SOLUTIONS

Part I Investment Basics

PRODUCTS, MARKETS AND PLAYERS

1. One of the best examples of the use of the prefix "Euro" is in the Eurodollar market where US Dollars are being traded outside of the domestic US Dollar market.

   Answer is (c)

Part I Investment Basics

INVESTMENT RETURN AND RISK

1. Using a HP17B. Note that the repayments are monthly, so we then need to calculate the interest payable on a monthly basis.

   Hence there will be 20 x 12 = 240 payments.

   FIN, TVM. NB. Set the payments at 1 P/YR (1 per period). The number of periods then becomes 240.

   PV +100,000
   IR 6.85/12 = 0.570833
   FV 0
   N 240
   PMT -766.32

   Answer is (a)

2. We take the monthly standard deviation and multiply by the square root of time. In this case, 5.25 x $\sqrt{12}$ = 18.19%

   Answer is (d)

3. First we calculate the purchase price of the CD

$$\text{PRICE} = \frac{\$1{,}000{,}000\left[1+\left(0.10\times\frac{180}{360}\right)\right]}{\left[1+\left(0.095\times\frac{90}{360}\right)\right]}$$

$$= \frac{\$1{,}050{,}000}{1.02375} = \$1{,}025{,}641.03$$

Then we calculate the sale price of the CD 30 days later as a 60 day CD

$$\text{PRICE} = \frac{\$1{,}050{,}000}{\left[1+\left(0.096\times\frac{60}{360}\right)\right]}$$

$$= \$1{,}033{,}464.57$$

Then we work out the annual holding period return on a 365 day basis

$$\text{HOLDING PERIOD RETURN} = \left\{\frac{\$1{,}033{,}464.57 - \$1{,}025{,}641.03}{\$1{,}025{,}641.03}\right\} \times \frac{365}{30} \times 100$$

$$= \underline{\underline{9.28\%}}$$

Answer is (b)

4. The loan commences on 30 Sept for 6-months, terminating on 31 March, 2003 [30 March is a Sunday]. Using the time function on the HP calculator, the actual days in this three-month period are 182.

Accordingly, given a act/365 day count convention, the interest payable on a £1m deposit is: £1m x 0.04125 x 182/365 = £20,568.49

Answer is (b)

5. Cash flows =

Years	1- 5	6-11
	$1000	$2000

Present Value of the cashflows	:	3790.79
		5408.55
Total PV		$9,199.34 x $(1.10)^{11}$
which gives a Future Value of :		$26,246.79
Required amount :		$30,000.00
Deficiency		$3,753.21

The addtional three years annuity with a FV of $3,753.21 would be met by equal instalments of $1,133.91.

Answer is (c)

Part II Investment Basics

BONDS AND GOVERNMENT SECURITIES

1. **Answer = (c)**

2. **Answer = (e)**

3. **Answer = (a)**

4. The accounts are audited by the company's auditors. The investment bank will do all the other things. Note that the lawyers referred to in (b) will be lawyers to the issue – the company may well want to retain separate legal advice.

   Answer is (d)

5. 6-month Bill at issue is 182-day Bill

$$\text{Price} = 100 - \left(5.20\ x\ \frac{182}{360}\right) = 97.3711111111$$

$$\text{Money Market Yield} = \left\{\frac{100}{97.3711111111} - 1\right\} x\ \frac{360}{182}\ x\ 100$$

$$= 5.34\%$$

   Answer = (d)

6. After 60 days Bill will be a 122-day Bill

$$\text{Price} = 100 - \left(5.00\ x\ \frac{122}{360}\right) = 98.305555556$$

$$\text{Holding Period Yield} = \left\{\frac{98.30555555556}{97.3711111111} - 1\right\} x\ \frac{360}{60}\ x\ 100$$

$$= \quad 5.76\%$$

Answer = (b)

7. Calculate the terminal wealth of the CD:

Terminal Value $= \$1,000,000\left\{1+\left(0.06 \text{ x } \frac{180}{360}\right)\right\}$ = \$1,030,000

Then calculate the CD's value as an 80 days CD at a yield of 5.50%

$$\text{Value} = \frac{\$1,030,000}{\left(1+\left\{0.0550 \text{ x } \frac{80}{360}\right\}\right)} = \$1,022,050.72$$

