Introduction

- Capital budgeting is the process of determining which investments are worth pursuing.
- Firms (and individuals) can diversify their operations (investments) across countries, so …
- How do firm-level and country characteristics influence the value of “investments” in different countries?
- Which characteristics are important to consider? How do they influence the techniques we use to value these “projects”?
- What does it mean if global financial markets have become “de-coupled”? “Segmented”?

How to Value Assets - Theory

"The central idea underlying valuation is the application of formulas and higher mathematics to establish the present value of the forecasted issue. But the combination of precise formulae with highly intuitive assumptions can lead to failure, or rather parity, particularly any value one wishes, to remain high, for a truly outstanding issue."

- How does this influence our decision making process?
- Useful to have several perspectives. Each will have different strengths and weaknesses which should be acknowledged and leveraged.
Valuation of Assets - Example

**Ford stock rally could be boon to GM IPO**

- **NEW YORK/Detroit** (Reuters) — Ford Motor Co's $18 billion initial public offering at General Motors headquarters, the 100-year-old automaker's shares could be GM as it replaces its lenders' role as public lenders.

- As GM's only major U.S.-listed rival, Ford is the company investors and bankers are leaning to as they debate the biggest U.S. automaker's initial public offering and the high stakes IPO scheduled for some time next week's U.S. market elections.

- For all these reasons, the GM IPO could help determine value for GM, including a multiple of its projected cash flow based on Ford's multiples, or a valuation based on leveraged financial models or trading:

**Valuation Techniques:**

**Current events.**

- How to value assets?
  - Global expansion opportunities.
  - How are assets valued on the balance sheet? Does the market?
  - What is the market for a market? Market the market?
  - Global expansion opportunities.

- How to value relatively illiquid assets?
  - TRAP: funds in the U.S. participations.

- How to determine the value for different industries?
  - Does it matter what the plan is for the firm?
  - Different winners (e.g., privatization versus strategic partnerships)?

**Valuation Techniques: Review**

- Discounted cash flow (DCF) approaches:
  - Dividend discount models (DDM's)
  - Free cash flow models (FCF's)

- Relative / multiples valuation approaches:
  - Determine market value of a firm based on financial ratios or other characteristics of comparable firms.
  - Value based on "similar" transactions.

- Valuation of separate parts / Break-up value
  - Determine the value of all "subsidiaries" separately and add together.
Valuing Cross-Border Investments

• One of the most common and intuitive ways to value a project is by discounting the future expected cashflows generated by the “project”.
  – Can generally forecast cashflows but comparable transactions are not always available, especially in emerging markets.

• Essentially the DCF analysis from the first Finance course.

• To extend this to international problems there are some extra things we need to consider:
  – Choice of currency for the FCF’s
  – Choice of country for cost of capital (discount rate)
  – Special international risks: political risk, etc.
  – Option value of setting up a project in a different country

Cost of Capital

• The minimum required rate of return on a capital investment for the investor/firm to be willing to undertake the “project”:
  – the expected return that is just sufficient to compensate all investors for the risk of the project.
  – sometimes referred to as the discount rate, required rate of return or the hurdle rate.

• The basic principle is:
  – any project that can provide an expected return greater than the cost of capital required by its investors should be undertaken.
  – any positive NPV project should be undertaken.

Some Preliminary Issues

• The true cost of capital cannot be observed directly
  – It is frequently estimated by analyzing the required returns on publicly traded financial securities for firms or projects with “similar risk characteristics”.

• The estimated cost of capital should make sense!
  – Investors require higher returns on assets whose cash flow generating ability is more uncertain.
  – It is a long-run characteristic of the firm so it should be stable over time.
  – Only include compensation for risks consistently faced by the firm. Other factors should be allowed to influence expected cashflow estimates.
  – What about country and political risk? (i.e., China? Russia? US?)
Relationship between Risk and Return

- Risk Free Rate
- Risk Premium
- Risk Free Rate
- Risk

Local versus Foreign Cost of Capital

- It appears logical to use the local cost of capital (the cost of capital for the home market of the project).
  - A French cost of capital for a project located in France
  - What return is required in France for the project?

- The key question is: who are the investors supplying the capital for the project and what are the returns that they require on the capital they are providing?
  - The cost of capital should be calculated using the required returns for the actual suppliers of capital (both debt and equity) for projects with the same level of risk.

