Answers

DO NOT TURN THIS PAGE UNTIL YOU HAVE COMPLETED THE MOCK EXAM

A PLAN OF ATTACK

We've already established that you've been told to do it 102 times, so it is of course superfluous to tell you for the 103rd time to **Take a good look at the paper before diving in to answer questions.** You are going to remember aren't you; good!

Which order to do the questions

Having **looked through** the **paper in detail,** you need to have worked out the **order** in which to attempt the questions. You will probably have decided which question looks the easiest and started with that one. Answer plans will help you to decide how to approach each question.

The next step

You're probably thinking that you don't know where to begin or you could answer all of the questions in two hours!

Option 1 (Oh dear)

If you are challenged by this paper, do the **questions in the order of how well you think you can answer them.**

- **Question 1** has 13 marks for explanations which can be written even if you struggle with the calculations in part (a).
- The calculations in parts (a) and (b) of **Question 2** are not too difficult if you can remember the formulae! Part (c) can be answered if you are struggling with the calculations in the other parts of the question.
- **Question 3** is a wide ranging share issue question which may look daunting. You can however gain marks in each part even if you cannot complete all of the calculations.
- **Question 4** concerns interest rate and exchange rate risks which you may find difficult. There are however plenty of marks available for some straightforward discussions and explanations.

Option 2 (This one's definitely easier)

Are you **sure** it is? If you are then that's encouraging but don't forget to do answer plans to make sure you don't miss the point of the questions.

- Don't just concentrate on the calculations in **Question 1.** Make sure you also write full answers to the discussion parts.
- Make sure you do full written explanations in **Question 2,** there are as many marks for discussion as for calculations.
- Time management is going to be important in **Question 3** as there are a lot of calculations to get through. Make sure you leave enough time for the written parts of the question which have equal marks.
- **Question 4** answers need to be sufficiently detailed and, in part (a), applied to the organisation in the question.

Once more for the road

You must **allocate your time** according to the marks for the question in total, and for the parts of the questions. And you must also **follow the requirements exactly.**

Finished with fifteen minutes to spare?

Looks like you slipped up on the time allocation. However if you have, make sure you don't waste the last few minutes; go back to **any parts of questions that you didn't finish** because you ran out of time.

Forget about it!

Forget about what? Excellent, you already have.

Question 1

Text reference. Capital rationing is covered in Chapter 11.

Top tips. Parts (b) and (c) can be answered with no reference to the rest of the question. You might choose to do them first and to get these marks before doing the calculations in part (a).

In part (a) show your workings. This will ensure you earn good marks even if you make an arithmetic error.

Easy marks. Students are often tempted to spend more time on the numerical elements of a question.

Part (b) was straightforward and full marks should be attainable for making some obvious discussion points.

Again this is a question where a proforma approach could be used. Once you have your proforma for part (a) set out you should have been able to pick up some easy marks for costs and annuity factors.

There was a gift of a mark in part (a) for making a recommendation. Make a recommendation based on your calculations. As long as you recommend the lowest cost then the mark is yours!

For Part (c) make sure you cover all three elements covered in the question. In order to ensure this try to use separate sub-headings.

Marking scheme

			Marks
(a)	Servicing costs	1	
	Cleaning costs	1	
	Present values of total costs	1	
	Present values of trade-in values	2	
	Net present values of costs of each cycle	3	
	Annuity factors	1	
	Equivalent annual costs	2	
	Recommendation	1	
			12
(b)	Causes of capital rationing		4
(c)	Single-period and capital rationing	3	
	Project divisibility	3 - 4	
	Investment of surplus funds	3 - 4	
			9
			25

(a)

Replace every year

Year	*0*	*1*
Initial cost	(15,000)	
Trade-in value		11,250
Service cost		(1,000)
Cleaning cost		(500)
Net cost	(15,000)	9,750
Discount factor @ 10%	1	0.909
Present value	(15,000)	8,863
NPV	(6,137)	
Annuity factor	0.909	
Equivalent annual cost	**(6,751) pa**	

Replace every 2 years

Year	*0*	*1*	*2*
Initial cost	(15,000)		
Trade-in value			9,000
Service cost		(1,000)	(1,400)
Cleaning		(500)	(625)
Net cost	(15,000)	(1,500)	6,975
Discount factor 10%	1	0.909	0.826
Present value	(15,000)	(1,364)	5,761
NPV	(10,603)		
Annuity factor	1.735 for 2 years		
Equivalent annual cost	**(6,111) pa**		