Finally, Calculate the CD's value as a 50 days CD at a yield of 5.60%

$$\text{Value} = \frac{\$1,030,000}{\left(1+\left\{0.0560 \text{ x } \frac{50}{360}\right\}\right)} = \$1,022,050.72$$

Now we can calculate the 30 days return on a 365 days basis:

$$\frac{\{\$1,022,050.72 - \$1,017,563.12\}}{\$1,017,563.12} \text{ x } \frac{365}{30} \text{ x } 100 = 5.37\%$$

Answer = (b)

8. First we calculate the current price of the Treasury Bill

$$\text{PRICE} = 100 - \left[4.5 \times \frac{180}{360}\right] = 97.75$$

The interest cost over the 40 days will be

$$97.75 \text{ x } 0.0475 \text{ x } \frac{40}{360} = 0.5159$$

Hence we would need to sell the Bill at a price of 98.2659

The equivalent discount rate would be

$$(100 - 98.2659) \text{ x } \frac{360}{140} = 4.46\%$$

Answer = (c)

9. Answer = (b)

Part II Bonds and Fixed Income

BOND STRATEGIES

1.

91 days (Sept 16, 1996 → Dec 16,1996) 182 days (Dec 16,1996 → June 16,1997)

Sept 16, 1996 Dec 16,1996 June 16,1997

Money market yield on T-Bill.

Price of T-bill $= 100 - \left[5.75\ x\ \frac{273}{360}\right]$

$= 95.639583$

Money Market Yield $= \left[\frac{100}{95.639583} - 1\right] x \frac{360}{273}$

$= 6.012155\%$

Terminal Value of T-Bond $= 4\left[1 + R\%\ x\ \frac{182}{360}\right] + 104$

Price = 101.625 Accrued = 2.0109

Dirty Price = 103.6359

Hence to breakeven with T-Bill

$$(103.6359)\left[1 + 0.06012155\, X \frac{273}{360}\right] = 4\left[1 + R\%\, x \frac{182}{360}\right] + 104$$

R = <u>17.85%</u>

2. First we calculate the zero yields

6-month zero 100.50 = $\frac{103}{1 + R_1}$

R_1 = 2.4876%

12-month zero 105.28125 = $\frac{5.5}{1.024876} + \frac{105.5}{(1+R_2)}$

R_2 = 2.7570%

Coupon yield is calculated as

$$100 = \frac{C}{1.024876} + \frac{(100+C)}{(1.02757)^2}$$

C = 2.7533% x 2

Annual Coupon = 5.5067% = 5.51%

Answer = (c)

3. Firstly we must calculate the price of the Treasury Bond

$$\text{Price} = \frac{2.5}{1.03} + \frac{2.5}{(1.03)^2} + \frac{2.5}{(1.03)^3} + \frac{102.5}{(1.03)^4} = 98.142$$

Secondly, we calculate the duration of the bond:

$$\text{Duration} = \frac{\frac{2.5}{1.03} + \frac{2.5(2)}{(1.03)^2} + \frac{2.5(3)}{(1.03)^3} + \frac{102.5(4)}{(1.03)^4}}{98.141} = 3.854 \text{ Half Years}$$

Thirdly, we use the duration number to calculate the expected price change for a 100 basis points change in yield:

$$\text{Expected Change} = \frac{98.141 \text{ x } 3.854 \text{ x } 0.0050}{1.03} = 1.836$$

Finally we re-calculate the exact price of the bond using a yield of 7.00%

$$\text{Price} = \frac{2.5}{1.035} + \frac{2.5}{(1.035)^2} + \frac{2.5}{(1.035)^3} + \frac{102.5}{(1.035)^4} = 96.327$$

Actual Price Change is: 98.141 - 96.327 = 1.814

Answer = (a)

4. The Hedge Ratio is obtained from:

$$HR = \frac{P_1}{P_2} \times \frac{D_1}{D_2} \times \frac{(1 + Y_2)}{(1 + Y_1)} \times \frac{\text{Change in } Y_1}{\text{Change in } Y_2}$$

Assuming equal absolute changes in yield on both bonds we have:

$$HR = \frac{98.00}{105.00} \times \frac{5.0}{4.0} \times \frac{1.065}{1.064} = 1.1678$$

You would therefore require $10,000,000(1.1678) or $11,678,000 nominal of the second bond as a hedge.

