L10: Revision

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Essentials of Financial Economics 2020
Financial Decision-Making (1^{st} Quarter)

Quarter overview

- Split into two parts.

1. Information => financial decisions. What are the tools required?

2. Applications of these tools.

Revision — Decision rules

- The best decision rule to use is NPV/discounted cash flow analysis.
- Measures the cash flows paid to all stakeholders in the company, (both debt and equity).
- Accounts for the time value of money in addition to risk.
- All about **marginal/incremental benefit** (MB) versus **marginal/incremental cost** (MC).
  - If NPV is positive — indicates that $MB > MC$.
  - If NPV is negative — indicates that $MB < MC$.
- Remember to always look at the cash flows arising from the new potential project **separately** from the rest of the firm.

Revision — Discount rates

- An input into the use of the NPV method of valuation.
- Always match the **risk** and **maturity** of the project's cash flows.
- Can be determined using the CAPM theory.

$$r_i = \underbrace{r_f}_{\text{Time value of money}} + \underbrace{\beta_i(\mathbb{E}[r_m] - r_f)}_{\text{Risk adjustment}}$$

- Risk adjustment can be broken into two parts
  - $(\mathbb{E}[r_m] - r_f)$ is the **compensation per unit** of systematic risk.
  - β_i is the **number of units** of systematic risk, to which the project is exposed.
- The riskless rate and market risk premium are aggregate variables we can easily observe.
- The β_i is something specific to the project.

Revision — Finding β_i

- The β_i coefficient for the determination of r_i measures the correlation of the project's risk with that of the market.
- When evaluating a new project, we need to find the units of risk of the underlying project, independent of capital structure.
- This is captured by the beta of assets — β_A.
- Beta of equity — β_E — captures business and financial risks.
- Unless your comparable firm has the same capital structure as you will use for the new project, β_Es are not comparable.
- We find β_A by removing the effects of capital structure — through **unlevering**.

Revision — effect of taxes on leverage (1)

- Taxes can potentially create an advantage for debt.
- One method for valuing the firm is **adjusted present value** (APV).
  - APV involves adjusting the firm's **cash flows** by adding-in those associated with the tax shields.
- Under this assumption, there will be an optimal level of leverage.

$$V_L = V_U + PV(DTS)$$

- Form of the $PV(DTS)$ term will depend on what tax rates are present.
- If you assume that the **debt level** is perpetual, then

$$PV(DTS) = D\left[1 - \frac{(1-\tau^c)(1-\tau^e)}{(1-\tau^i)}\right]$$

where τ^c is the **corporate** rate, τ^e is the **dividend** rate and τ^i is the rate on **interest**.

Revision — effect of taxes on leverage (2)

- More commonly-used method in practice is to use the **weighted average cost of capital** (WACC).
  - Method involves instead adjusting the firm's **discount rate** to account for the tax shields.

$$WACC = r_A - r_D \frac{D}{V} \tau^c$$

- Generally $WACC$ is less than r_A to inflate the value of the levered firm relative to unlevered.
- WACC assumes that the **leverage ratio** is held constant.
- If the leverage ratio is constant and we discount the DTS with r_A, then the WACC and APV methods deliver the same answer.

Revision — raising capital

- There is usually a mismatch between sources and uses of capital.
- A firm will generally undergo several rounds of financing, roughly of the order:
  - Initial equity from the entrepreneur.
  - Angel investors.
  - Venture capitalists.
  - IPO.
  - SEO.
- Be wary of conditions that VCs stipulate in the term sheet for the capital offer.
- There will typically be considerable heterogeneity in the offers depending on the preferences of the VC firm.

Revision — mergers and acquisitions

- Many reasons for companies to merge; typically the firms will be looking for synergy gains or to increase market power.
- Deals can take place through cash payments or through a stock deal. Should be treated like any other project.
  - Valuation should be done using DCF analysis.
  - Although the use of multiples is a popular technique in practice.
- Stock price reactions to merger announcements typically reflect the friction of information asymmetry.
  - Empirical regularity to see the acquirer's stock price fall while that of the target increases.

Revision — multinational corporate finance

- Multinational firms face risk of movements in exchange rates.
- These firms can hedge these movements with the use of forward contracts, which lock-in their future exchange rates.
- When valuing overseas projects, use either the Home or Foreign currency approach.
- Approaches rely on estimates of future rates based on the forward rate and interest rate parity.

Revision — policy, firms and the macroeconomy

- NPV analysis involves costs and benefits to a decision.
- Government policy can affect both.
- U.S. TCJA removal of the repatriation tax: a prominent example.
- Firm decisions are affected: can aggregate to have a quantitatively meaningful impact on the macroeconomy.

Conclusion

- That's all from me.
- This class was all about the *application* of corporate finance.
- Spiros Bougheas' *Economics of Corporate Finance* will dig much deeper into what's behind the theory.