Replace every 3 years

Year	*0*	*1*	*2*	*3*
Initial cost	(15,000)			
Trade-in value				6,200
Service cost		(1,000)	(1,400)	(1,960)
Cleaning cost		(500)	(625)	(781)
Net cost	(15,000)	(1,500)	(2,025)	3,459
Discount factor @ 10%	1	0.909	0.826	0.751
Present value	(15,000)	(1,364)	(1,673)	2,598
NPV	(15,439)			
Annuity factor	2.487 for 2 years			
Equivalent annual cost	**(6,208) pa**			

(b) In order to invest in all projects with a positive net present value a company must be able to raise funds as and when it needs them: this is only possible in a **perfect capital market**. In practice capital markets are not perfect and the capital available for investment is likely to be **limited** or **rationed**. The causes of capital rationing may be external (hard capital rationing) or internal (soft capital rationing).

Soft capital rationing is more common than hard capital rationing. When a company cannot raise external finance even though it wishes to do so, this may be because providers of debt finance see the company as being **too risky**. In terms of **financial risk**, the company's gearing may be seen as too high, or its interest cover may be seen as too low. From a **business risk** point of view, lenders may be uncertain whether a company's future profits will be sufficient to meet increased future interest payments because its trading prospects are poor, or because they are seen as too variable.

When managers **impose restrictions** on the funds they are prepared to make available for capital investment, soft capital rationing is said to occur. One reason for soft capital rationing is that managers may not want to raise new external finance.

For example, they may not wish to raise new debt finance because they believe it would be unwise to commit the company to meeting future interest payments given the current economic outlook. They may not

wish to issue new equity because the finance needed is insufficient to justify the **transaction costs** of a new issue, or because they wish to avoid **dilution of control**.

Another reason for soft capital rationing is that managers may prefer **slower organic growth**, where they can remain in control of the growth process, to the sudden growth arising from taking on one or more large investment projects.

A key reason for soft capital rationing is the desire by managers to make capital investments **compete** for funds, ie to create an internal market for investment funds. This competition for funds is likely to weed out weaker or marginal projects, thereby channelling funds to more robust investment projects with better chances of success and larger margins of safety, and reducing the risk and uncertainty associated with capital investment.

(c) The net present value decision rule is to invest in all projects that have a **positive** net present value. By following this decision rule, managers will **maximise the value of a company** and therefore maximise the **wealth of ordinary shareholders**, which is a primary objective of financial management. Even when capital is rationed, it is still essential to be able to offer advice on which capital investment projects should be selected in order to secure the **maximum return** for the investing company, ie the maximum overall net present value.

Single-period capital rationing

The approach to solving single-period capital rationing problems depends on whether projects are divisible or not. A **divisible project** is one where a partial investment can be made in order to gain a pro rata net present value. For example, investing in a forest is a divisible project, since the amount of land purchased can be varied according to the funds available for investment (providing the seller agrees to a partial sale, of course). A non-divisible project is one where it is not possible to invest less than the full amount of capital. When building an oil refinery, for example, it is not possible to build only one part of the overall facility.

Where projects are divisible, the objective of maximising the net present value arising from invested funds can be achieved by **ranking projects** according to their profitability index and investing sequentially in order of decreasing profitability index, beginning with the highest, assuming that each project can be invested in only once, ie is non-repeatable.

The **profitability index** can be defined as net present value divided by initial investment. Ranking projects by profitability index is an example of **limiting factor analysis**. Because projects are divisible, there will be no investment funds left over: when investment funds are insufficient to for the next ranked project, part of the project can be taken on because it is divisible.

When projects are non-divisible, the objective of maximising the net present value arising from invested funds can be achieved by calculating the net present value arising from different combinations of projects. With this approach, there will usually be some surplus funds remaining from the funds initially available.

The investment of surplus funds

When investigating combinations of non-divisible projects in order to find the combination giving rise to the highest net present value, any **return from investing surplus funds is ignored**. The net present value analysis has been based on the company's average cost of capital and it is unlikely that surplus funds can be invested in order to earn a return as high as this.

