***European Option Put-Call Parity***

Buying a stock and buying a put option is equivalent to buying a call option and buying government bonds, where both European-style options are written on the same underlying stock, with the same strike price and maturity, and the government bond investment equals the present value of the options’ strike price:

LongStock + LongPut = LongCall + LongGovtBonds

The above equation shows asset prices at time zero (now).

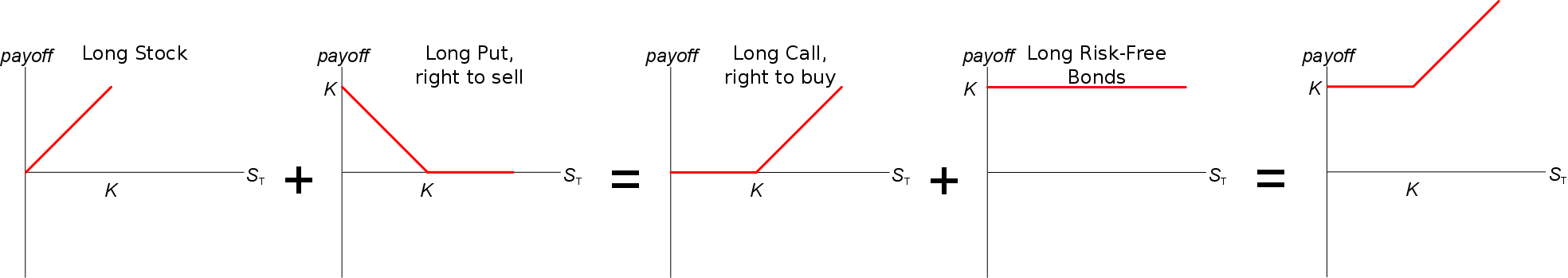
This relationship should always hold before and at maturity. At any time t:

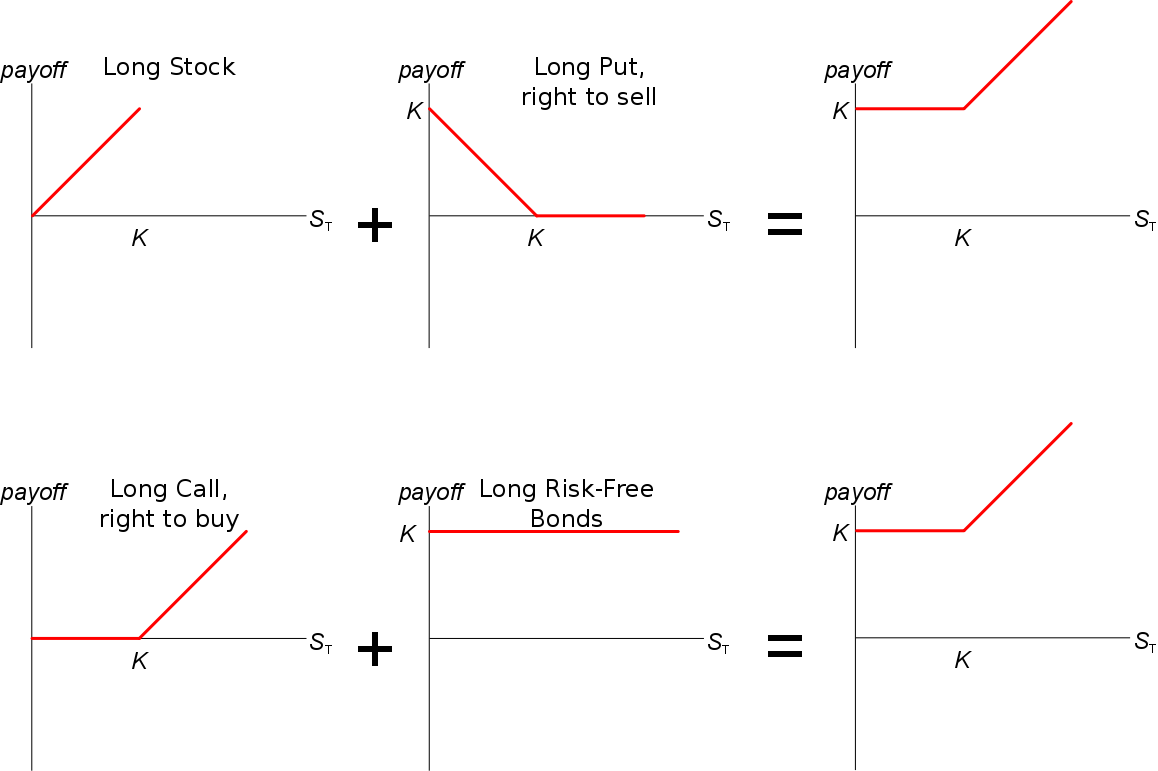
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At maturity (T):





***Investments versus Cash Flows***

A positive investment is a negative cash flow, so put-call parity expressed as an investment now (t=0) uses the familiar equation:

But put-call parity expressed as cash flows now (t=0) is:

This is because investing in, say, a stock, means paying money now which is a negative cash flow now, hence the switch in the signs (+ to -). So:

Buying stock = Long stock = Investing in stock = Spending cash on stock = Negative cash flow on stock purchase

***Adjustment for Dividends***

Dividends can be included by simply replacing all instances of with:

* where is the present value of the discrete dividend paid at time t, so and r is the continuously compounded risk free rate:
* where is the continuously compounded annual dividend yield, say when is a stock index such as the S&P500: