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DACH Capital Market Study December 31, 2022

Analysis of cost of capital parameters and multiples for the capital markets of Germany, Austria and Switzerland

Volume 12, January 2023

powered by



finexpert





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1 Preface & people

DACH Capital Market Study Preface

Dear business partners and friends of ValueTrust,

We are pleased to release our twelfth edition of the ValueTrust DACH¹) Capital Market Study powered by finexpert and W Vienna. The study was carried out by ValueTrust in cooperation with finexpert and the Institute of Accounting and Auditing at the W Vienna. With this study, we provide a data compilation of the capital market parameters which enable an enterprise valuation in Germany, Austria and Switzerland. It has the purpose to serve as an assistant and data source as well as to show trends in the analyzed parameters.

In this study, we analyze the relevant parameters to calculate the costs of capital based on the Capital Asset Pricing Model (risk-free rate, market risk premium and beta). Additionally, we determine implied as well as historical market and sector returns. Moreover, this study includes capital structure-adjusted implied sector returns, which serve as an indicator for the unlevered cost of equity. The relevered cost of equity can be calculated by adapting the company specific debt situation to the unlevered cost of equity. This procedure serves as an alternative to the CAPM.

Furthermore, we provide an analysis of empirical (ex-post) costs of equity in the form of **total shareholder returns** which consist of capital gains and dividends. The total shareholder returns can be used as a plausibility check of the implied (ex-ante) returns. Lastly, **trading multiples** frame the end of this study. We examine the before mentioned parameters for the **German, Austrian and Swiss capital markets** (in form of the CDAX²), WBI³) and SPI⁴)). These indices have been merged into **twelve** <u>finexpert</u> sector indices (so-called "super sectors") Banking, Insurance, Financial Services, Consumer Service, Consumer Goods, Pharma & Healthcare, Information Technology, Telecommunication, Utilities, Basic Materials, Industrials and Real Estate.

Historical data has been compiled between the reference dates **December 31, 2016 and December 31, 2022** and will be **updated semiannually**, with the objective that **historical**, as well as **current data**, can be consulted at the same time. Hence, we can understand changes over time, which allows us to track the performance of all three capital markets. Additionally, further knowledge and information for financial decision making is provided at <u>www.finexpert.info</u>.

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Prof. Dr. Ewald Aschauer Institute for Accounting and Auditing, WU Vienna

Prof. Dr. Bernhard Schwetzler

Chair of Financial Management, HHL Leipzig

1) D (Germany), A (Austria), CH (Switzerland). 2) German Composite DAX Index. 3) Vienna Stock Index. 4) Swiss Performance Index.

DACH Capital Market Study People

ValueTrust



Prof. Dr. Christian Aders

Senior Managing Director, ValueTrust

- Almost 30 years of experience in corporate valuation and financial advisory
- Previously Partner at KPMG and Managing Director at Duff & Phelps
- Honorary professor for "Practice of transaction-oriented company valuation and value-oriented management" at LMU Munich
- Member of the DVFA Expert Group "Fairness Opinions" and "Best Practice Recommendations Corporate Valuation"
- Co-Founder of the European Association of Certified Valuators and Analysts (EACVA e.V.)

finexpert



Prof. Dr. Bernhard Schwetzler

Chair of Financial Management, HHL Leipzig

- Senior Advisor ValueTrust
- Co-Founder and board member of the European Association of Certified Valuators and Analysts (EACVA e.V.)

ValueTrust



Marion Swoboda-Brachvogel, MSc

Director, ValueTrust

- More than 15 years of project experience in financial advisory, investment banking and investment management
- Previously with McKinsey & Company, UniCredit, C.A. Cheuvreux and B&C Industry Holding
- Extensive experience in the valuation of listed and private companies in various industries and in advising on strategic and financial issues



Prof. Dr. Ewald Aschauer

Institute for Accounting and Auditing, WU Vienna

- Senior Advisor ValueTrust
- Member of the Working Group on Business Valuation of the Austrian Chamber of Public Accountants and Tax Advisors
- Nominated expert in valuation disputes

DACH Capital Market Study Disclaimer

This study presents an empirical analysis which serves the purpose of illustrating the cost of capital of Germany's, Austria's, and Switzerland's capital markets. Nevertheless, the available information and the corresponding exemplifications do not allow for a complete presentation of a proper derivation of costs of capital. Furthermore, the market participant must consider that the company specific costs of capital can vary widely due to individual corporate circumstances.

The listed information is not specific to anyone and consequently, it cannot be directed to an individual or juristic person. Although we are always endeavored to present information that is reliable, accurate, and current, we cannot guarantee that the data is applicable to valuation in the present as well as in the future. The same applies to our underlying data from the data provider S&P Capital IQ.

We recommend a self-contained, technical, and detailed analysis of the specific situation and we dissuade from acting solely based on the information provided.

ValueTrust and its co-authors do not assume any liability for the up-todatedness, completeness or accuracy of this study or its contents.

2 Executive summary

Executive Summary (1/2)

Cost of equity per sector according to four different methodologies

Sectors		Implied levered cost of equity	Levered cost of equity (CAPM) ¹⁾	1/PE-ratio (1yf)	Total shareholder return (Ø 6y) ²⁾
	Banking	11.9%	9.3%	10.9%	7.2%
	Insurance	11.0%	7.6%	7.6%	12.5%
<u>ы</u>	Financial Services	8.7%	9.7%	7.0%	18.6%
	Consumer Service	6.9%	10.2%	5.5%	16.4%
	Consumer Goods	9.8%	9.4%	5.7%	8.8%
•	Pharma & Healthcare	7.2%	10.0%	5.3%	16.9%

1) Based on 2-year sector beta, risk-free rate of 2.03% and implied market risk premium of 7.6% for the German market.

2) Total shareholder returns can be viewed as historic, realized cost of equity. However, it has to be considered that total shareholder returns vary widely, depending on the relevant time period.

December 31, 2022

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Executive Summary (2/2)

Cost of equity per sector according to four different methodologies



1) Based on 2-year sector beta, risk-free rate of 2.03% and implied market risk premium of 7.6% for the German market.

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December 31, 2022

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3 Risk-free rate

Risk-Free Rate Background & approach

The **risk-free rate** is a return available on a security that the market generally regards as free of default risk. It serves as an input parameter for the **CAPM** and is used to determine the risk-adequate cost of capital.

The risk-free rate is a yield, which is obtained from **long-term government bonds** of countries with top notch ratings. By using interest rate data of different maturities, a **yield curve** can be estimated for fictitious zero-coupon bonds (spot rates) for a period of up to 30 years. Therefore, the German Central Bank (Deutsche Bundesbank) and the Swiss National Bank (Schweizer Nationalbank) publish – on a daily basis – the parameters needed to determine the yield curve using the Svensson method. Based on the respective yield curve, a **uniform risk-free rate** is derived under the assumption of present value equivalence to an infinite time horizon.

The **German bonds** are internationally classified as **almost risk-free securities** due to their AAA rating according to S&P. As a result, the **Austrian** Chamber of Public Accountants and Tax Consultants also recommends deriving the risk-free rate from the yield curve using the parameters published by the German Central Bank.¹⁾ Likewise, bonds issued by **Switzerland** enjoy a AAA rating and are also considered risk-free according to the Swiss National Bank.²⁾ Hence, a similar approach as for Germany and Austria is in our view appropriate for Switzerland with Swiss parameters.³⁾

To compute the risk-free rate for a specific reference date, the **Institute** of **Public Auditors** (Institut der Wirtschaftsprüfer, **IDW**) in Germany recommends using an **average value** deduced from the daily yield curves over the **past three months** (IDW S 1).

On the contrary, the Austrian Expert Opinion (KFS/BW 1) on company valuation recommends deriving the risk-free rate in line with the evaluated company's cash flow profile from the yield curve that is valid for the reference date (reference date principle). Thus, the KFS/BW 1 and its counterpart, the IDW S 1, differ from each other. Consequently, in the following analyses, we depict the yield curve for Germany following IDW S 1, while for Austria we adhere to the recommendations of KFS/BW 1.

For **Switzerland**, there is no generally accepted scheme to determine the risk-free rate. The most widely used risk-free rates in valuation practice are the yield of a **10-year Swiss government bond** as of the reference date as well as the **yield derived from the 3-month average of the daily yield curves** (in accordance with IDW S 1).

Additionally, we illustrate the monthly development of the risk-free rates since December 2016 for all three capital markets.

1) www.bundesbank.de.

2) Swiss National Bank - Zinssätze und Renditen, p.11.

3) ibid., p.13.

Risk-Free Rate – DACH

Determination according to country specific recommendations Interest rate curve based on long-term bonds (Svensson method)



Risk-free rates as of December 31, 2022

Risk-Free Rate – DACH Historical development of the risk-free rate (Svensson method) since December 2016



1) Interest rate as of reference date using 3-month average yield curves in accordance with IDW S 1; 2) Interest rate calculated using the daily yield curve in accordance with KFS/BW 1 (no 3-month average).

December 31, 2022

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4 Market returns and market risk premium

a. Implied returns (ex-ante analysis)

Implied Market Returns and Market Risk Premium Background & approach

The future-oriented computation of implied market returns and market risk premiums is based on profit estimates for public companies and return calculations. This approach is called ex-ante analysis and allows us to calculate the "implied cost of capital". It is to be distinguished from the expost analysis.

Particularly, the **ex-ante method** offers an **alternative** to the **ex-post approach** of calculating the costs of capital by means of the regression analysis through the **CAPM**. The ex-ante analysis method seeks costs of capital which represent the **return expectations of market participants**. Moreover, it is supposed that the estimates of financial analysts reflect the expectations of the capital market.

The concept of **implied cost of capital** gained momentum recently. For example, it was recognized by the German *Fachausschuss für Unternehmensbewertung* "FAUB".¹⁾ It is acknowledged that implied costs of capital capture the **current capital market situation** and are thus able to reflect the effects of the current **low interest rate environment**.

Furthermore, recent **court rulings** with regards to appraisal proceedings appreciate the use of **implied cost of capital** as they are **forward-looking**. As of the **reference date**, it offers a more insightful perspective in comparison to the exclusive use of ex-post data.

For the following analysis, we use – simplified annually – the formula of the Residual Income Valuation Model by Babbel:²⁾

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

With the following parameter definitions:

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

Through solving the models for the cost of capital, we obtain the implied return on equity.³⁾ Since *Babbel's* model does not need any explicit assumptions, except for the growth rate, it turns out to be **robust**. We source all data (i.e. the expected annual net income, the market capitalizations, and the company's book value of equity, etc.) of the analyzed companies from the data supplier S&P Capital IQ. Additionally, we apply the European Central Bank target inflation rate of **2.0% as a typified growth rate**.