Investment of surplus funds in, for example, the money markets would therefore be an investment project that would be rejected as having a negative net present value, or an internal rate of return less than the company's average cost of capital if using IRR to assess investments projects. However, it is **good working capital management** to ensure that liquid funds are invested to earn the highest available return, subject to any risk constraints, in order to increase overall profitability.

Question 2

Text reference. Working capital management is covered in Chapters 4, 5 and 6.

Top tips. Parts (c) can be answered with no reference to the rest of the question. You might choose to answer it first and to get these marks before doing the calculations in the rest of the question.

In parts (a) and (b) you were asked for calculations based on formulae you should have learnt. As a starting point for answering these types of questions write out the formula first and then slot in the numbers.

Where a question asks for a number of factors, as in part (c), then try to give as many factors as you can think of. Don't limit yourself to just a couple of points.

Note that there are two separate elements to part (b).

Easy marks. Part (a) and (b) were both very straightforward calculations followed by brief discussion parts. Note that there were as many marks for the discussion elements as the calculation.

Marking scheme

				Marks
(a)	Ratio calculations		3	
	Comment		3	
				6
(b)	Calculation of cash operating cycle		2	
	Significance of cash operating cycle		2	
				4
(c)	Working capital and business solvency		3-4	
	Factors influencing optimum cash level		4-5	
		Maximum		7
(d)	New level of receivables		1	
	Finance saving		1	
	Administration cost savings		1	
	Interest on advance form factor		2	
	Factor annual fee		1	
	Net benefit of factor's offer		1	
	Conclusion and discussion		1	
				8
				25

(a) **Inventory days**

$$\text{Inventory Days} = \frac{\text{Inventory level at year end}}{\text{Cost of sales}} \times 365$$

20X6: (3,000/9,300) × 365 = 118 days
20X5: (1,300/6,600) × 365 = 72 days

Sector average: 90 days

Receivable days

$$\text{Receivable Days} = \frac{\text{Receivables at year end}}{\text{Turnover}} \times 365$$

20X6: (3,800/15,600) × 365 = 89 days
20X5: (1,850/11,100) × 365 = 61 days

Sector average: 60 days

Payable days

$$\text{Payable Days} = \frac{\text{Trade payables at year end}}{\text{Cost of sales}} \times 365$$

20X6: (2,870/9,300 × 0.95) × 365 = 119 days
20X5: (1,600/6,600 × 0.95) × 365 = 93 days

Sector average: 80 days

Commentary

In each case, the ratio in 20X6 is **higher** than the ratio in 20X5, indicating that deterioration has occurred in the management of inventory, receivables and payables in 20X6.

Inventory days have increased by 46 days or 64%, moving from below the sector average to 28 days – one month – more than it. Given the rapid increase in turnover (40%) in 20X6, Anjo Co may be expecting a continuing increase in the future and may have built up inventories in preparation for this, ie inventory levels reflect future sales rather than past sales. Accounting statements from several previous years and sales forecasts for the next period would help to clarify this point.

Receivable days have increased by 28 days or 46% in 20X6 and are now 29 days above the sector average. It is possible that more generous credit terms have been offered in order to stimulate sales. The increased turnover does not appear to be due to offering lower prices, since both gross profit margin (40%) and net profit margin (34%) are unchanged.

Payable days. In 20X5, only management of payables was a cause for concern, with Anjo Co taking 13 more days on average to settle liabilities with trade payables than the sector. This has increased to 39 days more than the sector in 20X6. This could lead to difficulties between the company and its suppliers if it is exceeding the credit periods they have specified.

Anjo Co has no long-term debt and the balance sheet indicates an **increased reliance** on short-term finance, since cash has reduced by $780,000 or 87% and the overdraft has increased by $850,000 to $1 million. Perhaps the company should investigate whether it is **undercapitalised** (overtrading). It is unusual for a company of this size to have no long-term debt.

(b) Cash operating cycle = Inventory days + Receivable days – Payable days

Cash operating cycle (2005) = 72 + 61 – 93 = 40 days
Cash operating cycle (2006) = 118 + 89 – 119 = 88 days

Significance

The cash operating cycle or working capital cycle gives the average time it takes for the company to receive payment from receivables after it has paid its trade payables. This represents the period of time for which receivables require financing. The cash operating cycle of Anjo Co has lengthened by 48 days in 20X6 compared with 20X5. This represents an increase in working capital requirement of approximately $15,600,000 × 48/365 = $2.05 million.

