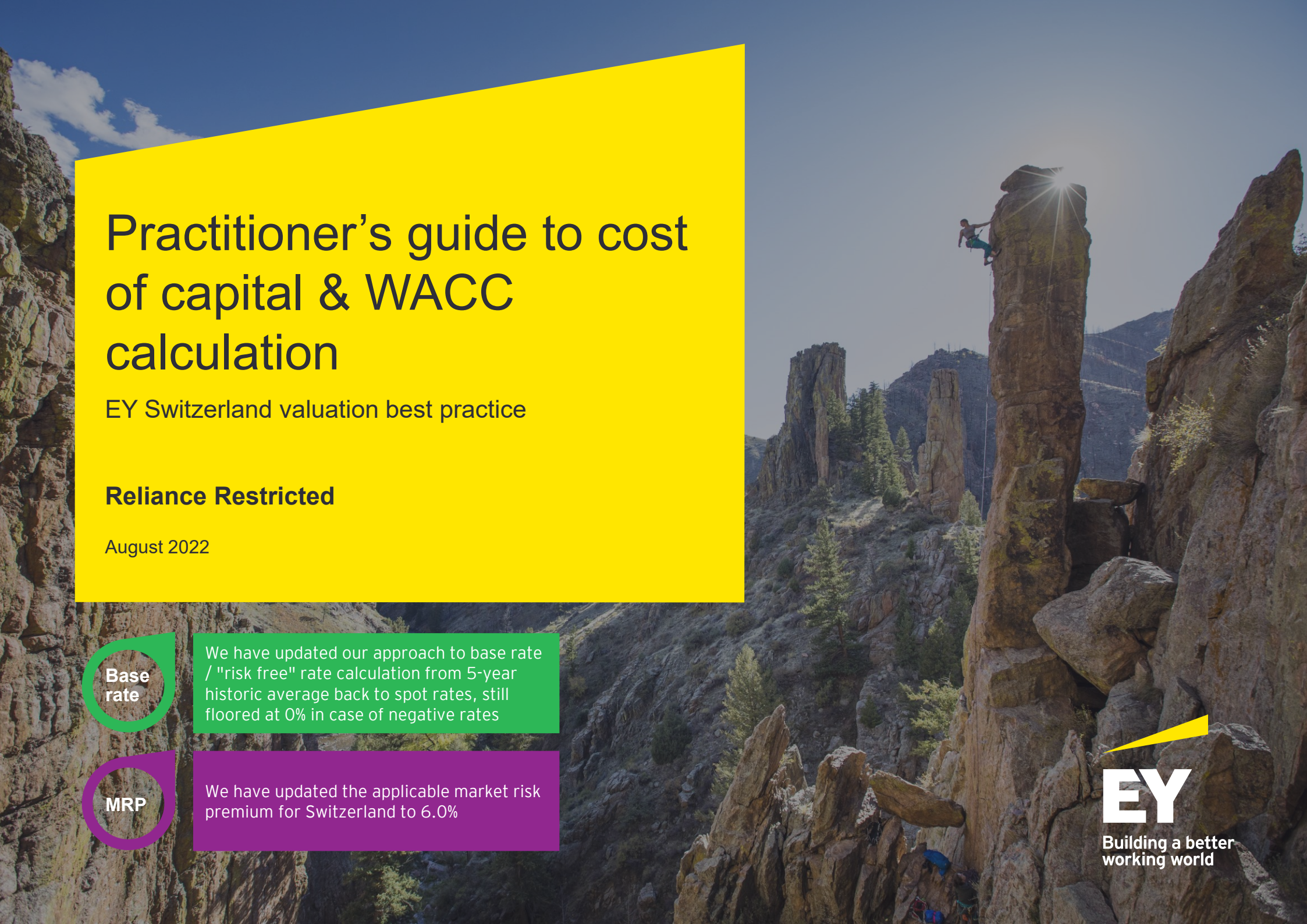
Practitioner's guide to cost of capital & WACC calculation

EY Switzerland valuation best practice

Reliance Restricted

August 2022



Building a better working world

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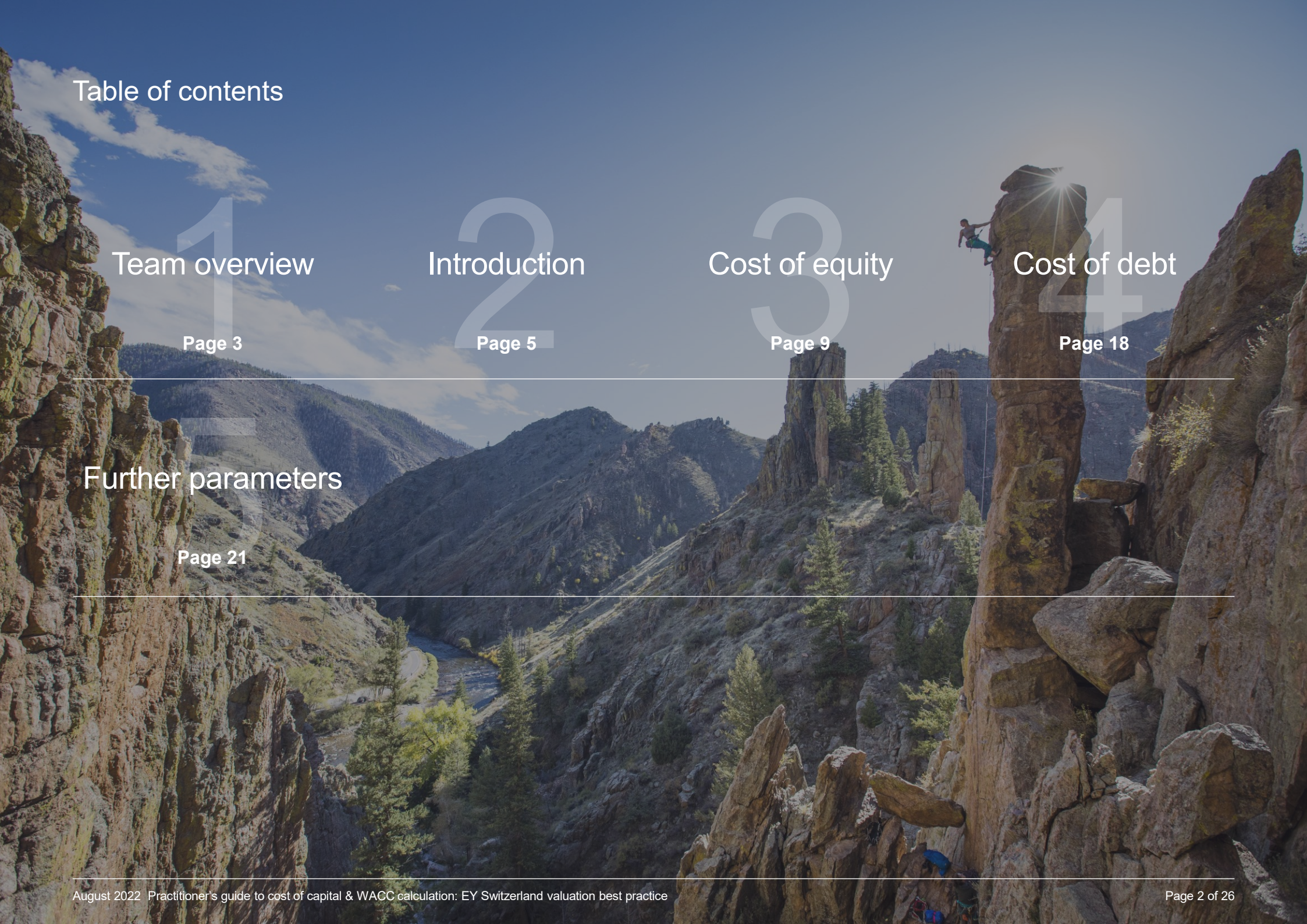

