



# Financial Management Module 14 November 2010

## Suggested Solutions

## Section A - Question 1

### Part a:

6 marks for advantages and disadvantages, 6 marks for calculating the effects on future earnings and 6 marks for calculating the effects on the balance sheet = 18 marks in all.

i) A rights issue:

A rights issue is the offer of new shares by a company to its existing shareholders in proportion to their existing shareholding.

Advantages would include:

If all rights are taken up, no change in ownership.

Costs of raising equity is cheaper and less disclosures required than if "Going Public"

No obligation to pay dividends

Helps to lower the debt:equity ratio and will therefore signal to creditors that existing equity holders still have faith in company and could help to reduce the cost of credit.

Disadvantages would include:

Market for shares is illiquid, not all shareholders may wish to take up rights which will change the structure of ownership.

Can be more expensive than the two other options.

ii) Issuing convertible debentures:

Convertible debentures are a type of bond that gives the holder the right but not the obligation to convert their bonds into new equity issued by the company at a predetermined ratio.

Advantages would include:

The interest payments on such bonds would be less than on similar non convertible bonds.

They may make an otherwise unattractive bond issue more attractive to lenders.

The loan would not need to be paid back which means that the financial resources stay in the company.

There is a widening in the number of people holding shares in the company. In fact this can be a reason in itself for issuing them.

This could make the market for its shares more liquid.

Any sinking fund which had been built up to repay the debt could be ploughed back into the company.

Disadvantages would include:

An increase in the number of shares will dilute EPS.

The increase in the number of shareholders will change the structure of ownership in the company.

If bonds are not converted they must be repaid as if they were similar non convertible bonds.

iii) Issuing debentures with warrants attached:

Warrants are financial securities that were originally sold with a bond issue but can be "stripped off" and sold separately. They are call options on the company's equity issued by the company. They give the bearer the right but not the obligation to purchase shares in the company at a predetermined future date in predetermined quantities.

Advantages would include:

The interest payments on such bonds would be less than on similar bonds issued without warrants.

They may make an otherwise unattractive bond issue more attractive to lenders.

There is a widening in the number of people holding shares in the company. In fact this can be a reason in itself for issuing them.

This could make the market for its shares more liquid.

If exercised the price paid for them brings financial resources into the company.

Disadvantages would include:

If exercised, they will cause an increase in the number of shares and this will dilute EPS.

The increase in the number of shareholders will change the structure of ownership in the company.

Whether exercised or not the bonds must be eventually repaid as if they were similar non convertible bonds.

Part a (ii):

Next years profit before interest and tax	€60,000	x	130.00%
	equals		€78,000
Funds required			
Increase in fixed assets	€180,000		
Increase in stocks	€16,000		
Increase in debtors	€12,000		
increase payables	(€18,000)		
	<u>€190,000</u>		

Methods

	<b>Rights Issues</b>	<b>Convertible Debentures</b>	<b>Debentures with warrants</b>
		Costs> 8.00%	Cost> 9%
Shares	160,000	120,000	100,000
Funds	€200,000	€200,000	€200,000
		<b>prospective&gt;</b>	<b>warrants</b>
Profit before tax	€78,000	€78,000	€78,000
Interest costs		<u>(€16,000)</u>	<u>(€18,000)</u>
Profit before tax	<u>€78,000</u>	€62,000	€60,000
Corporation tax	<u>(€9,750)</u>	<u>(€7,750)</u>	<u>(€7,500)</u>
	€68,250	€54,250	€52,500
Dividends	<u>(€21,000)</u>	<u>(€15,000)</u>	<u>(€15,000)</u>
	€47,250	€39,250	€37,500
EPS	€0.122	€0.136	€0.131
Shares in issue	560,000	400,000	400,000
Potential shares	<u>560,000</u>	<u>120,000</u>	<u>100,000</u>
		520,000	500,000
Profit as above	€68,250	€54,250	€52,500
interest saved			
net of tax	<u>no change</u>	<u>€14,000</u>	<u>no change</u>
Post issue	€68,250	€68,250	€52,500
Diluted EPS	N/A	€0.131	€0.105

Note: in the case of warrants there is no surrender of the debentures. Thus the interest continues to be paid. The advantage of warrants is to persuade lenders to take a lower interest rates

Part a (iii):

Balance Sheets after particular proposals:

	<b>Rights Issues</b>	<b>Convertible Debentures</b>	<b>Debentures with warrants</b>
Non Current Assets	€480,000	€480,000	€480,000
Current Assets			
Inventories	€96,000	€96,000	€96,000
Receivables	€72,000	€72,000	€72,000
Cash	€57,250	€49,250	€47,500
	<b>€705,250</b>	<b>€697,250</b>	<b>€695,500</b>
Equity			
Ordinary share capital	€280,000	€200,000	€200,000
Share Premium	€120,000		
Profit bfwd to start of year	€150,000	€150,000	€150,000
Profit for the year	€47,250	€39,250	€37,500
Total Equity	€597,250	€389,250	€387,500
<b>Non Current Liabilities</b>			
as at start of year	€0	€0	€0
Raised during year	€0	8% €200,000	9% €200,000
Current Liabilities			
Payables	€108,000	€108,000	€108,000
	€0	€0	€0
	<b>€705,250</b>	<b>€697,250</b>	<b>€695,500</b>

Question 1 Part b:

1 mark for explaining trade off, and 3 \* 2 marks for explaining each approach = 7 marks in all.

