



CERTIFIED PUBLIC ACCOUNTANT
ADVANCED LEVEL II EXAMINATION
A2.1: STRATEGY CORPORATE FINANCE
DATE: WEDNESDAY 27, MAY 2026
MARKING GUIDE AND MODEL ANSWERS

SECTION A

QUESTION ONE

Marking Guide

	Marks
a) Adjusted Present Value	
Calculation of taxes (0.5 marks each, max 2)	2.0
Computation of capital allowances (0.5 marks each, max 2)	2.0
Computation of net cash flows (0.5 marks each, max 2)	2.0
Computation of present values (0.5 marks each, max 2)	2.0
Initial Investment	0.5
Residual value	0.5
Computation of Base Present Value (NPV)	1
Calculation of asset beta	1
Calculation of CAPM - cost of capital (Ke) (W2)	1
Calculation of issue cost on equity	0.5
Calculation of issue cost on debt	0.5
Calculation of PV of Tax Shield on Debt	2
Calculation of APV	1
Decision taken under APV	1
Internal Rate of Return	
Award 0.5 marks for calculating each PV of any other rate. Note That PV of former Rate Should be the one used on base NPV	3
Award 1 mark for calculating IRR	1
Award 1 mark for decision taken under IRR	1
Maximum marks	22
b) Calculation of inventory days (0.5 marks each, max 1)	1.0
Calculation of trade receivables days (0.5 marks each, max 1)	1.0
Computation of trade payable days (0.5 marks each, max 1)	1.0
Computation of current ratio (0.5 marks each, max 1)	1.0
Computation of quick ratio (0.5 marks each, max 1)	1.0
Explanation related to overtrading (1 mark each, max 5)	5
a) Remedies for overcoming overtrading (As a financial analyst in KIHl's treasury team, with reference to Section 2.	
i) Analyse the dispersion of NPVs for EACH investment.	(14
Marks)	
<i>(Hint: standard deviation of the NPV for each investment.)</i>	
Using the Coefficient of Variation, advise the Finance Director which investment is more viable and justify your recommendation. each, max 5)	5
Maximum marks	15
c) Award 1 mark for each well explained agency problem	5

Award 1 mark for each well explained Solution	5
Maximum marks	10
d) Award 1 mark for each factor for formulating dividend policy	3
Total	50

Model Answer

To estimate the NPV, first compute the discount rate

This is obtained from the weighted average cost of capital calculated as

Cost of equity

Using CAPM

$$K_e = r_f + [\beta(r_m) - r_f]$$

Where K_e – cost of equity, r_f – risk free rate, r_m – return on market rate, β -beta

$$K_e = 10 + 1.38(12 - 10) = 12.76\% = 13\%$$

Computation of Base NPV

Year	0	1	2	3	4
	FRW “000”	FRW “000”	FRW “000”	FRW “000”	FRW “000”
Pre-tax cash flows		12,500	13,800	15,000	26,000
Tax @ 30%		- 3,750	- 4,140	-4,500	-7,800
Tax savings from capital allowances (W1)		3,750	2,813	2,109	4,828
Investment cost	- 50,000				
After tax realized value					5,000
Net cash flows	- 50,000	12,500	12,473	12,609	28,028
Discount rate @ 12% (W2)	1.000	0.893	0.797	0.712	0.636
Present Values	-50,000	11,163	9,941	8,978	17,826
Net Present Values	-2,093.16				

Adjusted Present Value Calculation

Component		FRW'000
Base Case NPV		-2,093
PV of Debt Tax Shield	W4	1,941
Issue Costs	W3	-1,336
APV		-1,488

Working

W1 - Capital Allowances (Tax Shields)

Year	Value at start of year	Capital Allowance	Tax saving
	FRW “000”	25%	30%
0	50,000		
1	37,500	12,500	3,750
2	28,125	9,375	2,813
3	21,094	7,031	2,109
4	5,000		

At Year 4: Residual WDV = 21,094; Sale proceeds = 5,000.

Balancing charge = 21,094 – 5,000 = 16,094 (negative, i.e. extra tax = 16,094 × 30% = 4,828)

W2 - Cost of Debt (Pre & Post Tax)

To calculate the base case NPV, the investment cash flows should be discounted at the ungeared cost equity,

Ungear the equity beta:

$$\text{Asset beta, } \beta_a = \beta_e \left(\frac{E}{E+D(1-t)} \right)$$

$$\beta_a = 1.38 \left(\frac{65}{65+35(1-0.30)} \right)$$

$$\beta_a = 1.0022$$

Then compute the base case discount rate for the project using CAPM/ Ungear (base) cost of equity

$$E(R_i) = R_f + \beta_a [E(R_m) - R_f]$$

$$E(R_i) = 10\% + 1 (12\% - 10\%) = 12\%$$

W3 - Gross Investment & Issue Costs

Component	Net Amount	Gross Formula	Gross Amount	Issue Cost
Debt (40%)	20,000,000	÷ 0.98	20,408,163	408,163
Equity (60%)	30,000,000	÷ 0.97	30,927,835	927,835

Total	50,000,000	51,336,000	1,336,000
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W4 - Financing Side Effects (PV of Tax Shield on Debt)

Gross debt raised = FRW 20,408,163

Annual interest = $20,408,163 \times 10\% = 2,040,816$

Annual tax shield = $2,040,816 \times 30\% = 612,245$ per year for 4 years

PV of tax shield (discounted at pre-tax $K_d = 10\%$):

$PV = 612,245 \times PVIFA(10\%, 4) = 612,245 \times 3.170 = \text{FRW } 1,941,000$