1 Team overview

EY Switzerland – Valuation, Modeling & Economics (VME)

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VME solutions portfolio

Valuation Services

- Tax-related valuations (business and intangible assets)
- Transactional business valuations
- Expert / fairness opinions
- "Regulatory" valuations, e.g. valuations relating to contributions-in-kind
- Start-up / venture valuations
- Purchase Price Allocations IFRS 3 / ASC 805
- Impairment Testing IAS 36 / ASC 350
- Share based payment valuations IFRS 2 / ASC 718
- Disputes and arbitration services

Decision modeling

- Integrated financial (3-statement) models
- Forecasting & planning
- Strategic option modeling
- Financing and LBO modeling
- Net working capital models
- Liquidity and cash flow modeling
- Carve-out models (auditable)
- Financial model review

Data analytics and visualizations

- Descriptive / Diagnostic / Predictive / Prescriptive
- Deals analytics
- Commercial analytics
- Distribution network optimization

2 Introduction

Cost of capital is a key decision criterion in transactions, (regulatory) valuations and value-based management

Application in valuation

- Cost of capital has several applications
- Cost of capital is a key value driver in all valuations
- Cost of capital as a general term refers to the risk-adjusted cost rate that investors ask as return for their investment
- In entity based valuations (covering debt and equity, i.e. total invested capital / enterprise value), the most commonly used application is the weighted average cost of capital (WACC)
- The WACC is derived via the financing side using observable market data for cost of debt, cost of equity and capital structure

Areas of application

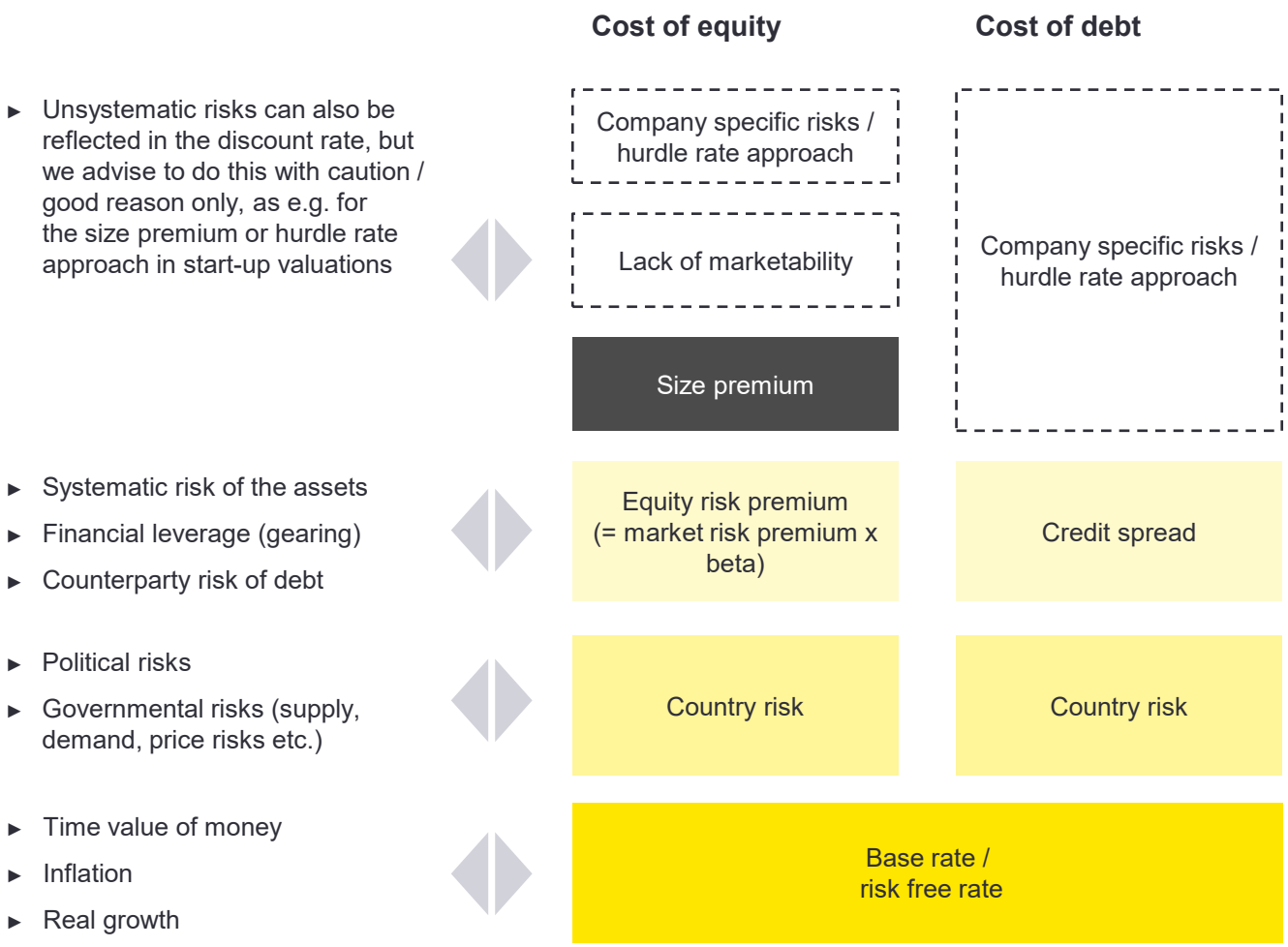
Theory – cost of capital need to account for risks not covered in the cash flow forecast and avoid double counts

Cost of capital and risk

- Risk can either be accounted for in the cash flows or in the discount rate
- Consistency is key: only consider risks in cost of capital that are not reflected in cash flows and the other way around

Consistency is key! Avoid double counting!