Current ratio shows the excess of current assets over current liabilities. A high current ratio might be good for creditors but is expensive for the company in terms of locking up valuable and costly resources. Liquid assets such as stock, debtors or even cash in the bank has to be financed yet generally do provide little if any return.

Conversely long term assets do generally produce profits but are not liquid. This therefore causes firms to have to make a decision in relation to their allocation of resources. This trade off between liquidity and profitability leads to an approach to working capital that can be characterised as “conservative” / “prudential” or “matching” / “hedging” or “aggressive”.

The Managing Director is recommending a conservative approach. This would involve financing all the fixed and permanent current assets and a proportion of the temporary current assets out of long term funds. While this is of low risk, as the current ratio is quite high, the use of expensive long term liabilities rather than less expensive short term liabilities is costly to the firm in terms of lost profitability.

The Finance director is recommending a more matched or hedged approach. This would quite simply involve matching all the fixed and permanent current assets out of long term funds and all the temporary current assets out of current liabilities. While this is of slightly higher risk, as the current ratio is quite high, the use of less expensive short term liabilities rather than more expensive long term liabilities is less costly to the firm in terms of lost profitability.

The aggressive approach as advocated by the Sales Director would involve financing some of the fixed assets, possibly all the permanent and all the temporary current assets out of its current liabilities, i.e. its short term funds. This is of a much higher risk, particularly at the moment when securing any form of finance is difficult and “rolling over” debt not proving easy. However as the current ratio is high, the use of less expensive short term liabilities rather than more expensive long term liabilities is the least costly to the firm in terms of lost profitability.

Question 2

5 marks for calculating nominal rates and expected future exchange rates, 7 marks for calculating the after-tax remittance values in Paysan pounds, 7 marks for calculating the NPV in Siang Shillings, 6 marks for explanations / discussions = 25marks in all.

Note: in lines 6 and 7, students should use either Interest Rate Parity, (IRP) or Purchasing Power Parity, (PPP). There is no need to use both.

Row		Inflation	Real rate of interest	Nominal rate of interest	
1	Country B; Paysan	20%	2%	22.4%	
2	Country A; Siang	8%	2%	10.16%	
2a	Real required rate of return				7%
2b	Nominal required rate of return				15.56%
3	Year	0	1	2	3
4	Nominal Compound rates; Paysan	1.000	0.817	0.667	0.545
5	current spot, (units of A per 1 unit of B)	0.50			
6	IRP Expected Future Exchange Rate at Time t	0.500	0.450	0.405	0.365
7	PPP Expected Future Exchange Rate at Time t	0.500	0.450	0.405	0.365
8	CURRENCY B (20% INFLATION) \ Year	0	1	2	3
9	Fixed Investment	3.00			
10	Variable Costs	0.50	0.56	0.63	0.70
11	Revenue		5.00	5.25	5.51
12	Net incremental cash flow	- 3.50	4.44	4.62	4.81
13	CURRENCY B (20% INFLATION)	0	1	2	3
14	Net incremental cash flow	- 3.50	4.44	4.62	4.81
15	Estimated taxable income		3.44	3.62	3.81
16	Country B corporate taxes at 30%		1.03	1.09	1.14
17	After-tax cash flows	- 3.50	3.41	3.54	3.67
18	Remitted Cash flows		2.04	2.12	2.20
19	Postponed remittances, (PPR's)		1.36	1.41	
20	PPR's compounded at 22.4%		1.50	1.22	
21	Compounded values of PPR's		2.04	1.73	-
22	= Yr 3 value of PPR's in yrs 1-2				5.97
23	Withholding taxes at 0%		-	-	-
24	Remittance after-tax	- 3.50	2.04	2.12	9.64
25	Expected Future Exchange Rate at Time t; (from IRP, row 6 or PPP, row 7)	0.500	0.450	0.405	0.365

26	CURRENCY A (8% INFLATION)				
27	Remittances received	- 1.75	0.92	0.86	3.51
28	Estimated taxable income		1.55	1.47	1.39
29	Corporate tax at 35%		- 0.54	- 0.51	- 0.49
30	Foreign tax credit		0.46	0.44	0.42
31	After-tax cash flow	- 1.75	0.84	0.79	3.44
32	Discount factor, $r = 15.56\%$ , (see Row 2b)	1.000	0.865	0.749	0.648
33	Present Values	- 1.75	0.73	0.59	2.23
34	Net present value at 15.56% =	1.80	As NPV >0 implies accept Project.		

