Stockholm School of Economics

6123 - Corporate Finance in Global Firms

Exercise Handbook

Diogo Mendes

1 Time Value of Money; Interest Rates; Cash Flows Determination; Investment Decision Rules

↳ Time Value of Money

Problem 1 What is the future value of €1,000, compounded annually during:

(a) 5 years at 7%?

(b) 5 years at 10%?

(c) 10 years at 7%?

(d) Why is the interest in c) not twice more than that of a)?

Problem 2 Compute the present value of the following cash-flows, discounted at 10%, compounded annually:

(a) €1,000 received in 2 years

(b) €2,000 received in 1 year

(c) €10,000 received in 8 years

Problem 3 A company has signed a contract today to sell an asset next year for €70,000. In order to sell that asset it has to invest immediately €60,000.

(a) If the interest rate is 10%, is that contract profitable?

(b) Compute the interest rate for which signing the contract becomes profitable.

Problem 4 The company CEO wants you to deposit €100,000 into an account in the end of each year during 4 years and starting one year from now. If the interest rate is 12%, how much cash will you have in the account in 7 years time?

Problem 5 What is the present value of a 10 year annuity of €300, with an interest rate of 10%...

(a) which starts being paid by the end of this year?

(b) which starts being paid in the end of the 6th year?

↳ Interest Rates

Problem 6 Consider the following bank accounts:

1. gives an annual percentage rate of 4.5% and pays interest half-yearly
2. gives an annual percentage rate of 4.5% and pays interest quarterly
3. gives an annual percentage rate of 4.5% and pays interest monthly

(a) Which of the bank accounts do you prefer and why?

(b) Assume now you want to invest $100 in one of the bank accounts. Test whether your answer above was correct by calculation how much money you would get with each of them over a period of 3 and a half years.

Problem 7 Suppose the interest rate is 9% APR with monthly compounding. What is the present value of an annuity that pays $250 every three months for the next five years?

Problem 8 You have €10,000 to invest today. The interest rate on the investment is 5% (stated annually) with semi-annual compounding.

(a) How much will you have ten years from now?

(b) How many years will take to double the amount invested today?

(c) What is the effective annual rate?

(d) What would be the stated annual rate with daily compounding equivalent to the 5% stated annual rate with semi-annual compounding?

⤻ Cash Flows Determination and Investment Decision Rules

Problem 9 BMW is planing to develop a new motorcycle. Development will cost about 225,000 a year and will take 7 years. Once in production, the motorbike is expected to make 430,000 per year for 8 years. Assume the cost of capital is 9%.

(a) Calculate the NPV of this investment opportunity, assuming all cash flows occur at the end of each year. Should BMW make this investment?

(b) By how much must the cost of capital estimate deviate to change the decision? Use Excel to calculate the IRR.

(c) What is the NPV if the cost of capital is 12%?

Problem 10 Inspired by "En man som heter Ove" you want to go into the movie business. For a first movie the studio would provide you $5 million now. With that money you should be able to finish the movie quickly and in the end of the first year the movie will bring a revenue of $2.5 million and in the next 4 year each $1 million.

(a) If the studio only invests in movies that have a payback time of two years, will they invest in your movie?

(b) If the cost of capital is 10%, what NPV does your movie have?

Problem 11 Epiphany Industries is considering a new capital budgeting project that will last for three years. Based on extensive research, it has prepared the following projections: The project requires an initial investment of $90,000 for its equipment, which will be depreciated straight line over its three-year life to a residual value of $0. The project will result in sales of $100,000 for three years (since year 1) with a gross margin of 50%. Net working capital is estimated to be 5% of sales in year 1, 10% in year 2 and can be recovered in year 3. Epiphany plans using a cost of capital of 12% to evaluate this project. Tax rate is 35%. [*Note*: gross margin is a company's total sales revenue minus its cost of goods sold (COGS), divided by total sales revenue.]

(a) Determine the free cash flows and the NPV of the project.

Problem 12 Your boss wants you to double check a consultants report about a new project in your firm. The report is build on the estimates in the table below.