Weighted Average Cost of Capital (WACC)

- What is the cost of capital for all of a firm’s investors?
- Since the government "pays" part of the interest expense, the after-tax cost of capital is:

\[ k_c = \left\{ \frac{\text{cost of equity}}{D} \right\} \times (1-t) \]

- \( k_d \) = cost of debt
- \( D \) = value of debt
- \( k_e \) = cost of equity
- \( E \) = value of equity
- \( k_c \) = overall cost of capital
- \( Value \ of \ firm \) = \( D + E \)
- \( t \) = firm’s marginal tax rate
Capital Structure: Local vs Global

- Localized capital structures are better because:
  - Addresses criticisms that the foreign affiliate is insensitive to local market conditions.
  - Helps management evaluate performance relative to other firms in the same market.
  - Forces the local firm to allocate capital efficiently by not insulating them from local forces.

- Localized capital structures are worse because:
  - Loss of their competitive advantage from their better access to global capital markets.
  - Harder to interpret consolidated financial statements.
  - The affiliate’s debt ratio does not reflect true default risk due to the guarantees it has from the parent firm.

What Do We Do?

- The target capital structure for the “project” is the mix of financing (in market values) it would maintain as a “stand alone” entity.
  - May need local comparables or even comparables from another country to determine this.

- Its actual capital structure may deviate from this for tax purposes, to deal with political risk or other types of risk.
  - Expected tax effects of the actual capital structure should be incorporated into the expected cashflows to the parent. Putting this in the discount rate would be double counting.

Cost of Debt \( (k_d) \)

- Match with the term of projects (generally long-term).

- Use current rates (what the firm would pay today) as opposed to past interest rates:
  - If the corresponding corporate rates cannot be found, take government rates and add a risk “premium” based on:
    - historic spread or premium for issuer
    - spread required given the bond rating, if available
      - What risks does the bond rating capture? What risks does it not consider?

- Tax shield
  - depends on the countries involved and tax treaties. Usually use the highest marginal tax rate to be conservative.
Cost of Equity ($k_e$)

- **Problem**: we cannot observe current required equity returns directly.
  - We can only observe current equity prices and past equity returns.
  - This is an even greater problem in the international environment, because market data may not be readily available and/or reliable.

**Two Basic Approaches**:
1. Estimate the expected (internal rate of) return to owning the company’s stock using the dividend discount model (DDM).
2. Estimate the market’s required return on the firm’s equity using a risk pricing model such as the CAPM.
   - Note: in an efficient market the required and expected returns should be the same.

Cost of Equity: The CAPM Approach

- The return the firm’s investors require on their investment based on the risk they face relative to the most relevant market index.
- The CAPM relates the cost of equity for an individual asset to that asset’s “beta”. Formally:
  \[ k_e = r_f + \beta \cdot (E(R_m) - R_f) \]

where:
- $k_e$ = required rate of return on equity
- $r_f$ = risk-free rate
- $\beta$ = beta of stock (risk relative to market)
- $E(R_m) - R_f$ = expected market risk premium

CAPM: Graphically

- **Slope** = $(E(R_m) - R_f) \cdot \beta$
- **Risk Premium** = $\beta \cdot (E(R_m) - R_f)$
- **Risk Free Rate** = $r_f$
- **Risk** = $\beta_i$
How Is Beta Measured or Estimated?

- Regression of observed excess returns for security i, \( R_{i,t} - R_{f,t} \), against the excess return on a market index, \( R_{m,t} - R_{f,t} \):
  \[
  (R_{i,t} - R_{f,t}) = \alpha_i + \beta_i (R_{m,t} - R_{f,t}) + \epsilon_{i,t}
  \]
  where \( \beta_i \) is the slope or regression coefficient, and \( \alpha_i \) is the intercept that represents the sample "abnormal" return.

- The \( R^2 \) from the regression is an indication of the degree of correlation between the market and the asset.

- This can be done using Excel or another statistical program or Bloomberg and other sources do this automatically.

The CAPM: Inputs and Outputs

- \( \beta \) - beta
  - Beta for an asset of similar risk to the market portfolio = 1.0.
  - Typical range of betas: 0.5 - 2.0
  - If you cannot measure this for a firm, use the beta of comparable firms. Be consistent with capital structure assumptions - may need to unlever / relever the beta.

- \( r_f \) - risk free rate
  - Current yield on intermediate or long-term government bonds (What does this capture?)

- \( E(R_m - r_f) \) - expected market risk premium
  - Historic average of difference between the return on the market (e.g. S&P500, S&P/TSX, Hang Seng) and long-term government bonds
  - 4-6% for most developed countries if no better data available (what about for less-developed countries?)

