

Capital Budgeting in Global Markets

ISFP
Fall 2011

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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 corporate and country characteristics influence the value of “investments” in different countries?
- Which characteristics are important and how do they influence the techniques we use to value these “projects”?
- What are the implications if global financial markets have become “de-coupled”?

How to Value Assets - Theory

“The concept of future prospects and particularly of continued growth in the future invites the application of formulas out of higher mathematics to establish the present value of the favored issue. But the combination of precise formulas with highly imprecise assumptions can be used to establish, or rather justify, practically any value one wishes, however high, for a really outstanding issue.”

Benjamin Graham

- What does this mean? 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

Prada's HK IPO: better valuation? June 6, 2011 (Financial Times)

- Prada announced on Monday that it hopes to raise up to \$2.6bn in its Hong Kong initial public offering.
- Prada's decision to IPO in Hong Kong is a testament to the luxury market in Asia. Greater Chinese demand will account for 44 per cent of global demand by 2020.
- It's no wonder then that bankers say the company is likely to gain a higher valuation by listing in Hong Kong than in Milan.
- At the top of the range, the deal values Prada at 27 times its forecast 2011 earnings – which would make it one of the most valuable luxury goods companies globally. This valuation compares with London-listed Burberry's trading at 22.3 times forecast 2011 earnings, and Paris-listed LVMH's 19.4 times forecast 2011 earnings.

Valuation Techniques:

Current events:

- How to value assets?
 - Global mergers and acquisitions.
 - How are assets valued on the balance sheet?
 - What is marking-to-market? Marking-to-model?
 - Why would these issues create serious problems?
- How to value relatively illiquid assets?
 - Greek government bonds?
- How to determine the value for different bidders:
 - Different countries?
 - Different motives (i.e., private equity versus strategic partner)?

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.
- Similar to 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

