European Capital Market Study

June 30, 2020

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

June 30, 2020

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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 sixth edition of the **ValueTrust European Capital Market Study.** With this study, we provide a data compilation of **capital market parameters** that enables an enterprise valuation in Europe. he purpose of the study is to serve as a tool and data source as well as to show trends in the parameters analyzed.

Our study is usually published semi-annually. However, due to the current COVID-19 crisis and the strong decline in market capitalization, we have issued an additional study as of March 31, 2020 in order to give a timely guide for decision-making. Therefore, this study also offers comparisons with the data and developments since the end of March.

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 June 30, 2014 and June 30, 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 March 31, 2020, the European risk-free rate continued its declining trend and decreased from 0.11% to 0.06% as of June 30, 2020.	Chapter 3
Market return and market risk premium	▪ After a severe decline in market capitalizations in the first quarter of 2020, market capitalizations have mostly recovered and the implied market return (ex-ante) for the European market decreased significantly from 9.1% as of March 31, 2020 to 7.3% as of June 30, 2020. ▪ The annual total shareholder return was -3.8% as of June 30, 2020. When looking at the past 15 years, we observe average historical market returns between 5.3% p.a. and 6.7% p.a.	Chapter 4
Betas	▪ The Technology sector has the highest unlevered sector-specific beta at 0.78, but only the sixth highest levered beta at 1.01. The highest levered beta shows the Financials sector at 1.12 (for a five-year period). ▪ Companies within the Consumer Non-Cyclicals sector display the lowest unlevered beta at 0.43 and the lowest levered beta at 0.65 as of June 30, 2020, closely followed by Telecommunication companies and Utilities.	Chapter 6
Sector returns (p.a.) ex-ante	▪ Between December 31, 2019 and June 30, 2020 the development of the implied sector returns demonstrated a decreasing trend across all sectors. ▪ The ex-ante analysis of implied sector returns reveals that unlevered sector returns are the highest for the companies of the Basic Materials sector at 4.6% (6.8% levered) and the lowest for the companies of the Telecommunication sector at 2.9% (8.1% levered) as of June 30, 2020. ▪ The Financials sector shows the highest levered implied sector return at 8.5%.	Chapter 7a

Executive Summary (2/2)

Sector returns (p.a.) ex-post

- Annual total shareholders returns as of June 30, 2020 vary widely between sectors (up to 58%-points)
- The Technology sector shows the highest total shareholder return annually at 30.0% as of June 30, 2020.
- The lowest total annual shareholder return was realized by the Energy sector at -27.6% as of June 30, 2020.
- The ex-post analysis of historical sector returns highlights that over a six-year period all sectors show positive total shareholder returns.

Chapter 7b

Trading Multiples

- As of June 30, 2020, the Healthcare sector has the highest forward Revenue-Multiples, compared to all other sectors, with 3.7x.
- Opposed to that, the lowest 1yf Revenue-Multiples 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 26.4x as of June 30, 2020. In contrast, the Financials sector posts the lowest 1yf P/E-Multiples with 12.0x.
- After a strong decline in market capitalizations in the first quarter of 2020 followed by a rebound, all sector multiples increased and thus showed higher forward P/E-Multiples on June 30, 2020 compared to March 31, 2020.
- Overall, the Technology sector shows the highest valuation level on average, followed by the Healthcare sector. On the contrary, the Financials sector 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 June 30, 2014 for the European capital markets.

