***Principles of Finance***

A 2 ½ hour exam[[1]](#footnote-1)

**COVERING CHAPTERS 1 - 11**

The exam is in TWO Parts:

 Each part is worth 50% of the total exam mark.

**PART A**: 24 multiple choice questions each worth 1½ marks

 = 36 marks

**PART B**: 4 numerical questions, worth 14, 16, 16 and 18 marks, respectively. = 64 marks

You should attempt ALL questions.

A formula sheet is attached.

**SECTION A**

Answer the following multiple choice questions. Each question is worth 2 marks. This section is worth a total of 50 marks.

**QUESTION 1**

A central bank will engage in *repurchasing* Treasury bill in open market operations so as to \_\_\_\_ interest rates aimed at \_\_\_\_\_ the economy.

(a) raise, restraining;

(b) lower, stimulating;

(c) raise, stimulating;

(d) lower, restraining

**QUESTION 2**

A “Minsky moment” refers to

(a) the moment when debt turns from contributing to sustaining optimistic growth in the economy to contributing to a collapse of asset prices in the economy.

(b) the moment when debt turns from contributing to a collapse of asset prices in the economy to sustaining optimistic growth in the economy.

(c) the moment when government decides to intervene in the economy by lowering interest rates.

(d) the moment when government decides to intervene in the economy by stimulating inflation.

**QUESTION 3**

The prime rate

(a) is the rate at which banks borrow and lend to each other.

(b) is influenced by central banks by the rate the central bank offers on its accounts with the banking sector.

(c) is generally the lowest market rate against which other commercial rates are referenced.

(d) All of the above.

**QUESTION 4**

Which of the following are true statements?

(a) The “yield curve” is a curve that plots the structure of interest rates through time.

(b) The “term structure” of interest rates refers to the structure of interest rates through time.

(c) The discount rate applied to the interest payments and face value of a bond to determine its value is otherwise known as the “yield to maturity” of the bond.

(d) All of the above.

**QUESTION 5**

Company *ABC* has issueda 5-year bond with 5% coupon rate and £1000 face value. The bond currently has a yield to maturity of 8.56%. Calculate the value of the bond. (Assume annual interest payments and that a coupon payment has recently been made.)

(a) £860;

(b) £923;

(c) £1005.4;

(d) £1006.0

**QUESTION 6**

CompanyABC has a policy of retaining 20% of its earnings as reinvestment. This policy is expected to continue indefinitely, as is the company’s growth rate of 5%. If investors require a rate of return in the company of 10%, the P/E of the firm ABC should be

(a) 10.0

(b) 10.4

(c) 16.8

(d) 20.

**QUESTION 7**

It is anticipated that *Company XYZ* will pay a dividend of $4.75 one year from now and a dividend of $5.0 one year following, after which dividends are expected to grow at the rate of 5% per annum indefinitely. If this information is communicated to the market, and the market’s required rate of return is 15%, estimate the current market price of the share.

(a) $20.0

(b) $27.2

(c) $30.0

(d) $47.6

**QUESTION 8**

The following data relates to shares in *Company ABC*:

Last dividend (recently paid): $5; Projected growth rate of dividends (paid annually): 5%.

If the required equity rate of return in *ABC* is 10%, the market value of *ABC* shares is

(a) $55.0

(b) $105

(c) $125

(d) $135

**QUESTION 9**

Company has a *P/E* = 10.4. The company has a policy of retaining 40% of its earnings as reinvestments. This generates a growth rate for the company of 4%, which is expected to continue indefinitely. This is consistent with investors’ required rate of return in *Cypress Avenue* approximately equal to

(a) 10.0%

(b) 20%

(c) 30%

(d) 35%

**QUESTION 10**

The capital asset pricing model (CAPM) states that the expected market risk premium of an investment is proportional to its:

(a) Beta**;**

**(**b) Standard Deviation;

(c) Variance;

(d) All of the above.

