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European Capital Market Study

March 31, 2020

Analysis of cost of capital parameters and multiples for European capital markets

March 31, 2020

Volume 5, April 2020

Overview

Content & Contacts

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1 Preface & people

European Capital Market Study
Preface

Dear business partners and friends of ValueTrust,

We are pleased to release our fifth edition of the **ValueTrust European Capital Market Study**, which is usually released on a semi-annual basis. However, given the **current COVID-19 crisis** and the associated declines in market capitalization and revision of analyst forecasts, we release an additional study as of March 31, 2020 in order to give decision-makers guidelines with regard to current valuation parameters.

With this study, we provide a data compilation of **capital market parameters** that enables an enterprise valuation in Europe. It has the purpose to serve as an assistant and data source as well as to show trends of the analyzed parameters.

In this study, we analyze the relevant parameters to calculate the cost of capital with 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 unlevered cost of equity to the company specific debt situation**. This procedure serves as an alternative to the CAPM.

Furthermore, we provide an analysis of empirical (ex-post) cost 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 **European capital market** (in form of the STOXX Europe 600). This index includes the countries Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland as well as the UK and has been subdivided into **ten sector indices by industry**[1)]: Financials, Basic Materials, Consumer Cyclicals, Telecommunications Services, Industrials, Consumer Non-Cyclicals, Healthcare, Technology, Utilities and Energy.

Mostly, the historical data has been compiled from the reference dates between December 31, 2013 and March 31, 2020.

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1) Based on Thomson Reuters Business Classification.

European Capital Market Study
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European Capital Market Study
Disclaimer

This study presents an empirical analysis, which serves the purpose of illustrating the cost of capital of European capital markets. Nevertheless, the available information and the corresponding exemplifications do not allow a complete presentation of a proper derivation of costs of capital. Furthermore, the market participant has to take into account that the company specific costs of capital can vary widely due to individual corporate situations.

The listed information is not specified 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 and Thomson Reuters Aggregates App.

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

ValueTrust does not assume any liability for the up-to-datedness, completeness or accuracy of this study or its contents.

2 Executive summary

Executive Summary (1/2)

Risk-free rate	▪ In comparison to December 31, 2019, the European risk-free rate decreased from 0.21% to 0.11% as of March 31, 2020. This is largely a consequence of the liquidity measures taken by the European Central Bank in response to the COVID-19 crisis.	Chapter 3
Market return and market risk premium	▪ The implied market return (ex-ante) for the European market increased from 7.8% as of December 31, 2019 to 9.1% as of March 31, 2020, mainly caused by a severe decline in market capitalizations in March 2020. ▪ The market risk premium rose from 7.6% to 9.0%, mainly due to the increase of the implied market return. ▪ The annual total shareholder return was -12.6% as of March 31, 2020. When looking at the past 15 years, we observe average historical market returns between 4.9% p.a. and 7.2% p.a.	Chapter 4
Betas	▪ The Energy sector has the highest unlevered sector-specific beta at 0.78 and with a levered beta of 1.10 the Energy sector is only insignificantly lagging the levered beta of the Financials at 1.11 (for a five-year period). ▪ Companies within the Utilities sector display the lowest unlevered beta at 0.44 and the lowest levered beta at 0.68 as of March 31, 2020.	Chapter 6
Sector returns (p.a.) ex ante	▪ Between December 31, 2019 and March 31, 2020 the development of the implied sector returns demonstrated an increasing trend across all sectors with the exception of the Energy sector. The ex-ante analysis of implied sector returns reveals that unlevered sector returns are the highest for the companies of the Energy sector at 5.8% (9.4% levered) and the lowest for the companies of the Utilities sector at 3.6% (8.3% levered) as of March 31, 2020. ▪ The Financials sector shows the highest levered implied sector return at 11.6%.	Chapter 7a

Executive Summary (2/2)

Sector returns (p.a.) ex post

- The total annual shareholder returns of all sectors show significant declines as of March 31, 2020 vs. December 31, 2019. Most sectors yield negative total annual shareholder returns as of March 31, 2020.
- The ex-post analysis of historical sector returns highlights that over a three-year period all sectors show positive total shareholder returns except the Financials, Telecommunication and Energy sectors.
- The Utilities sector shows the highest total shareholder returns both annually and over a three-year period as of March 31, 2020.
- The lowest total annual shareholder returns were realized by the Energy sector at -30.8% as of March 31, 2020.

Chapter 7b

Trading Multiples

- As of March 31, 2020, the Healthcare sector displays the highest 1yf Revenue-Multiples compared to all other sectors with 3.4x.
- Opposed to that, the lowest 1yf Revenue-Multiple with a value of 0.7x is attributable to the Energy sector.
- The highest 1yf P/E-Multiple can be observed for the Technology sector with 19.0x as of March 31, 2020. In contrast, Financials post the lowest 1yf P/E-Multiples with 8.1x.
- With exception of the Energy sector all sectors show lower forward earnings multiples on March 31, 2020 compared to December 31, 2019. This is the consequence of a stronger decline in market capitalisations than reduction in earnings estimates.
- Overall, the Technology sector shows the highest valuation level on average, followed by the Healthcare sector. On the contrary, Financials shows the lowest average valuation level.

Chapter 8

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 risk of default. It serves as an input parameter for the **CAPM** in order to determine the risk-adequate cost of capital.

The risk-free rate is a yield which is obtained from **long-term government bonds** of European countries with top-notch rating. As of the reference date, the AAA-rated countries in the Eurozone included Germany, Luxembourg and the Netherlands. The European Central Bank (ECB) publishes – on a daily basis – the parameters needed to determine the yield curve using the **Svensson method**.[1)] By using interest rate data from different maturities, a **yield curve** can be estimated for fictitious zero-coupon bonds (spot rates) for a period of up to 30 years. 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.

To compute the risk-free rate for a specific reference date we used an average value of the daily yield curves of the **past three months.** This method **avoids a misleading semblance of precision** and is recognized in court proceedings.[2)]

Additionally, we illustrate the monthly development of the risk-free rates since December 31, 2013 for the European capital markets.

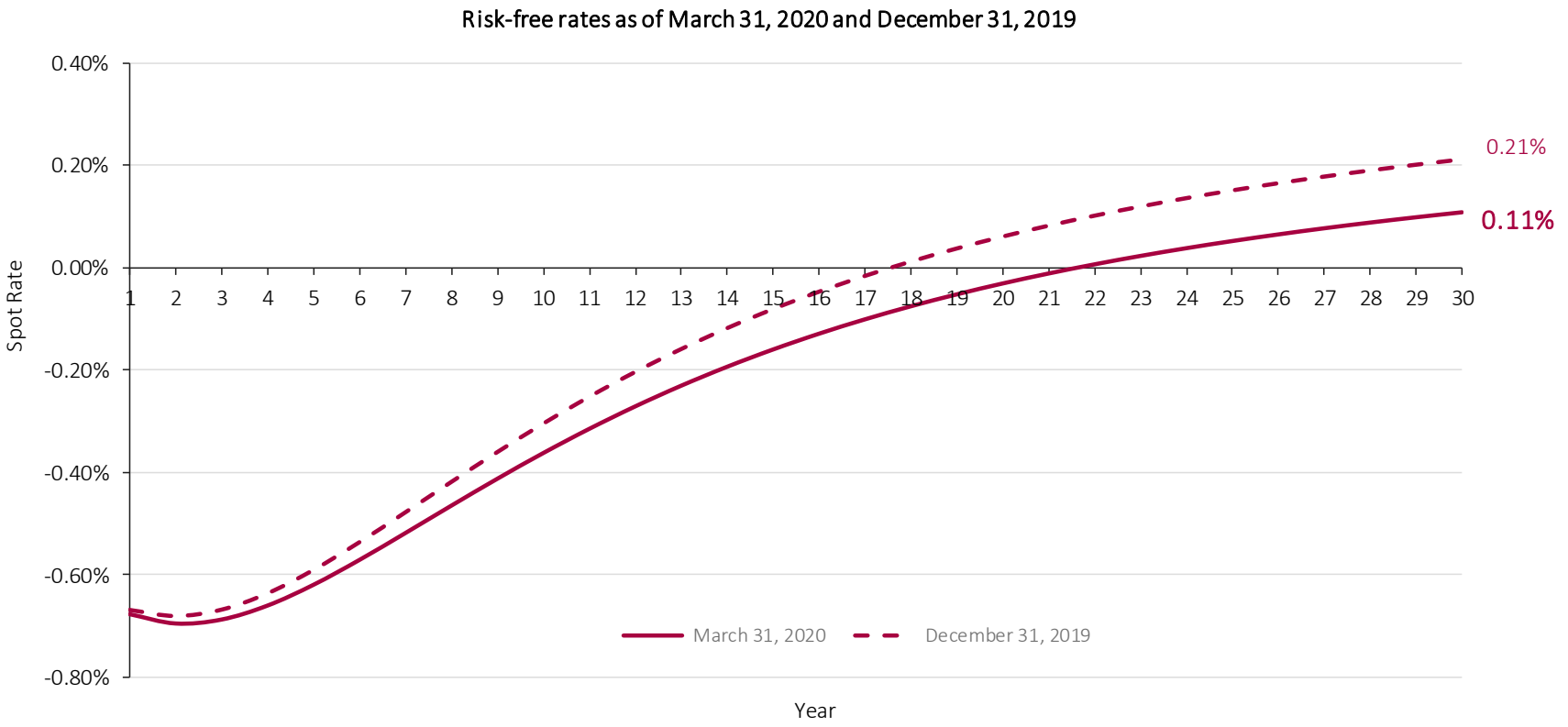
1) European Central Bank (https://www.ecb.europa.eu/stats/financial_markets_and_interest_rates/euro_area_yield_curves/html/index.en.html).

2) The Institute of Public Auditors (Institut der Wirtschaftsprüfer, IDW) in Germany also recommends this approach.

Risk-Free Rate – Europe

Determination according to IDW S 1

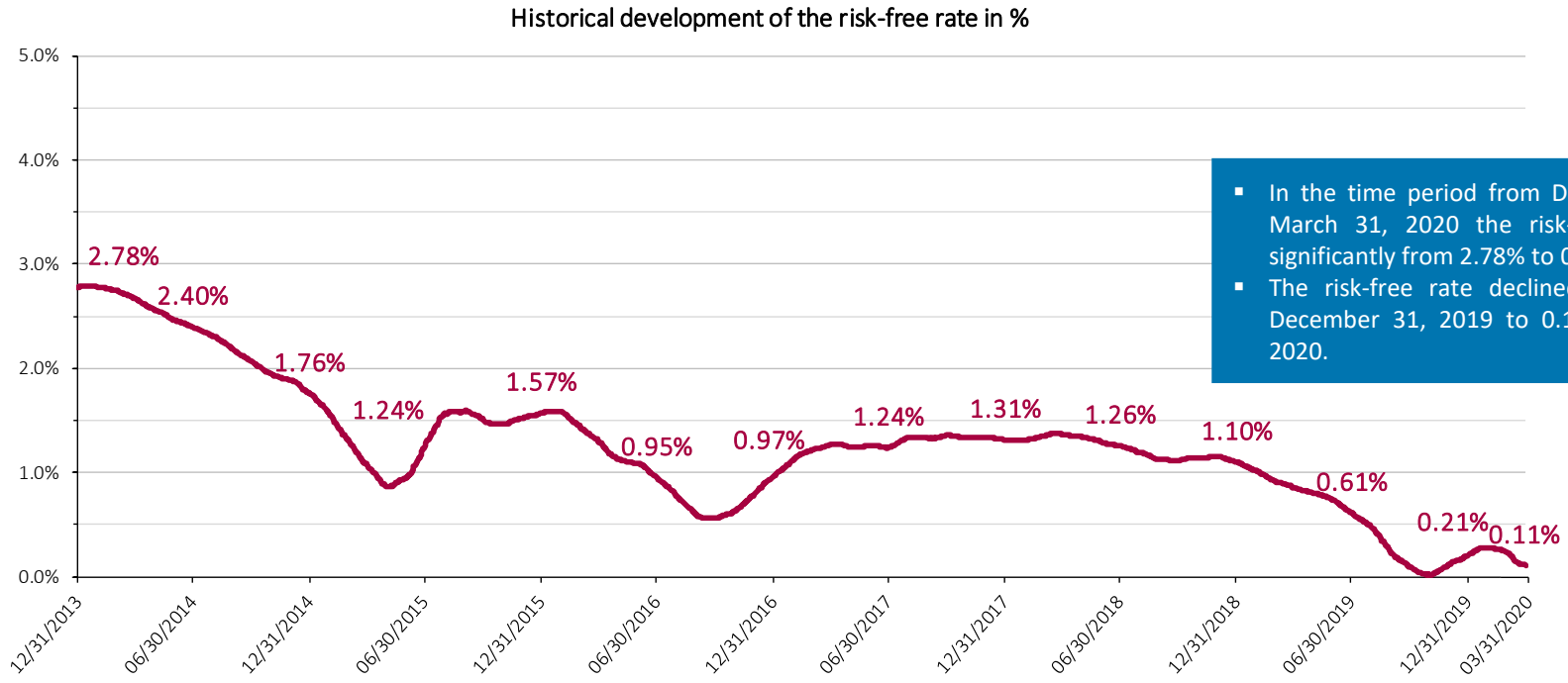
Interest rate curve based on long-term bonds (Svensson Method)



Note: Interest rate as of reference date using 3-month average yield curves in accordance with IDW S 1.

Risk-Free Rate – Europe

Historical development of the risk-free rate (Svensson method) since 2013



- In the time period from December 31, 2013 to March 31, 2020 the risk-free rate decreased significantly from 2.78% to 0.11%.
- The risk-free rate declined from 0.21% as of December 31, 2019 to 0.11% as of March 31, 2020.

Risk-free rate	January	February	March	April	May	June	July	August	September	October	November	December
2020	0.28%	0.24%	0.11%									
2019	1.02%	0.92%	0.86%	0.80%	0.74%	0.61%	0.48%	0.23%	0.10%	0.02%	0.11%	0.21%
2018	1.31%	1.35%	1.37%	1.35%	1.29%	1.26%	1.19%	1.13%	1.12%	1.14%	1.15%	1.10%
2017	1.12%	1.21%	1.27%	1.25%	1.26%	1.24%	1.33%	1.33%	1.36%	1.34%	1.34%	1.31%
2016	1.59%	1.45%	1.29%	1.13%	1.09%	0.95%	0.78%	0.60%	0.56%	0.63%	0.78%	0.97%
2015	1.56%	1.32%	1.07%	0.87%	0.95%	1.24%	1.57%	1.59%	1.51%	1.46%	1.52%	1.57%
2014	2.78%	2.75%	2.67%	2.56%	2.46%	2.40%	2.31%	2.18%	2.07%	1.95%	1.89%	1.76%

4 Market returns and market risk premium

a. Implied returns (ex-ante analysis)

Implied Market Returns and Market Premium
Background & approach

The **future-oriented** computation of **implied market returns** and **market risk premiums** is based on earnings estimates for public companies and return calculations. This approach is called ex-ante analysis and allows to calculate the "**implied cost of capital**". It is to be distinguished from the **ex-post 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 in momentum in recent times. For example, it was recognized by the German *Fachausschuss für Unternehmensbewertung* "**FAUB**".[1)] It is acknowledged that implied cost of capital capture the **current capital market situation and** are thus able to reflect the effects of the current **low interest rate environment**.

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 to annually – the formula of the Residual Income Valuation Model by *Babbel*:[2)]

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

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

Through dissolving the model to achieve 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 our data (i.e. the expected annual net income, the market capitalizations, and the book value of equity, etc.) of the analyzed sectors from the data supplier Thomson Reuters. Additionally, we apply the European Central Bank target inflation rate of **2.0% as a typified growth rate**.

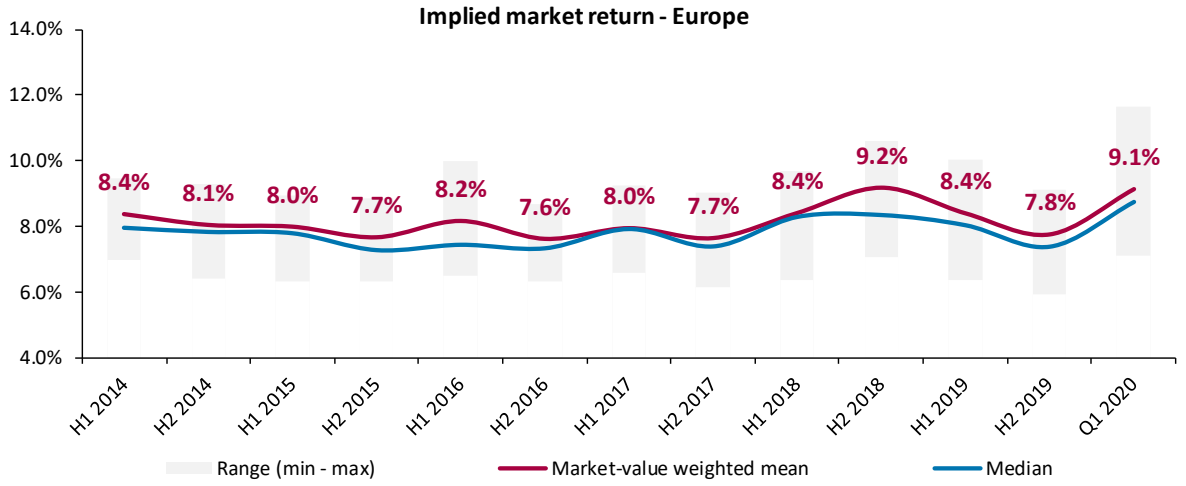
Henceforth, we determine the **implied market returns** for the STOXX Europe 600. We consider this index as a valid approximation for the total European market. The result builds the starting point for the calculation of the **implied market risk premium** of the European capital market.

1) cf. Castedello/Jonas/Schieszl/Lenckner, Die Marktrisikoprämie im Niedrigzinsumfeld – Hintergrund und Erläuterung der Empfehlung des FAUB (WPg, 13/2018, p. 806-825).
2) cf. Babbel, Challenging Stock Prices: Share prices and implied growth expectations (Corporate Finance, n. 9, 2015, p. 316-323, especially p. 319).
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); ValueTrust powered by finexpert and JKU, DACH Capital Market Study December 31, 2019.