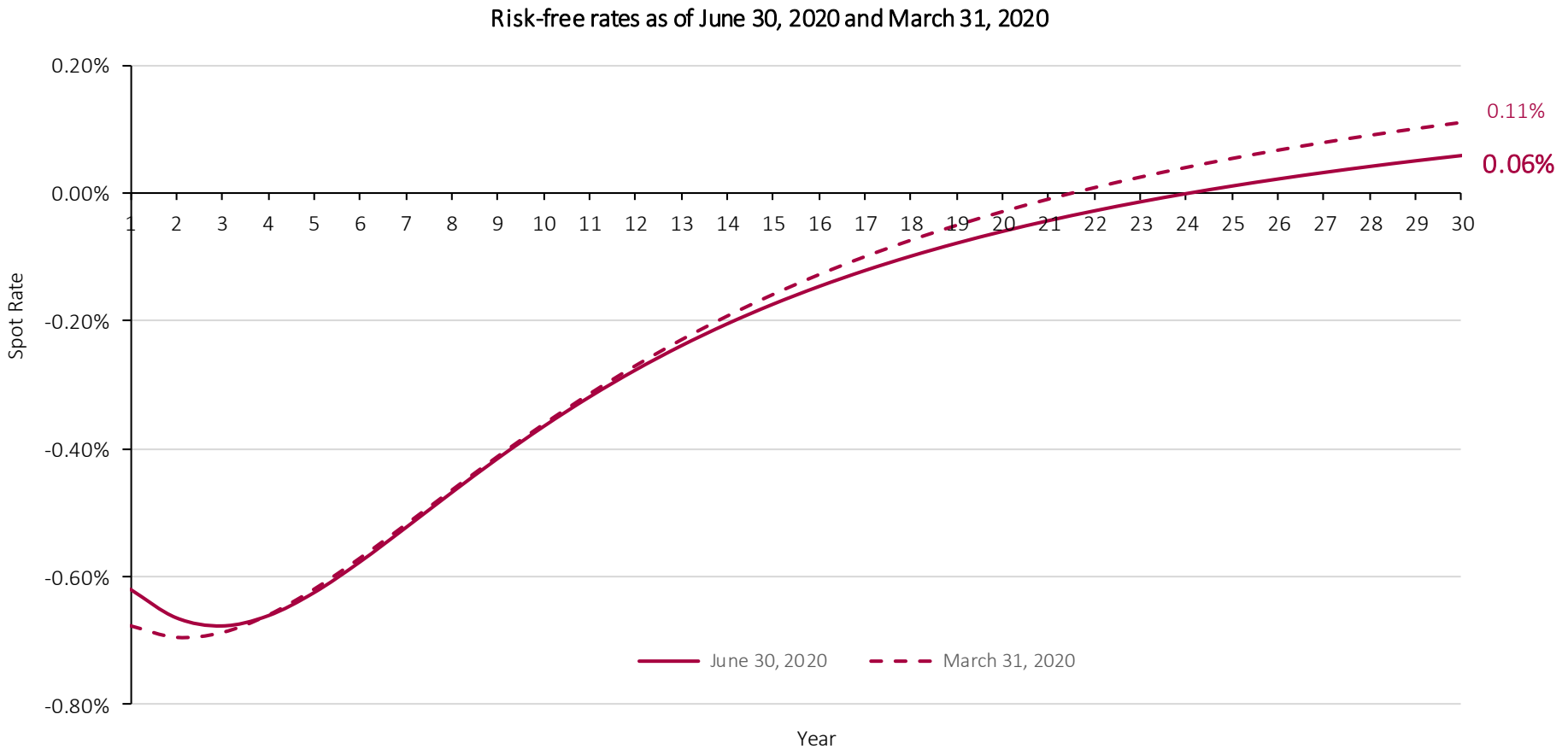
1) European Central Bank (https://www.ecb.europa.eu/stats/financial_markets_and_interest_rates/euro_area_yield_curves/html/index.en.html).

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

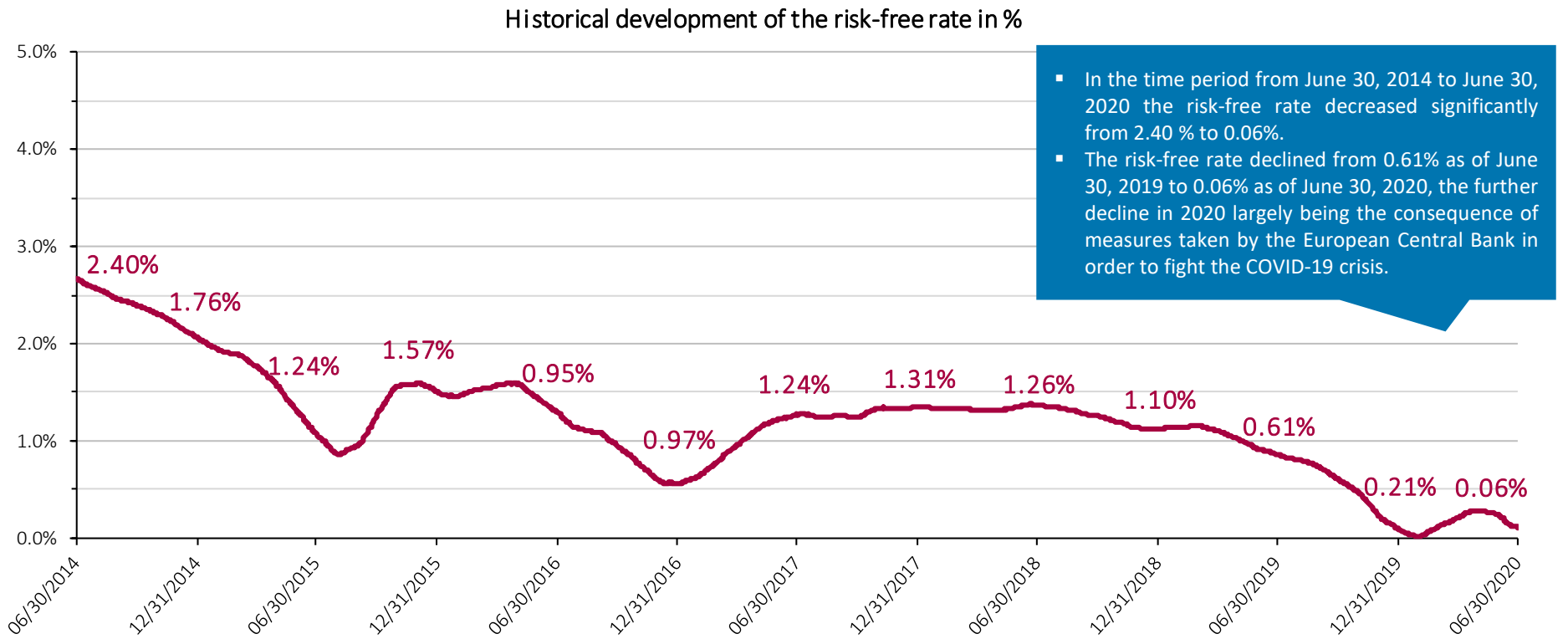
Interest rate curve based on long-term bonds (Svensson Method)



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 2014



- In the time period from June 30, 2014 to June 30, 2020 the risk-free rate decreased significantly from 2.40 % to 0.06%.
- The risk-free rate declined from 0.61% as of June 30, 2019 to 0.06% as of June 30, 2020, the further decline in 2020 largely being the consequence of measures taken by the European Central Bank in order to fight the COVID-19 crisis.

