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Practice Question 1

You own a municipal bond that is priced at $256 on Mar. 22nd, 2023. If it pays semi-annual coupons of $20, what is your semi-annual realized return when you sell the bond on Sep. 22nd, 2023 for $250?

$P_t = 256$ $\qquad\qquad P_{t+1} = 250$ $\qquad\qquad I_{t+1} = 20$

$256 \qquad\qquad\qquad \$250 + \$20$

$\qquad\quad t \qquad\qquad\qquad\qquad t+1 \qquad\qquad$ Time

Mar 22nd $\qquad\qquad$ **Sep 22nd**
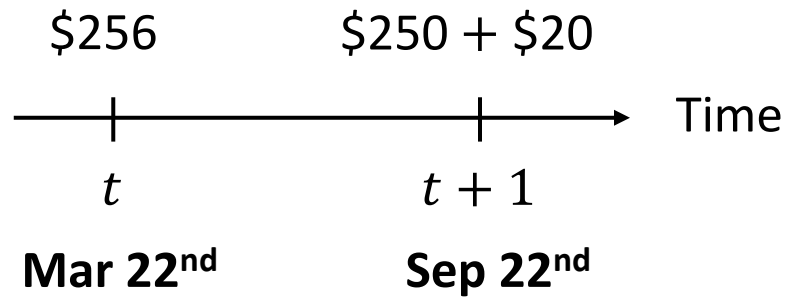
$$R_{t+1} = \frac{I_{t+1} + (P_{t+1} - P_t)}{P_t} = \frac{20 + (250 - 256)}{256} = \mathbf{0.0547}$$

Practice Question 2

A GIC you found on the internet website displayed realized returns of 3.4%, 2.8% and -2.4% for Q2, Q3, and Q4, respectively. If the annual realized return on the asset is 6%, what was the realized return for Q1?

$R_1 = ?$ $R_2 = 0.034$ $R_3 = 0.028$ $R_4 = -0.024$ $R_{annual} = 0.06$

$$R_{annual} = (1 + R_1)(1 + R_2)(1 + R_3)(1 + R_4) - 1$$

$$0.06 = (1 + R_1)(1.034)(1.028)(0.976) - 1$$

$$1.06 = 1.03744 \cdot (1 + R_1)$$

$$\frac{1.06}{1.03744} = 1 + R_1$$

$$R_1 = \frac{1.06}{1.03744} - 1 = \mathbf{0.0217}$$

Practice Question 3

Your parents bought some RBC stocks at the beginning of the year. The stocks yield a constant monthly return of 2.51% and provide quarterly dividend payments. If the capital gain yield over the first quarter was 3.75%, what was the dividend yield across this time?

Capital Gain Yield (quarterly) $= 0.0375$ Dividend Yield (quarterly) $= ?$ $R_{monthly} = 0.0251$

Capital Gain Yield (**quarterly**) $+$ Dividend Yield (**quarterly**) $= R_{quarterly}$ (want **quarterly** dividend yield)

$$R_{quarterly} = \left(1 + R_{monthly}\right)^3 - 1 = (1 + 0.0251)^3 - 1 = 0.0772$$

$0.0375 +$ Dividend Yield (quarterly) $= 0.0772$

Dividend Yield (quarterly) $= \mathbf{0.0397}$

Practice Question 4

Approximately 95% of yearly returns on Canadian common stocks from $1957 - 2017$ lie between -22.6% and 43.2%. If the yearly returns are normally distributed, what is their mean and variance?

-0.226   0.432

$$\bar{R} - 2s_R \qquad \bar{R} \qquad \bar{R} + 2s_R$$

↑

midpoint
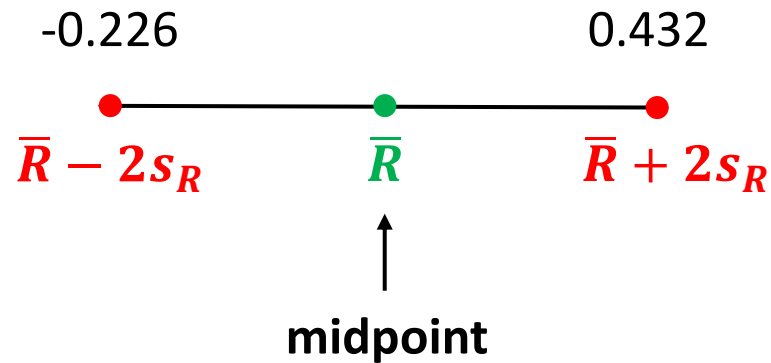
$$\bar{R} = \frac{-0.226 + 0.432}{2} = \mathbf{0.103}$$

$$\bar{R} + 2s_R = 0.432 \quad \Rightarrow \quad 0.103 + 2s_R = 0.432$$

$$s_R = \frac{0.432 - 0.103}{2} = 0.1645$$

$$Var(R) = s_R^2 = (0.1645)^2 = \mathbf{0.0271}$$

Practice Question 5

Your finance professor invested $8000 in two mystery stocks (A & B) at the start of the year. Their portfolio received an annual return of 7.8%. If they told you that $R_A = 2.3\%$ and $R_B = 8.7\%$, what percentage of their investment went towards stock A?

$$R_{portfolio} = 0.078 \qquad R_A = 0.023 \qquad R_B = 0.087$$

$$R_{portfolio} = w_A R_A + w_B R_A \qquad\qquad w_A + w_B = 1 \implies w_B = 1 - w_A$$

$$R_{portfolio} = w_A R_A + (1 - w_A) R_B$$

$$0.078 = w_A(0.023) + (1 - w_A)(0.087)$$

$$0.078 = 0.023 w_A + 0.087 - 0.087 w_A$$

$$-0.009 = -0.064 w_A \qquad\qquad w_A = \mathbf{0.1406}$$

Practice Question 6

It is empirically known that stock A and B are perfectly negatively correlated with each other. Based on the sample data below, calculate the variance of a portfolio that contains 65% of stock A and 35% of stock B.