(c) The objectives of working capital management are **liquidity** and **profitability**, but there is a tension between these two objectives. Liquid funds, for example cash, earn no return and so will not increase profitability. Near-liquid funds, with short investment periods, earn a lower return than funds invested for a long period. Profitability is therefore decreased to the extent that liquid funds are needed.

The main reason that companies fail, though, is because they **run out of cash** and so good cash management is an essential part of good working capital management. Business solvency cannot be maintained if working capital management in the form of cash management is of a poor standard.

In order to **balance** the twin objectives of liquidity and profitability in terms of cash management, a company needs to decide on the **optimum** amount of cash to hold at any given time. There are several factors that can aid in determining the optimum cash balance:

First, it is important to note that cash management is a forward-looking activity, in that the optimum cash balance must reflect the expected need for cash in the next budget period, for example in the next month. The cash budget will indicate expected cash receipts over the next period, expected payments that need to be made, and any shortfall that is expected to arise due to the difference between receipts and payments. This is the **transactions need** for cash, since it is based on the amount of cash needed to meet future business transactions.

However, there may be a degree of **uncertainty** as to the timing of expected receipts. Receivables, for example, may not all pay on time and some may take extended credit, whether authorised or not. In order to guard against a possible shortfall of cash to meet future transactions, companies may keep a **'buffer inventory'** of cash by holding a cash reserve greater than called for by the transactions demand. This is the **precautionary demand** for cash and the optimum cash balance will reflect management's assessment of this demand.

Beyond this, a company may decide to hold additional cash in order to take advantage of any business opportunities that may arise, for example the possibility of taking over a rival company that has fallen on hard times. This is the **speculative demand** for cash and it may contribute to the optimum cash level for a given company, depending on that company's strategic plan.

(d)

	$000
Current receivables	3,800
Receivables under factor = 3,800 × 0.7	2,660
Reduction in receivables	1,140

	$000
Finance cost saving = 1,140 × 0.08	91.2
Administration cost saving = 1,000 × 0.02	20.0
Interest on advance = 2,660 × 0.8 × 0.01	(21.3)
Factor's annual fee = 15,600 × 0.005	(78.0)
Net benefit of accepting factor's offer	11.9

Although the terms of the factor's offer are financially acceptable, suggesting a net financial benefit of $11,900, this benefit is small compared with annual turnover of $15.6 million. Other benefits, such as the application of the factor's expertise to the receivable management of Anjo Co, might also be influential in the decision on whether to accept the offer.

Question 3

Text references. Sources of finance are covered in Chapter 12 and market efficiency in Chapter 18.

Top tips. A very good indication of the sort of question you might get in the exam, in terms of the calculations you may be asked to do and the balance between calculations and discussion.

Remember in (a) that on a rights issue, relative voting rights will only be unchanged if all current shareholders take up their rights, and they have to have the money to pay for the rights to do that. Also don't confuse scrip **issues** with scrip **dividends** (where shareholders are offered the choice of dividends in the form of shares or cash.)

In (b) (ii) remember you are calculating the value of the **rights.** A further adjustment (25/5) = 5c would be needed to calculate the value of the rights **to each share currently held.**

In (c) two alternative methods are given to calculate the rate of dividend growth. However the first method is superior if you can calculate the fourth roots of numbers. The methods of calculating the cost of debt and the cost of preference shares are identical; if the debt was redeemable however, you would have to carry out an internal rate of return calculation.

The best approach to (d) is to define strong form market efficiency first; points from the definition can be used to support your reasons as to the possible effects of the hypothesis on managers' behaviour.

Marking scheme

			Marks
(a)	Rights issue explanation	2	
	Scrip issue explanation	2	
	Effect on private investors	3	
			7
(b)	Take up rights calculation	2	
	Sell rights calculation	2	
			4
(c)	Cost of equity	3	
	Cost of preference shares	1	
	Cost of debt	2	
	WACC	2	
			8
(d)	Explanation of strong form efficiency	3	
	Effect on behaviour	3	
			6
			25

(a) **Rights issue**

A rights issue is a way of raising **new share capital** by means of an offer to existing shareholders enabling them to buy more shares, usually at a **price lower** than the **current market price**. Under a rights issue existing shareholders are invited to **subscribe cash** for new shares in proportion to their existing holdings.