Risk-free rate	January	February	March	April	May	June	July	August	September	October	November	December
2020	0.28%	0.24%	0.11%	0.02%	-0.02%	0.06%						
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 period t+1[3)]

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.[4)] 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**.

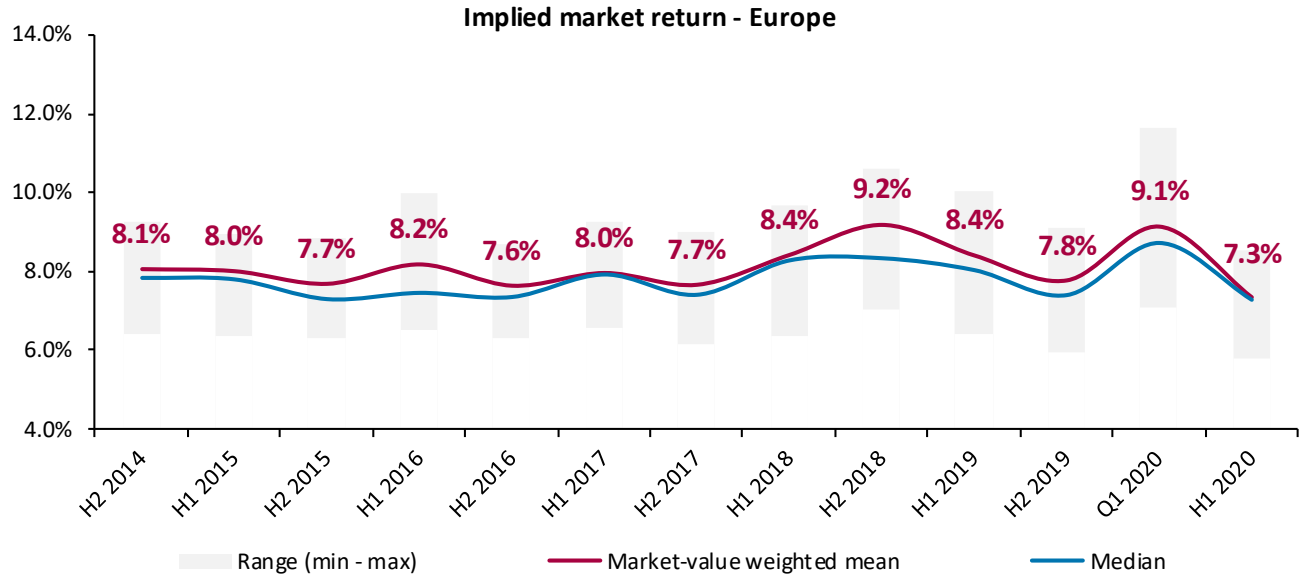
Henceforth, we determine the **implied market returns** for the STOXX Europe 600. We consider this index as a valid approximation for the total European market. The result builds the starting point for the calculation of the **implied market risk premium** of the European capital market.

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) Analyst consensus forecasts for the year 2021 were applied.
4) 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, DACH Capital Market Study December 31, 2019.

Implied Market Returns
European Market – STOXX Europe 600

Implied market return - Europe

	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020	H1 2020
	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	06/30/2020
Minimum	6.4%	6.3%	6.3%	6.5%	6.3%	6.6%	6.2%	6.4%	7.1%	6.4%	5.9%	7.1%	5.8%
Median	7.8%	7.8%	7.3%	7.4%	7.3%	7.9%	7.4%	8.3%	8.3%	8.0%	7.4%	8.7%	7.3%
Arithmetic mean	7.8%	7.8%	7.4%	7.9%	7.4%	7.8%	7.5%	8.2%	8.9%	8.3%	7.6%	9.0%	7.3%
Market-value weighted mean	**8.1%**	**8.0%**	**7.7%**	**8.2%**	**7.6%**	**8.0%**	**7.7%**	**8.4%**	**9.2%**	**8.4%**	**7.8%**	**9.1%**	**7.3%**
Maximum	9.3%	9.0%	8.8%	10.0%	8.7%	9.3%	9.0%	9.7%	10.6%	10.0%	9.1%	11.6%	8.5%



- After reaching the second highest market-value weighted mean at 9.1% as of March 31, 2020 the implied European market return decreased to 7.3% as of June 30, 2020.
- Overall, the implied market return decreased to the lowest level within our observation period.