Stock		Statistical Measure	
		$E(R)$	$SD(R)$
	A	1.7%	0.86%
	B	2.6%	0.32%

$$\rho_{AB} = -1 \qquad w_A = 0.65 \qquad w_B = 0.35$$

$$SD(R_A) = 0.0086 \qquad SD(R_B) = 0.0032$$

$$Var(R_A) = SD(R_A)^2 = 0.0086^2 = 0.00007396 \qquad Var(R_B) = SD(R_B)^2 = 0.0032^2 = 0.00001024$$

$$Var\left(R_{portfolio}\right) = w_A^2 \cdot Var(R_A) + w_B^2 \cdot Var(R_B) + 2w_Aw_B \cdot \rho_{AB} \cdot SD(R_A) \cdot SD(R_B)$$

$$Var\left(R_{portfolio}\right) = 0.65^2 \cdot 0.00007396 + 0.35^2 \cdot 0.00001024 + 2(0.65)(0.35)(-1)(0.0086)(0.0032)$$

$$Var\left(R_{portfolio}\right) = \mathbf{0.00001998}$$

Practice Question 7

Which of the following is true about portfolio theory?

(Select all that apply)

a) The covariance between assets has greater influence over a portfolio's variance as more assets are added

b) The sign of the correlation coefficient and covariance between any two stocks will always be the same

c) If the correlation coefficient between two stocks is not 0, the stocks are dependent

d) If the variance of monthly returns on a portfolio is $Var(R)$, the annual variance is exactly $12 \cdot Var(R)$

e) The correlation coefficient between two identical stocks is always 1

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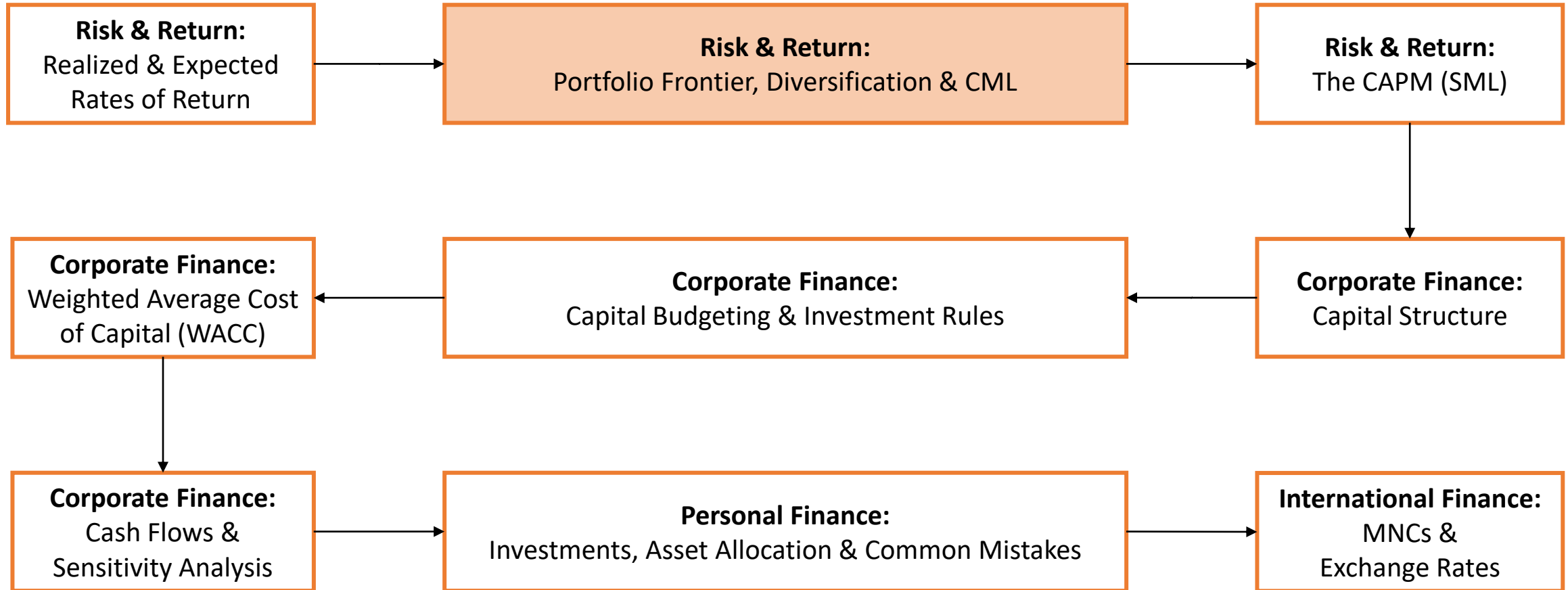
Practice Question 1

Which of the following is true about risk and diversification?

(Select all that apply)

a) It takes around 30 carefully chosen stocks to obtain a well-diversified portfolio

b) Buying stocks from companies in the same industry will effectively diversify away risk

c) Variance is a measure that accounts for both diversifiable and undiversifiable risk

d) Adding an asset to a portfolio that has $0 < \rho < 1$ with all existing assets is useless for diversification

e) The effectiveness of diversification depends on the strength of the correlation coefficient between securities

Practice Question 2

If portfolio A has a higher expected return and standard deviation than portfolio B, a risk adverse investor will:

(Select all that apply)

a) Choose to invest in portfolio A as it has a higher expected value

b) Choose to invest in portfolio B because it has a lower standard deviation

c) Choose to invest in portfolio B because investing in portfolio A makes them risk preferring

d) Choose to invest in portfolio A because investing in portfolio B makes them risk preferring

e) None of the above

Practice Question 3

Suppose portfolio A and B have the same Sharpe ratio. Which of the following is true?

(Select all that apply)

a) Both portfolios must lie on the capital market line

b) If portfolio A has a lower expected return than B, portfolio A will have a lower standard deviation than B

c) At least one of the portfolios must lie on the old efficient frontier

d) Both portfolios must be dominated by the market portfolio

e) None of the above

Practice Question 4

Which of the following is true about the model of the portfolio frontier and capital market line?

(Select all that apply)

a) In a 2-asset portfolio, $E(R_{portfolio})$ is the same for all $\rho_{AB} < 1$ holding all else constant

b) A risk-free asset enables higher levels of expected return and standard deviation on an investor's portfolio

c) Every portfolio on the old efficient frontier is dominated by a portfolio on the capital market line

d) If an investor puts 100% of his wealth into the market portfolio, he is neither lending or borrowing at R_f

e) There is no other portfolio that has a higher Sharpe ratio than the market portfolio

Practice Question 5

A complete portfolio on the CML has an expected return of 17%. If the market has an expected return of 15%:

(Select all that apply)

a) The risk-free rate must be 2%

b) The weight put on the risk-free asset in the complete portfolio must be negative

c) The complete portfolio has greater total risk than the market portfolio

d) An investor holding the complete portfolio is lending at the risk-free rate

e) The complete portfolio has a higher expected return than any other portfolio on the old efficient frontier

Practice Question 6

State whether each portfolio is efficient or dominated. If it is dominated, state which portfolio(s) dominate it.