Reasons for rights issue

A company may choose to make a rights issue for the following reasons:

(i) Rights issues are **cheaper** than offers for sale to the general public. This is because:

(1) **No prospectus** is **required** (provided that the issue is for less than 10% of the class of shares concerned).

(2) **Administration** is **simpler**.

(3) The **costs** of **underwriting** will be **less**.

The company will however need to **explain** clearly to shareholders the purpose for which the additional funds are required, and **demonstrate** that the **return on capital** will at least be **maintained**, and ideally enhanced as a result of the issue.

(ii) Relative **voting rights** are **unaffected** if shareholders all take up their rights.

(iii) Funds can be raised in this way for any type of **long term investment**, or to **reduce** the level of **capital gearing**.

Impact on private investor

The effects from the point of view of the **private investor** include:

(i) He must decide whether to **take up** or **sell** the rights. If the market is efficient, he should be **no worse off** whether he decides to take up the rights or to sell them. However, if he were to do nothing then he would **forego** the **financial benefits** of the issue.

(ii) If he decides to take up the rights he must have **additional funds** available to invest in the company. He must therefore decide if this is the **best use** of those funds, and also consider the effect of such an investment on the **risk/return profile** of his investment portfolio.

Scrip issue

A scrip issue (or bonus issue) is an issue of new shares to existing shareholders, by **converting equity reserves** into **issued share capital**. For example, a company with issued share capital of 10m $1 nominal value shares with a market price of $10 and reserves of $20m, could make a scrip issue of one for one. This would have the effect of doubling the number of shares in issue, and thus reducing the theoretical market price of the shares to $5.

Impact on company

The advantage to the company of a scrip issue is that it makes the **shares cheaper** and therefore **more marketable** on the Stock Exchange.

Impact on private investor

From the point of view of the investor, there should be **no change** as a result of a scrip issue. He is not required to subscribe additional capital, unlike the rights issue. Once the issue has taken place, he will own a **larger number of shares** in the company, but the overall value of his holding will be the same as it was before. However, in practice the **share price** may **rise slightly** as a result of improved marketability, and therefore he may experience a small capital gain.

(b) (i) Theoretical ex-rights price $= \frac{1}{N+1}((N \times \text{cum rights price}) + \text{issue price})$

$= \frac{1}{5+1}((5 \times 1.60) + 1.30$

= $1.55 per share

After the rights issue, James Brown will own 12,000 shares (10,000 + 2,000) at a price of $1.55. **The theoretical value** of **his holding** will therefore be $18,600.

(ii) **Value of rights** per share = Theoretical ex-rights price – Cost of taking up rights
= $1.55 – $1.30
= 25 cents per share

James Brown has the right to subscribe for an additional 2,000 shares. If he sells these rights he can expect to receive 2,000 × $0.25 = $500.

(c) **The required return on equity using the dividend growth model**:

$$k_e = \frac{d_0(1+g)}{p_0} + g$$

Where d_0 = Current level of dividends = 12c per share
g = Rate of growth in dividends (see below)
p_0 = Market price of shares = $1.60 per share

'g' can be estimated over the four year period as $\left(\sqrt[4]{12/8}\right) - 1 = 0.1067$ ie 11%.

Alternatively, it can be approximated by finding the average annual rate of growth as follows:

Year	*Div*	*Increase*	*Increase*
	cents	cents	%
20X5	8		
20X6	9	1	12.5
20X7	11	2	22.2
20X8	11	0	0.0
20X9	12	1	9.1
			43.8

Over four years this gives an average rate of 11%.

The required rate of return can now be found:

$$k_e = \frac{12(1+0.11)}{160} + 0.11$$

$$= 19.3\%$$

Cost of preference shares (k_{pref})

This can be found by dividing the preference dividend rate by the market price of the shares:

$$k_{pref} = \frac{15}{145}$$

$$= 10.3\%$$

Although preference shares are included with prior charge capital, the dividend is not allowable for tax, and therefore no adjustment needs to be made for this.