Implied Market Returns
European Market – STOXX Europe 600

Implied market return - Europe

	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
	06/30/2014	**12/31/2014**	**06/30/2015**	**12/31/2015**	**06/30/2016**	**12/31/2016**	**06/30/2017**	**12/31/2017**	**06/30/2018**	**12/31/2018**	**06/30/2019**	**12/31/2019**	**03/31/2020**
Minimum	7.0%	6.4%	6.3%	6.3%	6.5%	6.3%	6.6%	6.2%	6.4%	7.1%	6.4%	5.9%	7.1%
Median	7.9%	7.8%	7.8%	7.3%	7.4%	7.3%	7.9%	7.4%	8.3%	8.3%	8.0%	7.4%	8.7%
Arithmetic mean	8.1%	7.8%	7.8%	7.4%	7.9%	7.4%	7.8%	7.5%	8.2%	8.9%	8.3%	7.6%	9.0%
Market-value weighted mean	**8.4%**	**8.1%**	**8.0%**	**7.7%**	**8.2%**	**7.6%**	**8.0%**	**7.7%**	**8.4%**	**9.2%**	**8.4%**	**7.8%**	**9.1%**
Maximum	9.5%	9.3%	9.0%	8.8%	10.0%	8.7%	9.3%	9.0%	9.7%	10.6%	10.0%	9.1%	11.6%



- The market-value weighted mean of the implied European market return increased from 7.8% as of December 31, 2019 to 9.1% as of March 31, 2020.
- Thus, at 9.1% as of March 31, 2020 the implied market return nearly reached again its highest level of 9.2% in H2 2018.

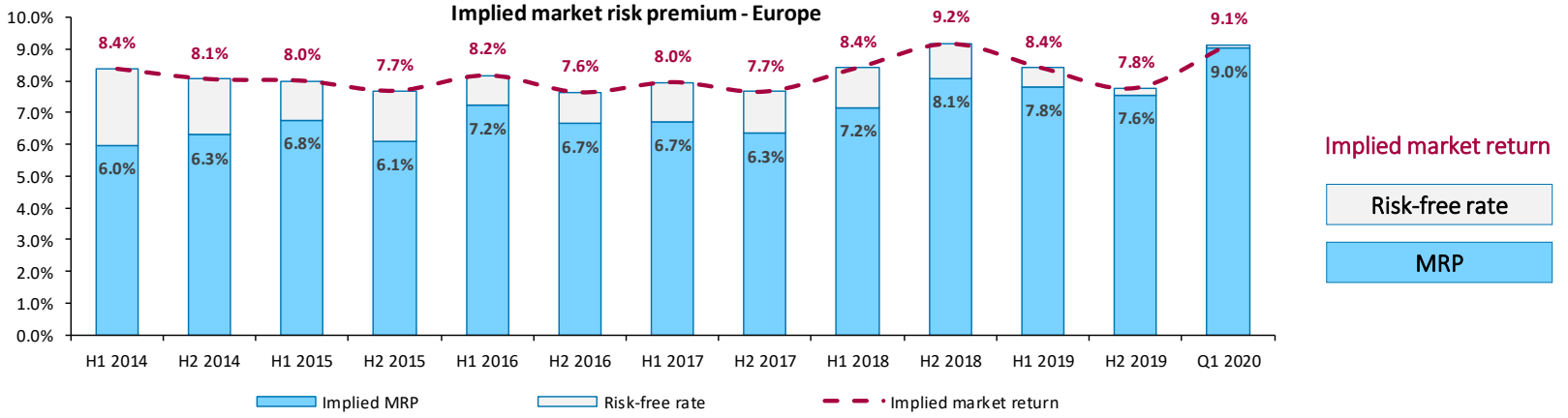
Note: Range based on implied sector returns.

Implied Market Risk Premium
European Market – STOXX Europe 600

Knowing the **implied market return** and the daily measured risk-free rate of the European capital market, we can determine the implied **market risk premium**.

In the years from 2014 to 2020 the **implied market returns** ranged from **7.6% to 9.2%**. Subtracting the risk-free rate from the implied market return, we derive a **market risk premium** within the range of **6.0% to 9.0%.**

The **implied market return lies at 9.1%** as of the reference date March 31, 2020. Taking the **risk-free rate of 0.11%** into account, we determine an **implied market risk premium of 9.0%**, which is at the upper end of the range in the observation period. To determine the appropriate market risk premium for valuation purposes, it is important to take also the analysis of historical returns as well as volatility (see p. 20) into account.



	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
Implied market return	8.4%	8.1%	8.0%	7.7%	8.2%	7.6%	8.0%	7.7%	8.4%	9.2%	8.4%	7.8%	9.1%
Risk-free rate	2.4%	1.8%	1.2%	1.6%	1.0%	1.0%	1.2%	1.3%	1.3%	1.1%	0.6%	0.2%	0.1%
Implied MRP	**6.0%**	**6.3%**	**6.8%**	**6.1%**	**7.2%**	**6.7%**	**6.7%**	**6.3%**	**7.2%**	**8.1%**	**7.8%**	**7.6%**	**9.0%**

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 analyze **historical (ex-post) returns**. Once this analysis is performed over a **long-term observation period**, an expected **return potential** of the European capital market 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 European capital market, 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 needful to focus on **total return indices** because they include the price and dividend yields. Since the **STOXX Europe 600** is a performance index, it only includes price yields. Hence, we need its total return index. The relevant total return index for Europe is called the STOXX Europe 600 Gross Return ("**STOXX Europe 600 GR**").

The following slide serves as an introduction by showing the historical development of the **STOXX Europe 600 GR** since **March 2014**. Additionally, the EURO STOXX 50 Volatility ("**VSTOXX**") is displayed for the same period. The VSTOXX serves as an indicator for the **stock market's expectations of volatility** and can thus be used as a risk measure. The **VSTOXX** is often named "fear index", high levels are typically associated with more turbulent markets.

The observation period for the total shareholder returns analysis amounts to 15 years. Therefore, the analyzed data of the STOXX Europe 600 GR Return reaches back to March 31, 2006.

The following slides illustrate how the two calculation methods (arithmetic and geometric mean) differ from each other for the period between March 31, 2005 and March 31, 2020. For the longest **observation period** of **15 years** the average historical mean of the market return amounts to **7.2%**. Using geometrical averaging, we obtain a market return of **4.9%**.

Please note that the historical market return calculations are based on actual index data points, whereas the implied market return and all sector calculations are based on the Thomson Reuters Aggregates App. Therefore, the comparability can be impeded by different aggregation and composition methodologies.

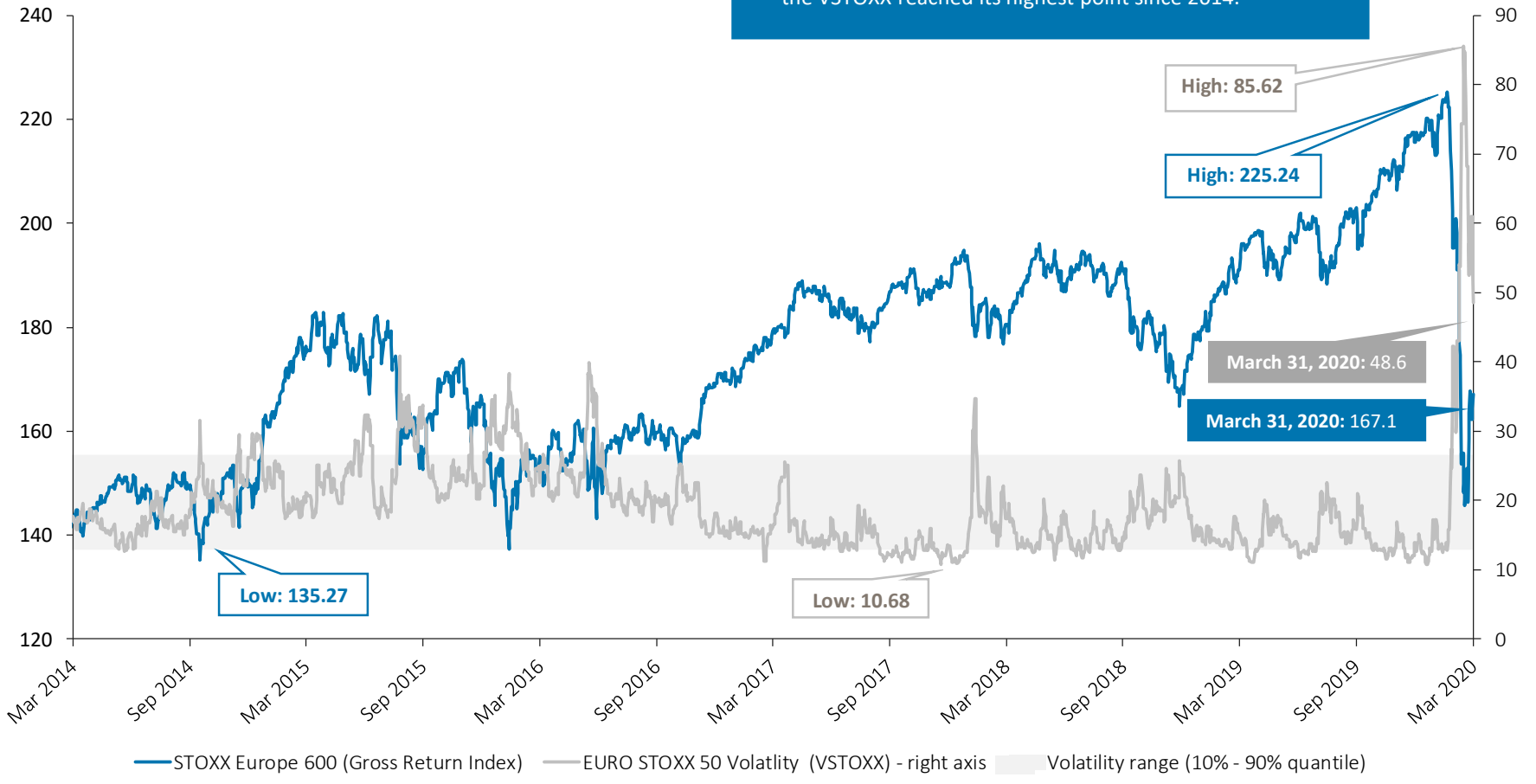
1) The German Stock Institute e.V. (DAI) developed the return triangle for DAX and EURO STOXX.

Historical Market Returns and Volatility – European Market

STOXX Europe 600 GR vs. VSTOXX since 2014

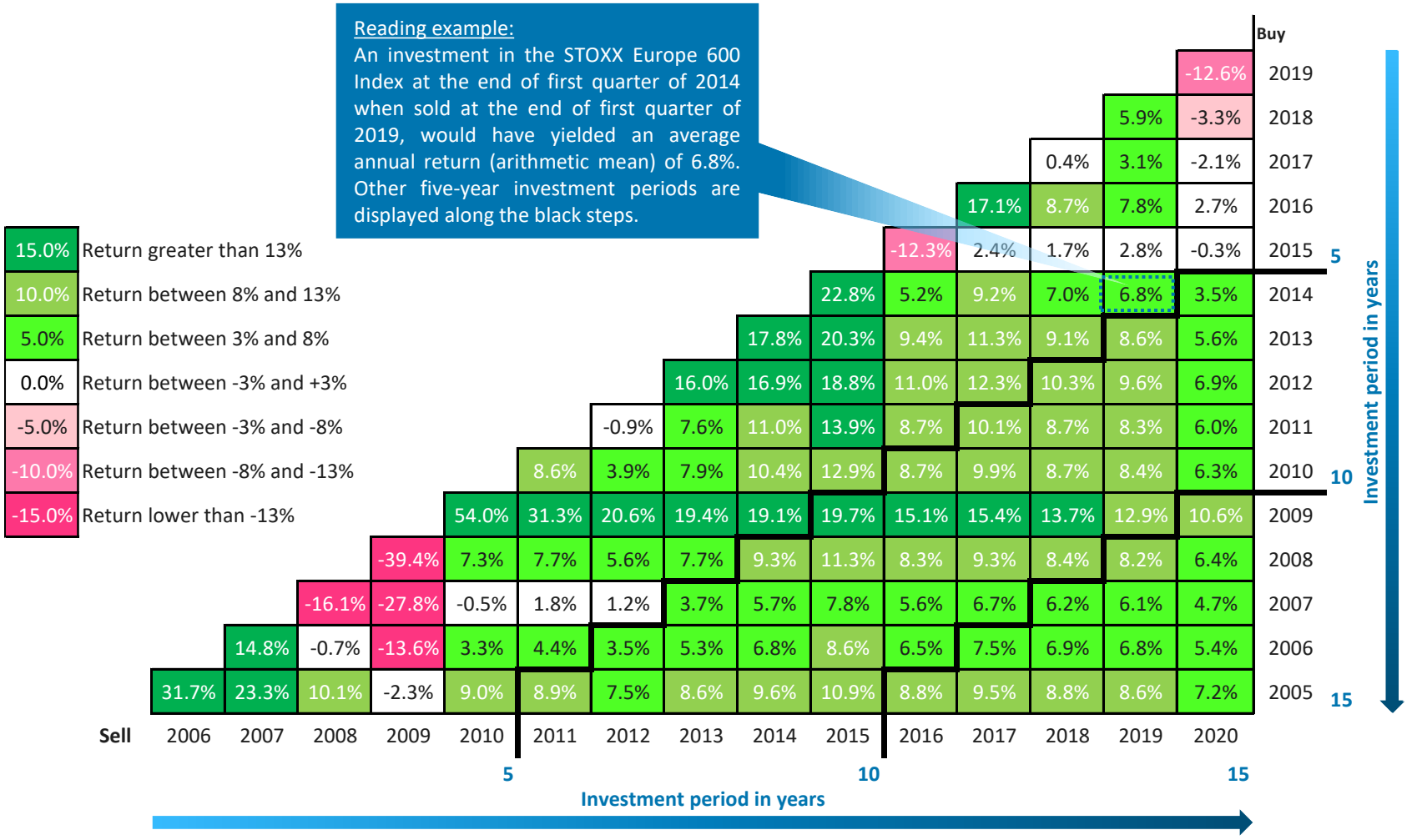
- In the first quarter of 2020 the STOXX Europe 600 declined nearly 30%, equaling the levels of 2016.
- Since March 2019, the VSTOXX increased from rather low levels close to the 10% quantile. In the first quarter of 2020, the VSTOXX reached its highest point since 2014.

Historical development of STOXX Europe 600 GR vs VSTOXX



Historical Market Returns (Arithmetic Mean) – European Market

STOXX Europe 600 GR Return Triangle as of March 31, 2020



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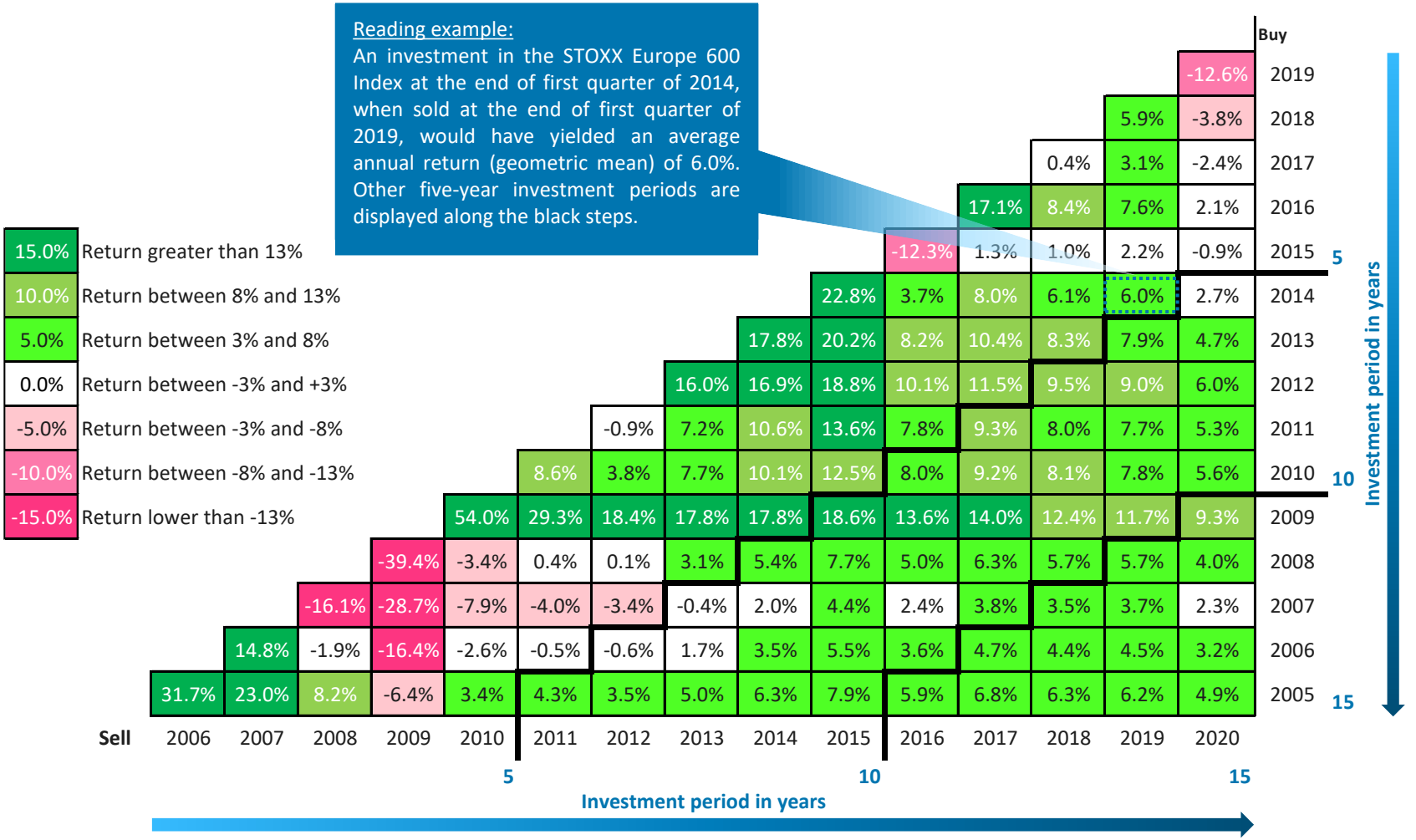
Historical Market Returns (Geometric Mean) – European Market

