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IVC Snippets 2020/01

Focus:

Base Rate & Market Risk Premium - Update April 2020

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Dear readers,

the Fachausschuss für Unternehmensbewertung und Betriebswirtschaft (FAUB) of the IDW published new **recommendations on cost of capital on October 25th 2019**.

At its meeting on October 22nd 2019, the FAUB discussed about the recommendation on deriving the **base rate** on the basis of an extrapolation of the yield curve due to the continued and recently intensified expansionary monetary policy (quantitative easing) of the ECB. At present, the FAUB decided to **remain unchanged with its previous approach**, but critically question it on an ongoing basis.

With regard to its previous **bandwidth recommendation for the market risk premium** before personal income tax, the FAUB has decided not to keep the bandwidth recommendation of 5.0 % to 7.0 % from September 19th 2012 but rather to increase the **bandwidth recommendation to 6.0 % to 8.0 %.** On March 25th 2020, against the background of the spread of the coronavirus, the FAUB additionally issued a professional advice stating that there are **no identifiable reasons for a change** in the methodology for deriving the capitalization rate.

In this IVC Snippet we will present **our own analyses** of the development of the base rate and the market risk premium. Do you need to derive the **cost of capital** for your **impairment test** or **investment calculation**? Please contact us.

With best regards from the „Ruhrgebiet"

Lars Franken and Jörn Schulte

- *Executive Summary*
- *Base Rate*
- *Shareholder Return*
- *Market Risk Premium*
- *FAUB Announcement*

IVC Snippets – Executive Summary

Background

- Against the background of the interest rate policy of the ECB, the effective interest rates of top-rated government bonds observable on the market continued to fall. Negative effective interest rates can also be observed for bonds with medium to long maturities now.
- The base rate, which is based on the IDW recommendation, is significantly below 1.0 % and is approaching 0.0 %.
- Against this background, the FAUB questioned in October 2019 the proper derivation of the cost of capital.

Meaning

- The derivation of the cost of capital is required in the goodwill impairment test in accordance with IAS 36 when determining the recoverable amount (Value in Use) or when making investment decisions.
- A low base rate reduces the cost of capital and increases the calculated value in the net present value calculation.
- If the cost of capital does not reflect an appropriate alternative investment, the generated values are economically implausible.