Henceforth, we determine the **implied market returns** for the entire DAX, ATX and SMI. We consider these indices to be a valid approximation for the total markets.⁴⁾ The results form the starting points for the calculations of the **implied market risk premiums** of the three capital markets. Subtracting the risk-free rate from the implied market returns results in the implied market risk premium.

To determine the appropriate market risk premium for valuation purposes, it is also important to take into account the analysis of historical returns as well as volatility. Especially in times of crisis it can make sense to apply an average market risk premium over several periods instead of a reference date value.

1) cf. Castedello/Jonas/Schieszl/Lenckner, Die Marktrisikoprämie im Niedrigzinsumfeld – Hintergrund und Erläuterung der Empfehlung des FAUB (WPg, 13/2018, p. 806-825).

3) cf. Reese, 2007, Estimation of the costs of capital for evaluation purposes; Aders/Aschauer/Dollinger, Die implizite Marktrisikoprämie am österreichischen Kapitalmarkt (RWZ, 6/2016, p. 195-202).

4) Approx. 75% of the total market capitalization (CDAX, WBI, SPI) is covered.

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²⁾ cf. Babbel, Challenging Stock Prices: Stock prices und implied growth expectations, in: Corporate Finance, N. 9, 2015, p. 316-323, in particular p. 319. In the observation period from H2 2020 until H2 2021, we applied t+2 earnings forecasts in our model due to distortions by the COVID-19 crisis;

Implied Market Returns and Market Risk Premium German, Austrian and Swiss markets



4 Market returns and market risk premium

b. Historical returns (ex-post analysis)

Historical Market Returns Background & approach

Besides analyzing the implied market returns through the ex-ante analysis, we also analyze **historical (ex-post) returns**. Once this analysis is performed over a **long-term observation period**, an expected **return potential** of the German, Austrian and Swiss capital markets is assessable. Therefore, the analysis of historical returns can be used for **plausibility checks of the costs of capital**, more specifically **return requirements**, which were evaluated through the CAPM.

To further enable a precise analysis of the historical returns of the German, Austrian and Swiss capital markets, we use the so-called **return triangle**.¹⁾ It helps to present the **annually realized returns** from **different investment periods** in a simple and understandable way. Especially the **different buying and selling points in time** and the different annual holding periods are illustrated comprehensively. To calculate the **average annual returns** over several years, we use both the **geometric and arithmetic mean**.

In this study, we analyze the so-called **total shareholder returns**, which include the **returns on investments** and the **dividend yields**. For our analysis, it is crucial to focus on **total return indices** because they include the price and dividend yields. Since **DAX** is a performance index, we already have an index which includes the price and dividend yields. The ATX and SMI only include the price yields, hence we need their specific total return indices. The relevant total return index for Austria is called the **ATX Total Return** and for Switzerland **SMI Total Return**. The composition of both indices are identical to the ATX and the SMI and compromise 20 companies each.

The observation period amounts to 25 years. Therefore, the earliest data of the **DAX and the ATX Total Return** is from the end of 1997. However, the data of the **SMI Total Return** starts from the end of 1997. All ex-post returns are calculated using the **data as of the reference date December 31, 2022.**

The following slides illustrate how the two calculation methods (arithmetic and geometric) differ from each other for the period between December 31, 1997 and December 31, 2022:

- DAX:
 - the arithmetic mean of the historical market returns is 7.5%
 - the **geometric mean** of the historical market returns is **4.9%**
- ATX:
 - the arithmetic mean of the historical market returns is 10.3%
 - the **geometric mean** of the historical market returns is **6.3%**
- SMI:
 - the arithmetic mean of the historical market returns is 6.9%
 - the **geometric mean** of the historical market returns is **5.4%**

¹⁾ The German Stock Institute e.V. (DAI) developed the return triangle for DAX and EURO STOXX.

Historical Market Returns (Arithmetic Mean) – German Market DAX Performance Index Return Triangle

																											Buy
									<u>R</u>	<u>eadin</u>	g exan	<u>nple:</u>		V. I.a.al.		le e										-12.3%	2021
									A P	n inve nd of	estmer the ve	ar 20 [°]	ne da 12 wł	nen so	ld at t	ne he									15.8%	1.7%	2020
									e	nd of	the	year	2017	, woi	ild ha	ive								3.5%	9.7%	2.3%	2019
									y	ielded	an	avera	age a	innual	retu	ırn							25.5%	14.5%	14.9%	8.1%	2018
									(6	arithm	ietic	mean) of	11.4%	5. Otł	ner						-18.3%	3.6%	3.6%	6.6%	2.8%	2017 <mark>5</mark>
									fi	ve-yea	ar in	vestr	nent	perio	ods a	are						-2.9%	6.6%	5.8%	7.8%	4.5%	2016
									a	ispiay	ed alo	ng the	e black	steps	5.					6.9%		0.4%	6.6%	6.0%	7.7%	4.8%	2015
																			9.6%	8.2%		2.7%	7.2%	6.6%	7.9%	5.4%	2014
																		2.7%	6.1%	6.4%	7.9%	2.7%	6.5%	6.1%	7.3%	5.1%	2013
																	25.5%	14.1%	12.6%	11.1%	11.4%	6.5%	9.2%	8.5%	9.3%	7.1%	2012 10
																29.1%	27.3%	19.1%	16.7%	14.7%	14.4%			10.8%	11.3%	9.1%	2011
15.0%	Return h	igher tha	an 13%												-14.7%	7.2%	13.3%	10.6%	10.4%	9.8%		6.6%		8.2%	8.9%	7.1%	2010
10.0%	Return b	etween 8	8% and 13	8%										16.1%	0.7%	10.1%	14.0%	11.7%	11.4%	10.7%	10.9%	7.7%	9.5%	8.9%	9.5%	7.8%	2009 tug
5.0%	Return b	etween 3	3% and 8%	6									23.8%	20.0%	8.4%	13.6%	16.0%	13.7%	13.1%			9.3%	10.8%			9.0%	2008 est
0.0%	Return a	round ze	ro (betwe	en -3% a	nd +3%)							-40.4%	-8.3%	-0.2%	-3.8%	2.8%	6.6%	6.0%	6.4%	6.5%	7.1%	4.8%	6.5%	6.3%	7.0%	5.7%	2007 15
-5.0%	Return b	etween -	-3% and -8	3%							22.3%	-9.0%	1.9%	5.5%	1.4%	6.0%	8.8%	8.0%	8.2%	8.1%	8.5%	6.3%	7.7%	7.4%	8.0%	6.7%	2006
	Return b	etween -	-8% and -:	13%						22.0%	22.1%	1.3%	6.9%	8.8%	4.9%			9.6%	9.6%	9.3%		7.5%		8.4%	8.9%	7.6%	2005
-15.0%	Return l	ower thai	n -13%						27.1%	24.5%	23.8%	7.7%	11.0%	11.8%	8.0%		12.3%	11.3%	11.2%	10.8%		8.9%	10.0%	9.6%		8.7%	2004
								7.3%	17.2%	18.8%	19.7%	7.7%	10.4%	11.2%	7.9%	10.3%	11.8%	11.0%	10.9%	10.5%	10.7%	8.8%	9.8%	9.4%	9.8%	8.6%	2003
							37.1%	22.2%	23.8%	23.4%	23.2%	12.6%	14.2%	14.4%	11.2%	13.0%	14.1%	13.1%	12.9%	12.4%	12.4%	10.5%			11.2%	10.0%	2002 20
						-43.9%	-3.4%	0.2%	6.9%	9.9%	12.0%	4.5%	6.9%	7.9%	5.7%	7.8%	9.3%	8.8%	8.8%	8.7%	8.9%	7.3%	8.3%	8.1%	8.5%	7.5%	2001
					-19.8%	-31.9%	-8.9%	-4.8%	1.5%	5.0%	7.4%	1.5%	3.9%	5.2%	3.4%	5.5%	7.0%	6.7%	6.9%	6.9%	7.2%	5.8%	6.9%	6.7%	7.1%	6.2%	2000
				-7.5%	-13.7%	-23.8%	-8.5%	-5.4%	0.0%	3.2%	5.6%	0.5%	2.8%	4.0%	2.4%	4.5%	6.0%	5.8%	6.0%	6.1%	6.4%	5.1%	6.1%	6.0%	6.5%	5.6%	1999
			39.0%	15.7%	3.9%	-8.1%	1.0%	2.0%	5.6%	7.6%	9.3%	4.3%	6.1%	6.9%	5.3%	7.0%	8.2%	7.8%	7.9%	7.9%		6.8%	7.7%	7.5%	7.9%	7.0%	1998
	Soll	18.5%	28.7%	16.7%	7.5%	-2.8%	3.9%	4.4%	7.2%	8.9%	10.2%	5.6%	7.1%	7.8%	6.2%	7.7%	8.8%	8.5%	8.5%	8.4%	8.6%	7.4%	8.2%	8.0%	8.3%	7.5%	1997 25
	5011	1990	1999	2000	2001	2002	2003	2004	2003	2000	2007 10	2008	2009	2010	2011	2012 15	2013	2014	2013	2010	2017 20	2019	2019	2020	2021	2022 25	
												Invest	ment p	eriod in	years												

 $Following: https://www.dai.de/files/dai_usercontent/dokumente/renditedreieck/2015-12-31\% 20DAX-Rendite-Dreieck\% 2050\% 20Jahre\% 20Web.pdf.$

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Buy Reading example: 2021 An investment in the DAX Index at the 15.8% 0.7% 2020 end of the year 2012, when sold at the 3.5% 1.7% 2019 end of the year 2017, would have 25.5% 14.0% 14.6% 7.2% 2018 yielded an average annual return (geometric mean) of 11.2%. Other 1.3% 2.0% 5.3% 1.5% 2017 five-year investment periods are -4.1% 4.9% 4.6% 6.7% 3.3% 2016 displayed along the black steps. 5.4% 5.0% 6.7% 3.8% 6.9% -0.6% 2015 6.2% 4.5% 1.9% 5.8% 7.1% 2014 2.7% 6.1% 6.3% 7.8% 2.0% 5.6% 5.3% 6.6% 4.3% 2013 Investment period in years 10.8% 📕 11.2 5.6% 6.2% 25.5% 7.6% 2012 10 2011 Return higher than 13% 4.9% 7.5% 7.1% 7.9% 6.0% 2010 5.4% Return between 8% and 13% 16.1% -0.5% 6.6% 7.9% 6.7% 2009 5.0% Return between 3% and 8% 23.8% 19.9% 7.0% 14.7% 7.9% 2008 2.5% 0.0% Return around zero (between -3% and +3%) -40.4% -14.1% -5.0% -7.5% -1.2% 2.9% 2.8% 3.6% 4.0% 4.8% 4.2% 4.2% 5.0% 3.7% 2007 15 -2.2% 2.4% 5.4% 5.1% 5.6% 5.7% 5.5% 5.4% 4.8% Return between -3% and -8% -3.3% 1.2% 6.3% 4.0% 6.0% 2006 -5.0% -3.8% 2.4% 1.5% 7.1% 7.5% 7.0% Return between -8% and -13% 5.0% 5.0% 7.4% 6.8% 7.1% 5.3% 6.6% 6.4% 5.7% 2005 7.6% -15.0% Return lower than -13% 24.5% 23.8% 3.1% 7.0% 4.8% 7.5% 6.7% 7.9% 6.8% 2004 3.9% 7.6% 7.3% 16.8% 7.0% 5.1% 7.5% 6.7% 7.8% 6.8% 2003 22.8% 2002 20 -43.9% -12.3% 1.2% 5.0% 7.7% -1.0% 1.3% 3.6% 5.3% 5.1% 5.4% 5.5% 5.9% 4.3% 5.4% 5.3% 5.8% 4.8% 2001 -6.2% 1.8% 3.3%

Historical Market Returns (Geometric Mean) – German Market DAX Performance Index Return Triangle

Following: https://www.dai.de/files/dai_usercontent/dokumente/renditedreieck/2015-12-31%20DAX-Rendite-Dreieck%2050%20Jahre%20Web.pdf.