INTERNAL RATE OF RETURN

Year	Cash flow FRW “000”	Discount factor 10%	Present Value FRW “000”	Discount factor 12%	Present Value FRW “000”
0	-50,000	1	-50,000.00	1.000	-50,000.00
1	12,500	0.909	11,362.50	0.893	11,162.50
2	12,473	0.826	10,302.29	0.797	9,940.58
3	12,609	0.751	9,469.64	0.712	8,977.88
4	28,028	0.683	19,143.21	0.636	17,825.89
NPV			277.64		-2,093.16

Using the IRR formula below we get

$$IRR = LR + \frac{NPV \text{ at LR}}{NPV \text{ at LR} - NPV \text{ at HR}} (HR - LR)$$

Where: IRR is Internal Rate of Return, LR is the lower rate, HR is the higher rate, n NPV is the Net present value

$$IRR = 10\% + \frac{277.64}{2370.79} * (12\% - 10\%) = 10.23\%$$

The internal Rate of return is 10.23%

Recommendation: MCL should NOT undertake the investment

1. Negative APV of FRW 1.488m means even after capturing the debt tax shield benefits, the project destroys shareholder value
2. IRR of 10.23% < hurdle rate of 12%, confirming the project fails to meet the required return

b. Ratio Analysis to over trading

Financial ratio analysis

Ratios	Computation	2021	2022	Industrial sector
Inventory days				
Formula; $\frac{\text{Inventory}}{\text{Cost of sales}} * 360$	$\frac{3100}{8500} * 360$	131 days	137 days	60 days
	$\frac{3500}{9600} * 360$			
Trade receivables days				
Formula; $\frac{\text{Trade receivables}}{\text{Sales income}} * 360$	$\frac{2000}{13000} * 360$	55 days	59 days	30 days
	$\frac{3000}{18200} * 360$			
Trade payables days				
Formula; $\frac{\text{Trade Payables}}{\text{Cost of sales}} * 360$	$\frac{2250}{8500} * 360$	95 days	113.5 days	45 days
	$\frac{2900}{9200} * 360$			
Current ratio				
Formula; $\frac{\text{Current Assets}}{\text{Current Liabilities}}$	$\frac{5100}{4100}$	1.2 times	1.07 times	1.6 times
	$\frac{6500}{6100}$			
Quick ratio		0.5		

Formula; $\frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$	$\frac{5100 - 3100}{4100}$ $\frac{6500 - 3500}{6100}$	times		
			0.5 times	0.7 times

Symptoms or indicators of overtrading

Inventory Days

Inventory is sitting on shelves for 137 days vs the 60-day industry norm. Slow-moving stock ties up cash unnecessarily and increases storage costs and obsolescence risk.

Receivables Days

Debtors are taking nearly twice as long to pay as industry peers. This suggests MCL may be offering extended credit terms to win sales - a common overtrading tactic that defers cash collection.

Payables Days

MCL is taking 114 days to pay suppliers vs 45 days industry average. While this delays cash outflows, it signals that MCL is using supplier credit as a substitute for proper working capital finance. Risk: suppliers may refuse credit or demand early payment.

Current Ratio

The current ratio has deteriorated from 1.24× (2021) to 1.07× (2022), and is significantly below the 1.6× industry average. MCL has only FRW 1.07 of current assets for every FRW 1.00 of current liabilities - a dangerously thin margin.

Quick Ratio

The acid test ratio of 0.49× means MCL cannot cover even half its current liabilities with liquid assets. Without selling inventory, MCL cannot meet short-term obligations. This is a critical solvency concern.

Rapid increase in sales income

Increase in sales income without corresponding to increase in working capital investment showing that the company is overtrading.

Another indication of overtrading is the 40% increase in the sales income over the year.

The increase in the sales to net working capital ratio from 13 times to 91 times also shows that working capital investment does not correspond to the increase in sales income.

Rapid increase in current assets

Trade receivables have increased by 100% from FRW 2,000,000 to FRW 3,000,000 over the year. The inventory has also increased from 2021 to 2022 by 13% from FRW 3,100,000 to FRW 3,500,000. Overtrading shows that current assets have increased in line with sales incomes.

Increase in dependence on short - term finance

The company heavily depends on short - term financing because trade payables and overdraft have increased from 2021 to 2022 by 29% to 84% respectively.

Decline in liquidity

The current ratio the company declined from 1.2 times to 1.07 times while quick ratio did not change at 0.5 times. These ratios are all below their respective sector averages.

Remedies

	Remedy	Ratio(s) Addressed
1	Raise Long-term Finance	Current Ratio and Quick Ratio
2	Tighten Receivables Collection	Receivables Days and Quick Ratio
3	Reduce Inventory Levels	Inventory Days and Quick Ratio
4	Slow Revenue Growth	Current Ratio
5	Renegotiate Customer Payment Terms	Receivables Days
6	Normalise Payables Days	Payables Days
7	Build Retained Earnings	Current Ratio and Quick Ratio

c. Support the statement made by the chairperson of the board of directors at MCL and suggest how all these issues raised could be resolved.

To support the statement made by the chairperson of the board of directors, it was evident that there were some conflicts of interests between the shareholders and management, which is agency problems.

These can be shown by the following issues:

Consumption of Perquisites: Prerequisites refer to the high salaries and generous fringe benefits which the directors might award themselves. This is shown where the senior management independently determines their own salaries and fringe benefits, as well as the salaries of other employees. These salaries are subject to annual review and are approved by senior management once finalized. This can be a source of conflict between shareholders and management as it can reduce their dividend.

