

Financial Management

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Lecture 10

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- Hedging
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Hedging with futures

Among the most important use of derivatives are speculation and hedging.

Speculation with derivatives consists in taking a position allowing to buy or sell at a price more convenient than what will be the spot price at maturity. It is risky and should generally be avoided, especially from a financial management perspective.

Hedging involves using the derivative(s) as a hedge, i.e., as an investment position that neutralizes future fluctuations in the value of an investment.

Hedging with futures

A **short hedge** involves taking a short position in futures contracts. It is appropriate when the hedger owns an asset to be sold at a later date, and wants to eliminate the risk of its price being lower than expected.

For example, suppose the current spot price of crude oil is 50\$ per barrel and the futures price for a delivery three months from now is 49\$ per barrel (which means that the convenience yield is greater than the cost of carry).

An oil producer can lock the 49\$ price by taking a short position on futures for the desired amount of barrels.

Hedging with futures

Since the futures price near the expiration is very close to the spot price, the producer can then simply close the futures position (which results either in a profit or loss) and sell at the spot price.

The position is closed by taking an opposite long position; the **clearing house** (a financial institution that manages futures positions) will balance the two positions out and close them.

Most futures contract are not taken to expiration, but closed before it in this way.

Hedging with futures

In our example, if the price will be 45\$, the oil producer who took a short position at 49\$ can take a long futures position at 45\$ for the same amount of barrels, and make a profit of 4\$ per barrel. Then the physical barrels are sold at the spot price for 45\$ per barrel, for a total gain of $4 + 45 = 49$ \$ per barrel.

If, on the contrary, the price will be, e.g., 55\$ per barrel, the producer will lose 6\$ to close the futures position, but will then sell the physical barrels at 55\$ on the spot market, so the gain is $55 - 6 = 49$ \$.

Hedging with futures

A **long hedge** involves taking a long position in futures contracts. It is appropriate when the hedger will have to buy a good at a later date, and wants to eliminate the risk of its price being higher than expected.

Consider again the example of crude oil with a current spot price of 50\$ per barrel and futures price for a delivery three months from of 49\$ per barrel.

A buyer who knows will need to buy oil three months from now can lock the 49\$ price by taking a long position on futures for the desired amount of barrels.

Hedging with futures

If the price will be 45\$, the buyer who took a long futures position at 49\$ can take a short futures position at 45\$ for the same amount of barrels and close the position, losing 4\$ per barrel. But he will then buy the physical barrels on the spot market for 45\$ per barrel, for a total expense of $-4 - 45 = -49$ \$ per barrel.

If, on the contrary, the price will be 55\$ per barrel, the producer will make a profit of 6\$ when closing the futures position. But he will then buy the physical barrels at 55\$, so the net expense is $6 - 55 = -49$ \$.

Hedging with futures

In our example we had a **perfect hedge**: one that completely eliminates risk.

In reality, this perfect match generally cannot be achieved, and we are left with some **basis risk**.

This is because the asset to be hedged might not be exactly the same as the one underlying the futures contract, or because of expiration date mismatch, or simply because closing the position early implies some difference between spot and futures price.

This price difference is called **basis**:

basis = spot price of the asset – futures price of contract

Hedging with forwards

What said about hedging with futures also applies to hedging with forwards, aside from the differences due to operating on an OTC market.

Hedging with forwards generally implies lower basis risk, as they are not standardized contracts, but rather contracts tailored on the needs of the parties involved.

Forwards hedges are more likely to be held until expiration compared to futures (both because they are meant to be executed and because closing them early might sometimes be difficult).

Hedging with options

Suppose the current one-year forward exchange rate is 1.20\$ per euro. We could lock this rate with a forward or futures, but we can also use a call option.