Items (typically) covered in cost of capital



WACC approach – built on international best practice

Basic formula

- The weighted average cost of capital (WACC) is determined by the cost of equity and debt, weighted by the market value of their share in total capital:

$$\text{WACC} = c_e \times \frac{E}{D+E} + c_d \times (1-t) \times \frac{D}{D+E}$$

Where

- c_e = Cost of equity
- c_d = Cost of debt
- D = Market value of debt
- E = Market value of equity
- t = Corporate income tax rate (assuming notional taxes on EBIT in cash flow projection)

Up-date

Over the past years of low to negative interest rates, we deviated from our standard spot rate approach to risk free rate calculation and applied medium-term averaging, paired with a 0% floor where applicable and a 6.5% MRP

In this issue of our Practitioner's guide to cost of capital & WACC calculation, we re-calibrate our approach to risk free rate and MRP as a necessary evolution to reflect the recent changes in the market and central banks monetary policies

EY Switzerland best practice

- Our **base rate** is based on sales or EBIT(DA) weighted government bond rates in local currency, reflecting adequate country risk as well as nominal growth / inflation expectations in respective currencies
- We apply the capital asset pricing model (CAPM) incl. a size premium to determine the **cost of equity**
- We determine the **cost of debt** by adding a credit spread according to a corporate bond reference index with adequate geographic and industry focus and a respective rating to the base rate
- We determine the **target capital structure** based on the median capital structure of a meaningful peer group of ideally 5+ listed companies (incl. the target company, if listed), based on market values

Illustrative example for an earth moving equipment company (small-sized, CHF based)

WACC calculation	Previous approach	Updated approach		Comment (source)
Base rate / "risk free" rate	- %[1]	1.03%	a	Implied yield on 10y government bond of Switzerland in local currency (Capital IQ)
Market risk premium	6.50%[2]	6.00%	b	Global market risk premium (market studies)
Adjusted unlevered beta	0.717x	0.717x	c	Derived from peer group median value (Capital IQ). Adjustment according to Blume
Adjusted relevered beta	1.420x	1.420x	d	According to Practitioners' Method: Beta (relevered) = beta (unlevered) * (1 + D/E)
Size premium	3.50%	3.50%	e	Size premium (illustrative)
Cost of equity	**12.73%**	**13.05%**	**Ce**	**= a + b x d + e**
Base rate / "risk free" rate	- %[1]	1.03%	f	Implied yield on 10y government bond of Switzerland in local currency (Capital IQ)
Credit spread	0.80%	0.80%	g	Credit spread from comparable corporate yield curve - Z-spread (All Corporates, BBB, 10Y) (Capital IQ)
Cost of debt	**0.80%**	**1.83%**	**Cd**	**= f + g**
Equity ratio	50.54%	50.54%	h	Capital structure derived from peer group median value (Capital IQ)
Debt ratio	49.46%	49.46%	i	Capital structure derived from peer group median value (Capital IQ)
Corporate income tax rate	16.00%	16.00%	j	Corporate income tax rate of Switzerland (EY Worldwide Corporate Tax Guide)
WACC, rounded	**6.8%**	**7.4%**		**= Ce * h + Cd * (1 – j) * i**

Source: Capital IQ, EY analysis
Valuation date: 30 June 2022
Notes:
[1] 5-year historic average (Capital IQ), floored at 0%, consistently with our previous update of the *Practitioner's guide to cost of capital & WACC calculation* issued in 2020
[2] 6.50% Market risk premium based on market studies, consistently with our previous update of the *Practitioner's guide to cost of capital & WACC calculation* issued in 2020

3 Cost of equity

Overview

Basic formula

- Application of the capital asset pricing model (CAPM) to determine the cost of equity:

$$c_e = r_f + \beta \times MRP$$

Where

- c_e = Cost of equity
- r_f = Risk free rate
- β = Beta (correlation measure of equity with market returns)
- MRP = Market risk premium (expected market return less risk free rate)

EY Switzerland best practice

- We apply the capital asset pricing model (CAPM) to determine the cost of equity
- We extend the basic CAPM formula with the size premium, if appropriate

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Source: see comments
Valuation date: 30 June 2022

Risk free rate / base rate

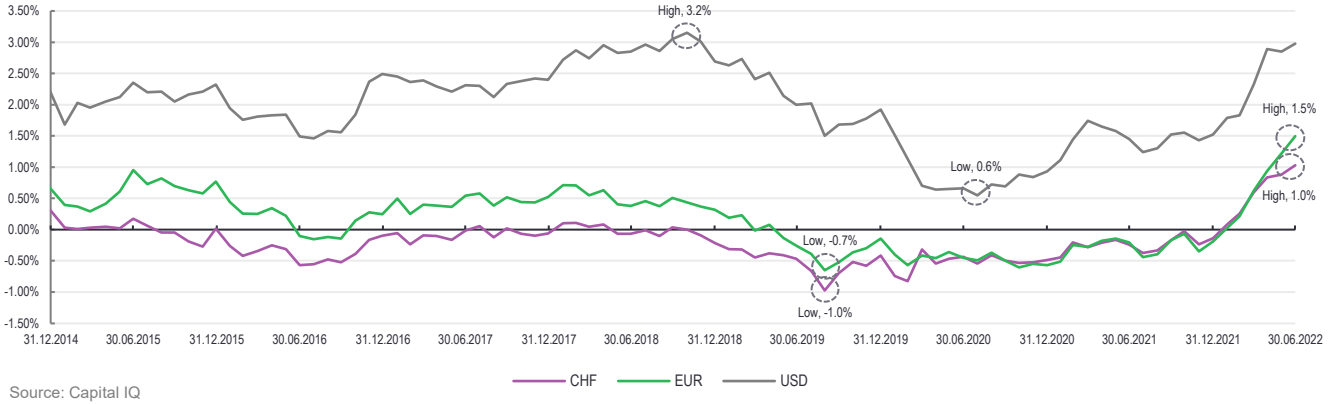
Key points to consider

- In theory, the risk free rate represents the return an investor expects from an “absolutely” risk free investment over a specified period of time (i.e. the time value of money)
- In reality, there is no such “absolutely” risk free asset and hence no “pure” risk free rate exists. Therefore, we often refer to the “base rate” as some other items are covered in the rate we use as the base rate, i.e. time value of money, inflation (consistent with cash flows), certain real growth (of economy) and country risk (as reflected in the counterparty risk of the government)