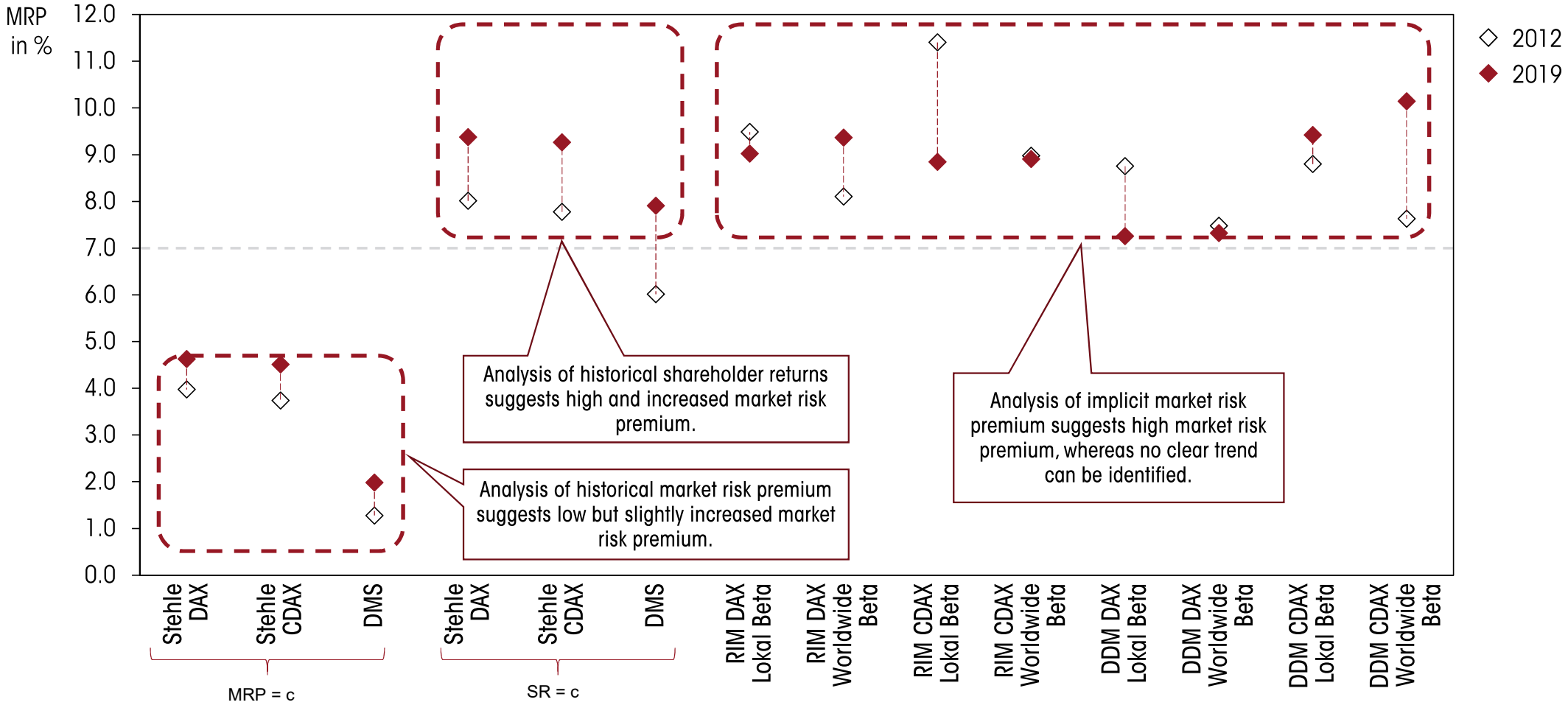
Current Trend

- On October 25th 2019 the FAUB announced its recommendation to increase the bandwidth of the market risk premium before personal income tax from 6.0 % to 8.0 % and after personal income tax from 5.0 % to 6.5 %.
- This recommendation has been valid since then and is still valid even against the background of the corona-induced price plummets on the world's stock markets.

IVC Snippets

- In the following analyses IVC will present the development of the base rate and the market risk premium. The current capital market situation will be compared to the previous one on September 19th 2012 (last FAUB recommendation on the determination of the market risk premium).
- In conclusion, the empirical data shows that the
  - analysis of historical market risk premium suggests low but slightly increased market risk premium,
  - analysis of historical shareholder returns suggests high and increased market risk premium, and
  - analysis of implicit market risk premium suggests high market risk premium, whereas no clear trend can be identified.

Overview of Results (I/II)



Overview of Results (II/II)

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Historical

	Sep. 12		Dec. 19	
	MRP = c	AR = c	MRP = c	AR = c
Stehle DAX	4.0%	8.0%	4.6%	9.4%
Stehle CDAX	3.7%	7.8%	4.5%	9.3%
DMS weltweit	1.3%	6.0%	2.0%	7.9%

Implicit

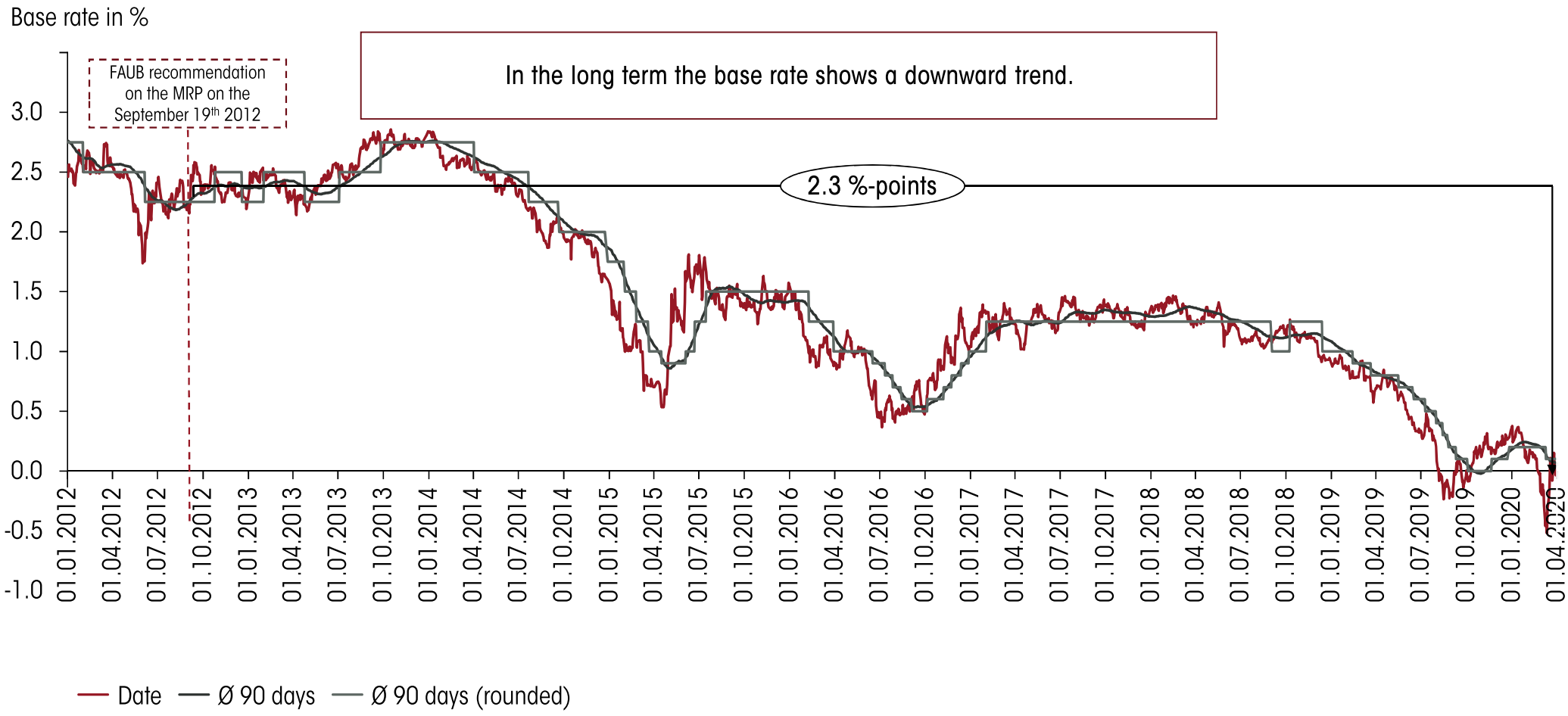
RIM	Sep. 12		Dec. 19	
	Beta CDAX	Beta MSCI AC World	Beta CDAX	Beta MSCI AC World
DAX	9.5%	8.1%	9.0%	9.4%
CDAX	11.4%	9.0%	8.8%	8.9%

