

Floors and Caps

Now let us make the switch to Insurance and introduce Floors and Caps.

Definition (Floor)

A Floor is the combination of **owning an asset** and **owning a put option** on that asset. A Floor **provides insurance** against a falling asset price.

Here the put option guarantees a minimum sales price of the asset while having the asset's value at time $t=0$ as strike price. Let us look at an example:

Example (Floor)

An investor buys an asset for the price of \$ 500. He also buys a 6-month put option on this asset (with strike price $K = \$ 500$) for \$ 25.88. The risk free rate is 6 % convertible semiannually.

In our example we have:

Asset's market price in 6 months	Put payoff	Total payoff	Profit
400	100	500	-41.66
450	50	500	-41.66
500	0	500	-41.66
550	0	550	8.34
600	0	600	58.34

where Cost = $(\$ 500 + \$ 25.88) * 1,03 = \$ 541.66$

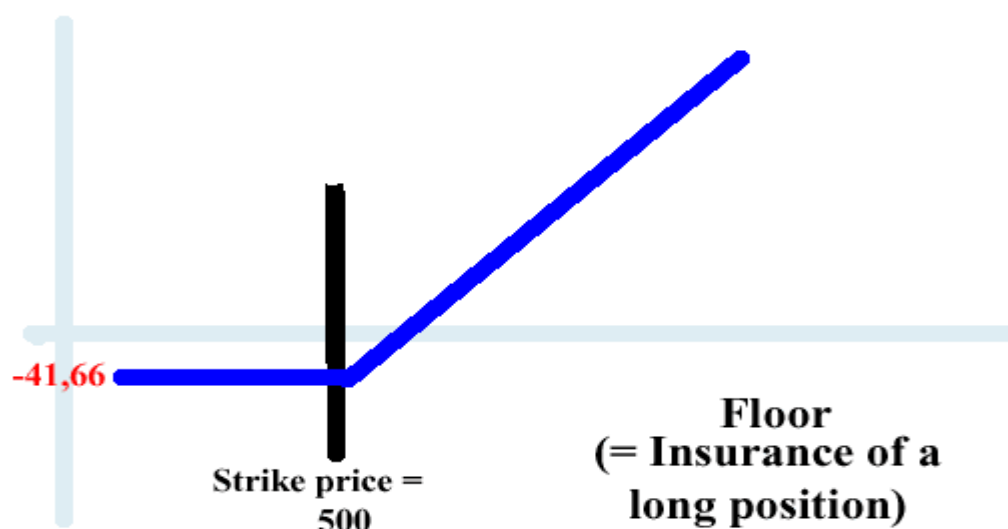


Exhibit FL.1: A Floor

When the asset price in 6 months is less than \$ 500, you lose \$ 41.66, no matter what is the price of the asset. That means you are insured against a decline in the price of the asset.

When you short an asset, you borrow the asset and sell, hoping to replace them at a lower price and profit from the decline. Thus, a short seller will experience loss if the price rises. He can insure his position by purchasing a call option to protect against a higher price of repurchasing the asset. The combination of short sale and purchased call option is called a **cap**.

Definition (Cap)

A cap is the **combination** of a **purchased call option on an asset** and a **short position on the asset** itself.

The call option provides insurance for the short position.

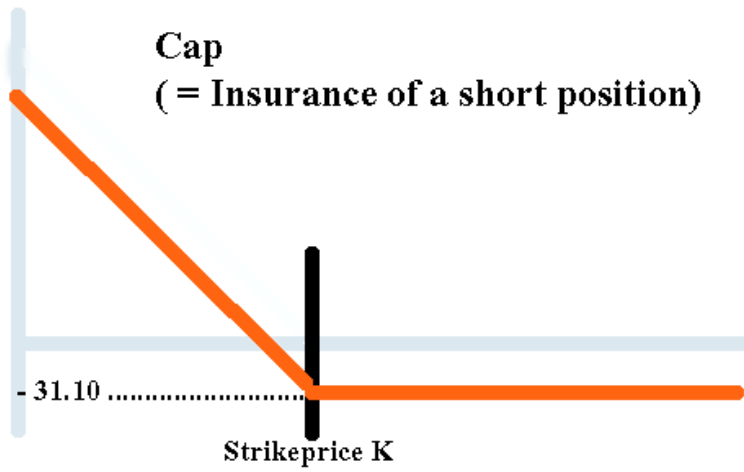
Here comes an example:

Example (Cap)

Short an asset for \$ 500 and purchase a 6-month call option (with strike price of $K = \$ 500$) for a premium of \$ 46.90. The risk-free rate is 6 % convertible semiannually.

Asset's market price in 6 months	Shortened	Call Option payoff	Total payoff	Profit
400	-400	0	-400	66.9
450	-450	0	-450	16.9
500	-500	0	-500	-33.1
550	-550	50	-500	-33.1
600	-600	100	-500	-33.1

where $Cost = (- \$ 500 + \$ 46.70) * 1.03 = - \$ 466.90$



When the asset price in 6 months is more than \$ 500, you loose \$ 31.10, no matter what is the price of the asset. That means you are insured against an increase in the price of the asset.