Question 3

Part A

2.5 marks for each ratio = 10 marks in all.

Lux Fashions:

$$\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Sales}} = \frac{91,875}{7,500,000} = 0.01225 = 1.23\%$$

$$\text{Total Asset Turnover} = \frac{\text{Sales}}{\text{Total Assets less current liabilities}} = \frac{7,500,000}{8,500,000} = 0.88235$$

$$\begin{aligned} \text{Return on Total Assets (ROA)} &= \text{Net Profit Margin} \times \text{Total Asset Turnover} \\ &= 0.01225 \times 0.8823529 = 0.01081 = 1.08\% \end{aligned}$$

$$\begin{aligned} \text{Return on Equity (ROE)} &= \text{ROA} \times (\text{Total Assets} / \text{Total Equity}) \\ &= 1.08\% \times 2.125 = 0.02297 = 2.30\% \end{aligned}$$

Part b) 1 marks for each ratio and 1 mark for discussion = 6 marks in total.

Sale of assets	=	1,000,000
Percentage debt financing	=	100%
Annual interest rate	=	6%
Decrease in sales	=	-700,000

Lux Fashions Ltd. Income Statement

Sales	=	6,800,000
- Costs and expenses @ 90%	=	<u>6,120,000</u>
Earnings before interest and taxes	=	680,000
- Interest (6% x €3,500,000)	=	<u>210,000</u>
Earnings before taxes	=	470,000
Taxes @12.5%	=	<u>58,750</u>
Net Income	=	<u><u>411,250</u></u>

DeeLux Fashions Ltd. Balance Sheet as at 31 December 2009

<u>Fixed Assets</u>	€	€
Tangible		<u>7,500,000</u>
		7,500,000
<u>Current Assets</u>	0	
<u>Current Liabilities</u>	<u>0</u>	
	0	
<u>Creditors: amount payable within one year</u>		
Creditors	<u>0</u>	
	0	
Net current assets		<u>0</u>
Total Assets less current liabilities		<u>7,500,000</u>
<u>Creditors: amount payable after one year</u>		
10% Debentures		<u>3,500,000</u>
		<u><u>4,000,000</u></u>
<u>Financed By:</u>		
Ordinary shares of €1.00 each		3,850,000
Share Premium		0
Retained profits		<u>150,000</u>
Total Equity		<u><u>4,000,000</u></u>

$$\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Sales}} = \frac{411,250}{6,800,000} = 0.06048 = 6.05\%$$

$$\text{Total Asset Turnover} = \frac{\text{Sales}}{\text{Total Assets less current liabilities}} = \frac{6,800,000}{7,500,000} = 0.90667$$

$$\begin{aligned} \text{Return on Total Assets (ROA)} &= \text{Net Profit Margin} \times \text{Total Asset Turnover} \\ &= 0.060477941 \times 0.9066667 = 0.05483 = 5.48\% \end{aligned}$$

$$\begin{aligned} \text{Return on Equity (ROE)} &= \text{ROA} \times (\text{Total Assets} / \text{Total Equity}) \\ &= 5.48\% \times 1.875 = 0.10281 = 10.28\% \end{aligned}$$

As measured by ROE, which increases from 2.30% to 10.28%  
the purchase of the assets is a success

<b>Summary</b>	Original	Case (b)
Net Profit Margin =	1.23%	to 6.05%
Total Asset Turnover =	0.88	to 0.91
Return on Total Assets (ROA) =	1.08%	to 5.48%
Return on Equity (ROE) =	2.30%	to 10.28%

### Part C

2 marks for decreases in interest rates and 2 marks for increasing credit quality = 4 marks in all.

While there are many factors that must be considered, the two main factors for when a company may wish to refinance its debt are when there is a decrease in the market interest rate or when there has been an improvement in the firm's credit quality. Depending on the terms of the debt, the firm is obliged to pay interest (the coupon) and/or to repay the principal at maturity. The coupon rate reflects the current market interest rates and the firm's credit rating.

If interest rates were to drop, the firm might want to refinance its debt at the new lower rate. Because its debt was issued at a time of higher interest rates, the company could be paying a higher rate of interest than current market conditions would require. The firm could refinance by issuing new bonds at a lower coupon rate and use the proceeds to pay off the older bonds. This allows the company to benefit from the lower interest rates.

Also the firm's credit rating is reflected in the interest rate on its debt. A firm perceived as being risky will need to pay a higher rate of interest, to compensate for the additional risk of investing in that firm. If a firm's credit quality improves, investors won't require such a high premium as its debt will be perceived as a safer investment. This allows the firm to refinance its older debt at the new lower rate.

## Section B

### Question 4

Part (a):

3 marks for explaining Principal – Agent conflicts, 4 marks for applying to ratings agencies and the institutions they rate = 7 marks in all.

Agency problems arise from the separation of ownership and control.

Most of the attention in the literature has been focused on shareholders and managers. But it can also be applied to many other situations such as bond rating agencies and the firms whose assets they rate.