**QUESTION 11**

Wehave the following two stocks *AAA* and *BBB*:

|  |  |  |
| --- | --- | --- |
|  Security  | Expected Rate of Return | Beta |
| *AAA* | 7.2% | 1.1 |
| *BBB* | 7.4% | 1.25 |

If the expected market rate of return is 6% and the risk-free rate is 2%, which security would be considered the better buy according to the CAPM?

a. *BBB* because its beta is greater than that of *AAA*

b. *BBB* because its expected return is much greater than the risk-free rate

c. *BBB* because it offers a higher expected return than *Jackson*

d. Both stocks are attractive in relation to the CAPM.

**QUESTION 12**

A risk-free government security yields 5% and the expected market return is 11%.

Thebeta for company ABC is 0.8 and its growth rate is 4.8%. The company’s last dividend (recently paid) was $5.0. Thecurrent price of ABC should be:

(a. $100.00;

(b) $104.8;

(c) $165.8;

(d) $204.8

**QUESTION 13**

In tests of the CAPM,

(a) the outcome returns as a function of beta are generally higher for all portfolios than is predicted by the CAPM.

(b) the outcome returns are generally higher for low beta portfolios and lower for high beta portfolios than is predicted by the CAPM.

 (c) the outcome returns as a function of beta are generally lower for all portfolios than is predicted by the CAPM.

 (d) the outcome returns are generally lower for low beta portfolios and higher for high beta portfolios than is predicted by the CAPM.

**QUESTION 14**

In the tests of the Fama and French three-factor model,

(a) A time-series regression identifies the loading factors on the additional high minus low (book market) and small minus big (firm size) risk premiums for each stock.

(b) Fama and French support their FF-3F model on the basis that the intercepts terms in the above regression are (mostly) indistinguishable from zero.

(c) (a) is a valid statement, but (b) is not.

(d) both (a) and (b) are reasonably accurate statements.

**QUESTION 15**

A firm has Net plant and equipment = $100 million in 2016. The following year it reports Depreciation = $10 million, and expenditure on Net plant and equipment is zero. The Net plant and equipment for 2017 should therefore be

(a) $90 million.

(b) $100 million.

(c) $110 million.

(d) $125 million.

**QUESTION 16**

If a firm has a market debt to equity ratio *VD*/*VE* = ⅓, the firm has ratios *VD*/(*VD* + *VE*) and *VE*/(*VD* + *VE*), respectively, as

(a) 33.3%, 66.6%;

(b) 66.6%, 33.3%;

(c) 20%, 80%;

(d) 25%, 75%

**QUESTION 17**

When comparing levered versus unlevered capital structures, leverage works to increase earnings per share (*EPS*) for successful companies because:

(a) Although debt leads to a reduction of income available for shareholders overall, there

 are fewer shareholders.

(b)Debt leads to an *increase* in total income available for all shareholders.

(c) Interest payments on the debt vary with *EBIT* levels.

(d) Interest payments on the debt stay fixed, leaving *more* income to be distributed over

 *more* shares.

**QUESTION 18**

Company ABC has riskless debt in its capital structure, which makes up 30% of the total capital structure and equity is the other 70% of the total capital structure. The beta of the assets for this business is 0.7 (meaning that the unlevered beta (*βU*) = 0.7). Assuming there are no taxes, and consistent with Modigliani and Miller’s proposition II, which of the following is closest to the value of the equity beta for *ABC*?

(a) 0.73

(b) 1.0

(c) 1.33

(d) 1.25.

**QUESTION 19**

Which of the following statements is correct?

(a) Consistency of the Modigliani and Miller propositions with the *CAPM* requires that investors adjust their cost of equity capital in accordance with the *CAPM*.

(b) Consistency of the *CAPM* with the Modigliani and Miller statements regarding debt, requires that the firm’s borrowing rate on its debt is consistent with its beta.

(c) Statement a. is correct but Statement b. is not necessarily correct.

(d) Both a. and b. above are essentially correct.

**QUESTION 20**

Based on forward rate parity, the larger the degree by which the US interest rate exceeds the foreign interest rate, the:

(a) larger will be the forward discount of the foreign currency.

