



INSTITUTE OF ACTUARIAL
& QUANTITATIVE STUDIES

Subject: Business finance 2

Chapter: Unit 4

Category: Practice question

Which of the following best describes the cost of providing finance from retained earnings?

- A There is no cost associated with retained earnings.
- B Retained earnings are less expensive than equity share capital.
- C Retained earnings are equally expensive as equity share capital.
- D Retained earnings are more expensive than equity share capital.

2. CT2 April 2013 Question 5

Which of the following justifies the use of the payback method for evaluating capital investment projects?

- A. Management has to predict cash flows from the projects in order to determine payback.
- B. Project with short payback are always more profitable.
- C. Project with short payback always have higher net present values.
- D. Project with short payback are always more predictable.

3. CT2 September 2013 Question 3

A company has a policy of investing in projects on the basis of their internal rate of return (IRR). Which of the following is a drawback of using IRR?

- A. Positive net present value project may be rejected.
- B. High yield investment opportunities may be overlooked.
- C. IRR is more difficult to interpret than Net present value (NPV).
- D. Ranking mutually exclusive projects on the basis of IRR may give misleading results.

4. CT2 September 2013 Question 4

Which of the following best illustrates an opportunity cost?

- A. Accepting a project with a negative net present value
- B. Rejecting a project with a positive net present value because of funding constrain.
- C. Understanding the project return on a potentially positive net present value project in order to adjust for risk
- D. Rejecting a project with a positive net present value because it has been decided to invest the available funds in a different project

5. CT2 September 2013 Question 2

Which of the following is an unsystematic (specific) risk?

- A Interest rates may change.
- B Company directors may make bad decisions.
- C Consumer demand can be affected by global economic cycles
- D Basic commodity prices can change.

6. CT2 April 2014 Question 6

A quoted company's statement of financial position shows equity shares worth £10m, retained earnings of £20m and non-current liabilities in the form of a £15m nominal loan paying 7% pa interest. The shares have a total market value of £48m and the non-current liabilities have a market value of £18m.

The company's cost of equity has been determined as 17% and the cost of debt as 8%.

7. CT2 April 2014 Question 7

A speculator has a policy of investing all of his cash in a single company for a short period in the hope of achieving a capital gain. The speculator is presently looking for a company whose shares have a high beta coefficient.

Which of the following is the most rational explanation for the speculator's desire to identify a high beta security?

- A High beta securities tend to increase in value.
- B Specific risks can be diversified away and only systematic risks matter.
- C The speculator expects stock market prices to strengthen.
- D The speculator expects stock market prices to weaken.

8. CT2 September 2014 Question 6

A project that has been under review for some time has been modified so that the cash receipts will remain the same, but their timing will be brought forward throughout the length of the project. How will this affect the projects internal rate of return and net present value (using a positive risk discount rate)?

- A. The internal rate of return and net present value will both decrease.
- B. The internal rate of return and net present value will both increase.
- C. The internal rate of return will increase and the net present value will decrease.
- D. The internal rate of return will decrease and the net present value will increase.

9. CT2 April 2015 Question 5

A new machine will cost a company £700,000 and will increase profits by £180,000 per year. The machine will be depreciated over ten years.

What is the payback period on this machine?

- A. 2 years and 10 months
- B. 3 years and 11 months
- C. 6 years and 4 months
- D. 10 years

10. CT2 September 2015 Question 3

An investment opportunity involves the purchase of a machine for \$40,000. The machine will have a useful life of five years, after which time it will be scrapped. The machine will increase reported profit by \$11,000 every year for five years. The company uses straight line depreciation. The required rate of return is 8% per annum. The investment will be funded by a loan for five years with an interest rate of 6% per annum.

Calculate the net present value of this investment.

- A. \$3,923
- B. \$6,332
- C. \$35,867
- D. \$40,028

How should these results be interpreted?

- A. The actual outcome will be within the upper and lower limits arising from simulation.
- B. The average outcome calculates from these figures shows how the project is likely to turn out.
- C. The project should proceed because there is only a 10% probability of a loss.
- D. The range and frequency of the expected outcomes provide a broad indication of risk.

12. CT2 September 2015 Question 5

What is the most logical interpretation of a very small positive net present value determined for an investment proposal?

- A. The internal rate of return should be calculated in order to determine whether that provides further information.
- B. The investment should only consider if it also has a very short payback.
- C. The project offers slightly more than the required rate of return and so it is worth considering.
- D. The project should be disregarded because the small net present value means that it is not worth pursuing.