Agency Costs arise due to:

1. Costs of monitoring
2. Bonding costs

In the shareholder and manager context:

Ownership is widely spread

Day to day Control is in the hands of a few managers, (small overall share of ownership)

This leads to the rise of so called “managerialism” = the self serving behaviour by managers at the shareholders expense, e.g.

- excessive expenditure on perquisites
- low risk survival strategies
- “satisficing” behaviour

Attempts to minimise this behaviour include internal and external methods. Internal methods are schemes agreed by shareholder to try to align the interests of the manager with the shareholders, e.g. share option schemes. External methods rely on the capital markets to recognise where a manager is failing to maximise the value of a firm and hence leave scope for a profitable takeover.

As Jensen and Meckling (1976) show ultimately it is the shareholders who will bear the agency costs so it is in their best interests to minimise them. So a company might attempt to minimise such problems so as to reduce the cost of capital for the company and hence increase firm value.

Similarly Jensen and Meckling, (1976), show that a firm has an incentive to minimise agency costs between themselves and potential lenders.

However bond rating agencies and the financial institutions who pay the bond rating agencies to rate them also involves Principal – Agent problems. The bond rating agencies income derives from these institutions and therefore it might seem obvious that an institution could “shop around” to receive the best rating. Such a situation is alleged to be at the root of the “sub prime” securitised bond market collapse, in the USA. However similar to an auditor and its clients, should a bond rating agency get a reputation of issuing overly positive ratings then such ratings would not be trusted by the markets. As happened to Arthur Andersen, one of the then “Big Five” auditing company in the world. Hence institutions would no longer wish to continue to pay to have their bonds rated by a bond rating agency that was not seen as impartial. Thus it is in the long term interest of the agency to give an honest and fair valuation.

Part (b)

1 mark for 3 types, 1 mark for a discussion of EMH and 6 marks for applying to value of bonds = 8 marks in all.

EMH can be discussed from a number of perspectives:

- Weak form efficiency: a form of the theory that suggests you can't beat the market by knowing past prices.
- Semi-strong form efficiency: perhaps the most controversial form of the theory, it suggests you can't consistently beat the market using publicly available information. That is, you can't win knowing what everyone else knows.
- 3. Strong form efficiency: the form of the theory that states no information of any kind can be used to beat the market. Evidence shows this form does not hold.

In a strongly efficient market, investors will be alert to the fact that market prices are an accurate reflection of their investments prospects, and that if they behave in a manner which results in bad investment decisions, their investment value will quickly fall due to worsening prospects.

If markets were truly strong form efficient, would there be a need for bond rating agencies at all?

Thus the existence of such agencies shows that not all participants in the financial markets believe the markets to be strong form efficient. The fact that so much effort is made to reveal the true value of the bonds that are rated would indicate that markets are believed to be semi-strong efficient at best.

The effect of an efficient market is that it keeps investors alert to the consequences of their decisions. In an inefficient world, prices may take a while to adjust to reflect poor investment decisions, but in a semi-strong or strong market environment this will not be true. It can thus be said that the efficient markets hypothesis encourages higher quality investment. In a similar vein, it also serves to discourage the artificial manipulation of financial information to or by bond rating agencies. Thus as we have said in relation to the Principal-Agent relationship above, it is in the long term interest of the agency to give an honest and fair valuation.

The dramatic rise and fall of Irish (and international) bank shares could be seen as an example of a speculative bubble. However a speculative bubble would be an invalidation of the Efficient Market Hypothesis (EMH).

It seems obvious in retrospect that investors in the bonds of Irish financial institutes and the financial markets in general were not fully informed about the true situation inside financial institutions in Ireland and indeed the world. Either deliberately or erroneously, Irish financial institutes and the bond rating agencies, temporarily disseminated a deceptively rosy picture of their prospects and liquidity. However, it is difficult to imagine how Irish financial institutes could have been said to have been acting in their shareholders' best interests by deceiving the people that owned their share and those that lent to them. Similarly it would not have been in the long term interests of the bond rating agencies to have deliberately disseminated a deceptively rosy picture of the true value of Irish financial institutes.

The value of a bond is the discounted value of all expected future payments, both interest and capital. Since all assets in an equivalent risk class must be priced to offer the same expected return, the market capitalisation rate must equal the opportunity cost of capital of investing in an asset, even the bonds of Irish financial institutes. An implication of this is that, on average, the typical market participant cannot earn excessive profits from a particular trading strategy.

Financial bubbles are not unknown in history and they are examples of markets participants not behaving rationally. However the fact that the value of the bonds of Irish financial institutes may eventually return to their “true” value could be said to show that markets are efficient in the long run.

## Question 5 Part (a)

5 marks for dividend policy and 3 marks for example = 8 marks in all.

Nobody disputes that dividends and share repurchases matter. However the question is does dividend policy matter? Dividend policy and share repurchases deal with the timing of payments, not the amounts ultimately paid. They are irrelevant only when the timing of payments doesn't affect the present value of all future payments. Dividend policy and / or engaging in share repurchasing are among the most controversial issues of corporate finance. The controversy surrounds the question - do dividends increase the value of a firm?