(b) larger will be the forward premium of the foreign currency.

(c) smaller will be the forward premium of the foreign currency.

(d) smaller will be the forward discount of the foreign currency.

**QUESTION 21**

The spot Euro is quoted $0.96/€. A forward rate of $1.04/€ is closest to a

(a) 8.33% premium for the Euro and 7.69% discount for the $.

(b) 8.33% discount for the Euro and 7.69% premium for the $.

(c) 8.33% premium for the $ and 7.69% discount for the Euro.

(d) 8.33% discount for the $ and 7.69% discount for the Euro.

**QUESTION 22**

According to purchasing power parity, given that Australia and China are running annual inflation rates at 3% and 5.5% this year, respectively, the value of the Australian dollar in terms of the Chinese currency will change. Assuming purchasing power parity, which of the following implies that Australia will gain export competitiveness against China?

(a) Australian dollar appreciates by 2.43%

(b) Australian dollar appreciates by more than 2.43%

(c) Australian dollar appreciates by less than 2.43%

(d) None of the above

**QUESTION 23**

Assume that a call option has an exercise price of $1.50/£. At a spot price of $1.45/£, the call option has

(a) a time value of $0.04;

(b) a time value of $0.00;

(c) an intrinsic value of $0.00;

(d) an intrinsic value of $0.04.

**QUESTION 24**

Jack borrows ¥5,000,000 for 6 months at an annual rate of 0.60% and uses the proceeds to invest in the US money market at an annual rate of 4.50%. If the spot rate today is ¥115/$ and the spot rate in 6 months is ¥113/$ Jack’s net proceeds in 6 months will be:

(a) ¥104,130;

(b) $8,587;

(c) $921;

(d) ¥8,587

**SECTION B**

This section consists of three questions. This section is worth a total of 50 marks.

**QUESTION 1**

Company ***Dylan’s*** *is a book distributor.*  The directors of *Dylan’s* are considering opening a new outlet to extend the company’s capacity. Bob, who is the financial officer, has made forecasts and it is estimated that the new outlet will cost $1.0 million, but will add $1.25 million to the value of the company.

The company is financed entirely by equity capital. The number of shares in issue is 3 million, and the current market price per share is $4.46.

The directors are considering two ways of financing the possible expansion:

1. Raising $1.0 million by a *rights* issue of one new share for every twelve held at a price of $4.0 per share.
2. Raising $1.0 million by a *public* issue of ordinary shares. In this case it is estimated that the issue price on the shares would be $4.20.

**REQUIRED**

(*a*) Assume that a rights issue is made to raise $1 million for the required expansion. Show

(*i*) that the required $1 million of financing can be raised by the proposed “1 for 12” rights issue at $4.0, and estimate, and

  **(4 marks)**

(*ii*) the new ex-dividend market price per ordinary share.

  **(3 marks)**

(*b*) Assume that a public issue is made to raise $1 million for the required expansion. Estimate

(*i*) the number of shares that need to be issued and  **(4 marks)**

(*ii*) the new ex-dividend market price per ordinary share.  **(3 marks)**

 **(4 + 3 + 4 + 3 =14 marks)**

**QUESTION 2**

The attached is the (1) Profit and Loss account and (2) Balance sheet for Company ABCXYZ for end of financial year 2016. ***All numbers are in millions ($)***

The company has 1 million shares, which are currently trading at $63.00.

**REQUIRED**

(a) Calculate the P/E ratio for Company ABCXYZ. **(3 marks)**

(b) Calculate the Price-to-book ratio for Company ABCXYZ. **(3 marks)**

(c) Calculate the firm’s retention ratio for this year. **(2 marks)**

(d) Prepare a *Statement of Cash Flows* so as to justify the Cash and Equivalents entry in the Balance Sheet. **(8 marks)**

 **(3 + 3 + 2+ 8 =16 marks)**

 ***2016***

Sales $100.0

Costs (84.0)

Earnings before interest, taxes, depreciation

and amortization (EBITDA) $16.0

Depreciation (and amortization) (4.0)