DDM	Sep. 12		Dec. 19	
	Beta CDAX	Beta MSCI AC World	Beta CDAX	Beta MSCI AC World
DAX	8.8%	7.5%	7.3%	7.3%
CDAX	8.8%	7.6%	9.4%	10.1%

/ Compared to September 2012, an overall increase in the market risk premium can be recognized.

- *Executive Summary*
- *Base Rate*
- *Shareholder Return*
- *Market Risk Premium*
- *FAUB Announcement*

Development of the Base Rate (January 1st 2012 to March 31th 2020)



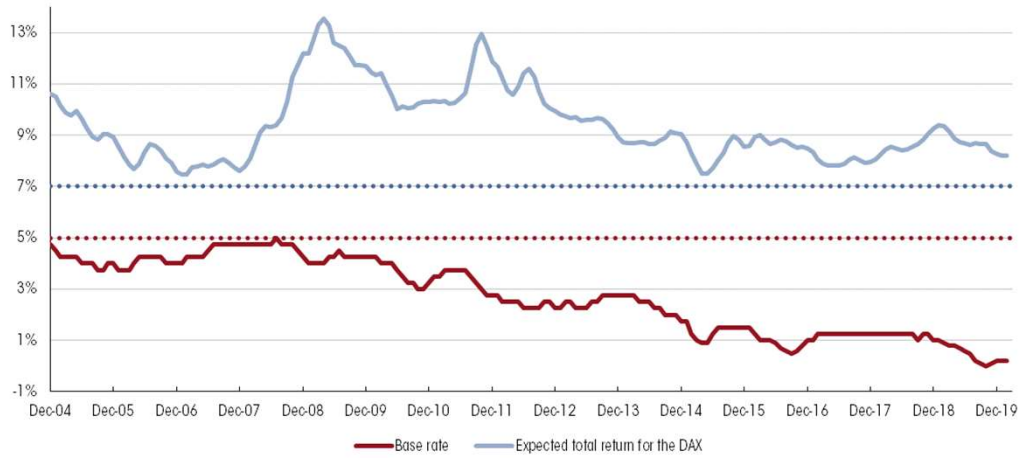
- *Executive Summary*
- *Base Rate*
- ***Shareholder Return***
- *Market Risk Premium*
- *FAUB Announcement*

Considerations of the constancy of Shareholder Return

Considerations

- While the base rate has fallen in the past and is currently 0.0 %, no corresponding trend of the expected shareholder return is observed.
- In the past, shareholder return has generally been well above 8.0 %.
- Based on the previous FAUB recommendation of a bandwidth of 5.0 % to 7.0 %, the expected shareholder return was 0.0 % + [5.0 % to 7.0 %] = 5.0 % to 7.0 %.
- Against this background, the FAUB questioned whether an expected total return / shareholder return of this magnitude is plausible.
- Currently, the expected shareholder return indicates that the total return may be higher.
- In this context, the empirical finding points to an increased required market risk premium.