Cost of debentures (k_{dnet})

The after tax cost of the debentures can be found using the following expression:

$$k_{dnet} = \frac{i(1-T)}{p_0}$$

where: i = rate of debenture interest
p_0 = market price of debentures
T = rate of tax on profits

$$k_{dnet} = \frac{12(1-0.33)}{80}$$

$$k_{dnet} = 10.1\%$$

Total market value of capital ($m)

$= (1.60 \times 5) + (1 \times 0.8) + (0.5 \times 1.45)$

= $m (8 + 0.8 + 0.725)

= $9.525 million

Weighted average cost of capital $= \frac{8(0.193) + 0.8(0.101) + 0.725(0.103)}{9.525}$

$= 17.8\%$

(d) **Stock market efficiency**

An efficient stock market is one in which:

(i) The prices of securities traded **reflect** all the **relevant information**, which is **available** to the buyers and sellers. Share prices **change quickly** to reflect all new information about future prospects.

(ii) **No individual dominates** the market.

(iii) **Transaction costs** of buying and selling are **not so high** as to **discourage trading** significantly.

Strong form efficiency

The efficient markets hypothesis exists in a number of forms, which relate to the nature of the information available to investors. Strong form efficiency means that share prices **reflect all information** available from:

(i) Past price changes
(ii) Public knowledge or anticipation
(iii) Insider knowledge available to specialists or experts such as investment managers

Impact of strong form efficiency

If the stock market is believed to operate with strong level efficiency, this might affect the behaviour of the finance directors of publicly quoted companies in the following ways.

Managers are likely to be aware that **share prices** will **change quickly** to reflect decisions that they take. This means that all financial decisions are likely to be evaluated in the light of their **potential impact** on the **share price**. A contrary view is that management should concentrate simply on **maximising** the **net present value** of its investments and need not worry about the **effect** on **share prices** of financial results in the published accounts. **Investors** will make **allowances** for low profits or dividends in the current year if higher profits or dividends are expected in the future.

Question 4

Text reference. Foreign currency risk is covered in Chapter 19 and interest rate risk in Chapter 20.

Top tips. Make sure you apply your answer in part (a) to the specific circumstances of this company.

If you picked the wrong rate in (b), remember that the company needs to obtain dollars by buying them with pounds and the lower figures mean that it will get fewer dollars per pound (the customer always loses when it deals with the bank).

Part (c) is a textbook explanation and part (d) requires you to bring out that swaps are used for different reasons to other derivatives – as a means of borrowing on the best terms possible rather than trying to limit losses from foreign exchange dealings.

Marking scheme

			Marks
(a)	Up to 3 marks per risk discussed. To obtain high marks, must include discussion of company's circumstances		8
(b)	Forward market calculation	2	
	Money market calculation	3	
	Conclusion	1	6
(c)	Explanation of model		4
(d)	Swaps – must include advantages compared with other methods for maximum marks	4	
	Other methods	5	
	max		7
			25

(a) **Types of currency risk**

Economic risk

Economic risk refers to the effect of **exchange rate movements** on the international competitiveness of a company. For example, JetAWay provides airline services to many European countries. Movements in exchange rates will change the relative value of currencies. An appreciation of sterling against other European currencies will **erode the competitiveness** of the company where airline services are denoted in Sterling. Providing websites selling airline tickets in different currencies helps to alleviate this risk.

However, the fact that bookings can be made in any of JetAWay's web sites may cause problems. If JetAWay does not amend prices to reflect currency movements, this means that customers can '**shop around**' for the cheapest airfare from the 15 regional websites, paying in the site with the weakest currency. JetAWay needs to update its websites to **reflect currency movements** to ensure this does not happen.

Transaction risks

This is the risk of adverse exchange rate movements occurring in the **course of normal international trading transactions**. It arises when **export prices are fixed** in foreign currency terms or **imports are invoiced in other foreign currencies**.

For JetAWay, all sales are transferred to Milan and then to the regional locations for each JetAWay office. This exposes JetAWay to **currency risk** in respect of the euro against all non-euro countries. There will also be **transaction and conversion costs** for each currency movement. **Maintaining sales in local currencies** and **paying local expenditure** first before remitting surplus funds to Milan would help to limit this risk and transaction costs.

Translation risks

Translation risk arises from **differences in currencies** in which assets and liabilities are denominated. Where a company has different proportions of assets and liabilities denominated in different currencies, then exchange rate movements are likely to have varying effects on the value of those assets and liabilities.

