

Homework — Cost of Capital

Optional. Worked solutions are on the website

Practice problems

10.1

1. A corporate bond yields 9.2% while the comparable government bond yields 4.3%. State the risk premium, and explain why the equity of the same company must require more than 9.2%.
2. Explain in three sentences why a bond's risk premium can be observed while equity's must be estimated.
3. List the three inputs CAPM requires and, for each, name a source you would use for a US-listed company.
4. A colleague says CAPM cannot be used in Ghana "because the theory doesn't hold there." Rewrite the objection accurately in two sentences.

10.2

1. Classify each as diversifiable or systematic: (a) a factory fire; (b) a rise in central bank policy rates; (c) the loss of a patent case; (d) a currency devaluation; (e) a chief executive's resignation.
2. Using the table in the video, compute the percentage of total risk eliminated by moving from 1 holding to 10, and from 10 to 100. Comment on the pattern.
3. Explain in four sentences why an asset with very high total volatility might still require a low expected return.
4. A family owns 90% of its wealth in a single private company. Explain why CAPM understates the risk they actually bear, and describe how you would reflect this in valuing their business.

10.3

1. Compute the cost of equity for a firm with a beta of 0.85, a risk-free rate of 4.2%, and a market risk premium of 5.5%.
2. Estimate whether each has a beta above or below 1.0, with one sentence of reasoning: (a) an electricity utility; (b) a luxury car maker; (c) a supermarket chain; (d) a commercial property developer.
3. Two data providers publish betas of 1.05 and 1.38 for the same company. Compute the cost of equity under each at a 4% risk-free rate and a 6% market premium, and describe how you would handle the discrepancy in a valuation.
4. Explain in four sentences why CAPM is still used despite performing poorly empirically.

10.4

1. A firm borrows at 8.4% and faces a 27% marginal tax rate. Compute the after-tax cost of debt and the annual value of the tax shield on \$50M of debt.
2. A firm's bonds were issued at a 3% coupon and now trade at a yield of 6.5%. Which figure belongs in the WACC, and why?
3. Explain in three sentences why a firm with large accumulated tax losses has a higher effective after-tax cost of debt than an identical profitable firm.
4. A distressed firm's bonds yield 24%. Explain why this is not a good estimate of its marginal cost of debt, and suggest what you would use instead.

10.5

1. A firm has equity worth \$800M, debt worth \$300M, a cost of equity of 12.5%, a pre-tax cost of debt of 7%, and a 25% tax rate. Compute the WACC.
2. The same firm has book equity of \$250M and book debt of \$320M. Recompute the WACC using book weights and state the size and direction of the error.
3. Using both WACCs, value a perpetuity of \$60M growing at 2.5%. State the percentage overstatement.
4. Explain in four sentences why substituting debt for equity does not reduce the WACC indefinitely.
5. A firm's share price falls 30% in three months with no change to its business. Its analyst recomputes the WACC using the new market values and gets a materially different figure. Should the valuation be revised? Argue both sides in four sentences.

10.6

1. Build a dollar cost of equity for a Kenyan cement producer: US risk-free 4.2%, US market risk premium 5.8%, global cement industry beta 1.05, Kenyan sovereign spread 450 basis points.
2. Convert your answer to shillings, given Kenyan inflation of 6% and US inflation of 2.5%.
3. Explain in four sentences why a Ghanaian 91-day Treasury bill yield should not be used as the risk-free rate in CAPM.
4. An analyst discounts cedi cash flows at a 14.5% dollar cost of equity. A colleague says the error is "small." Using a perpetuity of GH¢50M growing at 20%, compute the value under the correct and incorrect rates and comment.
5. A valuation of a Nigerian company uses a 3% terminal growth rate in naira with inflation at 22%. Compute the implied real growth rate, explain what the analyst has probably done, and state what growth rate you would use instead.

10.7

1. A project in Ghana was approved using a 20% cedi discount rate. Build a defensible cedi cost of equity from: US risk-free 4.0%, US market risk premium 6.0%, global industry beta 0.90, Ghana

sovereign spread 600 basis points, Ghana inflation 20%, US inflation 2%. State the gap against the approved rate in percentage points.

2. The firm funds the project 70% equity and 30% debt, borrowing at 28% before a 25% tax deduction. Compute the WACC using your answer to question 1.
3. A perpetuity of GH¢12M growing at 18% a year is valued first at the approved 20% and then at your built WACC. Compute both values and the percentage difference, and explain in two sentences why the gap is so large.
4. Explain in four sentences why "the rate was given to us by the client" is not an adequate defence of a valuation, and describe what an analyst should do instead when a rate is imposed.
5. A colleague argues that because both the Week 8 and Week 9 valuations reversed when the rate was rebuilt, discounted cash flow is too fragile to be useful. Respond in four sentences.