Project Year	1	2	...	9	10
Sales revenue	26	26	...	26	26
-Cost of goods sold	15.6	15.6	...	15.6	15.6
=Gross profit	10.4	10.4	...	10.4	10.4
-General, sales, and admin expenses	2.24	2.24	...	2.24	2.24
-Depreciation	2.8	2.8	...	2.8	2.8
=EBIT	5.36	5.36	...	5.36	5.36
-Income tax	1.876	1.876	...	1.876	1.876
=Net income	3.484	3.484	...	3.484	3.484

All of the estimates in the report seem correct. You note that the consultants used straight-line depreciation for the new equipment that will be purchased today (year 0), which is what the accounting department recommended. The report concludes that because the project will increase earnings by $3.484 million per year for 10 years, the project is worth $34.84 million. You think back to your halcyon days in finance class and realize there is more work to be done! First, you note that the consultants have not factored in the fact that the project will require $7 million in working capital upfront (year 0), which will be recovered to 50% in year 10. Next, you see they have attributed $2.24 million of general, sales, and administrative expenses to the project, but you think based on your experience that it should rather be $2.88 million.

(a) At first glance do you agree with the consultants estimation of the project value of $34.84 million?

(b) Given the available information, what are the free cash flows in years 0 through 10 that should be used to evaluate the proposed project?

(c) If the cost of capital for this project is 11%, what is your estimate of the value of the new project?

Problem 13 Consider the following two mutually-exclusive projects:

- Project A costs $20 million and gives a return of $2 million every year ever after.
- Project B costs $20 million and gives a return of $1.5 million which is growing by 2% every year afterwards forever.

(a) Please use the decision criteria you learned in class (e.g., NPV, IRR, Payback rule, ...) to decide which of the two following projects you prefer to invest in.

(b) Provide a graphical illustration to your argumentation.

Problem 14 A company has two alternative (mutually-exclusive) projects that require an investment of €5,000. Project A generates annual cash flows of €1,000 forever. Project B generates annual cash flows of €1,500 during the next ten years. The opportunity cost of capital is 10%. What is the best project?

2 Bond and Stock Valuation

↳ Bond Valuation

Problem 1 A bond with 5 years left to maturity pays an annual coupon of 5% on a face value of €5. The next coupon payment occurs precisely in 1 year. Calculate:

(a) The value of the bond for a market discount rate of 6%.

(b) The value of the bond after paying the first coupon (assuming discount rate is still 6%).

Problem 2 Please complete the following table showing information on government bonds with a face value of $100:

	A	**B**	**C**	**D**	**E**
Maturity (years)	2	3	2	2	...
Coupon rate (EAR)	0%	0%	2%	3%	0%
Price	93.85	...	...	89.47	92.82
Yield to Maturity	...	2.50%	3.00%	...	1.50%

Problem 3 Bond "James" pays semiannual coupons and the yield to maturity is 12%. What would be the market price of that bond if:

(a) The coupon rate was 8%, the time to maturity 20 years and the next coupon payment occurred precisely in 1 semester?

(b) The coupon rate were 10%, the time to maturity 15 years and the next coupon payment occurred precisely in 1 semester?

Problem 4 Let's now work on real data. Please go to Sveriges Riksbanken webpage and download a monthly series of Swedish T-bill and government bond yields for 2019. Use averaged calculated yields and all possible maturities.

https://www.riksbank.se/en-gb/statistics/search-interest--exchange-rates/

(a) For which maturities is a yield available? What is the difference between T-bills and government bonds?

(b) Plot the yield-curve for January 2019 and for December 2019.

(c) Is the yield curve upward sloping, downward sloping or flat?

(d) Looking at short term debt of 6 month, did it get more or less expensive for the Swedish finance ministry to borrow?

Problem 5 Consider the following prices for zero-coupon bonds (face value of €100):

Maturity (years)	**Price**
1	97.087
2	93.351
3	89.157
4	84.826

(a) Calculate the Term Structure of Interest Rates.

(b) What is the price of a 4-year bond with a face value of €100 and annual coupon payments at a rate of 3%?

(c) What is the yield to maturity of the previous bond?

Problem 6 The price of a two-year maturity bond with a coupon of 5% (with annual frequency) is €96.428. The price of a one-year maturity bond with a coupon of 6% (with annual frequency) is priced at par. The face value of both bonds is €100.

(a) What are the 1-year and 2-year spot rates?

(b) What is the price of a 2-year zero coupon bond with a face value of 100?

Problem 7 Solero Inc., a shipbuilding company in Greece, just started the construction of Princess Petunia of the Seas, a new ship for transatlantic luxury cruises. To finance this project, Solero just issued a bond with 6 years left to maturity, annual coupon rate of 5% (paid semi-annually) and face value of £1200. The next coupon payment occurs in precisely 6 months. The yield-to-maturity of this bond is 8%.

(a) Compute the market price of the bond.