EY Switzerland best practice

- Spot rate of the 10-year generic government bond in local currency from Capital IQ / Bloomberg / Reuters / www.investing.com etc.
- Choice of the 10-year bond due to consistent availability for most countries / currencies and market liquidity, even though for USA and Switzerland also 20 or 30 year generic government bonds exist
- Use of 20 or 30 year government bonds also considered appropriate
- Use of the historical average of yields of respective government bond to smoothen historical volatility or extraordinary events, where applicable
- Judgement to be applied based on individual government rate development and central bank interventions
- *Alternative approach*: If no local government bond is available use CHF / USD / EUR bond + inflation differential for a given currency + country risk for a given country

Implied yield to maturity on a 10-year government bond in local currency



Source: Capital IQ
Valuation date: 30 June 2022

Assumption, that country risk is generally reflected in local government bond rate; however, in case of excessive counter party risk (e.g. for Argentina during debt crisis) the local government bond rate might overestimate the country risk of the cash flows and a separate assessment is necessary to obtain a long-term view

Challenge: How to deal with changes in the macroeconomic environment?

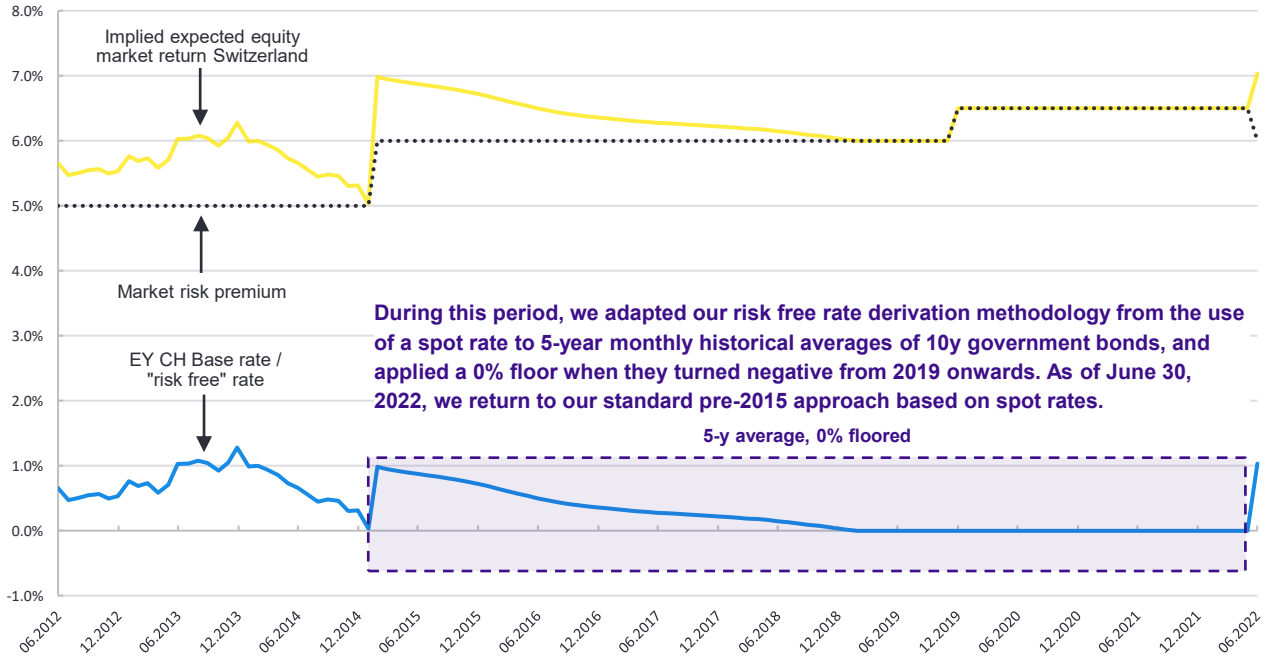
Key points to consider

- As typically only “one WACC” is applied in a valuation, the underlying assumptions need to represent a consistent, long-term steady view and equilibrium
- Base rate must also reflect long-term growth expectations e.g., as applied in terminal value calculations
- Base rate and market risk premium (MRP) must be applied consistently (see next page)

EY Switzerland best practice

- Due to persistently low interest rates in certain developed economies (e.g., Germany and Switzerland) in 2015 onwards, we adapted our standard spot rate approach to risk free rate calculation to the use of 5-year historical monthly averages of 10y government bonds. Further, in 2019 we started applying a 0% floor when these moving averages turned negative. Negative base rates were applied exclusively to companies or assets with a clear exposure to negative interest rates (e.g. infrastructure with a definite life)
- Recent shocks in the global markets have led central banks to shift from expansionary to disinflationary policies. To reflect these interest raises and our view of the long-term expected growth for the Swiss economy and our long-term macroeconomic outlook, we re-calibrate our approach to the use of a spot rate of the 10y government bond as of the valuation date

Base rate, MRP, EY concluded expected rate of return for Switzerland



Source: Capital IQ

Market risk premium (MRP)

Basic formula

- The MRP is the extra return that is required by investors for shifting their money from a risk free investment to a diversified equity portfolio
- The unsystematic risk of a single investment is eliminated
- The MRP can be derived via historical or prospective models
- Implied (forward-looking) MRPs are based on dividend discount models, calculating the expected market return by comparing the index value with the estimated dividend streams (analyst estimates)
- Implied MRPs are available e.g. on Bloomberg