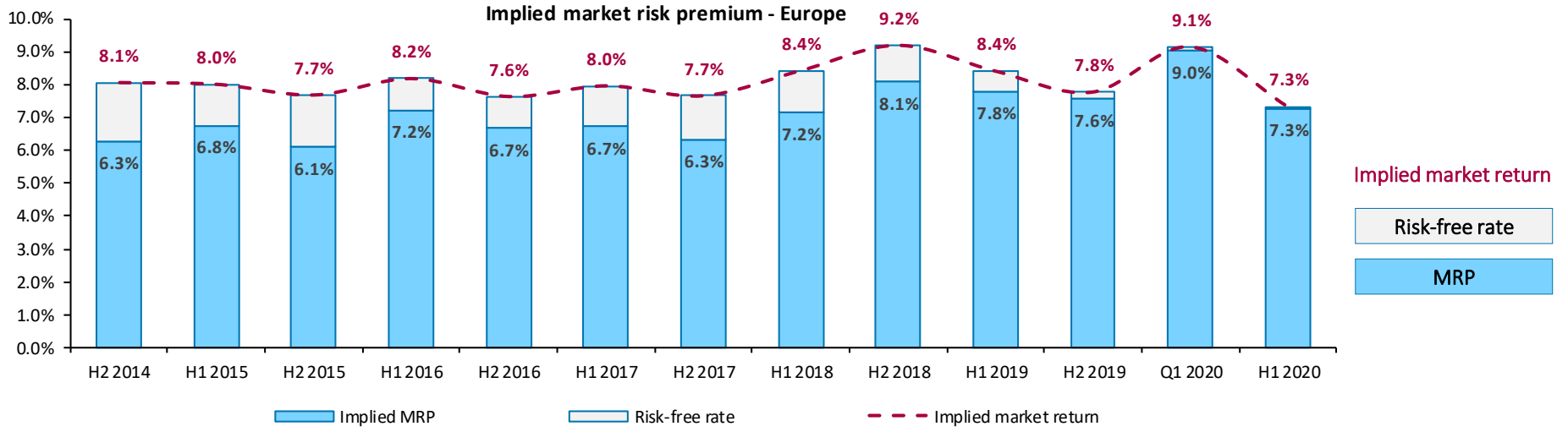
Note: Range based on implied sector returns.

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 **7.3% to 9.2%**. Subtracting the risk-free rate from the implied market return, we derive a **market risk premium** within the range of **6.1% to 9.0%.**

The **implied market return lies at 7.3%** as of the reference date June 30, 2020. Taking the **risk-free rate of 0.06%** into account, we determine an **implied market risk premium of 7.3%**, 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. 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.



	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020	H1 2020
Implied market return	8.1%	8.0%	7.7%	8.2%	7.6%	8.0%	7.7%	8.4%	9.2%	8.4%	7.8%	9.1%	7.3%
Risk-free rate	1.8%	1.2%	1.6%	1.0%	1.0%	1.2%	1.3%	1.3%	1.1%	0.6%	0.2%	0.1%	0.1%
Implied MRP	**6.3%**	**6.8%**	**6.1%**	**7.2%**	**6.7%**	**6.7%**	**6.3%**	**7.2%**	**8.1%**	**7.8%**	**7.6%**	**9.0%**	**7.3%**

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 **June 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 June 30, 2006.

The following slides illustrate how the two calculation methods (arithmetic and geometric mean) differ from each other for the period between June 30, 2005 and June 30, 2020. For the longest **observation period** of **15 years** the average historical mean of the market return amounts to **6.7%**. Using geometrical averaging, we obtain a market return of **5.3%**.

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.

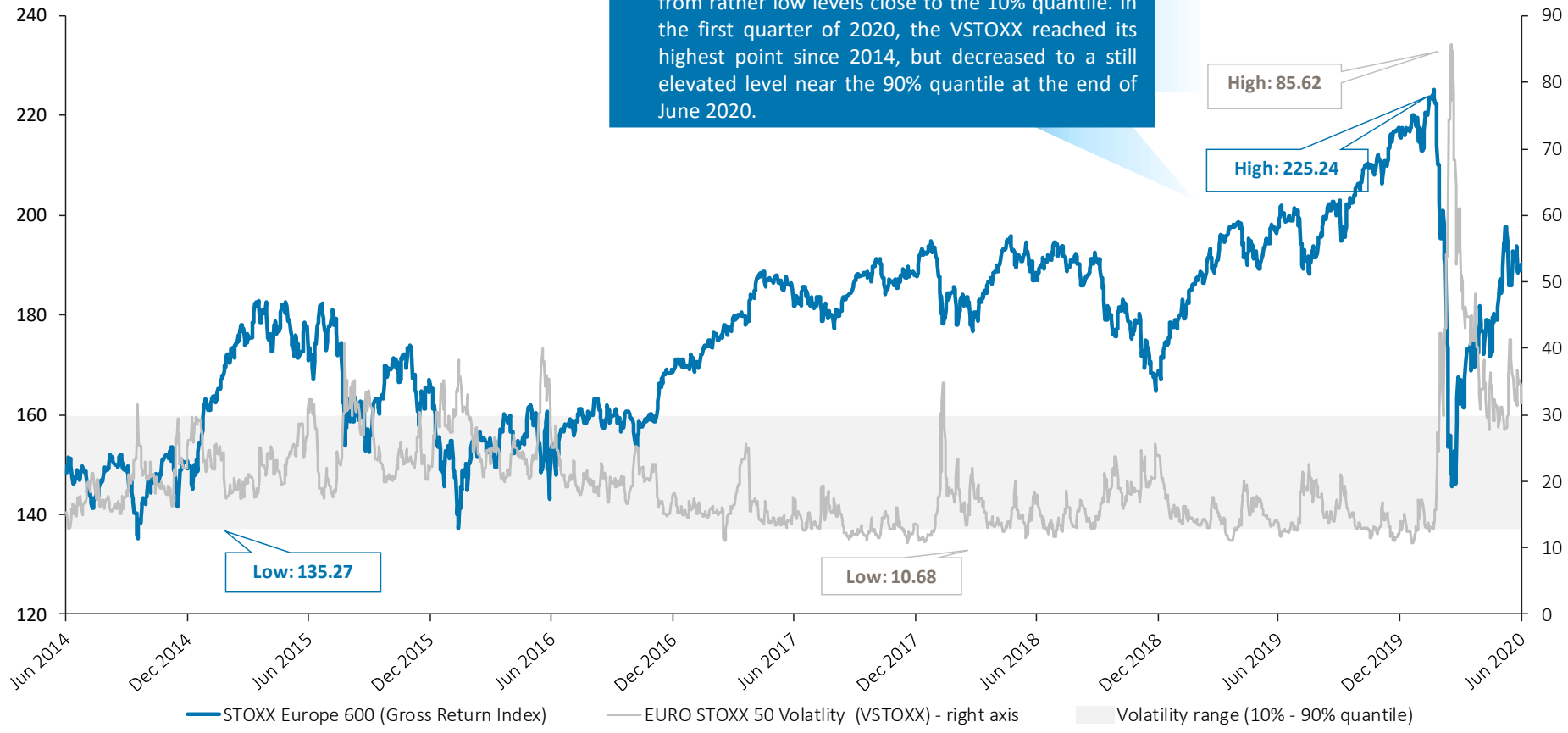
1) The German Stock Institute e.V. (DAI) developed the return triangle for DAX and EURO STOXX.

