Corporate Finance, Module 18: Financing and valuation: weighted average cost of capital

*Readings for the Fourteenth Edition (2022) of the Brealey, Myers, Allen, and Edmans text*

(The attached PDF file has better formatting.)

The sections in this posting are for the *fourteenth* edition of the Brealey, Myers, Allen, and Edmans text. You may also use the seventh through thirteenth editions; final exam problems can be answered from any edition.

{The Brealey, Myers, Allen, and Edmans textbook is excellent. We say to read certain sections and to skip others. This does not mean that certain sections are better; it means that the homework assignments and exam problems are based on the sections that you must read for this course. Some of the skipped sections are fascinating, but they are not tested.}

Read the introduction on page 518 for sections 18-1, 18-2, and 18-3. Module 18 covers the weighted average cost of capital; module 19 covers the adjusted present value approach.

Read section 18.1, "The After-Tax Weighted Average Cost of Capital." Module 16 introduces the weighted average cost of capital; module 18 covers the WACC approach to capital structure. Know formula 18.1, which is used by final exam problems ; the effect of corporate income taxes on optimal capital structure implies that financing may vary by country. Don't forget that the tax adjustment ("$1 - T_c$") affects the return on debt, not the return on equity. Work through the Sangria Corporation example 18.1; the final exam problems are similar. The *returns* on debt and equity give the return on assets; the *betas* of debt and equity give the beta of assets. The formulas are the same.

Skip section 18.2, "Valuing Businesses." This section is helpful if you work on mergers and acquisitions or if you must value a company's stock price, but it is not needed for the financial theory.

Read section 19.3, "Using WACC in Practice - Some Tricks of the Trade." The final exam does *not* cover convertible debt, which is covered in a section not in the readings for this course. Know the effects on the cost of equity and the WACC as the debt ratio increases; Figure 18.1 helps to understand the relations. Know the Three-Step Procedure for Finding WACCs at Different Debt Ratios on pages 532-33; final exam problems will give the return on debt at two debt ratios, the corporate tax rate, and the WACC at one of the debt ratios, and ask you to compute the return on equity at the two debt ratios. Read "Unlevering and Relevering Betas" on pages 533-34; skip "Calculating Divisional WACCs" on page 534.

Valuation methods should agree with market values.

- The Black-Scholes formula gives market values that accord with empirical trading of options; this gives us confidence that the Black-Scholes formula is correct.
- Stocks with high unique risk but low systematic risk do not seem to have high returns; this supports the modern portfolio theory perspective on systematic risk.
- The effect of interest rate movements on bond prices is worked out by discounted cash flow procedures; the bond markets support the theory.

Sometimes empirical evidence is sparse but few analysts dispute the theory.

- The dividend growth model gives the value of a stock. We rarely know the dividend growth pattern or the market capitalization rate, so we can't test the theory.
- Some assumptions about the effects of taxes on investment strategy are hard to test, since tax rates vary by investor and by type of investment. But the theory is not disputed; taxes paid to the government are not received by the investor, so the value of the investment is reduced by the cost of the taxes.

Capital structure in the presence of positive corporate taxes, costs of bankruptcy, principal agent problems, and other market imperfections is difficult to justify. The empirical evidence does not support any one theory, reflecting both the uncertainty in our understanding and the lack of good data. Brealey, Myers, Allen, and Edmans posit that the adjusted present value depends on the firm's financing position: is the debt fixed or

does it vary with the value of the project? In practice, neither assumption is entirely correct: a firm has dozens or hundreds of projects, and it deals with each financing issue as it comes up.

*Illustration:* an auto manufacturer produces dozens of vehicles; at any time, it has hundreds of projects that are financed partly by debt and partly by equity. Debt issues are not tied to specific projects. Each project has a finite life, but we don't know whether it is five years or fifty years. We do not know if the firm intends its debt financing for a given project to be fixed or to vary with the value of the project, since it doesn't think of its debt in this fashion. Its debt strategy is a corporate decision, based on its views of the optimal mode of financing at that time.

For Brealey, Myers, Allen, and Edmans, adjusted present value depends on the financing rule. It might seem that we can evaluate the financing perspective by seeing which projects the auto manufacturer accepts.

- Before the project is accepted, the firm has only a vague idea of the probable cash flows.
- Some academicians use hind-sight measures, assuming that the realized cash flows are good proxies for the expected cash flows. But we don't know the cash flows for a specific project even in hind-sight. Cash flows are not shown separately by project in the financial statements, and most cash flows can't be separated by project even if we are given more data. Research, marketing, overhead, and most expenses cannot be easily separated by project. Moreover, we have cash flows for successful projects; we lack data for most failures.

The empirical evidence does not support the aggregate theory, since firms seem to have too little debt and too much equity to optimize their operations. The uncertainties in principal agent problems and other capital market imperfections are so great that we don't always know what the empirical evidence says.

We remain with theory, and the theory is disputed. We say: "Given certain assumptions and modes of corporate behavior, firms do the following." We don't know if the assumptions are correct or if firms behave as we posit, so the predictions are often guesses.

*Question:* Do you mean that the capital structure modules are not important?

*Answer:* Just the opposite. The CFO must say whether a particular financing method is good. With just equity financing, we say: "Check the net present value." With both debt and equity financing, we must say: "Examine the present value adjusted for taxes, costs of bankruptcy, principal agent problems, and other capital market imperfections." We may not know the proper method to derive the adjusted present value, but we have theories. Theories that are closer to the truth make help firms successful.

Brealey, Myers, Allen, and Edmans know more than most other analysts, but they are not arrogant. They say: "Here are several theories and several methods."

Read the *key takeaways* until adjusted present value on page 544. Review end of chapter problems 3, 4, 5, 6, 7, 8, 9.

Illustrative test questions, problems, and homework assignments are shown separately on the discussion forum.