Net operating income (NOI) =

Earnings before interest and tax (EBIT) $12.0

Interest (2.0)

Earnings before taxes (EBT) $10.0

Taxes (here, 30% of EBT) (3.0)

**Net income** $7.0

Ordinary dividends (5.0)

**Addition to retained earnings** $2.0

 ***ASSETS 2016 2015 LIABILITIES AND EQUITY 2016 2015***

*Cash and equivalents $5.0 $12.0 Accounts payable $8.0 $8.0*

*Accounts receivable 20.0 20.0 TOTAL CURRENT LIABILITIES $8.0 $8.0*

*Inventory 30.0 26.0 Long-term bonds 32.0 32.0*

*TOTAL CURRENT ASSETS $55.0 $58.0 TOTAL DEBT LIABILITIES $40.0 $40.0*

*Net plant and equipment $45.0 $40.0 Retained earnings 44.0 42.0*

*TOTAL FIXED ASSETS $45.0 $40.0 Ordinary shares 16.0 16.0*

 *BOOK VALUE OF EQUITY = $60.0 $58.0*

***TOTAL ASSETS $100 $98.0 TOTAL LIABILITIES AND EQUITY $100 $98.0***

***Question 3***

**PART A**

Company ABC is considering an upgrade of its photocopying machines. The upgrade at a cost of $18,000 would be effective for the next 3 years and provide savings in efficiency as well as a reduction in on-going maintenance throughout that time. It is assumed that the savings would effectively be the same in each year (in real terms). With or without the upgrade, the company considers that the photocopiers will endure for 5 years and at the end of 5 years will have zero resale value. There are no other implications (such as depreciation allowances) if the company decides to proceed with the upgrade of the photocopiers.

Assume that the additional savings would lead to additional profits that would be liable to corporate tax at 30%.

The company applies a *real* discount rate of 10% to the calculations.

**REQUIRED**

(a) Calculate the savings (in efficiency as well as a reduction in on-going maintenance) in real terms per year that are required to justify the upgrading of the company’s photocopying machines.

 **(6 marks)**

**PART B**

As an alternative, the company is considering replacing its photocopying machines with brand new ones at a cost of $60,000. Again, the company considers that the new machines will lead to savings in efficiency as well as a reduction in on-going maintenance in that time. Again, it is assumed that these savings would be the same in each year (in real terms). If it were to maintain the existing photocopiers, it is anticipated that they would endure to the end of the 3 years when they would have zero re-sale value. The company considers that if it goes ahead and purchases the proposed brand new photocopying machines they will have a re-sale value of $20,000 in real terms at the end of 3 years. The new equipment would qualify for straight-line depreciation over 3 years, which is to say, $20,000 over each of the 3 years in nominal terms. Inflation is expected to be 2% per annum over the next 3 years.

Again, assume that the additional savings would lead to additional profits that would be liable to corporate tax at 30%, and that the company applies a *real* discount rate of 10% to the calculations.

**REQUIRED**

(b) Calculate the savings (in efficiency as well as a reduction in on-going maintenance) in real terms per year that are required to justify the purchase of the proposed new photocopying machines.

 **(10 marks)**

 **(6 + 10 =16 marks)**

**QUESTION 4**

 The following data is currently available to *Joe*:

Spot rate: $ 1.28 / €

one-year forward rate: $ 1.29 / €

one-year US dollar deposit rate: 1.0% per annum

one-year US dollar borrowing rate: 1.0% per annum

one-year euro deposit rate: 2.0% per annum

one-year euro borrowing rate: 2.0% per annum

The following CALL options on the euro would also be available to *Joe’s*:

|  |  |  |
| --- | --- | --- |
|  | Strike price | Premium |
| one-year *call* option on the euro | $ 1.30 / € | $ 0.02/€  |
| one-year *call* option on the euro | $ 1.20 / € | $ 0.10/€  |

**PART A**

(*a*) Determine if the principle of forward parity is consistent with the above data.