Historical Market Returns and Volatility – European Market

STOXX Europe 600 GR vs. VSTOXX since 2014

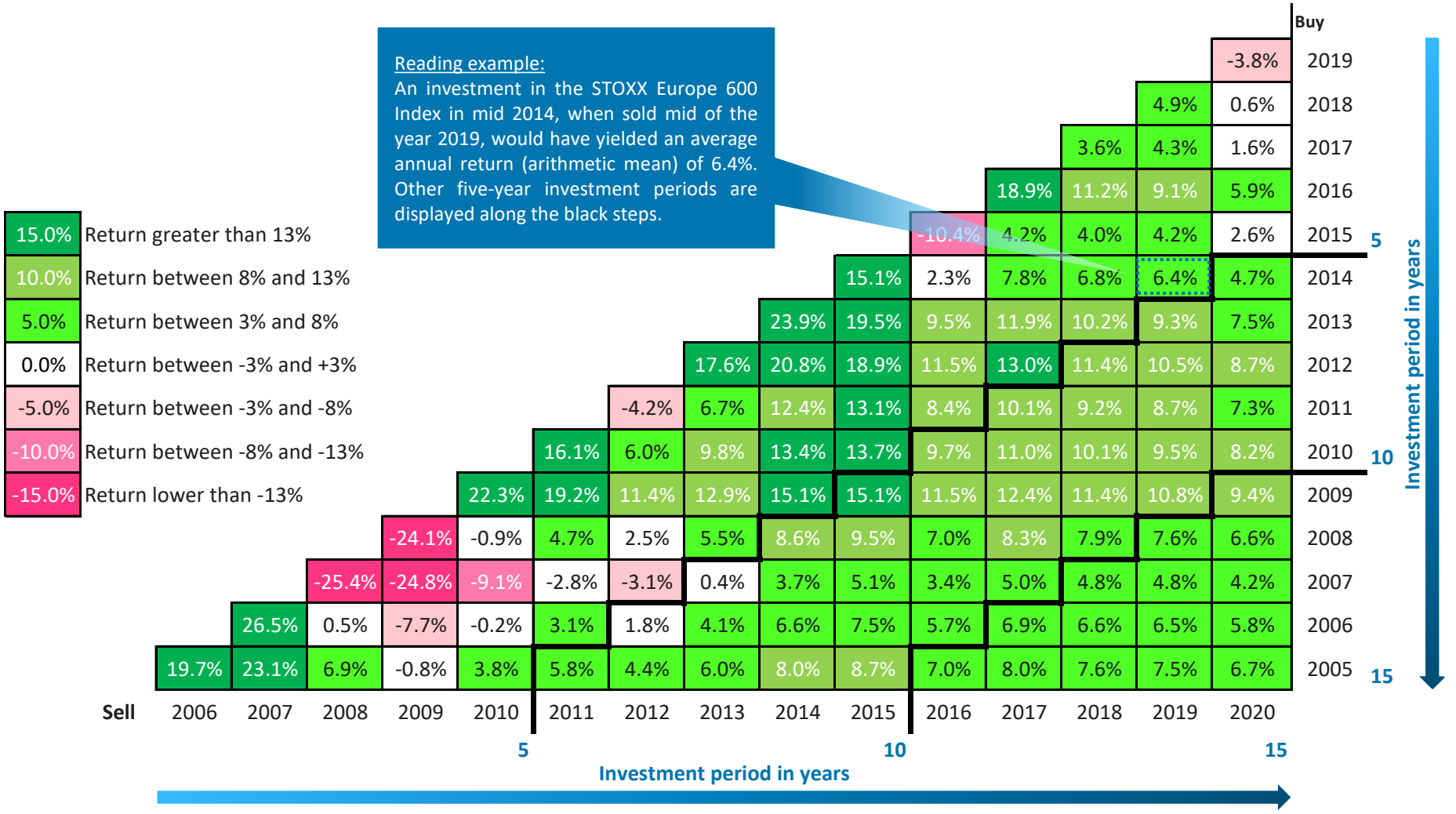
- In Q1 2020, the STOXX Europe 600 declined by nearly 30% to 167.1 as of March 31, 2020 as a consequence of the COVID-19 crisis. Since then, the STOXX Europe 600 has been recovering to 190.16 as of June 30, 2020.
- Since December 2019, the VSTOXX has increased from rather low levels close to the 10% quantile. In the first quarter of 2020, the VSTOXX reached its highest point since 2014, but decreased to a still elevated level near the 90% quantile at the end of June 2020.