STOXX Europe 600 GR Return Triangle as of March 31, 2020



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5 Sector classification of European companies

based on STOXX® industry classification

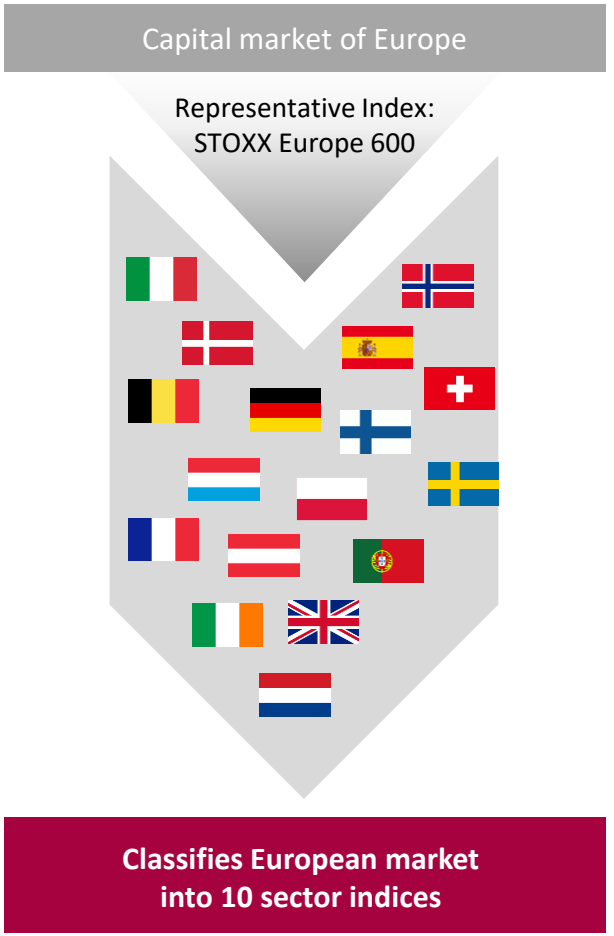
Sector Indices of the European Capital Market
Methodology & approach

The sector indices aim to cover the **whole capital market of Europe**. Therefore, this capital market study contains all equities of the **STOXX Europe 600** as listed in the Thomson Reuters Aggregates App.[1)] The STOXX Europe 600 Index represents large, mid and small capitalization companies across **17 countries of the European region**: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

The **ten sector indices** for this study are defined according to the Thomson Reuters Business Classification:

- Financials
- Basic Materials
- Consumer Cyclicals
- Telecommunications Services
- Industrials
- Consumer Non-Cyclicals
- Healthcare
- Technology
- Utilities
- Energy

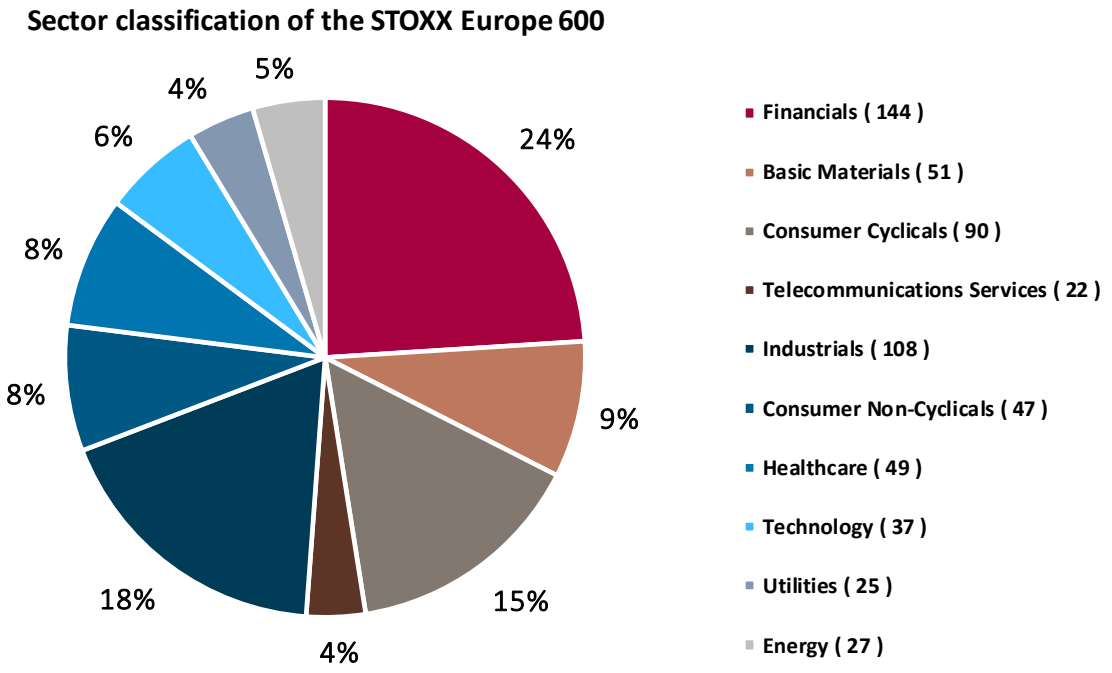
sector indices



1) The Thomson Reuters Aggregates App offers analyst forecasts and historical values of key financials on an aggregated sector level.

Sector Indices of Europe as of March 31, 2020

Sector distribution and number of companies



The chart shows the percentage distribution of the 600 listed companies in the 10 industries based on the STOXX Europe 600 as listed in the Thomson Reuters Aggregates App (the numerical amounts are listed behind the sector names).

The ten defined sectors can be classified in three different dimensions:

- Seven different sectors represent a share of less than 10%,
- two sectors represent a share between 10% and 20%,
- and one sector represents a share of more than 20%.

Companies within the Financials and Industrials sectors represent more than 40% of the entire market measured by the number of companies included in the STOXX Europe 600 index.

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 on the basis of **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 do 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**").

The estimation of beta factors is usually accomplished through a **linear regression analysis**. Furthermore, it is important to set a time period, in 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**.

In the CAPM, company specific **risk premiums** include besides the **business risk** also the **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 sector rating through the application of the **credit spread** derived from the expected cost of debt. The **debt beta** is then derived by dividing the **sector credit spread** by the current **European market risk premium**. For simplification reasons, we do not adjust the credit spread for unsystematic risks.

In this study, we use levered sector betas as determined in the Thomson Reuters Aggregates App. Due to data availability, we only apply the five-year observation period and then calculate unlevered betas.

Betas

Sector specific levered and unlevered betas as of March 31, 2020

Sector	Beta levered 5-years 2020-2015 monthly	Debt ratio[1)] 5-years 2020-2015 monthly	Leverage 5-years 2020-2015 monthly	Rating as of March 31, '20	Credit Spread 5-years 2020-2015 monthly	Debt Beta 5-years 2020-2015 monthly	Beta unlevered 5-years 2020-2015 monthly
Financials	1.11	67%	205%	BBB+	1.78%	n.a.	n.a.[2)]
Basic Materials	1.02	35%	55%	BBB	1.56%	0.20	0.73
Consumer Cyclicals	1.06	47%	90%	BBB+	1.78%	0.22	0.66
Telecommunications Services	0.66	58%	136%	BBB-	2.50%	0.31	0.46
Industrials	1.03	53%	111%	BBB	1.56%	0.20	0.59
Consumer Non-Cyclicals	0.70	47%	89%	BBB	1.56%	0.20	0.46
Healthcare	0.86	39%	63%	A-	1.22%	0.15	0.58
Technology	0.97	27%	37%	A-	1.22%	0.15	0.75
Utilities	0.68	57%	135%	BB+	2.00%	0.25	0.44
Energy	1.10	37%	58%	BBB+	1.78%	0.22	0.78
All	**0.94**[3)]						

1) The debt ratio corresponds to the debt-to-total capital ratio.

2) The debt illustration of the companies of the Financials sector only serves informational purposes. We will not implement an adjustment to the company's specific debt (unlevered) because a bank's indebtedness is part of its operational activities and economic risk. Therefore, a separation of operational and financial obligations is not possible. In addition, 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.

3) The levered beta of the market does not exactly amount to 1.00 due to the exclusion of statistically insignificant betas.

7 Sector returns

a. Implied returns (ex-ante analysis)

Implied Sector Returns
Background & approach

Besides the future-oriented calculation of **implied market returns**, we calculate **implied returns for sectors**. That offers an **alternative** and simplification to 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 a **sector specific leverage**. Because of this, another simplification is 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 Thomson Reuters on an aggregated sector level. Regarding the profit growth, we assume for all sectors for simplification purposes 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_E^L = Levered cost of equity
r_E^U = Unlevered cost of equity
R_f = Risk-free rate
$\frac{D}{E}$ = Debt[4)] -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); 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 capital 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 of the "Financials" sector only serves an informational purpose. We will not implement an adjustment to the company's specific debt (unlevered) because a bank's indebtedness is part of its operational activities and economic risk.

Implied Sector Returns

Exemplary calculation to adjust for the company specific capital structure

Calculation example:

As of the reference date March 31, 2020, we observe sector specific, levered cost of equity of **8.4%** (market-value weighted mean) in the European Basic Materials sector. Taking the sector-specific leverage into account, we derive unlevered cost of equity of **5.7%.** For the exemplary company X, which operates in the European Basic Materials sector, the following assumptions have been made:

- The debt-to-equity ratio of the exemplary company X: **40%**
- The risk-free rate: **0.11%**

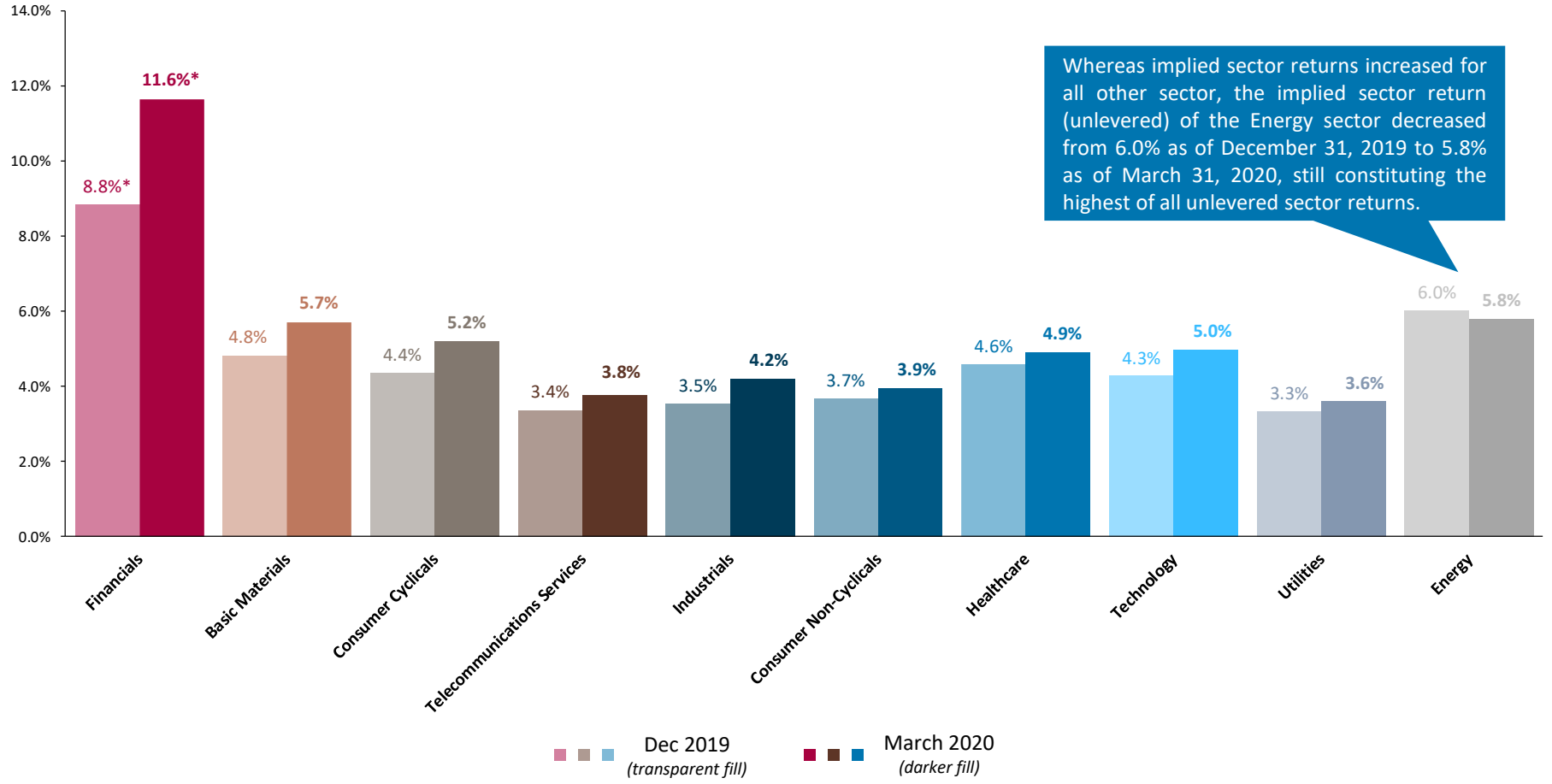
Based on these numbers, we can calculate the relevered costs of equity of company X with the adjustment formula:

$$\mathbf{r_E^L} = 5.7\% + (5.7\% - 0.11\%) * 40\% = 7.9\%$$

Thus, **7.9%** is the company's relevered cost of equity. In comparison, the levered cost of equity of the Basic Materials sector is **8.4%**, reflecting the sectors' higher average leverage.

Implied Sector Returns (unlevered)*
Overview as of March 31, 2020 vs December 31, 2019

The increase of implied sector returns is the consequence of declines in market caps (average unweighted: -26%) outstripping the downwards revision in analyst estimates (average unweighted: -17%) in Q1 2020. This applies to all sectors except Energy.

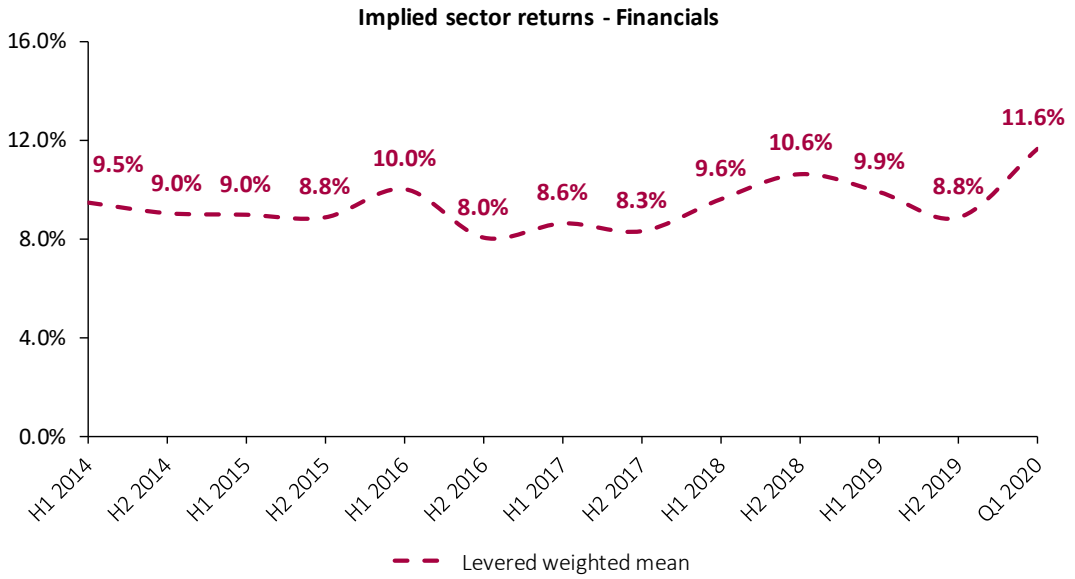


* The returns for the Financials sector refer to levered sector returns. For all other sectors unlevered returns are displayed.

Implied Sector Returns
Financials

Implied sector returns - Financials

	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
	06/30/2014	**12/31/2014**	**06/30/2015**	**12/31/2015**	**06/30/2016**	**12/31/2016**	**06/30/2017**	**12/31/2017**	**06/30/2018**	**12/31/2018**	**06/30/2019**	**12/31/2019**	**03/31/2020**
Levered weighted mean	9.5%	9.0%	9.0%	8.8%	10.0%	8.0%	8.6%	8.3%	9.6%	10.6%	9.9%	8.8%	11.6%
Leverage	267.5%	267.2%	226.9%	226.7%	210.2%	210.4%	206.0%	206.0%	191.7%	189.1%	199.3%	200.8%	201.2%



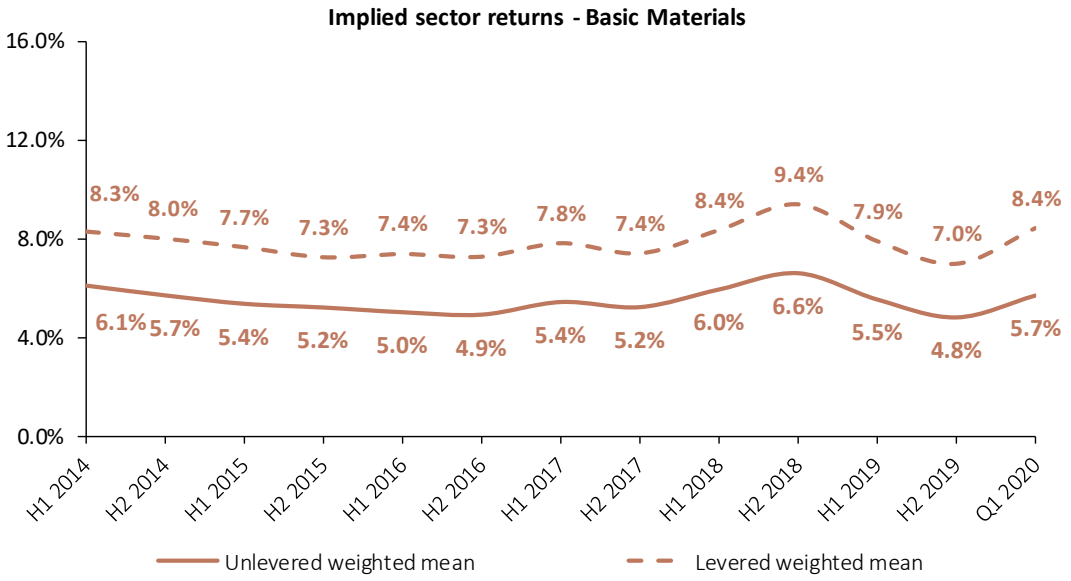
- The implied sector return of the Financials sector increased from 8.8% as of December 31, 2019 to 11.6% as of March 31, 2020.
- Overall, we can observe a fluctuation between 8.0% and 11.6% of the levered weighted mean since June 30, 2014.