Shareholder Return



- The expected shareholder return / total return is calculated by inverting the expected price/earnings ratio:

$$P = \frac{E^{expected}}{k_e - g} \Leftrightarrow k_e = \left(\frac{P}{E^{expected}}\right)^{-1} + g$$

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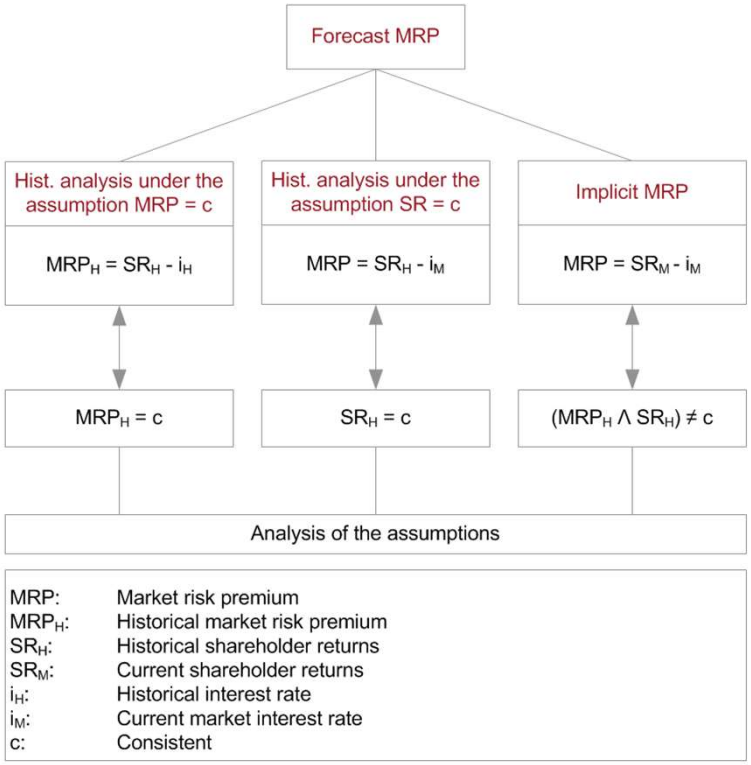
Concept of Analysis

MRP – Models and Basic Assumptions



Methodology

- The forecast of the (future expected) market risk premium on the basis of the CAPM can generally be carried out:
  - indirectly on the basis of historical data[1] or
  - directly, for instance on the basis of current capital market data and estimates.
- Both approaches are basically compatible with the CAPM. The different approaches are based on specific assumptions with advantages as well as disadvantages.
- Since there is no fundamental preference for one of the individual approaches, a pluralistic approach should be chosen. This view – in connection with the current announcement – is also held by the FAUB of the IDW[2].

[1] Cf. IDW, IDW S 1 i.d.F. 2008, para. 118 f.
[2] Cf. IDW FAUB, Hinweise zur Berücksichtigung der Finanzmarktkrise bei der Ermittlung des Kapitalisierungszinssatzes, FN-IDW 2012, p. 68 f.

Historical Analysis – Description of the Procedure

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MRP = c

- The first approach assumes that the market risk premium is constant over time (MRP = c). The market risk premium is calculated as the difference between the historical shareholder return and the historical return on bonds. This approach is used in particular in the study by Stehle (2004)[3].
- It is sometimes criticized that especially in recent decades, high bond yields have been realized through price gains as a result of falling interest rates, which in this respect do not correspond to the expected returns on a "safe investment". It is also argued that the historical market risk premium is not stable, but fluctuates over time.
- The mean value is calculated (respectively) in the form of an arithmetic or geometric mean value for the period 1955 to 2019.
- Data basis: DMS und Stehle, Federal Bank of Germany (recent market returns).

SR = c

- The second approach assumes that the shareholder return is constant over time (SR = c). The market risk premium is calculated as the difference between the historical shareholder return and the current safe interest rate. This approach is used in particular in the study of Wright/Mason/Miles (2003)[4].
- The economic consideration here is the empirical observation of Siegel (1994)[5] that investors have achieved a constant shareholder return in the past ("Siegel's constant"). In economic terms, it is assumed that investors have a fixed expectation of total return (safe investment + market risk premium).
- It is sometimes criticized that the assumption of a constant shareholder return is difficult to prove in theory. It is also argued that the empirical findings of a constant shareholder return are not correct.
- The mean value is calculated (respectively) in the form of an arithmetic or geometric mean value for the period 1955 to 2019.
- Data basis: DMS und Stehle, Federal Bank of Germany (recent market returns, base rate), Refinitiv (inflation expectations)

[3] Cf. Stehle, Die Festlegung der Risikoprämie von Aktien im Rahmen der Schätzung des Wertes von börsennotierten Kapitalgesellschaften, WPg 2004, p. 916 ff.
[4] Cf. Wright/Mason/Miles, A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K., London 2003.
[5] Cf. Siegel, Stocks for the Long Run, New York 1994.

