Alternative Approaches to Valuation of Private Companies

1) Comparables
2) Net Present Value Approach
3) Adjusted Presented Value Approach
4) The 'Venture Capital' Method
5) Options Analysis

- Each approach has advantages and disadvantages.
- Generally there is no "right" answer to a valuation problem. Valuation is very much an art as much as a science!

Evaluation of Comparables

- How to compute comparables:
  - Start with a sample of securities whose business characteristics are similar to the company being valued.
  - Assume that the company has similar financial ratios to the "comparable" companies. A number of different ratios are typically used: Price/Earnings, Market/Book, Market Value/Sales, EBIT.
  - Then back out the implied value of the company being studied.
- Comparables Approach relies on two assumptions:
  - Comparable companies have future cash flow expectations and risks similar to the firm being valued
  - Performance measure is actually proportional to value

Different ways of Doing Comparables

- "Comparable Company" – Uses a multiple calculated from the trading values of firms in the same industry as the firm being valued.
- "Comparable Transaction" – Uses a multiple from companies that were involved in a similar transaction as the firm being valued.
- "Comparable Industry Transaction" – Uses a multiple from companies from the same industry that were involved in a similar transaction as the firm being valued.

Problems with Comparables Approach

- Generally tough to find appropriate companies to be comparable
- Which ratio/comparable do you use? There isn't a "right" answer, so comparables approach will give a range of values rather than one?
- Many comparable companies have different capital structures.
  - Leverage will mechanically affect some financial ratios.
  - It is often a good idea to use ratios that are not affected by leverage (for example, debt+equity/operating cash flow).

Discounted Cash flow Approach

- Capitalizes the cash flows the firm is expected to generate.
- Strength: Reflects actual benefits that investors care about (cash flows) better than other methods.
- Weakness: Relies heavily on projections. Valuations are only as good as these projections!

Different DCF Methods

- Net Present Value Approach
  - Discount Free Cash Flows at WACC.
- Adjusted Present Value
  - Calculate the value of the 'all-equity' firm, then add the present value of tax shields.
  - Useful approach when leverage ratios are projected to change over time. This often occurs in buyouts.

Valuing Firms using Discounted Cash Flows

$V_F = PV(FCF_T) + PV(TV_T) + NOA$

V_F = the value of the business

$PV(FCF_T)$ = the present value of the total free cash flows from operations during the forecast period

$PV(TV_T)$ = the present value of the total terminal or residual value at the end of the forecast period

NOA = the market value of excess or non-operating assets (including assets that could be sold without affecting operations such as excess land, an extra building, etc.)

Valuing Firms Using Discounted Cash Flows

The total value of a firm also equals the sum of value of the claims against its cash flows.

$V_F = V_D + V_E$

where V_D = the market value of debt

and V_E = the market value of the firm's equity.

- This suggests that the value of the equity claims against a firm can be calculated as:

$V_E = V_F - V_D$.

Taxes and WACC

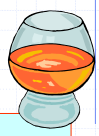
- If you discount using the WACC approach, cash flows have to be projected just as you would for a capital investment project.
  - Do not deduct interest.
  - Calculate taxes as if the company were all-equity financed. The value of interest tax shields is picked up in the WACC formula.

The Weighted Average Cost of Capital (WACC) Formula

$$WACC = (1 - Tc)\left(\frac{D}{V} \times r_D\right) + \left(\frac{P}{V} \times r_P\right) + \left(\frac{E}{V} \times r_E\right)$$

After-Tax WACC

Example - Sangria Corporation



Balance Sheet (Market Value, millions)			
Assets	125	50	Debt
		25	Preferred Equity
		50	Common Equity
Total assets	125	125	Total liabilities

$$WACC = (1 - .35)\left(\frac{50}{125} \times .08\right) + \left(\frac{25}{125} \times .10\right) + \left(\frac{50}{125} \times .146\right)$$
$$= .1104$$
$$= 11.04\%$$

Cost of Financing for WACC

- How are costs of financing determined?
  - Return on equity can be derived from market data. For private companies, this typically involves using the beta of a comparable company.
  - Cost of debt is set by the market given the specific rating of a firm's debt.
    - Difference between promised and actual returns can create problems, especially with junk bonds.
  - Preferred stock often has a preset dividend rate.

Calculating Free Cash Flows

- The free cash flows from the business in period t are calculated as:

$$FCF_t = EBIT_t*(1 - T_c) + DEP_t - CAPEX_t - \Delta NWC_t + other$$

Where:

$EBIT_t$ = the projected earnings before interest and taxes

T_c = the corporate tax rate

DEP_t = book depreciation and amortization

$CAPEX_t$ = the total capital expenditures (maintenance and new expenditures) consistent with the EBIT projections

ΔNWC_t = the additional net working capital that must be obtained during period t to support the level of activity implied by $EBIT_t$.

other = increases in taxes payable, wages payable, etc.