Portfolio	$E(R_{portfolio})$	$SD(R_{portfolio})$	
A	1.36%	0.60%	**Dominated by C**
B	2.72%	0.86%	**Dominated by C/D/E**
C	3.40%	0.44%	**Efficient**
D	5.04%	0.76%	**Dominated by E**
E	6.39%	0.76%	**Efficient**
F	10.20%	0.92%	**Efficient**

Explanation:

A is dominated by C: Portfolio C has lower SD and higher expected return than portfolio A

B is dominated by C/D/E: Portfolios C/D/E have lower SD and higher expected returns than portfolio B

D is dominated by E: Portfolio E has the same SD but higher expected return than portfolio D

Practice Question 7

You are given the following information about two complete portfolios on the CML

		Statistical Measure	
		$E(R_C)$	$SD(R_C)$
Portfolio	A	11.5%	10.0%
	B	22.3%	35.1%

a) What is the Sharpe ratio of the market portfolio?

Slope of CML $= S_M = \dfrac{Rise}{Run} = \dfrac{E(R_B)-E(R_A)}{SD(R_B)-SD(R_A)} = \dfrac{0.223-0.115}{0.351-0.100} = \mathbf{0.43}$

Practice Question 7

		Statistical Measure	
		$E(R_C)$	$SD(R_C)$
Portfolio	A	11.5%	10.0%
	B	22.3%	35.1%

b) What is the risk-free rate?

$S_M = 0.43$ from part a)

Slope of CML $= S_M = \dfrac{Rise}{Run} = \dfrac{E(R_B) - E(R_f)}{SD(R_B) - SD(R_f)} = \dfrac{0.223 - R_f}{0.351 - 0} = 0.43$

$0.43 \cdot 0.351 = 0.223 - R_f \qquad R_f = \mathbf{0.0721}$

Practice Question 8

An investor constructed an efficient portfolio with an expected return of 10% and standard deviation of 20%. The investor was able to lend or borrow at the risk-free rate of 3%. If the expected return on the market is 8%, what is the standard deviation of the market portfolio?

$$E(R_C) = 0.1 \qquad SD(R_C) = 0.2 \qquad R_f = 0.03 \qquad E(R_M) = 0.08 \qquad SD(R_M) = ?$$

$$E(R_C) = R_f + w_M \cdot \left[E(R_M) - R_f\right] \Rightarrow 0.1 = 0.03 + w_M \cdot [0.08 - 0.03] \qquad w_M = 1.4$$

$$SD(R_C) = w_M \cdot SD(R_M) \Rightarrow 0.2 = 1.4 \cdot SD(R_M)$$

$$SD(R_M) = \mathbf{0.143}$$

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Practice Question 1

Which of the following statements about risk & return is true?

(Select all that apply)

a) Most individual stocks have lower returns and higher total risk than large portfolios

b) A company factory burning down is an example of systematic risk

c) Investors are rewarded for the risk they bear regardless if they can diversify it away or not

d) Larger stocks tend to be less volatile than smaller stocks

e) Total risk is an appropriate measure of systematic risk for individual securities and diversified portfolios

Practice Question 2

Which of the following is a correct interpretation of beta?

(Select all that apply)

a) An asset with $\beta_i < 0$ will fluctuate opposite to the market on average

b) Beta is the intercept of the regression line of excess stock returns on excess market returns

c) Stocks from companies that produce necessities (e.g., toilet paper) tend to have lower values of beta

d) An asset with $0 < \beta_i < 1$ exhibits higher expected returns than risk-free assets but not the market

e) Assets with $\beta_i < 0$ will demand a negative risk premium

Practice Question 3

Which of the following is true when comparing the CML to the SML?

(Select all that apply)

a) Both have the same y-intercept

b) The SML plots return against systematic risk while the CML plots return against unsystematic risk

c) Both have the same slope

d) The minimum y-value of both is the risk-free rate

e) Only the SML is useful in determining the required return on individual securities

Practice Question 4

A stock has a standard deviation of 23% and a beta of 1.4. If the market standard deviation is 15%, what is the correlation coefficient between the stock and the market?

$$SD(R_i) = 0.23 \qquad \beta_i = 1.4 \qquad SD(R_M) = 0.15$$

$$\beta_i = \frac{Cov(R_i, R_M)}{Var(R_M)} = \frac{\rho_{iM} \cdot SD(R_i) \cdot SD(R_M)}{SD(R_M)^2} = \frac{\rho_{iM} \cdot SD(R_i)}{SD(R_M)}$$

$$1.4 = \frac{\rho_{iM} \cdot 0.23}{0.15} \Rightarrow \rho_{iM} = \mathbf{0.913}$$

Practice Question 5

You own a portfolio that is equally split between two risky stocks (A & B) and a risk-free asset. The portfolio has an expected return of 27% and comes with the following information: $R_f = 5\%$, $E(R_M) = 20\%$. If the beta of stock A is 1.6, what is the beta of stock B?

$$E\left(R_{portfolio}\right) = 0.27 \qquad R_f = 0.05 \qquad E(R_M) = 0.2 \qquad \beta_A = 1.6 \qquad \beta_f = 0 \qquad \beta_B = ?$$

$$w_A = w_B = w_f = 0.333$$

$$E\left(R_{portfolio}\right) = \left[E(R_M) - R_f\right] \cdot \beta_{portfolio} + R_f$$

$$0.27 = [0.2 - 0.05] \cdot \beta_{portfolio} + 0.05 \Rightarrow \beta_{portfolio} = 1.467$$

$$\beta_{portfolio} = w_A\beta_A + w_B\beta_B + w_f\beta_f$$

$$1.467 = (0.333)(1.6) + (0.333)\beta_B + (0.333)(0) \qquad \beta_B = \mathbf{2.8}$$

Practice Question 6

Which of the following is a correct interpretation of alpha?