(b) The total amount raised with the bond issue was £15 million (assume no transaction costs). How many units of the bond were sold? What is the total amount that Solero needs to pay at maturity, i.e., the last cashflow to bondholders?

Depending on the economic conditions over the next few years, the ship can be sold in the end of year 6 for £28 million with probability 0.6 or £18 million with probability 0.4. Over the 5 years that it takes to build the ship, Solero estimates the annual cashflows to be constant at - £3 million. Assume the appropriate discount rate for shipbuilding projects is 12%.

(c) What is the NPV of the project? Should Solero invest in this project?

(d) Can you rely on the IRR to evaluate this project? Explain why or why not.

Problem 8 [ADVANCED: Great to practice; not covered in the exam.] Find below four default free bonds and their cash-flows:

		Cash Flows		
Bond	Price Today	Year 1	Year 2	Year 3
A	4575.71	0	0	5000
B	2078.80	100	100	2000
C	970.87	1000	0	0
D	961.17	0	1000	0

(a) Do you find an arbitrage opportunity? How could you exploit it?

⤻ Stock Valuation

Problem 9 A company's stock paid a dividend of €2 yesterday and the appropriate discount rate is 12%.

(a) What is the stock price of this company knowing that dividends are expected to grow 5% forever?

(b) What is the stock price knowing that dividends are expected to grow 8% annually during the next three years, and then at 4% forever?

Problem 10 Sarro Shipping, Inc. expects to earn €1 million per year in perpetuity if it undertakes no new investment opportunities. There are 100,000 shares outstanding, so earnings per share (EPS) equal €10 (=€1,000,000/100,000). The firm will have an opportunity at date 1 to spend €1,000,000 on a new marketing campaign. The new campaign will increase earnings in every subsequent period by €210,000 (or €2.10 per share). This is a 21% return per year on the project. The firm's discount rate is 10%.

(a) What is the value per share before deciding to accept the marketing campaign?

(b) What is the value after accepting the marketing campaign?

(c) Why does this project create value? What is the minimum rate at which the marketing campaign creates value?

Problem 11 Prof Tool Inc. produces teaching equipment and is expected to have the following free cash flows in million US Dollars. In year one they will have a FCF of $37 million, the next 5 years this will grow at 4% each year and thereafter we estimate a more conservative growth of only 3% forever after.

(a) Estimate the firm value using a cost of capital of 14%.

(b) If Prof Tool Inc. has $150 million in debt and no excess cash, what is the share value if there are 20 million shares outstanding?

(c) Prof Tool Inc. thinks now about starting to pay out dividends. What would the new share price be if they pay $1.2 per share at the end of next year and plan to increase the dividend each year by 2%? Assume the required return to be 16%.

Problem 12 Quepos Real Estate Inc. expects to earn €110 million per year in perpetuity if it does not undertake any projects. The firm has an opportunity to invest €12 million today and €7 million in one year in real estate. The new investment will generate annual earnings of €10 million in perpetuity, beginning two years from today. The firm has 20 million shares of stock outstanding, and the required rate of return on the stock is 15%.

(a) What is the share price if the firm does not undertake the new investment?

(b) What is the Net Present Value per share of the investment?

(c) What is the price per share if the firm undertakes the investment?

Problem 13 [ADVANCED: Great to practice; not covered in the exam.] Annual earnings of Avalanche Skis, Inc. will be €5 per share in perpetuity if the firm makes no investments. Under such scenario the firm would pay out all of its earnings as dividends. Assume the first dividend will be received exactly one year from now. Alternatively, assume that three years from now, and in every subsequent year in perpetuity, the company can invest 25% of its earnings in new projects. Each project will earn 20% per year in perpetuity. The firm's discount rate is 14%.

(a) What is the price per share today without the company making the new investment?

(b) If the company announces that the new investment will be made, what will the share price be today?

3 Risk and Return; Diversification; CAPM

⤻ Risk and Return

Problem 1 Assume that there are only two stocks in the world: stock A and stock B. The expected return of each stock is 10% and 20% and the standard deviation (volatility) of the returns is 5% and 15%, respectively. The correlation between the returns of both stocks is zero.

(a) What is the expected return and the standard deviation of the returns of a portfolio with 30% of its value invested in stock A and 70% of its value invested in stock B?

(b) What is the expected return and the standard deviation of the returns of a portfolio with 90% of its value invested in stock A and 10% of its value invested in stock B?

(c) Assuming you are risk averse, would you invest all your money in stock A? Why, or why not?