  **(3 marks)**

(*b*) Suppose that Joe is considering the following strategies:

*Strategy A*: borrow 1 million dollars, convert to Euros ($1.28/€) and simultaneously use the forward rate ($1.29/€) to guarantee a return to dollars at the end of the year when Joe will repay the borrowed amount with interest.

*Strategy B*: borrow 1 million Euros, convert to dollars ($1.28/€) and simultaneously use the forward rate ($1.29/€) to guarantee a return to Euros at the end of the year when Joe will repay the borrowed amount with interest.

Determine the outcome for Joe under each strategy.

  **(3 marks)**

**PART B**

Suppose that *Joe* in the U.S. knows he must make a payment of €10,000,000 in twelve months.

 In US dollars, determine the outcome amount *Joe* will require in one year under each of the following strategies (ignore the “carry forward” cost of purchasing the option in your calculation):

(*c*) *Joe* chooses to buy the euros forward,

  **(3 marks)**

 (*d*) *Joe* chooses a call option hedge at the strike price of US $ 1.30 / €,

  **(3 marks)**

 (*e*) *Joe* chooses a call option hedge at the strike price of US $ 1.20 / €.

  **(3 marks)**

 (*f*) Calculate the exchange rate at the end of one year at which the two call options considered in PART B provide equal outcomes for *Joe*.

  **(3 marks)**

 **(3 + 3 + 3 + 3 + 3 + 3 = 18 marks)**

***Formula Sheet***

 $ Market bond price=\$PMT\left[\frac{1-(1+r)^{-N}}{r}\right]+\frac{face value of the bond}{(1+r)^{N}}$

 $ PV\_{0}=\sum\_{y=1}^{N}\frac{\$X\_{y}}{(1+i)^{y}} $ .

 $PV\_{0}=\frac{\$X\_{1}}{i-g}$ .

$PV\_{0}=\frac{\$X\_{1}}{i}$ .

 $PV\_{0}=\$X\left[\frac{1-(1+i)^{-N}}{i}\right] $ .

 $PV\_{0}=\$X\left[\frac{1}{i} -\frac{1}{(1+i)^{N}} \frac{1}{i}\right] $ .

$ real rate of interest= \frac{1+nominal interest rate }{1+ inflation rate} - 1$ .

$ Market bond price=\$PMT\left[\frac{1-(1+r)^{-N}}{r}\right]+\frac{face value of the bond}{(1+r)^{N}}$ .

 $P\_{0}^{cum}=DIV\_{0}+\sum\_{i=1}^{\infty }\frac{\$DIV\_{i}}{(1+k)^{i}} $ .

 $P\_{0}^{ex}=share value\_{0}^{ex}=\frac{\$DIV\_{1}}{k-g} $ .

 Real internal growth rate = *b*.*r* .

 $P\_{0}^{ex}=share value\_{0}^{ex}=\frac{\$CFE\_{1}(1-b)}{k-b.r}$ .

$P/E=\frac{(1+g)(1-b)}{k-g}$ .

*kj* = *rf* + *βj* (*MRP*) = *rf* + *βj* [*kM* - *rf* ] .

*kP* - *rf* = *bP*.(*kM* - *rf*) + *sP*.*kSMB* + *hP*.*kHML*  .

 *Vfirm* ≡ *VE* + *VD*  = *VU* .

$ k\_{AV} ≡ \frac{V\_{E}}{V\_{E}+V\_{D}}k\_{E}+\frac{V\_{D}}{V\_{E}+V\_{D}}k\_{D}= k\_{U}$ .

$ k\_{E}=k\_{U}+\frac{V\_{D}}{V\_{E}}\left(k\_{U}-k\_{D}\right)$ .

$β\_{AV}≡ \frac{V\_{E}}{V\_{E}+V\_{D}}β\_{E}+\frac{V\_{D}}{V\_{E}+V\_{D}}β\_{D} $= $β\_{U}$ .