(Select all that apply)

a) It is the slope of the regression line of excess market returns on excess stock returns

b) It is the difference between the expected market return on an asset and CAPM expected return

c) An asset with negative alpha will be bought by investors as the market tends to equilibrium

d) An asset with positive alpha plots above the CML

e) None of the above

Practice Question 7

Which of the following is true about the CAPM?

(Select all that apply)

a) The model is invalidated whenever realized returns differ from the expected returns predicted by CAPM

b) The familiarity bias and relative wealth concerns can make investors depart from the CAPM

c) An investor who consistently holds onto stocks when they do well is exhibiting the disposition effect

d) The CAPM is favoured over computations of historical average returns by a majority of corporations

e) The CAPM isn't perfect in practice as small stocks often yield higher returns than predicted

Practice Question 8

The Interastral Peace Corporation's common stock currently sells at $60. It pays no dividends and has an alpha of 2.3%. If the market expects a yearly return of 20% on this stock, what should its equilibrium year-end selling price be according to the CAPM?

$$P_0 = 60 \qquad D_1 = 0 \qquad \alpha_i = 0.023 \qquad E(R_i)^M = 0.2$$

We are pricing according to CAPM, so we use: $\quad P_0 = \dfrac{D_1 + P_1}{1 + r} = \dfrac{D_1 + P_1}{1 + E(R_i)^{CAPM}}$ **(need to find $E(R_i)^{CAPM}$)**

$$E(R_i)^M - E(R_i)^{CAPM} = \alpha_i$$

$$0.2 - E(R_i)^{CAPM} = 0.023 \qquad E(R_i)^{CAPM} = 0.177$$

$$P_0 = \frac{D_1 + P_1}{1 + E(R_i)^{CAPM}} \Rightarrow 60 = \frac{0 + P_1}{1 + 0.177} \qquad P_1 = \$\mathbf{70.62}$$

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Risk & Return:
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Risk & Return:
The CAPM (SML)

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Weighted Average Cost of Capital (WACC)

←

Corporate Finance:
Capital Budgeting & Investment Rules

←

Corporate Finance:
Capital Structure

Corporate Finance:
Cash Flows & Sensitivity Analysis

→

Personal Finance:
Investments, Asset Allocation & Common Mistakes

→

International Finance:
MNCs & Exchange Rates

Practice Question 1

Which of the following statements is true?

(Select all that apply)

a) Most firms choose to finance with only debt alone or a mix of debt and equity

b) Security prices and future investment opportunities can influence a firm's choice of capital structure

c) Underwriting fees are a possible transaction cost firms may face when issuing securities

d) A financial manager is responsible for evaluating the costs and benefits of projects

e) The market value of a firm with unstable cash flows will likely be comprised of mostly equity
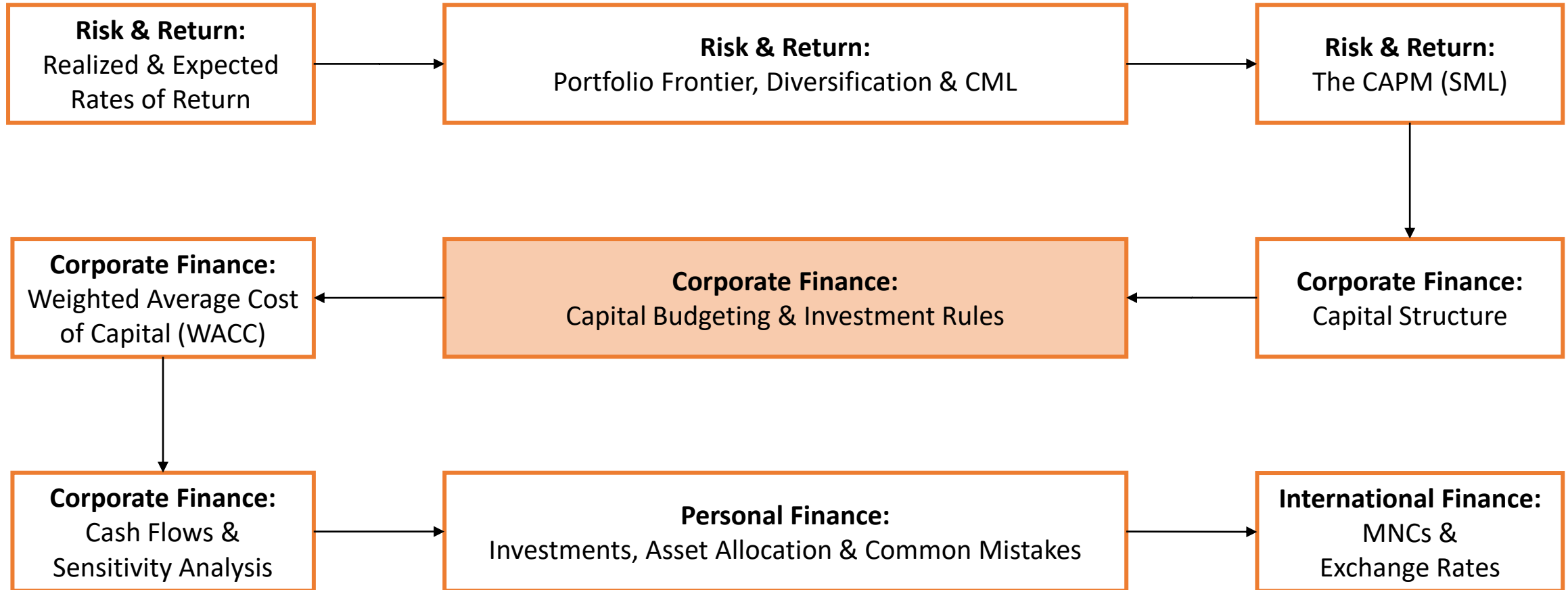
Practice Question 2

Which of the following statements is true?

(Select all that apply)

a) Investors who own subordinate debt will be paid first when a company goes into bankruptcy

b) Angel investors and venture capital are sources of equity financing for public companies

c) Secured debt promises specific firm assets (e.g., land) that cannot be promised to anyone else

d) A disadvantage of private corporate debt is that it is quite illiquid

e) The IPO of a firm takes place in the primary market while the SEO takes place in the secondary market

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Practice Question 1

If two projects are not mutually exclusive and provide poor estimations of their cost of capital:

(Select all that apply)

a) The payback period rule can be used to evaluate both projects

b) The NPV rule can be used to evaluate both projects

c) The IRR rule can be used to evaluation both projects

d) The profitability index rule can be used to evaluate both projects

e) None of the rules are appropriate to evaluate both projects

Practice Question 2

Two mutually exclusive projects (A & B) have smooth declining NPV profiles. Project A has an IRR rate 12% while project B has an IRR of 10%. If their cross-over rate is 6%, which of the following is true?

