

Introduction to Derivatives

Module 1

1.1 Let's Get to Know Derivatives Better

If you have tried to invest in the markets before or have heard your parents or family talk about stocks you would have heard the term “Derivatives”. The word “Derivatives” could have been scary then. It is a word that not many people may understand. There is no need to be afraid of Derivates as this module attempts to familiarise you with the concept of derivatives in a simple and easy to understand way.

So, what are derivatives?

A derivative is a financial instrument that does not have a value of its own, the value it has is attached (derived) from another asset. Hence, the word derivatives. Was it too difficult to understand? Let's make it a little simpler through an example.

- Did you know petrol is an example of a derivative?
- Petrol actually does not have a value of its own. It is created from an underlying ingredient called Crude Oil. The value of petrol that we pay at the petrol pump is mainly depended on the value of crude oil.
- So, if the price of crude increases, the price of petrol will also increase.



Derivatives in Capital Markets



A financial derivative is a contract that extracts its worth from other assets on which it is based. Could be stock, bonds, commodities, currencies, etc.

Each derivative would have a specific contract/lot size, expiry date, and price at which the contract would be settled.



There are various types of financial derivatives such as:

- Futures
- Forwards
- Swaps
- Options

We will get to learn a little more about the various types of derivatives in the following chapters.

1.1 What are Forward Contracts?

A Boring History Lesson on Forwards

The first official Derivates were used in 1848 in Chicago, United States of America. It was a customized contract called 'Forwards' where the underlying asset was a commodity called wheat. The reason behind the innovation of derivatives was to reduce the risk from constant price fluctuations of the commodity which effect both the producers and consumers.

Wouldn't you be happy if the price of bread was steady at Rs.8 per loaf for the next few months instead of changing daily or weekly depending on the price of wheat that day? This is what a forward contract aims to do.

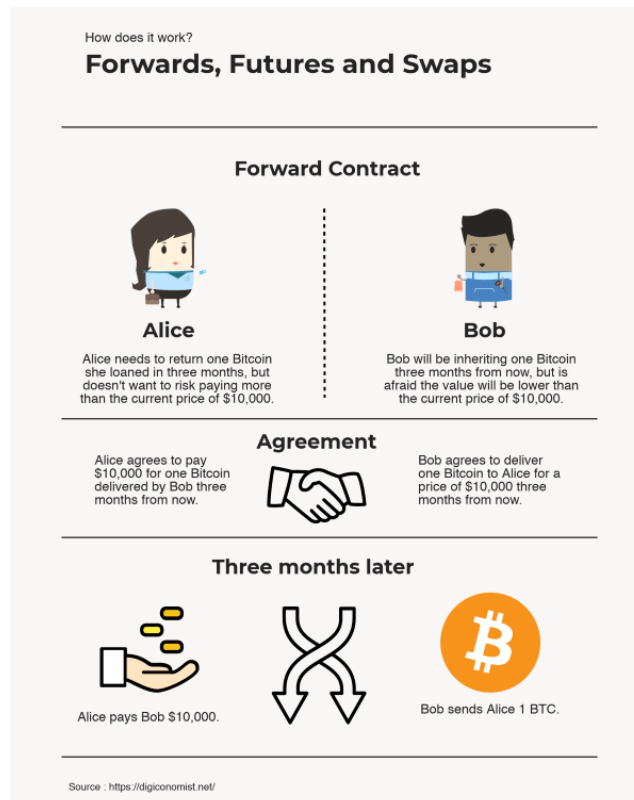
What is a Forward Contract?

Do you remember the wheat example from the history paragraph above? With that example we now know that a forward contract is a customised contract between two people to buy or sell an asset at a specified price in the future. A forward contract is generally used for hedging or speculation.

The two main components of a forward contract:

Price: The contract will state the fixed price at which the asset will be sold in the future

Expiration Date: The contract will also state the fixed delivery date the contract will expire and when the two parties would have to settle the contract. One would sell the asset and receive money and the other would pay money and receive the asset.



A forward contract can be customised between the two parties as it is not trade on an exchange. Therefore, they are known as Over-The-Counter (OTC) products.

1.2 Munna Bhaiya's Special Sauce

Guddu Bhaiya (Seller) and Munna Bhaiya (Buyer)

Let's say in another universe Munna Bhaiya (buyer in contract) is a tomato sauce manufacturer who requires tomatoes to make his 'Munna Bhaiya's Special Sauce'. He enters into a forward contract with Guddu Bhaiya who is an organic tomato farmer to supply him 10,000 kgs of a certain quality of tomatoes at a fixed price in two months. Both parties decide to maintain a price of Rs 10/kg for this contract.

You may be wondering why are they entering into a contract when tomatoes are readily available in the market. This was done to fix the price in advance so that the volatility of prices in the open market could be avoided. As Munna Bhaiya would not change his prices on a daily or a weekly basis depended upon the price of tomatoes in the market as his profit margins. If he maintains his price of sauce while the price of tomatoes change, his profit margins will be effected.