Which Cashflows to Forecast?

- Usually easier to forecast FCF’s in the local currency
  - Can take the local market conditions into consideration (e.g. inflation, regulation, … )

- Cashflows earned abroad may be hard to repatriate.
  - Regardless of when the earnings will be repatriated, we should use earned cashflows since these are the funds that can be invested by the firm.

- An “as is” valuation uses existing market prices as forecasts.
  - Ultimately, however, we are interested in the value of the “project” with transfer pricing, royalties, subsidies, taxes etc.

- At the end of the process, we should perform sensitivity analysis on economic risks, political risks, learning and the impact of other international risks/opportunities on cashflows.
Cashflows and Cost of Capital

- The appropriate discount rate can be either:
  - A domestic currency rate if expected future cashflows are in the
domestic currency, or
  - A foreign currency rate if expected future cashflows are converted
  into the foreign currency for a conversion.
- Choice of currency depends on the ability to
  accurately forecast each type of cashflow and convert
  them back to the firm’s home currency.
  - Generally better to use the foreign currency for these forecasts
    because it is easier to eventually include factorized inflation
    effects, etc., in economic calculations.
- No clear and consistent!

Converting Cost of Capital

- What do we do if we cannot compute the costs of capital in the
  required markets? (i.e., if the equity and/or bond markets are
  under-developed or there are no local comparables)
  - We can convert estimates made in the home market to
    approximate the foreign values.
- A French WACC (or cost of debt or cost of equity) can be
  converted to a Canadian WACC (or vice-versa) using interest
  rate parity:
    \[(1 + k_{Canada}) = (1 + k_{France}) \cdot \frac{(1 + r_{Canada})}{(1 + r_{France})}\]
  - Intuition: if Canada or the Canadian dollar is riskier than France or
    the Euro, the interest rates should be higher in Canada so the cost
    of capital in Canada will be higher than in France.

Free Cash Flows to the Firm (FCF)

- What exactly are these cashflows?
- FCFs represent cash flows upon which all stakeholders
  have a claim. They are the cashflows we expect to have
  generated by the assets of the firm in the future.
- Basically, free cash flows to the firm equal:
  \[ FCF = EBIT \times (1 - \text{tax rate}) + \text{Depreciation and amortization} - \text{Capital Expenditures} - \text{Increase in Working Capital} \]
Forecasting Free Cashflows

- The value of the assets is the net present value (NPV) of all of the expected future operating free cash flows (actually EV).
- Once we have forecasts for these, they are discounted at the firm's cost of capital:

\[
NPV = \frac{FCF_1}{1+k_c} + \frac{FCF_2}{(1+k_c)^2} + \ldots
\]

- If the growth rate is constant into the future (i.e., terminal value):

\[
NPV = \frac{FCF_1}{k_c - g}
\]

- Or combination of the two: forecast period and terminal value.

NPV for FCF in Different Currencies

- Suppose we are considering a firm with a sequence of forecasted free cash flows to the firm (revenues) in Yen:

\[
FCF_1, FCF_2, FCF_3, \ldots, FCF_n \text{ in Yen.}
\]

- What is the present value of this cash stream in Canadian dollars?

Method 1:

- Discount the yen cash flows using the yen discount rate.
- This gives us a present value in yen.
- Convert the result into today's dollars using the spot dollar/yen exchange rate.

\[
NPV = \text{PV in Yen} = S(FCF_1/(1+k_{c,Yen}) + FCF_2/(1+k_{c,Yen})^2 + \ldots + FCF_n/(1+k_{c,Yen})^n)
\]
 Method 2:

- Use forward contracts (interest rate parity) to determine the expected future dollar/yen exchange rate at the different points in time at which cash flows are received.

- Compute the present value of the “hedged into dollars” cash flows using the dollar discount rate.

\[
\text{NPV} = \frac{\text{FCF}_1 \times \text{FCF}_1}{(1 + k_{c,\text{CAD}})} + \frac{\text{FCF}_2 \times \text{FCF}_2}{(1 + k_{c,\text{CAD}})^2} + 
\]
\[
\vdots + \frac{\text{FCF}_n \times \text{FCF}_n}{(1 + k_{c,\text{CAD}})^n}
\]

Method 3:

- Use explicit forecasts. For example, assume relative PPP holds, so can predict exchange rates using:

  - Japan and Canada:
    - Inflation in Japan is expected to be 2% per year
    - Inflation in Canada is expected to be 3% per year
    - We expect the Yen to appreciate against the Canadian dollar by
      \[
      [(1+0.03)/(1+0.02) - 1] = 1 \text{ percent per year.}
      \]
    - Compute the present value of the expected dollar cashflows (determined with PPP) using the dollar discount rate:

\[
\text{NPV} = \frac{\text{P}_1 \times \text{FCF}_1}{(1 + k_{c,\text{CAD}})} + \frac{\text{P}_2 \times \text{FCF}_2}{(1 + k_{c,\text{CAD}})^2} + 
\]
\[
+ \frac{\text{P}_n \times \text{FCF}_n}{(1 + k_{c,\text{CAD}})^n}
\]

Final Stage of DCF Valuation

- Adjustments to cashflows may need to be made for non-diversifiable risks such as political risks. The cashflows are expected cashflows and this may need to be considered.
  - Political risk insurance is available to help deal with some of these and the premium can be deducted from the cashflows.

- We need to consider the impact that tax breaks and subsidies may have on the cashflows to the project as well as to the parent company.

- We need to consider the potential “cannibalization” by the new project and the possible option value of doing other, subsequent projects in this country.

- Sensitivity or scenario analysis to determine the impact of different assumptions and risks on our results.
Relative Valuation Approaches

- Expected value of the equity of a company (on a per share basis) is equal to P/E multiple times expected earnings:

\[ P_0 = \text{"P/E multiple" \times \text{EPS}_1} \]

- This multiple usually comes from “comparable” firms or is based on “comparable” transactions.
  - Preferably within the same country or a country with similar characteristics.
  - Different countries value assets differently and have different accounting standards.

Valuation: The Process

Min. bid

Max. Bid

Transaction Costs

Value of synergy and other gains to bidder

Value of target with synergies

Value of target

Stand-alone target value

Valuation: Example with forecasted FCF

**Missy the million dollar Holstein** (Globe and Mail: November 16, 2009)

Her name is Eastside Lewisdale Gold Missy and, as of last week, she is worth $1.2-million …

Missy is an example of what’s still possible. Where the average Holstein produces 9,700 kilograms per 305-day lactation cycle, she is projected to do 14,600 kilograms.

Missy’s owners have already pre-sold 25 embryos for $230,000. They expect her to produce 150 embryos … Missy also has six bull contracts worth $500,000. If she can produce six male offspring who become sought-after sires, her owners can earn up to $500,000 from each in royalty payments from semen sales.
Relative Valuation: Example

Ford stock rally could be base to GM IPO cont'd

- With a market capitalization of about $45 billion, Ford shares are now trading at 2.7 times projected 2011 earnings before interest, tax, depreciation and amortization (EBITDA) of about $16 billion, according to estimates by Thomson Reuters I/B/E/S.
- Based on a 2011 EBITDA projected of mid August of $13 billion for GM by GST Capital Group, GM could theoretically command a market value of $53 billion, when applying Ford's multiple.
- Jitters will also take into account the automobile's net cash position, which in January 2011 was $10.4 billion, net debt of $20 billion, and its recent $50 billion sale of truck maker Kenworth to Mercedes-Benz.

Valuation and Capital Raising

Prada Studying IPO in Hong Kong next year (Bloomberg: October 6, 2010)

- Prada which has scrapped an IPO four times in the past 10 years, might raise more money having a primary listing in Hong Kong that in Milan as individual investors are more active in Asia.
- With such a listing Prada may fetch a valuation in excess of Louis Vuitton Moet Hennessy SA's trading multiples. The world's largest maker of luxury goods has an enterprise value of 11.65 times 2010 EBITDA.

Valuation: Best Practices

- DCF is the dominant valuation technique.
- WACC is the dominant discount rate. For WACC:
  - weights based on market not book values
  - CAPM used to estimate cost of equity
  - betas obtained from published sources
  - risk-free rate to match stream of cash flows (eg, L-T)
  - historical equity risk premium of 6% or lower
  - monitor changes at least annually

### Summary

1) & I) Forecast foreign currency FCF's
   - use expected inflation rates, marginal tax rate
   - include a terminal value

II) Forecast FX rates - parity conditions
   - convert foreign FCF's to domestic

2) Determine foreign WACC
   - use project specific capital structure
   - use project specific beta
   - incorporate systematic risks

III) Determine home country WACC
   - use project specific cap struct
   - use project specific beta
   - incorporate systematic risks

3) Calculate PV in foreign currency
4) Convert to domestic currency at spot rate

IV) Calculate PV in domestic currency