$$MRP = (\text{expected market return} - r_f)$$

Where

- MRP = Market risk premium
- r_f = Risk free rate

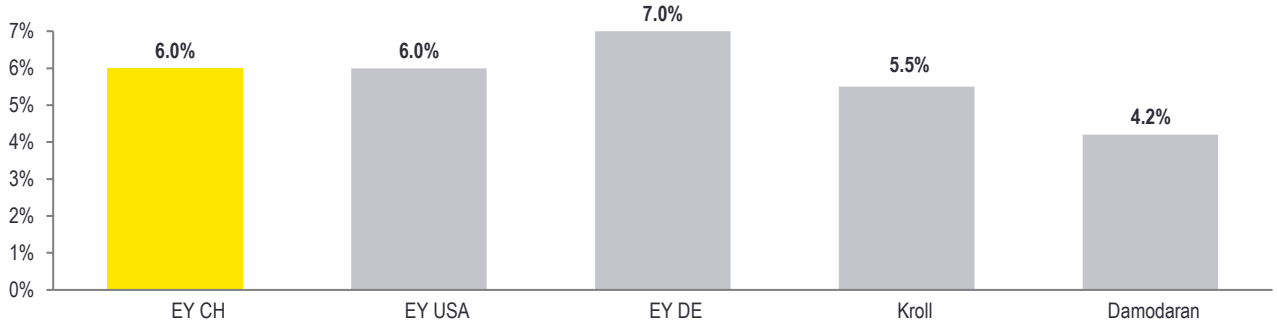
MRP

We have updated the applicable market risk premium for Switzerland to 6.0%

EY Switzerland best practice

- EY Switzerland assumes a “historical“ MRP of 6.0% along with the use of a spot rate for the respective risk free rate
- EY Switzerland has decreased the applicable MRP from 6.5% to 6.0% in June 2022. This reflects a compromise between a relatively stable MRP implied by observed investor expectations as well as the currently rising interest rate levels, leading to an expected market return in Switzerland between 6.5-7.5% based on current gov bond levels
- The MRP is based on own research on the Swiss stock market but also considers international developments and consensus estimates

Market risk premiums in selected countries



Source: EY, IDW, Kroll, and Damodaran online database

Notes to the graph

- IDW, the standard setter in Germany, suggests a range between 6.0 and 8.0%, with a recommendation of 7.0% by EY Germany
- EY USA suggests a range of 5.5-6.5% with a mid-point of 6.0%
- Kroll recommends the use of 5.5% in conjunction with a normalized base rate of 3.0% in USD, or spot 20-Year treasury yield when higher, and 5.5-6.0% with a normalized base rate of 2.0% for the Eurozone

Beta calculations

Basic formula

- The beta is a correlation measure of equity returns with market returns. The beta represents the systematic risk of a security or a portfolio in comparison to the market as a whole
- Historical beta is usually determined applying OLS regression

$$\beta = \frac{Cov(R_Z, R_M)}{Var(R_M)}$$

Where

- R_z = Ln-returns of equity of valuation target
- R_M = Ln-returns of the market

Historical beta versus future beta

- The CAPM theory is based on market participants' expectations of the future
- Therefore, in theory, future betas should be used

Company beta versus peer group beta

- If a valuation target is quoted on a stock exchange, one could take the company's beta instead of a peer group

Appropriate reference index

- CAPM is based on an "all-comprising" market index, but such an index does not exist in practice
- National versus supranational index (e.g. MSCI World)
- Performance versus price index
- Currency of the index versus currency of the stock

EY Switzerland best practice

- Since no standardized and widely accepted sources exist for future betas, we rely on historical betas
- N.B. Barra Beta as one source for future betas

EY Switzerland best practice

- For fair market valuations, we usually rely on an unlevered peer group beta as this is considered current best practice in IFRS / US GAAP valuations
- Sometimes we rely on the company beta, if observable, liquid and statistically significant

EY Switzerland best practice

- Use the broadest local index of a stock exchange where a company is listed (to avoid currency conversion)
- Use MSCI World (attention: adjust for FX effects) as a comparison
- Use price return indices instead of performance indices to avoid dividend correction

Beta calculations

Appropriate time horizon

- Depending on the time horizon and periodicity of beta estimation, the beta might vary significantly
- 5 years monthly / 2 years weekly / daily price observations

EY Switzerland best practice

- We apply 5 years monthly data (i.e. 60 observations)
- Monthly to exclude positive and negative market exaggerations

Raw beta versus adjusted beta

- The raw beta is the beta based on an OLS regression
- The adjusted beta is an average (2/3 raw beta + 1/3 times the market beta of 1) accounting for mean reversion. This is known as Blume adjustment

EY Switzerland best practice

- We apply the adjusted beta, since mean reversion seems to be an observable phenomenon

Un- and relevering formulas

- Based on the implied assumption on the sustainability of cash flows and tax shields as well as a relatively or absolutely constant capital structure, there are different options of un- and relevering

EY Switzerland best practice

- Due to practicality, we usually apply the Practitioner's method, assuming a relatively constant capital structure and a debt beta of 0
- Unlevered beta = beta levered / (1 + D / E)

Beta calculations

1 Identification / selection of comparable companies (long list, short list)

- Industry / sector
- Size
- Profitability / growth
- Markets / segments
- Risk profiles

2 Collection / analysis of financial information of peers, which serve as a basis for the determination of the capital structure

3 Determination of the raw beta by the use of regression techniques

Based on empirical analysis, betas tend to 1 over time, therefore the betas are often adjusted according to Blume (see formula)

$$Adjusted\ beta = \frac{2}{3} * unadjusted\ beta\ (raw) + \frac{1}{3} * 1$$

4 Due to a lack of comparability of the equity betas because of the different capital structures of the peers, the respective equity betas are transformed by unlevering, i.e. neutralizing the individual capital structure, in order to obtain the unlevered beta (asset beta, i.e. beta if the assets are fully equity financed)

1							2		3	4			
Companies	**Ticker**	**Country**	**Currency**	**Filing date**	**Market cap**	**Minority interests**	**Total debt**	**Debt / total capital**	**Adjusted beta**	**Unlevered beta**	**Unadjusted beta (raw)**	**Number of points**	**Ref. Index**
BAUER Aktiengesellschaft	XTRA:B5A	Germany	EUR	06/2022	235	3	587	71.12%	1.017	0.294	1.025	60	Cdax Index
Caterpillar Inc.	NYSE:CAT	United States	USD	06/2022	95.346	32	36.962	27.93%	0.995	0.717	0.993	60	S&P 500 Index
CNH Industrial N.V.	NYSE:CNHI	UK	USD	06/2022	15.686	55	21.183	57.37%	1.519	0.647	1.778	60	S&P 500 Index
Kato Works Co., Ltd.	TSE:6390	Japan	JPY	06/2022	9.386	1.175	37.534	78.04%	0.962	0.211	0.942	60	Nikkei 225 Index
Komatsu Ltd.	TSE:6301	Japan	JPY	06/2022	2.843.500	128.071	1.226.683	29.22%	1.257	0.890	1.385	60	Nikkei 225 Index
Tadano Ltd.	TSE:6395	Japan	JPY	06/2022	113.209	-	110.806	49.46%	1.191	0.602	1.286	60	Nikkei 225 Index
Terex Corporation	NYSE:TEX	United States	USD	06/2022	1.897	-	828	30.39%	1.388	0.966	1.582	60	S&P 500 Index
The Manitowoc Company, Inc.	NYSE:MTW	United States	USD	06/2022	372	-	419	52.96%	1.736	0.817	2.104	60	S&P 500 Index
Wacker Neuson SE	XTRA:WAC	Germany	EUR	03/2022	1.122	-	358	24.17%	1.242	0.942	1.363	60	Cdax Index
Low								24.17%	0.962	0.211			
High								78.04%	1.736	0.966			
Average								46.74%	1.256	0.676			
Median								**49.46%**	**1.242**	**0.717**			