13. CT2 April 2016 Question 8

An oil company has used a probability tree to evaluate the risks and benefits associated with drilling for oil at each of four potential locations. The probability tree shows that drilling on site Y has a positive expected net present value of \$100m, which is greater than those for sites W, X or Z. How should this be interpreted?

- A. Drilling at site Y will definitely generate further net cash inflows of \$100M.
- B. The oil company should definitely drill at site Y.
- C. The probability tree outcome should be considered before making a decision.
- D. The probability tree provides an objective basis for reaching a final decision.

14. CT2 April 2016 Question 9

Risk averse individuals often buy lottery tickets despite the fact that the expected value of doing so is negative. What does this reveal?

- A. These individual are behaving in an irrational manner.
- B. The certainty equivalent of a slim chance of winning a major prize exceeds the cost of a lottery ticket.
- C. The certainty equivalent of a slim chance of winning a major prize is smaller than the cost of a lottery ticket.
- D. Lottery contestants do not understand basic probability theory.

15. CT2 April 2016 Question 7

A company's beta coefficient is 1.6 and it has a 30% gearing ratio. How would beta change if the corporation tax rate increased?

- A Any change in beta would depend on the market's reaction.
- B Beta would decrease.

1. CT2 April 2010 Question 15

A small company engaged a firm of consultants to evaluate a very complicated investment opportunity. The consultancy devised a monte carlo simulation and ran a very large number of iterations. They discovered that the project generated a positive net present value for 85% of the simulation. The directors of the company believe that this result is sufficient for them to justify investing in the project.

Explain how the directors should go about interpreting the results of this simulation before making a final decision on the project.

2. CT2 October 2010 Question 16

- (a) Explain the implications for the weighted average cost of capital if a company's ordinary share price decreases.
- (b) Explain how this will affect the company's strategy for investing in capital projects.

3. CT2 October 2012 Question 20

Hatton is a quoted company in the entertainment industry. The company's directors are extremely ambitious and strive to maximise Hatton's rate of growth. The directors have identified the availability of finance as the company's biggest constraint.

The directors have been offered the opportunity to invest in two projects, each involving the development of a new games console. The projects involve competing products and so they are effectively mutually exclusive because there would be no commercial justification in investing in both. Project A requires an investment of £20 million and has a projected net present value of £80 million. Project B requires an investment of £50 million and has a projected net present value of £200 million. Hatton does not have any spare cash and so it will have to raise finance in order to invest in either project.

The directors of Hatton are unable to decide which of the two investments is better for the company. Each is relatively risky, but the two projects are exposed to virtually the same factors that will determine success or failure and, in that sense, the risks are virtually identical.

Hatton is heavily geared. The company's equity has a book value of £900 million and its debt has a book value of £350 million. Hatton made a large share issue last year and the directors do not believe that they could seek further equity in the short term. The company's debt includes a major loan from a commercial bank that carries a debt covenant under which the loan is repayable in the event that gearing (measured as debt as a percentage of total finance) exceeds 30%.

Hatton's marketing director is keen to proceed with Project B on the basis that it offers the greatest opportunity to enhance the company's share price.

Hatton's chief executive is keen to proceed with Project A on the basis that it will be possible to finance that project without taking the company to the very brink of its debt covenant.

Hatton's finance director has urged caution and recommends refusing both opportunities on the grounds that the only cost of doing so is the opportunity cost. His reasons for this recommendation is that the company is already heavily involved in the games business and it might be better to diversify into other areas of entertainment. In his opinion, refusing the projects will not risk harm to Hatton's share price.

- (i) Outline the reasons why a bank might impose a debt covenant such as that affecting Hatton's borrowing capacity.
- (ii) Discuss the risks associated with Hatton permitting its borrowings to rise to the maximum gearing level agreed with its bank.
- (iii) Discuss the validity of comments made by the finance director that:

CT2 April 2013 Question 11

Explain whether a loss-making company should allow for the effects of tax when deciding whether to raise fresh finance through debt or equity.

5. CT2 April 2013 Question 20

Partan is a quoted company. The directors have asked for a report on the company's cost of capital. The following information has been provided:

- The market capitalisation of the company's equity is £600 million.
- The company has debentures with a face value of £250 million. Their market value is £220 million.
- The corporation tax rate is 23%.
- The risk-free rate of interest is 4% per annum.
- The ungeared beta on Partan's equity is 1.3.
- The debentures have a coupon rate of 5% and are redeemable at par in five years' time.

The market rate of return is 9% pa.