Three views:

- The prevailing wisdom was that increased dividend payouts increase firm value.
- Modigliani and Miller (MM) argued that a firm's value is decided by the success of its investments and not by how it pays dividends.
- Finally a radical view suggests that due to the differential taxation of dividends and capital gains, dividends will reduce the firm's value as they are taxed at a higher rate.

The dividend irrelevancy argument of MM assumes a world of perfect capital markets. Given the assumptions used by MM, it is very hard to dispute their claim. MM's position was a direct challenge to the traditional view, which held that high payout ratios tend to increase the value of the firm. One of the cornerstones of this position is that cash dividends today are valued more highly than cash dividends in the future because future cash dividends are more risky. While there is still debate on the issue, it appears that the traditional position has weakened considerably and there is more acceptance of the general wisdom of MM's argument.

Part of the controversy and confusion about dividends arises from the way the issue is framed. In order to decide whether dividends add value to the firm, one has to keep other variables like investment policy and debt policy constant. The dividend policy has to be isolated from capital budgeting and borrowing decisions. This would clearly imply that dividend policy trade-off is between retaining earnings for reinvestment and paying dividends and financing the investments with newly issued stocks. Keep this in mind throughout the discussion on the merits of dividends. In other words, dividend policy issue is not about paying off any excess funds the company has; but whether a company should pay out earnings as dividends when it can profitably reinvest the same.

A financial manager needs to understand the issue and trade-off involved in order to be able to make the right decisions. Answers should include a discussion on how a change in dividend policy and / or a share repurchase often results in the value of a firm changing.

In addition the answer should discuss:

- How dividends are paid.
- The effects on other stakeholders.
- The effect of taxation.
- The information content of a change in dividend policy and / or share repurchases.

Examples could include Ryanair Holdings PLC as it achieved a fiscal-year net profit on substantially lower fuel prices and an improved route mix but with reduced growth prospects. Or any other suitable example with an appropriate explanation of choice.

Part b)

2 marks each for NAV, P:E and Dividend Growth, 1 marks for application to Ryanair = 7 marks in all.

i) Net Asset Value (liquidation) basis:

This is a rather conservative method of valuing based on historical cost; it is total assets (fixed and current) less liabilities divided by the number of shares to give an asset value per share. This measure is frequently used to estimate the value of private companies and is especially useful for property companies or firms with substantial amounts of fixed assets. As Ryanair would have a considerable amount of fixed assets this method could serve as a "floor" value for its shares.

ii) Price Earnings ratio:

This measure is based on the price earnings ratio which is market price per share divided by the earnings per share (measure of growth or future prospects); the PE ratio is multiplied by the profits and then divided by the number of shares; suited for public companies and obviously the higher the PE ratio the greater the value of the firm. Potential purchasers would be more interested in future earnings than past earnings but often reliable forecasts of future earnings are not always obtainable.

The firm needs to be quoted because if the firm is not quoted it is not possible to obtain a market price per share. A quoted company can be used as a proxy but the figure for the P/E ratio must be adjusted. For Ryanair as it traditionally reinvested all earnings and paid no dividend this would probably have been deemed an appropriate method to compare its share price to that of other quoted companies.

iii) Dividend valuation methods:

This measure is based on gross dividends divided by the dividend yield; frequently used for companies that regularly pay dividends; hence relevant for public companies and not private ones; based on the rationale that dividends reflect the earnings capacity of the firm; future cash flows rather than assets or past events. It would have been deemed inapplicable for a firm such as Ryanair which had never paid a dividend. It could now be used but assumptions in relation to future dividend payouts are implied by this method. Since Ryanair are only starting to pay this would be a very hypothetical way to value Ryanair.

Comparison

There is no single one which is the best. It depends. Net Asset basis is usually considered quite conservative and can serve as a base or minimum value. However if the asset value of a company is quite high it is possible that it might attract the attention of an asset stripper. Unless the purchasing company intends to sell the assets acquired, it is more likely that a valuation would be based on earnings. Now that Ryanair is starting to pay a dividend this will help.

## Question 6 Part (i)

Standard deviation and beta and when each is as an appropriate measure of risk in a portfolio.

2 marks for standard deviation, 2 marks for Beta and 1 mark for appropriate measure = 5 marks in all.

While it is possible for investors to avoid risk by only investing in risk free investments e.g. short term Government paper the expected returns will be low. Generally it is accepted that investors need a higher reward to take on higher levels of risk. Similarly, investors accept that the higher the return they can expect, the higher the level of risk they will have to bear, and vice versa. So it is important that we know what is meant by risk and how we measure it.