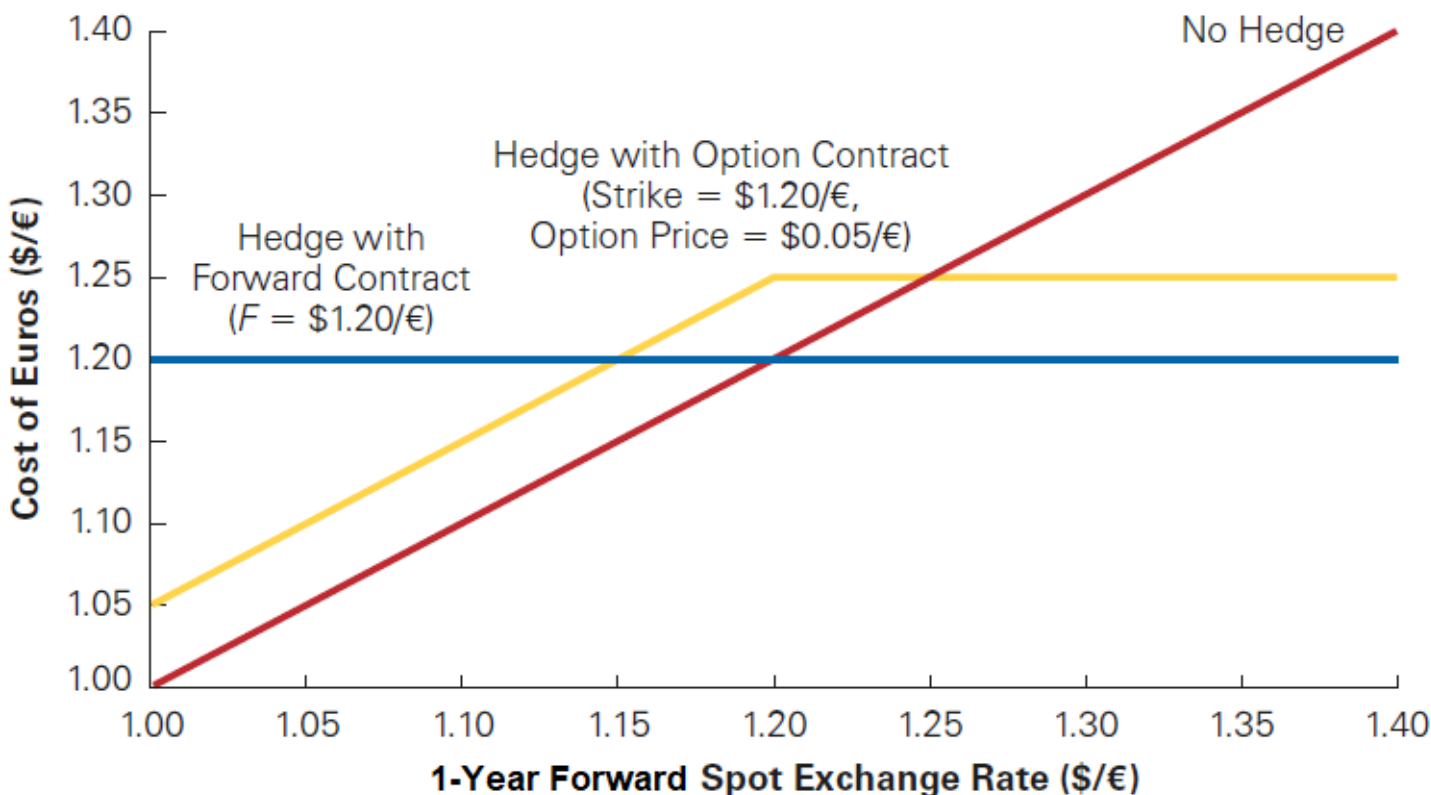
Suppose the call option on euros trades at 0.05\$. For such price, we buy the right – but not the obligation – to buy euros for 1.20\$ per euro one year from now.

If, one year from now, the price is lower than 1.20\$ per euro, we do not exercise the option. If it is higher than 1.20\$ per euro we exercise the option (or we close the position earlier, making a profit from it and then buy at the spot price). So we are protected from price increases.

Hedging with options

The advantage over hedging with futures or forwards is that we can still benefit from lower prices in case the spot rate will decrease rather than increase.

The disadvantage is that we need to pay the price of the option (0.05\$). The net total cost is summarized below:



Leasing

Leasing is a contract between two parties:

- the **lessor**, who owns the asset (a car, land, equipment, etc.) and grants the lease;
- the **lessee**, who obtains use of the property in exchange for lease payments.

Finance (or capital) leases are generally longer term, and the lessee has the option or obligation to purchase the ownership of the asset at the end of the lease, usually for a low price. They are recorded in the balance sheet.

Leasing

A special kind of finance lease is the **sale and leaseback** agreement. Here the owner sells the asset and then retains its use by entering a leasing agreement. This is generally done to free up cash.

Operating leases are typically short-term, and the asset is generally returned to the lessor at the end of it.

Reasons for entering a leasing agreement instead of buying the asset involve lower initial costs, more flexibility, and tax benefits.