

FNCE20005 CORPORATE FINANCIAL DECISION MAKING

TUTORIAL 1: OPTIONS

Part A Solutions

1. (a) *Put option.* The buyer of a put obtains the right to sell the underlying asset.
Call option. The buyer of a call obtains the right to buy the underlying asset.
(b) *American option.* This may be exercised at any time up to (and including) the expiry date.
European option. This may be exercised only on the expiry date (and not before).
(c) *Time value of an option.* This is the difference between an option's price and its 'intrinsic' value. For a call, intrinsic value is the difference between asset price and exercise price (if this difference is positive), or zero (if this difference is negative). That is; $\text{Max}[P_T - X, 0]$. For a put option the intrinsic value is $\text{Max}[X - P_T, 0]$. All other things being equal, time value is greater the longer the term to expiry. However, time value reflects a number of factors apart from term to expiry – for example an increase in volatility of asset prices will also increase the time value of the option.
Time value of money. A dollar receivable today is worth more than a dollar receivable at a later date. This is for three reasons. Firstly, in the presence of inflation, a dollar received today has more purchasing power than a dollar received in the future. Secondly, the dollar received today is inherently less risky than a dollar promised tomorrow. Finally, a dollar received today can be invested and hence generate a return overnight whereas the dollar promised tomorrow cannot. This implies that there is an opportunity cost with delaying receipt of the dollar.
2. The statement is false. A put option is not the opposite of a call option. For example, the payoffs on a put option are not simply the opposite of the payoffs on a call option. Instead, the opposite position to buying a call option (going long) is selling a call option (going short). Similarly, the opposite to buying a put option (going long) is selling a put option (going short).

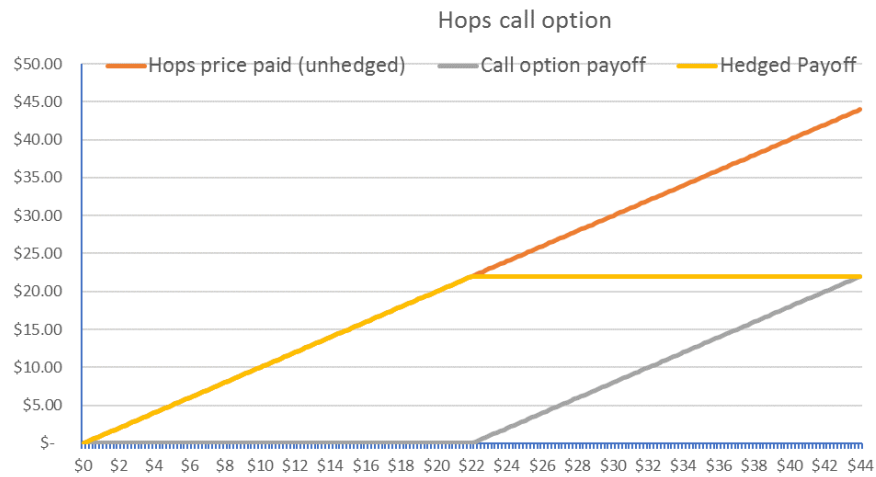
Put simply, the opposite of buying a call option is selling a call option. The opposite of buying a put option is selling a put option.
3. The factors and the direction of influence of each factor on call price are as follows:
 - (a) Current share price (positive).
 - (b) Exercise price (negative).
 - (c) Term to expiry (positive).
 - (d) Volatility of the share (positive).
 - (e) Risk-free interest rate (positive).
 - (f) Expected dividends (negative).

See lecture notes for an explanation of why these factors impact on options prices as they do.

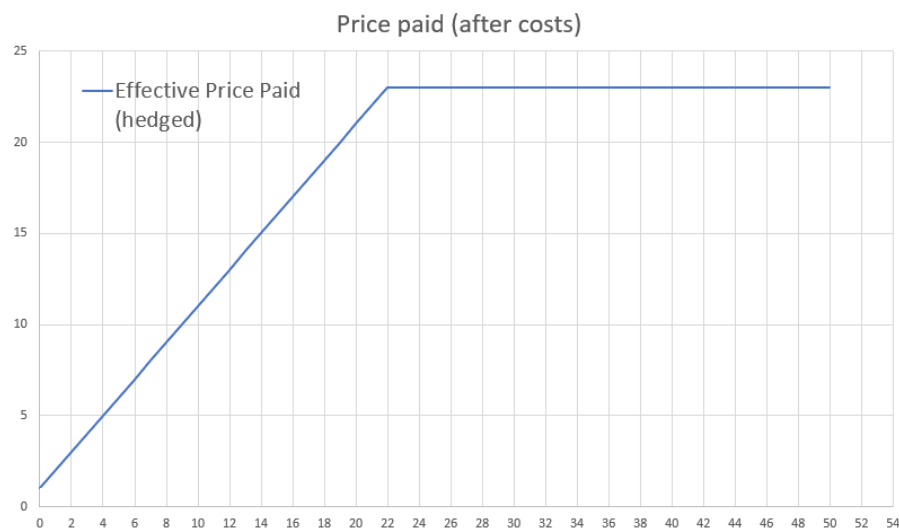
Question 4

(a) To hedge against the risk of a price increase Pinder Ltd would need to buy a call option as this gives them the right to buy the underlying asset at a predetermined exercise price.

(b)

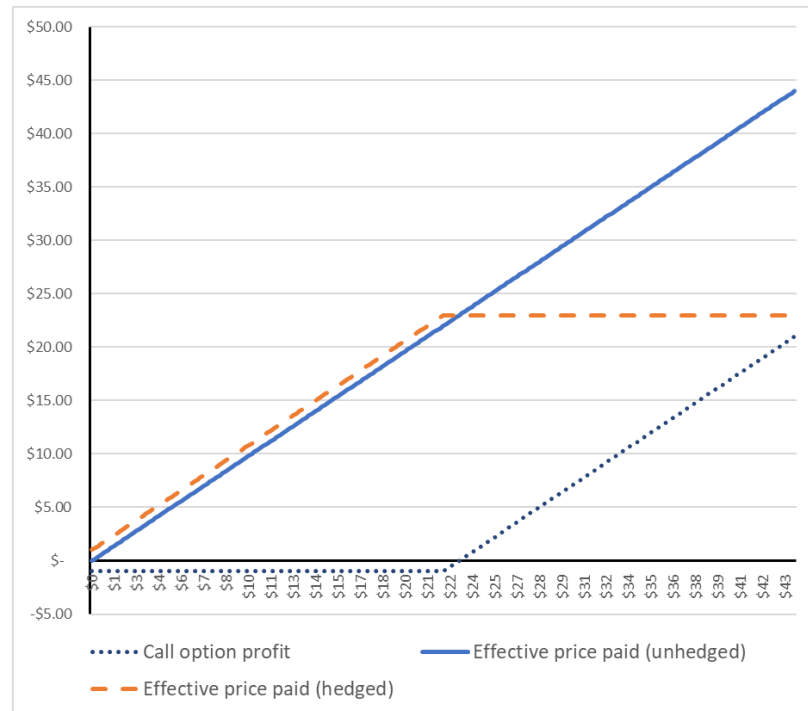


(c)



Note that the diagram here involves an upward shift to reflect the cost of the option.

(d)



The key with this last one is to get across the notion of “hedging and regretting”. That is that having hedged you might actually regret doing so if your competitors don’t hedge if the market doesn’t move against you. For example – in this case if the price of hops does not increase beyond \$23 (which is equal to the exercise price plus the cost of the option) then we are actually worse off then if we had not have hedged at all.