In the case of JetAWay no information is available regarding the currencies in which assets and liabilities are denominated. It is possible that all assets are held in the UK accounts in which case the company would not be subject to translation risk.

(b) **Forward exchange market**

Cost of $40 million in 3 months = $40,000,000/1.6445 = £24,323,503

Money markets

US dollar deposit rate = 7%, so three month rate = 7/4 = 1.75%

To earn $40,000,000 in three months need to lend now:

40,000,000/1.0175 = $39,312,039

Purchase dollars now at spot rate of 1.6625

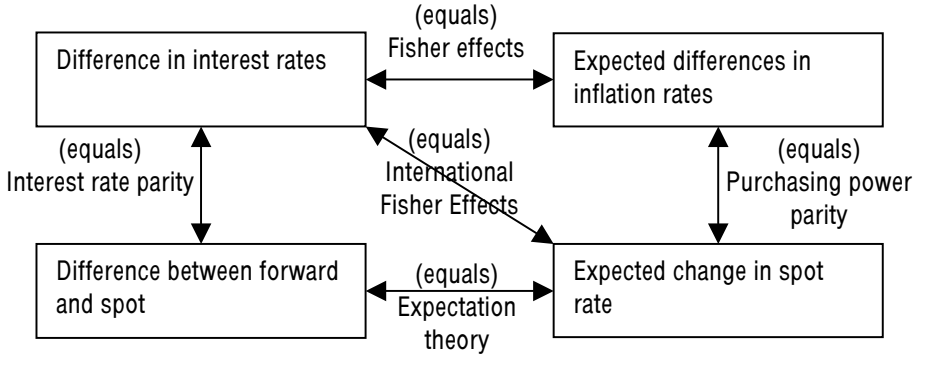
39,312,039/1.6625 = **£23,646,339**

Annual borrowing interest rate for 3 months = 10.75/4 = 2.6875%

Amount required = 23,646,339 × 1.026875 = £24,281,834

Conclusion – use money market to hedge risk.

(c) The **four-way equivalence model** states that in equilibrium, differences between forward and spot rates, differences in interest rates, expected differences in inflation rates and expected changes in spot rates are **equal** to one another.



(d) **Hedging interest rate risk**

Interest rate risk can be hedged using the following techniques:

Forward rate agreements

This is an agreement that can be **purchased 'over the counter'** to lend or borrow a given sum of money in the future for an interest rate that is agreed now. In terms of currencies, this equates to a **forward contract** – that is an agreement to buy or sell a given amount of currency in the future at an exchange rate that is agreed today. Both types of contracts are used to **'fix' interest rates or exchange rates** on future transactions which removes the risk of rate movements in the intervening period.

Interest rate futures

Interest rate futures are similar to FRA's, although they are not available at a bank; they are **traded on the futures market**. The **terms, amounts and periods are standardised**. This means that forward rate agreements are more appropriate than interest rate futures for non-financial companies such as ReGen.

Interest rate options

An interest rate option gives the **right to borrow or lend a specified amount at a guaranteed rate of interest**. On or before the expiry of the option, the holder must decide whether or not to exercise the right to borrow or lend.

In a borrowing situation, the option will only be exercised if the **market interest rates** have **risen above the option rate**. Bespoke contracts can be obtained from major banks while standardised contracts are traded in a similar way to interest rate futures. Interest rate options tend to cost more than forward rate agreements.

Interest rate swaps

These are transactions which **exploit different interest** rates in different markets for borrowing, with the aim of reducing interest rate costs for fixed or floating loans. An interest rate swap is actually an agreement where two companies, or a bank and a company, swap interest rate commitments with each other. Each party effectively simulates the other's borrowings while maintaining their original obligation to their lender. Each party therefore accepts a counterparty risk.

The benefits of a swap compared to other hedging instruments include:

- **Low transaction costs** – legal fees only.
- **Flexibility** – swaps can be arranged in any size and reversed if necessary.
- **Companies with different credit ratings can borrow at the best cost** in the market that is accessible to each company, and then swap the benefit with another company with the aim of reducing mutual borrowing costs.
- Swaps can allow **capital restructuring** by changing the nature of interest commitments without the need to redeem old debt or issue new debt, which again reduces transaction costs.