Management Buy Out (MBO): The board of directors may attempt to acquire the business of the principal. This is equivalent to the agent buying the firm which belongs to the shareholders. This occurred in MCL where in a previous board meeting, management submitted a proposal to acquire 100% ownership of the company from the shareholders. This is also another source of conflict between management and shareholders.

Pursuing power and self-esteem goals: This is called “empire building” to enlarge the firm through mergers and acquisitions hence increase in the rewards of managers. This was the case for MCL whereby the management proposed a potential merger with two smaller companies operating in the same sector. After thorough due diligence, it was found that these companies would not add value to MCL. Shareholders concluded that the proposed acquisition was not aligned with their goal of maximizing wealth.

Different Evaluation Horizons: Managers might undertake projects which are profitable in short-run. Shareholders on the other hand evaluate investments in long-run horizon which is consistent with the going concern aspect of the firm. For example, at the recent annual general meeting, tensions rose due to disagreements between shareholders and management over an investment appraisal proposal. Management advocated for short-term projects lasting no more than five years to minimize risk, while shareholders favored long-term projects exceeding 15 years, citing their higher profitability potential. This is the evidence that both management and shareholders have different evaluation horizon.

Creative Accounting: This involves the use of accounting policies to report high profits e.g stock valuation methods, depreciation methods recognizing profits immediately in long term construction contracts etc. This was also evidenced in MCL whereby audits revealed inconsistencies in the financial statements, particularly concerning the accounting treatment of property, plant, and equipment, where depreciation and revaluation methods were inconsistently applied. Similar issues were noted in the valuation of mineral inventories, with management unable to clearly explain the inventory valuation methodology used. Furthermore, external auditors found that revenues from contracts were being recognized before the goods were delivered to customers, thereby overstating both revenue and non-current assets

Different Risk-profile: Shareholders will usually prefer high-risk-high return investments since they are diversified. They have many investments and the collapse of one firm may have insignificant effects on their overall wealth.

How all these issues raised could be resolved?

- **Direct intervention of board of directors:** It is very clear that management set high their salaries, wages and other benefits which obviously reduce the profit to be distributed to shareholders. To resolve this the active board should be appointed and the very active **remuneration committee** to set the senior management remuneration packages. This would prevent senior management to set their own remuneration packages.
- **Incurring agency costs:** It was realized that the company made creative accounting which resulted in misstatements of financial statements. MCL should ensure that both internal and external audits are frequently conducted for the company to reduce the potential errors in their financial statements.
- **Threat of firing:** This is where there is a possibility of firing the entire management team by the shareholders due to poor performance. Management of companies have been fired by the shareholders who have the right to hire and fire the top executive officers
- Managers should have voluntary code of practice, which would guide them in the performance of their duties

- **The Threat of Hostile Takeover:** If the shares of MCL are undervalued due to poor performance and mismanagement. Shareholders can threaten to sell their shares to competitors. In this case the management team is fired and those who stay on can lose their control and influence in the new firm. This threat is adequate to give incentive to management to avoid conflict of interest

c) Key considerations or factors for formulating/ setting a dividend policy

- i) Taxation. In some countries dividends and capital gains are subject to different marginal rates of taxation, usually with capital gains being subject to a lower level of taxation than dividends.
- ii) Brokerage fees. If shareholders have a preference for some current income and are paid no or low dividends their wealth will be reduced if they have to sell some of their shares and incur brokerage fees in order to create current income. Shareholders, especially institutional shareholders, often rely on dividends to meet their cash flow needs.
- iii) The corporate tax treatment of dividends may favour a higher level of retention.
- iv) If the company needs to finance new investment it is usually cheaper to use retained earnings. This is because most forms of external finance involve issue costs, which, in the case of equity finance can be three percent or more of the funds raised.
- v) Information asymmetry may exist between shareholders and directors. If the market is not strong form efficient shareholders may have less complete knowledge of the likely future prospects of the company than directors, which may influence the shareholders' desire for dividends or capital gains.

SECTION B

QUESTION TWO

Marking guide

	CRITERIA	Marks
a) (i)	Award 1 mark for correct identification of FRA contract rate (7.34%) and settlement rate (10.50%)	1
	Award 1 mark for correct application of FRA settlement formula	1
	Award 1 mark for correct numerator computation	1
	Award 1 mark for correct discounting (denominator)	1
	Award 1 mark for correct final settlement amount	1
(ii)	Award 1 mark for correct identification (type of contract): SELL futures	1
	Award 2 marks for correct number of contracts	2
	Award 2 marks for correct tick size / price movement calculation	2
	Award 2 marks for correct total futures profit with 48 contracts	2
(iii)	Award 1 mark for correct loan interest calculation at 12.25% for 6 months	1
	Award 1 mark for correct fixed payment by TCB	1
	Award 2 marks for correct floating receipt by TCB	2
	Award 2 marks for correct net swap settlement amount (receipt)	2
b)	Award 1 mark for well Clear, accurate definition of an interest rate swap	1
	Award 1 mark for well Clear, accurate definition of Swap option	1
	Award 1 mark for correct example and application to TCB/SBK swap arrangement	1
	Award 1 mark for correct example and application of swap option concept to TCB's situation	1
c)	Award 1 mark for well explained advantage of swap option over a plain interest rate swap Max. 3 marks	3
Total Marks		25

Model Answers

a) i) Forward Rate agreement (FRA)

Given data	Value
Loan principal/exposure	FRW 12,000,000,000
Loan period	6 months (180 days)
FRA contract rate (agreed rate)	7.34% p.a. (prevailing interbank rate at inception)
Settlement rate (interbank on 1 July 2026)	10.50% p.a.
Day count convention	Actual/365