-3.4%

-4.1%

1.1%

3.1%

2005

0.4%

-0.8%

3.5%

5.1%

2006

3.3%

1.9%

5.4%

6.7%

2007

10

-3.6%

-4.0%

-0.4%

1.2%

2008

-19.8% -32.9% -14.9%

-7.3%

2002

5

-25.4% -13.1%

-4.6%

-1.0%

2003

-2.7%

0.1%

2004

-7.5%

13.4%

15.1%

2000

1.0%

5.1%

2001

39.0%

28.3%

1999

18.5%

1998

Sell

VALUETRUST

0.7%

-0.1%

2.7%

3.9%

2010

Investment period in years

-0.9%

-1.5%

1.6%

2.9%

2009

-0.8%

-1.4%

1.3%

2.4%

2011

1.4%

0.7%

3.0%

4.0%

2012

15

3.1%

2.3%

4.3%

5.1%

2014

3.5%

2.8%

4.6%

5.3%

2015

3.1%

2.3%

4.4%

5.2%

2013

4.2%

3.5%

5.1%

5.7%

2017

20

3.7%

3.0%

4.7%

5.4%

2016

3.9%

3.3%

4.7%

5.3%

2019

2.8%

2.2%

3.8%

4.5%

2018

3.9%

3.3%

4.7%

5.3%

2020

4.4%

3.8%

5.1%

5.7%

2021

3.6%

3.1%

4.4%

4.9%

2022

25

2000

1999

1998



Historical Market Returns (Arithmetic Mean) – Austrian Market ATX Total Return Index Return Triangle

Reading example:														
Reading example: An investment in the ATX Index at the														
An investment in the ATX Index at the	.8% 2020													
end of the year 2012, when sold at the	.6% 2019													
yielded an average annual return	.3% 2018													
(arithmetic mean) of 10.4%. Other	. <mark>0%</mark> 2017 <mark>5</mark>													
five-year investment periods are 34.0% 8.3% 12.4% 6.6% 14.0% 9	.0% 2016													
displayed along the black steps. 12.5% 23.2% 9.7% 12.4% 7.8% 13.7% 2	.5% 2015													
11.6% 12.0% 19.4% 10.2% 12.2% 8.4% 13.4% 9	7% 2014													
-11.4% 0.1% 4.2% 11.7% 5.9% 8.3% 5.6% 10.3% 7.4%														
5.3% -3.0% 1.9% 4.5% 10.4% 5.8% 7.9% 5.5% 9.8% 5	2% 2012 10 by													
31.9% 18.6% 8.6% 9.4% 10.0% 14.0% 9.5% 10.9% 8.5% 12.0% 9	4% 2011 [.]													
15.0% Return higher than 13% -0.2% 1.6% -1.6% 1.0% 2.9% 7.4% 4.3% 6.1% 4.4% 8.0% 6	. <mark>0%</mark> 2010													
10.0% Return between 8% and 13% 6.2% 2.7% 4.1% 5.3% 8.9% 6.0% 7.4% 5.8% 8.9% 5.8% 8.9% 7	. <mark>0%</mark> 2009 to													
5.0% Return between 3% and 8% 11.2% 16.3% 14.1% 9.9% 10.1% 10.4% 10.0% 11.0% 9.1% 11.8% 9.1%	8% 2008 U													
0.0% Return around zero (between -3% and +3%) -58.8% -6.4% 2.3% -6.3% 1.3% 2.0% 0.1% 1.5% 2.7% 5.9% 3.7% 5.1% 3.9% 6.8% 5	2% 2007 15 C													
5.00 Return between -3% and -8% 0.8% -29.0% -4.0% 1.9% -4.9% 1.2% 1.8% 0.2% 1.4% 2.5% 5.4% 3.5% 4.8% 3.7% 6.4% 5.4%	2006													
10.0% Return between -8% and -13% 26.0% 13.4% -10.7% 3.5% 6.8% 0.2% 4.8% 4.8% 3.0% 3.9% 4.7% 7.1% 5.2% 6.3% 5.2% 7.6% 6	2% 2005													
15.0% Return lower than -13% 52.6% 39.3% 26.4% 5.1% 13.3% 14.4% 7.7% 10.7% 10.1% 8.0% 8.3% 8.7% 10.6% 8.6% 9.4% 8.1% 10.2% 8	8% 2004													
59.0% 55.8% 45.8% 34.6% 15.9% 20.9% 20.8% 14.1% 16.1% 15.0% 12.5% 14.1% 12.0% 12.5% 14.1% 12.9% 1 1 1	.4% 2003													
39.4% 49.2% 50.3% 44.2% 35.5% 19.8% 23.6% 23.1% 16.9% 18.4% 17.2% 14.9% 14.6% 15.8% 13.7% 14.1% 12.7% 14.3% 1	.8% 2002 <mark>20</mark>													
3.7% 21.5% 34.0% 38.7% 36.1% 30.2% 17.5% 21.1% 20.9% 15.6% 17.1% 16.1% 14.0% 13.8% 13.7% 15.0% 13.1% 13.5% 12.2% 13.8% 1	.4% 2001													
9.2% 6.4% 17.4% 27.8% 32.8% 31.6% 27.2% 16.5% 19.8% 19.8% 15.0% 16.4% 15.6% 13.7% 13.5% 14.7% 12.9% 13.3% 12.1% 13.6% 1	.2% 2000													
-9.1% 0.1% 1.3% 10.8% 20.4% 25.8% 25.8% 22.7% 13.6% 16.9% 17.1% 13.0% 14.5% 13.8% 12.1% 12.1% 13.3% 11.7% 12.2% 11.1% 12.5% 1	.3% 1999													
8.9% -0.1% 3.0% 3.2% 10.4% 18.5% 23.4% 23.7% 21.2% 13.2% 16.5% 12.7% 14.1% 13.5% 11.9% 11.9% 11.9% 13.1% 12.0% 11.0% 12.4% 1	.2% 1998													
-12.3% -1.7% -4.1% -0.8% 0.1% 18.9% 19.7% 17.8% 10.9% 13.8% 14.2% 10.9% 12.3% 11.9% 10.5% 10.6% 10.7% 11.8% 10.9% 11.4% 1	.3% 1997 25													
Sell 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2 5 10 15 20	25													
Investment period in years														

 $Following: https://www.dai.de/files/dai_usercontent/dokumente/renditedreieck/2015-12-31\% 20DAX-Rendite-Dreieck\% 2050\% 20Jahre\% 20Web.pdf.$

ValueTrust

Historical Market Returns (Geometric Mean) – Austrian Market ATX Total Return Index Return Triangle

Buy														
	Reading exam	nple:	1					-15.9%	2021					
	An investmen	nt in the AIX in	idex at the					43.6% 9.9%	2020					
	end of the	vear 2012, when s	ould have				-10.8%	13.2% 2.5%	2019					
	yielded an	average annu	ual return				20.5% 3.7%	15.6% 6.7%	2018					
	(geometric m	nean) of 9.4%. (Other five-			-17.4%	-0.3% -3.9%	6.3% 1.4%	2017 5					
	year investme	ent periods are	e displayed			34.0% 5.2%	10.1% 4.4%	11.3% 6.2%	2016					
	along the blac	ck steps.			12.5%	22.8% 7.6%	10.7% 6.0%	11.5% 7.1%	2015					
					11.6% 12.0%	18.9% 8.6%	10.8% 6.9%	11.5% 7.6%	2014					
-11.4% -0.5% 3.6% 10.5% 4.2% 6.8% 4.1% 8.4% 5.3% 20														
				5.3% -3.4%	1.4% 4.0%	9.4% 4.4%	6.6% 4.2%	8.0% 5.3%	2012 10					
			31.9%	17.9% 7.2%	8.3% 9.1%	12.9% 8.0%	9.5% 7.0%	10.2% 7.5%	2011					
15.0% Return higher than 13%			-32.3% -5.5%	-2.0% -4.4%	-1.4% 0.8%	5.0% 1.9%	3.8% 2.2%	5.4% 3.5%	2010					
10.0% Return between 8% and 13%		19.79	7% -9.9% 2.3%	3.0% 0.0%	1.8% 3.3%	6.7% 3.7%	5.3% 3.7%	6.5% 4.6%	2009 tu					
5.0% Return between 3% and 8%		46.0% 32.29	2% 5.8% 11.8%	10.5% 6.5%	7.2% 7.8%	10.5% 7.3%	8.4% 6.7%	9.2% 7.1%	2008					
0.0% Return around zero (between -3% and +3%)		-58.8% -22.4% -10.3	3% -16.4% -8.4%	-6.3% -7.0%	-4.9% -3.1%	0.1% -1.6%	0.0% -0.8%	1.8% 0.5%	2007 15					
-5.0% Return between -3% and -8%	0.8%	-35.5% -15.3% -7.7%	7% -13.2% -7.0%	-5.3% -6.1%	-4.3% -2.7%	0.2% -1.4%	0.1% -0.7%	1.8% 0.6%	2006					
10.0% Return between -8% and -13%	26.0% 12.7%	-19.4% -6.5% -1.89	3% -7.7% -2.8%	-1.9% -3.0%	-1.6% -0.4%	2.1% 0.4%	1.8% 0.9%	3.1% 1.9%	2005					
15.0% Return lower than -13%	52.6% 38.6% 24.7%	-5.5% 3.1% 5.7%	<mark>%</mark> -0.8% 2.8%	3.1% 1.5%	2.4% 3.2%	5.3% 3.5%	4.5% 3.5%	5.5% 4.2%	2004					
	59.0% 55.7% 45.1% 32.5%	4.9% 10.8% 12.19	1% 5.2% 7.9%	7.6% 5.8%	6.2% 6.7%	8.5% 6.5%	7.3% 6.2%	8.0% 6.5%	2003					
39.4% 4	48.9% 50.1% 43.7% 33.8%	10.0% 14.5% 15.29	2% 8.6% 10.7%	10.2% 8.2%	8.5% 8.8%	10.3% 8.3%	9.0% 7.8%	9.4% 8.0%	2002 <mark>20</mark>					
3.7% 20.2% 3	32.0% 36.8% 34.6% 28.3%	9.1% 13.1% 13.8	8.1% 10.0%	9.6% 7.9%	8.1% 8.4%	9.9% 8.0%	8.7% 7.6%	9.1% 7.8%	2001					
9.2% 6.4% 16.4% 2	25.9% 30.8% 30.0% 25.3%	9.1% 12.7% 13.4	1% 8.2% 10.0%	9.6% 8.0%	8.2% 8.5%		8.7% 7.6%	9.1% 7.8%	2000					
-9.1% -0.4% 1.0% 9.4% 1	17.9% 23.1% 23.5% 20.4%	6.9% 10.3% 11.19	1% 6.6% 8.4%	8.2% 6.7%	7.0% 7.3%	8.7% 7.1%	7.7% 6.8%	8.2% 7.0%	1999					
8.9% -0.5% 2.6% 2.9% 9.3% 1	16.4% 21.0% 21.6% 19.1%	7.1% 10.2% 10.99	9% <mark>6.8%</mark> 8.4%	8.2% 6.9%	7.1% 7.4%	8.7% 7.2%	7.8% 6.9%	8.3% 7.1%	1998					
-12.3% -2.3% -4.6% -1.3% -0.3% 5.4% 1	11.8% 16.2% 17.3% 15.5%	5.2% 8.1% 8.9%	% 5.3% 6.9%	6.8% 5.6%	6.0% 6.3%	7.5% 6.2%	6.8% 6.0%	7.3% 6.3%	1997 <mark>25</mark>					
Sell 1998 1999 2000 2001 2002 2003 :	2004 2005 2006 2007	2008 2009 2010	10 2011 2012	2013 2014	2015 2016	2017 2018	2019 2020	2021 2022	<u></u>					
	10	Investment period	d in years			20			,					