The directors have already calculated Partan's weighted average cost of capital (WACC), but they want you to prepare a calculation in order to confirm their figures. They are concerned that the WACC is higher than they think is justified and they wish to discuss some proposals for reducing the figure because the directors plan to raise further finance in order to fund expansion, but they are unwilling to do so if the cost of capital is overstated.

- (i) Determine Partan's cost of equity using the company's geared beta.
- (ii) Determine Partan's approximate cost of debt.
- (iii) Calculate Partan's WACC.

The marketing director has suggested that the company could dramatically reduce the cost of capital if the board promotes the company in the same way that it promotes its products. The directors should identify the market's needs and explain to those who provide finance just how well suited Partan is to meeting those needs.

- (iv) Discuss the logic of the marketing director's proposal for reducing the WACC.

6. CT2 April 2014 Question 20

Sally has been offered a business opportunity. Her brother Tom is about to go to university and will need to earn a living over the next three years. He has been offered the opportunity to buy a motorboat for £21,000. If Sally buys this boat then Tom will offer fishing trips for clients at weekends. Tom is qualified to operate a small boat that carries paying passengers and there is plenty of demand for this service in their home town.

Tom proposes that he and Sally should prepare an annual income statement and split the cash surplus for the year equally on the last day of each business year, after leaving £2,000 in the business bank account to allow for working capital needs. The motor boat will be scrapped at the end of the third year and the business will be wound up.

Tom knows that Sally cannot afford to invest in this proposal unless it offers an acceptable rate of return. He proposes that she evaluates this opportunity on the basis that she will only invest if it offers her a minimum annual return of 12%.

Sally is interested in this proposal, and has decided to evaluate it in some detail. Her one major concern is that the government is considering changing the law. If they do so, then Tom's business will probably lose its operating licence with the boat becoming worthless. Tom has assured her that he took account of this risk and has already factored it into his suggested return of 12%, which is why he has not suggested a lower rate.

	2015 £	2016 £	2017 £
Revenue (all cash sales)	40,000	50,000	60,000
Fuel, boat repairs and mooring (all cash)	(14,000)	(17,500)	(21,000)
Depreciation	(7,000)	(7,000)	(7,000)
	<u>19,000</u>	<u>25,500</u>	<u>32,000</u>

- (i) Calculate the net present value of Sally's cash flows and comment on the results.
- (ii) Explain how Sally might use certainty equivalents to evaluate Tom's proposal.
- (iii) Discuss the argument that the risks of legal changes should be dealt with by setting a slightly higher discount rate.

7. CT2 April 2015 Question 15

An investor maintains a balanced portfolio of shares. She tends to favour low beta securities. She was concerned to discover that the beta of a particular share that she has held for many years has increased over the past year.

Explain why a beta value might change.

8. CT2 April 2015 Question 16

An investment project involves an initial investment, followed by five years with net cash inflows and a sixth year with a net cash outflow because the site used for the project will have to be repaired.

The project's internal rate of return (IRR) has been calculated. There are two internal rates of return: 2% p.a. and 9% p.a.

Explain how a project could have two internal rates of return and how this will affect the decision to accept or reject the project.

9. CT2 April 2015 Question 17

An airline has been offered the opportunity to purchase an international express delivery company. The delivery company operates in the same countries as the airline. The airline's directors are considering this investment on the grounds of "strategic fit", even though the investment appears to have a negative net present value.

Describe the arguments for using strategic fit to justify this investment.

10. CT2 September 2015 Question 12

Modigliani and Miller argue that gearing is irrelevant, but this argument depends in part on the fact that investors can borrow in order to invest in shares issued by companies that are under geared.

Discuss the extent to which personal gearing can be a realistic substitute for corporate gearing.

11. CT2 September 2015 Question 19

Global plc is a quoted company that manufactures petrochemicals. The company has recently patented a new process that will enable it to extract oil from oilwells that had previously been regarded as uneconomic.

Global plc is confident that the process is fully protected by patent law, so that nobody else can use it without permission. The directors have demonstrated the process to business and oil industry journalists and to television news stations and it has generated a great deal of publicity. Global plc's directors were disappointed that there was very little evidence of an increase in the share price in

The directors are considering how best to exploit this new technology. One possibility would be to buy oil exploration rights and to hire the necessary equipment and expert staff to explore for oil. Global plc could then use the process to extract oil from any wells that it drills. The other possibility would be to sell the right to use the process to oil companies under licence. These rights could be valuable to oil companies and so Global plc could charge a great deal for them.