Answer = (d)

5. Using the HP17B Bond program gives a yield to maturity for a 10-year T-Bond maturing on March 22 2013 with settlement on March 22 2003 as 7.5038%.

The true annual yield is therefore:

$$(1 + R) = \left(1 + \frac{0.075038}{2}\right)^2$$

$$R = 7.6446\%$$

The price of the zero must be:

$$P = \frac{100}{(1.07446)^{10}}$$

$$P = 47.87$$

Answer = (d)

6. First we work out the price changes per 100 nominal using the usual equation:

$$\text{Price} \times \text{Duration} \times \frac{\text{Basis Point}}{1 + \text{Yield}}$$

$$\text{Bond} \quad 102 \times 6 \times \frac{0.0001}{1.0675} = 0.05733$$

$$\text{Hedge} \quad 95 \times 7 \times \frac{0.0001}{1.068} = 0.06227$$

Hence hedge amount will be

$$\$10,000,000 \times \frac{0.05733}{0.06227} = \$9,206,681$$

or $9,207,000 rounded

Answer is (e)

7. First we must calculate the zero coupon interest rates by bootstrapping.

$$100 = \frac{108}{1+R_1} \qquad R_1 = 8\%$$

$$98.30 = \frac{7.5}{1.08} + \frac{107.5}{\left(1+R_2\right)^2} \qquad R_2 = 8.48\%$$

$$97.00 = \frac{7.25}{1.08} + \frac{7.25}{(1.0848)^2} + \frac{107.25}{\left(1+R_3\right)^3} \qquad R_3 = 8.43\%$$

Now we use these zero rates to calculate the fair value of the 9% 3 year bond

$$\text{PRICE} = \frac{9}{(1.08)} + \frac{9}{(1.0848)^2} + \frac{109}{(1.0843)^3}$$

$$= \underline{\underline{101.48}}$$

Answer is (c)

8. Step 1 Work out yield to maturity on bond with HP17B

Type	30/360 Annual
Settlement	30/9/00
Maturity	30/9/04

Coupon	6%
Call	100
Price	98

Gives yield = 6.585%

Step 2 Calculate bond's duration

$$D = \frac{\frac{6}{1.06585} + \frac{6(2)}{(1.06585)^2} + \frac{6(3)}{(1.06585)^3} + \frac{106(4)}{(1.06585)^4}}{98}$$

= 3.6693

Step 3 Calculate duration implied price change for yield reduction of 1%

$$\Delta P = -3.6693 \text{ x } 98 \text{ x } \left(\frac{-0.01}{1.06585}\right)$$

= 3.3738

Step 4 Calculate actual price change for yield reduction of 1% using HP17B

Yield = 5.585%
Gives
Price = 101.4517

PRICE CHANGE = 101.4517 - 98

= 3.4517

Hence	DURATION CHANGE	=	3.3738
	CONVEXITY CHANGE	=	0.0779
	TOTAL CHANGE	=	3.4517

Answer is (b)

9. First we must calculate the zero coupon interest rates by bootstrapping.

$$100 = \frac{108}{1 + R_1} \qquad R_1 = 8\%$$

$$98.30 = \frac{7.5}{1.08} + \frac{107.5}{(1+R_2)^2} \qquad R_2 = 8.4768\%$$

$$97.00 = \frac{7.25}{1.08} + \frac{7.25}{(1.084768)^2} + \frac{107.25}{(1+R_3)^3} \qquad R_3 = 8.4316\%$$

Now we use these zero rates to calculate the fair value of the 9% 3 year bond

$$\text{PRICE} = \frac{9}{(1.08)} + \frac{9}{(1.084768)^2} + \frac{109}{(1.084316)^3}$$

$$= \underline{\underline{101.48}}$$

Answer is (c)

10. **Answer is (a)**

11. Assuming even yield, etc., as above, the bond with the call disadvantages the investor compared to the bond with no embedded options, while those with the puts give the investor an advantage compared to the bond with no embedded options.