- Note: Free cash flows are after-tax and are **not** adjusted for interest deductibility. The WACC uses the tax-adjusted interest rate, which has the effect of adjusting for the deductibility of interest payments.

Terminal Values

- Because businesses are typically long-lived assets and detailed cash flow forecasts beyond 5 or 10 years tend to be more fiction than fact, most analysts project cash flows for a finite period and then assume some terminal value at the end of that period.
- The terminal value is often estimated by assuming that the cash flows beyond the last projection year remain flat or increase moderately (e.g., at the long-term expected rate of inflation).
- Sometimes in venture situations, terminal values are estimated by other methods such as comparables.

Terminal Values

- For instance, if detailed cash flow forecasts are produced for 5 years, the terminal value, TV, may be estimated as:

$TV = CF_5/WACC_5$

CF_5 = the cash flow in year 5

- $WACC_5$ = the weighted average cost of capital in year 5.
- This equation assumes that both the cash flows and the discount rate remain constant in the out-years.
- More commonly, it is assumed that the cash flows exhibit some nominal level of growth, g, in the out-years, implying that:

$TV = CF_5(1+g)/(WACC_5 - g)$.

Strengths and Weakness of the NPV Method

- Strengths
  - Theoretically sound. Method discounts cash flows, which is what actually determines value.
- Weaknesses
  - Relies on cash flow forecasts, which tend to be inaccurate and biased upwards.
  - Assumes that firm's capital structure remains constant over time.
  - Cannot easily estimate betas for private firms.

Uncertainty about cash flows and the NPV Method

- One approach:
  - Estimate value assuming 'best', 'most likely' and 'worst' case scenarios.
  - Assign probabilities to each scenario and compute the probability-weighted firm value.
- Monte Carlo Simulation
  - Specify probability distribution of each cash flow.
  - Then simulation program such as 'Crystal Ball' will generate distribution of firm values.
  - Approach relies on knowing distributions of cash flows, which in practice can be difficult to estimate.

The Adjusted Present Value (APV) Approach

- Variation on the NPV Method
- Value of firm = Value of unlevered firm + PV (Tax Shields)
- Useful when firm's capital structure is changing or firm has net operating losses (NOLs).

Calculating APV

- First calculate cash flows, ignoring capital structure.
- Discount cash flows using *unlevered* beta.
- Calculate tax shields, and discount them using appropriate discount rate.
  - Often it makes sense to discount tax shields at the debt's rate of return rather than the equity's, since tax shields are typically less risky than cash flow.
- Calculate PV of NOLs.
- APV equals the sum of these factors.

The 'Venture Capital' Method

- Commonly used in the private equity industry.
- Starts from an estimate of the value of the business upon exit (the expected price of an IPO or sale).
- Then backs out the initial stake the VC must have to make a specified dollar investment lead to this exit value (assuming a very high rate of return, typically 40-70%).

The Venture Capital Method (continued)

- Terminal value (TV) is usually taken to be a multiple of projected cash flows in some point in the future.
- Discounted TV = $TV/(1 + Target)^{years}$
- Required Final % Ownership = Investment/Discounted TV
  - Assumes that there is no subsequent investment
- If there are to be future issues (and dilution of initial ownership stake):
  - Retention ratio = (final % ownership)/(initial % ownership)
  - Required initial % ownership = (Required final % own.)/retention ratio

The Venture Capital Method: Reliance on high discount rates

- Justifications for high discount rates:
  - Premium for Risk
  - Premium for Illiquidity
  - Premium for Value-Added by Investor
  - Offsets overly optimistic cash flow forecasts.
- These justifications are simply 'fudge factors'. Better to address each of these concerns directly.
- Rather than use high discount rates to adjust optimistic cash flow estimates, why not ask tough questions (or do both)?
  - What is performance of comparable companies?
  - What market share does company need to meet projections?
  - What are the key risks?
  - What happens if subsequent financing opportunities are different from those projected?

Options Analysis

- Often, new ventures have 'options' associated with them.
  - Can expand projects, abandon them, go into related businesses, etc. depending on what happens in the future.
  - Discounted cash flow analysis such as NPV or APV ignores flexibility associated with these options
  - 'Real options' analysis uses option pricing methods to analyze the value of such flexibility.

Options Analysis (example)

- Suppose you have a project that costs $150, and generates cash flows worth (in today's dollars) $200, $160, or $120 with equal probability.
  - Project's NPV= (1/3)(50+10-30)= $10
- If you can delay decision on whether to invest 1 period:
  - Will not invest if cash flow is $120.
  - NPV = (1/3)(50 + 10 + 0) = $20
  - Option to delay has a value of $10.