⤻ Diversification

Problem 2 You are considering how to invest part of your retirement savings. You have decided to put $300,000 into three stocks: 60% of the money in Gold Finger (currently $23/share), 30% of the money in Moosehead (currently $71/share), and the remainder in Venture Associates (currently $4/share). Then Gold Finger stock goes up to $40/share, Moosehead stock drops to $53/share, and Venture Associates stock rises to $14 per share.

(a) What is the new value of the portfolio?

(b) What return did the portfolio earn?

(c) If you don't buy or sell any shares after the price change, what are your new portfolio weights?

Problem 3 An investor currently has an investment in Natasha Fund. It has an expected return of 14% with a volatility of 20%. However, she is optimistic regarding the future prospects of the market, so she considers an investment in the Hannah Corporation as well. After an analysis of the past performance of the Corporation's stocks, she finds that the shares can provide a 20% expected return with 60% volatility. Her analyses also reveal that the Corporation's shares have a 0.3 correlation with Natasha Fund. The risk-free rate is 4%.

(a) She plans to allocate 50% of her portfolio to the Natasha Fund, 10% to the risk-free asset and the remaining 40% to Hannah Corporation. What is the expected return and volatility of this portfolio?

(b) The investor's advisor suggests her to allocate 89.6% of her portfolio to the Natasha Fund, 2.1% to the risk-free asset and the remaining 8.3% to Hannah Corporation. Should the investor follow this suggestion?

⤻ CAPM

Problem 4 Complete the following table:

Asset	Expected Return	Standard Deviation	Corr(Ri,Rm)	Beta
1	0.15	?	1	1.5
2	0.15	0.18	0.5	?
3	0.1	0.02	?	0.5
Market	0.1	0.04	?	?
Risk free	0.05	0	?	?

Problem 5 The risk-free return is 5% and the market portfolio has an expected return of 12% and a standard deviation of 44%. ATP Oil and Gas has a standard deviation of 68% and a correlation with the market of 0.91.

(a) What is ATP's beta with the market?

(b) Under the CAPM assumptions, what is ATP's expected return?

Problem 6 Asset A has a beta of 1.6 and an expected return of 21%. Asset B has a beta of 1.2 and an expected return of 17%.

(a) If both assets are on the SML (security market line), what is the risk-free rate? What is the Market Risk Premium?

(b) Another asset C has a beta of 1.4 . An investor can get an expected cash flow of $10 per year in perpetuity. If the asset is priced at $50, is it a good investment?

Problem 7 Consider the following information on Stocks I and II:

State of Economy	**Prob.**	**Return (stock I)**	**Return (stock II)**
Recession	0.2	0.07	0.02
Normal	0.5	0.15	0.12
Boom	0.3	0.09	0.31

(a) Compute the expected return and standard deviation of stock II.

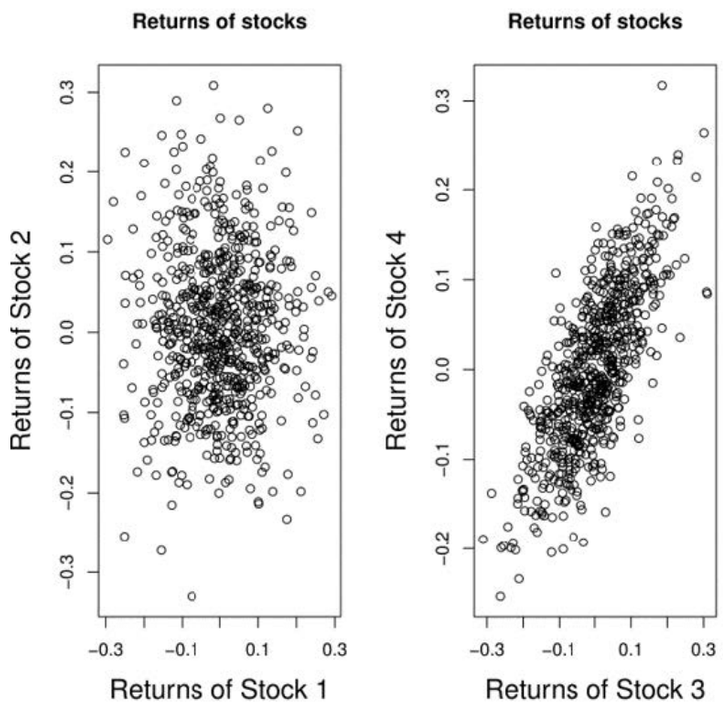
(b) The expected return of stock I is 11.6%. If a portfolio of the two assets has an expected return of 13%, what are the portfolio weights?