FRA settlement formula

The FRA settlement (paid at the start of the loan period, discounted) is:

$$\text{Settlement Amount} = [(\text{Settlement Rate} - \text{Contract Rate}) * \text{Notional} * (\text{Days}/360)] \div [1 + \text{Settlement Rate} * (\text{Days}/360)]$$

Numerator: $(10.50\% - 7.34\%) * 12,000,000,000 * (6/12) = \text{FRW } 189,600,000$

Denominator: $[1 + 10.50\% * (180/360)] = 1.05250$

FRA Settlement Receipt: $189,600,000 \div 1.05250 = \text{FRW } 180,142,518$

Conclusion

Since the settlement rate (10.50%) exceeds the FRA contract rate (7.34%), TCB (as the FRA buyer borrower) receives a settlement payment of approximately **FRW 180,142,518** from the FRA seller (SBK). This receipt compensates TCB for the higher than expected interest it will pay on the floating rate loan, effectively locking in its borrowing cost at or near the contracted FRA rate.

For learning purpose,

Effective all in borrowing rate verification:

Actual loan interest at $10.50\% + 1.75\% = 12.25\%$ p.a.

FRA receipt offsets the incremental cost above the contracted rate, bringing the effective cost back toward: $7.34\% + 1.75\% = 9.09\%$ p.a.

ii) Interest Rate Futures Contract

Step 1: Identify the type of future contract

TCB is a **borrower** it fears rising of interest rates. When rates rise, futures prices fall (since futures price = 100 interest rate). Therefore, TCB should **SELL** futures contracts to hedge.

Initial futures Price: 90
Final Price; 89.50
Change: 0.5

Step 2: Determine the number of contracts required

A hedger borrows for 6 months using 90-day futures contracts. The number of contracts is adjusted for the loan period vs. contract period:

$N = (\text{Loan Principal} / \text{Contract Notional}) * (\text{Loan Period} / \text{Contract Period})$

$N = (\text{FRW } 12,000,000,000 / \text{FRW } 500,000,000) * (180 \text{ days} / 90 \text{ days})$

$N = 24 * 2 = 48 \text{ contracts}$

Step 3: profit/loss on the futures position

Item	Value
Opening futures price (sold)	90
Closing futures price (bought back)	89.5
Tick movement	$90.00 - 89.50 = 0.50$ (50 ticks)
Tick size (0.01 price movement)	$\text{FRW } 500,000,000 * 0.01\% * (90/360) = \text{FRW } 123,288$ per tick

Profit per contract	50 ticks * FRW 123,288 = FRW 6,164,384
Total futures profit (48 contracts)	48 * FRW 6,164,384 = FRW 295,890,411

Alternative tick value approach (commonly used)

Tick value = Notional * (1/100) * (90/360) = FRW 500,000,000 * 0.0001 * 0.24658 = FRW 12,329 per 0.01 move

Price move = 0.50 = 50 ticks per contract

Profit = 50 * FRW 12,329 * 48 = **FRW 295,890,411**

Note to markers: Accept either approach with consistent working. The key principle is SELL futures when borrowing+ price falls = profit to hedger.

For learning purpose,

Let determine Effective borrowing cost after hedge

Settlement rate implied by futures = 100 - 89.50 = **10.50% p.a.**

Loan interest at 10.50% + 1.75% = 12.25% p.a.

Futures profit offsets the additional interest cost above the opening futures-implied rate (10.00% + 1.75% = 11.75%), resulting in an effective rate of approximately **11.75% p.a.**

iii) Interest Rate Swap

Swap terms: TCB pays fixed 9.80% p.a. and receives floating Rwanda interbank rate on a notional of FRW 12,000,000,000 for 6 months (180 days).

Step 1: Loan interest (floating, paid to SBK)

Rate = 10.50% + 1.75% = 12.25% p.a.

Interest = FRW 12,000,000,000 * 12.25% * (180/365) = FRW 724,931,507

Step 2: Swap (fixed payment by TCB)

Fixed payment = FRW 12,000,000,000 * 9.80% * (180/365) = **FRW 579,945,205**

Step 3: Swap (floating receipt by TCB)

Floating receipt = FRW 12,000,000,000 * 10.50% * (180/365) = **FRW 621,369,863**

Step 4: Net swap cash flow

Net = FRW 621,369,863 - FRW 579,945,205 = FRW 41,424,658 net receipt from swap counterparty

For learning purpose

Let's determine All in effective interest cost

Item	FRW
Loan interest paid to SBK (floating)	724,931,507
Less: Swap net receipt	(41,424,658)
Net effective interest cost	683,506,849

Effective annual rate = (683,506,849 / 12,000,000,000) * (365/180) = **11.55% p.a.**

This approximates: fixed rate + credit spread = 9.80% + 1.75% = **11.55% p.a.**

confirming that the swap locks in TCB's effective borrowing cost at the fixed rate plus the credit spread, regardless of where the interbank rate settles.

b) TCB's case, distinguish between an interest rate swap and a swaption with examples, clearly explaining what each instrument is and how each would apply in TCB's situation with SBK.

Aspect	Interest Rate Swap	Swaption (Swap Option)
Definition	A contract where two parties exchange interest payment obligations.	An option that gives the holder the right, but not the obligation, to enter into a swap at a future date.
Obligation	Both parties are obligated to perform once the swap is entered into.	The holder can choose whether or not to exercise the option.
Upfront Cost	Usually no premium is paid.	An option premium must be paid.
Flexibility	Less flexible.	More flexible because exercise is optional.
Protection	Locks in a fixed interest rate immediately.	Provides protection while allowing participation if rates move favorably.