Following: https://www.dai.de/files/dai_usercontent/dokumente/renditedreieck/2015-12-31%20DAX-Rendite-Dreieck%2050%20Jahre%20Web.pdf.

December 31, 2022

ValueTrust

Historical Market Returns (Arithmetic Mean) – Swiss Market SMI Total Return Index Return Triangle

																											Buy	
									<u>R</u>	eadin:	g exan	nple:														-1.6%	2021	
									A	n inve nd of	estmei	nt in t	the SN	/II Ind	ex at t	the									23.7%	11.1%	2020	
									e	nd of	the ye	vear	2017	WOI	ild ha									4.4%	14.0%	8.8%	2019	
									v	ielded	an	avera	age a	annua	l reti	urn							30.2%	17.3%	19.4%	14.2%	2018	
									(a	arithm	etic	mean) of	10.5%	6. Otł	her						-7.0%	11.6%	9.2%	12.8%	9.9%	2017	5
									fi	ve-yea	ar in	ivestn	nent	perio	ods a	are					17.9%	5.4%	13.7%		13.8%	11.3%	2016	
									d	isplay	ed alo	ng the	e blacl	< step	s.					-3.4%	7.3%	2.5%	9.4%	8.4%	11.0%	9.2%	2015	
																			1.2%	-1.1%	5.2%	2.2%	7.8%	7.2%	9.6%	8.2%	2014	
																		12.9%	7.0%	3.6%	7.2%	4.3%	8.6%	8.0%		8.7%	2013	
																	23.9%	18.4%		8.7%	10.5%	7.6%	10.8%			10.2%	2012	/ear;
																19.1%	21.5%	18.6%	14.3%	10.7%	11.9%	9.2%	11.8%	11.0%	12.3%	11.0%	2011	d in
15.0%	Return h	igher tha	in 13%												-4.6%	7.2%	12.8%	12.8%	10.5%	8.2%	9.6%	7.5%		9.4%	10.7%	9.7%	2010	erio
10.0%	Return b	etween 8	3% and 13	3%										1.2%	-1.7%	5.2%	9.9%		8.9%	7.2%		6.8%	9.1%	8.7%	9.9%	9.1%	2009	ent p
5.0%	Return b	etween 3	3% and 89	%									22.1%	11.6%	6.2%			12.4%	10.8%			8.3%	10.3%	9.8%		10.0%	2008	stme
0.0%	Return a	round ze	ro (betwe	een -3% a	and +3%)							-32.8%	-5.3%	-3.2%	-3.5%	1.0%	4.8%	6.0%	5.4%	4.4%	5.7%	4.6%	6.7%	6.5%	7.8%	7.1%	2007	15 _
-5.0%	Return b	etween -	-3% and -	8%							-1.4%	-17.1%	-4.0%	-2.7%	-3.1%	0.6%	3.9%	5.1%	4.6%	3.8%	5.1%	4.1%	6.1%	6.0%	7.2%	6.6%	2006	
-10.0%	Return b	etween -	8% and -	13%						18.0%	8.3%	-5.4%	1.5%	1.4%	0.4%	3.1%	5.7%	6.5%	6.0%	5.1%	6.2%	5.2%	6.9%	6.8%	7.8%	7.3%	2005	
-15.0%	Return l	ower thai	n -13%						36.0%	27.0%	17.5%	5.0%	8.4%	7.2%	5.5%	7.2%			8.7%	7.7%		7.4%	8.9%	8.6%	9.5%	8.9%	2004	
								5.5%	20.7%	19.8%	14.5%	5.1%	7.9%	6.9%	5.5%	7.0%		9.1%	8.4%	7.5%		7.2%	8.7%	8.4%		8.7%	2003	
							20.9%	13.2%	20.8%	20.1%	15.8%	7.7%	9.8%		7.2%		9.8%	10.1%			9.1%	8.1%	9.4%			9.3%	2002	20
						-26.6%	-2.8%	-0.1%	9.0%	10.8%	8.7%	2.8%	5.2%	4.8%	3.8%	5.2%	6.8%	7.3%	6.8%	6.1%	6.9%	6.1%	7.4%	7.2%	8.1%	7.6%	2001	
					-20.2%	-23.4%	-8.6%	-5.1%	3.1%	5.6%	4.6%	-0.1%	2.4%	2.3%	1.6%	3.1%	4.7%	5.3%	5.0%	4.5%	5.3%	4.6%	5.9%	5.9%	6.7%	6.3%	2000	
				9.3%	-5.5%	-12.5%	-4.2%	-2.2%	4.1%	6.1%	5.2%	1.0%	3.1%	2.9%	2.3%	3.6%	5.0%	5.6%	5.3%	4.8%	5.5%	4.8%	6.1%	6.0%	6.8%	6.5%	1999	
			7.2%		-1.3%	-7.6%	-1.9%	-0.7%	4.6%	6.3%	5.4%	1.6%	3.5%	3.3%	2.7%	3.8%	5.2%	5.7%	5.4%	4.9%	5.6%	5.0%	6.2%	6.1%	6.8%	6.5%	1998	
		15.7%	11.4%		3.0%	-2.9%	1.0%	1.7%	6.0%	7.3%	6.4%	2.9%	4.5%	4.2%	3.6%	4.6%	5.8%	6.2%	6.0%	5.5%	6.1%	5.5%	6.6%	6.5%	7.2%	6.9%	1997	25
	Sell	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022		
						5					10	Invest	tment p	eriod ir	n years	12					20					25		

 $Following: https://www.dai.de/files/dai_usercontent/dokumente/renditedreieck/2015-12-31\% 20DAX-Rendite-Dreieck\% 2050\% 20Jahre\% 20Web.pdf.$

ValueTrust

Historical Market Returns (Geometric Mean) – Swiss Market SMI Total Return Index Return Triangle

