QUESTIONS & ANSWERS

Examination Paper 2.5

Special Certification Programme

EQUITY DEALING

March 2021

Question 2 - Equity Valuation and Analysis

2a) An analyst gathered the following data:

- An earnings retention rate of 40%.
- An ROE of 12%.
- The stock's beta is 1.2.
- The nominal risk free rate is 6%.
- The expected market return is 11%.

Assuming next year's earnings will be ₦4 per share, what is the intrinsic value of the stock? (3 marks)

Solution to 2a)

Dividend payout ratio = 1 − earnings retention rate = 1 − 0.4 = 0.6 (½ mark)
$K_E = R_f + \beta(R_M − R_f) = 0.06 + 1.2(0.11 − 0.06) = 0.12$ (½ mark)
g = (retention rate)(ROE) = (0.4)(0.12) = 0.048 (½ mark)
$D_1 = E_1 \times$ payout ratio = ₦4.00 × 0.60 = ₦2.40 (½ mark)
Price = $D_1/(k − g)$ = ₦2.40/(0.12 − 0.048) = ₦33.32 (1 mark)

Question 2b

Discuss the relationships between the required rate of return on a stock, the firm's return on equity, the plowback rate, the growth rate, and the value of the firm. (3 marks)

Solution to Question 2b

If the firm earns more on retained earnings (equity) than the firm's cost of equity capital (required rate of return), the value of the firm's stock increases; therefore, the firm should retain more earnings, which will increase the growth rate and increase the value of the firm (share price). (1 mark)

If the firm earns less on retained equity than the required rate of return, and the firm increases the retention rate and the growth rate, the firm decreases firm value, as reflected by share price. In this scenario, the shareholders would prefer that the firm pay out more of earnings in dividends, which the shareholders could invest at a greater rate of return than that earned by the firm (ROE). (1 mark)

If the required rate of return equals the ROE, investors are indifferent between the firm's retaining earnings and paying out dividends. As a result, the retention rate and the growth rate in this scenario have no effect on firm value (stock price). (1 mark)

Question 2c

Identify **three** rationales why analysts make use of Enterprise value to EBITDA (EV/EBITDA) in equity valuation. (3 marks)

Solution to Question 2c

Analysts have offered the following rationales for using EV/EBITDA:
- EV/EBITDA is usually more appropriate than P/E alone for comparing companies with different financial leverage (debt), because EBITDA is a pre-interest earnings figure, in contrast to EPS, which is post interest.
- By adding back depreciation and amortization, EBITDA controls for differences in depreciation and amortization among businesses, in contrast to net income, which is post depreciation and post amortization. For this reason, EV/EBITDA is frequently used in the valuation of capital-intensive businesses (for example,

cable companies and steel companies). Such businesses typically have substantial depreciation and amortization expenses.
- ☐ EBITDA is frequently positive when EPS is negative

(1 for any 3)

Question 3d

You are given the following information about a company for the year just ended.

Price per share	₦15
Share outstanding	1,000,000
Market Value of Debt	₦750,000
Cash and Short Term investments	₦1,250,000
Marginal Tax Rate	40%
Market Value of Preferred Stock	₦500,000

The company has an EV/EBITDA ratio of 7.5.

Calculate the EBITDA of the company.
(3 marks)

Solution to Question 3d

Enterprise Value (EV) = Market Cap + MV of Debt + MV of Preferred Stock – (Cash + Short Term Investments)   (1 mark)

$$= (15 \times 1,000,000) + 750,000 + 500,000 - 1,250,000 = ₦15,000,000$$
(1 mark)

$$\frac{EV}{EBITDA} = 7.5$$

$$EBITDA = \frac{EV}{7.5} = \frac{15,000,000}{7.5} = 2,000,000$$
(1 mark)

Question 3 - Corporate Finance

Identify three reasons why a publicly quoted company will be interested in the composition of its shareholders. (2 marks)

Solution to Question 3

Any three of the following

i). **Dividend policy**: The knowledge of shareholders' preferences with regards to dividends or capital appreciation and marginal tax rates will assist in the determination of the company's optimal dividend policy.