Standard deviation, or total risk, is the square root of the weighted average deviation of the returns on the individual stocks in a portfolio from the mean return, E.g. for a two asset portfolio, the Standard Deviation (= "the total risk of the portfolio") =  $\sigma_P = \sqrt{\{x_1^2 \sigma_1^2 + x_2^2 \sigma_2^2 + 2 x_1 x_2 \rho_{12}\}}$

The standard deviation or total risk of so called 'risky investments' can be broken down into two forms, namely: unsystematic risk which is diversifiable and systematic risk which is undiversifiable.

For an investor with an undiversified portfolio, it is total risk or standard deviation which is the most appropriate measure of risk.

The risk-return relationship an investor will be willing to accept will be a personal decision, influenced to a great extent by their attitude to risk i.e. their degree of risk aversion. While total risk is composed of unique risk and market risk, the market only compensates for market risk. There is no return for taking on unique risk that is diversifiable.

The systematic risk remaining in a portfolio reveals how that portfolio responds to changes in the value of the market portfolio. Some shares will be more cyclical and hence more responsive to changes in the value of the market portfolio. These are considered inherently more risky than other portfolios. Any investor wishing to invest in such shares must accept the associated level of risk which is undiversifiable.

The systematic risk of a security is incorporated into the beta term of the capital asset pricing model. Beta is the slope of a regression line, and it equals the covariance of the return on a security with the return on the market divided by the variance of the market return:

Beta measures the sensitivity of a stock's return to the return on the market portfolio. The market portfolio is a portfolio of all assets in the economy. In practice a broad stock market index, such as the S&P Composite, is used to represent the market. By definition the Beta of the market portfolio is one and that of the risk free asset is zero. While beta does not directly measure risk, it is a crucial risk indicator, reflecting the extent to which the returns on the single asset move with the market.

CAPM states that  $E(r_i) = r_f + \{E(r_m) - r_f\} \cdot \beta_i$

Unlike standard deviation, Beta is not a measure of total risk but a measure of relative risk, the risk of an asset relative to the market. Beta is also a measure of market risk. Market risk accounts for most of the risk of a well-diversified portfolio.

For an investor with a diversified portfolio, it is the beta not the standard deviation of the portfolio which is the most appropriate measure of risk.

Question 6 Part (ii):

Financial future contracts and how they are used to hedge a position.

3 marks for Financial future contracts, 2 marks for how they are used to hedge a position = 5 marks in all.

A futures contract is a derivative product that is a type of forward but traded on a futures exchange. It is generally used, like a forward contract to reduce risk. It can though be used to take on risk. This would be speculation! It is as a standardised arrangement between two parties today to buy or sell an asset at a particular time in the future for a particular price agreed today. The difference between a forward and a future contract is like that between buying a made to measure suit and buying "ready-to-wear" (or "Prêt-à-porter" as they say in France). The advantage of buying "made to measure is a perfect fit. The disadvantage is the price you pay for this. The advantage of a futures contract is that it is comparatively cheaper and this may outweigh the fact that it may not be a perfect fit.

It is not necessary that the underlying asset to a futures contract be a traditional "real" commodity. For financial futures, the underlying asset can be an intangible assets or referenced items such as stock indexes and interest rates. Futures for currencies, securities or financial instruments are all traded on futures exchanges.

Like a forward contract, a futures contract can be used to counterbalance risk exposure. It can limit any adverse change in the value of the underlying asset. In theory a futures contract can be used to hedge a position perfectly and completely remove all risk. In reality this is it is difficult to achieve a perfect hedge. They are therefore used not to completely eliminate but to reduce risk as much as possible. The price of a future contract is determined by the equilibrium between the supply and demand for them. This comes about through the competing buy and sell orders on an exchange at a particular time.

The party agreeing to buy the underlying asset in the future assumes a long position, and the party agreeing to sell the asset in the future assumes a short position. If you know that you will be making a purchase in the future of a certain asset, you should take a long position in a futures contract to hedge your position. For example, suppose that you know that in 3 months time you will have to buy US dollars to pay a supplier. By buying the futures contract today, you can lock in the price offered on the futures exchange today for dollars in three months time, (or thereabouts if not a perfect hedge).

This reduces your risk because you will be able to close your futures position and buy the US dollars you will need in three months at the price agreed today.

If you know that in the future you will be selling a certain asset, you should take a short position in a futures contract to hedge your position. For example, suppose that you know that in 3 months time you must sell US dollars you will make from an export sale. By selling the futures contract today, you can lock in the price offered on the futures exchange for the euro-dollar exchange rate in three months time, (or thereabouts if not a perfect hedge). This reduces your risk because you will be able to close your futures position and sell the US dollars you will receive in three months at the price agreed today.

Thus the uncertainty about the future price of an item is reduced which makes trading easier. Futures contracts can be very useful in limiting the risk exposure that an investor takes on in business. The main advantage of participating in a futures contract is that it removes or reduces risk by locking in the price of whatever you are buying or selling.

#### Question 6 Part (iii)

Interest rate and currency swaps and how they are used to hedge a position.

2 marks for Interest rate and currency swaps, 3 marks for how they are used to hedge = 5 marks in all.