Historical Analysis – Description of the Data Sets

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Stehle (2004)

- In his study in 2004, Stehle[6] particularly carried out a retrospective calculation of shareholder returns of the DAX and CDAX back to 1955. The Stehle study was the basis for the first bandwidth recommendation of the FAUB in 2004. Stehle's data set can be updated with current capital market data.
- As a result, the average shareholder return can be calculated when investing in the DAX portfolio and the CDAX portfolio. These shareholder returns are compared to the REXP or the current base rate.
- As a result a 'German' market risk premium can be determine on the basis that a German investor would have achieved by investing in the German market portfolio.

Dimson/Marsh/ Staunton

- Since 2002, Dimson/Marsh/Staunton[7] have been providing a data set containing worldwide data on shareholder returns, bond yields and exchange rates. The data set is unique as it can be used to model the worldwide diversification required by the CAPM.
- Based on the data from DMS, the average shareholder return can be calculated when investing in worldwide portfolios. These shareholder returns are compared to German bond yields or the current base rate.
- As a result a 'worldwide' market risk premium can be determined on the basis that a German investor would have achieved by investing in the worldwide market portfolio.

[6] Cf. Stehle, Die Festlegung der Risikoprämie von Aktien im Rahmen der Schätzung des Wertes von börsennotierten Kapitalgesellschaften, WPg 2004, p. 916 ff.
[7] Cf. Dimson/Marsh/Staunton, Credit Suisse Global Investment Returns Yearbook 2020, Zürich 2020.

Historical Market Risk Premium Analysis (I/II) – Germany (Stehle)

Historical market risk premium for DAX and CDAX

(Stehle, MRP = c)

IVC Snippet

Start	End	MRP DAX Arithmetic Mean	MRP DAX Geometric Mean	MRP DAX Ø	MRP CDAX Arithmetic Mean	MRP CDAX Geometric Mean	MRP CDAX Ø
1955	2011	5.6%	2.4%	4.0%	5.2%	2.3%	3.7%
1955	2019	6.1%	3.2%	4.6%	5.8%	3.2%	4.5%

Source: Stehle, Federal Bank of Germany

Historical Market Risk Premium Analysis (II/II) – Germany (Stehle)

Historical market risk premium for DAX and CDAX

(Stehle, SR = c)

1955 to 2011

IVC Snippet

1955-2011	Derivation of MRP DAX			Derivation of MRP CDAX		
	Arithmetic Mean	Geometric Mean	Ø	Arithmetic Mean	Geometric Mean	Ø
Real shareholder return	9.4%	6.1%	7.8%	9.0%	6.1%	7.6%
Inflation expectations	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Expected nominal shareholder return	**12.0%**	**8.6%**	**10.3%**	**11.6%**	**8.6%**	**10.1%**
Nominal base rate	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
Nominal MRP	**9.7%**	**6.3%**	**8.0%**	**9.3%**	**6.3%**	**7.8%**

Source: Stehle, Federal bank of Germany, Capital IQ

Historical market risk premium for DAX and CDAX

(Stehle, SR = c)

1955 to 2019

IVC Snippet

1955-2019	Derivation of MRP DAX			Derivation of MRP CDAX		
	Arithmetic Mean	Geometric Mean	Ø	Arithmetic Mean	Geometric Mean	Ø
Real shareholder return	9.5%	6.5%	8.0%	9.3%	6.6%	7.9%
Inflation expectations	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
Expected nominal shareholder return	**11.1%**	**8.0%**	**9.6%**	**10.8%**	**8.1%**	**9.4%**
Nominal base rate	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Nominal MRP	**10.9%**	**7.8%**	**9.4%**	**10.6%**	**7.9%**	**9.3%**

Source: Stehle, Federal bank of Germany, Capital IQ

Historical Market Risk Premium Analysis (I/II) – World (DMS)

Historical worldwide market risk premium according to DMS

(MRP = c)

IVC Snippet

	Period	MRP (World) (Bonds)			MRP (World) (Bills)		
		Arithmetic Mean	Geometric Mean	Ø	Arithmetic Mean	Geometric Mean	Ø
Nominal MRP	1955-2011	2.1%	0.4%	1.3%	5.1%	3.2%	4.2%
Nominal MRP	1955-2019	2.7%	1.2%	2.0%	6.2%	4.5%	5.4%

Source: DMS

Historical Market Risk Premium Analysis (II/II) – World (DMS)

IVC

Historical worldwide market risk premium according to DMS

(SR = c)