Historical development of STOXX Europe 600 GR vs VSTOXX



Historical Market Returns (Arithmetic Mean) – European Market

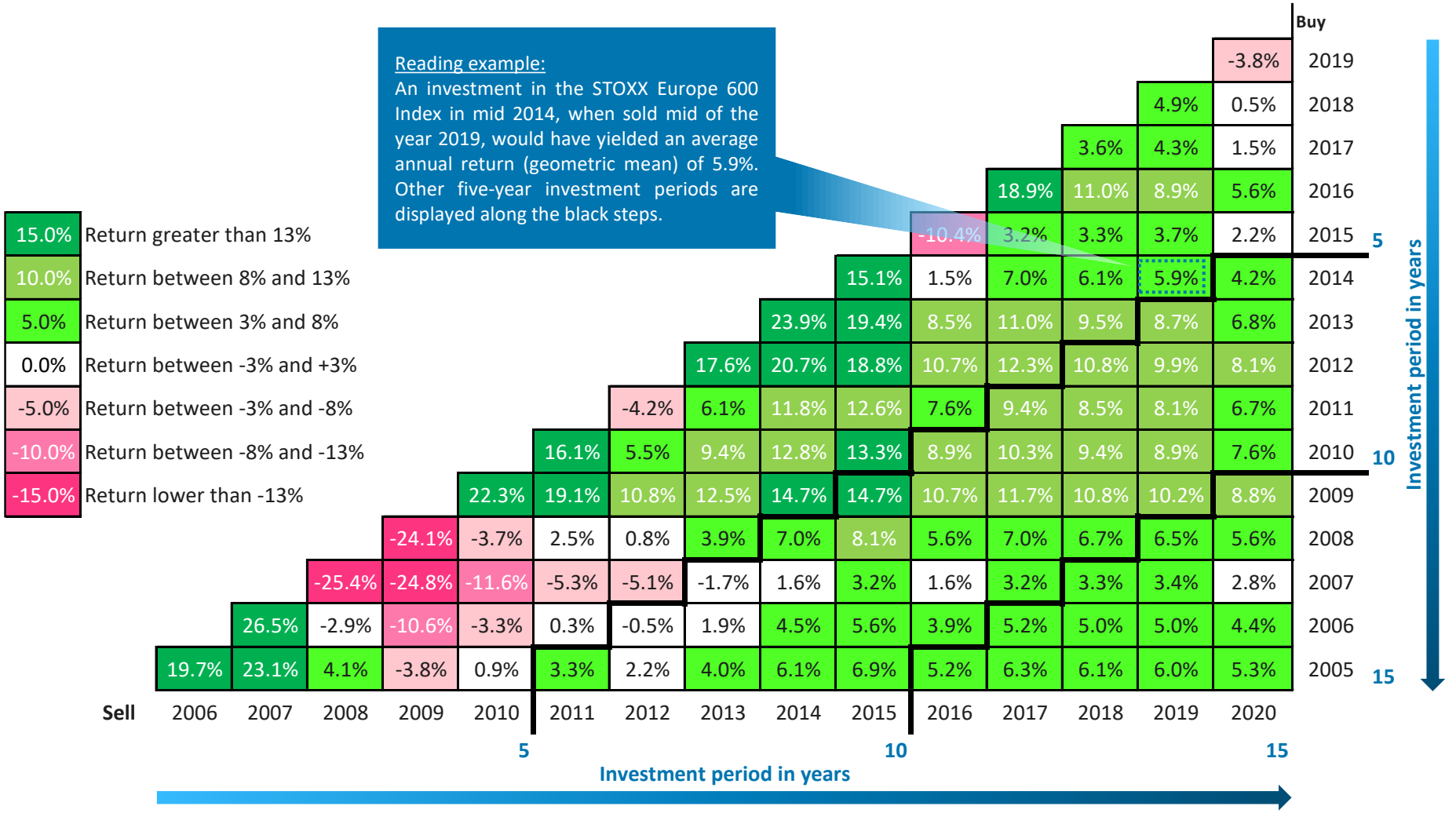
STOXX Europe 600 GR Return Triangle as of June 30, 2020