    Answer is (b)

12. The first step is clearly to calculate the zero coupon interest rates by bootstrapping. To keep things simple, we assume equal 6-month periods.

$$100.50 = \frac{100+3.5}{1+R_{1/2}} \qquad R_1 = \underline{5.97\%}$$

$$99.53125 = \frac{3}{1+\left(\frac{0.0597}{2}\right)} + \frac{(100+3)}{(1+R_{2/2})^2}$$

$$R_2 = \underline{6.50\%}$$

$$104.1875 = \frac{5}{1+\left(\frac{0.0597}{2}\right)} + \frac{5}{\left[1+\left(\frac{0.065}{2}\right)\right]^2} + \frac{(100+5)}{\left(1+\frac{R_3}{2}\right)^3}$$

$$R_3 = \underline{7.045\%}$$

Then we can calculate the price of an eighteen month zero coupon bond by:

$$P \quad = \quad \frac{100}{\left[1+\left(\frac{0.07045}{2}\right)\right]^{3}} \quad = \quad 90.1354 \quad = \quad 90\text{-}04$$

Answer is (b)

13. First we need to calculate the market price of the bond. Using a bond calculator with a 30/360 annual basis, I get a price of 101.7526.

We then calculate the PV of the cash flows

$$\frac{6}{1.055} = 5.6872$$

$$\frac{6}{(1.055)^{2}} = 5.3907$$

$$\frac{6}{(1.055)^{3}} = 5.1097$$

$$\frac{106}{(1.055)^{4}} = 85.5650$$

Now we calculate the duration from

$$D = \frac{5.6872(1) + 5.3907(2) + 5.1097(3) + 85.5650(4)}{101.7526}$$

$$= \underline{\underline{3.676}} \text{ years}$$

Answer is (d)

Part III Equities

EQUITIES: ANALYSIS AND VALUATION

1. Answer is (d)

2. Since the historic P/E ratio is 10.0, the last dividend payment was 20p and the payout ratio is 40%, we can determine the current stock price:

$$P_0 = 20p\ (10)\ \left\{\frac{1}{0.40}\right\} = 500p$$

Using Gordon's Growth Model to determine the expected return on the stock:

$$R = \frac{D_1}{P_0} + G$$

$$R = \frac{20\ (1.12)}{500} + 0.12 = 16.48\%$$

The incremental return over the Risk-Free rate is therefore 8.48%

Answer = (d)

3. If last dividend was 30P and dividend payout ratio is 30%, most recent earnings were 100P.

Given a P/E ratio of 20 the current price is evidently 2000P.

We know expected return on equity from Gordon Model is sum of dividend yield in period 1 and growth rate.

$$R = \frac{30\ (1.12)}{2000} + 0.12 = 0.1368 \quad (\text{or} \quad 13.68\%)$$

Hence the premium over the riskless rate of 6% is 7.68%.

Answer is (e)

4. Remember we have the usual dividend valuation model

$$P_0 = \frac{D_1}{1.14} + \frac{(D_2 + P_2)}{(1.14)^2}$$

$P_0 = 45 \quad D_1 = 2.5(1.08) = 2.70$

$D_2 = 2.5(1.08)^2 = 2.916$

$$\frac{P_2}{(1.14)^2} = 45 - \frac{2.70}{(1.14)} - \frac{2.916}{(1.14)^2}$$

$$P_2 = 45(1.14)^2 - 2.70(1.14) - 2.916$$

$$= \underline{52.488}$$

We can check this by calculating

$$P_2 = \frac{D_3}{R-g} = \frac{2.5(1.08)^3}{0.14-0.08}$$

$$= \underline{52.488}$$

And rounded to the nearest quarter the share price will be <u>$52.50</u>

Answer = (d)

5.

$$\frac{P_0}{E_0} = 15$$

$$D_1 = 10p$$

$$\frac{D_1}{E_1} = 50\%$$

$$E_1 = 20p$$

$$E_0 = 20p / 1.07 = 18.69p$$

$$P_0 = 15 \times 18.69 = 280.35p$$

Formula for Gordon's growth model

$$P_0 = \frac{D_1}{R-G}$$

$$280.35 = \frac{10}{R-0.07}$$

R = 10.57%

Answer is (c)