Being usually OTC as opposed to exchange traded financial instruments both interest rate and currency swaps can come in a huge number of varieties. As the market for interest rate swaps is large and highly liquid they can be specifically structured to meet whatever the counterparties need. In reality as opposed to theory, financial markets are not perfect. Two parties can have an advantage in different aspects of the global financial market. Interest rate and currency swaps can allow them to take advantage of these differences more efficiently. Interest rate swaps can now be traded as an Index through the FTSE MTIRS Index.

An interest rate swap is a derivative in which one party exchanges a stream of interest payments for another party's stream of cash flows for a particular principal amount. However, while the principal amount is the same for both sides of the currency the principal amount itself is not actually exchanged. An interest rate swap is an agreement between two parties to exchange aspects (namely the interest payments) of a loan. At the outset, these aspects should be equivalent in net present value terms, i.e. the swap should have a NPV = 0 when initiated.

The simplest type of interest rate swaps are known as "Fixed for Floating" and involves a fixed payment being exchanged for a floating payment that is pegged to a variable reference interest rate such as, for the Euro zone, the Euribor. Euribor is the Euro Interbank Offered Rate and is a daily reference rate based on the averaged interest rates at which banks offer to lend unsecured funds to other banks in the euro wholesale money market (or interbank market). "Fixed for Floating" interest rate swaps can allow both parties to benefit. This is due to the varying levels of creditworthiness in the

counterparties. This gives rise to a positive quality spread differential and it is this differential which can give rise to arbitrage opportunities.

Interest rate swaps can be used by hedgers to manage their fixed or floating assets and liabilities in either the same or differing currencies. Or they can be used by speculators to profit from changes in interest rates. Interest rate swaps however expose users to interest rate risk and credit risk. Interest rate risk is due to changes in the floating rate. For example, if we had a plain vanilla fixed-for-floating swap, if we were the party who was paying the floating rate we would benefit if interest rates fell. For hedging purposes our interest rate exposure position would be the same as if we held a long bond position.

Credit risk on either an interest rate or currency swap depends on whether the swap is "in the money". If it is, then we face the credit risk of a possible default by the other side and vice versa for them.

Swaps can help you to hedge against an interest rate exposure by reducing the uncertainty of future cash flows. A swap can allow you to change your debt conditions and thus you can take advantage of current or expected future market conditions.

Similar to an interest rate swap, a currency swap can allow both parties to benefit. Again this is due to differentials between the counterparties that can give rise to arbitrage opportunities. A currency swap is a foreign-exchange agreement between two parties to exchange aspects (namely the principal and/or the interest payments) of a loan in one currency for equivalent aspects of an equal (in net present value terms) loan in another currency. The exchange of principal is done at market rates and is usually the same rate at both the commencement and maturity of the contract.

For example, suppose company A is located in the U.K. and company B is located in Ireland. Company A needs to take out a loan denominated in Euros and company B needs to take out a loan denominated in British pounds. By engaging in a swap these two companies can take advantage of the fact that each might have access to better rates in its respective country. Thus they by combining the privileged access they have in their own markets they could reduce the interest rate they would otherwise have to pay. As with interest rate swaps, there can also be counter party risks, the risk that the other party will fail to meet its obligations.

Essentially as a result of these advantages, both currency and interest rate swaps have the same benefits for a company. They help to eliminate or manage exposure to fluctuations in interest rates or to acquire a lower interest rate than a company would otherwise be able to obtain. Swaps are often used because a domestic firm can usually receive better rates than a foreign firm. Are used as financial tools to lower the amount needed to service a debt.

Question 6 Part (iv)

Net Present Value and the disadvantages of using NPV as an investment criterion.

1 mark for explaining NPV and 1 mark for each disadvantage (max 4) = 5 marks in all.

NPV is primarily used as an investment criterion in capital budgeting, the method by which you can establish if a new investment or expansion opportunity is advisable. Before undertaking an investment opportunity, you need to decide whether the investment will create positive or negative net present value cash flows. This will require you to estimate the future cash flows of the project and discounts them into present value amounts. This requires you to estimate the risk of the investment and hence its opportunity cost of capital which gives the appropriate discount rate. This allows all of the project's future cash flows (including the project's initial cash outlay) to be reduced into one present value number, the net present value (NPV) of the investment. In theory all positive NPV investments should be accepted.

Disadvantages:

Sensitivity to discount rates. NPV is a summation of multiple discounted cash flows - both positive and negative - converted into present value terms for the same point in time. The discount rate used in the denominators of each present value (PV) computation is critical in determining the final NPV figure. If a small increase or decrease in the discount rate has a considerable effect on the sign of the final value then one would have to be wary of its usefulness. Choosing the correct discount rate is not an exact science. There is no way to avoid this issue so "stress testing" the figure used may help.

Differential risk over the life of the project. There is a possibility that a project will not have the same level of risk throughout its life. This would require a change in the discount used over the life of the project. As already stated it can be hard to choose one discount rate accurately, trying to choose numerous rates over the life of the project makes it even more difficult and is therefore not usually undertaken.