1955 to 2011

IVC Snippet

1955-2011	Derivation of MRP Arithmetic Mean	Geometric Mean	Ø
Real shareholder return	6.8%	4.9%	5.8%
Inflation expectations	2.4%	2.4%	2.4%
Expected nominal shareholder return	**9.3%**	**7.3%**	**8.3%**
Nominal base rate	2.3%	2.3%	2.3%
Nominal MRP	**7.0%**	**5.0%**	**6.0%**

Source: DMS

Historical worldwide market risk premium according to DMS

(SR = c)

1955 to 2019

IVC Snippet

1955-2019	Derivation of MRP Arithmetic Mean	Geometric Mean	Ø
Real shareholder return	7.5%	5.7%	6.6%
Inflation expectations	1.4%	1.4%	1.4%
Expected nominal shareholder return	**9.0%**	**7.2%**	**8.1%**
Nominal base rate	0.2%	0.2%	0.2%
Nominal MRP	**8.8%**	**7.0%**	**7.9%**

Source: DMS

Implicit Analysis – Models (I/II)

RIM

/ Residual-Income-Model (RIM) according to Babbel (2015)[8]:

$$r_t = \frac{NI_{t+1}}{MC_t} + \left(1 - \frac{BV_t}{MC_t}\right) * g$$

r_t:	Cost of equity at period t
NI_{t+1}:	Expected net income in the following period t+1
MC_t:	Market capitalization at period t
BV_t:	Book value of equity at period t
g:	Expected growth rate

DDM

/ Dividend Discount Model:

$$MC_t = \frac{NI_{t+1} * (1-q)}{(1 + r_f + \beta * MRP)} + \frac{NI_{t+2} * (1-q)}{(1 + r_f + \beta * MRP)^2} + \frac{NI_{t+3} * (1-q)}{(1 + r_f + \beta * MRP)^3} + \frac{NI_{t+3} * (1-q) - w.Th}{(1 + r_f + \beta * MRP - g)} * \frac{1}{(1 + r_f + \beta * MRP)^3}$$

r_f:	Base rate
MC_t:	Market capitalization at period t
NI_t:	Expected net income at period t
β	Leverred beta factor
MRP:	Market risk premium
q:	Retention ratio
$w.Th$:	Growth-related retention
g:	Expected growth rate

[8] Cf. Babbel, Challenging Stock Prices: Stock prices und implied growth expectations, in: Corporate Finance, N. 9, 2015, p. 316-323.

Implicit Analysis – Models (I/II)

P/E ratio

/ The market risk premium is derived from the inverted price/earnings ratio:

$$P = \frac{E^{expected}}{k_e - g} \Leftrightarrow k_e = \left(\frac{P}{E^{expected}}\right)^{-1} + g \Leftrightarrow MRP = \left(\frac{P}{E^{expected}}\right)^{-1} + g - i$$

P:	Stock price
$E^{expected}$:	Expected returns
g:	Growth rate
i:	Base rate or risk-free rate
k_e:	Cost of equity

Implicit Analysis – Explanation of the Data Sets (I/II)

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RIM

- The data is provided by the financial information service provider Capital IQ. Data is collected for companies listed on the DAX and CDAX.
- Net incomes are determined on the basis of analyst estimates. A growth rate of 2.0 % is applied.
- The corresponding calculated cost of equity is then resolved according to the market risk premium.
- For the cost of equity, the safe interest rate is based on the data from the Federal Bank of Germany; Beta factors are calculated for the individual companies with CDAX and MSCI AC World as reference indices.
- The mean of the MRP is weighted by the market capitalization.

DDM

- The data is provided by the financial information service provider Capital IQ. Data is collected for companies listed on the DAX and CDAX.
- Dividends are calculated on the basis of analyst estimates. A growth rate of 1.0 % is applied.
- For the cost of equity, the safe interest rate is based on Bundesbank data; beta factors are calculated for the individual companies with CDAX and MSCI AC World as reference indices. The market risk premium is then determined numerically.
- The mean of the MRP is weighted by the market capitalization.

Implicit Analysis – Explanation of the Data Sets (II/II)

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P/E ratio

- The data is provided by the financial information service provider Capital IQ. Corresponding data is collected for companies listed on the DAX.
- The P/E ratio is provided by Capital IQ. A growth rate of 1.0 % is assumed.
- For the cost of equity, the risk-free interest rate is based on the data from the Federal bank of Germany.
- The 3-month average is applied.