✓ Interest Rate Swap

An interest rate swap is a binding contractual agreement between two counterparties to exchange periodic interest cash flows on a specified notional principal for a defined period.

One party pays a fixed rate and receives a floating rate; the other does the reverse. Once entered, both parties are obligated to honor the exchange for the full duration of the contract there is no right to exit without mutual consent or cost.

In TCB's situation: TCB enters into a 6-month plain vanilla swap with SBK where TCB pays 9.80% fixed and receives the Rwanda interbank rate (floating). The notional is FRW 12 billion. TCB is locked in if rates fall unexpectedly, TCB still pays 9.80% fixed and cannot benefit from the lower floating rate.

✓ Swaption

A swaption (swap option) is an option not an obligation to enter into an interest rate swap on pre-agreed terms (fixed rate, notional, duration) on or before a specified expiry date. The buyer pays an upfront option premium to acquire this right.

A payer swaption gives the holder the right to pay fixed and receive floating which is what TCB would need to hedge against rising rates. If rates rise as feared, TCB exercises the swaption and enters the swap. If rates fall or remain low, TCB lets the swaption expire and borrows at the more favorable floating rate forfeiting only the premium paid.

In TCB's situation: Had TCB purchased a payer swaption (say at a fixed rate of 9.80%), it would have the flexibility to exercise it if the interbank rate rose above 9.80% on 1 July 2026, or to allow it to lapse and take advantage of lower rates if the geopolitical crisis de-escalated. This asymmetry is the core advantage over a plain swap.

c) THREE Advantages of a Swaption over a Plain Interest Rate Swap

1. Flexibility to Benefit from Favorable Rate Movements

A swaption gives TCB the right but not the obligation to enter the swap. In the current volatile environment driven by the Iran and US crisis, if geopolitical tensions ease unexpectedly and Rwanda's interbank rate falls below 9.80%, TCB can simply allow the swaption to expire and borrow at the lower prevailing floating rate. A plain swap would have locked TCB into paying 9.80% regardless, forgoing the benefit of falling rates.

2. Protection against Adverse Rate Movements

Like a swap, the swaption still provides TCB with a **ceiling on its borrowing cost** if it is exercised. If the interbank rate rises above the swaption's fixed strike rate (9.80%), TCB exercises the payer swaption, effectively converting to fixed-rate borrowing. The swaption thus provides downside protection without sacrificing upside potential a feature unavailable in a plain swap.

3. Appropriate for Uncertain/Contingent Borrowing Needs

In the current geopolitical environment, there is significant uncertainty about whether TCB's loan will proceed on the originally planned terms. A swaption is ideal for **contingent exposures** if the loan drawdown is delayed, cancelled, or renegotiated, TCB can simply decline to exercise the swaption. Entering a plain swap when the underlying borrowing is uncertain would leave TCB with an unhedged swap position, creating new interest rate risk rather than eliminating it.

QUESTION THREE

Marking guide

	CRITERIA	Marks
a)	Award 1 mark for correct BST EPS in FRW	1
	Award 1 mark for correct BST MPS in FRW	1
	Award 1 mark for correct Maximum exchange ratio	1
	Award 1 mark for correct premium per share	1
	Award 1 mark for correct total premium	1
	Maximum	5
b)	Award 0.5 Marks for correct new shares issued by NTS	0.5
	Award 0.5 Marks for correct total NTS shares post-acquisition	0.5
	Award 0.5 Marks for well translated BST Net Income from UGX to FRW	0.5
	Award 0.5 Marks for correct combined Net Income	0.5
	Award 1 mark for correct Post-acquisition EPS	1
	Maximum marks	3
c)	Award 1 mark for correct number of debentures issued	1
	Award 1 mark for correct total par value of debentures	1
	Award 1 mark for correct net interest cost (after tax)	1

	Award 1 mark for correct adjusted combined earnings	1
	Award 1 mark for correct Post-acquisition EPS	1
	Maximum marks	5
d)	Award 1Marks for well explained impact of government activities on international transactions in reference to case study. Max 6 marks	6
e)	Award 1Marks for well explained CSR activity influence in success of cross-border mergers and acquisitions .Max 6 marks	6
	Total marks	25

Model Answers

Preliminary: Convert BST figures to FRW

Exchange rate: 1 FRW =2.862 UGX

1UGX = FRW 0.3494

BST EPS in FRW = UGX 9,000 ÷ 2.862 = FRW 3,145

BST MPS in FRW = UGX 27,000 ÷ 2.862 = FRW 9,434

a)

Maximum Exchange Ratio-No EPS Dilution

Workings	NTS	BST
EPS (FRW)	5,200	3,145
Maximum exchange ratio = BST EPS ÷ NTS EPS	= 3,145 ÷ 5,200	0.605

Maximum exchange ratio is 0.605 NTS shares per BST share

This means NTS can offer at most 0.605 of its own shares for every 1 BST share without diluting its EPS.