Global plc's directors have estimated potential cash flows from both exploring for oil and for selling licences. They will compare the two in terms of their net present values. With that in mind, they have obtained the following information concerning beta coefficients:

- Global plc's own beta coefficient is 1.3
- an oil exploration company has a beta of 0.8
- a product-design company that specialises in environmentally sustainable developments has a beta coefficient of 1.0

(ii) Evaluate the suitability of each of the beta coefficients identified by Global's directors as a basis for deciding whether to pursue one of the alternatives for exploiting the new process.

12. CT2 April 2016 Question 15

Many organisations require the evaluation of a project appraisal report to be documented. Explain the purpose of this documentation.

13. CT2 April 2016 Question 16

A leisure company is considering building and operating a theme park.

Describe the process of conducting a simulation of this investment as part of the evaluation of this project.

14. CT2 April 2017 Question 19

Hort is an actuarial consultancy. Hort has owned a two floor office block for the past 20 years.

Improvements in technology mean that Hort has reached the point where the whole of the upper floor is left unoccupied.

Hort's directors are considering using the free space in the building to launch a new consultancy venture. This would involve taking on new consultants with relevant expertise, as well as equipping the floor with suitable IT equipment.

The initial investment in the IT equipment will be £1.5 million.

Over the next five years, Hort predicts that the fees earned from the new consultancy venture, minus the cash outflows associated with wages and other running costs, will have a net present value of £4.0 million.

Hort's directors believe that they should allow something for the building in deciding whether to proceed with this venture. Four possible arguments have been put forward by four members of the board:

1. The building cost £2.0 million when it was acquired and it has been depreciated by £800,000 since. That leaves a net book value of £1.2 million, of which £0.6 million could be attributed to the upper floor.
2. The cost of the building is a sunk cost and it should not be incorporated into the project appraisal.
3. The upper floor could be sold to a third party for £2.7 million.
4. The upper floor could be rented out over the next five years, with rental income yielding a net present value of £0.9 million.

Critics of the net present value (NPV) technique state that it has a fundamental flaw in that it is possible to justify either the acceptance or rejection of almost any project by manipulating estimates and assumptions in the evaluation of NPV.

(iii) Evaluate the assertion that this project illustrates this fundamental flaw in the net present value criterion.

15. CT2 April 2018 Question 15

Explain why an investment opportunity could be rejected when evaluated using the shareholder value approach despite having a positive net present value (NPV).

16. CT2 September 2018 Question 20

Doron is an unquoted company which was founded 12 years ago and which has grown steadily since. Its directors are considering an investment opportunity that will increase the productive capacity of the business by 30%.

Doron was established using the savings of its three founders, who now comprise the company's board of directors. Each of the three founders owns one third of the company's equity. Doron's growth has been funded using retained earnings and the proposed expansion will be funded in the same way. The company has no debt. None of the founders has any other significant personal assets apart from their shares in Doron and their family homes.

The founders are considering more sophisticated approaches to the evaluation of capital investment projects. They have asked you to determine Doron's cost of equity.

They have established the following facts:

- The risk free rate is 4% per annum.
- The equity risk premium is 10% per annum.
- The beta coefficient of a quoted company which is in the same industry as Doron is 1.4.
- The above quoted company has a debt:equity ratio of 0.6:1.
- The corporation tax rate is 20%.

(i) Calculate Doron's cost of equity.

(ii) Discuss the relevance of the rate that you calculated in part (i) to the evaluation of the project to expand Doron.

(iii) Discuss the relevance of the rate that you calculated in part (i) to the three founders.

17. CB1 April 2020 Question 12

The directors of ABC, a manufacturing company, evaluate projects using the payback method. The directors are reluctant to switch to the net present value criterion and are justifying their reluctance on the basis that the company has grown steadily since it was founded 20 years ago.

Describe the relevance of the payback criterion to ABC.

18. CB1 September 2020 Question 16

Discuss the proposition that the cost of equity is zero for an unquoted company because there is no observable share price.

19. CB1 September 2020 Question 13

A company has traditionally evaluated projects on the basis of their net present value (NPV).

Discuss the advantages of extending project evaluation to include strategic fit as an additional factor in investment appraisal.

Process and Investment Criteria

21. CB1 April 2021 Question 13

A change in safety regulations will require a train company to fit new equipment to all trains. The company does not believe that the equipment will reduce the risk of accidents and it will be expensive. Explain the usefulness of the Net Present Value (NPV) criterion in planning the company's response to this change.

22. CB1 April 2021 Question 14

A quoted company has a policy of seeking an internal rate of return of at least 14% p.a. on all investments of more than €5 million. This rate was set 5 years ago.