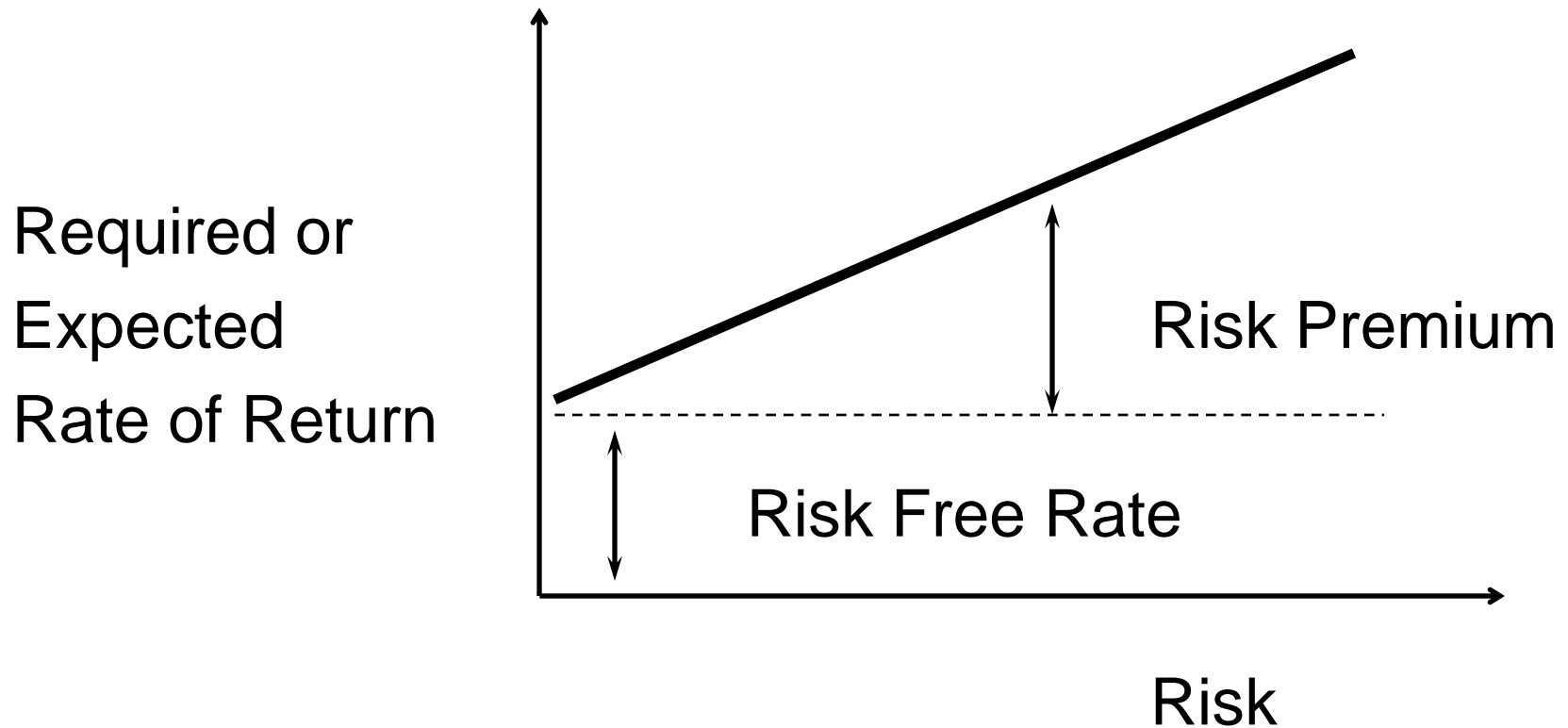
Cost of Capital

- 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 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



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.
- 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:

$$k_c = (D/V) * k_d * (1-t) + (E/V) * k_e$$

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 can not 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:

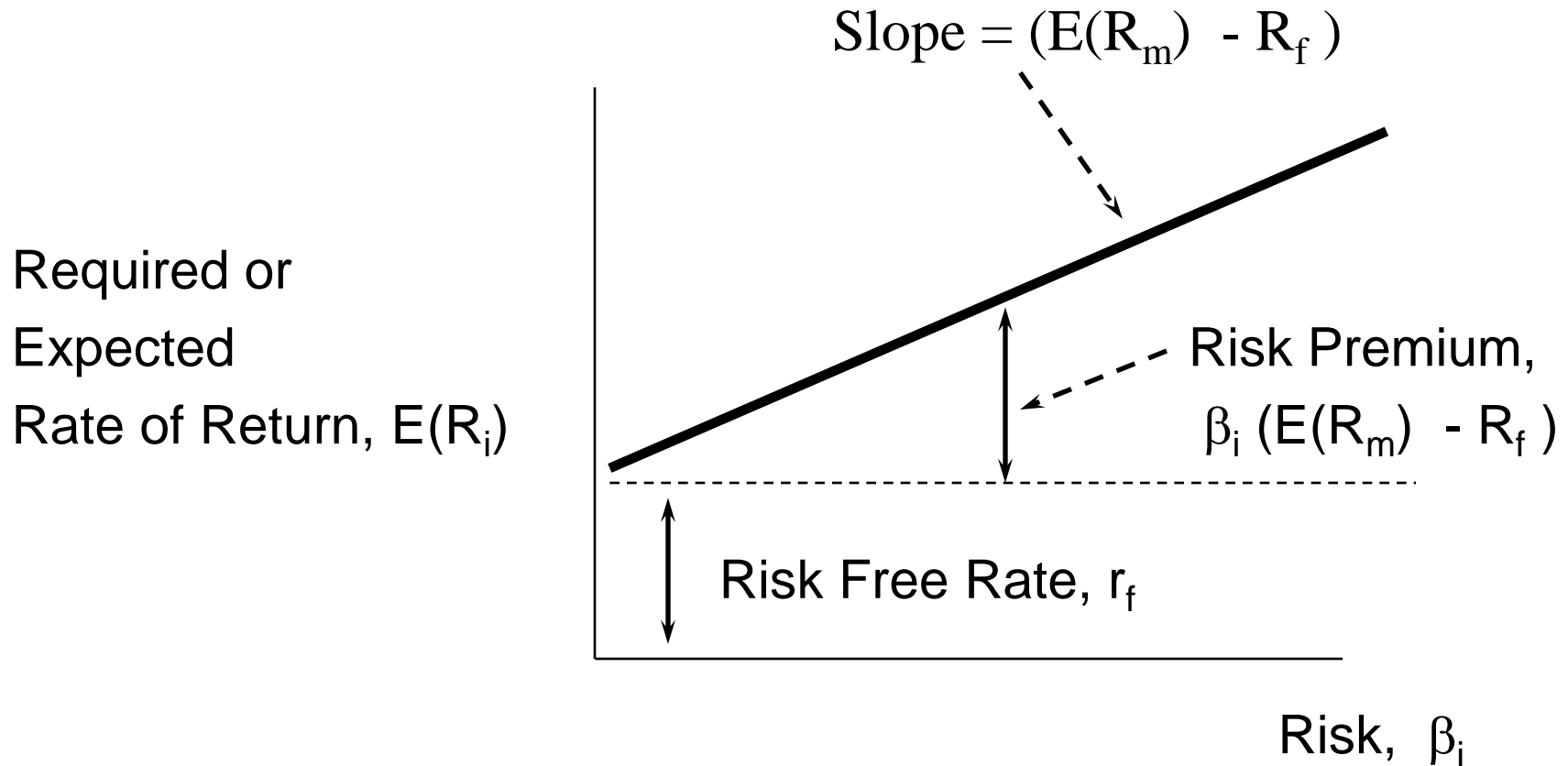
k_e = required rate of return on equity

r_f = risk-free rate

β = beta of stock (risk relative to market)

$E(R_m - R_f)$ = expected market risk premium

CAPM: Graphically



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, $R_{m,t} - R_{f,t}$:

$$(R_{i,t} - R_{f,t}) = \alpha_i + \beta_i(\text{MRP}_t) + \varepsilon_{i,t}$$

where β_i is the slope or regression coefficient, and α_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

- **β - 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.
- 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 explicitly include forecasted inflation, exchange rates, etc. in these estimates.
- ***Be clear and consistent!***

Converting Cost of Capital

- What do we do if we can not 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:

$$(1 + k_{\text{Canada}}) = (1 + k_{\text{France}}) \cdot \left\{ (1 + r_{\text{Canada}}) / (1 + r_{\text{France}}) \right\}$$

- 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:

$$FCF = EBIT \times (1 - \text{tax rate}) + \text{Depreciation and amortization}$$

- *Capital Expenditures*
- *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:

$$NPV = \frac{FCF_1}{1+k_c} + \frac{FCF_2}{(1+k_c)^2} + \dots$$

- 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:

$FCF_1, FCF_2, FCF_3, \dots, FCF_n$ 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.

$$\text{NPV} = S \left[\overbrace{\text{FCF}_1 / (1 + k_{c, \text{Yen}}) + \text{FCF}_2 / (1 + k_{c, \text{Yen}})^2 + \dots + \text{FCF}_n / (1 + k_{c, \text{Yen}})^n}^{\text{PV in Yen}} \right]$$

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.

$$\text{NPV} = \overbrace{[F_1 \times \text{FCF}_1]}^{\text{FCF in \$}} / (1 + k_{c,\text{CAD}}) + [F_2 \times \text{FCF}_2] / (1 + k_{c,\text{CAD}})^2 + \dots + [F_n \times \text{FCF}_n] / (1 + k_{c,\text{CAD}})^n$$

Method 3:

- Assume relative PPP holds, so use the inflation differential to predict exchange rates:
- Example:
 - 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 $[(1+0.03)/(1+0.02) - 1] = 1$ percent per year.
 - Compute the present value of the expected dollar cashflows (determined with PPP) using the dollar discount rate:

$$\text{NPV} = \frac{\overbrace{[P_1 \times \text{FCF}_1]}^{\text{FCF in \$}}}{(1 + k_{c,\text{CAD}})} + \frac{[P_2 \times \text{FCF}_2]}{(1 + k_{c,\text{CAD}})^2} + \dots + \frac{[P_n \times \text{FCF}_n]}{(1 + k_{c,\text{CAD}})^n}$$

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.