ii). **Risky investment**: Shareholders' preferences may assist corporate management when making decisions concerning risky capital investments. Depending on their attitude to risk and their specific circumstances, they may dislike, or preferm the company to undertake risky investment with the possibility of a higher return.

iii). **Financing decisions**: With respect to the level of debt to employ, the risk attitude of shareholders can again be useful: generally speaking a risky approach is to employ more and more debt; since in the event off default, the shareholders are paid last of all. However, the high level of risk is matched by a high potential return to equity holders.

iv). **Rebuffing a take-over**: A company whose shares are held by a few shareholders may find an unwanted take-over bid less easy to rebuff as the bidder need convincem only a few shareholders for the bid to be successful. However if shares are held by a few key shareholders it may be easier to provide these shareholders with the type of return they require with a possible reduction in their likely acceptance of any take-over.

v). **Measurement of performance**: Ascertaining how shareholders judge performance may enable management to optimise this measure, or measures, when making decisions, although this measure may not be in the prime interest of the company in terms of value maximisation. For example, this measure may be dividend growth or growth in earnings, or a book (accounting) return on capital employed.

(2/3 mark for any 3 points)

Question 4 - Financial Accounting and Financial Statement Analysis

You have the following information about Company A for the year 2018:

Sales	5,000,000
Purchases	2,800,000
Depreciation	200,000
Other expenses	600,000
Opening inventory	400,000
Closing inventory	350,000
Income tax rate	30%

All sales and expenses were paid during year 2018. What are the company's PAT
and Cash flow from operating activities?   (6 marks)

Solution to Question 4

	₦'000	₦'000
Sale		5,000
Less Cost of Sales:		
Opening Inventory	400	
Purchases	2,800	
	3,200	
Less Closing Inventory	(350)	(2,850)
Gross Profit		**2,150** (1mark)
Less Operating Expenses:		
Depreciation	200	
Other expenses	600	(800)
Net Operating Profit		**1,350** (1 mark)
Income Tax (0.3 * 1,350)		(405)
Profit After Tax (PAT)		**945** (1 mark)

Cash flow from operating activities

	₦'000	₦'000
Net Operating Profit		1,350
Add: Depreciation		200
		1,550 (1 mark)
Changes in working capital:		
Reduction in Inventory (400 -350)		50
		1,600 (1 mark)
Taxation		(405)
Cash flow from operating activities		**1.195** (1 mark)

Question 5 – Equity Valuation and Analysis

5a)
KT plc is in the information technology (IT) sector. The main business of KT is assembly of personal computer from components that are imported from abroad. Recently, it is expanded its business activities to include the assembly of smartphones. Its shares are actively traded on the stock market.

The beta of KT's equity is 20% higher than the beta of the whole market. The company's current debt-to-equity ratio is 50%. KT's management has projected income statements for the next four fiscal years. These projections are given in Table 1. Furthermore, KT's management plans to have capital expenditures and changes of net working capital in the coming four fiscal years as stated in Table 2. KT's outstanding debt is risk free.

Risk free rate of return is 3% p.a. and the stock market is expected to earn a 12% return p.a. corporate tax is 30%.

Table 1

Income statement	2020	2021	2022	2023
	₦	₦	₦	₦
Revenues	3,000,000	3,300,000	3,600,000	4,000,000
Cost of goods sold	1,800,000	1,900,000	2,000,000	2,200,000
Depreciation	300,000	360,000	390,000	420,000
EBIT	900,000	1,040,000	1,210,000	1,380,000
Interest	300,000	300,000	300,000	300,000
EBT	600,000	740,000	910,000	1,080,000
Taxes	180,000	222,000	273,000	324,000
Net income (NI)	420,000	518,000	637,000	756,000

Table 2

	2020	2021	2022	2023
Capital expenditures (CE)	200,000	328,000	350,000	430,000
Changes in net working capital (ΔNWC)	220,000	200,000	277,000	326,000

5a) The management assumes that KT's business will increase only at a 2% compound growth rate after 2023 as the extraordinary growth in the market for smartphones is not expected to be sustainable after 2023.