Total Premium to BST Shareholders

Description	FRW
Value offered per BST share = 0.605*FRW78,000	47,190
Current BST MPS (FRW equivalent)	9,434
Premium per share (FRW)	37,756
Total BST shares (millions)	3
Total premium (FRW million) = (37,756*3M)	113,268

Total premium payable to BST shareholders is FRW113,268 Million

b) Post-Acquisition EPS at Offer Price FRW 9,434 per share of BST

Description	FRW Million
Normal Exchange ratio= offer price/MPS of predator: 9,434÷78,000	0.121
New shares issued by NTS = (9,434÷78,000)*3M shares	0.121*3M =362,820 shares
Total NTS shares post-acquisition = 10M + 0.363M	10.363M
BST Net Income in FRW = 27,000M UGX ÷ 2.862	9,434M

Combined Net Income (FRW million)	
Combined Net Income = 52,000 M+9,434 M (BST net income in FRW)	61,434
Post-acquisition EPS = 61,434M÷10.363M shares	FRW 5,929

Post-acquisition EPS is FRW 5,929

Which shows that No dilution because it is higher than pre-Acquisition EPS of FRW 5,200

c) Post-Acquisition EPS-Debenture Offer (100 BST shares=2 Debentures of FRW 1,500,000)

Description	FRW Million
Number of debentures issued = $(3,000,000 \div 100) * 2$	60,000 debentures
Total par value of debentures = $60,000 * 1,500,000$	FRW 90,000M
Annual interest cost = $12\% * 90,000M$	10,800M
Tax shield on interest = $30\% * 10,800M$	3,240M
Net interest cost (after tax) = $10,800M - 3,240M$	7,560M
Combined Net Income (pre-interest) = 61,434M	61,434M
Less: Net interest cost	(7,560M)
Adjusted combined earnings	53,874M
NTS shares remain unchanged (no new equity)	10M
Post-acquisition EPS = $53,874M \div 10M$	FRW 5,387

Post-acquisition EPS with debentures is FRW 5,387 (slight dilution vs pre-Acquisition EPS of FRW 5,200-still marginally acceptable)

d) impact of government activities on international transactions

Government activities significantly influence international transactions such as the proposed cross-border Acquisition between NTS (Rwanda) and BST (Uganda). Key areas of impact include:

1. Regulatory Approvals and Competition Law

Both the Rwanda Utilities Regulatory Authority (RURA) and the Uganda Communications authority would need to approve the Acquisition. Competition authorities may block or impose conditions if the merged entity creates a monopoly or reduces competition in the East African digital market. The East African Community (EAC) Competition Authority may also have jurisdiction over the transaction.

2. Tax Treaties and Withholding Taxes

Rwanda and Uganda have bilateral tax agreements under the EAC framework. Government-imposed withholding taxes on dividends, interest, and royalties transferred across borders can increase the cost of the Acquisition. The availability of double taxation relief treaties between the two countries reduces the tax burden on cross-border income flows.

3. Exchange Rate and Capital Control Policies

Both the National Bank of Rwanda (BNR) and the Bank of Uganda (BoU) manage exchange rate policies. Any capital controls restricting the repatriation of profits or the transfer of acquisition funds would affect the Acquisition's feasibility. Currency volatility between FRW and UGX introduces foreign exchange risk into valuation and consideration payment.

4. Bilateral Investment Treaties (BITs)

Rwanda and Uganda are both signatories to bilateral investment treaties that protect foreign investors from expropriation, ensure fair treatment, and provide dispute resolution mechanisms. The EAC Common Market Protocol further facilitates cross-border investment by removing restrictions on the free movement of capital and services.

5. Government Incentives and Restrictions

Governments may offer investment incentives (e.g., tax holidays, reduced corporate tax rates for technology companies) that make the Acquisition more attractive. Conversely, restrictions on foreign ownership (e.g., requirements for local shareholding) could limit NTS's ability to fully absorb BST.

6. Political Stability and Policy Risk

Political decisions such as changes in government, nationalization policies, or shifts in trade policy between Rwanda and Uganda can affect the long-term value of the merged entity. Investors and analysts carefully assess political risk when evaluating cross-border Acquisitions in developing markets.

e) Corporate Social Responsibility(CSR) considerations can influence the success of cross-border mergers and acquisitions and the long-term sustainability of the merged entity in the East African region.

Corporate Social Responsibility (CSR) refers to a company's commitment to operating ethically and contributing positively to society, the environment, and the economy beyond its legal obligations. In the context of the NTS-BST acquisition and international trade and investment, CSR is relevant in the following ways:

1. CSR and Investor Confidence

International investors and institutional shareholders increasingly demand strong CSR practices before committing capital. NTS's CSR record in Rwanda and BST's in Uganda will influence whether institutional investors (including foreign investors) support the merger. Companies with poor CSR records face higher risk premiums and reduced access to international capital markets.

2. CSR and Cross-Border M&A Success

CSR due diligence is now standard in cross-border mergers and acquisitions. NTS must evaluate BST's CSR liabilities (e.g., environmental violations, labor disputes, data privacy issues) before completing the acquisition. Unaddressed CSR issues can result in regulatory sanctions, reputational damage, and reduced synergies.

3. CSR and Host Country Relations

As a Rwandan company operating in Uganda through a merger, NTS has a responsibility to respect Ugandan laws, employment practices, and cultural values. Demonstrating commitment to CSR in Uganda (e.g., local employment, community development, digital inclusion programs) will be crucial to gaining regulatory approval and public acceptance.

4. CSR and Sustainable Supply Chains

In international trade, companies are expected to ensure ethical practices throughout their supply chain. The merged entity serving clients across East Africa must ensure that procurement, data handling, and technology deployment comply with international CSR standards, including responsible AI and digital ethics frameworks.

5. CSR and International Trade Agreements

Many international trade agreements (e.g., EAC Customs Union, AfCFTA) include CSR-related provisions on environmental standards, labor rights, and anti-corruption. Companies that fail to meet these standards may lose trade preferences or face exclusion from government tenders in the region.