Real Options. NPV does not usually take into consideration the value of any real options that can occur due to the project. E.g. if a project initially has a negative NPV over its current life but is expected to give the opportunity to expand greatly in the future it might still be worthwhile. This real option of expansion in the future should be included in the value of the total NPV of the investment. However the standard NPV formula provides no way to include the value of real options.

Interpretation under capital rationing. While all positive NPV projects should be accepted, there may not be the resources to do so. Thus an overall view of the gain or loss of each positive NPV project being included or excluded is necessary.

Interpretation for comparisons. The final NPV figure does not give the initial investment required or a rate of return. This can cause its interpretation to be misunderstood. To see a percentage gain relative to the investment for the project, can be better achieved usually, by finding its Internal Rate of Return, (IRR). The IRR is therefore often used as a complement to NPV.

NPV can act as a useful aid to value investments, but should not be used as the sole method to obtain a definitive answer for all investment decisions.

Question 6 Part (v)

The components of the risk premium for international investments?

1 mark for each component = 5 marks in all.

A risk premium is an excess return above the risk-free rate that you require as compensation for the higher uncertainty associated with investing in a risky asset. There are five main risks that encompass the risk premium for international investments. These are business risk, financial risk, liquidity risk, exchange-rate risk and country-specific risk. As each of these can both positively but more importantly negatively impact on the actual return an investor will receive, an investor needs to be adequately compensated for taking them on.

Business Risk. This is the risk arising from the uncertainty of an investment's future cash flows. These are affected by both the actions of the company and the economic environment in which it operates. The more variable the cash flows the greater the risk and hence the greater compensation required by investors.

Financial Risk. This is the risk arising from the uncertainty of the investment's reliance on leverage and the ability of a company's to meet its debt obligations. The more obligations a company has, the greater the financial risk and hence the greater compensation required by investors. All equity firms have no financial risk. As they have no debt they have no financial obligations. But they still have business risk. However as debt finance is comparatively cheaper than equity finance, there is a desire to increase financial leverage. The higher the financial leverage, the higher the chance that the company will be unable to meet its obligations. This can result in a complete loss for equity investors.

Liquidity Risk. This is the risk due to the uncertainty of whether one is able to exit an investment easily, both in timeliness and cost terms. If it seems likely that it will difficult to exit quickly and with minimal cost, for example a large property investment, the greater the liquidity risk and hence the greater compensation required by investors. This can be seen in the low bid-ask spreads for very liquid investments compared to thinly traded ones.

Exchange Rate Risk. This is the risk arising from the uncertainty of the investment's value in the investor's home currency if it is denominated in a foreign currency. The greater the historical amount of variation between the two currencies, the greater the exchange rate risk and hence the greater compensation required by investors. Should two currencies be perceived to be likely to stay pegged to one another and not vary greatly from their current rate then exchange rate risk is low. Where currencies tend to fluctuate more widely over time, investors will require a greater return.

Country-Specific Risk. This is the risk associated with the political and economic uncertainty of the foreign country in which an investment is made. These risks can include major policy changes, overthrown governments, economic collapses and war. Countries such as the United States and Canada are seen as having very low country-specific risk because of their relatively stable nature. Other countries, such as Russia,

are thought to pose a greater risk to investors. The higher the country-specific risk, the greater the compensation investors will require.

#### Question 6 Part (vi)

3 marks for explaining a bond selling at a premium, 2 marks for if a good investment = 5 marks in all.

A bond is a debt security. Depending on the terms of the bond, the issuer owes the holders a debt and, is obliged to pay interest (the coupon) and/or to repay the principal at maturity. Before deciding the interest rate that the issuer of a bond must pay there are many factors that must be considered. For example how much are similar bonds paying, what is the benchmark current rate of interest, what is the length of the term of the bond, what is the creditworthiness of the issuer perceived as etc.

As mentioned there are many factors that influence a bond's value. However bond values, as with most fixed-income securities, are highly correlated with interest rates. As interest rates rise, a bond's market price will fall and vice versa. When referring to a fixed rate bond, the terms premium and discount are often used. This means that the bond is selling for more than (a premium) or less than (a discount) its original price or par value. For example, if a bond with a par value of €1,000 is selling for more than €1,000 then it is being sold at a premium. If less than €1,000 then it is selling at a discount.

This can occur due to changing market interest rates. For example, assume the market interest rate is 5% today and a bond with a face value of €1,000 is paying an 8% coupon. If interest rates go down to 4% from the time of its issue, it becomes more desirable than newly issued bonds paying a new lower coupon reflecting the new lower rate of interest. The bond should sell for more than the par value to reflect this increased demand. This is because the bond is now paying a 4% spread over the interest rate instead of the previous 3%.

Is it a good investment? Just because a bond is selling at a premium does not determine whether it is a good or bad investment. The many other factors already mentioned affect the future value of the bond, including the expectation of changes in interest rates and the credit worthiness of the issuer of the bond itself.