Note: The debt illustration of the companies of the Financials sector only serves informational purposes. We will not implement an adjustment to the company's specific debt (unlevered) because a bank's indebtedness is part of its operational activities and economic risk.

Implied Sector Returns
Basic Materials

Implied sector returns - Basic Materials

	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
	06/30/2014	**12/31/2014**	**06/30/2015**	**12/31/2015**	**06/30/2016**	**12/31/2016**	**06/30/2017**	**12/31/2017**	**06/30/2018**	**12/31/2018**	**06/30/2019**	**12/31/2019**	**03/31/2020**
Levered weighted mean	8.3%	8.0%	7.7%	7.3%	7.4%	7.3%	7.8%	7.4%	8.4%	9.4%	7.9%	7.0%	8.4%
Leverage	59.2%	58.3%	55.6%	55.9%	57.8%	59.3%	56.8%	55.7%	51.4%	50.8%	48.0%	47.3%	48.9%
Unlevered weighted mean	**6.1%**	**5.7%**	**5.4%**	**5.2%**	**5.0%**	**4.9%**	**5.4%**	**5.2%**	**6.0%**	**6.6%**	**5.5%**	**4.8%**	**5.7%**

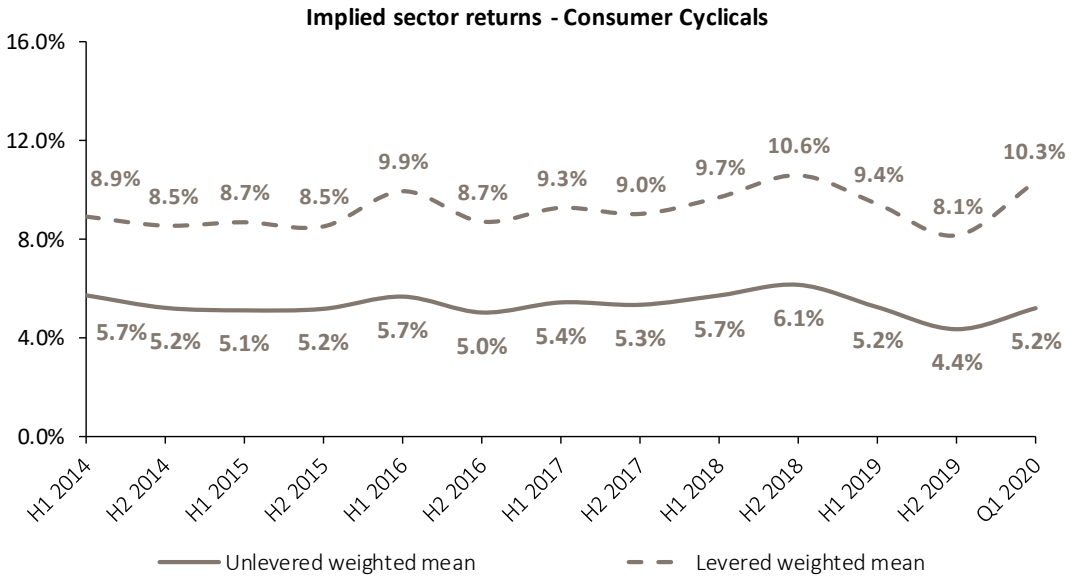


- The implied sector return (unlevered) in the Basic Materials sector increased from 4.8% as of December 31, 2019 to 5.7% as of March 31, 2020.
- In comparison to other sectors, the Basic Materials sector has the second highest unlevered implied sector return as of March 31, 2020.

Implied Sector Returns
Consumer Cyclicals

Implied sector returns - Consumer Cyclicals

	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
	06/30/2014	**12/31/2014**	**06/30/2015**	**12/31/2015**	**06/30/2016**	**12/31/2016**	**06/30/2017**	**12/31/2017**	**06/30/2018**	**12/31/2018**	**06/30/2019**	**12/31/2019**	**03/31/2020**
Levered weighted mean	8.9%	8.5%	8.7%	8.5%	9.9%	8.7%	9.3%	9.0%	9.7%	10.6%	9.4%	8.1%	10.3%
Leverage	96.2%	96.1%	91.8%	92.3%	90.7%	90.4%	91.3%	91.3%	89.5%	88.4%	90.2%	90.9%	100.8%
Unlevered weighted mean	**5.7%**	**5.2%**	**5.1%**	**5.2%**	**5.7%**	**5.0%**	**5.4%**	**5.3%**	**5.7%**	**6.1%**	**5.2%**	**4.4%**	**5.2%**

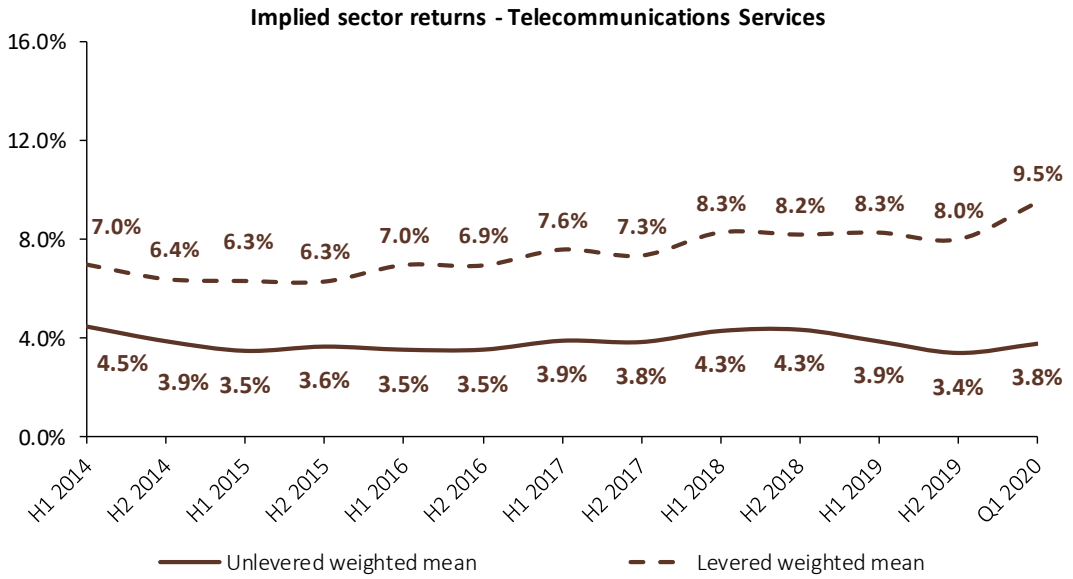


- The implied sector return (unlevered) in the Consumer Cyclicals sector increased to 5.2% as of March 31, 2020 after reaching its lowest level of 4.4% as of December 31, 2019.

Implied Sector Returns
Telecommunication Services

Implied sector returns - Telecommunications Services

	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
	06/30/2014	**12/31/2014**	**06/30/2015**	**12/31/2015**	**06/30/2016**	**12/31/2016**	**06/30/2017**	**12/31/2017**	**06/30/2018**	**12/31/2018**	**06/30/2019**	**12/31/2019**	**03/31/2020**
Levered weighted mean	7.0%	6.4%	6.3%	6.3%	7.0%	6.9%	7.6%	7.3%	8.3%	8.2%	8.3%	8.0%	9.5%
Leverage	120.5%	120.8%	129.3%	129.1%	135.3%	135.5%	140.0%	139.6%	131.2%	118.1%	135.8%	146.2%	156.6%
Unlevered weighted mean	**4.5%**	**3.9%**	**3.5%**	**3.6%**	**3.5%**	**3.5%**	**3.9%**	**3.8%**	**4.3%**	**4.3%**	**3.9%**	**3.4%**	**3.8%**

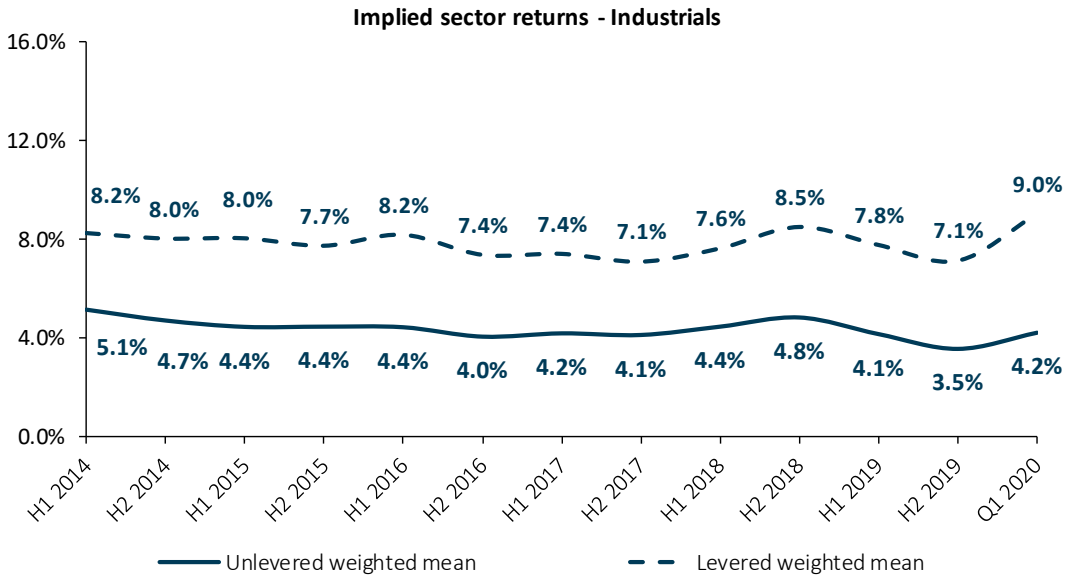


- In the Telecommunications Services sector the implied return (unlevered) increased by 0.4%-points in the first quarter of 2020.
- In comparison to other sectors, the Telecommunications Services sector has the second lowest unlevered weighted mean as of March 31, 2020.

Implied Sector Returns
Industrials

Implied sector returns - Industrials

	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
	06/30/2014	**12/31/2014**	**06/30/2015**	**12/31/2015**	**06/30/2016**	**12/31/2016**	**06/30/2017**	**12/31/2017**	**06/30/2018**	**12/31/2018**	**06/30/2019**	**12/31/2019**	**03/31/2020**
Levered weighted mean	8.2%	8.0%	8.0%	7.7%	8.2%	7.4%	7.4%	7.1%	7.6%	8.5%	7.8%	7.1%	9.0%
Leverage	115.1%	114.5%	113.2%	115.3%	108.7%	109.1%	111.0%	107.6%	100.8%	99.4%	103.0%	107.9%	118.0%
Unlevered weighted mean	**5.1%**	**4.7%**	**4.4%**	**4.4%**	**4.4%**	**4.0%**	**4.2%**	**4.1%**	**4.4%**	**4.8%**	**4.1%**	**3.5%**	**4.2%**

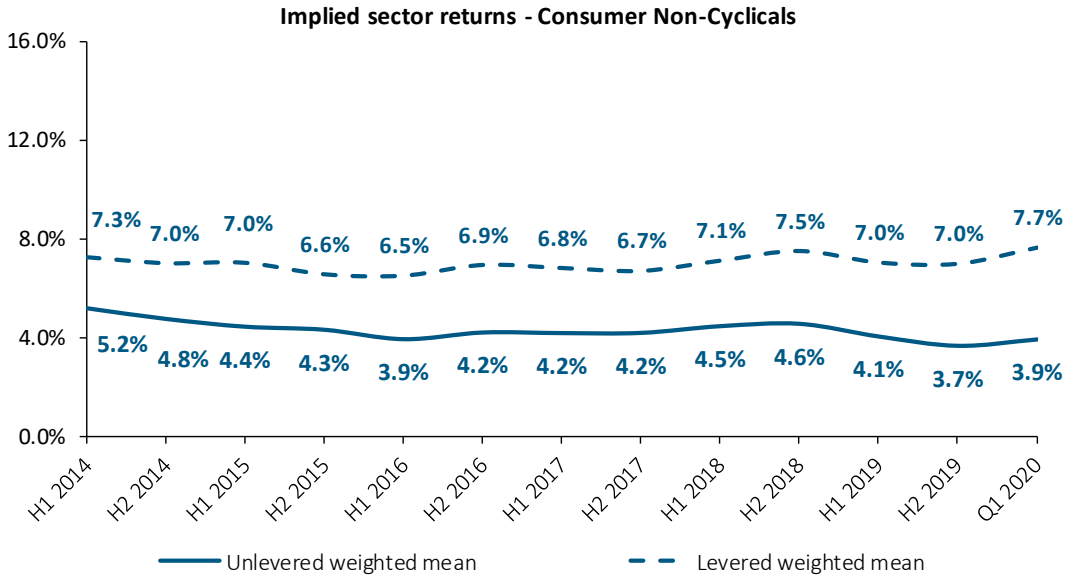


- The implied sector return (unlevered) in the Industrials sector rose from a low of 3.5% as of December 31, 2019 to 4.2% as of March 31, 2020.
- Since June 2004, the unlevered weighted mean varied within a range of 3.5% to 5.1%.

Implied Sector Returns
Consumer Non-Cyclicals

Implied sector returns - Consumer Non-Cyclicals

	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
	06/30/2014	**12/31/2014**	**06/30/2015**	**12/31/2015**	**06/30/2016**	**12/31/2016**	**06/30/2017**	**12/31/2017**	**06/30/2018**	**12/31/2018**	**06/30/2019**	**12/31/2019**	**03/31/2020**
Levered weighted mean	7.3%	7.0%	7.0%	6.6%	6.5%	6.9%	6.8%	6.7%	7.1%	7.5%	7.0%	7.0%	7.7%
Leverage	74.2%	75.3%	80.7%	81.5%	85.8%	84.3%	89.3%	86.8%	82.7%	85.2%	86.9%	95.7%	97.1%
Unlevered weighted mean	**5.2%**	**4.8%**	**4.4%**	**4.3%**	**3.9%**	**4.2%**	**4.2%**	**4.2%**	**4.5%**	**4.6%**	**4.1%**	**3.7%**	**3.9%**

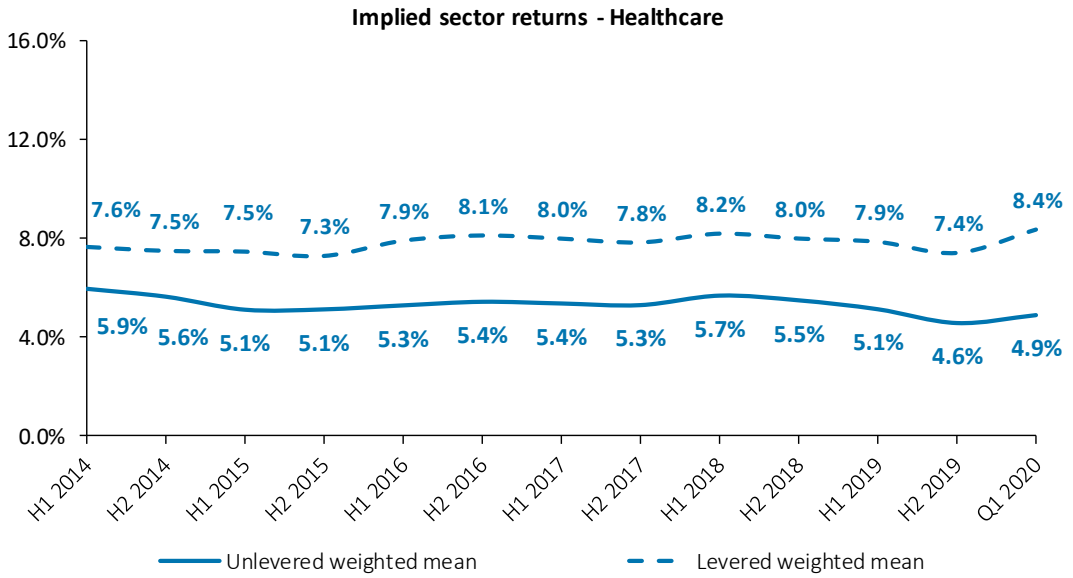


- In the Consumer Non-Cyclicals sector the implied sector return (unlevered) showed a steadily decreasing trend until June 30, 2016 and since then trended upwards to 4.6% before dropping to 3.7% as of December 31, 2019. Afterwards it gained 0.2%-points and reached 3.9% as of March 31, 2020.