5a1i) Determine KT's expected free cash flow to the firm (FCFF) in the fiscal years 2020 to 2023. (4 marks)

5a1ii) Determine KT's weighted average cost of capital. (1 mark)

5a1iii) Determine KT's total value using discounted cash flows (DCF) as of January 1, 2020. (4 marks)

5a2) KT has some investment opportunities in an innovative strategic business segment: smart mobility technologies. In order to finance this investment, KT's management is considering increasing leverage to a debt-to-total asset ratio equal

to 50% without affecting its credit rating adversely. KT can issue a convertible bond in order to finance this investment. The convertible bond has a face value of ₦500,000, features an annual coupon rate of 5%, and a maturity of eight years. The convertible bond could be sold at a price of 118.04%.

5a2i) Determine KT's equity cost of capital under the new proposed capital structure

(4 marks)

5a2ii) Determine the extra financing which KT can raise by issuing the convertible bond compared to a straight coupon bond with the same terms except for the conversion feature and provide an economic reason for this extra financing.

(3 marks)

(Total: 16 marks)

Solution to Question 5a

5a1i) FCFF = EBIT – Taxes + Depreciation – ΔNWC – CE

	2020	**2021**	**2022**	**2023**
	₦	₦	₦	₦
EBIT	900,000	1,040,000	1,210,000	1,380,000
Taxes	(270,000)	(312,000)	(363,000)	(414,000)
Depreciation	300,000	360,000	390,000	420,000
ΔNWC	(220,000)	(200,000)	277,000	326,000
CE	(200,000)	(328,000)	(350,000)	(430,000)
FCFF	510,000	560,000	610,000	630,000

($^{1/6}$ mark for each)

Note: Alternative methods are available and allowed – for example, candidates can start from net income.

5a1ii) Cost of equity = KE = 3 + 1.2(12 – 3) = 13.8%
    Cost of debt = K_D = 3%
    WACC
    Debt/Equity = 0.5
    If debt = 5, equity = 10 or any other figures in similar proportion.
    WACC = (10/15)(13.8) + (5/15)(3) = 9.9% or (say) 10%.   (1 mark)

5a1iii) Valuation of KT (₦'000)
    • **First 4 year**

$$PV = 510 \left(\frac{1}{1.10}\right) + 560 \left(\frac{1}{1.10}\right)^2 + 610 \left(\frac{1}{1.10}\right)^3 + 630 \left(\frac{1}{1.10}\right)^4 = 1,815$$

(2 marks)

    • **Years 5 – infinity**

$$PV = \frac{630(1.02)}{0.10 - 0.02} \times \left(\frac{1}{1.10}\right)^4 = 5,540$$

(1$^{1/2}$ marks)

        Total value = 1,815 + 5,540 = 7,355   (½ mark)

5a2)
  5a2i) The existing equity beta of 1.2 of KT reflects the business risk of IT sector and current financial risk of KT (imposed by its current D/E ratio of 50%). With the

change in D/E ratio, we need to recompute a revised equity beta that reflects the new D/E ratio.

Step 1: Ungear the current equity beta – to remove the impact of the current D/E ratio. This means converting the existing equity beta to asset beta. When debt is risk free.

$$\beta_A = \frac{E \cdot \beta_E}{E + D(1-t)} = \frac{10 \times 1.2}{10 + 5(1-0.3)} = 0.89$$

(1¹/² marks)

(Note that the calculation uses the current D/E ratio of 0.5)
This asset beta of 0.89 reflects only the business risk of IT sector.

Step 2: To incorporate the revised financial risk of KT (represented by the revised D/E of 1 **or** debt/asset = 50%), we regear the above asset beta, using:

$$\beta_E = \beta_A + (\beta_A - \beta_D)\left(\frac{D}{E}\right)(1-t) = 0.89 + (0.89 - 0)(1)(1-0.3) = 1.5$$

This reflects the business risk of the IT sector and the revised financial risk of TK Plc.