6. CSR and Long-Term Sustainability of the Merged Entity

CSR is intrinsically linked to long-term business sustainability. The merged NTS-BST entity, as a major East African technology company, has a responsibility to bridge the digital divide, support youth employment, reduce its carbon footprint, and foster innovation that benefits society. A strong CSR framework will enhance brand loyalty, attract global partnerships, and ensure the long-term viability of the merged company in the competitive regional market.

QUESTION FOUR

Marking guide

	Description	Marks
a))		
(i)	Award 1 mark for correct annual net cash flow	1.5
	Award 1 mark for correct initial investment and scrap value (0.5 marks each)	1
	Award 2 mark for correct NPV	0.5
(ii)	Award 1 mark for correct %/correct sensitivity for each component (cost of equipment, scrap value and Sales revenue) Max .3 marks	3
	Award 1 for comment on most sensitive variable.	1
(b)		
(i)	Government Bond	
	Award 1 mark for correct NPV under each economic state on Bond	3
	Award 1 mark for correct Expected NPV-Bond	1
	Award 1 mark for correct Variance-Bond	1
	Award 2 marks for correct Standard Deviation-Bond	2

	Real Estates	
	Award 1 mark for correct NPV under each economic state on commercial real estate	3
	Award 1 mark for correct Expected NPV-Real Estate	1
	Award 1 mark for correct Variance-real estate	1
	Award 2 marks for correct Standard Deviation-real estate	2
(ii)	Award 1 mark for correct Coefficient of Variation- Government Bond	1
	Award 1 mark for correct Coefficient of Variation-real estate	1
	Award 2 marks for correct Advice to the Finance Director and well justified	2
	Total	25

Model Answer

a)

(i) Net Present Value (NPV) of the Equipment Project

The NPV is calculated by discounting the annual net cash flows and terminal scrap value at the cost of capital of 10%, then deducting the initial investment.

Annual Net Cash Flow = Sales Revenue - Operating Costs = FRW 6,600,000 - FRW 4,290,000 = FRW 2,310,000

Year	Description	Discount Factor (10%)	Amount (FRW)
Year 0	Initial Investment	1.0000	(5,500,000)
Year 1–3	Annual Net Cash Flow	2.4869	5,744,628
Year 3	Scrap Value	0.7513	661,157
	NET PRESENT VALUE		905,785

notes: Annuity factor (3 years @ 10%) = 2.4869; Discount factor (Year 3 @ 10%) = 0.7513

The NPV of the equipment project is FRW 905,785, which is positive. The project is therefore expected to add value and should be accepted.

(ii) Sensitivity Analysis

Sensitivity analysis measures the percentage change required in each variable before the NPV falls to zero (the break-even point at which the project would be rejected). A smaller percentage change implies greater sensitivity i.e.; the project is more vulnerable to changes in that variable.

Formula: % Change to rejection = NPV / PV of the variable being tested * 100

Variable 1 Initial Investment (Cost of Equipment)

A rise in the cost of equipment reduces NPV. The project is rejected when NPV = 0, i.e., when the initial investment increases by the amount of the NPV.

Break-even Cost = PV(Annual CFs) + PV(Scrap) = 5,744,628 + 661,157 = FRW 6,405,785

$$\% \text{ Change} = (\text{Break-even Cost} - \text{Original Cost}) \div \text{Original Cost} \times 100$$

Working	FRW / %
NPV (amount by which capex could increase)	905,785
Initial investment (capex)	5,500,000
Sensitivity = $905,785 / 5,500,000 \times 100$	16.47%

The initial investment would need to INCREASE by 16.47% before the project is rejected.

Variable 2 Scrap Value

A fall in scrap value reduces NPV. Sensitivity is measured as the NPV as a percentage of the present value of the scrap value.

Working	FRW / %
NPV	905,785
PV of scrap value ($880,000 \times 0.7513$)	661,157
Sensitivity = $905,785 / 661,157 \times 100$	137%
Interpretation: scrap value would need to FALL by this percentage	137%

The scrap value would need to FALL by 137.00% before the project is rejected. Since the scrap value is only FRW 880,000, even a fall of 100% (to zero) would not cause the project to be rejected the project is therefore very insensitive to changes in scrap value.

Variable 3 Sales Revenue

A fall in revenue reduces the annual net cash flow. Sensitivity is measured as the NPV as a percentage of the PV of revenue.

Working	FRW / %
NPV	905,785
PV of annual revenue ($6,600,000 \times 2.4869$)	16,413,540
Sensitivity = $905,785 / 16,413,540 \times 100$	5.52%

Revenue would need to FALL by 5.52% before the project is rejected.

Sensitivity Summary and Comment

Variable	% Change to Rejection	Direction	Comment
Cost of Equipment (Initial Investment)	+16.47%	Increase	2nd most sensitive
Scrap Value	137.00%	Decrease	Least sensitive
Sales Revenue	5.52%	Decrease	MOST sensitive

Conclusion: The project is MOST sensitive to changes in Sales Revenue. A reduction of only 5.52% in revenue would eliminate all value from the project. Management should therefore focus its risk management efforts on protecting revenue assumptions, particularly given market competition. The scrap value is the least critical variable even a 100% write-down of scrap would not render the project unviable.

b. i) Portfolio Risk Assessment

This section quantifies the risk profile of the Government Infrastructure Bond and the Commercial Real Estate investment using Expected NPV, Variance, Standard Deviation, and Coefficient of Variation.