Implied Sector Returns
Healthcare

Implied sector returns - Healthcare

	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
	06/30/2014	**12/31/2014**	**06/30/2015**	**12/31/2015**	**06/30/2016**	**12/31/2016**	**06/30/2017**	**12/31/2017**	**06/30/2018**	**12/31/2018**	**06/30/2019**	**12/31/2019**	**03/31/2020**
Levered weighted mean	7.6%	7.5%	7.5%	7.3%	7.9%	8.1%	8.0%	7.8%	8.2%	8.0%	7.9%	7.4%	8.4%
Leverage	48.0%	47.9%	60.4%	60.5%	60.2%	60.1%	63.6%	63.5%	56.9%	56.9%	60.1%	64.4%	72.0%
Unlevered weighted mean	**5.9%**	**5.6%**	**5.1%**	**5.1%**	**5.3%**	**5.4%**	**5.4%**	**5.3%**	**5.7%**	**5.5%**	**5.1%**	**4.6%**	**4.9%**

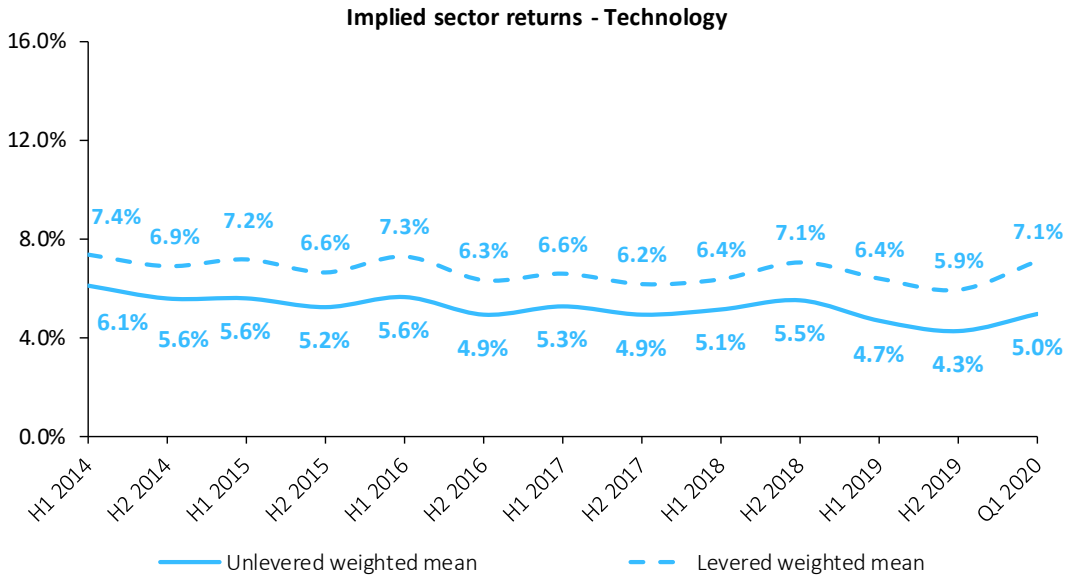


- The implied sector return (unlevered) in the Healthcare sector fluctuated between 5.9% and 5.1% until June 30, 2019. In the second half year in 2019 the implied sector return dropped from 5.1% to 4.6%. Afterwards it showed an upwards tendency and ended up at 4.9% as of March 31, 2020.

Implied Sector Returns
Technology

Implied sector returns - Technology

	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
	06/30/2014	**12/31/2014**	**06/30/2015**	**12/31/2015**	**06/30/2016**	**12/31/2016**	**06/30/2017**	**12/31/2017**	**06/30/2018**	**12/31/2018**	**06/30/2019**	**12/31/2019**	**03/31/2020**
Levered weighted mean	7.4%	6.9%	7.2%	6.6%	7.3%	6.3%	6.6%	6.2%	6.4%	7.1%	6.4%	5.9%	7.1%
Leverage	34.3%	34.2%	36.3%	38.1%	35.1%	34.7%	32.7%	33.5%	31.1%	34.8%	41.4%	40.4%	44.0%
Unlevered weighted mean	**6.1%**	**5.6%**	**5.6%**	**5.2%**	**5.6%**	**4.9%**	**5.3%**	**4.9%**	**5.1%**	**5.5%**	**4.7%**	**4.3%**	**5.0%**

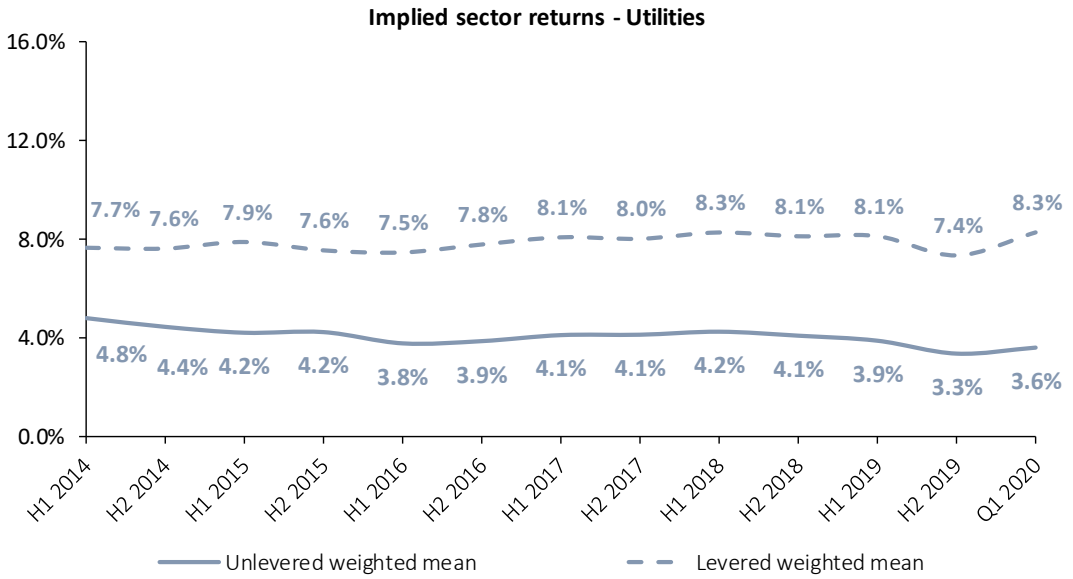


- The implied sector return (unlevered) in the Technology sector rose from 4.3% as of December 31, 2019 to 5.0% as of March 31, 2020
- The Technology sector has the lowest leverage of the analyzed sectors. This indicates less favorable financing conditions for companies within the Technology sector due to a more pronounced operational risk profile. However, the leverage is at the upper level within the observation period, reflecting the benign financing environment.

Implied Sector Returns
Utilities

Implied sector returns - Utilities

	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
	06/30/2014	**12/31/2014**	**06/30/2015**	**12/31/2015**	**06/30/2016**	**12/31/2016**	**06/30/2017**	**12/31/2017**	**06/30/2018**	**12/31/2018**	**06/30/2019**	**12/31/2019**	**03/31/2020**
Levered weighted mean	7.7%	7.6%	7.9%	7.6%	7.5%	7.8%	8.1%	8.0%	8.3%	8.1%	8.1%	7.4%	8.3%
Leverage	118.5%	118.6%	124.6%	125.2%	131.9%	136.5%	138.8%	138.8%	135.0%	135.6%	130.4%	128.3%	134.9%
Unlevered weighted mean	**4.8%**	**4.4%**	**4.2%**	**4.2%**	**3.8%**	**3.9%**	**4.1%**	**4.1%**	**4.2%**	**4.1%**	**3.9%**	**3.3%**	**3.6%**

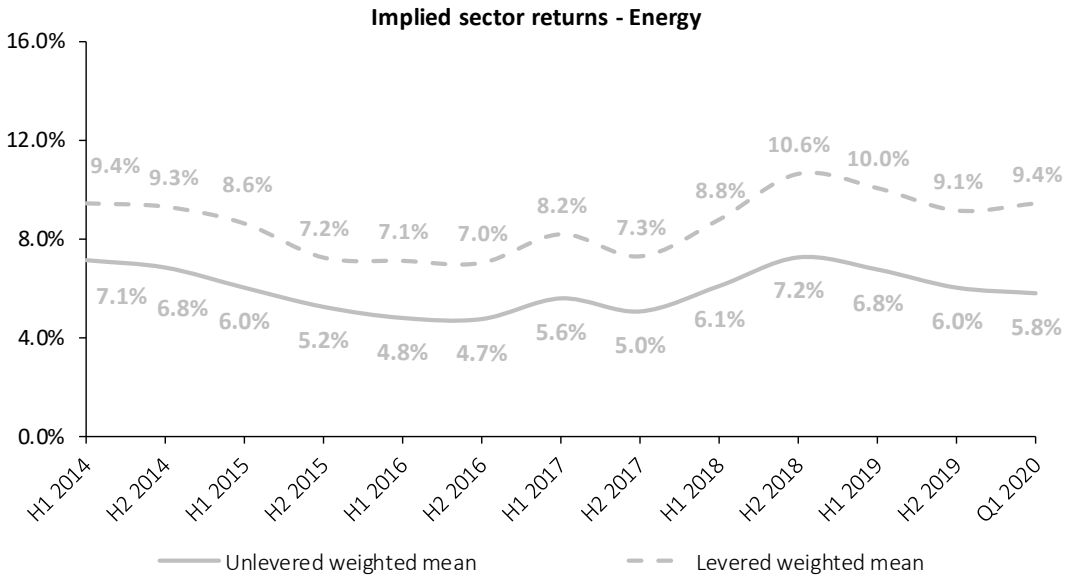


- In comparison to the other sectors, the Utilities sector has the lowest unlevered implied sector return with a weighted mean of 3.6% as of March 31, 2020.
- The high average leverage indicates favorable financing conditions for the companies in the Utilities sector. This can be attributed to the relatively low operational risk profile of the sector.

Implied Sector Returns
Energy

Implied sector returns - Energy

	H1 2014	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020
	06/30/2014	**12/31/2014**	**06/30/2015**	**12/31/2015**	**06/30/2016**	**12/31/2016**	**06/30/2017**	**12/31/2017**	**06/30/2018**	**12/31/2018**	**06/30/2019**	**12/31/2019**	**03/31/2020**
Levered weighted mean	9.4%	9.3%	8.6%	7.2%	7.1%	7.0%	8.2%	7.3%	8.8%	10.6%	10.0%	9.1%	9.4%
Leverage	48.2%	48.2%	54.2%	54.2%	60.2%	60.2%	59.6%	59.4%	55.6%	54.8%	53.4%	53.6%	64.0%
Unlevered weighted mean	**7.1%**	**6.8%**	**6.0%**	**5.2%**	**4.8%**	**4.7%**	**5.6%**	**5.0%**	**6.1%**	**7.2%**	**6.8%**	**6.0%**	**5.8%**



- The Energy sector, in comparison to other sectors, has the highest unlevered weighted mean (5.8%) as of March 31, 2020. Also it is the only sector, whose implied sector return dropped in Q1 2020, which is due to the significant decrease in oil prices and consequently strong revision of analyst estimates.
- Overall, the sector experienced a decreasing trend for the implied sector return (unlevered) from 7.1% as of June 30, 2014 to 4.7% as of December 31, 2016. Afterwards it increased by reaching its maximum in December 31, 2018.

7 Sector returns

b. Historical returns (ex-post analysis)

Historical Sector Returns
Background & approach

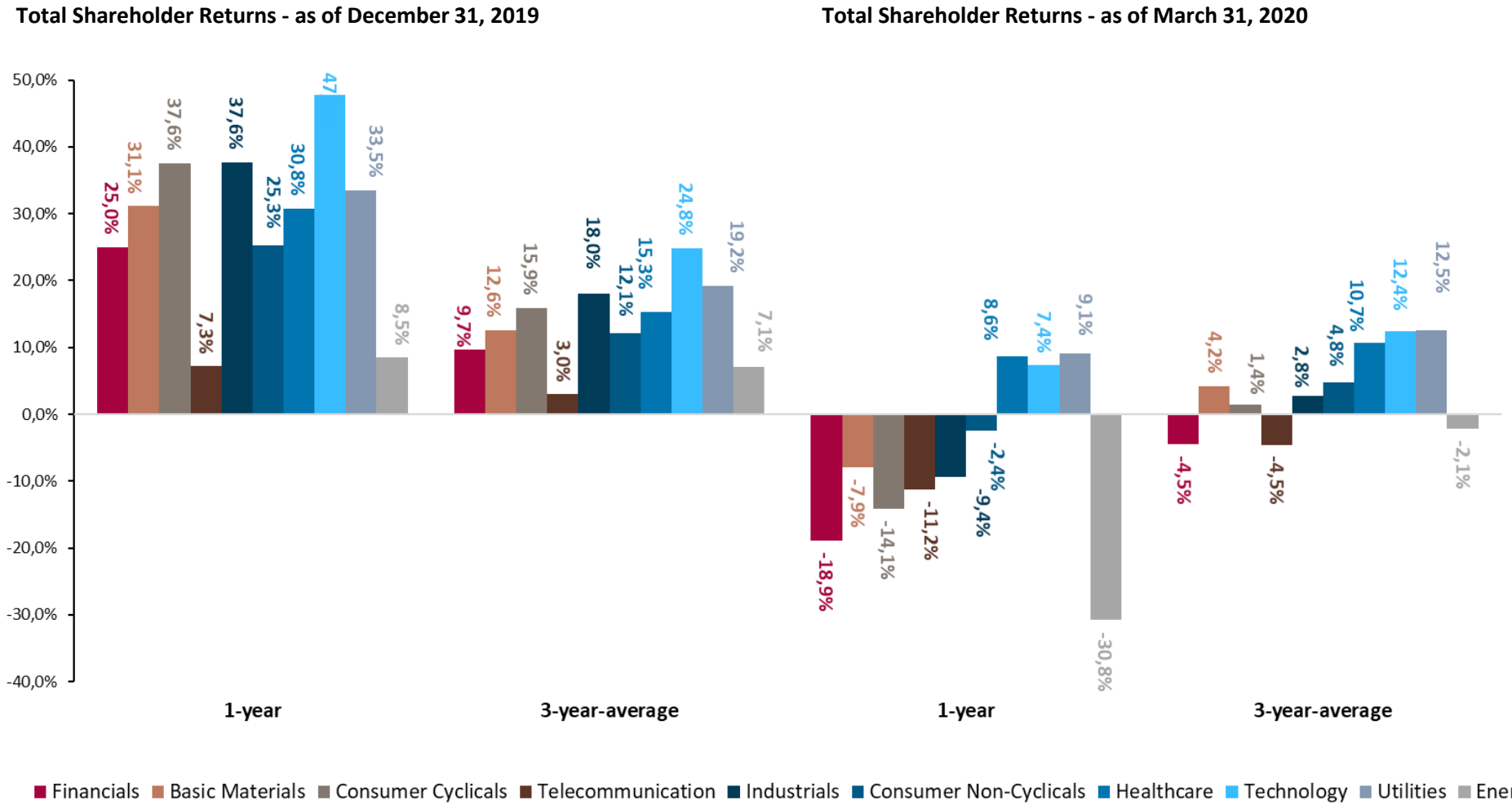
In **addition** to the **determination of historical market returns**, we calculated the **historical sector returns p.a.** This option is an **alternative approach,** like the implied sector returns, for the ex-post analysis of the determination of costs of capital based on regression analyses following the **CAPM**.

Our analysis contains so-called **total shareholder returns** (TSR) p.a. analogous to the return triangles for the European 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 returns.

We derive the **annual total shareholder returns between end of 2014 and March 31, 2020** for every STOXX Europe 600 sector. We also show the 1-year and the 3-year average market-value weighted means. Since annual total shareholder returns tend to fluctuate to a great extent, their explanatory power is limited.

Historical Sector Returns

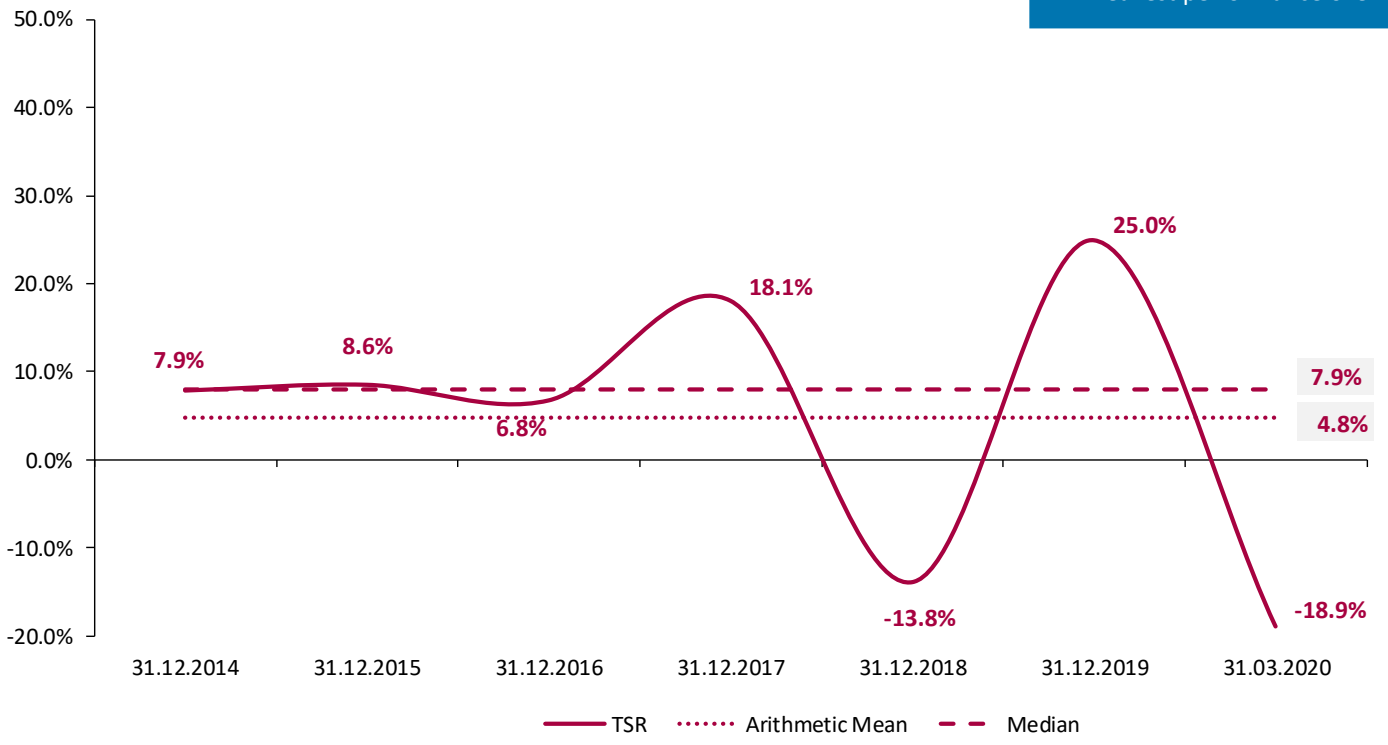
Average total shareholder returns as of December 31, 2019 and March 31, 2020



Total Shareholder Returns
Financials

- The total annual shareholder return for the Financials sector is with -18.9% clearly below the arithmetic mean and median as of March 31, 2020.
- Together with the Telecommunications sector Financials showed the weakest performance over the past three years.