(1¹/² marks)

Note

Debt/Total asset = Debt/Debt + Equity
For D/D + E of 0.5

If total asset = 10, for example, D = 5 and E = 5, or any similar proportion.
$$K_E = 3 + 1.5(12 - 3) = 16.50\%$$

(1 mark)

5a2ii) The fair value of a straight coupon bond per ₦000 in nominal (face) value is given by:

$$₦5\left(\frac{1 - 1.03^{-8}}{0.03}\right) + 100\left(\frac{1}{1.03}\right)^8 = 114.04\%$$

(1¹/² marks)

This means that if straight (option – free) bond is issued rather than a convertible, it would have been priced at 114.04% rather than 118.04%.

Hence, the additional financing raised by issuing the convertible is:
(118.04% - 114.04%) × ₦500,000 = ₦20,000.

(½ mark)

The extra financing raised by KT reflects the economic value of the conversion feature. It is the conversion premium and represents the value of the equity leg of the convertible bond.

(½ mark)

5b)
Mr. T and Miss K are securities analysts who are evaluating TK plc, a company in the pharmaceuticals industry with 25 million shares. TK is currently in its first year of operations and has just reported a profit after tax of ₦1,500 million in July 2018. The company has a debt to equity ratio of 10% at present. The book value of the company's debt is ₦600 million and the average interest rate on its debt is 5%.

The company is expected to have a high growth period for the first 5 years of its operations. From the sixth year onwards, i.e. from August 2022, the firm is expected to attain an annual stable dividend growth rate of 6% and an expected ROA (return on assets) of 14%. The company has a long term target debt to equity ratio of 40%. Ignore taxes.

5b1) What is the expected growth rate in earnings during the initial period of high growth (5 years) if the retention rate during this is expected to be 80%.

(3 marks)

5b2) What is the expected dividend payout ratio after the period of high growth, if the average interest rate on debt remains unchanged? (4 marks)

5b3) If the company's cost of equity is 12%, the WACC is 10%, and the retention rate is 80%, what is its current expected price?

Note: If you did not answer (a) above, assume an initial growth rate of 20%.

(4 marks)

5b4) Discuss two (2) key weaknesses of dividend valuation model in valuing equity shares. (2 marks)

5b5)
Consider two firms producing DVD recorders. One uses a highly automated robotics process, whereas the other uses workers on an assembly line and pays overtime when there is heavy production demand.

5b5i) Which firm will have higher profits in a recession? In a boom?

5b5ii) Which firm's stock will have a higher beta? (3 marks)

(Total: 16 marks)

Solution to 5b)

5b1) Using the formula:

g = ROE x b, where:
ROE = return on equity
b = retention rate = 80%

(3 marks)

We know that:

$$ROE = \frac{PAT}{Book\ value\ of\ equity}$$

$$= \frac{1,500}{600/0.10} = 25\%$$

Hence g = (25)(0.8) = 20%

5b2) Using the formula:

g = ROE·b

$$ROE = ROA + (ROA - i) \times \frac{Debt}{Equity}$$

= 14 + (14 − 5) × 0.4 = 17.60%

(4 marks)

6 = (17.60)(b)
b = 34% = retention rate
Payout ratio = 100% - 34% = 66%

5b3) Current (July 2018) EPS$_o$ = 1,500/25 = ₦60
Current (July 2018) div = D$_o$ = ₦60 × 20% = ₦12

PV of dividends:

First 4 years when g = 20%

Using growing annuity:

$$PV = \frac{D_0(1+g)}{r-g}\left[1 - \left(\frac{1+g}{1+r}\right)^n\right]$$

$$= \frac{12(1.2)}{0.12 - 0.2}\left[1 - \left(\frac{1.2}{1.12}\right)^4\right] = 57.21$$

Years 5 – infinity when g = 6%

$D_5 = 12(1.20)^4(1.06) = ₦26.38$

$$PV = \frac{26.38}{0.12 - 0.06} \times [1.12]^{-4} = 279.42$$

Total VPS = 57.21 + 279.42 = ₦336.63

(4 marks)

Notes
1. Alternative methods of calculation are available with full credit
2. The growth rate of 20% is for the first five years of the company's operations and the result of the first year are already available. We therefore have 4 years to go.
3. The information given on WACC is irrelevant as the dividend valuation model uses cost of equity.