(c) Assuming that the capital asset pricing model holds, a stock I's beta of 1.5 and a stock II's beta of 2.5:

- What is the expected market risk premium?
- What is the beta of a portfolio with 13% return?

(d) Explain in words how you can achieve a portfolio on the capital market line with an expected return higher than the return of the market portfolio.

Problem 8 [This question is taken from the exam in 2018.] You are a new quantitative analyst at a hedge fund where you are expected to support decision-making based on solid analysis of stocks and the financial market. Your boss walks into your office and asks you to continue the work of the previous colleague with studying some stocks and their portfolios that the fund wants to pick. In one of the folders, you find the scatterplots of a few securities:



(a) You can form a portfolio from Stock 1 and Stock 2, then a separate one from Stock 3 and Stock 4. Both portfolios contain equal amount of each of the securities, and the returns

of each share has the same variability. Based on the scatterplots, which portfolio should have lower volatility? Why?

(b) Further analysis reveals that the beta of the portfolio of Stock 3 and Stock 4 is 0.8. How can we interpret this result in terms of riskiness? Does the obtained riskiness contradict with what you can infer from the scatterplot and your answer for part a)?

(c) You finally decide to long the portfolio from Stock 3 and Stock 4 (with 50% and 50% weights). Historical data shows that the yearly percentage return on Stock 3 is 7% and 9% on Stock 4, and the volatilities are 0.4 and 0.4.

- What is the average historical yearly return on the portfolio?
- What is the standard deviation of the portfolio if cov(Stock 3, Stock 4)=0.096?
- What is the return you can ask for holding the portfolio if the risk-free rate is 3%, the market return is 6%, and you calculate it based on CAPM?

4 Capital Structure

↳ Capital Structure in Perfect and Imperfect Capital Markets

Problem 1 Company A has an expected return on equity of 12% and a debt cost of 6%. The business has also a debt to equity ratio of 0.5 and faces a corporate tax rate of 35%.

(a) What is the WACC of Company A with its present capital structure?

(b) If the debt to equity ratio increases to 2, what is the new WACC of Company A?

Problem 2 TPA expects a perpetual EBIT of €4,000,000 per year. The expected return of the business if it were only financed by equity would be 15%. TPA faces a corporate tax of 35% and pays an interest of 10% on its €10,000,000 perpetual debt, traded at par.

(a) Calculate the value of TPA.

(b) Calculate the expected return of TPA's equity.

(c) Compute the WACC of TPA.

Problem 3 Assume perfect capital markets and no taxes or costs of financial distress. Consider a firm, XYZ Inc. that has assets that pay total cash flows of either £200 million or £50 million in one year from now (after which the company shuts down), each with probability 50%. XYZ has debt with face value of £30 million outstanding at the end of the year. It also has 100 million shares outstanding. Assume that the discount rate for all cash-flows is zero (for simplicity).

(a) Compute the total market value of XYZ's equity, debt, and its price per share.

Now, XYZ's shareholders issue new *junior* debt (holders of such debt receive cash-flows after existing debtholders have been paid, but before equity holders are paid) with a face value of £30 million to repurchase equity (leverage recap).

(b) What is the new market value of equity, old debt, and new debt, and the new price per share? Does the Modigliani and Miller theorem hold?

Problem 4 A firm is considering the following capital structures (no corporate tax rate):

	Unlevered	**Levered**
Assets	€20,000	€20,000
Debt	€0	€8,000
Equity	€20,000	€12,000
Cost of debt	-	5%
EBIT (every year)	€2,000	€2,000

(a) Calculate the net income of the firm for each capital structure.

(b) Considering the net income is totally paid out as dividends, calculate the cash flow received by an investor who invests €1,200 for each of the following cases:

- Buy 10% of the firm with the levered capital structure.
- Buy 10% of the firm with the unlevered capital structure, having the possibility of borrowing money at a 5% interest rate.

(c) Determine the value of the firm, the cost of equity and the WACC for both capital structures

(d) Determine the value of the firm, the cost of equity and the WACC for both capital structures considering that the firm faces a corporate tax rate of 40% and that the after-tax EBIT (i.e., $(1-t) \times EBIT$) is €2,000.

Problem 5 [ADVANCED: Great to practice; not covered in the exam.] Cold Antarctica Inc. (CA) plans to announce that it shall issue £2,000,000 of perpetual debt, and use it to purchase its own equity. The bonds will pay a 6% annual coupon rate. Additionally, CA is currently only financed by equity, which is presently worth £10,000,000 and made up of 500,000 shares. The firm generates an EBIT of £1,500,000 per year, forever and faces a corporate tax rate of 40%.