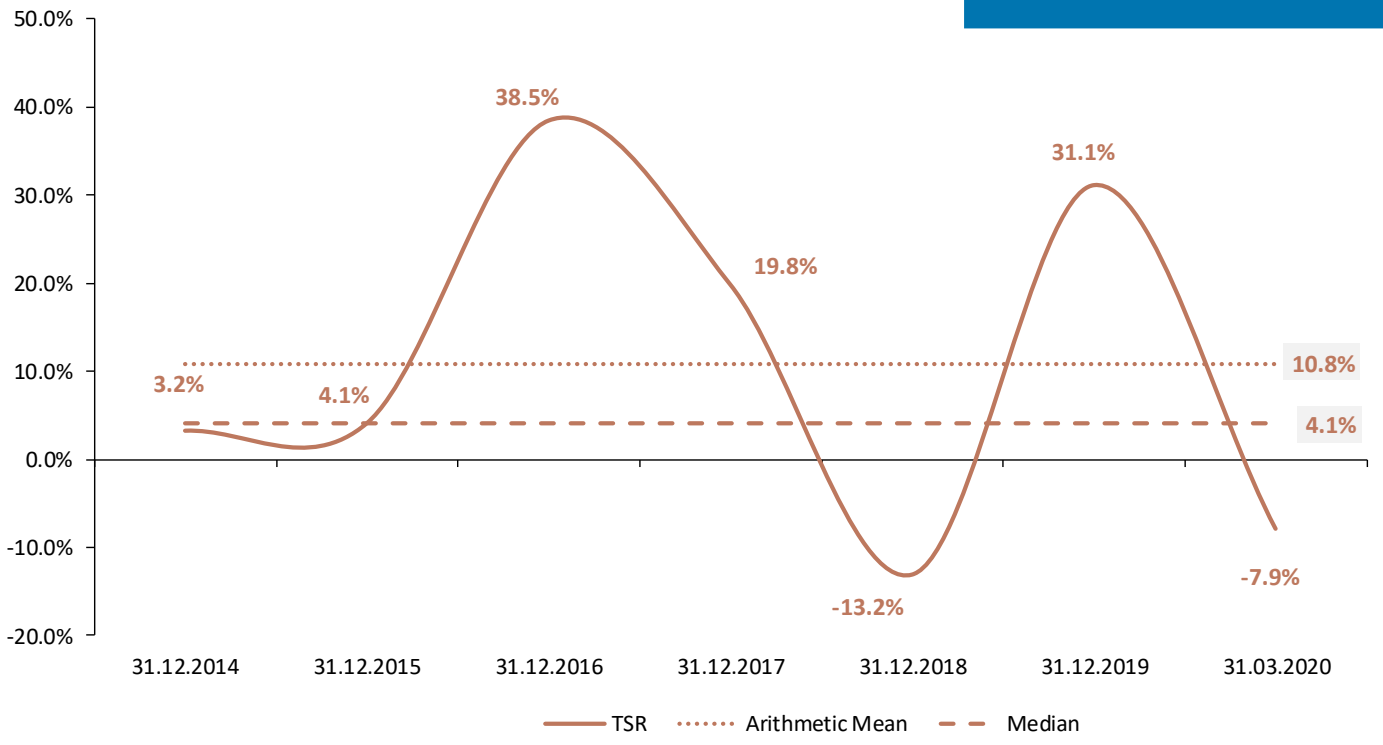
Total annual shareholder returns - Financials



Total Shareholder Returns
Basic Materials

- Since 2014, the total annual shareholder return fluctuated strongly between -13.2% and 38.5%. As of March 31, 2020 its annual TSR stands at -7.9%.

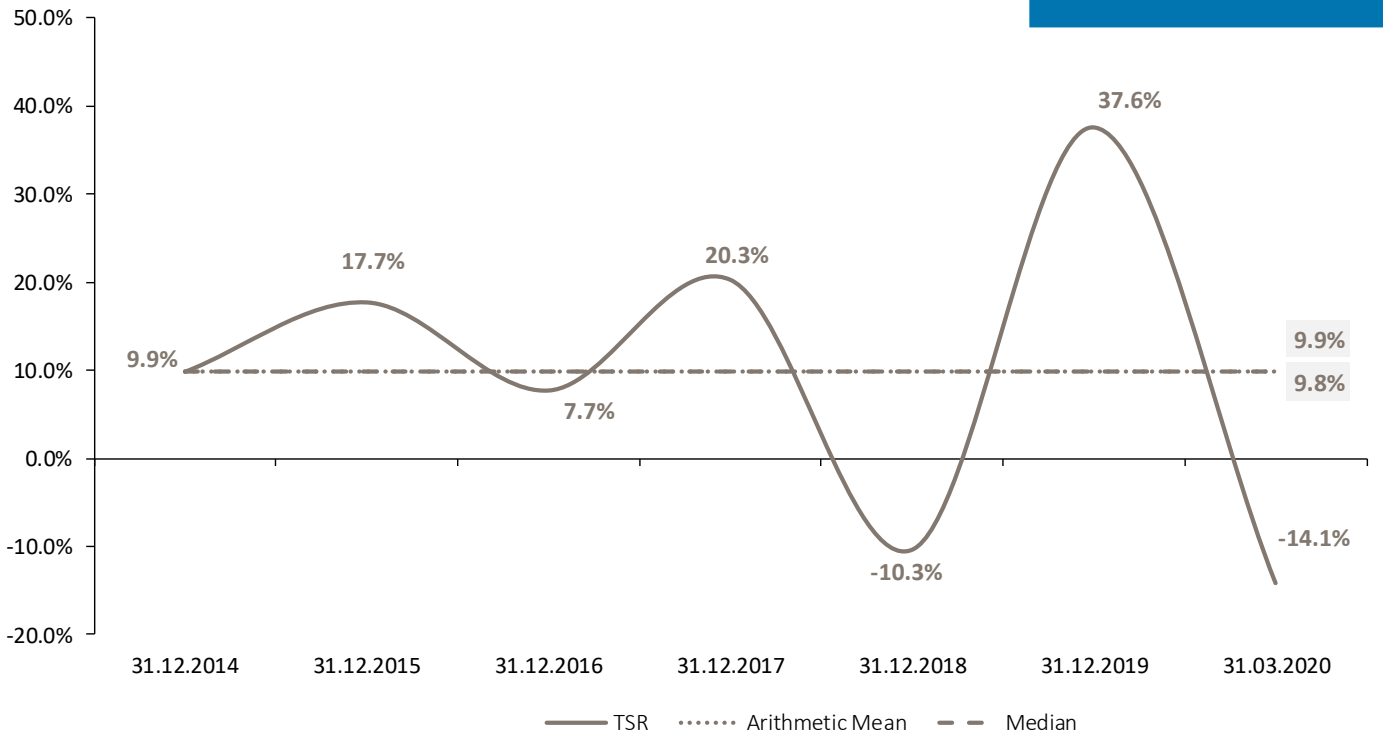
Total annual shareholder returns - Basic Materials



Total Shareholder Returns
Consumer Cyclicals

- The total annual shareholder return in the Consumer Cyclicals sector is at -14.1% as of March 31, 2020, which is far below the arithmetic mean and median.

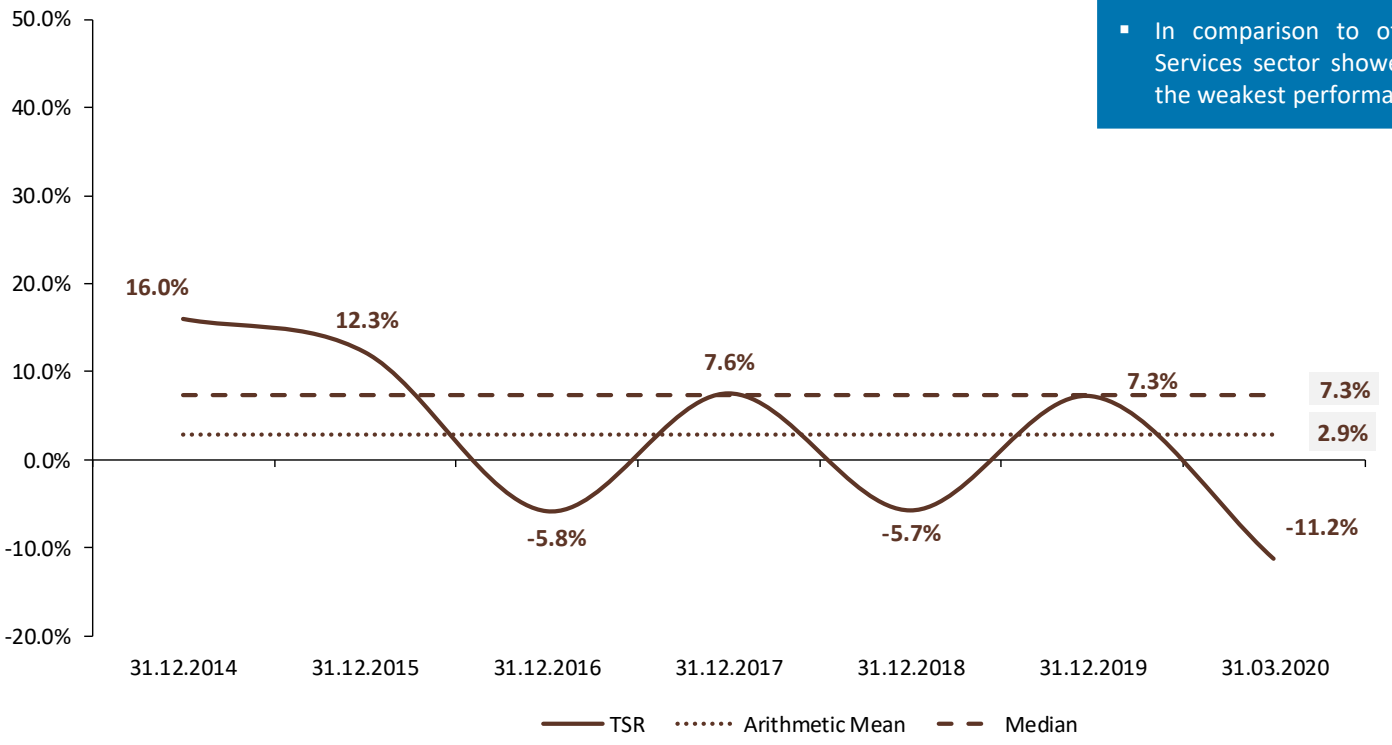
Total annual shareholder returns - Consumer Cyclicals



Total Shareholder Returns
Telecommunications Services

- The total annual shareholder return in the Telecommunications Services sector decreased from 7.3% as of December 31, 2019 to -11.2% as of March 31, 2020.
- In comparison to other sectors, the Telecommunications Services sector showed, together with the Financials sector, the weakest performance over the past three years.

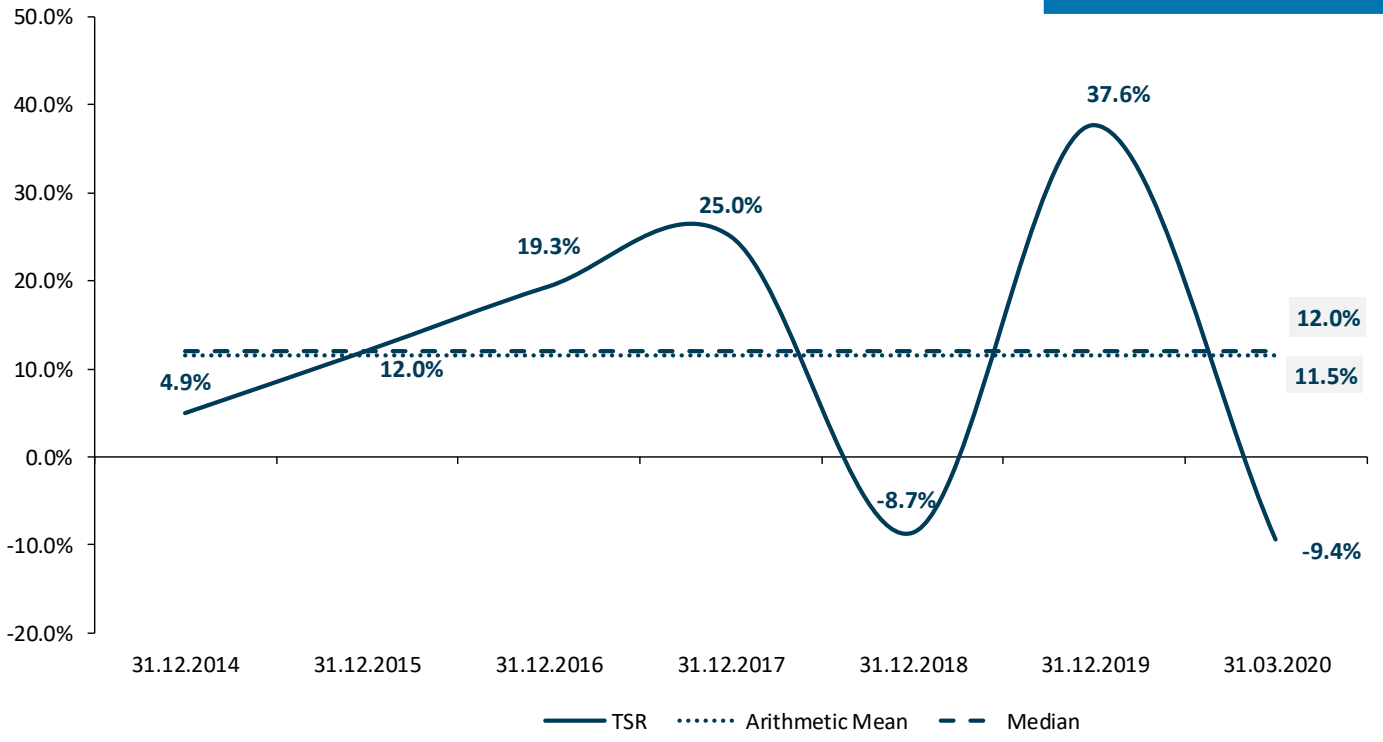
Total annual shareholder returns - Telecommunications Services



Total Shareholder Returns
Industrials

- As of March 31, 2020, the total annual shareholder return stands at -9.4%, which is well below the total shareholder returns during our observation period.

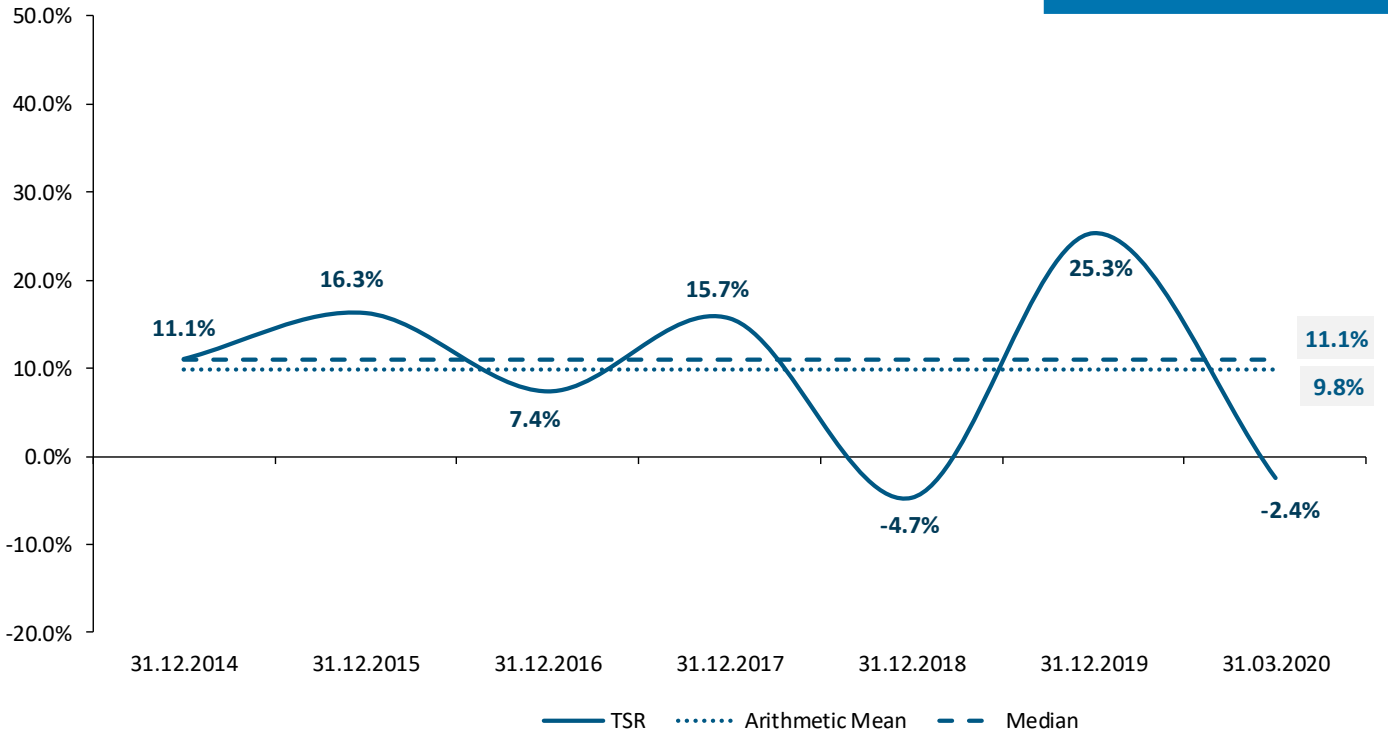
Total annual shareholder returns - Industrials



Total Shareholder Returns
Consumer Non-Cyclicals

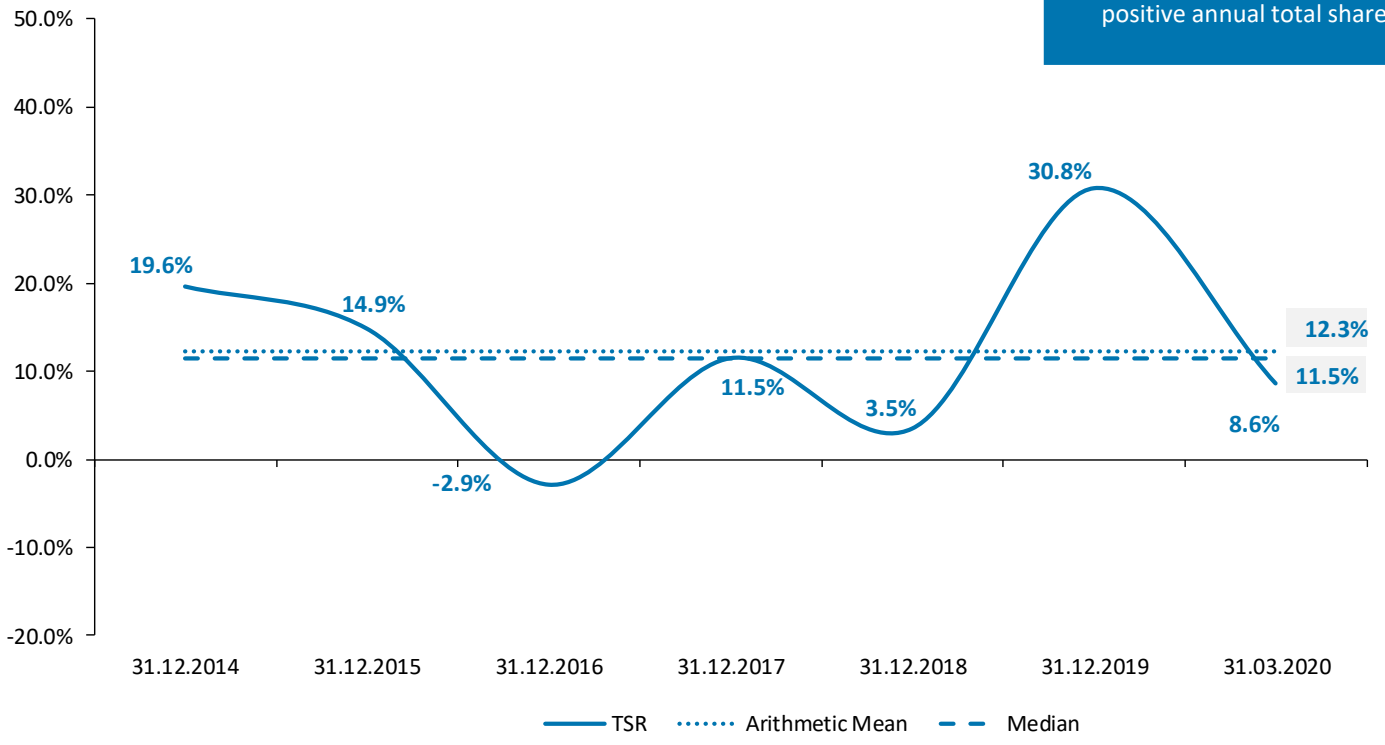
- The total annual shareholder return in the Consumer Non-Cyclicals sector declined from 25.3% as of December 31, 2019 to -2.4% as of March 31, 2020.