6. **Answer is (d)**

Part III   Equities

PORTFOLIO THEORY

1. **Answer is (a)**

2. This is given as follows:

$S^2 = (0.5)^2 (28)^2 + (0.5)^2 (35)^2 + 2 (0.5) (0.5) 196 = 600.25$

$S = 24.50\%$

3. For a perfectly negatively correlated security, we can write

$S^2 = (W_1)^2 (S_1)^2 + (W_2)^2 (S_2)^2 - 2 (W_1) (W_2) (S_1)(S_2)$

Setting this = 0 for a risk-free portfolio and recognising that the above equation is a perfect square of (W_1S_1-W_2S_2), we can write

$0 = W_1S_1 – W_2S_2$ or $W_1/W2 = S_2/S_1$

Substituting, $S_1 = 10$ and $S_2 = 20$ gives W_1: W_2= 2: 1

Answer is (c)

Part III   Equities

THE CAPITAL ASSET PRICING MODEL

1. Answer is (c)

2. If the stock has an alpha of 1%, it is expected to outperform its CAPM return of 6% + (expected return on market – 6%) x 2.0. So, 20% = 1% + 6% +2(E(Rm) – 6%). Solving, gives E(Rm) = 12.5%.

   Answer is (c)

3. Using the CAPM, gives E (R) = 8% + 2(15% - 8%) = 22%. Using the Gordon Growth Model with g = 5% and D1/P0 = 5%, gives an expected return of 10%. Comparing with 22% gives an overvaluation using the CAPM of 12%.

   Answer = (a)

4. Answer is (d)

5. An increased use of equity versus debt will decrease the leverage of the Company. Hence it will do better in bad markets but not so well in good markets.

   Answer is (d)

<u>Part IV   Risk Management Products</u>

FUTURES

1. Remember that the gross basis is simply found from

   BOND PRICE - [FUTURES PRICE x CONVERSION FACTOR]

   = 124.28125 - [109 x 1.13] = 1.11125

   1.11125 x 32 = 35.6 32nds

   Answer is (d)

2. We simply take the dividend yield and interest rate into account

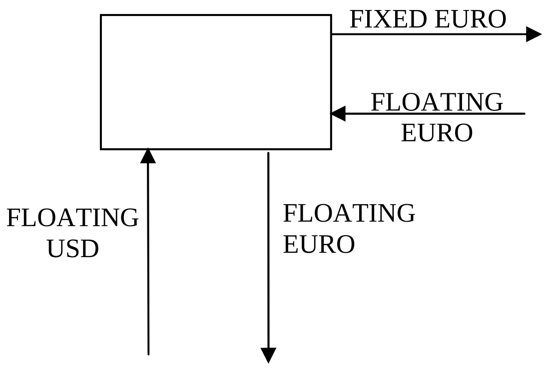
$$
\begin{aligned}
F &= S\left(1 + \left(R - D\right)T\right) \\
&= 1200\left[1 + \left(0.06 - 0.025\right)\left(\frac{90}{360}\right)\right] \\
&= 1210.5
\end{aligned}
$$

   Answer is (d)

Part IV   Risk Management Products

SWAPS (PART OF FUTURES CHAPTER)

1. Obviously candidates need to check the arrows for each of the positions. For (a) we have:



NET IS PAY FIXED EURO, RECEIVE FLOATING USD. THIS IS CORRECT. ALL THE OTHER COMBINATIONS GIVE THE WRONG RESULT.

Answer is (a)

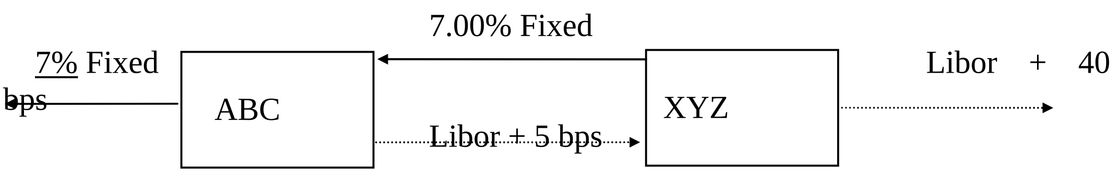
2. 1. If we receive fixed on a swap, we pay the floating;

   2. If we own a floating rate note, we receive the floating;

   Therefore, the net effect of receiving fixed on a swap and owning a floating rate note is to receive fixed on an asset package, which is the equivalent of owning a bond.