Describe the company's approach to capital project appraisal.

23. CB1 April 2021 Question 20

Drentel is a quoted company that manufactures bicycles and was established many years ago. It has been making losses for the past 5 years because its products have not kept up with consumer tastes and sales have been declining.

Despite the losses, Drentel has continued to pay a steady dividend each year.

Drentel's Board is considering a proposal to sell a range of battery-powered electric bicycles, which is a major growth area in the bicycle market. Drentel's current range of bicycles is suitable for modification to carry an electric motor. This would require a significant investment in order to acquire the rights to use patented manufacturing processes and also to acquire the specialised machinery that would have to be built to Drentel's specifications. The investment required is equivalent to approximately 25% of the company's market capitalisation.

Drentel's beta is currently 1.8. The Board believes that the beta will fall to 1.6 if the company proceeds with the electric bicycle project.

- (i) Evaluate the relevance of the decline in Drentel's beta for the decision to invest in electric bicycles.
- (ii) Discuss Drentel's policy of maintaining its dividend payments despite losses.

24. CB1 September 2021 Question 20

G is a quoted company that manufactures mobile phones. The company's directors are considering expanding by investing in a new factory that will be designed to manufacture gym equipment. This will incorporate smart sensors that can track users' exercise routines.

G's beta coefficient is 1.3, based on historical observations. The directors believe that the proposed investment in the new factory will make G's future cash flows more volatile, but will have the effect of reducing beta to 1.1, ignoring the effects of funding the investment.

The funding of the proposed investment has yet to be decided. It may be in the form of debt or equity.

- (i) Discuss the significance of the fact that the calculation of G's present beta coefficient was based on historical observations.
- (ii) Suggest possible reasons why the investment in the new factory could have the effect of increasing the volatility of G's cash flows while reducing its beta.
- (iii) Evaluate the likely effect of the choice between debt and equity for the funding of this investment for G's beta.

25. CB1 April 2022 Question 12

Outline the advantages of setting a standard hurdle rate of, for example, 15% p.a. for all investment projects undertaken by a large company.

Explain the impact of these losses on the company's cost of debt

27. CB1 September 2022 Question 20

M is a quoted mining company that owns the rights to mine for ore in a developing country. The company has discovered a large deposit in a remote area that is close to a vast government-owned wildlife park. M's directors are considering building a mine to extract this deposit.

Opening up the ore deposit will cost \$900 million and will require many thousands of tonnes of soil and rock to be dumped nearby. If the ore is found to be of good quality then it will be extracted by digging out a strip of land covering an area of 400 hectares and reaching a depth of hundreds of metres.

M will build a railway link from the mine to the nearest seaport 120 kilometres away so that it can export the ore by ship for processing into metal. The government has given permission for the railway to pass through the wildlife park.

The total investment in the mine will be \$4.5 billion, including the initial opening up of the land, the heavy equipment that will be required and the railway line, locomotives and wagons.

(i) Discuss the distinction between systematic and unsystematic risk and the relevance to M's share price of that distinction in evaluating the company's prospective investment in this mine.

(ii) Evaluate the agency issues associated with M's directors' decision to proceed with this project to extract the ore.

(iii) Discuss the ethical implications of M's decision to proceed with this mine.

28. CB1 September 2023 Question 18

Company Y wishes to build a windfarm in a location that is ideally suited to the generation of electricity using wind power. The proposed development will generate a substantial positive NPV. Unfortunately, the windfarm will also interfere with the migration patterns of birds including some rare species.

Describe the ethical implications of proceeding with this development.

29. CB1 September 2023 Question 19

The following information has been extracted from Q's financial statements as published during the last 6 years to 31 March:

	2018	2019	2020	2021	2022	2023	Average for 2018–2023
	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)
Profit/(loss) for the year	1,900	1,600	1,300	(200)	(400)	(900)	550
Equity	15,480	16,760	17,800	17,600	17,200	16,300	16,857
Loans	6,000	8,000	8,000	11,000	11,000	12,000	9,333
Interest (included in calculation of profit for the year)	840	1,120	1,120	1,540	1,540	1,680	1,307

	%	%	%	%	%
Return on equity	12.3	9.5	7.3	(1.1)	(2.3)
Return on capital employed	12.8	11.0	9.4	4.7	4.0
Gearing	27.9	32.3	31.0	38.5	39.0

(i) Calculate Q's return on equity, return on capital employed, and gearing for:
· 2023

gearing ratio and cost of equity



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