**STOCHASTIC METHODS IN FINANCE 2021–22**
**STAT0013**
**Alexandros Beskos**

# Exercises 2 - Introduction to Derivatives

1. What is the difference between entering into a long forward contract when the forward price is £50 and taking a long position in a call option with a strike price of £50?

2. You would like to speculate on a rise in the price of a certain stock. The current stock price is £29 and a 3-month call with strike of £30 costs £2.90. You have £5,800 to invest. Identify two alternative strategies, one involving an investment in the stock and the other involving investment in the option. What are the potential gains and losses from each?



3. Show that a long forward contract is equivalent to a long position in a European call option and a short position in a European put option with the same strike price.





4. Suppose that you enter into a six-month forward contract on a non-dividend paying stock when the stock price is £30 and the risk-free interest rate (with continuous compounding) is 12% per annum. What is the forward price?

5. An one-year long forward contract on a non-dividend paying stock is entered when the stock price is £40 and the risk-free interest rate (with continuous compounding) is 10% per annum.

   (a) What is the forward price? (the initial value of the forward contract is of course zero).

   (b) Six months later the price of the stock is £45 and the risk-free interest rate is still 10%. What is the price of a new forward written at this time with the same delivery date?

   (c) What is the value of the original forward contract at this time?

6. A stock is expected to pay a dividend of \$1 per share in two months and again in five months. The stock price is \$50 and the risk-free rate of interest is 8% per annum with continuous compounding for all maturities. What is the forward price of a six-month forward contract?