(Select all that apply)

a) If the cost of capital is 5%, a firm will invest in project A and not in project B

b) If the cost of capital is 4%, a firm will invest in project B and not in project A

c) If the cost of capital is 6%, a firm will be indifferent between project A and B

d) If the cost of capital is 8%, a firm will invest in project B and not in project A

e) None of the above

Practice Question 3

You have been asked to analyze the following four projects for a client. Each project provides non-zero cash flows in every year for the next three years. Answer the questions posed in the following slides.

Project	Cash Flows				Measures			
	C_0	C_1	C_2	C_3	Payback	IRR	NPV	PI
A	-240	25	100	375	2.3 years	31.9%	(a)	■
B	-75	5	(b)	■	1.7 years	31.4%	46.38	0.62
C	-100	40	30	50	(c)	9.3%	8.50	0.09
D	-300	■	50	400	2.4 years	26.5%	176.60	(d)

Practice Question 3

Project	Cash Flows				Measures			
	C_0	C_1	C_2	C_3	Payback	IRR	NPV	PI
A	-240	25	100	375	2.3 years	31.9%	(a)	■
B	-75	5	(b)	■	1.7 years	31.4%	46.38	0.62
C	-100	40	30	50	(c)	9.3%	8.50	0.09
D	-300	■	50	400	2.4 years	26.5%	176.60	(d)

a) If the client's cost of capital is 5%, what is the NPV of project A?

$$NPV_A = -240 + \frac{25}{(1+0.05)} + \frac{100}{(1+0.05)^2} + \frac{375}{(1+0.05)^3} = \mathbf{\$198.45}$$

Practice Question 3

Project	Cash Flows				Measures			
	C_0	C_1	C_2	C_3	Payback	IRR	NPV	PI
A	-240	25	100	375	2.3 years	31.9%	(a)	■
B	-75	5	(b)	■	1.7 years	31.4%	46.38	0.62
C	-100	40	30	50	(c)	9.3%	8.50	0.09
D	-300	■	50	400	2.4 years	26.5%	176.60	(d)

b) If the client's cost of capital is 5%, what cash flow is received in the 2nd year of project B?

$$0.7 = \frac{Amount\ left\ until\ C_0\ is\ offset}{Amount\ paid} = \frac{70}{C_2} \qquad \text{(use payback period method)}$$

$$C_2 = \$\mathbf{100}$$

Practice Question 3

Project	Cash Flows				Measures			
	C_0	C_1	C_2	C_3	Payback	IRR	NPV	PI
A	-240	25	100	375	2.3 years	31.9%	(a)	
B	-75	5	(b)		1.7 years	31.4%	46.38	0.62
C	-100	40	30	50	(c)	9.3%	8.50	0.09
D	-300		50	400	2.4 years	26.5%	176.60	(d)

c) If the client's cost of capital is 5%, what is the payback period of project C?

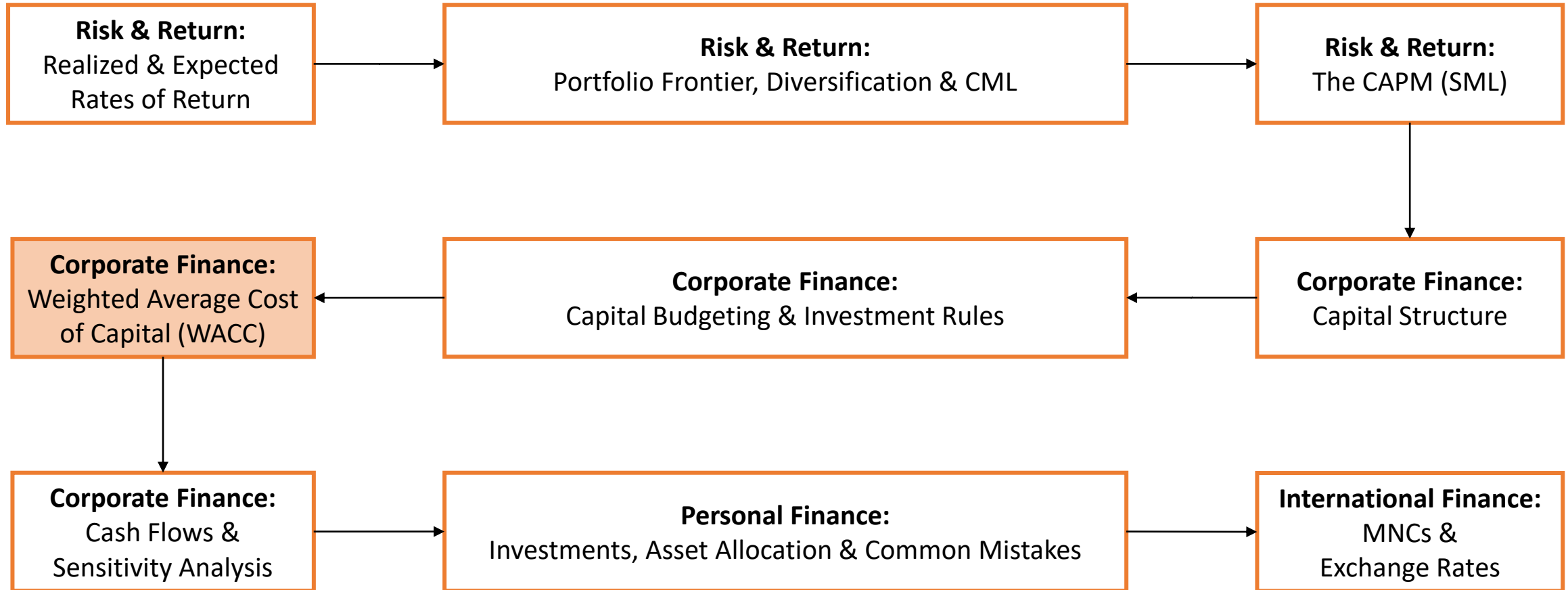Payback Period $= 2 + \dfrac{30}{50} = \mathbf{2.6\ years}$

Practice Question 3

Project	Cash Flows				Measures			
	C_0	C_1	C_2	C_3	Payback	IRR	NPV	PI
A	-240	25	100	375	2.3 years	31.9%	(a)	
B	-75	5	(b)		1.7 years	31.4%	46.38	0.62
C	-100	40	30	50	(c)	9.3%	8.50	0.09
D	-300		50	400	2.4 years	26.5%	176.60	(d)

d) If the client's cost of capital is 5%, what is the profitability index of project D?

$$PI_D = \frac{176.6}{300} = \mathbf{0.59}$$

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Practice Question 1

Which of the following factors increases a levered company's WACC assuming $R_E > R_D$?