																											Buy		
	Reading example: An investment in the SMI Index at the																							-1.6%	2021				
									A	n inve nd of	estmer	nt in t Iar 20'	ne Siv 12 we	II INDE	t te bl	ne									23.7%	10.3%	2020		
									e	nd of	the	vear	2017	. WOL	ild ha	ive								4.4%	13.6%	8.3%	2019		
									yi	ielded	an	avera	ige a	nnual	retu	irn							30.2%	16.5%	18.9%	13.4%	2018		
									(g	geome	etric i	mean)	of	10.0%	. Otł	ner						-7.0%			11.8%	9.0%	2017	5	
									fi	ve-yea	ar in	vestm	nent	perio	ods a	are					17.9%	4.7%			13.0%	10.4%	2016		
									d	isplay	ed alo	ng the	e black	< steps	5.					-3.4%	6.7%	1.9%		7.5%	10.1%	8.3%	2015		
																			1.2%	-1.1%	4.8%	1.7%	6.9%	6.4%	8.8%	7.4%	2014		
																		12.9%	6.9%	3.3%	6.8%	3.9%	7.9%	7.4%		8.0%	2013		,
																	23.9%	18.3%		8.1%	10.0%	7.0%	10.0%		10.8%	9.5%	2012	10	200
																19.1%	21.5%	18.5%	13.9%	10.2%	11.5%	8.6%			11.6%	10.3%	2011	יב ד	:
15.0%	Return h	igher tha	an 13%												-4.6%	6.6%	12.1%	12.3%	10.0%	7.6%	9.0%	6.9%		8.7%	10.0%	9.0%	2010	orio	2
LO.0%	Return b	etween 8	8% and 1	3%										1.2%	-1.8%	4.7%		10.0%	8.4%	6.7%	8.0%	6.2%	8.4%	8.0%	9.3%	8.4%	2009	nt n	2
5.0%	Return b	etween a	3% and 8	%									22.1%	11.2%	5.6%	8.8%		11.9%	10.3%			7.7%	9.6%	9.1%		9.3%	2008	the	
0.0%	Return a	round ze	ro (betw	een -3% a	and +3%)							-32.8%	-9.4%	-6.0%	-5.7%	-1.2%	2.6%	4.0%	3.7%	2.9%	4.3%	3.2%	5.2%	5.1%	6.4%	5.8%	2007	15 2	
5.0%	Return b	etween -	-3% and -	8%							-1.4%	-18.6%	-6.8%	-4.9%	-4.8%	-1.2%	2.0%	3.3%	3.1%	2.4%	3.8%	2.8%	4.7%	4.7%	5.8%	5.4%	2006	1	
10.0%	Return b	etween -	-8% and -	13%						18.0%	7.9%	-7.9%	-1.1%	-0.7%	-1.3%	1.3%	3.9%	4.9%	4.5%	3.8%	4.9%	3.9%	5.6%	5.5%	6.6%	6.1%	2005		
15.0%	Return l	ower tha	n -13%						36.0%	26.7%	16.5%	1.6%	5.4%	4.7%	3.3%	5.1%	7.1%	7.6%	7.0%	6.1%	7.0%	5.9%	7.4%	7.2%	8.1%	7.5%	2004		
								5.5%	19.8%	19.2%	13.7%	2.3%	5.4%	4.8%	3.6%	5.2%	6.9%	7.4%	6.9%	6.1%	6.9%	5.9%	7.3%	7.1%	8.0%	7.4%	2003		
							20.9%	12.9%	20.1%	19.6%	15.1%	5.2%	7.5%	6.7%	5.4%	6.7%	8.1%	8.5%	7.9%	7.1%	7.8%	6.8%	8.0%	7.8%	8.6%	8.1%	2002	20	
						-26.6%	-5.8%	-2.2%	6.2%	8.5%	6.8%	0.0%	2.5%	2.3%	1.6%	3.1%	4.7%	5.3%	5.0%	4.4%	5.2%	4.4%	5.7%	5.7%	6.5%	6.1%	2001	1	
					-20.2%	-23.5%	-10.9%	-7.0%	0.3%	3.1%	2.4%	-2.8%	-0.3%	-0.2%	-0.6%	0.9%	2.5%	3.2%	3.1%	2.7%	3.5%	2.9%	4.2%	4.2%	5.0%	4.7%	2000		
				9.3%	-6.6%	-13.8%	-6.2%	-4.0%	1.8%	3.9%	3.3%	-1.5%	0.6%	0.6%	0.2%	1.5%	3.0%	3.6%	3.5%	3.1%	3.8%	3.2%	4.4%	4.4%	5.2%	4.9%	1999		
			7.2%	8.2%	-2.2%	-9.0%	-3.7%	-2.2%	2.5%	4.3%	3.7%	-0.7%	1.2%	1.2%	0.7%	1.9%	3.3%	3.8%	3.7%	3.3%	4.0%	3.4%	4.6%	4.5%	5.3%	5.0%	1998		
		15.7%	11.3%	10.7%	2.0%	-4.5%	-0.7%	0.2%	4.1%	5.5%	4.8%	0.7%	2.3%	2.2%	1.7%	2.8%	4.0%	4.5%	4.3%	3.9%	4.6%	4.0%	5.0%	5.0%	5.7%	5.4%	1997	25	
	Sell	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022		1	
						5					10	Invest	ment p	eriod in	years	15					20					25			

Following: https://www.dai.de/files/dai_usercontent/dokumente/renditedreieck/2015-12-31%20DAX-Rendite-Dreieck%2050%20Jahre%20Web.pdf.

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5 Sector classification of the DACH region

based on [finexpert] sector indices

finexpert Sector Indices of the DACH Region Methodology & approach

The **finexpert** sector indices aim to cover the **whole capital market of the DACH region**. Therefore, this capital market study contains all equities of the **German Composite DAX Index (CDAX)**, **Vienna Stock Exchange Index (WBI)** and **Swiss Performance Index (SPI)**. These three indices contain all shares listed on the **Official** and **Semi-Official Market**.

The **631 public companies**, which are listed in the mentioned indices as of December 31, 2022, build the base for the **sector classification** and the **subsequent analyses**:

- The German DAX Sector All Index¹ includes 369 companies listed in the Prime Standard and General Standard and is classified into nine "Deutsche Börse super sectors".
- The Austrian ATX only has five sector indices, ValueTrust assigns the remaining companies of the WBI to the classified sector indices.
- The Swiss SPI contains ten sector indices that comprise 206 companies.

Eventually, <u>finexpert</u> merged all three market indices and the respective sector index classification into twelve <u>finexpert</u> sector indices, so-called "super sectors."

The twelve sector indices for this study are defined as follows:

- Banking
- Insurance
- Financial Services
- Consumer Service
- Consumer Goods
- Pharma & Healthcare

- Information Technology
- Telecommunication
- Utilities
- Basic Materials
- Industrials
- Real Estate



1) The DAX Sector All Index contains all equities listed in the Prime and General Standard as well as in the Scale segment of the Frankfurt stock exchange.

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finexpert Sector Indices of the DACH Region as of December 31, 2022 Sector distribution and number of companies



Sector classification of the DACH Region

- Banking (34)
- Insurance (13)
- Financial Services (41)
- Consumer Service (52)
- Consumer Goods (74)
- Pharma & Healthcare (62)
- Information Technology (71)
- Telecommunication (13)
- Utilities (13)
- Basic Materials (36)
- Industrials (175)
- Real Estate (47)

The chart shows the percentage distribution of the 631 listed companies in the twelve "super sectors" (the absolute number of companies is displayed in parentheses).

The twelve defined sectors can be classified in **three different dimensions**.

- eight different sectors represent a proportion of less than 10%,
- three represent a share between 10% and 20%,
- and only one represents a portion of more than 20%.

Companies within the Industrials, Information Technology and Consumer Goods sectors, hence, represent approximately 50% of the entire market.

1) Including asset managers, leasing firms and distribution companies for financial products.

6 Betas

Betas Background & approach

Beta is used in the **CAPM** and is also known as the beta coefficient or beta factor. Beta is a measure of **systematic risk** of a security of a specific company (**company beta**) or a specific sector (**sector beta**) in comparison to the market. A beta of less than 1 means that the security is theoretically less **volatile** than the market. A beta of greater than 1 indicates that the security's price is more volatile than the market.

Beta factors are estimated based on historical returns of securities in comparison to an approximate market portfolio. Since the company valuation is forward-looking, it has to be examined whether or what potential risk factors prevailing in the past also apply for the future. By valuing non-listed companies or companies without meaningful share price performance, it is common to use a beta factor from a group of comparable companies ("peer group beta"), a suitable sector ("sector beta") or one single listed company in the capital market with a similar business model and a similar risk profile ("pure play beta"). Within this capital market study we have used sector beta swhich are computed as arithmetic means of the statistically significant beta factors of all companies of a particular sector.

The estimation of beta factors is usually accomplished through a **linear** regression analysis. We use the CDAX, WBI, and SPI as country specific reference indices.

Furthermore, it is important to set a time period for which the data is collected (benchmark period) and whether daily, weekly or monthly returns (return interval) are analyzed. In practice, it is common to use observation periods of two years with the regression of weekly returns or a five-year observation period with the regression of monthly returns. Both alternatives are displayed in our study.

In the CAPM, company specific **risk premiums** include not only **business** risk, but also financial **risk**. The beta factor for levered companies ("**levered beta**") is usually higher compared to a company with an identical business model but without debt (due to financial risk). Hence, **changes in the capital structure** require an **adjustment of the betas** and therefore of the company specific risk premiums.

In order to calculate the **unlevered beta**, adjustment formulas have been developed. We prefer to use the **adjustment formula by Harris/Pringle** which assumes a value-based financing policy, stock-flow adjustments without time delay, uncertain tax shields and a so-called **debt beta**. We calculate the debt beta based on the respective company's rating or the average sector rating (if a company's rating is not available) through the application of the **credit spread** derived from the expected cost of debt. We do not adjust the credit spread for unsystematic risks. The capital market data, in particular historical market prices, is provided by the data supplier S&P Capital IQ.

Betas

Sector specific levered and unlevered betas as of December 31, 2022 (arithmetic mean)



Sector	Beta levered	Beta unlevered
Information Technology	1.01 1.15	0.88 0.99
(w) Telecom- munication	0.61	0.51 0.64
Utilities	0.83 0.80	0.60 0.57
Basic Materials	1.00 1.11	0.73 0.81
Industrials	1.08 1.23	0.88 0.98
Real Estate	0.60 0.77	0.50 0.56
DACH ²⁾	1.02 1.02	

1) We refrained from adjustments of the companies' specific debt (unlevered) because indebtedness is part of the companies' operational activities and economic risk. Bank specific regulations about the minimum capital within financial institutions let us assume that the indebtedness degree is widely comparable. For that reason, it is possible to renounce the adaptation of levered betas.

2) For all DACH companies, the market value-weighted mean of the levered beta was calculated. This value deviates slightly from 1 due to the exclusion of statistically insignificant betas.

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7 Sector returns

a. Implied returns (ex-ante analysis)

Implied Sector Returns Background & approach

Other than the future-oriented calculation of **implied market returns** (cf. slide 16 et seq.), we calculate **implied returns for sectors**. That offers an **alternative** to and simplification of the **ex-post analysis** of the company's costs of capital via the **CAPM**. Using this approach, the calculation of sector betas via regression analyses is not necessary.

The **implied sector returns** shown on the following slides can be used as an **indicator** for the **sector specific levered costs of equity**. Those already consider **sector specific leverage**. Accordingly, another simplification would be to renounce making adjustments with regards to the capital structure risk.

Comparable to the calculation of the implied market returns, the following return calculations are based on the Residual Income Valuation Model by *Babbel*.¹⁾ The required data (i.e. net income, market capitalization, and book values of equity) are sourced from the data provider S&P Capital IQ. With regards to the profit growth, we assume a growth rate of 2.0%.

We unlever the implied returns with the following **adjusting equation** for the **costs of equity**²⁾ to take the specific leverage into account:³⁾

$$r_E^L = r_E^U + \left(r_E^U - R_f\right) * \frac{D}{E}$$

with:

 $r_{\rm E}^{\rm L}$ = Levered cost of equity $r_{\rm E}^{\rm U}$ = Unlevered cost of equity $R_{\rm f}$ = Risk-free rate $\frac{\rm D}{\rm E}$ = Debt⁴⁾-to-equity ratio

The **implied unlevered sector returns** serve as an indicator for an **aggregated** and **unlevered cost of equity** for **specific sectors**. The process of relevering a company's cost of capital to reflect a company specific debt situation (cf. calculation example on the next slide) can be worked out without using the CAPM.

- 1) cf. Babbel, Challenging Stock Prices: Share prices and implied growth expectations (Corporate Finance, n. 9, 2015, p. 316-323, especially p. 319); cf. Aders/Aschauer/Dollinger, Die implizite Marktrisikoprämie am österreichischen Kapitalmarkt (RWZ, 6/2016, p. 195-202).
- 2) In situations in which the debt betas in the market are distorted, we would have to adjust these betas to avoid unsystematic risks. For simplification reasons, we deviate from our typical analysis strategy to achieve the enterprise value (Debt beta > 0) and assume that the costs of debt are at the level of the risk-free rate. This process is designed by the so-called Practitioners formula (uncertain tax shields, debt beta = 0), cf. Pratt/Grabowski, Cost of Capital, 5th ed., 2014, p. 253.