(a) Construct the market value balance sheet of CA before the debt issue announcement. What is the price per share?

(b) Construct the market value balance sheet of CA after the debt issue announcement. What is the price per share?

(c) How many shares does CA have to purchase in order to rearrange its capital structure? How many shares are left?

(d) Construct the market value balance sheet of CA after issuing debt. What is the price per share?

Problem 6 [ADVANCED: Great to practice; not covered in the exam.] Consider two firms with perfectly correlated earnings. The first is Debtplus and the second is NoDebt. Each company is expected to earn $35 million (before interest) in perpetuity. All these earnings are distributed as interest or dividends. DebtPlus has $150 million of perpetual debt. The interest on this debt is 7 percent. It has 1.5 million shares priced at $115 per share. NoDebt has no debt. It has 3.6 million shares at $86 per share. Capital markets are perfect, there is no corporate tax and there are no transaction costs.

(a) Can you spot any arbitrage opportunity?

(b) Construct a zero-risk, zero-investment portfolio with $1 million invested in the equity of NoDebt that generates a positive income in perpetuity.

↳ Valuation with Leverage

Problem 7 Consider a company that is investing in the following project with the following financials:

	Year 1	Year 2	Year 3
Revenues	€600,000	€800,000	€1,200,000
COGS	€300,000	€500,000	€700,000

Initial capital expenditures are €600,000 with a life of 4 years (straight-line depreciation). Working capital is 10% of next year revenues. Fixed assets can be sold at the end of year 3 for €200,000. Company levered beta is 0.75, debt-to-equity is 1 and cost of debt is 5%. The project is in an industry with levered beta of 1.25, debt-to-equity of 1.5 and cost of debt is 5%. The risk-free rate is 5% and expected market risk premium is 6%. The corporate tax rate is 30%.

(a) Compute the Free Cash Flows.

(b) What is NPV assuming the project is entirely financed by equity? Use the following formula to compute β_E and remember that $\beta_D = 0$ as debt is risk free:

$$\beta_E = \beta_U + \frac{D}{E}(\beta_U - \beta_D)(1 - \tau)$$

(c) What is NPV assuming the project is financed at the company current capital structure and cost of debt?

5 International Corporate Finance; International Capital Budgeting; Risk Management

↳ International Corporate Finance

Problem 1 The Local Bank plc quotes the following rates for the euro versus sterling: 1.6296 – 1.632

(a) How many euros would a firm receive when selling £10 million?

(b) How much sterling would it receive when selling €12 million?

Problem 2 Assuming:

Spot EUR/AUD	0.6725 – 0.6735
One-month forward:	0.0010 – 0.0015 premium

(a) What are the EUR/AUD one-month forward rates?

(b) Is the Australian dollar (AUD) appreciating or depreciating against the euro?

(c) What is the Australian dollar cost of selling €350 000 at spot?

(d) What is the euro receipt from the one-month forward sale of AUD 450 000?

(e) Given a EUR/AUD spot rate of 0.6725 – 0.6735, and if you are told that the Australian dollar is expected to depreciate by 3% per year for the next four years and is then likely to appreciate by 10% per year thereafter, estimate the EUR/AUD spot rate in six-years' time.

Problem 3 If EUR/GBP spot is 0.8160 and €/£ 12-month forward is 0.8082 and the yield on UK government is 5%, what is the yield on European Central Bank bonds?

Problem 4 US inflation is expected to be 5% next year and UK inflation 3%. If the current GBP/ USD spot rate is 0.6120, forecast the spot rate in 12-months' time.

Problem 5 The current EUR/CHF spot rate is 0.8240. Inflation forecasts for the next three years are:

Eurozone	Switzerland	Year
2%	1%	1
3%	3%	2
4%	2%	3

(a) Forecast the spot rates over the next three years.

Problem 6 Assume you are the treasurer of a multinational company based in Switzerland. Your company trades extensively with the United States. You have just received US$1 million from a customer in the United States. As the company has no immediate need of capital, you decide to invest the money in either US$ or Swiss francs for 12 months. Assume investment in either currency is risk-free and ignore transaction costs. The following information is relevant:

- The spot rate of exchange is CHF1.3125 to US$1.
- The 12-month forward rate is CHF1.275 to US$1.
- The interest rate on a 1-year Swiss franc bond is 4,5625 per cent.
- The interest rate on a 1-year US$ bond is 7,625 per cent.