   Answer is (a)

3. We can see the net saving by drawing the swap box diagram:



Net cost to XYZ is:

1. Negative Libor + 40 bps
2. Positive Libor + 5 bps

3. Negative 7% Fixed
Net: 7.35%

When compared to a fixed funding rate of 7.50% this is a saving of 15 bps.

Answer = (c)

4. The six month period October 1, 2001 through April 1, 2002 is 182 days.

LIBOR Payment = $- \$100,000,000 \times 0.05 \times \frac{182}{360}$

= - $2,527,777,78

Dividend = $\$100,000,000 \times 0.015 \times \frac{182}{360}$

= $758,333.33

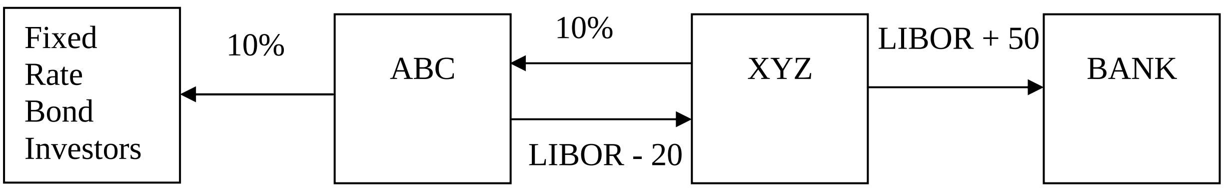
Capital Gain = $\$100,000,000 \quad \frac{100}{1200}$

= $8,333,333.33

Net Payment = + $6,563,889

Answer = (c)

5.



The net cost of fixed rate funding for XYZ is

10% - (LIBOR – 0.20) + LIBOR + 0.50)

= <u>-10.70%</u>

When compared to XYZ's usual fixed rate funding of 11% this represents a saving of 30 basis points

Answer = (a)

6. The question is the same as asking what would be the par yield on a three period bond given the specific zero curve.

Hence we have to find R in the following

$$100 = \frac{R}{1.05} + \frac{R}{(1.0525)^2} + \frac{R}{(1.055)^3} + \frac{100}{(1.055)^3}$$

$R = 5.48$

Hence the 3-period swap rate on the fixed side is 5.48%

Answer is (b)

7. Here we use simple bootstrapping to find the 3-year spot rate.

<u>ONE YEAR</u>

$$100 = \frac{100}{1.05}$$

<u>TWO YEAR</u>

$$100 = \frac{5.25}{1.05} + \frac{105.25}{(1+R_2)^2}$$

$R_2 = 5.256579\%$

<u>THREE YEAR</u>

$$100 = \frac{5.5}{1.05} + \frac{5.5}{(1.05256579)^2} + \frac{105.5}{(1 + R_3)^3}$$

$R_3 = \underline{\underline{5.51867\%}}$

ANSWER IS (c)

8. First we estimate the one, two and three year discount factors:

$$\frac{1}{1.10} = 0.90909091$$

$$\frac{1}{(1.10)(1.11)} = 0.81900082$$

$$\frac{1}{(1.10)(1.11)(1.1225)} = 0.72962211$$

Then we can find the three year per swap rate by finding the coupon yield on a three year bond priced at par.

$$100 = C(0.90909091) + C(0.81900082) + C(0.72962211) + 100(0.72962211)$$

$$C = 11.001194\%$$

ANSWER IS (b)

Part IV Risk Management Products

OPTIONS

1. **Answer is (d)**

2. We simply remember that the expected drift of the stock in a simple Black-Scholes model, with a continuous dividend yield, is given by

$$\text{INTEREST RATE} - \text{DIVIDEND YIELD} - \frac{(\text{VOLATILITY})^2}{2}$$

In this case over one year we have

$$(0.06) - (0.02) - \frac{(0.20)^2}{2} = 0.02$$

Hence the stock price is expected to drift up at 2% per annum.

