

- At this new exchange rate a basket of goods costing US$15,450 in the USA has a sterling cost of 15,450/1.3435 = £11,500 and thus PPP is maintained

PPP

- The pure PPP concludes that the country with the higher inflation rate will be subject to a depreciation of its currency, and the extent of that depreciation is proportional to the relative difference in the two countries' inflation rates
- The PPP theory has some problems when applied in practice
- It only applies to goods freely traded internationally at no cost of trade
- It works in the long run, but that may be years away

Interest rate parity

- The interest rate parity theory holds true when the difference between spot and forward exchange rates is equal to the differential between interest rates available in the two currencies
- Suppose a UK investor is attracted by the 8 per cent interest rate being offered on one-year US government bonds
- One-year UK government bonds offer 6 per cent interest
- The IRP theory says that this investor will not achieve an extra return by investing abroad rather than at home because the one-year forward rate of exchange will cause the US$ to be at a discount relative to the present spot rate

Interest rate parity

1. Beginning of year
   a. Exchange £1m for US$1.5m at the spot rate of US$1.5/£
   b. Buy US$1.5m government bonds yielding 8 per cent
   c. Arrange a one-year forward transaction at US$1.5283/£ to sell dollars
2. End of year

   Exchange US$1.62m (US$1.5m × 1.08) with the bank which agreed the forward exchange at the beginning of the year at the rate 1.5283 to produce 1.62 × 1.5283 = £1.06m

The formula which links together the spot, forward and interest rate differences

$$\frac{1 + r_{US}}{1 + r_{UK}} = \frac{US\$/£_F}{US\$/£_S}$$

r_{US} = interest rate available in the USA

r_{UK} = interest rate available in the UK (for the same risk)

$US\$/£_F$ = the forward exchange rate

$US\$/£_S$ = the spot exchange rate

- Consider the case where both the spot rate and the forward rate are at US$1.50/£ - Here the investor can prearrange to convert the dollar investment back into sterling through a forward agreement and obtain an extra 2 per cent by investing in the USA
- The IRP theory generally holds true in practice - However there are deviations

Expectations theory

- The expectations theory states that the current forward exchange rate is an unbiased predictor of the spot rate at that point in the future
- **The theory does not say that the forward rate predicts precisely what spot rates will be in the future**
- For the more widely traded currencies it generally works well
- This knowledge may be useful to a corporate manager or treasurer

The influence of a current-account deficit and capital flows

- The presence or otherwise of an unsustainable balance of payments
- The exchange rate will move (in theory) so as to achieve current-account balance
- The **Fundamental Equilibrium Exchange Rate** (FEER) is the exchange rate that results in a sustainable current-account balance
- In reality, there are many factors other than the trade balance causing forex rates to move

The efficiency of the currency markets

- Efficient at pricing spot and forward currency rates
- Speculators on average should not be able to make abnormal returns by using information to take positions
- In an efficient market the best prediction of tomorrow's price is theprice today
- If the market is efficient, forecasting by corporate treasurers is a pointless exercise
- Weak form
- Semi-strong form
- Strong form
- **The question remains open**
- **Alan Greenspan 'To my knowledge no model projecting movements in exchange rates is superior to tossing a coin'**