Implicit Market Risk Premium – Germany (RIM / DDM)

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Implicit MRP for DAX and CDAX – RIM (g = 2.0 %)

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2012	Weighted Average	
	Beta CDAX	Beta MSCI AC World
DAX	9.5%	8.1%
CDAX	11.4%	9.0%

2019	Weighted Average	
	Beta CDAX	Beta MSCI AC World
DAX	9.0%	9.4%
CDAX	8.8%	8.9%

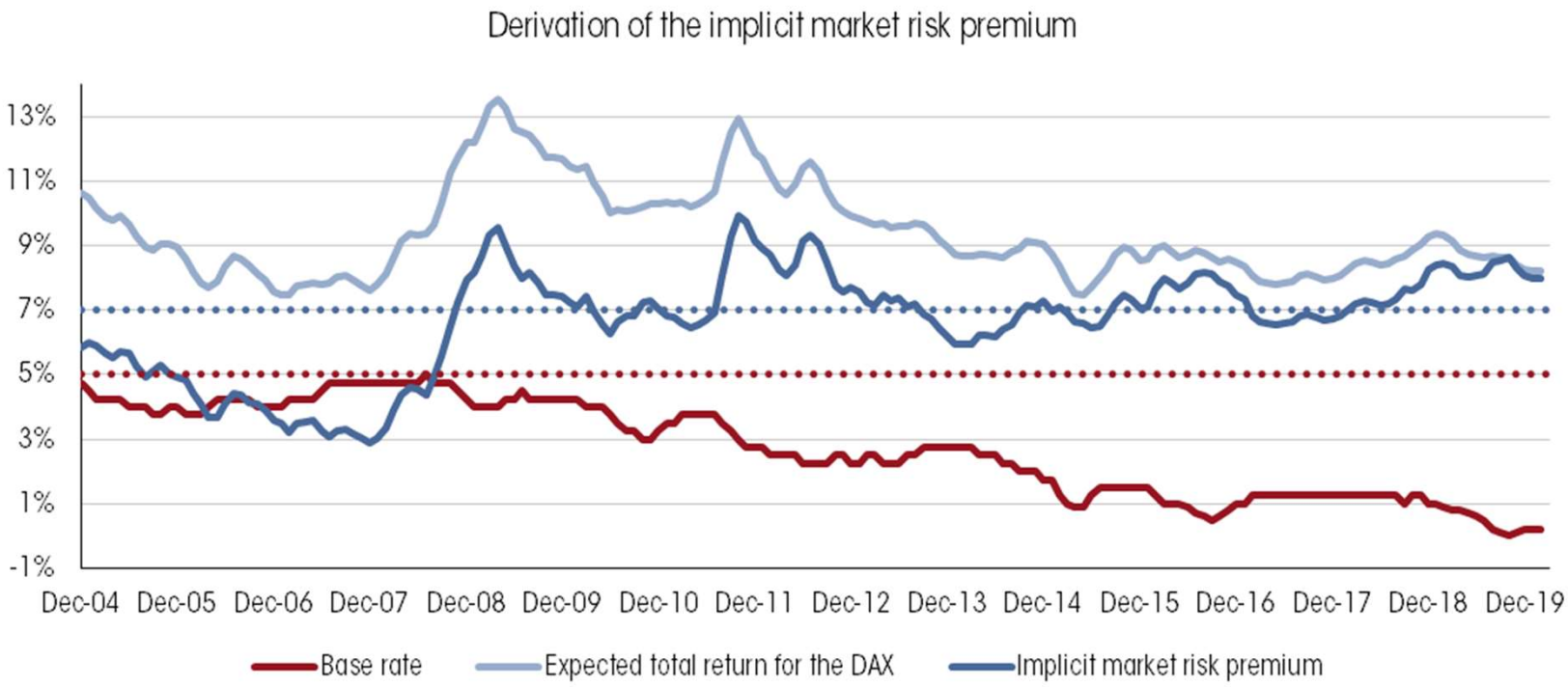
Implicit MRP for DAX and CDAX – DDM (g = 1.0 %)

IVC Snippet

2012	Weighted Average	
	Beta CDAX	Beta MSCI AC World
DAX	8.8%	7.5%
CDAX	8.8%	7.6%

2019	Weighted Average	
	Beta CDAX	Beta MSCI AC World
DAX	7.3%	7.3%
CDAX	9.4%	10.1%

MRP based on the P/E Ratio over time



- *Executive Summary*
- *Base Rate*
- *Shareholder Return*
- *Market Risk Premium*
- ***FAUB Announcement***

New Recommendations on the derivation of the Cost of Capital by the FAUB on Oktober 25th 2019

The Fachausschuss für Unternehmensbewertung und Betriebswirtschaft (FAUB) continuously monitors developments on the capital markets to determine whether its recommendations on the derivation of the cost of capital need to be adjusted. This is the case if the previous recommendations lead to cost of capital that no longer match the empirical observations on the capital markets. In the moment a unique situation can be observed as the yield curve derived by the Svensson method in accordance with the methodology of the Federal Bank of Germany (indirectly derived from the coupon yields of German government bonds), is negative for almost the entire 30-year term. The estimated risk-free interest rate derived from present value equivalent, which is used in the company valuation, is thus de facto zero percent for the first time and threatens to become negative in the foreseeable future.