(Select all that apply)

a) An increase in the expected return of the market portfolio

b) A decrease in the number of outstanding shares

c) An increase in the number of outstanding bonds

d) A decrease in the beta of the company's equity

e) A decrease in the coupon rate of outstanding bonds

Practice Question 2

a) SoulGlad Company has 1258 outstanding shares that demand a yearly return of 6%. Each share will pay a dividend of $40 next year. If dividends are expected to grow at a rate of 3% each year, what is the company's market value of equity?

# of shares $= 1258$ $\qquad r = 0.06$ $\qquad D_1 = 40$ $\qquad g = 0.03$

Market price per share $= P_0 = \dfrac{D_1}{r-g}$

$$P_0 = \dfrac{40}{0.06-0.03} = 1333.3333$$

E = # of shares $\times$ market price per share $= 1258 \cdot 1333.3333 = \mathbf{\$1677333.29}$

Practice Question 2

b) SoulGlad Company also has 5000 outstanding bonds that mature in 27 years. Each bond has a face value of $1000, a coupon rate of 8%, and YTM of 10%. If coupon payments occur yearly, what is the company's market value of debt?

# of bonds $= 5000$ $\quad\quad YTM = 0.10$ $\quad\quad CR = 0.08$ $\quad\quad F = 1000$ $\quad\quad k = 1$

Market price per bond $= P_0 = I\left[\dfrac{1-(1+r)^{-n}}{r}\right] + F\cdot(1+r)^{-n}$

$I = F\cdot\dfrac{CR}{k} = 1000\cdot\dfrac{0.08}{1} = 80$ $\quad\quad r_{annual} = \dfrac{YTM}{k} = \dfrac{0.10}{1} = 0.10$ $\quad\quad n = 27$ years

$P_0 = I\left[\dfrac{1-(1+r)^{-n}}{r}\right] + F\cdot(1+r)^{-n} = 80\cdot\left[\dfrac{1-(1+0.10)^{-27}}{0.10}\right] + 1000\cdot(1+0.10)^{-27} = 815.256$

$D = $ # of bonds outstanding $\times$ market price per bond $= 5000\cdot 815.256 = \mathbf{\$4076280}$

Practice Question 3

a) The Divination Corporation's equity has a beta of 1.5. Investors can currently borrow and lend at the risk-free rate of 4%. If the expected return of the market portfolio is 8%, what is the company's cost of equity?

$$\beta_E = 1.5 \qquad R_f = 0.04 \qquad E(R_M) = 0.08$$

$$R_E = \left[E(R_M) - R_f\right] \cdot \beta_E + R_f = [0.08 - 0.04] \cdot 1.5 + 0.04 = \mathbf{0.10}$$

Practice Question 3

Assume that Divination Corporation's cost of equity is 12%

b) Suppose the Divination Corporation has a market value of $180000. Its outstanding bonds pay semi-annual coupons and demand a semi-annual return of 4.5%. If the bonds have an aggregate market value of $70000, what is the company's weighted average cost of capital?
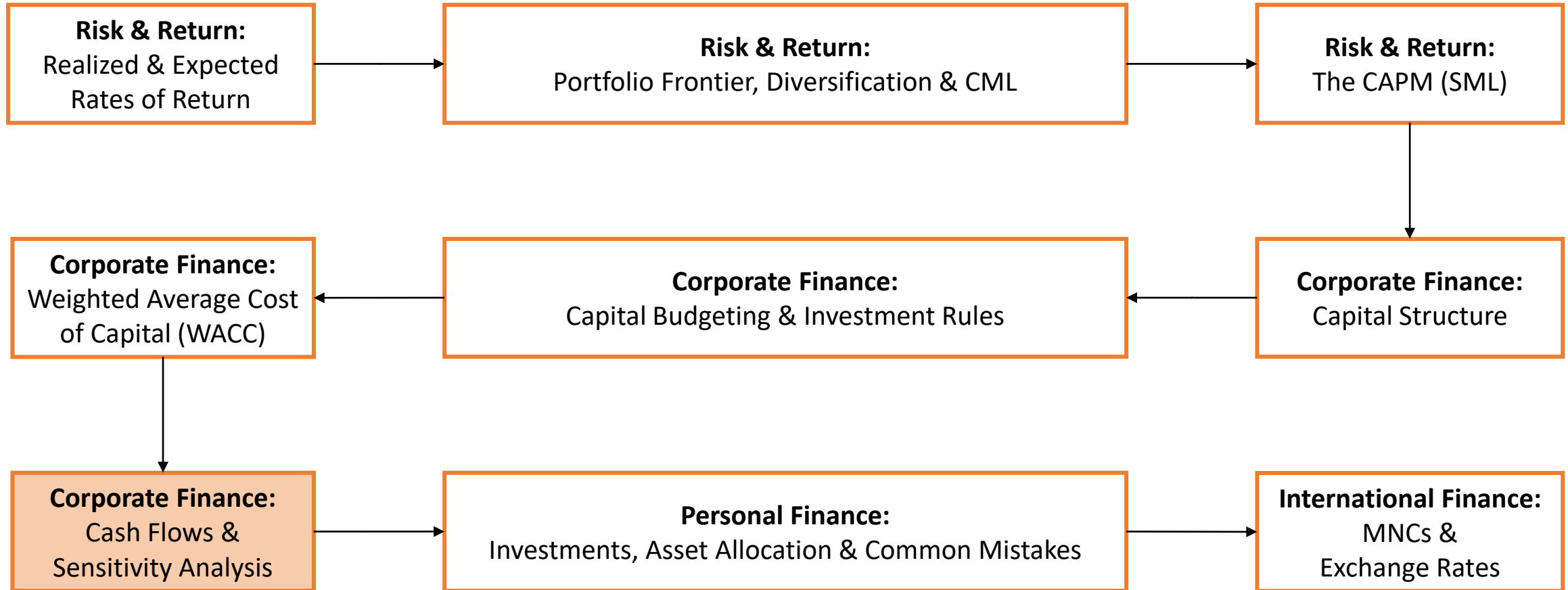
$$R_E = 0.12 \qquad V = 180000 \qquad D = 70000 \qquad k = 2 \qquad r_{semi-annual} = 0.045$$