5b4) The Gordon growth model suffers from the following weaknesses:
   • The model is not useful for valuing non-dividend paying companies.
   • The model is also not useful for directly valuing dividend paying firms if the dividends are not growing at a stable rate.
   • The estimated stock values are very sensitive to assumed required rate of return and the growth rate. Even a small variation in the assumed required rate of return or growth rate leads to a relatively large variation in the estimated stock value. (1 mark for any 2)

5b5)
5b5i) The robotics process entails higher fixed costs and lower variable (labour) costs. Therefore, this firm will perform better in a boom and worse in a recession. For example, costs will rise less rapidly than revenue when sales volume expands during a boom. ($1^{1/2}$ marks)

5b5ii) Because its profits are more sensitive to the business cycle, the robotics firm will have the higher beta. ($1^{1/2}$ marks)
(Total 16 marks)

Question 6 – Corporate Finance

Eko plc is considering investing ₦5 million in a new machine with an expected life of five years. The machine will have no scrap value at the end of five years. Details of the investment include:

Annual sales in units   20,000
Unit selling price   ₦300
Unit variable costs   ₦165
Incremental annual cash
Fixed cost   ₦1 million
Cost of capital   12%

The company expects invest projects to recover their initial investment within two years.

Required

6a1) Estimate the annual net cash flows associated with the project   (2 marks)
6a2) Calculate and comment on the payback period of the project   (2 marks)
6a3) Estimate and comment on the NPV of the project   (2 marks)

Solution to Question 6

	₦000	
6a1) Annual contribution:		
20,000 (₦300 – 165) (½ mark)	2,700	(½ mark)
Cash fixed cost	(1,000)	(½ mark)
Annual NCF	1,700	(½ mark)

6a2) Payback period = ₦5m/1.70m = 2.94 years   (1 mark)

Using the payback period method, the project will be rejected because it does not meet management target of 2 years payback period.
     (1 mark)

6a1) With constant annual CF, the NPV can easily be calculated as followings:

	₦000	
NPV = - ₦5000 + 1,700 × (3.605)	1,128.50	($1^{1/2}$ marks)

The NPV is positive and the project can be accepted.   (½ mark)

Question 7 – Financial Accounting and Financial Statement Analysis

The following information relates to three companies listed on the Nigerian Stock Exchange in the food and beverage sector.

The key ratios for the company are given below:

	Nestle	**Unilever**	**PZ**
ROA	9.89%	13.40%	6.45%
ROE	16.03%	45.04%	15.22%
Profit margin	11.85%	13.39%	18.13%
Asset turnover	0.88	1.01	0.49
Inventory turnover	4.99	5.18	1.29
No of inventory days	73 days	70 days	282 days
Current ratio	1.16	0.7	1.29
Acid test ratio	0.93	0.43	0.66
Debt/Equity	1.01	3.46	1.67
Debt/(Equity + Debt)	0.51	0.77	0.62
Long term debt/Equity	0.31	1.75	1.04
Equity/(Debt + Equity)	0.49	0.23	0.38

Required:

7a) Appraise the leverage and liquidity positions of the three companies.   (8 marks)

7b) Briefly explain how depreciation is an example of the accruals or matching convention. How should a company determine the estimated time over which to depreciate a fixed asset.   (2 marks)

7c) IFRS has introduced the use of fair value accounting for financial assets and liabilities.

Define the meaning of "fair value". How might fair value be determined?
                                                                                        (2 marks)

7d) An executive is given 10,000 share options on 1st May 2019, with immediate vesting, as a reward for past services. The shares are currently priced at ₦2.50 and the option strike price is ₦3.00. An appropriate valuation technique gives a value of ₦1.25 for each of the options. Assuming that the executive has yet to exercise the option by the year end date, how should this transaction be included in the company's accounts?   (2 marks)

7e) IFRS 15 "Revenue from Contracts with Customers" was issued in May 2014 and replaces the previous International Financial Reporting Standard relating to revenue.

