Swaps

Chapter 6

Nature of Swaps

A swap is an agreement to exchange cash flows at specified future times according to certain specified rules

An Example of a "Plain Vanilla" Interest Rate Swap

- An agreement by Microsoft to receive 6-month LIBOR & pay a fixed rate of 5% per annum every 6 months for 3 years on a notional principal of $100 million
- Next slide illustrates cash flows

Cash Flows to Microsoft

(See Table 6.1, page 127)

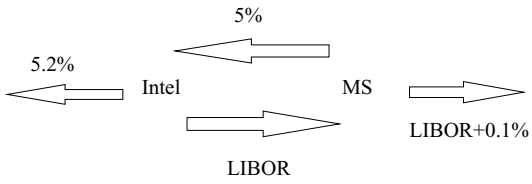
		---------Millions of Dollars---------		
Date	LIBOR Rate	*FLOATING* Cash Flow	*FIXED* Cash Flow	Net Cash Flow
Mar.5, 2001	4.2%			
Sept. 5, 2001	4.8%	+2.10	–2.50	–0.40
Mar.5, 2002	5.3%	+2.40	–2.50	–0.10
Sept. 5, 2002	5.5%	+2.65	–2.50	+0.15
Mar.5, 2003	5.6%	+2.75	–2.50	+0.25
Sept. 5, 2003	5.9%	+2.80	–2.50	+0.30
Mar.5, 2004	6.4%	+2.95	–2.50	+0.45

Typical Uses of an Interest Rate Swap

- Converting a liability from
  - fixed rate to floating rate
  - floating rate to fixed rate
- Converting an investment from
  - fixed rate to floating rate
  - floating rate to fixed rate

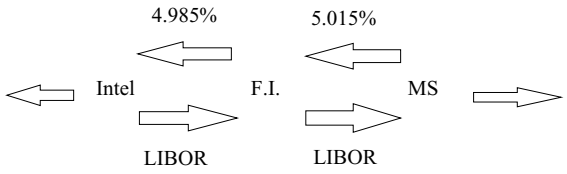
Intel and Microsoft (MS) Transform a Liability

(Figure 6.2, page 128)



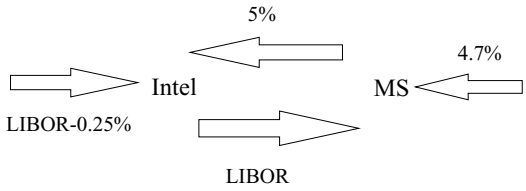
Financial Institution is Involved

(Figure 6.4, page 129)



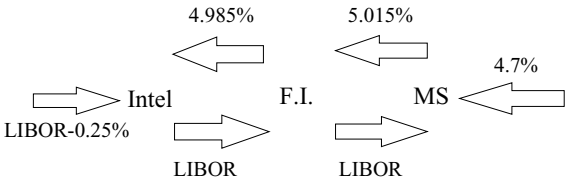
Intel and Microsoft (MS) Transform an Asset

(Figure 6.3, page 128)



Financial Institution is Involved

(See Figure 6.5, page 129)

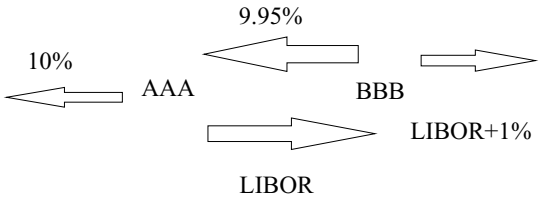


The Comparative Advantage Argument (Table 6.4, page 132)

- AAACorp wants to borrow floating
- BBBCorp wants to borrow fixed

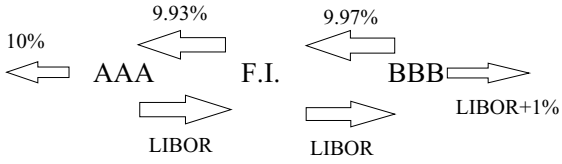
	Fixed	*Floating*
AAACorp	10.00%	6-month LIBOR + 0.30%
BBBCorp	11.20%	6-month LIBOR + 1.00%

The Swap (Figure 6.6, page 132)



The Swap when a Financial Institution is Involved

(Figure 6.7, page 133)



Criticism of the Comparative Advantage Argument

- The 10.0% and 11.2% rates available to AAACorp and BBBCorp in fixed rate markets are 5-year rates
- The LIBOR+0.3% and LIBOR+1% rates available in the floating rate market are six-month rates
- BBBCorp's fixed rate depends on the spread above LIBOR it borrows at in the future

Valuation of an Interest Rate Swap

- Interest rate swaps can be valued as the difference between the value of a fixed-rate bond and the value of a floating-rate bond
- Alternatively, they can be valued as a portfolio of forward rate agreements (FRAs)

Valuation in Terms of Bonds

- The fixed rate bond is valued in the usual way
- The floating rate bond is valued by noting that it is worth par immediately after the next payment date

Valuation in Terms of FRAs

- Each exchange of payments in an interest rate swap is an FRA
- The FRAs can be valued on the assumption that today's forward rates are realized

An Example of a Currency Swap

An agreement to pay 11% on a sterling principal of £10,000,000 & receive 8% on a US$ principal of $15,000,000 every year for 5 years

Exchange of Principal

- In an interest rate swap the principal is not exchanged
- In a currency swap the principal is exchanged at the beginning and the end of the swap

The Cash Flows (Table 6.6, page 140)

Year	Dollars $ millions	Pounds £ millions
2001	–15.00	+10.00
2002	+1.20	–1.10
2003	+1.20	–1.10
2004	+1.20	–1.10
2005	+1.20	–1.10
2006	+16.20	-11.10

Typical Uses of a Currency Swap

- Conversion from a liability in one currency to a liability in another currency
- Conversion from an investment in one currency to an investment in another currency

Comparative Advantage Arguments for Currency Swaps (Table 6.7, page 141)

General Motors wants to borrow AUD

Qantas wants to borrow USD

	USD	AUD
General Motors	5.0%	12.6%
Qantas	7.0%	13.0%

Valuation of Currency Swaps

Like interest rate swaps, currency swaps can be valued either as the difference between 2 bonds or as a portfolio of forward contracts

Swaps & Forwards

- A swap can be regarded as a convenient way of packaging forward contracts
- The "plain vanilla" interest rate swap in our example consisted of 6 FRAs
- The "fixed for fixed" currency swap in our example consisted of a cash transaction & 5 forward contracts

Swaps & Forwards (continued)

- The value of the swap is the sum of the values of the forward contracts underlying the swap
- Swaps are normally "at the money" initially
  - This means that it costs nothing to enter into a swap
  - It does not mean that each forward contract underlying a swap is "at the money" initially

Credit Risk

- A swap is worth zero to a company initially
- At a future time its value is liable to be either positive or negative
- The company has credit risk exposure only when its value is positive