Source: Capital IQ
Valuation date: 30 June 2022

Size premium

Extended formula

- Empirically, on average, smaller companies achieve higher risk-adjusted returns. In the long run, higher returns are related with higher risk
- The additional return of smaller companies is not fully reflected in the CAPM (i.e. beta is underestimated)
- To reflect the additional risk of smaller companies more adequately, the cost of equity derived from the CAPM is adjusted with a size premium

$$c_e = r_f + \beta \times MRP + SP$$

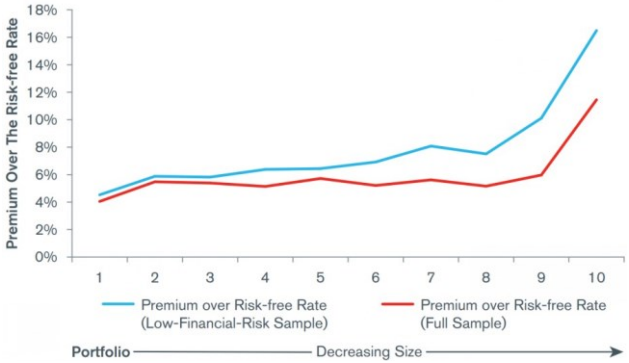
Where

- c_e = Cost of equity
- r_f = Risk free rate
- β = Beta (correlation measure of equity with market returns)
- MRP = Expected market return less risk free rate)
- SP = Size premium

EY Switzerland best practice

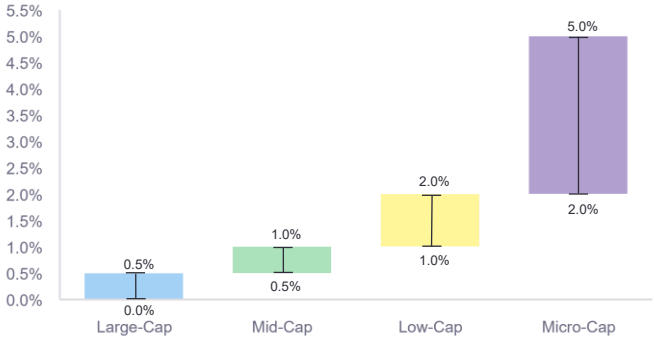
- EY Switzerland applies the size premium derived from a study published by Kroll. The smaller a company's market capitalization, the higher the size premium
- According to standard Anglo-Saxon valuation literature, systematic risk is considered in the cost of capital (i.e. the WACC), whereas unsystematic is accounted for in the cash flows or with discounts on the asset / company value. We recommend including only the size premium in the WACC. Other unsystematic risks should be accounted for in the cash flows (e.g., with scenario analysis) or with general discounts on the asset / company value (with the exception of start-up / venture valuation, where we suggest to apply hurdle rates, next to the probability of success approach)

Size premium over the risk free rate by size portfolio



Source: Kroll – 2014 European size study

Small size premium by company size category



Source: EY analysis

- Examples of size "risks":
  - Less flexible access to capital market + financing
  - Lower liquidity
  - Lower transparency e.g., in reporting
  - Lower stability in times of crisis
  - Higher dependency on key management or key customers
  - It is important to avoid double-counting of risks e.g., extra liquidity premiums in WACC etc.

Note

"US bias": please note that the size premia are based on studies on the US capital markets. Hence, application shall be scrutinized for other jurisdictions

4 Cost of debt

Overview

Basic formula

- Cost of debt is determined by a company's:
- debt capacity (FCF, leverage, interest rate coverage, debt / EBITDA multiple etc.)
- the overall market condition; and
- the company's access to financing

$$c_d = rf + \text{credit spread}$$

Where

- c_d = Cost of debt
- r_f = Risk free rate

EY Switzerland best practice

- Cost of debt as an input to the WACC is typically calculated on an after tax basis to reflect the tax deductibility of debt (tax shield on interest) if taxes in the cash flow calculation are based on EBIT times tax rate (i.e. notional taxes)

Illustrative example for an earth moving equipment company (small-sized, CHF based)

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Source: see comments
Valuation date: 30 June 2022

Credit spread

Key points to consider

- Companies have to compensate their creditors for the risk of a potential default. The credit spread represents the expected compensation of creditors of investments of a specific risk category compared to a risk free investment
- The credit spread should reflect the assumed target leverage and debt capacity
- The derivation of the credit spread should be consistent with the applied base rate

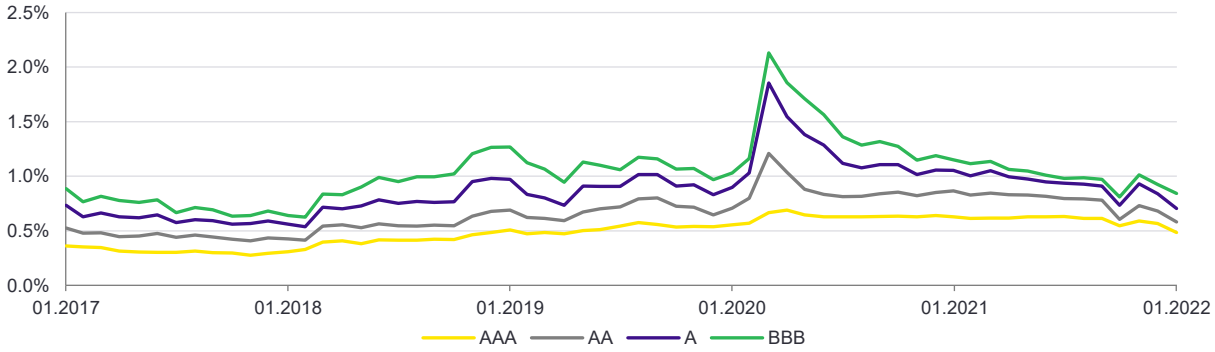
Note

When we issued our previous update of the Practitioner's guide to cost of capital & WACC calculation in 2020, we were applying Barclays Aggregate Indexes retrieved on Capital IQ to estimate the credit spread. Since then, Capital IQ has ceased publishing Barclays aggregates, and we changed our source to the corporate yield curve Z-spread provided by Capital IQ