3) We assume that the cash and cash equivalents are used entirely for operational purposes. Consequently, we do not deduct excess cash from the debt.

4) "Debt" is defined as all interest-bearing liabilities. The debt illustration of the companies in the Banking, Insurance and Financial Services sector only serves an informational purpose. We will not implement an adjustment to these companies' specific debt (unlevered) because their indebtedness is part of their operational activities and economic risk.

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Implied Sector Returns

Exemplary calculation to adjust for the company specific capital structure

Calculation example:

As of the reference date December 31, 2022, we observe a sector specific, unlevered cost of equity of **7.6%** (market-value weighted mean) in the German Basic Materials sector. For the exemplary company X, which operates in the German Basic Materials sector, the following assumptions have been made:

- The debt-to-equity ratio of the exemplary company X: **40%**
- The risk-free rate: 2.03% (cf. slide 13)

Based on these numbers, we calculate the relevered costs of equity of company X with the adjustment formula:

 $r_{\rm E}^{\rm L} = 7.6\% + (7.6\% - 2.03\%) * 40\% = 9.8\%$

Thus, **9.8%** is the company's relevered cost of equity. In comparison, the levered cost of equity of the Basic Materials sector is **11.2%**, reflecting the sectors' higher average leverage.

Implied Sector Returns (unlevered)^{*} Overview as of December 31, 2022 vs. June 30, 2022



* The returns for the sectors Banking, Insurance and Financial Services are levered sector returns. For all other sectors unlevered returns are displayed.

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Implied Sector Returns Banking, Insurance and Financial Services



Implied Sector Returns

Consumer Service, Consumer Goods and Pharma & Healthcare



December 31, 2022

Implied Sector Returns Information Technology, Telecommunication and Utilities



Implied Sector Returns Basic Materials, Industrials and Real Estate



7 Sector returns

b. Historical returns (ex-post analysis)

Historical Sector Returns Background & approach

In addition to the computation of historical market returns, we calculate historical sector returns. This allows for an alternative approach, like the implied sector returns, to the ex-post analysis of the determination of costs of capital based on regression analyses following the CAPM.

Our analysis contains so-called **total shareholder returns** analogous to the return triangles for the German, Austrian and Swiss total return indices. This means, we consider the **share price development** as well as the **dividend yield**, whereas the share price development generally represents the main component of the total shareholder return.

We calculate the **annual total shareholder returns as of December 31**, for every DAX Sector All Index, WBI, and SPI listed company. Afterwards, we aggregate those returns market-value weighted **to sector returns**. Our calculations comprise the time period between 2017 and 2022. Since annual total shareholder returns tend to fluctuate to a great extent, their explanatory power is limited. Therefore, we do not only calculate the 1-year market-value weighted means, but furthermore calculate the 3-year (2020-2022) and the 6-year (2017-2022) averages.

Historical Sector Returns

Annual total shareholder returns as of December 31, 2022



8 Trading multiples

Trading Multiples Background & approach

Besides absolute valuation models (earnings value, DCF), the **multiples approach** offers a practical approach for an enterprise value estimation. The multiples method estimates a company's value **relative** to another company's value. Following this method, the enterprise value arises from the product of a reference value (revenue or earnings values are frequently used) of the company with the respective multiples of **similar companies**.

Within this capital market study, we analyze **multiples for the "super sectors"** as well as **multiples for the DACH market** consisting of the German, Austrian and Swiss capital markets (DAX Sector All Index, ATX and SPI). We will look at the following multiples:

- Revenue-Multiples ("EV¹/Revenue")
- EBIT-Multiples ("EV¹/EBIT")
- Price-to-Earnings-Multiples ("P/E")
- Price-to-Book Value-Multiples ("EqV²)/BV")

Multiples are presented for the reference dates December 31, 2022 and June 30, 2022. The reference values are based on one-year forecasts of analysts (so called forward multiples, in the following "1yf"). Solely the Price-to-Book-Value-Multiples are calculated with book values as of the reference dates. We present median values.

We present historical multiples as of June 30, 2017 in the appendix and will update the applied multiples **semi-annually at the predefined reference date (as of December 31 and as of June 30)**.

For the purpose of **simplification**, we exclude negative multiples and multiples in the highest quantile (95%). The multiples in the lowest quantile (5%) build the lower limit.

To calculate the multiples, we source the data (i.e. Market Cap., Revenue, EBIT, etc.) from the data provider S&P Capital IQ. Based on the availability of data, especially in terms of forecasts, the number of companies underlying each specific multiple varies.

Additionally, we present a **ranking table** of the sector multiples. Firstly, sector multiples are sorted from highest to lowest for each analyzed multiple. The resulting score in the ranking is displayed in the table and visualized by a color code that assigns a **red color** to the **highest rank** and a dark **green color** to the **lowest rank**. Thus, a red colored high rank indicates a high valuation level, whereas a green colored low rank suggests a low valuation level. Secondly, we aggregate the rankings and calculate an average of all single rankings for each sector multiple. This is shown in the right column of the ranking table. This **average ranking** indicates the overall **relative valuation levels** of the sectors when using multiples.

1) Enterprise Value.

2) Equity Value.

Trading Multiples (1/2) Sector multiples as of December 31, 2022 and June 30, 2022 (1yf)

Sector	EV / Revenue	EV / EBIT	P/E	P / BV
Banking	n.a.	n.a.	9.2x 8.6x	0.8x 0.9x
Insurance	n.a.	n.a.	13.2x 11.7x	1.4x 1.1x
Financial Services	n.a.	n.a.	14.4x 12.6x	1.0x 1.3x
Consumer Service	1.0x 1.1x	17.7x 17.2x	18.2x 18.5x	1.7x 1.8x
Consumer Goods	1.0x 1.2x	15.8x 15.9x	17.4x 18.0x	1.3x 1.3x
Pharma & Healthcare	4.1x 4.4x	19.5x 20.1x	18.7x 21.0x	2.0x 3.0x
Note: For companies in the Banking Insurance and Fin	June 30, (transpare	2022 December nt fill) darker fill)	re not reported	

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Trading Multiples (2/2) Sector multiples as of December 31, 2022 and June 30, 2022 (1yf)

Sector	EV / Revenue	EV / EBIT	P/E	P / BV							
Information Technology	1.7x	15.6x	18.7x	2.3x							
	1.6x	15.9x	19.3x	2.3x							
Telecommunication	1.4x	23.3x	17.3x	1.8x							
	1.8x	21.0x	17.9x	1.8x							
Utilities	2.0x	16.9x	16.5x	1.6x							
	2.0x	16.1x	16.7x	1.8x							
Basic Materials	1.0x	12.6x	10.8x	1.1x							
	1.1x	12.0x	9.1x	1.6x							
Industrials	1.2x	16.7x	17.8x	1.6x							
	1.3x	14.8x	15.4x	1.8x							
Real Estate	7.6x	22.9x	13.7x	0.9x							
	9.7x	19.6x	14.4x	0.9x							
June 30, 2022 (transparent fill)											

Trading Multiples Country multiples – Median 1yf as of December 31, 2022 and June 30, 2022



Trading Multiples

Sector multiples ranking based on median 1yf as of December 31, 2022

	EV / Revenue 1yf	EV / EBIT 1yf	P / E 1yf	P / BV LTM	Ø Ranking	
Banking	n.a.	n.a.	12	12	12.0	The Banking sector shows the least expensive
E Insurance	n.a.	n.a.	10	7	8.5	valuation level of all sectors.
Financial Services	n.a.	n.a.	8	10	9.0	
Sconsumer Service	9	4	3	4	5.0	
Consumer Goods	8	7	5	8	7.0	
🎨 Pharma & Healthcare	2	3	1	2	2.0	The Pharma & Healthcare
Information Technology	4	8	2	1	3.8	multiples on average,
K Telecommunication	5	1	6	3	3.8	Information Technology and Telecommunication
Utilities	3	5	7	5	5.0	sectors.
S Basic Materials	7	9	11	9	9.0	
Industrials	6	6	4	6	5.5	
Real Estate	1	2	9	11	5.8	

Note: Multiples are ranked from highest to lowest values: 1 - highest (red), 9/12 - lowest (dark green).

Appendix

Historical development of trading multiples since 2017

Trading Multiples DACH – Revenue-, EBIT-, P/E- and P/BV-Multiples





P/E DACH



H2

2019

Η1

2020

H2

2020

Η1

2021

H2

2021

Η1

2022

H2

2022

EV/EBIT DACH

P/BV DACH



→ LTM arithmetic mean → LTM median → 1yf arithmetic mean → 1yf median

24.5x

17.7x

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H2

2017

Η1

2018

H2

2018

Η1

2019

0.0x

Η1

2017

Trading Multiples Banking – P/E- and P/BV-Multiples





Trading Multiples Insurance – P/E- and P/BV-Multiples







Trading Multiples Financial Services – P/E- and P/BV-Multiples





Trading Multiples Consumer Service – Revenue-, EBIT-, P/E- and P/BV-Multiples







P/E Consumer Service



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Trading Multiples Consumer Goods – Revenue-, EBIT-, P/E- and P/BV-Multiples





P/E Consumer Goods



Trading Multiples Pharma & Healthcare – Revenue-, EBIT-, P/E- and P/BV-Multiples



EV/Revenue Pharma & Healthcare



P/E Pharma & Healthcare









🔶 LTM arithmetic mean 🔶 LTM median 🔶 1yf arithmetic mean 🔶 1yf median

Trading Multiples Information Technology – Revenue-, EBIT-, P/E- and P/BV-Multiples



EV/Revenue Information Technology



P/BV Information Technology

P/E Information Technology





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Trading Multiples Telecommunication – Revenue-, EBIT-, P/E- and P/BV-Multiples





35.0x 30.0x 25.0x 24.9x 19.2x 20.0x 17.6x 15.0x 17.3x 10.0x 5.0x 0.0x H2 Η1 H2 Η1 H2 Η1 H2 Η1 H2 Η1 H2 Η1 2017 2017 2018 2018 2019 2019 2020 2020 2021 2021 2022 2022