Let us summarise the contract:

1. **Price:** Rs 10/kg
2. **Quantity:** 10,000 kgs
3. **Settlement Date:** 2 months

Profit and loss in forward contracts

Let's discuss profit and loss for both parties in various scenarios:

Scenario 1: Tomato prices close at Rs. 12/kg after 2 months

- In this case, Munna Bhaiya would be able to buy tomatoes at Rs. 10/kg as per contract terms which is Rs. 2 lower than the market rate.
- This means that he will earn a profit of Rs. 2/kg i.e. a total profit of Rs. 20,000 on 10,000 kgs of tomato.
- Conversely, Guddu Bhaiya would lose Rs. 2/kg because he will be selling the tomatoes to Munna Bhaiya at Rs. 2 per kg lower than market rates. This means that he will lose Rs. 20,000 on the transaction.

Scenario 2: Tomato prices close at Rs. 8/kg after 2 months

- In this case, Munna Bhaiya will still buy the tomatoes at Rs. 10/kg as per contract terms which will be Rs. 2 higher per kg than the market rate.
- This means that he would be losing Rs. 2/kg i.e. a total loss of Rs. 20,000 on 10,000 kgs of tomatoes.
- Conversely, Guddu Bhaiya will earn an additional Rs. 2/kg because he will be selling the tomatoes to Munna Bhaiya at Rs. 2 per kg higher than the market rate. This means that he will earn Rs. 20,000 more on the transaction.

Scenario 3: Tomato prices close at Rs. 10/kg after 2 months

- In this case, both parties neither earn nor lose anything as they are transacting at market price. This means that if the market price becomes equal to the contract price on the pre-decided date, no one will lose or earn anything.

Settlements

Settlements of these contracts can be done in two ways: cash settlements or via physical delivery.

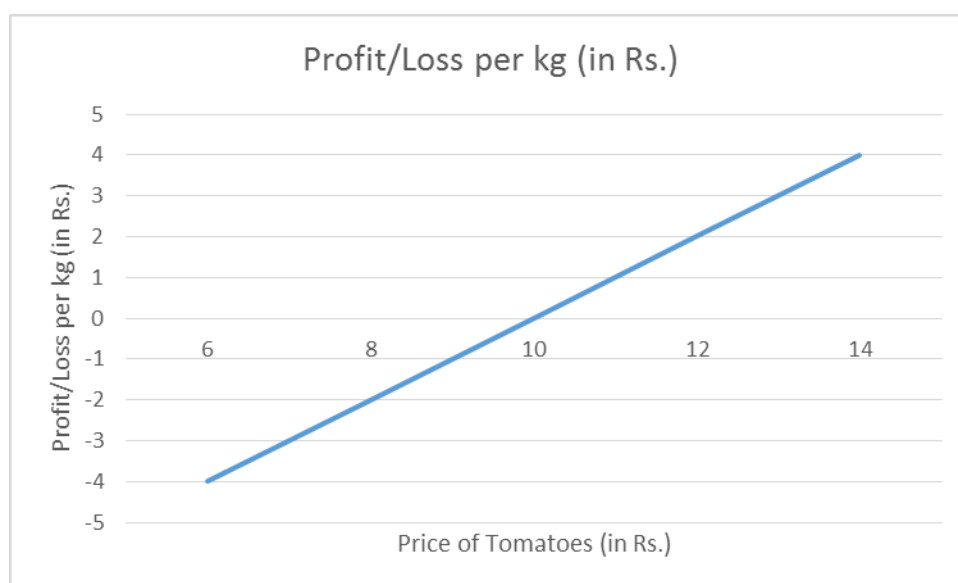
Cash settlement – In a cash settlement, only profit or loss is transferred from one party to the other. In the above example, in scenario 1, Guddu Bhaiya will pay the profit amount i.e. Rs. 20,000 to Munna Bhaiya. Cash settlement is usually preferred by speculators who are not involved in the consumption or trading of that commodity.

Physical settlement – In this case, if scenario 1 plays out, Guddu Bhaiya will deliver 10,000 kgs of tomatoes to Munna Bhaiya at Rs. 10/kg irrespective of the market price. This method of settlement is usually preferred by traders and consumers of underlying goods. This mode of settlement will be used for the example above.

Pay-off graph

Following is the pay-off graph for Munna Bhaiya. You can see from the graph that if the prices of tomatoes increase, then he will earn a profit or else he will incur a loss. The breakeven point, where there is no profit or loss is Rs. 10.

Pay-off graph for Munna Bhaiya (Buyer)



Following is the pay-off graph for Guddu Bhaiya. You can see from the graph that if the price of tomatoes decreases, then he will earn a profit or else he will incur a loss. The breakeven point, where there is no profit or loss for Mr Lakhani is also Rs. 10.

Pay-off graph for Guddu Bhaiya (Seller)