Step 1: Compute NPV for Each Scenario

NPV per scenario = Annual Cash Inflow * Annuity Factor - Initial Outlay

Annuity factor (3 years @ 8%) = $[1 - (1.08)^{-3}] / 0.08 = 2.5771$

Annuity factor (3 years @ 12%) = $[1 - (1.12)^{-3}] / 0.12 = 2.4018$

State	Prob	Cash Inflow (FRW)	PVIFA	PV of Inflows (FRW)	Outlay (FRW)	Scenario NPV (FRW)
Strong Growth	0.20	8,200,000	* 2.5771	21,132,220	- 18,000,000	3,132,195
Moderate Growth	0.50	9,800,000	* 2.5771	25,255,580	- 18,000,000	7,255,550
Recession	0.30	6,200,000	* 2.5771	15,978,020	- 18,000,000	(2,021,999)

1st. Government Infrastructure Bond Scenario NPVs (Outlay FRW 18,000,000; Discount Rate 8%)

State	Prob	Cash Inflow (FRW)	PVIFA	PV of Inflows (FRW)	Outlay (FRW)	Scenario NPV (FRW)
Strong Growth	0.25	9,500,000	* 2.4018	22,817,100	(22,000,000)	817,397
Moderate Growth	0.45	9,200,000	* 2.4018	22,096,560	(22,000,000)	96,848
Recession	0.3	14,800,000	* 2.4018	35,546,640	(22,000,000)	13,547,103

2nd: Commercial Real Estate Scenario NPVs (Outlay FRW 22,000,000; Discount Rate 12%)

Step 2: Expected NPV [E(NPV)]

$E(NPV) = \sum [\text{Probability} * \text{Scenario NPV}]$

State of Economy	Probability	Scenario NPV (FRW)	Prob * NPV (FRW)
Strong Growth	0.20	3,132,195	626,439

Moderate Growth	0.50	7,255,550	3,627,775
Recession	0.30	(2,021,999)	(606,600)
E(NPV) Gvt. Bond			3,647,615

E(NPV) of Government Bond = FRW 3,647,615

State of Economy	Probability	Scenario NPV (FRW)	Prob * NPV (FRW)
Strong Growth	0.25	817,397	204,349
Moderate Growth	0.45	96,848	43,582
Recession	0.30	13,547,103	4,064,131
E(NPV) Real Estate			4,312,062

E(NPV) of Commercial Real Estate = FRW 4,312,062

Step 3: Variance and Standard Deviation Government Infrastructure Bond

$$\text{Variance} = \sum [P * (NPV_i - E(NPV))^2]$$

State	Prob	NPV _i (FRW)	NPV _i - E(NPV)	(NPV _i - E(NPV)) ²	P * (NPV _i - E(NPV)) ²
Strong Growth	0.20	3,132,195	(515,420)	265,657,155,267	53,131,431,053
Moderate Growth	0.50	7,255,550	3,607,935	13,017,200,608,097	6,508,600,304,048
Recession	0.30	(2,021,999)	(5,669,614)	32,144,515,787,341	9,643,354,736,202
Variance					16,205,086,471,304

Variance (Government Bond) = FRW² **16,205,086,471,304**

Standard Deviation (Government Bond) = $\sqrt{\text{Variance}} = \sqrt{16,205,086,471,304} = \text{FRW } 4,025,554$

Step 4: Variance and Standard Deviation Commercial Real Estate

State	P	NPV _i (FRW)	NPV _i - E(NPV)	(NPV _i - E(NPV)) ²	P * (NPV _i - E(NPV)) ²
Strong Growth	0.25	817,397	(3,494,665)	12,212,679,934,448	3,053,169,983,612
Moderate Growth	0.45	96,848	(4,215,214)	17,768,028,018,137	7,995,612,608,162

Recession	0.3	13,547,103	9,235,041	85,285,986,451,682	25,585,795,935,504
Variance					36,634,578,527,278

Variance (Commercial Real Estate) = FRW^2 **36,634,578,527,278**

Standard Deviation (Commercial Real Estate) = $\sqrt{\text{Variance}} = \sqrt{36,634,578,527,278} = FRW$
6,052,651

ii) Summary Variability of NPVs

Measure (FRW)	Government Bond	Commercial Real Estate
Expected NPV E(NPV)	3,647,615	4,312,062
Variance	16,205,086,471,304	36,634,578,527,278
Standard Deviation (σ)	4,025,554	6,052,651

The higher variance and standard deviation of the Real Estate investment (FRW 6,052,651 compared to FRW 4,025,554) confirm it is the more volatile investment in absolute terms.

(iv) Coefficient of Variation (CV) and Recommendation

The Coefficient of Variation (CV) measures risk per unit of expected return, enabling comparison of investments with different expected NPVs on a like-for-like basis.

$CV = \text{Standard Deviation} / E(NPV)$

Measure	Government Bond	Commercial Real Estate
Standard Deviation (σ)	4,025,554	6,052,651
Expected NPV E(NPV)	3,647,615	4,312,062
Coefficient of Variation ($\sigma / E(NPV)$)	1.1036	1.4037

Interpretation: A CV of 1.10 means the Government Bond carries FRW 1.10 of risk for every FRW 1.00 of expected NPV. The Real Estate investment carries FRW 1.40 of risk per FRW 1.00 of expected NPV.

Recommendation to Finance Director

The Government Infrastructure Bond carries LESS risk per unit of return ($CV = 1.1036$) than the Commercial Real Estate investment ($CV = 1.4037$). Although the Real Estate investment offers a higher expected NPV (FRW 4,312,062 compared to FRW 3,647,615), it does so at disproportionately greater risk. If KIHIL's primary objective is capital preservation with acceptable risk-adjusted returns consistent with its stated risk tolerance the Government Bond is the preferred investment. However, if KIHIL is willing to accept higher variability in pursuit of higher expected returns, the Real Estate investment may be considered.

End of Model Answers and Marking Guide.