$ β\_{E}=β\_{U}+\frac{V\_{D}}{V\_{E}}\left(β\_{U}-β\_{D}\right)$ .

effective interest rate = nominal interest rate (*iD*) *x* (1 – *Tc*) .

 *free cash flow to equity* (*CFE*) = [*EBIT* - *DEBT*.*iD*](1-*Tc*) + *DEP&A* – *NINV*

 *– repayment of the debt principal*

 $V\_{E}=\sum\_{t=1}^{N}\frac{CFE\_{t}}{(1+k\_{E})^{t}}$

*FCF* = *EBIT*(1–*Tc*) + *DEP&A* – *NINV*

*WACC* ≡$ \frac{V\_{E}}{V\_{D}+V\_{E}}$ *kE* + $\frac{V\_{D}}{V\_{D}+V\_{E}}$ *iD* (1 - *Tc*)

$V\_{project}=\sum\_{t=1}^{N}\frac{FCF\_{t}}{(1+WACC)^{t}}$

$ F^{¥/\$}=S\_{1}^{¥/\$}= S\_{0}^{¥/\$}\frac{1+int^{¥}}{1+int^{\$}}= S\_{0}^{¥/\$}\frac{1+inf^{¥}}{1+inf^{\$}} $ .

Profit for a *Call* option on the Aussie dollar (provided the outcome price of an Aussie dollar is greater than the exercise/strike price) in US dollars (per option on a single Aussie dollar)

= outcome price of an Aussie dollar (US $ per Aussie dollar)

 – exercise price for one Aussie dollar (US $ per Aussie dollar)

 – price (premium, US$) for an option on a single Aussie dollar

Profit for a *Put* option on the Aussie dollar (provided the outcome price of an Aussie dollar is less than the exercise/strike price) in US dollars (per option on a single Aussie dollar) =

 exercise (strike) price for one Aussie dollar (US $ per Aussie dollar)

 – outcome price of an Aussie dollar (US $ per Aussie dollar)

 – price (premium, US$) for an option on a single Aussie dollar

**SOLUTIONS TO MULTIPLE CHOICE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1** | **2** | **3** | **4** | **5** |
| **b** | **a** | **d** | **d** | **a** |
| **6** | **7** | **8** | **9** | **10** |
| **c** | **d** | **b** | **a** | **a** |
| **11** | **12** | **13** | **14** | **15** |
| **d** | **b** | **b** | **d** | **a** |
| **16** | **17** | **18** | **19** | **20** |
| **d** | **a** | **b** | **d** | **b** |
| **21** | **22** | **23** | **24** | **25** |
| **a** | **c** | **c** | **c** |  |

***Solution notes to Multiple Choice questions***

(1) **b;** (2) **a;** (3) **d;** (4) **d;** (5) **a**

(6) $\frac{P}{E}=\frac{\left(1+g\right)\left(1-b\right)}{k-g}$

 $=\frac{1.05 x 0.8}{(0.1-0.05)}$ = **16.8**

(7) $P\_{0}^{ex}=share value\_{0}^{ex}=\frac{\$DIV\_{1}}{k-g}$

 = $\frac{\$4.75}{1.15}$ + $\frac{1}{1.15}\frac{\$5.0}{(0.15-0.05)} $= **$47.6**

(8) $P\_{0}^{ex}=share value\_{0}^{ex}=\frac{\$DIV\_{1}}{k-g}$

*P* = $\frac{\$5.0 (1.05)}{0.1-0.05} $= $**105**

(9) $\frac{P}{E}=\frac{\left(1+g\right)\left(1-b\right)}{k-g}$

 = 10.4 = $\frac{1.04 x 0.6}{(k-0.04)}$ → *k* = **10.0**%

(10) **a**

(11) *kj* = *rf* + *βj* (*MRP*) = *rf* + *βj* [*kM* - *rf* ]

*k*AAA = 2% + 1.1 x (4%) = 6.4% which is less than 7.2%

*k*BBB = 2%+ 1.25 x (4%) = 7.0% which is less than 7.4%

 → (**d**)

(12) *kj* = *rf* + *βj* (*MRP*) = *rf* + *βj* [*kM* - *rf* ]

 = 5% + 0.8 x (11%-5%) = 9.8%

P $=\frac{\$5.0 x 1.048}{(0.098-0.048)}$ = **$104.8**

(13) **b**

(14) *kP* - *rf* = *bP*.(*kM* - *rf*) + *sP*.*kSMB* + *hP*.*kHML* ; **d**

(15) = $100 - $10 million = **$90 million**.