(a) Calculate the returns under both options (investing in US$ or Swiss francs) and explain why there is so little difference between the two figures. Your answer may be expressed either in US$ or in Swiss francs.

Problem 7 Use the Law of One Price and PPP to predict the relative local prices of a cup of coffee and the future sterling/dollar spot rate under the following conditions:

- Price now in New York = $2.00
- Price now in London = £1.00
- Exchange rate for USD vs. GBP = $2.00:£1
- UK inflation is 4 per cent; US inflation is 2 per cent

⤻ International Capital Budgeting

Problem 8 How does FDI differ from domestic investment?

Problem 9 OJ Limited is a supplier of leather goods to retailers in the United Kingdom and other Western European countries. The company is considering entering into a joint venture with a manufacturer in South America. The two companies will each own 50 per cent of the limited liability company JV (SA) and will share profits equally. Of the initial capital, £450,000 is being provided by OJ Limited, and the equivalent in South American dollars (SA$) is being provided by the foreign partner. The managers of the joint venture expect the following net operating cash flows which are in nominal terms:

	SA$ 000	**Predicted exc. rates (to £)**
Year 1	4,250	10
Year 2	6,500	15
Year 3	8,350	21

For tax reasons, JV (SA), the company to be formed specifically for the joint venture, will be registered in South America. Ignore taxation in your calculations. Assume you are a financial adviser retained by OJ Limited to advise on the proposed joint venture.

(a) Calculate the NPV of the project under the two assumptions explained below. Use a discount rate of 16 per cent for both assumptions, and express your answer in sterling.

- Assumption 1: The South American country has exchange controls which prohibit the payment of dividends above 50 per cent of the annual cash flows for the first three years of the project. The accumulated balance can be repatriated at the end of the third year.
- Assumption 2: The government of the South American country is considering removing exchange controls and restrictions on repatriation of profits. If this happens, all cash flows will be distributed as dividends to the partner companies at the end of each year.

(b) Comment briefly on whether or not the joint venture should proceed based solely on these calculations.

Problem 10 PG plc is considering investing in a new project in Canada that will have a life of four years. Initial investment is C$150,000, including working capital. The net cash flows that the project will generate are C$60,000 per annum for Years 1, 2 and 3 and C$45,000 in Year 4. The terminal value of the project is estimated at C$50,000, net of tax. The current spot rate for C$ against the pound sterling is 1.70. Economic forecasters expect the pound to strengthen against the Canadian dollar by 5 per cent per annum over the next four years. The company evaluates UK projects of similar risk at 14 per cent per annum.

Calculate the NPV of the Canadian project using the following two methods:

(a) Convert the foreign currency cash flows into sterling and discount at a sterling discount rate.

(b) Discount the cash flows in C$ using an adjusted discount rate that incorporates the 12-month forecast spot rate.

Problem 11 Quia Motors, a South Korean car-maker, is considering expanding overseas. Specifically it can invest in a 2-year project in Alabama, US. The project's expected cash flows comprise an initial investment of $1 million with cash inflows of $700,000 and $600,000 in year 1 and year 2, respectively. The current exchange rate is 1050 South Korean won per US dollar. The weighted average cost of capital for this project is 13% (in South Korea). The table below reports the risk free interest rates in the United States and South Korea:

	1-year	2-year
US	4.00%	4.25%
South Korea	3.00%	3.25%

In your answers take the perspective of the South Korean company. Please use the direct quote exchange rates.

(a) What is the expected forward exchange rate 1 year from now and 2 years from now?

(b) What is the NPV of the project (in South Korean won) if Quia Motors decides to invest in the project? What is the internal rate of return?

(c) If the South Korean won depreciates against the US dollar, can a dollar buy more or fewer South Korean won as a result?

(d) In general, should a firm require higher rates of return on projects abroad than on domestic projects? Explain.

⤻ Risk Management

Problem 12 A UK-owned MNC produces in the United States and also exports to South American countries directly from the United Kingdom where it is paid in USD. Its US revenue is $50 million and its operating costs are $30 million. Export sales to South America are $100 million.

(a) What is its exposure to the USD/sterling exchange rate?

(b) Suggest three ways for the firm to lower its exposure.

Problem 13 List eight ways in which MNCs can lower political risk.

Problem 14 Bako Ltd is a medium-size bakery business. The financial manager has identified that its main risk exposure lie in the following areas:

- Raw material prices – specifically, flour and sugar
- Interest rate movements on its variable - rate borrowings
- Currency movements on imports and exports
- Loss of profits, e.g. lost production from a possible bakery fire

Which hedging instruments/markets do you find appropriate to hedge against each of the identified risks?

