GESTÃO FINANCEIRA II

PROBLEM SET 6:

Chapter 18

Capital Budgeting and Valuation with Leverage

(FROM BERK AND DEMARZO'S "CORPORATE FINANCE")

LICENCIATURA – UNDERGRADUATE COURSE

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Chapter 18
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18-4. Suppose Goodyear Tire and Rubber Company is considering divesting one of its manufacturing plants. The plant is expected to generate free cash flows of \$1.5 million per year, growing at a rate of 2.5% per year. Goodyear has an equity cost of capital of 8.5%, a debt cost of capital of 7%, a marginal corporate tax rate of 35%, and a debt-equity ratio of 2.6. If the plant has average risk and Goodyear plans to maintain a constant debt-equity ratio, what after-tax amount must it receive for the plant for the divestiture to be profitable?

18-5. Suppose Lucent Technologies has an equity cost of capital of 10%, market capitalization of \$10.8 billion, and an enterprise value of \$14.4 billion. Suppose Lucent's debt cost of capital is 6.1% and its marginal tax rate is 35%.

a. What is Lucent's WACC?

b. If Lucent maintains a constant debt-equity ratio, what is the value of a project with average risk and the following expected free cash flows?

Year	0	1	2	3
FCF	−100	50	100	70

c. If Lucent maintains its debt-equity ratio, what is the debt capacity of the project in part (b)?

18-6. Acort Industries has 10 million shares outstanding and a current share price of \$40 per share. It also has long-term debt outstanding. This debt is risk free, is four years away from maturity, has annual coupons with a coupon rate of 10%, and has a \$100 million face value. The first of the remaining coupon payments will be due in exactly one year. The riskless interest rates for all maturities are constant at 6%. Acort has EBIT of \$106 million, which is expected to remain constant each year. New capital expenditures are expected to equal depreciation and equal \$13 million per year, while no changes to net working capital are expected in the future. The corporate tax rate is 40%, and Acort is expected to keep its debt-equity ratio constant in the future (by either issuing additional new debt or buying back some debt as time goes on).

a. Based on this information, estimate Acort's WACC.

b. What is Acort's equity cost of capital?

18-8. **You are a consultant who was hired to evaluate a new product line for Markum Enterprises. The upfront investment required to launch the product line is $10 million. The product will generate free cash flow of $750,000 the first year, and this free cash flow is expected to grow at a rate of 4% per year. Markum has an equity cost of capital of 11.3%, a debt cost of capital of 5%, and a tax rate of 35%. Markum maintains a debt-equity ratio of 0.40.**

a. **What is the NPV of the new product line (including any tax shields from leverage)?**

b. **How much debt will Markum initially take on as a result of launching this product line?**

c. **How much of the product line's value is attributable to the present value of interest tax shields?**

18-9. **Consider Lucent's project in Problem 5.**

a. **What is Lucent's unlevered cost of capital?**

b. **What is the unlevered value of the project?**

c. **What are the interest tax shields from the project? What is their present value?**

d. **Show that the APV of Lucent's project matches the value computed using the WACC method.**

18-10. **Consider Lucent's project in Problem 5.**

a. **What is the free cash flow to equity for this project?**

b. **What is its NPV computed using the FTE method? How does it compare with the NPV based on the WACC method?**

18-12. **Prokter and Gramble (PG) has historically maintained a debt-equity ratio of approximately 0.20. Its current stock price is $50 per share, with 2.5 billion shares outstanding. The firm enjoys very stable demand for its products, and consequently it has a low equity beta of 0.50 and can borrow at 4.20%, just 20 basis points over the risk-free rate of 4%. The expected return of the market is 10%, and PG's tax rate is 35%.**

a. **This year, PG is expected to have free cash flows of $6.0 billion. What constant expected growth rate of free cash flow is consistent with its current stock price?**

b. **PG believes it can increase debt without any serious risk of distress or other costs. With a higher debt-equity ratio of 0.50, it believes its borrowing costs will rise only slightly to 4.50%. If PG announces that it will raise its debt-equity ratio to 0.5 through a leveraged recap, determine the increase in the stock price that would result from the anticipated tax savings.**

18-17. You are on your way to an important budget meeting. In the elevator, you review the project valuation analysis you had your summer associate prepare for one of the projects to be discussed:

	0	1	2	3	4
EBIT		10.0	10.0	10.0	10.0
Interest (5%)		–4.0	–4.0	–3.0	–2.0
Earnings Before Taxes		6.0	6.0	7.0	8.0
Taxes		–2.4	–2.4	–2.8	–3.2
Depreciation		25.0	25.0	25.0	25.0
Cap Ex	–100.0				
Additions to NWC	–20.0				20.0
Net New Debt	80.0	0.0	–20.0	–20.0	–40.0
FCFE	–40.0	28.6	8.6	9.2	9.8
NPV at 11% Equity Cost of Capital	5.9				

Looking over the spreadsheet, you realize that while all of the cash flow estimates are correct, your associate used the flow-to-equity valuation method and discounted the cash flows using the *company's* equity cost of capital of 11%. However, the project's incremental leverage is very different from the company's historical debt-equity ratio of 0.20: For this project, the company will instead borrow \$80 million upfront and repay \$20 million in year 2, \$20 million in year 3, and \$40 million in year 4. Thus, the *project's* equity cost of capital is likely to be higher than the firm's, not constant over time—invalidating your associate's calculation.

Clearly, the FTE approach is not the best way to analyze this project. Fortunately, you have your calculator with you, and with any luck you can use a better method before the meeting starts.

a. What is the present value of the interest tax shield associated with this project?

b. What are the free cash flows of the project?

c. What is the best estimate of the project's value from the information given?