(16) VD/VE = ⅓ → VD/VE + 1 = ⅓ + 1

 VD/VE + 1 = (VD + VE )VE + 1⅓ = 4/3

Hence VE / (VD + VE ) = **¾**

(17) $k\_{E}=k\_{U}+\frac{V\_{D}}{V\_{E}}\left(k\_{U}-k\_{D}\right)$ = 8% + (4/6) x 3% = **10%**

(18) $ β\_{E}=β\_{U}+\frac{V\_{D}}{V\_{E}}\left(β\_{U}-β\_{D}\right)$

 = 0.7 + (3/7) x 0.7 = **1.0**

(19) **d;** (20) **b** !!!

(21) $\frac{1.04-0.96}{0.96}$ = 0.8333 (**8.33%**)

 $\frac{1/1.04-1/0.96}{1/0.96}$ = 0.0769 (**7.69%**)

(22) **c;** (23) **c**

(24) ( $\frac{5m}{115}$ x 1.0225 x 113) million $¥$ = 5.0236 million $¥$

 - 5 x 1.003 million $¥$ = **8,587** $¥$.

 ***SOLUTIONS TO NUMERICAL QUESTIONS***

***Question 1***

 (*a*) (*i*) number of additional shares with a rights issue = $\frac{3,000,000}{12}$ = 250,000.

 Hence the issue raises: 250,000 *x* $4.0 = **$1 million**.

 (*ii*) newshare price = $\frac{new firm value}{new number of shares}$ = $\frac{\$\left(4.46 x 3,000,000\right) + \$1,250,000}{3,000,000+ 250,000} $**= $4.50**.

(*b*) (*i*) number of additional shares with a public issue = $\frac{\$1,000,000}{\$4.20}$ = **238,095**.

 (*ii*) new share price = $\frac{new firm value}{new number of shares} $= $\frac{\$\left(4.46 x 3,000,000\right)+\$1,250,000}{3,000,000+ 238,095}$ = **$4.52**.

***Question 2***

(a) Calculate the P/E ratio for Company ABCXYZ.

**Answer:** $63.00/$7.00 = **9**

(b) Calculate the Price-to-book ratio for Company ABCXYZ.

**Answer**: $63.00/$60.00 = **1.05**

(c) Calculate the firm’s retention ratio for this year.

**Answer: $2.00/$7.00 = 28.6%**

(d) Prepare a *Statement of Cash Flows* so as to justify the Cash and Equivalents entry in the Balance Sheet.

Commence with *Net Income + depreciation* = $7.0 + $4.0 = $11.0

CASH FLOWS FROM OPERATING ACTIVITIES

Addition to Inventory: $4.0

CASH FLOWS FROM LONG-TERM INVESTING ACTIVITIES

Investments: $9.0

CASH FLOWS FROM FINANCING ACTIVITIES

Dividends: $5.0

Hence: **Addition** to *Cash and Equivalents* = $11.0 - $4.0 - $9.0 - $5.0 = **minus $7.0.**

Hence *Cash and Equivalents* **= $12 (2015) - $7 = $5.0** (which is what we observe).

***Question 3***

(a) Let the required anticipated savings be $*S* at the end of each of the next 3 years.

 Hence, we require to solve:

 - $18,000 + *S* *x* $\left[\frac{1}{0.1} -\frac{1}{(1+0.1)^{3}} \frac{1}{0.1}\right]$ (1 – 0.30) = 0

giving S = $\frac{\$12,000}{2.487 x 0.7}$ = **$6,893** per annum.