Total annual shareholder returns - Consumer Non-Cyclicals



Total Shareholder Returns
Healthcare

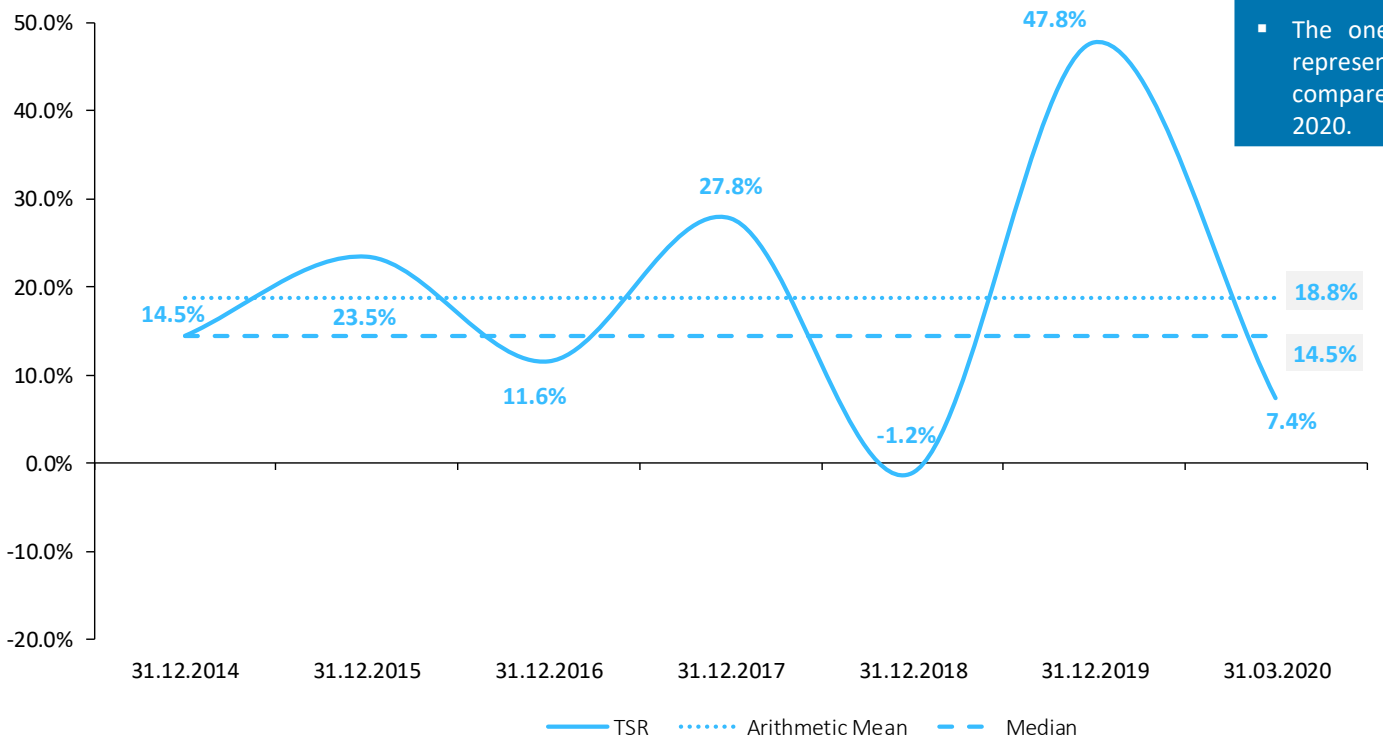
Total annual shareholder returns - Healthcare



- The Healthcare sector is amongst the three sectors that show positive annual total shareholder returns as of March 31, 2020.

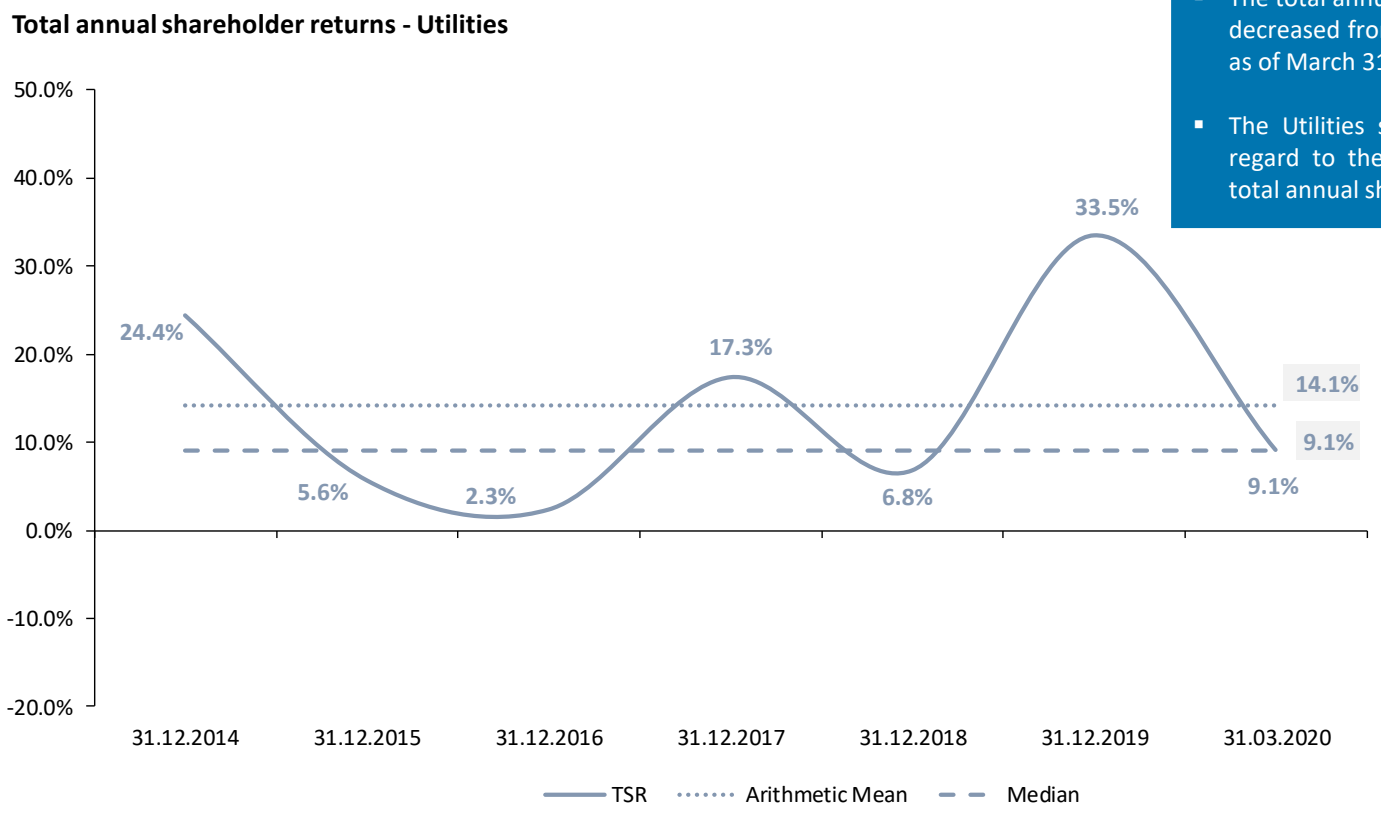
Total Shareholder Returns
Technology

Total annual shareholder returns - Technology



- The Technology sector shows the second-best sector performance in the 3-year average as of March 31, 2020.
- The one-year total shareholder return of 7.4% represents the third highest annual return compared to the other sectors as of March 31, 2020.

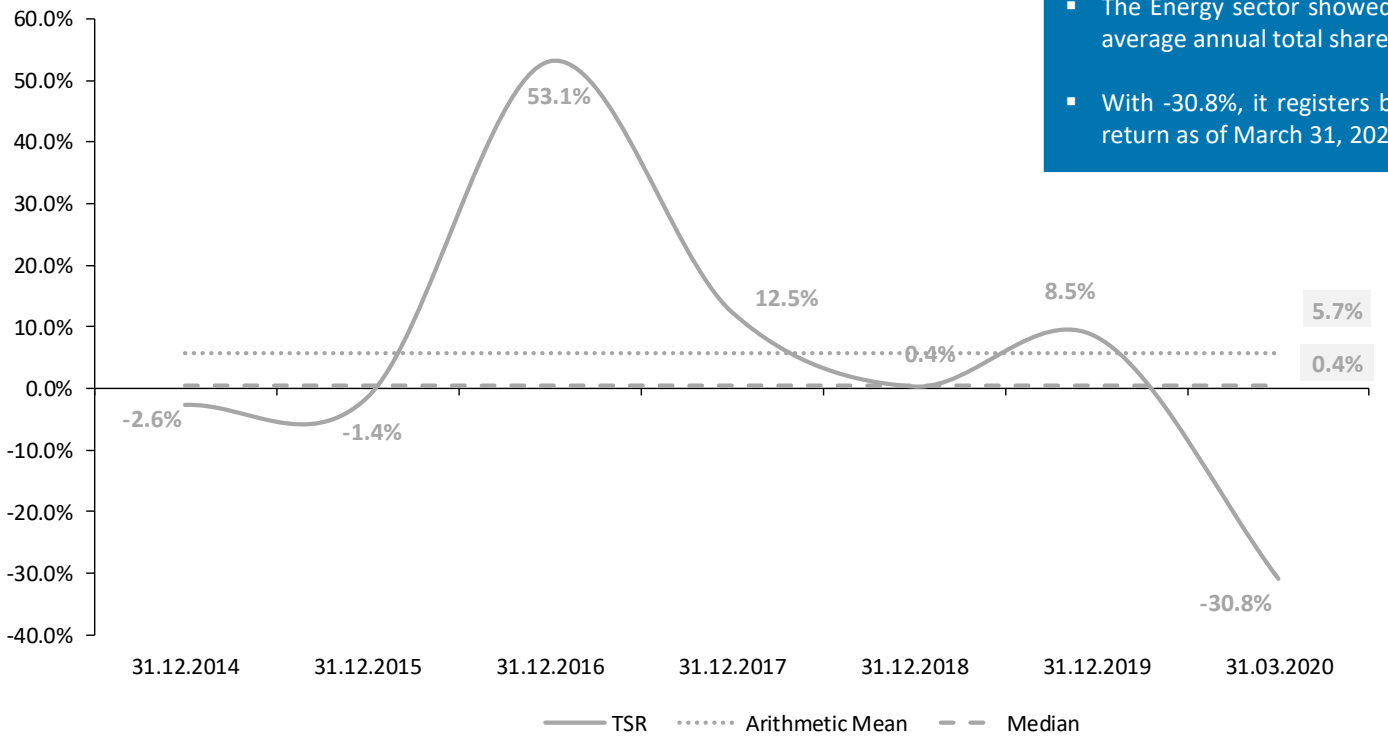
Total Shareholder Returns
Utilities



- The total annual shareholder return in the Utilities sector decreased from 33.5% as of December 31, 2019 to 9.1% as of March 31, 2020.
- The Utilities sector shows the best performance with regard to the highest 3-year average and the highest total annual shareholder return as of March 31, 2020.

Total Shareholder Returns
Energy

Total annual shareholder returns - Energy



- The Energy sector showed a negative 1-year and a negative 3-year average annual total shareholder return.
- With -30.8%, it registers by far the lowest total annual shareholder return as of March 31, 2020.

8 Trading multiples

Trading Multiples
Background & approach

Besides absolute valuation models (earnings value, DCF), the **multiples approach** offers a practical way for an enterprise value estimation. The multiples method estimates a company's value **relative** to another company's value. Following this approach, the enterprise value results 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 STOXX Europe 600 sectors**. We will look at the following multiples:

- Revenue-Multiples ("**EV**[1]**/Revenue**")
- EBIT-Multiples ("**EV**[1]**/EBIT**")
- Price-to-Earnings-Multiples ("**P/E**")
- Price-to-Book Value-Multiples ("**EqV**[2]**/BV**")

Multiples are presented for two different reference dates. 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 (December 31, 2019 or March 31, 2020).

To calculate the multiples, we source the data from the data provider Thomson Reuters. We provide a tabular illustration of the sector specific weighted averages of the multiples as of December 31, 2019 and March 31, 2020 on the following slide.

Additionally, we present a **ranking table** of the sector multiples. In a first step, the 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. In a second step, 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

Sector multiples as of March 31, 2020 and December 31, 2019

	EV/Revenue 1yf		EV/EBIT 1yf		P/E 1yf		EqV/BV LTM	
Sector	31.12.2019	31.03.2020	31.12.2019	31.03.2020	31.12.2019	31.03.2020	31.12.2019	31.03.2020
Financials	n.a.	n.a.	n.a.	n.a.	11.2x	8.1x	1.0x	0.6x
Basic Materials	1.7x	1.4x	13.3x	11.2x	16.5x	13.7x	2.1x	1.5x
Consumer Cyclicals	1.3x	1.1x	13.4x	12.1x	14.3x	11.7x	2.0x	1.4x
Telecommunications Services	2.2x	2.0x	15.5x	13.9x	13.7x	11.3x	1.6x	1.2x
Industrials	1.5x	1.2x	15.1x	12.6x	17.5x	14.0x	3.4x	2.3x
Consumer Non-Cyclicals	2.2x	1.9x	15.8x	14.4x	17.9x	16.3x	3.6x	2.9x
Healthcare	3.7x	3.4x	15.2x	13.9x	17.4x	15.7x	4.5x	3.5x
Technology	3.4x	2.8x	17.4x	15.3x	22.4x	19.0x	4.0x	3.4x
Utilities	1.4x	1.3x	13.7x	13.0x	15.4x	13.5x	1.7x	1.5x
Energy	0.8x	0.7x	8.8x	10.6x	11.5x	13.5x	1.3x	0.8x
All	1.9x	1.7x	13.7x	12.7x	14.8x	12.6x	2.1x	1.4x

Reading example:

The weighted average of the Telecommunications Services EV/EBIT-ratio based on the 1yf EBIT is 13.9x.

EUR 200 m in EBIT over the next year would hence result in an enterprise value of EUR 2,780 m.

Forward earnings multiples of the Energy sector increased due to the strong decline in oil prices and hence revision of analyst estimates outstripping the decline in market caps.

Note: For companies in the Financials sector, Revenue- and EBIT-Multiples are not meaningful and thus are not reported.

Trading Multiples

Sector multiples ranking as of March 31, 2020 and December 31, 2019

	EV/Revenue 1yf		EV/EBIT 1yf		P/E 1yf		EqV/BV LTM		Ø Ranking
Sector	31.12.2019	31.03.2020	31.12.2019	31.03.2020	31.12.2019	31.03.2020	31.12.2019	31.03.2020	
Financials	n.a.	n.a.	n.a.	n.a.	10	10	10	10	10.0
Basic Materials	5	5	8	8	5	5	5	6	5.9
Consumer Cyclicals	8	8	7	7	7	8	6	7	7.3
Telecommunications Services	3	3	3	4	8	9	8	8	5.8
Industrials	6	7	5	6	3	4	4	4	4.9
Consumer Non-Cyclicals	4	4	2	2	2	2	3	3	2.8
Healthcare	1	1	4	3	4	3	1	1	2.3
Technology	2	2	1	1	1	1	2	2	1.5
Utilities	7	6	6	5	6	6	7	5	6.0
Energy	9	9	9	9	9	7	9	9	8.8

The Financials sector shows the least expensive valuation level of all sectors.

The Technology sector shows the highest multiples on average, followed by the Healthcare sector.

The EqV/BV-Multiple of the Utilities sector ranks 5th highest in a comparison of all sectors. Overall, the average ranking of the Utilities sector is 6.0, indicating a medium valuation level.

Note: Multiples are ranked from highest to lowest values: 1 – highest (red), 9/10 – lowest (dark green)).

