

## DERIVATIVES

In finance, a **derivative** is a financial instrument (or, more simply, an agreement between two parties) that has a value, based on the expected future price movements of the asset to which it is linked—called the underlying asset—such as a share or a currency. There are many kinds of derivatives, with the most common being **swaps**, **futures**, and **options**. Derivatives are a form of alternative investment.

A derivative is not a stand-alone asset, since it has no value of its own. However, more common types of derivatives have been **traded on markets before their expiration date as if they were assets**. Among the oldest of these are rice futures, which have been traded on the Dojima Rice Exchange since the eighteenth century.

Derivatives are usually broadly categorized by:

- the relationship between the underlying asset and the derivative (e.g., forward, option, swap);
- the type of underlying asset (e.g., equity derivatives, foreign exchange derivatives, interest rate derivatives, commodity derivatives or credit derivatives);
- the market in which they trade (e.g., exchange-traded or over-the-counter); and
- their pay-off profile.

### Uses

Derivatives are used by investors to:

- provide leverage (or gearing), such that a small movement in the underlying value can cause a large difference in the value of the derivative;
- speculate and make a profit if the value of the underlying asset moves the way they expect (e.g., moves in a given direction, stays in or out of a specified range, reaches a certain level);
- hedge or mitigate risk in the underlying, by entering into a derivative contract whose value moves in the opposite direction to their underlying position and cancels part or all of it out;
- obtain exposure to the underlying where it is not possible to trade in the underlying (e.g., weather derivatives);
- create option ability where the value of the derivative is linked to a specific condition or event (e.g., the underlying reaching a specific price level).

### Hedging

Derivatives can be considered as providing a form of insurance in hedging, which is itself a technique that attempts to reduce risk.

Derivatives allow risk related to the price of the underlying asset to be transferred from one party to another. For example, a wheat farmer and a miller could sign a futures contract to exchange a specified amount of cash for a specified amount of wheat in the future. Both parties have reduced a future risk: for the wheat farmer, the uncertainty of the price, and for the miller, the availability of wheat. However, there is still the risk that no wheat will be available because of events unspecified by the contract, such as the weather, or that one party will renege on the contract. Although a third party, called a clearing house, insures a futures contract, not all derivatives are insured against counter-party risk.

From another perspective, the farmer and the miller both reduce a risk and acquire a risk when they sign the futures contract: the farmer reduces the risk that the price of wheat will fall below the price specified in the contract and acquires the risk that the price of wheat will rise above the price specified in the contract (thereby losing additional income that he could have earned). The miller, on the other hand, acquires the risk that the price of wheat will fall below the price specified in the contract (thereby paying more in the future than he otherwise would have) and reduces the risk that the price of wheat will rise above the price specified in the contract. In this sense, one party is the insurer (risk taker) for one type of risk, and the counter-party is the insurer (risk taker) for another type of risk.

Hedging also occurs when an individual or institution buys an asset (such as a commodity, a bond that has coupon payments, a stock that pays dividends, and so on) and sells it using a futures contract. The individual or institution has access to the asset for a specified amount of time, and can then sell it in the future at a specified price according to the futures contract. Of course, this allows the individual or institution the benefit of holding the asset, while reducing the risk that the future selling price will deviate unexpectedly from the market's current assessment of the future value of the asset.

Derivatives can serve legitimate business purposes. For example, a corporation borrows a large sum of money at a specific interest rate. The rate of interest on the loan resets every six months. The corporation is concerned that the rate of interest may be much higher in six months. The corporation could buy a forward rate agreement (FRA),

which is a contract to pay a fixed rate of interest six months after purchases on a notional amount of money. If the interest rate after six months is above the contract rate, the seller will pay the difference to the corporation, or FRA buyer. If the rate is lower, the corporation will pay the difference to the seller. The purchase of the FRA serves to reduce the uncertainty concerning the rate increase and stabilize earnings.

## Types of derivatives

In broad terms, there are two groups of derivative contracts, which are distinguished by the way they are traded in the market:

- **Over-the-counter (OTC) derivatives** are contracts that are traded (and privately negotiated) directly between two parties, without going through an exchange or other intermediary. Products such as swaps, forward rate agreements, and exotic options are almost always traded in this way. The OTC derivative market is the largest market for derivatives, and is largely unregulated with respect to disclosure of information between the parties, since the OTC market is made up of banks and other highly sophisticated parties, such as hedge funds. Reporting of OTC amounts are difficult because trades can occur in private, without activity being visible on any exchange. Because OTC derivatives are not traded on an exchange, there is no central counter-party. Therefore, they are subject to counter-party risk, like an ordinary contract, since each counter-party relies on the other to perform.
- **Exchange-traded derivative contracts (ETD)** are those derivatives instruments that are traded via specialized derivatives exchanges or other exchanges. A derivatives exchange is a market where individuals trade standardized contracts that have been defined by the exchange. A derivatives exchange acts as an intermediary to all related transactions, and takes Initial margin from both sides of the trade to act as a guarantee. According to BIS, the combined turnover in the world's derivatives exchanges totalled USD 344 trillion during Q4 2005.

## Common derivative contract types

1. **Futures/Forwards** are contracts to buy or sell an asset on or before a future date at a price specified today. A futures contract differs from a forward contract in that the futures contract is a standardized contract written by a clearing house that operates an exchange where the contract can be bought and sold, whereas a forward contract is a non-standardized contract written by the parties themselves.
2. **Options** are contracts that give the owner the right, but not the obligation, to buy (in the case of a call option) or sell (in the case of a put option) an asset. The price at which the sale takes place is known as the strike price, and is specified at the time the parties enter into the option. The option contract also specifies a maturity date. In the case of a European option, the owner has the right to require the sale to take place on (but not before) the maturity date; in the case of an American option, the owner can require the sale to take place at any time up to the maturity date. If the owner of the contract exercises this right, the counter-party has the obligation to carry out the transaction.
3. **Swaps** are contracts to exchange cash (flows) on or before a specified future date based on the underlying value of currencies/exchange rates, bonds/interest rates, commodities, stocks or other assets.

## Derivatives

1. What did Warren Buffet call derivatives?
2. What happened to mortgages? What did it lead to?
3. What are derivatives compared to?
4. What are the two elements mentioned to have been at the beginning of the crisis. Explain them.
5. How were loans made?
6. What did the two elements lead to?
7. What procedure failed?
8. What is No. 1 issue? What will be the consequences?
9. What is in the first proposal?
10. What might be the role of a central counterparty?