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

Historical Market Returns (Geometric Mean) – European Market

STOXX Europe 600 GR Return Triangle as of June 30, 2020



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

5 Sector classification of European companies

based on STOXX® industry classification

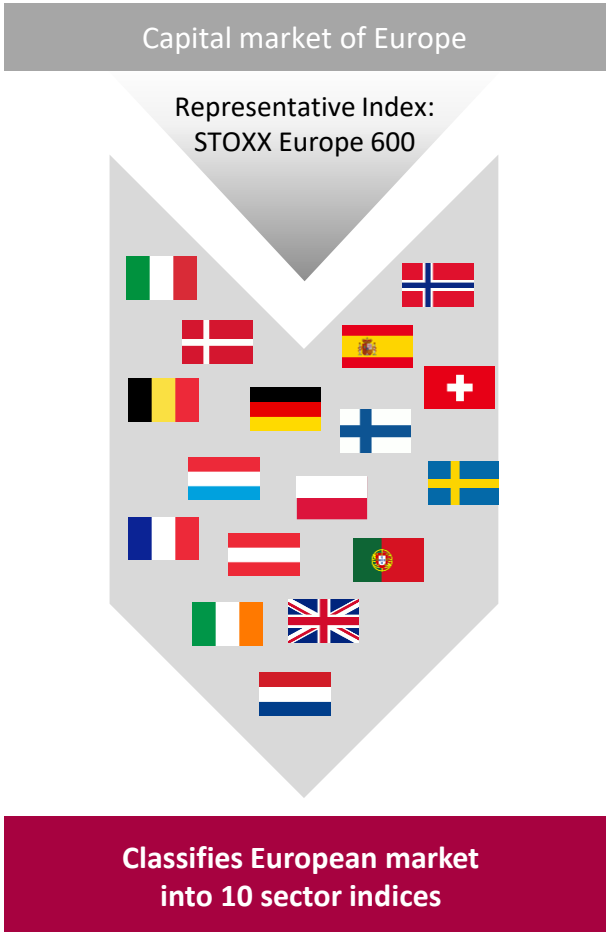
Sector Indices of the European Capital Market
Methodology & approach

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

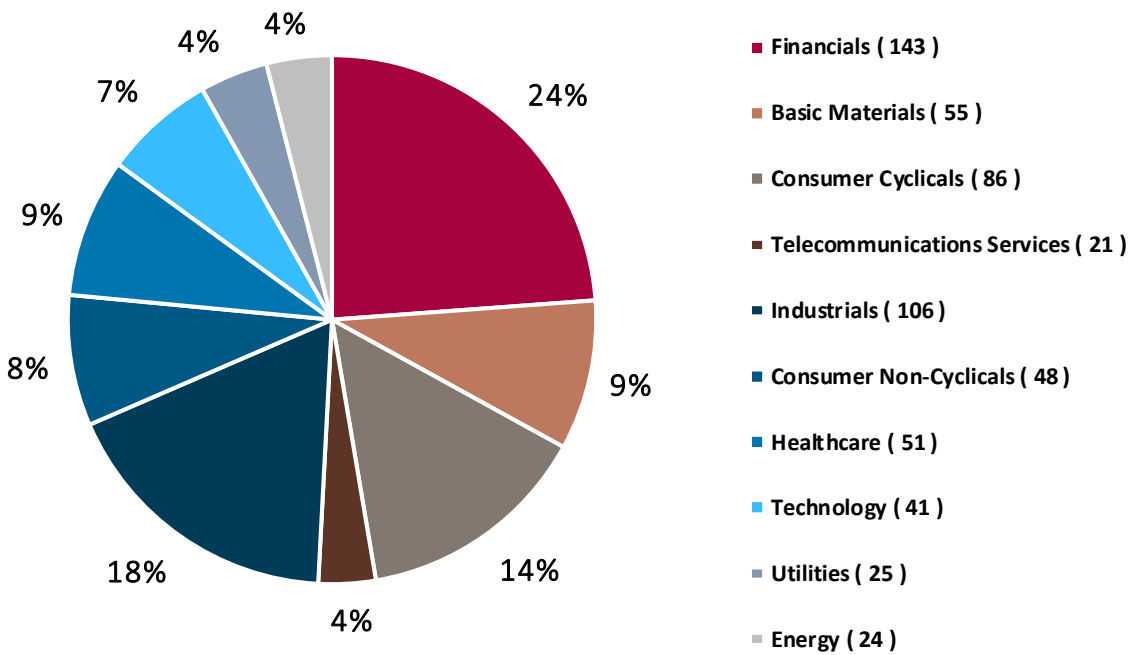


1) The Thomson Reuters Aggregates App offers analyst forecasts and historical values of key financials on an aggregated sector level.