On the basis of the previous recommendation for the market risk premium before personal income tax of 5.0 % to 7.0 % would mean that that an overall expected market return of 5.0 % to 7.0 % is assumed. Accordingly, the FAUB has examined whether such a declined expected total return is compatible with observable market data. In accordance with its pluralistic approach, the FAUB has supplemented historically measured shareholder returns, long-term real shareholder returns and implicit cost of capital using ex ante analyses from the market capitalizations of DAX companies with current observations.

The analyses indicate a slight decrease in the total return over time - especially in the recent period since 2012/13. However, this is in no relation to the decrease in the yields of German government bonds. With a cautious overall assessment of all analyses, the total nominal yield is rather in a range of 7.0 % to 9.0 %, which is also supported by current studies of the Federal Bank of Germany. If its upper limit was used, the current recommendation for the market risk premium would therefore just reach the lower boundary of the observable total return.

Against the background of the continued and recently intensified expansive monetary policy (quantitative easing) by the ECB – which represents a typical European path and for which there is currently no foreseeable end in sight – the FAUB also discussed to what extent it is still sensible to continue to use the yield curve from the coupon yields of German government bonds as an estimator for the risk-free base rate. In particular, the extrapolation of the curve from the year 31 using the spot rate of the year 30 was discussed. At present, the FAUB has decided to remain unchanged with its the previous procedure, but to critically question it on an ongoing basis.

Accordingly, the FAUB decided at its meeting on October 22nd 2019 to raise its recommendation for the market risk premium before personal income tax to 6.0 % to 8.0 %. In doing so, the FAUB has tended to orient itself towards the lower end of observable total returns, thus taking into account the possibility that these could continue to fall slightly over time.

In principle, the influence of shareholders' personal income tax must be taken into account when determining objectified company values. This applies not only to the risk-free base rate but also the market risk premium. Based on the recommendation on market risk premium before personal income tax, the FAUB has made a transition to a market risk premium after personal income tax due to the current flat-rate tax system. This leads to a corresponding slight adjustment of the recommendation for the market risk premium after personal income tax to a range of 5.0 % to 6.5 %.

Source: https://www.idw.de/idw/idw-aktuell/neue-kapitalkostenempfehlungen-des-faub/120158

Professional Advice of the FAUB on March 25th 2020 on the Effects of the Spread of the Coronavirus

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The second parameter of the Discounted-Cash-Flow method (which reflects the risk) is the risk premium. The risk premium can be derived in particular from capital market data. The long-term orientation of the Discounted-Cash-Flow method according to IDW S 1 as amended in 2008 allows and requires capital market data to be assessed over the long term and short term fluctuations and possible exaggerations on the capital markets to be classified as current and not necessarily long term sentiment indicators (cf. IDW S 1 as amended in 2008, para. 91). Therefore, even in a crisis, the capitalization rate is based on long-term analyses of returns, which the FAUB sees in a range of 7.0 % to 9.0 % (after corporate taxes and before personal income tax), and a market risk premium in a range of 6.0 % to 8.0 % (also after corporate taxes and before personal income tax), which is at the upper end of the range of historically measurable market risk premium (cf. FAUB's capital cost recommendation dated October 25th 2019, available at https://www.idw.de/idw/idw-aktuell/neue-kapi-talkostenempfehlungen-des-faub/120158). So far, no reason has been identified for a change in the methodology for deriving the capitalization rate. The increased uncertainty resulting from the corona crisis is thus reflected in the cash flow plans and in the risk premium of the capitalization rate.

Source: https://www.idw.de/blob/122884/2316fb82457e82143445b8d0740a3e89/down-corona-faub-fachlicher-hinweis-data.pdf

Contact

Dr. Jörn Schulte

Wirtschaftsprüfer, Steuerberater, CVA
Partner

+49 (201) / 31 04 83 – 75
+49 (151) / 16 30 10 – 75

joern.schulte@ivc-wpg.com

Dr. Lars Franken

Wirtschaftsprüfer, CFA
Partner

+49 (201) / 31 04 83 – 85
+49 (151) / 16 30 10 – 85

lars.franken@ivc-wpg.com

Dr. Alexander Brunner

Wirtschaftsprüfer, Steuerberater
Senior Manager

+49 (201) / 31 04 83 – 72
+49 (151) / 16 30 10 – 72

alexander.brunner@ivc-wpg.com

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Girardetstr. 2, 45131 Essen

Editors

Dr. Jörn Schulte (Responsible editor within the meaning of § 6 Abs. 2 MDSTV) and Dr. Lars Franken

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Girardetstraße 2 (Entrance via Rüttenscheider Straße), 45131 Essen