Required:
7e1) Identify the five steps which need to be followed by entities when recognizing revenue from contracts with a customer.   (2 marks)

7e2) Explain how IFRS 15 is expected to improve the financial reporting of revenue.
                                                                                        (2 marks)

Solution to Question 7

7a):

Leverage Appraisal

Unilever is financed mainly through external debt, whereas Nestle is financed to a large extent by equity.

Half of the debt of Unilever is short-term debt, which is usually more expensive than long term-debt.

It was observed that Unilever has a significantly higher gearing level than the two other companies, which implies that the financial risk of Unilever is higher.

Through this high leverage, Unilever is able to increase its ROE substantially if ROA is above the cost of debt.

Furthermore, the debt/equity ratio could be influenced by corporate policy/objective differences of the three companies such as credit orientation, financial status, product financing styles etc.   (1 for any 4)

Liquidity Appraisal

Current assets are supposed to be converted into cash in the current operating cycles of the companies. The higher the current ratio the more resources a company has available to repay the short term debts.

In this scenario, PZ is most liquid followed by Nestle with 1.16 and these two companies will be able to address any financial liquidity promptly. The reverse will be the case of Unilever which reveals higher current liabilities compared with the current assets.

In the Acid test or Quick ratio, the inventory (stock) is excluded from the current assets as it is the least convertible item of the company. This ratio further tests the liquidity position of the companies.

It is obvious that Nestle is the most liquid among the three companies, this again buttress the earlier current ratio applied and reflects that its working capital structure will not hinder its operations.

On the contrary, Unilever is illiquid in its operations. That is its current liabilities exceed its current assets less inventory. This is a delicate position because at any time the operations of the company could be hindered due to unavailability of working capital. Also the confidence of its shareholders and investors could be of concern.
                                                                        (1 for any 4)

7b):
Depreciation is an attempt to spread the cost of a non-current asset over its estimated useful life. This effectively implies matching expenses with the income generated in each of the period. It also accrues expenses to the relevant period even though cash is not being paid at that particular period.
                                       (1 mark)
 A number of factors should be considered in estimating the useful life of an asset:
i.   Intensity of use
ii.   Rate of obsolescence
iii.   Wear and tear   (½ each for any 2)

7c)
Fair value is the amount for which an asset could be exchanged or a liability settled between knowledgeable willing parties in an arm's length transaction.   (2 marks)

 7d)

An executive is given 10,000 share options on 1st May 2019, with immediate vesting, as a reward for past services. The shares are currently priced at ₦2.50 and the option strike price is ₦3.00. An appropriate valuation technique gives a value of ₦1.25 for each of the options. Assuming that the executive has yet to exercise the option by the year end date, how should this transaction be included in the company's accounts?   (1 mark)

7d)
The transaction will be accounted for in full on the grant date since the options **vest** immediately.

10,000 x 1.25 = N12,500   (1 mark)

Debit: Employment cost
Credit: Equity   (1 mark)

7e)
7e1) **The five steps model**
  1.   Identify the contract(s) with the customer.
  2.   Identify the performance obligations the contract(s) create.
  3.   Determine the transaction price.
  4.   Allocate the transaction price to the separate performance obligations.
  5.   Recognise the revenue associated with each performance obligation as the performance obligation is satisfied.
       (2/3 for each)

7e2) **The expected improvement on the financial reporting of revenue**
       The IASB issued IFRS 15 "Revenue from contract with customers" because the existing criteria for revenue recognition outlined in IAS 11 "Construction contract" and 18 "Revenue" were considered to be highly subjective. As a results this, it was difficult to verify the accuracy of the reported figures for revenue and associated costs.   (1 mark)

       One of the fundamental qualitative characteristics of useful financial information which is referred to in the IASB Conceptual Framework is faithful representation. Information needs to be verifiable in order to ensure it meets this fundamental characteristic. IFRS 15 "Revenue from contract with customers" provides a clearer framework upon which the revenue recognition decision is based, thus increasing the verifiability of the revenue figure and hence its usefulness.   (1 mark)