Appendix

Composition of the sectors as of March 31, 2020

Appendix
Composition of as the STOXX sectors of March 31, 2020

Financials (1/2)

3I GROUP PLC.
ABN AMRO BANK NV
ADMIRAL GROUP PLC.
ADYEN NV
AEDIFICA
AEGON
AGEAS SA
ALLIANZ SE
ALLREAL HOLDING AG
ALSTRIA OFFICE REIT AG
AMUNDI
AROUNDTOWN
ASHMORE GROUP PLC.
ASR NEDERLAND
ASSICURAZIONI GENERALI
AVIVA PLC.
AXA
BALOISE HOLDING AG
BANCO DE SABADELL SA
BANCO POPOLARE
BANCO SANTANDER SA
BANK OF IRELAND
BANK PKA.KASA OPIEKI SA
BANKINTER SA
BARCLAYS PLC.
BAWAG PSK BK.AG
BBV.ARGT.SA
BEAZLEY PLC.
BNP PARIBAS
BOLSAS Y MERCADOS
BRITISH LAND CO.PLC.
CAIXABANK SA
CASTELLUM AB
CEMBRA MONEY BANK N ORD
CLOSE BROTHERS GP.PLC.
CNP ASSURANCES
COFINIMMO
COMMERZBANK AG
COVIVIO SA
CREDIT AGRICOLE SA
CREDIT SUISSE GROUP AG
DANSKE BANK A/S
DERWENT LONDON PLC.
DEUTSCHE BANK AG
DEUTSCHE BOERSE AG
DIRECT LINE IN.GP.PLC.
DNB ASA
DT.WHN.SE
ENTRA
EQT AB
ERSTE GROUP BANK AG
EURAZEO SE
EURONEXT
FABEGE AB
FASTIGHETS BALDER AB
FINECOBANK SPA
GECINA
GJDG.FORSIKRING ASA
GRAND CITY PROPERTIES SA
GREAT PORTLAND ESTS.PLC.
GRENKE N AG
HAMMERSON PLC.
HANNOVER RUCK.AG
HARGREAVES LANSDOWN PLC.
HELVETIA HOLDING AG
HISCOX DI LTD.
HSBC HOLDINGS PLC.
ICADE
IG GROUP HOLDINGS PLC.
IMMOFINANZ AG
INDUSTRIVARDEN AB
ING GROEP
INMB.COLO.SOCIMI SA
INTERMEDIATE CAP.GP.PLC.
INTESA SANPAOLO
INVESTEC PLC.
INVESTOR AB
JULIUS BAER GRUPPE AG
KBC GROEP NV
KINNEVIK 'B'
KLEPIERRE
KOJAMO OYJ
LAND SECURITIES GP.PLC.
LEG IMMOBILIEN AG
LEGAL & GENERAL GP.PLC.
LLOYDS BANKING GP.PLC.
LONDON STOCK EX.GP.PLC.
LUNDBERGFORETAGEN AB
M&G PLC.
MAN GROUP PLC.
MAPFRE SA
MEDIOBANCA BC.FIN SA
MERLIN PROPERTIES REIT
MUNCH.RVRS.GESELL.AG IN
NATIXIS
NN GROUP
NORDEA BANK AB
OLD MUTUAL LIMITED
PARGESA HOLDING SA
PARTNERS GROUP HOLDING
PHNX.GHG.PLC.
PKO BANK SA
PRUDENTIAL PLC.
PSP SWISS PROPERTY AG
PZU GROUP SA
QUILTER PLC
RAIFFEISEN BANK INTL.AG
ROYAL BK.OF SCTL.GP.PLC.
RSA INSURANCE GROUP PLC.
SAMHALLS.I NRDN.AB
SAMPO PLC.
SANTANDER BANK POLSKA SA
SCHRODERS PLC.
SCOR SE
SEB 'A' SA
SEGRO PLC.
SIMCORP A/S
SOCIETE GENERALE SA
SOFINA SA
ST.JAMES'S PLACE PLC.
STD.CHARTERED PLC.
STD.LF.ABDN.PLC.
STOREBRAND ASA
SVENSKA HANDBKN.'A' PLC.
SWEDBANK AB
SWISS LIFE HOLDING AG
SWISS PRIME SITE
SWISS RE AG
TAG IMMOBILIEN AG
TOPDANMARK A/S
TP ICAP PLC.
TRITAX BIG BOX REIT PLC.
TRYG A/S
UBS GROUP
UNIBAIL-RODAMCO
UNICREDIT
UNIONE DI BANCHE ITALIAN
UNITE GROUP PLC.
VIRGIN MONEY UK PLC.
VONOVIA SE PRE

Appendix
Composition of as the STOXX sectors of March 31, 2020

Financials (2/2)
WDP - WHSES.DE PAUW
WIHLBORGS FASTIGHETER AB
WORLDLINE
ZURICH INSURANCE GP.AG

Basic Materials
AIR LIQUIDE
AKZO NOBEL NV
ANGLO AMERICAN PLC.
ANTOFAGASTA PLC.
ARCELORMITTAL
ARKEMA
BASF SE
BHP GROUP PLC.
BOLIDEN AB
BRENNTAG AG
CLARIANT AG
COVESTRO AG
CRH PLC.
CRODA INTERNATIONAL PLC.
EMS-CHEMIE HOLDING AG
EVONIK INDUSTRIES AG
EVRAZ PLC.
FUCHS PETROLUB AG
GIVAUDAN SA
GROEP BRUSSEL LAMBERT NV
HEIDELBERGCEMENT AG
HENKEL PREFERENCE AG.
HEXPOL AB
HOLMEN AB
HUHTAMAKI OYJ
IMCD GROUP
JOHNSON MATTHEY PLC.
KGHM POLSKA MIEDZ SA
KONINKLIJKE DSM
LAFARGEHOLCIM LTD
LANXESS AG
LINDE PLC.
MONDI PLC.
NORSK HYDRO ASA
NOVOZYMES A/S
POLYMETAL INTL.PLC.
RIO TINTO PLC.
SCA AB
SIG COMBIBLOC SVS.AG
SIKA AG
SMITH (DS) PLC.
SMURFIT KAPPA GROUP PLC.
SOLVAY SA
STORA ENSO OYJ
SYMRISE AG
THYSSENKRUPP AG
UPM-KYMMENE OYJ
VICTREX PLC.
VOESTALPINE AG
WIENERBERGER AG
YARA INTERNATIONAL ASA

Consumer Cyclicals (1/2)
ACCOR
ADIDAS AG
ASSA ABLOY AB
B&M EUR.VAL.RET.PLC.
BARRATT DEVS.PLC.
BELLWAY PLC.
BERKELEY GROUP HDG.PLC.
BMW AG.
BOLLORE SE
BURBERRY GROUP PLC.
CARNIVAL PLC.
CD PROJECT RED SA
CHRISTIAN DIOR SA
CINEWORLD GROUP PLC.
COMPASS GROUP PLC.
CONTINENTAL AG
COUNTRYSIDE PROPS.PLC.
CTS EVENTIM AG
DAIMLER AG
DOMETIC GROUP
DUFRY AG
ELECTROLUX AB
ESSILORLUXOTTICA SA
EVOLUTION GMG.GP.AB
EXOR
FAURECIA SE
FERGUSON PLC.
FERRARI NV
FIAT CHRYSLER AUTOS.
FLUTTER ENTM.PLC.
GAMES WORKSHOP GP.PLC.
GEBERIT AG
GREGGS PLC.
GVC HOLDINGS PLC.
H&M HENNES & MAURITZ AB

Appendix
Composition of as the STOXX sectors of March 31, 2020

Consumer Cyclicals (2/2)

HERMES INTERNATIONAL
HOWDEN JOINERY GP.PLC.
HUGO BOSS AG
HUSQVARNA AB
ICTL.HOTELS GROUP PLC.
INCHCAPE PLC.
INDITEX SA
INFORMA PLC.
ITV PLC.
JD SPORTS FASHION PLC.
KERING SAS
KINGFISHER PLC.
KINGSPAN GROUP PLC.
LA FRANCAISE DES JEUX SA
LPP SA
LVMH
MARKS & SPENCER GP.PLC.
MICHELIN
MONCLER
NEXT PLC.
NOKIAN RENKAAT OYJ
OCADO GROUP PLC.
PANDORA A/S
PEARSON PLC.
PERSIMMON PLC.
PEUGEOT SA
PORSCHE AML.HLDG.SE
PROSIEBENSAT 1 MEDIA AG
PUBLICIS GROUPE SA
PUMA SE
RATIONAL AG
REDROW PLC.
RENAULT SA
RHEINMETALL AG
RICHEMONT N SA
SAINT GOBAIN
SCHIBSTED A
SEB SA
SIGNIFY NV
SODEXO
SSP GROUP PLC.
SWATCH GROUP AG
TAYLOR WIMPEY PLC.
TRAINLINE PLC.
TRAVIS PERKINS PLC.
TUI AG
UBISOFT ENTERTAINMENT SA
VALEO
VISTRY GROUP PLC.
VIVENDI
VOLKSWAGEN AG
WH SMITH PLC.
WHITBREAD PLC.
WPP PLC.
ZALANDO

Telecommunications Services

ALTICE EUROPE NV
BT GROUP PLC.
CELLNEX TELECOM
DEUTSCHE TELEKOM AG
ELISA OYJ
EUTELSAT COMMUNICATIONS
FREENET AG
ILIAD SA
KONINKLIJKE KPN NV
ORANGE SA
PROXIMUS SA
SES SA
SUNRISE COMMUNICATIONS
SWISSCOM
TELE2 AB
TELECOM ITALIA
TELEFONICA DTL.HLDG.AG
TELEFONICA SA
TELENOR ASA
TELIA COMPANY AB
UNITED INTERNET AG
VODAFONE GROUP PLC.

Industrials (1/2)

A P MOLLER - MAERSK A/S
AALBERTS NV
AB SKF
ABB LTD N
ACCIONA SA
ACKERMANS & VAN HAAREN
ACS ACTIV.CONSTR.Y SERV.
ADECCO SA
ADP
AENA SME SA
AGGREKO PLC.
AIRBUS SE
ALFA LAVAL AB
ALSTOM SA
ANDRITZ AG
ASHTEAD GROUP PLC.
ATLANTIA
ATLAS COPCO AB
BAE SYSTEMS PLC.
BELIMO HOLDING AG
BOUYGUES SA
BUNZL PLC.
BUREAU VERITAS INTL.
CAPITA PLC.
CNH INDUSTRIAL NV
DASSAULT AVIATION
DEUTSCHE LUFTHANSA AG
DEUTSCHE POST AG
DIPLOMA PLC.
DSV PANALPINA A/S
EASYJET PLC.
EDENRED
EIFFAGE
ELIS
EPIROC AB NPV A

Appendix
Composition of as the STOXX sectors of March 31, 2020

Industrials (2/2)

EUROFINS SCIENTIFIC AG
EXPERIAN PLC.
FERROVIAL SA
FLUGHAFEN ZURICH AG
FRAPORT AG
G4S PLC.
GEA GROUP AG
GEORG FISCHER AG
GETLINK SE
HALMA PLC.
HAYS PLC.
HOCHTIEF AG
IMI PLC.
INDUTRADE AB
INTERPUMP GROUP
INTERTEK GROUP PLC.
INTL.CONS.AIRL.GROUP SA
ISS AS
IWG PLC
KION GP.AG PREREIN.
KNORR BREMSE AG
KONE OYJ
KUEHNE+NAGEL INTL.G
LEGRAND
LEONARDO SPA
LOOMIS AB
MEGGITT PLC.
MELROSE INDUSTRIES LTD.
METSO OYJ
MTU AERO ENGINES HLDG.AG
NET.INTHDG.PLC.
NEXI SPA
NIBE INDUSTRIER AB
OSRAM LICHT AG
PENNON GROUP PLC.
POSTE ITALIANE
PRYSMIAN
RANDSTAD NV
RELX PLC.
RENTOKIL INITIAL PLC.
REXEL
ROLLS-ROYCE HOLDINGS PLC
ROTORK PLC.
ROYAL MAIL PLC.
RYANAIR HOLDINGS PLC.
SAAB AB
SAFRAN SA
SANDVIK AB
SCHINDLER HOLDING AG
SCHNEIDER ELECTRIC SE
SECURITAS AB
SGS SA
SIEMENS AG
SIGNATURE AVIATION PLC.
SKANSKA AB
SMITHS GROUP PLC.
SPIE SA
SPIRAX-SARCO ENGR.PLC.
SUEZ CO.
TELEPERFORMANCE
THALES SA
TOMRA SYSTEMS ASA
TRELLEBORG AB
UMICORE SA
VALMET OYJ
VAT GROUP
VINCI SA
VOLVO AB
WARTSILA OYJ ABP
WEIR GROUP PLC.
WENDEL
WIRECARD AG
WOLTERS KLUWER NV

Consumer Non-Cyclicals (1/2)

AARHUSKARLSHAMN AB
ANHEUSER-BUSCH INBEV SA
ASSOCIATED BRIT.FDS.PLC.
BAKKAFROST ASA
BARRY CALLEBAUT AG
BEIERSDORF AG
BRITISH AMER.TOB.PLC.
BRITVIC PLC.
CARLSBERG AS
CARREFOUR SA
CHOC.LINDT &SPRUENGLI AG
CHR HANSEN HOLDING AS
COCA COLA HBC AG
COLRUYT
DANONE
DAVIDE CAMPARI MILANO
DIAGEO PLC.
ESSITY AB
GALENICA SANTE
GLANBIA PLC.
HEINEKEN HOLDING PLC.
HEINEKEN NV
HELLOFRESH SE
HOMESERVE PLC.
ICA GRUPPEN AB
IMPERIAL BRANDS PLC.
JERONIMO MARTINS SA
KERRY GROUP PLC.
KESKO OYJ
KON.AHOLD DLHZ.NV
L'OREAL
METRO AG.
MORRISON(WM)SPMKTS.PLC.
MOWI ASA
NESTLE AG

Appendix
Composition of as the STOXX sectors of March 31, 2020

Consumer Non-Cyclicals (2/2)
ORKLA ASA
PERNOD-RICARD
RECKITT BENCKISER GP.PLC
REMY COINTREAU
ROYAL UNIBREW A/S
SAINSBURY J PLC.
SALMAR ASA
SWEDISH MATCH AB
TATE & LYLE PLC.
TESCO PLC.
UNILEVER DUTCH CERT.
UNILEVER PLC.

Healthcare
ALCON AG
AMBU 'B'A/S
AMPLIFON SPA
ARGENX SE
ASTRAZENECA PLC.
BAYER AG
BIOMERIEUX SA
CARL ZEISS MEDITEC AG
COLOPLAST A/S
CONVATEC GROUP PLC.
DECHRA PHARMS.PLC.
DEMANT A/S
DIASORIN
ELEKTA AB
EVOTEC SE
FRESENIUS
FRESENIUS MED.CARE AG
GALAPAGOS
GENMAB A/S
GENUS PLC.
GETINGE AB
GLAXOSMITHKLINE PLC.
GN STORE NORD A/S
GRIFOLS SA
H LUNDBECK A/S
HIKMA PHARMS.PLC.
IPSEN SA
KON.PHILIPS ELTN.NA
LONZA GROUP AG
MERCK KGAA
MORPHOSYS AG
NOVARTIS AG
NOVO NORDISK A/S
ORION CORP. (FINLAND)
ORPEA SA
QIAGEN NV
RECORDATI INDUA.CHIMICA
ROCHE HOLDING AG
SANOFI
SARTORIUS AG
SARTORIUS STEDIM BIOTECH
SIEMENS HEALTHINEERS
SMITH & NEPHEW PLC.
SONOVA HOLDING AG
STRAUMANN HOLDING AG
SWED.ORPHAN BIOVITRUM AB
UCB SA
UDG HEALTHCARE PUB.LTD.
VIFOR PHARMA

Technology (1/2)
ALTEN
AMADEUS IT GROUP
AMS AG
ASM INTERNATIONAL
ASML HOLDING NV
ATOS
AUTO TRADER GROUP PLC.
AVAST PLC
AVEVA GROUP PLC.
BE SEMICONDUCTOR INDS.
BECHTLE AG
CAPGEMINI SE
DASSAULT SYSTEMES SE
DELIVERY HERO AG.
DIALOG SEMICON.AG.
ELECTROCOMP.PLC.
HEXAGON AB
INFINEON TECHNOLOGIES AG
INGENICO GROUP
JUST EAT TAKEAWAY COM NV
LOGITECH INTL.SA
MICRO FOCUS INTL.PLC.
MONEYSUPERMARKET COM GP.
NEMETSCHEK AG
NOKIA OYJ
PROSUS NV
RIGHTMOVE PLC.
SAP AG
SCOUT24 AG
SOPRA STERIA GROUP
SPECTRIS PLC.
STMICROELECTRONICS NV
TEAMVIEWER AG
TECAN GROUP AG
TELAB.LM ERIC.

Appendix
Composition of as the STOXX sectors of March 31, 2020

Technology (2/2)
TEMENOS AG
THE SAGE GROUP PLC.

Utilities
A2A SPA
CENTRICA PLC.
E ON SE
EDP ENERGIAS DE PORTL.SA
ELECTRICITE DE FRANCE
ELIA GROUP SA
ENDESA SA
ENEL SPA
ENGIE
FORTUM OYJ
HERA SPA
IBERDROLA SA
ITALGAS
NATIONAL GRID PLC.
NATURGY ENERGY GROUP SA
ORSTED A/S
RED ELECTRICA CORPN.SA
RWE AG.
SEVERN TRENT PLC.
SSE PLC.
TERNA RETE ELETTRICA NAZ
UNIPER SE
UNITED UTILITIES GP.PLC.
VEOLIA ENVIRONNEMENT
VERBUND AG

Energy
BP PLC.
DCC PLC.
DET NORS.OLJESELSKAP ASA
ENAGAS SA
ENI
EQUINOR ASA
GALP ENERGIA SGPS
GLENCORE PLC
KONINKLIJKE VOPAK NV
LUNDIN PETROLEUM AB
NESTE
OMV AG
PLKNC.NAFTOWY ORLEN
REPSOL YPF SA
ROYAL DUTCH SHELL
RUBIS
SAIPEM
SBM OFFSHORE NV
SIE.GAMESA RENWEN.SA
SNAM SPA
SUBSEA 7 SA
TECHNIPFMC PLC.
TENARIS SA
TGS-NOPEC GEOPHS.CO.ASA
TOTAL SA
VESTAS WINDSYSTEMS A/S
WOOD GROUP (JOHN) PLC.

VALUETRUST

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