EY Switzerland best practice

- Application of credit spread according to a corporate bond reference index with adequate geographic focus and a respective rating

Credit spread – Corporate Yield Curve Z-spread (EUR, AllCorp, 10Y, Annual compounding)



Source: Capital IQ

- Alternative sources based on the average rating of the peer group (and its capital structure) are credit spread tables from Reuters

Credit rating of peer group companies

Companies	Ticker	Effective date	Last Review Date	Rating	Outlook
BAUER Aktiengesellschaft	XTRA:B5A	06/2022	n.a.	n.a.	n.a.
Caterpillar Inc.	NYSE:CAT	06/2022	10/2021	A	Stable
CNH Industrial N.V.	NYSE:CNHI	06/2022	07/2022	BBB	Stable
Kato Works Co., Ltd.	TSE:6390	06/2022	n.a.	n.a.	n.a.
Komatsu Ltd.	TSE:6301	06/2022	09/2021	A	Stable
Tadano Ltd.	TSE:6395	06/2022	n.a.	n.a.	n.a.
Terex Corporation	NYSE:TEX	06/2022	06/2022	BB-	Stable
The Manitowoc Company, Inc.	NYSE:MTW	06/2022	06/2022	B	Stable
Wacker Neuson SE	XTRA:WAC	06/2022	n.a.	n.a.	n.a.

Source: Capital IQ
Valuation date: 30 June 2022

5 Further parameters

Determination of debt and equity

Debt or equity?

- Determination of capital structure requires further clarification
- Certain balance sheet items may not obviously be classified as debt or equity
  - Minority interests
  - Preferred equity
  - (Over)/underfunded pensions

EY Switzerland best practice

- Minority interests and preferred equity are classified as equity (1)
- (Over)/underfunded pensions are only considered if they reflect a "true" financial liability (which is e.g. not the case for Swiss IAS19 liabilities) or consistently reported by peer group companies (2)
- Balance sheet items which are classified as debt and interest bearing (to be separately analyzed under IFRS, US GAAP, Swiss GAAP FER etc.) are considered in the debt portion (3)
- Cash and cash equivalents are not considered, i.e. total debt = gross debt (as opposed to net debt), assuming that the cash a company holds is "on average" required to run the operations (4)

		(1)		(2)	(3)						(4)	
Companies	**Currency**	**Minority interests**	**Preferred equity**	**(Over) / Underfunded pensions**	**Short-term liabilities**	**Long-term liabilities**	**Current Portion of Long-Term Debt**	**Current Portion of Leases**	**Leases**	**Finance Div. Debt Current**	**Finance Div. Debt Non-Current**	**Cash and equivalents**	**Total debt**
BAUER Aktiengesellschaft	EUR	3	-	n/c	-	240	281	25	42	-	-	n/c	587
Caterpillar Inc.	USD	32	-	n/c	-	9,589	124	-	-	10,619	16,630	n/c	36,962
CNH Industrial N.V.	USD	55	-	n/c	-	4,828	139	-	227	-	15,989	n/c	21,183
Kato Works Co., Ltd.	JPY	1,175	-	n/c	13,352	19,442	4,740	-	-	-	-	n/c	37,534
Komatsu Ltd.	JPY	128,071	-	n/c	688,605	475,266	-	17,551	45,261	-	-	n/c	1,226,683
Tadano Ltd.	JPY	-	-	n/c	-	110,806	-	-	-	-	-	n/c	110,806
Terex Corporation	USD	-	-	n/c	-	826	2	-	-	-	-	n/c	828
The Manitowoc Company, Inc.	USD	-	-	n/c	-	380	14	-	26	-	-	n/c	419
Wacker Neuson SE	EUR	-	-	n/c	-	212	79	21	45	-	-	n/c	358

Source: Capital IQ
Valuation date: 30 June 2022

Impacts of IFRS 16 | Consideration of lease liability as debt

Key points to consider

- Adoption of IFRS 16 lease accounting does not change underlying cash flows to equity of the firm, i.e., in theory, market value of equity is assumed to be constant, all else equal
- Capital structure implicit in WACC shall be consistent to the reflection of lease cash flows and liabilities in company valuations
- All else equal, lease liability increases debt ratio applied for WACC derivation

$$Debt\ ratio = \frac{D}{\mathrm{D} + \mathrm{E}} < \frac{\mathrm{D} + Leasing}{\mathrm{D} + Leasing + \mathrm{E}}$$

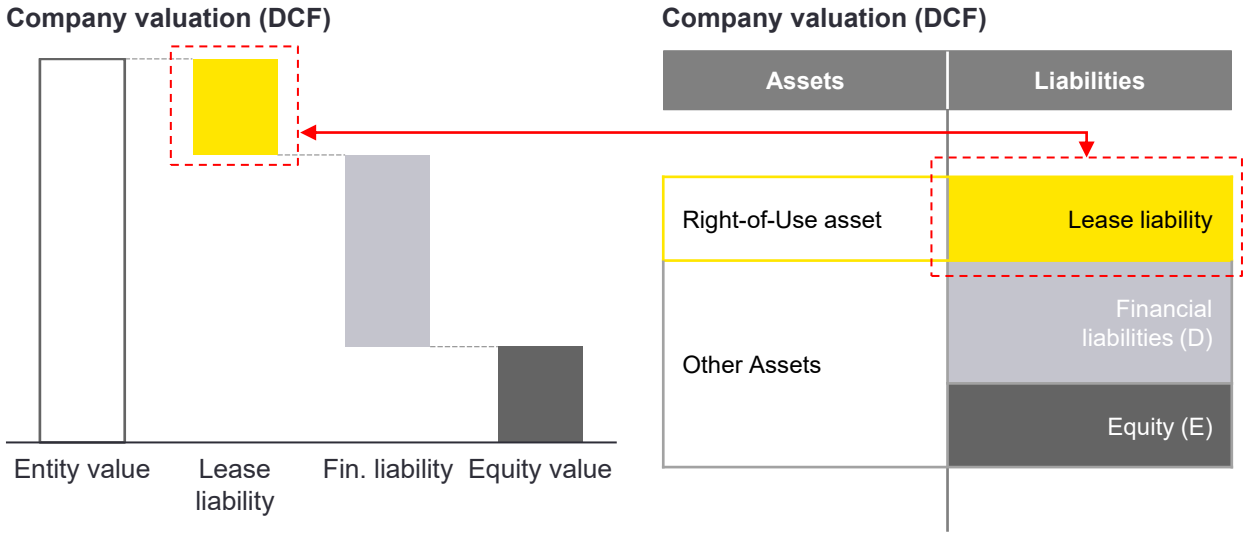
- Lease liability is valued with asset-specific discount rate (e.g., incremental borrowing rate, IBR)

IFRS 16

Consistency between cash flow derivation (CAPEX, EBITDA etc.), EV-equity bridge (debt definition) as well as the capital structure (debt definition) and cost of debt (IBR etc.) in the WACC calculation **is key**!

