

Some common mistakes to avoid in estimating and applying discount rates

One of the most critical issues for an investor to consider in a strategic acquisition is to estimate how much the company being acquired is worth. On the back of the 2008 financial crisis, a valuation is being looked at not just as a static value at a point in time, but more as a basis for developing a post-acquisition operation plan to drive value accretion and minimizing risk. As such, the Discounted Cash Flow (DCF) analysis is being more frequently used to value companies.

The discount rate is an essential component of the DCF-based valuation, which can be tricky to get right. In this article, we explore the reasons why estimated discount rates may differ between practitioners.

We also provide an overview of some of the common mistakes to avoid in estimating and applying discount rates.

1. There are varying approaches to determining a discount rate

The discount rate is an investor's desired rate of return, generally considered to be the investor's opportunity cost of capital. The Weighted Average Cost of Capital

(WACC) represents the average cost of financing a company debt and equity, weighted to its respective use.

Essentially, the K_e consists of a risk free rate of return and a premium assumed for owning a business and can be determined based on a Build-up approach or Capital Assets Pricing Model (CAPM). While both these approaches should theoretically result in the same discount rate, in practice the estimated discount rates will differ between companies, markets and geographical areas due to judgments by different valuers around some of the key components of the discount rate.

$$K_e = R_f + (RP_m + RP_i) + RP_s + CRP + RP_z$$

(based on the Build-up approach)

$$K_e = R_f + (\beta \times RP_m) + RP_s + CRP + RP_z$$

(based on the CAPM approach)

R_f = risk-free rate, RP_m = market premium, RP_i = industry premium, RP_s = size premium, CRP = country risk premium, RP_z = company specific risk and β = beta

$$WACC = K_e \times W_e + K_d \times W_d$$

K_e = cost of equity, K_d = after tax cost of debt,
 W_e and W_d = proportion of equity/debt based on market value

Illustrative Example (WACC calculation)

Let us walk through an example. Assume that an investor intends to value a private U.S.-headquartered company ABC & Co that operates schools in the United Arab Emirates and the United States. The common approach to calculate a WACC would be as follows:

WACC using CAPM

	U.S.	UAE
U.S. nominal 10-year treasury bond	1.8%	1.8%
Inflation differential		1.4%
Risk-free rate	1.8%	3.2%
Unlevered beta	0.50	0.50
D/E	5%	5%
Tax rate (assumed nil for U.S. as well)	0%	0%
Levered beta	0.53	0.53
Market risk premium–U.S.	6.0%	6.0%
Country risk premium–UAE		0.8%
Size & specific risks	2.0%	2.0%
Cost of equity (rounded)	7.0%	9.0%
After tax cost of debt (Kd)	5.0%	5.0%
WACC rounded	7.0%	9.0%

WACC using Build-up

	U.S.	UAE
U.S. nominal 10-year treasury bond	1.8%	1.8%
Inflation differential		1.4%
Risk-free rate	1.8%	3.2%
Market risk premium–U.S.	6.0%	6.0%
Country risk premium–UAE		0.8%
Industry risk premium	-2.6%	-2.6%
D/E	5%	5%
Size & specific risks	2.0%	2.0%
Cost of equity	7.2%	9.4%
After tax cost of debt (Kd)	5.0%	5.0%
WACC rounded	7.0%	9.0%

Notes:

1. Inflation differential based on the Economist Intelligence Unit long-term forecast
2. Beta and debt/equity based on Morningstar industry beta for educational services sector
3. Market risk premium based on historical implied risk premium on U.S. equity market
4. Country risk premium sourced from Prof. Damodaran's research based on sovereign credit rating by Moody's
5. Industry risk premium sourced from SBBI Valuation Essentials handbook
6. Size and specific risk as per judgment based on market dynamics, school operations, competitive advantage, etc. As this is subjective, it would be appropriate to apply a range of values, thus arriving at a range of WACC estimates.

2. Estimating the Ke is subjective

While the Kd (after tax cost of debt) is relatively easy to determine, in estimating the Ke there are differing perspectives amongst valuers on certain of its key components. Summarized below are some of these areas of judgment that may result in different discount rates:

- **Risk-free rate (Rf):** Government bonds are generally used as reference for deriving the Rf. However, we often notice valuation practitioners using the bonds with varying durations (e.g., 10, 20, 30 years) as a proxy for Rf, resulting in a difference in the discount rate. The selected Rf should match the duration of the underlying cash flows.

In practice the estimated discount rates will differ between companies, markets and geographical areas due to judgments by different valuers around some of the key components of the discount rate

- **Beta (β):** The β represents the correlation of industry or business sector with the economy. A challenge in the Middle Eastern region is the lack of liquidity in the local markets and inadequate data for the correlation analysis. This has resulted in practitioners relying on β determined from different sources (such as Prof. Ashwath Damodaran's publications) and personal experience and judgment.
- **Country risk premium (CRP):** When estimating the K_e based on data from a developed market, an adjustment needs to be considered for the country risk. While there is some convergence amongst valuers on how to determine the CRP, there is a difference of opinion on if and how to adjust the total CRP to reflect a company's exposure to country risk.

The discount rate is applied to determine the present value of future cash flows and represents the investor's appetite for risk and the underlying uncertainties in the cash flows. The higher the implied risk the higher the discount rate is and the lower the value, and vice versa.