$$V = D + E \Rightarrow E = V - D = 180000 - 70000 = 110000$$

$$R_D = YTM = r_{semi-annual} \cdot k = 0.045 \cdot 2 = 0.09$$

$$R_{WACC} = \left(\frac{D}{V}\right) \cdot R_D + \left(\frac{E}{V}\right) \cdot R_E = \left(\frac{70000}{180000}\right) \cdot 0.09 + \left(\frac{110000}{180000}\right) \cdot 0.12 = \mathbf{0.1083}$$

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Practice Problem 1

Dreamjolt Hostelry has invested $1000000 to date on a new drink. The drink is now ready to be put on their menu. Their marketing department estimates that 50000 drinks will be sold each year for the next four years. The price of each drink will be $7, and the variable cost of each drink will be $4. Yearly fixed costs will be $300000, which is comprised of $60000 new fixed costs and $240000 existing fixed costs.

To prepare the drinks, the Hostelry requires some special equipment. The equipment will be purchased immediately and costs $250000. At the end of the 4th year, the equipment can be salvaged for $20000. Furthermore, Dreamjolt Hostelry's cost of capital is 10%. Answer the questions in the following slides.

Practice Problem 1

a) What is the NPV of all non-operating cash flows?

$1000000 investment **(sunk cost, not included)**

Equipment costs & salvage **(incremental, included)**

Source of Cash Flow	Cash Flows			
	C_0	C_1	...	C_4
Equipment	-250000	0	...	20000

$n = 4$ $\qquad$ $R_{WACC} = 0.1$

$$NPV = -250000 + 20000(1 + 0.1)^{-4} = -\$\mathbf{236339.73}$$

Practice Problem 1

b) What is the NPV of all operating cash flows?

Fixed costs **($60000 is incremental, included)**

Variable costs & revenue **(incremental, included)**

$$Q = 50000 \qquad P = 7 \qquad VC = 4 \qquad FC = 60000 \qquad n = 4 \qquad R_{WACC} = 0.1$$

$$A = Q(P - VC) - FC = 50000 \cdot (7 - 4) - 60000 = 90000$$

Source of Cash Flow	Cash Flows			
	C_0	C_1	$\ldots$	C_4
Operating	0	90000	$\ldots$	90000

$$NPV = 90000 \cdot \left[\frac{1 - (1 + 0.1)^{-4}}{0.1}\right] = \$285287.89$$

Practice Problem 1

Assume the NPV of the entire project is $50000 and the NPV of all operating cash flows is $300000

c) What is the NPV break-even price?

$$Q = 50000 \quad VC = 4 \quad FC = 60000 \quad n = 4 \quad R_{WACC} = 0.1 \quad P = ?$$

$$[Q(P - VC) - FC] \cdot \left[\frac{1-(1+R_{WACC})^{-n}}{R_{WACC}}\right] = 300000 - 50000 = 250000$$

$$[50000 \cdot (P - 4) - 60000] \cdot \left[\frac{1-(1+0.1)^{-4}}{0.1}\right] = 250000$$

$$[50000 \cdot P - 260000] \cdot [3.17] = 250000$$

$$P = \$\mathbf{6.78}$$

Practice Problem 1

d) If incremental fixed costs decrease by $20000, how will this affect NPV?

$$A = Q(P - VC) - FC$$

When FC changes, only this part is impacted

$$n = 4 \qquad R_{WACC} = 0.1 \qquad \Delta FC = -20000$$

$$\Delta NPV = -\Delta FC \cdot \left[\frac{1-(1+R_{WACC})^{-n}}{R_{WACC}}\right] = -(-20000) \cdot \left[\frac{1-(1+0.1)^{-4}}{0.1}\right] = \mathbf{\$63397.31}$$