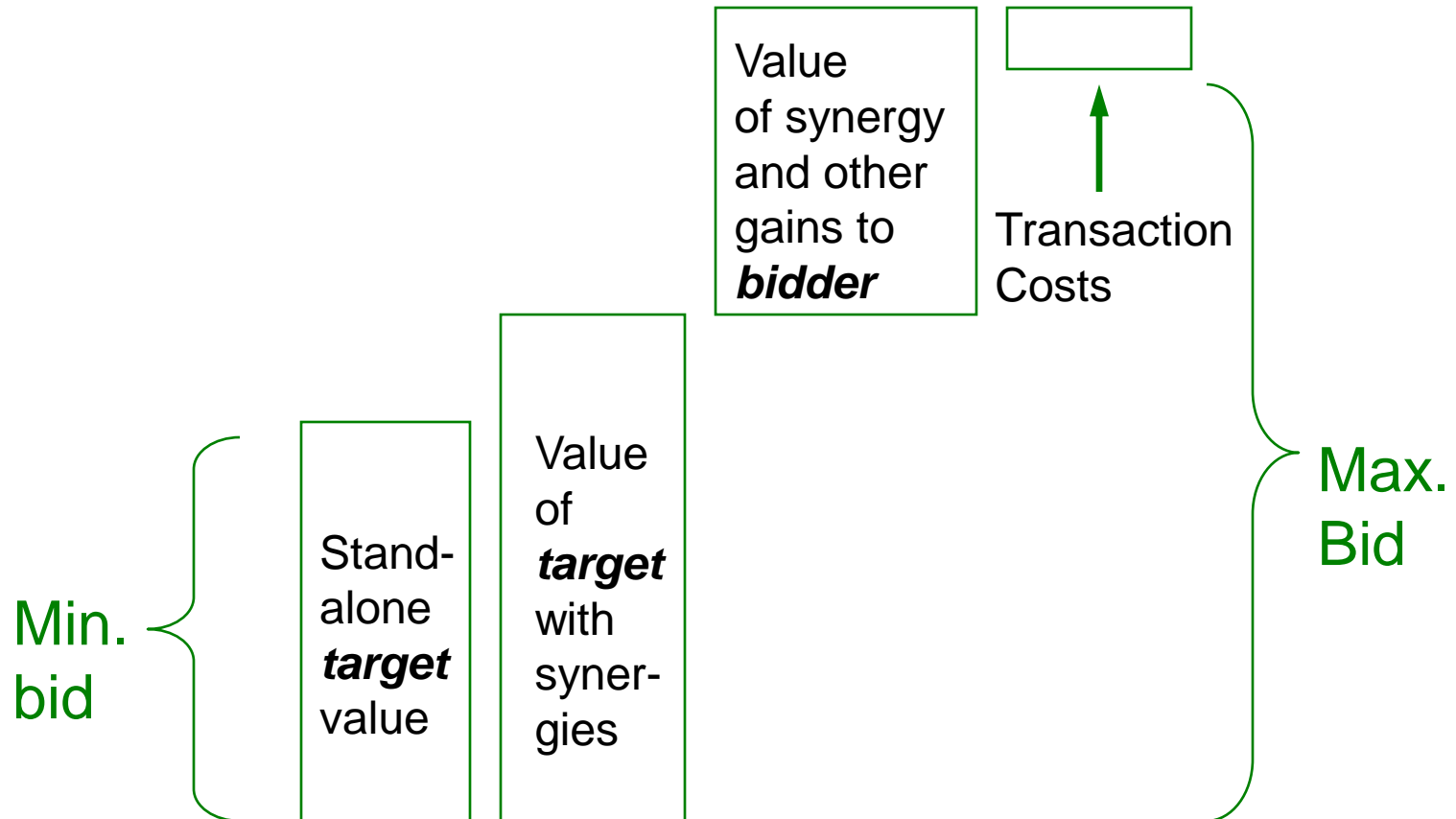
Relative Valuation Approaches

- 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



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.

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

Source: “Best Practices in Estimating the Cost of Capital: Survey and Synthesis”, R. Bruner, K. Eades, R. Harris and R. Higgins, *Financial Practice and Education*, Spring/Summer 1998, pp 13-28.

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 struc
use project specific beta
incorporate systematic risks

3) Calculate PV in foreign currency

IV) Calculate PV in domestic currency

4) Convert to domestic currency at spot rate