Answer is (b)

3. Remember the probability of exercise in the Black-Scholes model for a put option is $N(-d_2)$

$$d_2 = \frac{LN\left(S/X\right) + \left[(r-d) - \sigma^2/2\right]T}{\sigma\sqrt{T}}$$

$$= \frac{LN\left(100/100\right) + \left[(0.05-0.02) - \frac{(0.20)^2}{2}\right]0.25}{0.20\sqrt{0.25}}$$

$$= 0.025$$

N(-0.025) is, from the normal distribution tables provided, 0.4900. Hence there is a 49% chance that this option will be exercised.

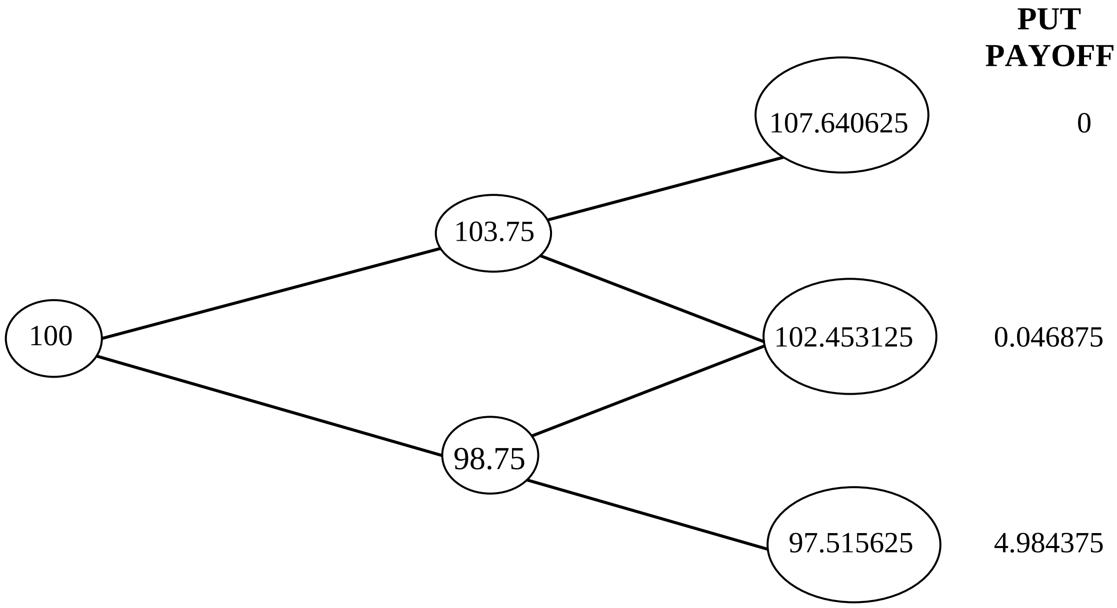
Answer is (b)

4. The first thing we need to do is work out the probability of an up step and a down step.

P (103.75) + (1-P) (98.75) = 100(1.0125)

P = 0.50 (1-P) = 0.50

We can construct the price tree:



Now we value the put in period 1 on the up step and the down step.

UPSTEP $P = \dfrac{0.50(0.046875) + .050(0)}{1.0125} = 0.02315$

DOWNSTEP $P = \dfrac{0.50(4.984375) + 0.50(0.046875)}{1.0125} = 2.48457$

Note that 2.48457 is well below the intrinsic value along the down step of (102.50 – 98.75) or 3.75. Hence we substitute this value to find the option price at period 0.

$$P = \frac{0.50(0.02315) + 0.50(3.75)}{1.0125} = 1.86328$$

Since this is less than the intrinsic value at period 0 of 2.50, the value of the option is 2.50.

Answer is (d)

5. This is a simple application of put-call parity

$$C - P = \frac{F - K}{1 + RT}$$

or $C - P = \dfrac{S - K}{1 + RT}$

so $P = C - S + \dfrac{K}{1 + RT}$

$$= 2 - 100 + \frac{105}{1.0125} = \underline{\underline{5.7037}}$$

Answer is (c)

Part V Institutions and International Investment

INTERNATIONAL INVESTMENT

1. The equilibrium forward rate (FR) is simply the rate that prevents arbitrage. But remember that Sterling money markets operate on a 365 day year and US Dollar rates on a 360 day year.