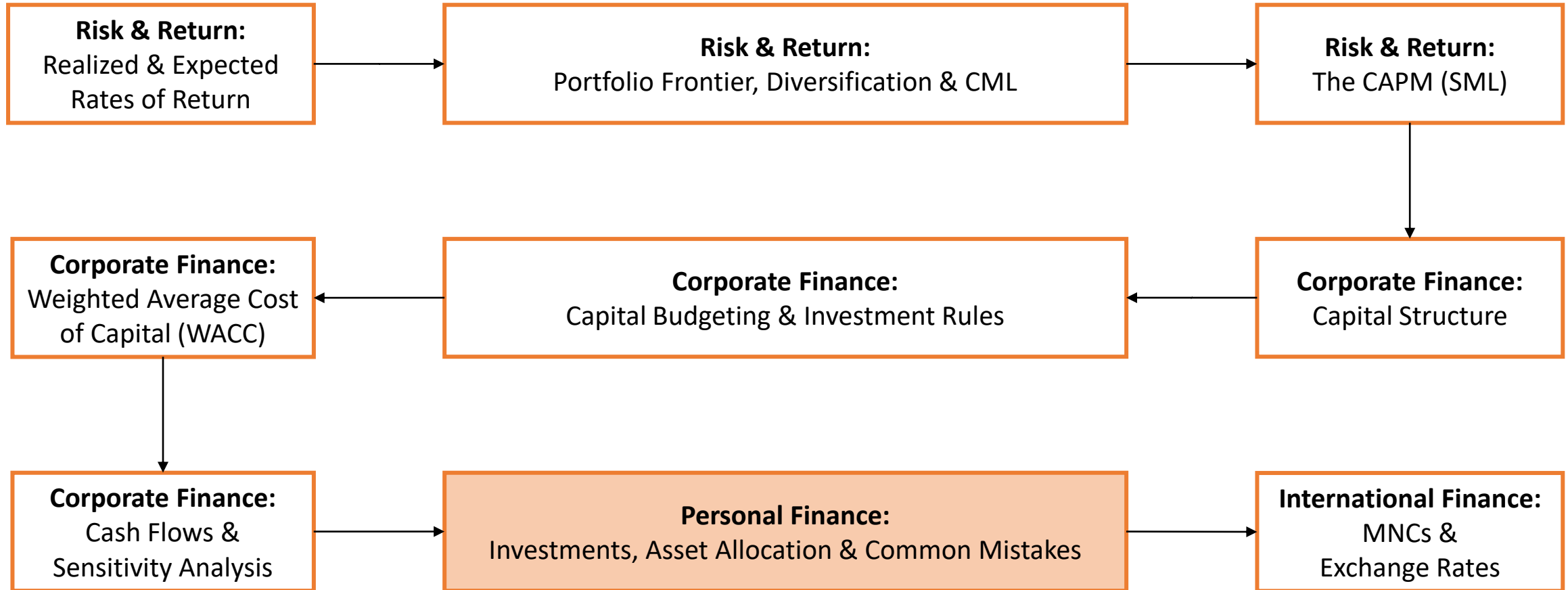# Practice Problem 1

e) If the salvage value of the equipment increases by $4250, how will this affect NPV?

$n = 4$ $R_{WACC} = 0.1$ $\Delta Salvage = 4250$

$\Delta NPV = \Delta Salvage \cdot (1 + R_{WACC})^{-n} = 4250 \cdot (1 + 0.1)^{-4} = \mathbf{\$2902.81}$

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Practice Question 1

Which of the following is true about investments & personal finance?

(Select all that apply)

a) The return on individual stocks are worse than the return on treasury bills on average

b) Most mutual funds today are actively-managed

c) One should always borrow to invest as it yields a higher expected return

d) A university student's portfolio will likely bear more risk than a retired professor's portfolio

e) ETFs replicate some indices like the S&P 500 quite successfully as their tracking error is near 0

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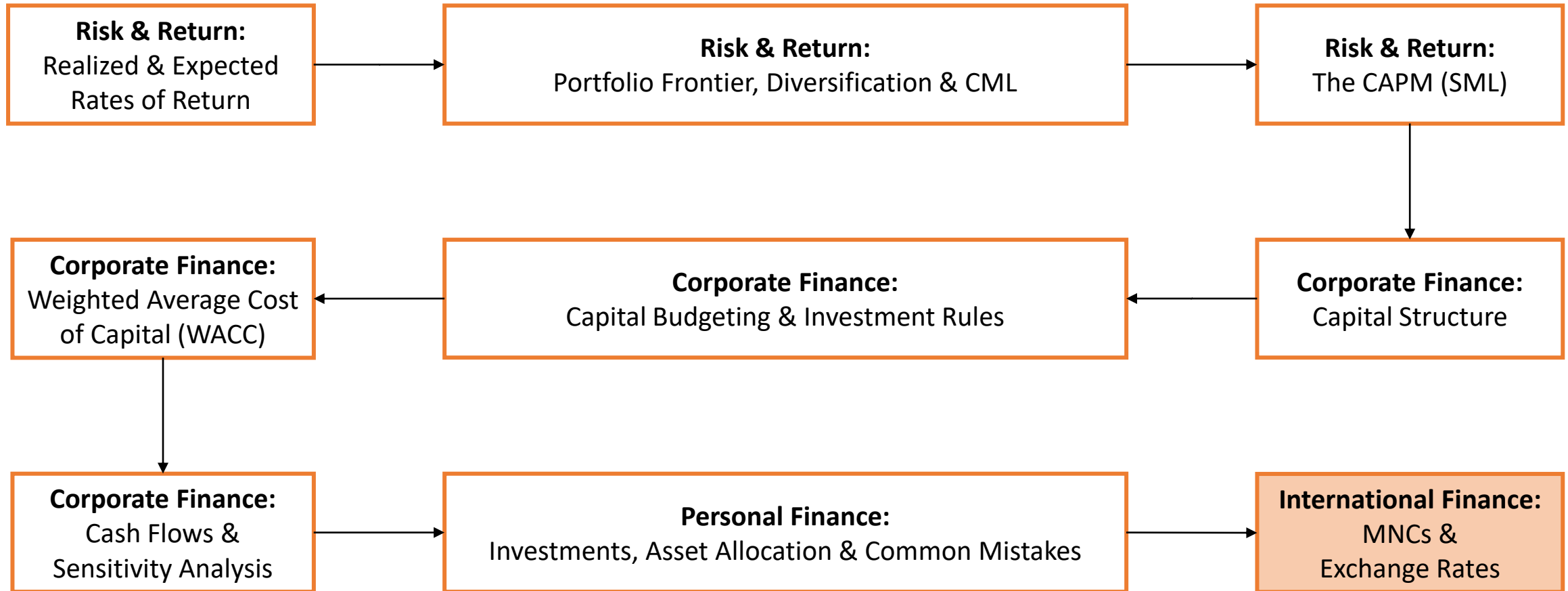
Practice Question 1

Which of the following is true about a multinational corporation?

(Select all that apply)

a) It is comprised of a parent company in a home country and subsidiaries in foreign countries

b) It often adapts to and exploits differences in costs, labour, and skills across countries

c) Its goods or services are produced and sold in more than one country

d) Its management is decentralized to allow global coordination when allocating resources

e) It may form because of market seeking, market imperfections, and cost minimization

Practice Question 2

Which of the following will make the Canadian dollar appreciate with respect to the American dollar?

(Select all that apply)

a) An increase in the real interest rate of the United States

b) When investors expect the GDP of Canada to fall more than the GDP of America next year

c) A public announcement that states that Canada's economic risk will fall

d) The price of US goods increase by 10%

e) The political risk of Canada increases due to an upcoming election

Practice Question 3

At the beginning of 2022, one British pound could buy €1.19 worth of German goods. At the end of 2022, the same British pound could only buy €1.13 worth of German goods. How much did the British pound change with respect to the Euro (€)?

$S_0 = 1.19$ $\qquad$ $S_1 = 1.13$

$$\Delta S = \frac{S_1 - S_0}{S_0} = \frac{1.13 - 1.19}{1.19} = -\mathbf{0.05} \quad \text{(depreciated by 5\%)}$$