EY Switzerland best practice*

- Scenario 1 “pure IFRS 16 environment”: Lease liability is considered as financial debt
  - DCF cash flows to the firm include IFRS 16 effects (i.e., no contractually committed lease cash out-flows; long-term CAPEX need to be adjusted for leases fading out over time)
  - Lease liability is deducted from DCF entity value to derive DCF equity value of the firm
  - WACC is derived including lease liability as debt in capital structure and is lower, all else equal, than in scenario 2
- Scenario 2 “non-IFRS 16 environment”: Lease liability is not considered as financial debt
  - DCF cash flows to the firm include lease cash out-flows and CAPEX reflect “true” CAPEX only
  - Lease liability is not deducted from DCF entity value to derive DCF equity value of the firm
  - WACC is derived excluding lease liability as debt in capital structure
- In both scenarios, the capital structure of peers shall be scrutinized accordingly for consistency and for different accounting standards such as Swiss GAAP FER, IFRS or US GAAP



Currencies

Key points to consider

- The currency of the base rate should be consistent with the currency in which the free cash flows are denominated
- The base rate should be determined by where a company generates its free cash flows and not (per se) where it is legally domiciled
- The company value should remain constant when considering different currencies (to avoid company under- or overvaluation)
- Interest rate parity theory (covered): Interest rate differential between two countries is equal to the differential between the forward exchange rate and the spot exchange rate
- Forward rates are not available for all currencies
- Long-term forward rates are generally difficult to come by

EY Switzerland best practice

Swiss company (Reporting currency: CHF)

- **Case 1 | Free cash flows: 100% CHF**
  - Cash flows are subject to 100% CHF related risks
  - Swiss government bond as base rate
- **Case 2 | Free cash flows: 50% CHF and 50% USD. Local USD business plan converted into CHF using forward rates**
  - Due to the conversion with forward rates, free cash flows are subject to CHF related risks only
  - Swiss government bond as base rate
- **Case 3 | Free cash flows: 50% CHF and 50% USD. Local USD business plan converted into CHF using spot rate**
  - Due to the conversion with a spot rate, USD free cash flows are subject to USD currency risks
  - Weighting of USD and CHF government bonds according to sales / EBITDA / free cash flow split

Country risk premium

"Damodaran approach"

Base rate (US / EUR / CH)

+ Inflation differential

+ [Market risk premium (MRP) incl. 0.14 x CRP] x Beta

+ Size premium

+ 0.86 x CRP

= Cost of equity

Base rate (US / EUR / CH)

+ Inflation differential

+ adj. default spread of resp. country (0.86 x CRP)

+ Credit spread

= Cost of debt

Where:

- CRP = Country risk premium
- 0.86 = 1 divided by 1.16

Note

Visit the Damodaran homepage via: http://pages.stern.nyu.edu/~adamodar/

EY Switzerland best practice

- Use of a local government bond rate which reflects (to a certain extent) specific country risk, if possible:
  - Requires availability of adequate financial information for appropriate base rate
  - No integration of specific country risk premium required: it is already reflected in the respective base rate
  - Can lead to inflated discount rates in case of excessive credit risk, e.g. in the case of Argentina
- Alternative approach:
  - Alternatively use Damodaran's country risk premiums on top of a USD, EUR or CHF base rate (adjusted for the inflation differential between the respective countries)
  - Country risk premium (CRP) = Country rating-based default spread x 1.16 (factor of 1.16 to adjust for the additional volatility of equity markets as compared to bond markets)

WACC calculation			Comment (source)
Inflation, CH	1.15%	p	Long-term inflation rate Switzerland (Oxford Economics)
Inflation, Brazil	3.00%	o	Long-term inflation rate Brazil (Oxford Economics)
Inflation differential	1.82%	q	Inflation differential between Switzerland and Brazil; (1 + p) / (1 + o) – 1
Base rate / "risk free" rate CH	1.03%	r	Implied yield on 10y government bond of Switzerland in local currency (Capital IQ)
Base rate / "risk free" rate	**2.87%**	**a**	**Implied yield on 10y government bond of Switzerland in local currency (Capital IQ), incl. inflation diff.**
Market risk premium	6.41%	b	Global MRP (market studies), incl. adj. for CRP for Brazil (Risk premium for other markets 2022 – Damodaran)
Adjusted unlevered beta	0.717x	c	Derived from peer group median value (Capital IQ). Adjustment according to Blume
Adjusted relevered beta	1.420x	d	According to Practitioners' Method: Beta (relevered) = beta (unlevered) * (1 + D/E)
Size premium	3.50%	e	Size premium (illustrative)
Country risk premium	2.56%	s	Adjusted default spread based on country risk for Brazil (Risk premiums for other markets 2022 - Damodaran)
Cost of equity	**18.04%**	**Ce**	**= a + b x d + e + s**
Base rate / "risk free" rate	2.87%	f	Implied yield on 10y government bond of Switzerland in local currency (Capital IQ), incl. inflation diff.
Credit spread	0.80%	g	Credit spread from comparable corporate yield curve - Z-spread (All Corporates, BBB, 10Y) (Capital IQ)
Country risk premium	2.56%	h	Adjusted default spread based on country risk for Brazil (Risk premiums for other markets 2022 - Damodaran)
Cost of debt	**6.23%**	**Cd**	**= f + g + h**
Equity ratio	50.54%	i	Capital structure derived from peer group median value (Capital IQ)
Debt ratio	49.46%	j	Capital structure derived from peer group median value (Capital IQ)
Corporate income tax rate	16.00%	k	Corporate income tax rate of Switzerland (EY Worldwide Corporate Tax Guide)
WACC, rounded	**11.7%**		**= Ce * i + Cd * (1 – k) * j**

Source: see comments, **Valuation date:** 30 June 2022

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About this publication

Building a better working world