P/E Telecommunication







← LTM arithmetic mean ← LTM median ← 1yf arithmetic mean → 1yf median VALUETRUST

Trading Multiples Utilities – Revenue-, EBIT-, P/E- and P/BV-Multiples











🔶 LTM arithmetic mean 🔶 LTM median 🔶 1yf arithmetic mean 🔶 1yf median

Trading Multiples Basic Materials – Revenue-, EBIT-, P/E- and P/BV-Multiples





P/BV Basic Materials

EV/EBIT Basic Materials



Trading Multiples Industrials – Revenue-, EBIT-, P/E- and P/BV-Multiples





P/E Industrials



Η1

2020

H2

2020

Η1

2021

H2

2019

H2

2021

Η1

2022

H2

2022





P/BV Industrials



→ LTM arithmetic mean → LTM median → 1yf arithmetic mean → 1yf median

21.7x

18.6x

L7.6x

16.7x

35.0x

30.0x

25.0x

20.0x

15.0x

10.0x

5.0x

0.0x

Η1

2017

H2

2017

Η1

2018

H2

2018

Η1

Trading Multiples Real Estate – Revenue-, EBIT-, P/E- and P/BV-Multiples









🔶 LTM arithmetic mean 🔶 LTM median 🔶 1yf arithmetic mean 🔶 1yf median

32.3x

31.0x

24.1x

H2

2021

Η1

2022

H2

2022

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H2

2017

Η1

2018

H2

2018

Η1

2019

H2

2019

Η1

2020

H2

2020

Η1

2021

45.0x

40.0x

35.0x

30.0x

25.0x

20.0x

15.0x

10.0x

5.0x 0.0x

Η1

Appendix

Composition of the sectors of DAX Sector All Index, WBI and SPI as of December 31, 2022

Banking

Germany AAREAL BANK AG COMMERZBANK AG DEUTSCHE BANK AG DT.PFANDBRIEFBK AG PROCREDIT HOLDING AG WUESTENROT & WUERTTEMBERG AG Austria BANK FUER TIROL UND VBG AG BAWAG AG **BKS BANK AG** ERSTE GROUP BANK AG **OBERBANK AG** RAIFFEISEN BANK INTERNATATIONAL AG Switzerland BASELLAND, KANTONALBANK AG BASLER KANTONALBANK SA BC DE GENEVE SA BC DU JURA SA **BC VAUDOISE SA** BERNER KANTONALBANK AG CEMBRA MONEY BANK AG CREDIT SUISSE GROUP AG EFG INTERNATIONAL AG **GLARNER KANTONALBANK AG** GRAUB KANTONALBANK AG HYPOTHEKARBANK LENZBURG AG JULIUS BAER EUROPE AG LUZERNER KANTONALBANK AG SCHWEIZERISCHE NATIONALBANK AG ST GALLER KANTONALBANK GA THURGAUER KANTONALBANK AG UBS GROUP AG VALIANT BANK AG VONTOBEL EUROPE AG WALLISER KANTONALBANK AG ZUGER KANTONALBANK AG

Insurance

Germany ALLIANZ SE DFV DEUTSCHE FAMILIENVERSICHERUNG AG HANNOVER RUECK SE MUENCHNER RUECK AG TALANX AG Austria UNIQA INSURANCE GROUP AG VIENNA INSURANCE GROUP AG Switzerland BALOISE HOLDING AG HELVETIA HOLDING AG SWISS LIFE HOLDING AG SWISS RE AG VAUDOISE VERSICHERUNGEN HOLDING SA ZURICH INSURANCE AG

Financial Services

Germany ALBIS LEASING AG **BROCKHAUS CAPITAL MGMT** CAPSENIXX AG CREDITSHELF AG DEUTSCHE BETEILIGUNGS AG DEUTSCHE BOERSE AG DEUTSCHE CANNABIS AG DF DEUTSCHE FORFAIT AG DWS GROUP GMBH & CO KGAA FINTECH GROUP AG FORIS AG FRITZ NOLS AG **GRENKE AG** HEIDELBERGER BETEILIGUNGSHOLDING AG HESSE NEWMAN CAPITAL AG HYPOPORT AG **KAP BETEILIGUNGS-AG** LINUS DIGITAL FINANCE AG MIP AG MUTARES AG OVB HOLDING AG PEARL GOLD AG SIXT LEASING SE SPOBAG VALUE MANAGEMENT & RESEARCH AG WCM BETEILIGUNGS- UND GRUNDBESITZ-AG WEBAC HOLDING AG Austria ADDIKO BANK AG **BURGENLAND HOLDING AG** WIENER PRIVATBANK SE Switzerland **BELLEVUE GROUP AG** CIF FIN TR GLOBAL ASSET MGMT AG LEONTEQ AG ONE SWISS BANK SA PARTNERS GROUP HOLDING AG

PRIVATE EQUITY HOLDING AG SWISSQUOTE GROUP HOLDING LTD TALENTHOUSE AG VALARTIS GROUP AG VZ HOLDING AG

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Consumer Service

Germany ARTNET AG

ABOUT YOU HOLDING AG AUTO1 GROUP SE BASTEI LUEBBE AG BEATE UHSE AG **BET-AT-HOME.COM AG BIJOU BRIGITTE AG** CECONOMY AG CTS EVENTIM AG & CO. KGAA DELIVERY HERO AG DELTICOM AG ELANIX BIOTECHNIK AG ELUMEO SE FIELMANN AG HAWESKO HOLDING AG HELLOFRESH SE HOME24 SE HORNBACH HOLDING AG & CO. KGAA INTERTAINMENT AG **KLASSIK RADIO AG** LUDWIG BECK AG METRO AG NEXR TECHNOLOGIES SE PHICOMM AG PROSIEBENSAT.1 MEDIA SE READCREST CAPITAL AG SCOUT24 AG SLEEPZ AG SPLENDID MEDIEN AG SPORTTOTAL AG STROEER SE & CO. KGAA TAKKT AG TRAVEL24.COM AG UNITED LABELS AG WESTWING GROUP AG WILD BUNCH AG WINDELN.DE SE YOUR FAMILY ENTERTAINMENT AG

ZALANDO SE ZEAL NETWORK SE Switzerland APG SGA AG ASMALLWORLD AG DUFRY AG GALENICA AG **HIGHLIGHT EVENT & ENTERTAINMENT AG** JUNGFRAUBAHN HOLDING AG KHD HUMBOLDT WEDAG AG MOBILEZONE HOLDING AG OREL FUESSLI HOLDING AG TX GROUP VILLARS HOLDING SA ZUR ROSE GROUP AG

Consumer Goods

Germany A.S.CREATION TAPETEN AG ADIDAS AG **BAWAG AG** BAYERISCHE MOTOREN WERKE AG BEIERSDORF AG BERENTZEN-GROUP AG BERTRANDT AG **BIKE24 HOLDING AG BKS BANK AG** BORUSSIA DORTMUND GMBH & CO. KGAA **CEWE STIFTUNG & CO.KGAA** CONTINENTAL AG DAIMLER TRUCK HOLDING AG DAIMLER AG DIERIG HOLDING AG EINHELL GERMANY AG ELRINGKLINGER AG GERRY WEBER INTERNATIONAL AG GRAMMER AG HELLA KGAA HUECK & CO. HENKEL AG & CO. KGAA HUGO BOSS AG KNAUS AG LEIFHEIT AG LEONI AG MING LE SPORTS AG MISTER SPEX SE **MUEHL PRODUKT & SERVICE AG** PFERDEWETTEN.DE AG PORSCHE AUTOMOBIL HLD. SE PROGRESS-WERK OBERKIRCH AG PUMA SE ROY ASSET HOLDING SE SAF-HOLLAND SE SCHAEFFLER AG SCHLOSS WACHENHEIM AG STO SE & CO. KGAA STS GROUP AG

SUEDZUCKER AG TC UNTERHALTUNGSELEKTRONIK AG VALENS HOLDING AG VILLEROY & BOCH AG VOLKSWAGEN AG WASGAU PRODUNKTIONS & HANDELS AG WESTAG & GETALIT AG Austria AGRANA BETEILIGUNGS-AG DO & CO AG GURKTALER AG JOSEF MANNER & COMP. AG LINZ TEXTIL HOLDING AG OTTAKRINGER GETRAENKE AG PIERER MOBILITY AG POLYTEC HOLDING AG STADLAUER MALZFABRIK AG WOLFORD AG Switzerland AIRESIS SA ARYZTA AG AUTONEUM AG BARRY CALLEBAUT AG BELL AG CALIDA HOLDING AG EMMI AG GM SA HOCHDORF HOLDING AG LALIQUE GROUP SE LECLANCHE SA LINDT & SPRUENGLI AG METALL ZUG AG NESTLE SA ORIOR AG **RICHEMONT SA** STADLER RAIL AG SWATCH GROUP SA V-ZUG

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Pharma & Healthcare

Germany

4 SC AG AAP IMPLANTATE AG **BB BIOTECH AG BIOFRONTERA AG** BIOTEST AG. CARL ZEISS MEDITEC AG CO.DON AG DERMAPHARM HOLDING SE DRAEGERWERK AG & CO. KGAA **ECKERT & ZIEGLER AG** EPIGENOMICS AG EVOTEC AG FRESENIUS MEDICAL CARE AG & CO. KGAA FRESENIUS SE & CO.KGAA GERRESHEIMER AG HEIDELBERG PHARMA AG MATERNUS-KLINK AG MEDICLIN AG MEDIGENE AG MEDIOS AG MERCK AG & CO. KGAA MORPHOSYS AG PAION AG PHARMASGP HOLDING SE **RHOEN-KLINIKUM AG** SARTORIUS AG SIEMENS HEALTHINEERS AG STRATEC SE SYGNIS AG SYNLAB AG VITA 34 AG Austria MARINOMED BIOTECH AG Switzerland ACHIKO AG ADDEX AG **AEVIS HOLDING SA** ALCON INC.