   Therefore we have:

$$\left\{1+\left(0.06 \text{ x } \frac{91}{365}\right)\right\} = 1.5500 \left\{1+\left(0.0525 \text{ x } \frac{91}{360}\right)\frac{1}{\text{FR}}\right\}$$

$$\text{FR} = 1.5500 \text{ x } \frac{\left\{1+\left(0.0525 \text{ x } \frac{91}{360}\right)\right\}}{\left\{1+\left(0.06 \text{ x } \frac{91}{365}\right)\right\}} = 1.5474$$

   Answer = (d)

2. **Answer = (d)**

   Standard role of economic or operating exposure

3. We can calculate the forward rate in the usual manner.

$$\$1.5250 \quad \frac{\left[1+\left(0.075\times\frac{90}{360}\right)\right]}{\left[1+\left(0.065\times\frac{90}{365}\right)\right]} \quad = \quad \text{FORWARD RATE}$$

   F = $\underline{\underline{\$1.5291}}$

   Answer is (e)

4. **Answer is (e)**

5. The bank will:

   1. Borrow USD 1.5250 at 7.50% for 90 days =

$$\text{USD } 1.525 \left(1+\left[0.075 \text{ x } \frac{90}{360}\right]\right) = \text{ USD } 1.5536$$

2. Sell USD 1.5250 for GBP 1 Spot Value

3. Invest GBP 1 at 6.50% for 90 days = $1 + \left(0.065 \text{ x } \frac{90}{365}\right) = \text{GBP}1.0160$

Therefore in 90 days:

GBP 1.0160 = USD 1.5536

GBP 1 = USD 1.5536 / 1.0160 = **USD 1.5291**

Note that USD are 360 day base whilst GBP are 365 day base.

Answer is (e)

6. The bank will work through the USD to achieve the quote:

1. The bank will buy CHF and sell USD at 1.4130
2. The bank will sell GBP and buy USD at 1.5860

Therefore if USD 1 = CHF 1.4130
And GBP 1 = USD 1.5860

Then GBP 1 must be the equivalent of : CHF 1.4130 x USD 1.5860
= **CHF 2.2410**

Answer is (d)

7. We use the usual FRA payment formula

$$\text{PAYMENT} = \frac{[R - 0.07]\ \$100{,}000{,}000 \left[{}^{N}\!/_{360}\right]}{1 + R\ {}^{N}\!/_{360}}$$

The number of days between July 15, and October 15, is 92 days.

$$\text{PAYMENT} = \frac{[0.085 - 0.07]\ \$100{,}000{,}000 \left[{}^{92}\!/_{360}\right]}{\left[1 + \left(0.085 \times \frac{92}{360}\right)\right]}$$

$$= \underline{\underline{\$375{,}184}}$$

Answer is (d)

8. If the company has to go through the dollar FX market, then he will rationally buy dollars for Swiss Francs and sell dollars for Sterling.

He will pay CHF 1.4130 for his dollars and pay $1.5860 for his Sterling. Hence, the effective CHF/Sterling rate will be

CHF (1.4130) (1.5860) per £ or CHF 2.2410

Answer = (d)

9. We can calculate the forward rate in the usual manner.

$$\$1.5250 \quad \frac{\left[1+\left(0.075\times\frac{90}{360}\right)\right]}{\left[1+\left(0.065\times\frac{90}{365}\right)\right]} \quad = \quad \text{FORWARD RATE}$$

F = $\underline{\underline{\$1.5291}}$

Answer = (e)

10. We work out the rate at which pounds can be offered in three months for dollars to avoid an arbitrage.

Borrow dollars 3-months
Sell dollars for sterling spot
Invest sterling 3-months

At what rate sell sterling for dollars in 3-months to breakeven

Borrow $ at 4 1/8% : 360 day year
Sell $ at 1.9010
Invest £ at 10% : 365 day year

$$\frac{1}{1.9010}\left[1+0.10\,\frac{92}{365}\right] \textit{X Forward Rate}$$

$$=\left[1+0.04125\,x\,\frac{92}{360}\right]$$

$$F = 1.9010\,\frac{\left[1+0.04125\,X\,\frac{92}{360}\right]}{\left[1+0.010\,X\,\frac{92}{365}\right]}$$

= 1.8738

Answer = (d)

11. **Answer = (d)**

Part VI Strategies and Issues

INVESTMENT OBJECTIVES, STRATEGIES AND ISSUES

1. **Answer = (d)**