Example (estimating K_e)

Risk-free rate

The nature of ABC & Co is such that operations are expected to be for an indefinite period. As such, longer maturity as proxy for R_f is more appropriate (e.g., a 30-year maturity treasury bond with a yield of 3% will result in a higher WACC).

Beta

The number of companies listed on the UAE stock exchanges, and data thereof, are limited. While the beta of public comparable companies within the same country/region should be used, we have used an industry beta based on developed markets. In the educational sector, the beta of developed and emerging markets is the same.

Country risk premium

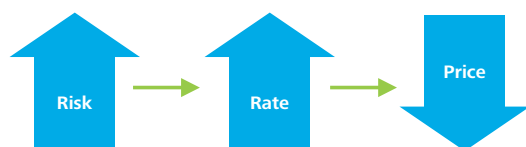
Let us now assume that the operations in the United Arab Emirates include revenue derived from international activities in the United States. As such, the UAE business is not 100 percent exposed to local country risk. One approach may be to adjust the total CRP based on the CRP portion of the total earnings that are exposed to local country risk (say 80 percent adjustment for ABC & Co).

3. The overall discount rate is dependent on the risk in the cash flows

The discount rate is applied to determine the present value of future cash flows and represents the investor's appetite for risk and the underlying uncertainties in the cash flows. The higher the implied risk the higher the discount rate is and the lower the value, and vice versa.

Two separate streams of cash flows will not have the same risk and return profile. While a generic discount rate based on market observations, say an industry WACC, may be used as a rough guide, it does not necessarily represent the appropriate discount rate for all companies in that industry.

Rate of return lever



4. Common mistakes to avoid

Having highlighted the issues, we draw on our experience and highlight below some of the common things to bear in mind when estimating the appropriate discount rate and performing a meaningful DCF analysis:

a. Match the discount rate to the risk

Each stream of cash flow has a specific risk structure. For instance, if the cash flows are distributable to equity holders only, cost of equity should be considered (not WACC).

Two separate streams of cash flows will not have the same risk and return profile. While a generic discount rate based on market observations, say an industry WACC, may be used as a rough guide, it does not necessarily represent the appropriate discount rate for all companies in that industry.

b. Match the real and nominal cash flow and discount rate

Use a nominal discount rate for nominal cash flows that integrate expected inflation or use a real rate for real cash flows (common in mining companies).

c. The R_f should be consistent with the time period

The selected R_f (risk-free rate) should match the duration of the underlying cash flows e.g. using the long-term rate for a going concern valuation into perpetuity, or say a 10-year rate as proxy for a mine that runs out of mineable ore in 10 years.

d. **Use alternate ways to determine the β**

The β is commonly sourced from industry resources including industry β or comparable company observations. However, in the absence of sufficient trading volumes and of market liquidity required to estimate the β (as is characteristic of Middle Eastern markets), using the Build-up approach to estimate the K_e is preferable, given that it limits the judgment in the WACC arising from estimating a β .

e. **Adjust the CRP for the company's exposure to country risk**

The CRP should reflect the risk of the company based on its operations in that country, not be a factor of where the company is incorporated/listed. As such, the CRP needs to be adjusted based on the relative exposure of the company to the subject country to take into consideration the risk that can be diversified by virtue of the company's earnings that have an exposure to the risk in the local country.

f. **Assess overall reasonability of the discount rate**

Where possible, the discount rate should be cross-checked using an alternate approach. Apart from calculations based on two separate approaches (CAPM/Build-up), observation of average industry discount rates and comparing the implied capitalization rate to multiples of broadly comparable companies will provide a good indicator of the reasonableness of the discount rate.

Example (adjusted WACC):

We present an adjusted calculation of the WACC for ABC & Co based on the CAPM approach to be 9% to 11% for the U.S. and U.A.E. respectively, after making changes to the following variables:

- R_f —Using a 30-year yield
- CRP—Adjusted downward by 80%
- RP_z —3% and 4% for inherent risk in aggressive cash flows

	U.S.	UAE
Old	7%	9%
Adjusted	9%	11%
<i>Implied Capitalization</i>	<i>11x</i>	<i>9x</i>

Example (recalculated WACC):

	U.S.	UAE
U.S. nominal 30-year R_f	3.0%	3.0%
Inflation differential		1.4%
R_f	3.0%	4.4%
Levered β	0.53	0.53
RP_m —U.S.	6.0%	6.0%
CRP—UAE		0.2%
K_d	6.0%	6.2%
Size & specific risks	3.0%	4.0%
K_e (rounded)	9.0%	12.0%
K_d (assumed)	5.0%	5.0%
Debt	5%	5%
Equity	95%	95%
WACC	9.0%	11.0%

5. Concluding remarks

No single discount rate will work in all circumstances, nor is there a compelling argument for why one approach may be better than another, as illustrated in the example above. Considering this and the subjectivity in estimating certain variables, practitioners will continue to have different views on a discount rate, resulting in potentially significant variances in the values. It is therefore important to know the key areas of judgment, use the appropriate approach based on the information available and investment objectives, and cross-check the reasonability of the discount rate using alternative approaches such as average industry discount rates and the implied multiples.

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