BACHEM HOLDING AG BASILEA PHARMACEUTICA AG COLTENE HOLDING AG DOTTIKON ES HOLDING AG EVOLVA HOLDING SA IDORSIA LTD IVF HARTMANN AG KINARUS THERAPEUTICS HOLDING AG KUROS BIOSCIENCES AG LONZA GROUP AG MEDARTIS HOLDING AG MOLECULAR PARTNERS AG NOVARTIS AG **OBSEVA SA** POLYPEPTIDE GROUP AG POLYPHOR AG RELIEF THERAPEUTICS HOLDING AG ROCHE AG SANTHERA PHARM. HOLDING AG SIEGFRIED HOLDING AG SKAN GROUP AG SONOVA HOLDING AG STRAUMANN HOLDING AG TECAN GROUP AG XLIFE SCIENCES AG YPSOMED HOLDING AG

Information Technology

Germany ADESSO AG ADVA OPTICAL NETWORKING SE AIXTRON SE ALL FOR ONE STEEB AG ALLGEIER SE ATOSS SOFTWARE AG **B & S BANKSYSTEME AG** BECHTLE AG CANCOM SE CENIT AG CHERRY AG COMPUGROUP MEDICAL SE DATA MODUL AG ELMOS SEMICONDUCTOR AG FIRST SENSOR AG FORTEC ELEKTRONIK AG GFT TECHNOLOGIES SE GIGASET AG **GK SOFTWARE SE** INFINEON TECHNIK AG INIT INNOVATION SE INTERSHOP COMMUNICATIONS AG INTICA SYSTEMS AG INVISION AG IVU TRAFFIC TECHNOLOGIE AG **KPS AG** MEVIS MEDICAL SOLUTIONS AG NAGARRO SE NEMETSCHEK SE NEW WORK SE NEXUS AG NORCOM INFORMATION TECHNOLOGY AG OHB SE PANAMAX AG PARAGON AG PSI AG Q.BEYOND AG

SAP SE SCHWEIZER ELECTRONIC AG SECUNET SECURITY AG SERVICEW ARE AG SILTRONIC AG SNP AG SOCIAL CHAIN AG SOFTWARE AG STEMMER IMAGING AG SUESS MICROTEC AG SYZYGY AG **TEAMVIEWER AG** TELES AG TISCON AG UNITED INTERNET AG USU SOFTWARE AG VIVANCO GRUPPE AG Austria AT&S AUSTRIA TECH.& SYSTEMTECH. AG FREQUENTIS AG **KAPSCH TRAFFICCOM AG** MASCHINENFABRIK HEID AG RATH AG Switzerland ALSO HOLDING AG AMS AG ASCOM HOLDING AG CREALOGIX HOLDING AG HUBER+SUHNER AG **KUDELSKI SA** LOGITECH INTERNATIONAL SA SOFTWAREONE HOLDING AG **TEMENOS GROUP AG U-BLOX HOLDING AG** WISEKEY INTERNATIONAL HOLDING AG

December 31, 2022

VALUETRUST

REALTECH AG

Telecommunication

Germany 1+1 AG 11 88 0 SOLUTIONS AG **3U HOLDING AG** DEUTSCHE TELEKOM AG ECOTEL COMMUNICATION AG FREENET AG LS TELCOM AG NFON AG TELEFONICA DEUTSCHLAND HOLDING AG VANTAGE TOWERS AG YOC AG Austria TELEKOM AUSTRIA AG Switzerland SWISSCOM AG

Utilities

Germany E.ON SE ENBW ENERGIE B./W. AG **ENCAVIS AG** GELSENWASSER AG MAINOVA AG **MVV ENERGIE AG RWE AG** UNIPER SE Austria EVN AG VERBUND AG Switzerland **BKW ENERGIE AG** EDISUN POWER EUROPE AG ROMANDE ENERGIE HOLDING SA

Basic Materials

Germany ALTECH ADVANCED MATERIALS AG ALZCHEM GROUP AG AURUBIS AG B.R.A.I.N. AG BASF SE BAYER AG COVESTRO AG DECHENG TECHNOLOGY AG **EISEN- & HUETTENWERKE AG EVONIK INDUSTRIES AG** FUCHS PETROLUB SE H & R GMBH & CO KGAA K & S AG LANXESS AG SALZGITTER AG SGL CARBON SE SIMONA AG SURTECO SE SYMRISE AG WACKER CHEMIE AG Austria AMAG AUSTRIA METALL AG LENZING AG OMV AG PORR AG SCHOELLER-BLECKMANN AG STRABAG SE VOESTALPINE AG WIENERBERGER AG Switzerland CLARIANT AG **CPH CHEMIE & PAPIER HOLDING AG EMS-CHEMIE AG GIVAUDAN SA** GURIT HOLDING AG SCHMOLZ & BICKENBACH AG SUNMIRROR AG **ZWAHLEN & MAYR SA**

Industrials (1/2)

Germany 7C SOLARPARKEN AG A.I.S. AG ALBA SE AMADEUS FIRE AG AUMANN AG BASLER AG BAUER AG **BAYWA AG BILFINGER SE BRENNTAG AG** COM.CHARG.SOL.AG CROPENERGIES AG DEUTSCHE POST AG DEUTZ AG DMG MORI AG DR. HOENLE AG DUERR AG ENAPTER AG ENERGIEKONTOR AG FRANCOTYP-POSTALIA HOLDING AG FRAPORT AG FRIEDRICH VORWERK GROUP SE FRIWO AG GEA GROUP AG GESCO AG HAMBURGER HAFEN & LOGISTIK AG HANSEYACHTS AG HAPAG-LLOYD AG HEIDELBERG.DRUCKMASCHINEN AG HEIDELBERGCEMENT AG HENSOLDT AG HGEARS AG HOCHTIEF AG INDUS HOLDING AG INFAS HLDG AG ITN NANOVATION AG JENOPTIK AG JOST WERKE AG

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Industrials (2/2)

JUNGHEINRICH AG KATEK SE KHD HUMBOLDT WEDAG KION GROUP AG **KLOECKNER & CO: SE KNORR-BREMSE AG KOENIG & BAUER AG KROMI LOGISTIK AG KRONES AG** KSB AG KWS SAAT SE LPKF LASER & ELECTRONICS AG LUFTHANSA AG MANZ AG MASCHINENFABRIK BERTHOLD HERMLE AG MASTERFLEX AG MAX AUTOMATION AG MBB SE MEDION AG MS INDUSTRIE AG MTU AERO ENGINES AG MUELLER-DIE LILA LOGISTIK AG NESCHEN AG NORDEX SE NORDWEST HANDEL AG NORMA GROUP SE ORBIS AG PFEIFFER VACUUM TECHNOLOGY AG PITTLER MASCHINENFABRIK AG PNE WIND AG **PVA TEPLA AG** R. STAHL AG RATIONAL AG RHEINMETALL AG **RINGMETALL AG** SCHUMAG AG SFC ENERGY AG SIEMENS AG SIEMENS ENERGY AG

SINGULUS TECHNOLOGIES AG SINO-GERMAN UNITED AG SIXT SE SLM SOLUTIONS GROUP AG SMA SOLAR TECHNOLOGY AG SOFTING AG SOLAR-FABRIK AG **TECHNOTRANS AG** THYSSENKRUPP AG TRATON SE TUFF GROUP AG UZIN UTZ AG VA-Q-TEC AG VARTA AG VERBIO VEREINIGTE BIOENERGIE AG VISCOM AG VITESCO TECHNOLOGIES GROUP AG VOLTABOX AG VOSSLOH AG WACKER NEUSON SE WASHTEC AG ZHONGDE WASTE TECHNOLOGY AG Austria ANDRITZ AG CLEEN ENERGY AG FACC AG FLUGHAFEN WIEN AG FRAUENTHAL HOLDING AG MAYR-MELNHOF KARTON AG **OESTERREICHISCHE POST AG** PALFINGER AG RHI MAGNESITA NV ROSENBAUER INTERNATIONAL AG SEMPERIT AG HOLDING SW UMWELTTECHNIK AG ZUMTOBEL GROUP AG Switzerland ABB LTD ACCELLERON INDUSTRIES LTD

ADECCO GROUP AG ADVAL TECH HOLDING AG ALUFLEXPACK AG ARBONIA AG **BELIMO AUTOMATION AG** BOSSARD HOLDING AG **BUCHER INDUSTRIES AG BURCKHARDT AG** BURKHALTER HOLDING AG **BVZ HOLDING AG** BYSTRONIC AG CICOR MANAGEMENT AG COMET HOLDING AG DAETWYLER HOLDING AG DKSH HOLDING AG DORMAKABA HOLDING AG ELMA ELECTRONIC AG FEINTOOL INTERNATIONAL HOLDING AG FISCHER AG FLUGHAFEN ZUERICH AG FORBO HOLDING AG GAVAZZI HOLDING AG GEBERIT AG IMPLENIA AG INFICON HOLDING AG INTERROLL HOLDING AG KARDEX AG KLINGELNBERG LTD KOMAX HOLDING AG **KUEHNE & NAGEL INTERNATIONAL AG** LAFARGEHOLCIM AG LANDIS+GYR GROUP AG LEM HOLDING AG MCH GROUP AG MEDACTA GROUP SA MEDMIX LTD MEIER TOBLER AG MEYER BURGER AG MIKRON SA

MONTANA AEROSPACE AG OC OERLIKON CORPORATION AG PERFECT SA PERROT DUVAL HOLDING SA PHOENIX AG **RIETER MASCHINENFABRIK AG** SCHAFFNER AG SCHINDLER AUFZUEGE AG SCHLATTER HOLDING AG SCHWEITER TECHNOLOGIES AG SENSIRION HOLDING AG SFS GROUP AG SGS SA SIG COMBIBLOC GROUP AG SIKA AG STARRAG GROUP HOLDING AG SULZER AG TORNOS HOLDING AG VAT GROUP AG VETROPACK HOLDING AG VON ROLL HOLDING AG ZEHNDER GROUP AG

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Real Estate

Germany

ACCENTRO REAL ESTATE AG ADLER REAL ESTATE AG ALSTRIA OFFICE REIT-AG DEMIRE DEUTSCHE MITTELSTAND REAL ESTATE AG DEUTSCHE EUROSHOP AG DEUTSCHE KONSUM REIT-AG DEUTSCHE REAL ESTATE AG DEUTSCHE WOHNEN AG DIC ASSET AG EYEMAXX REAL ESTATE AG FAIR VALUE REIT-AG FCR IMMOBILIEN AG GATEWAY REAL ESTATE AG GWB IMMOBILIEN AG HAMBORNER REIT AG INSTONE REAL ESTATE GROUP N.V. LEG IMMOBILIEN AG PATRIZIA IMMOBILIEN AG TAG IMMOBILIEN AG TTL AG **VONOVIA SE** YMOS AG Austria CA IMMOBILIEN ANLAGEN AG **IMMOFINANZ AG** S IMMO AG UBM DEVELOPMENT AG WARIMPEX FINANZ- UND BETEILIGUNGS AG Switzerland ALLREAL HOLDING AG ARUNDEL AG EPIC SUISSE AG FUNDAMENTA REAL ESTATE AG HIAG IMMOBILIEN HOLDING AG INA INVEST HOLDING AG INTERSHOP HOLDING AG **INVESTIS HOLDING SA** MOBIMO HOLDING AG

NOVAVEST REAL ESTATE AG ORASCOM DEVELOPMENT HOLDING AG PEACH PROPERTY GROUP AG PLAZZA AG PSP SWISS PROPERTY AG SWISS FINANCE & PROPERTY GROUP AG SWISS PRIME SITE AG VARIA US PROPERTIES AG WARTECK INVEST AG ZUEBLIN IMMOBILIEN HOLDING AG ZUG ESTATES HOLDING AG

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