Problem 15 Companies are required to disclose their principal risks and uncertainties within the annual report. Download the latest annual report for Ericsson (https://www.ericsson.com/en/investors/financial-reports/annual-reports). What are the major risks the company faces?

Problem 16 [ADVANCED: Great to practice; not covered in the exam.] Consider the following example of a company which plans to buy aluminium. It enters into a call option contract, paying an appropriate premium for the right to buy aluminium at $1,500/tonne in three months' time.

(a) If, at the end of the period, the spot price is $1,400/tonne, should the company exercise its option or let it lapse?

(b) What is the main difference between futures and options contracts?

6 Equity Capital

Problem 1 Benjamin Garcia's start up business is succeeding, but he needs €200,000 in additional funding to fund continued growth. Benjamin and an angel investor agree the business is worth €800,000 and the angel has agreed to invest the €200,000 that is needed. Benjamin presently owns all 40,000 shares in his business. Because the shares will be sold directly to an investor, there is no spread; the other flotation costs are insignificant.

(a) What is a fair price per share and how many additional shares must Benjamin sell to the angel?

Problem 2 The Beranek Company, whose share price is now €25, needs to raise €20 million in ordinary shares. Underwriters have informed the firm's management that they must price the new issue to the public at €22 per share because of signalling effects. The underwriters' compensation will be 5 per cent of the issue price, so Beranek will net €20.90 per share. The firm will also incur expenses in the amount of €150,000.

(a) How many shares must the firm sell to net €20 million after underwriting and flotation expenses?

Problem 3 Blue Coral Breweries (BCB) is planning an IPO. Its underwriters have said the shares will sell at €20 per share. The direct costs (legal fees, printing, etc.) will be €800,000. The underwriters will charge a 7 per cent spread.

(a) How many shares must BCB sell to net €30 million?

(b) If the share price closes the first day at €22, how much cash has BCB left on the table?

(c) What are BCB's total costs (direct, indirect, and underwriting) for the IPO?

Problem 4 Security Brokers Inc. specializes in underwriting new issues by small firms. On a recent offering of Beedles Inc., the terms were as follows:

Price to public	€5 per share
Number of shares	3 million
Proceeds to Beedles	€14,000,000

The out of pocket expenses incurred by Security Brokers in the design and distribution of the issue were €300,000. What profit or loss would Security Brokers incur if the issue were sold to the public at the following average price?

(a) €5 per share

(b) €6 per share

(c) €4 per share

Problem 5 Zang Industries has hired the investment banking firm of Eric, Schwartz Mann (ESM) to help it go public. Zang and ESM agree that Zang's current value of equity is €60 million. Zang currently has 4 million shares outstanding and will issue 1 million new shares. ESM charges a 7 per cent spread.

(a) What is the correctly valued offer price?

(b) How much cash will Zang raise net of the spread?

(c) Compute the change in share price. Why does the stock price decrease?

7 Mergers and Acquisitions

Problem 1 Answer the following questions:

(a) Suggest some managerial motives for growth by takeovers.

(b) Suggest how managerial pay schemes might encourage takeovers against the interest of shareholders.

(c) Why might the shareholders of a target company prefer to be paid in cash rather than shares?

Problem 2 Predator is valued on the market at £1,000 million, and Prey at £200 million. Predator values the expected post-merger synergies at £50 million.

(a) If it bids £230 million for Prey, what is the NPV of the bid?

(b) What is the share of the gains for each firm?

Problem 3 As treasurer of Holiday Ltd, you are investigating the possible acquisition of Leisure Ltd. You have the following basic data:

	Holiday	**leisure**
Earnings per share (expected next year)	£5	£1.50
Dividends per share (expected next year)	£3	£0.80
Number of shares	1 million	0.6 million
Share price	£90	£20

You estimate that investors currently expect a steady growth of about 6 per cent in Leisure's earnings and dividends. Under new management, this growth rate would be increased to 8 per cent per year, without any additional capital investment required.

(a) What is the gain from the acquisition?

(b) What is the new value of equity of target if the acquisition goes ahead?

(c) What is the cost of the acquisition if Holiday pays £25 in cash for each Leisure share? Should it go ahead?

(d) What is the cost of the acquisition if Holiday offers one of its own shares for every three shares of Leisure? Should it go ahead?

(e) How would the cost of the cash offer and the share offer alter if the expected growth rate of Leisure were not changed by the takeover? Does it affect the decision?