 (We have $\left[\frac{1}{0.1} -\frac{1}{(1+0.1)^{3}} \frac{1}{0.1}\right]$ = 2.487).

(b)

We now need to solve as for (a) with the additional complications of the tax-deductibility of the depreciation allowances:

 = $\left[\frac{\$20,000x0.3}{1.1 x 1.02} + \frac{\$20,000x0.3}{1.1^{2}1.02^{2}}+ \frac{\$20,000x0.3}{1.1^{3}1.02^{3}}\right]$ = $20,000 x 0.3 x 2.3936 = $14,361.60 per annum

As well as the present value of the resale at the end of year 3:

 = $\frac{\$20,000}{1.1^{3}}$ = $15,026.3.

Hence:

 - $60,000 + *S* *x* $\left[\frac{1}{0.1} -\frac{1}{(1+0.1)^{3}} \frac{1}{0.1}\right]$ (1 – 0.30) + $14,361.60 + $15,026.30 = 0

And hence:

*S* = **$17,585.0** approximately are the required savings per annum to justify the new photocopiers.

***Question 4***

**PART A**

(a) We have forward rate parity as: $ F^{\frac{\$}{€}}= S\_{0}^{\frac{\$}{€}} \frac{1+int^{\$}}{1+int^{€}}$

Implied forward rate = $ F^{¥/\$}=\$1.28/€ \frac{1.01}{1.02}$ = $1.267/ €

$1.267/€ is *lower* than the spot rate ($1.28/€), whereas the forward rate ($1.29/€) is observed to be *higher* than the spot rate ($1.28/€) – so even the direction is wrong! Hence, there is an opportunity for arbitrage as the next section demonstrates.

(b)

*(i) Strategy A*: Borrow 1 million dollars

 → 1 million x (1/1.28) x 1.02 x 1.29 = 1.028 million dolalrs

Pay back 1.01 million dollars → PROFIT = **0.018 million dollars**

*(ii) Strategy B*: Borrow 1 million Euros

 → 1 million x (1.28) x 1.01 x (1/1.29) = 1.002 million Euros

Pay back 1.02 million dollars → LOSS = **0.0178 million Euros**.

Hence, borrow dollars is the correct strategy.

**PART B**

(*c*) €10,000,000 *x* 1.29$/€ = **$12,900,000** – certain.

(*d*) €10,000,000 *x* (1.30 + 0.02) = **$13,200,000 - maximum**.

(*e*) €10,000,000 *x* (1.20 + 0.10) = **$13,000,000 - maximum**.

*Note*: in parts (*d*) and (*e*), the premium price must be *added* to the exercise (strike) price to determine the US dollar cost of the €10,000,000 received.

(f) The outcome exchange rate for the Euro lies between the two exercise prices (so that only the more expensive option is exercised). Thus, we solve:

 $(1.20 + 0.10)/€ = $(*ER* + 0.02)/€, giving us:

 *ER* = **1.28 $/€.**

 We can confirm as follows:

 Outcome for:

 the more expensive option (exercised) is $(1.20 + 0.10)/€ = 1.30$/€; and

 the cheaper option (not exercised) is $(1.28 + 0.02)/€ = 1.30$/€ .

Thus, we observe that if the outcome price of the Euro is *above* 1.28 $/€, the more expensive call option (exercise price 1.20$/€) does better; whereas if the outcome price of the Euro is *below* 1.28 $/€, the less expensive call option (exercise price 1.30 $/€) does better. In other words - as we might again remark as for the case of “insurance” against a down side - the *greater your concern* that the outcome might be detrimental to you – which in this case is that the Euro rises above 1.28 $/€, the more you should be inclined to choose the *more expensive* call option.

1. The exam may be considered “do-able” as a 2- hour exam (allowing 10 mins for reading). If a 3-hour exam is required the examiner might consider allocating 1 mark per multiple choice question and allocating the additional 12 marks to an essay question such as: “In the short-run, the market is inefficient, but in the long-run may be regarded as efficient”. Discuss the above. [↑](#footnote-ref-1)