Sector Indices of Europe as of June 30, 2020

Sector distribution and number of companies

Sector classification of the STOXX Europe 600



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 June 30, 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 June 30, '20	Credit Spread 5-years 2020-2015 monthly	Debt Beta 5-years 2020-2015 monthly	Beta unlevered 5-years 2020-2015 monthly
Financials	1.12	67%	199%	BBB+	1.78%	n.a.	n.a.[2)]
Basic Materials	1.04	35%	54%	BBB	1.56%	0.20	0.74
Consumer Cyclicals	1.10	47%	90%	BBB	1.56%	0.20	0.67
Telecommunications Services	0.66	59%	143%	BBB-	2.50%	0.31	0.45
Industrials	1.09	52%	110%	BBB	1.56%	0.20	0.62
Consumer Non-Cyclicals	0.65	47%	88%	BBB	1.56%	0.20	0.43
Healthcare	0.84	39%	63%	A-	1.22%	0.15	0.58
Technology	1.01	27%	38%	A-	1.22%	0.15	0.78
Utilities	0.66	58%	136%	BBB-	2.50%	0.31	0.46
Energy	1.08	37%	58%	BBB	1.56%	0.20	0.76
All	**0.95** [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 June 30, 2020, we observe sector specific, levered cost of equity of **6.8%** (market-value weighted mean) in the European Basic Materials sector. Taking the sector-specific leverage into account, we derive unlevered cost of equity of **4.6%.** 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: **0.06%**

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

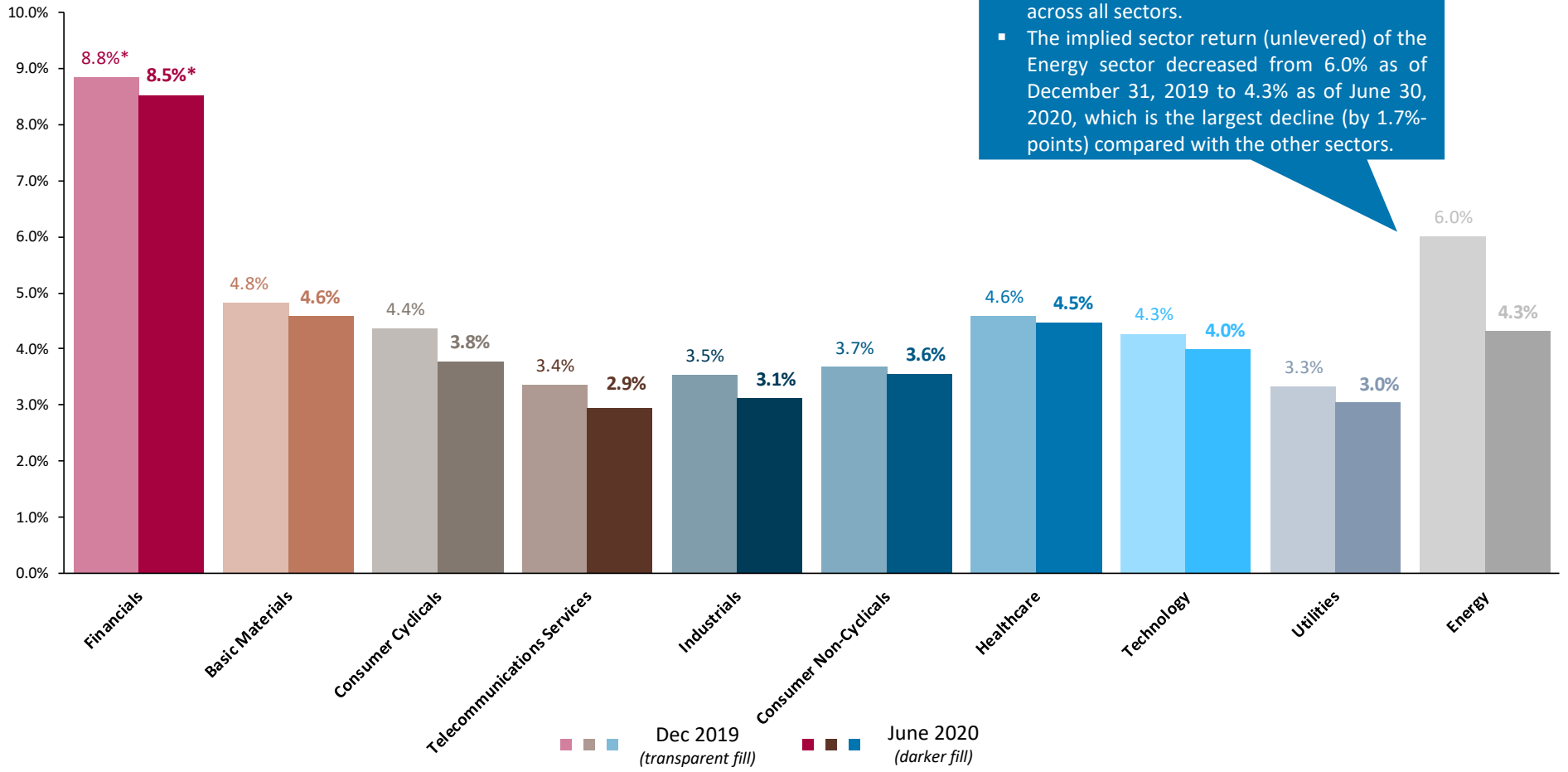
$$\mathbf{r_E^L} = 4.6\% + (4.6\% - 0.06\%) * 40\% = 6.4\%$$

Thus, **6.4%** is the company's relevered cost of equity. In comparison, the levered cost of equity of the Basic Materials sector is **6.8%**, reflecting the sectors' higher average leverage.

Implied Sector Returns (unlevered)*

Overview as of June 30, 2020 vs. December 31, 2019

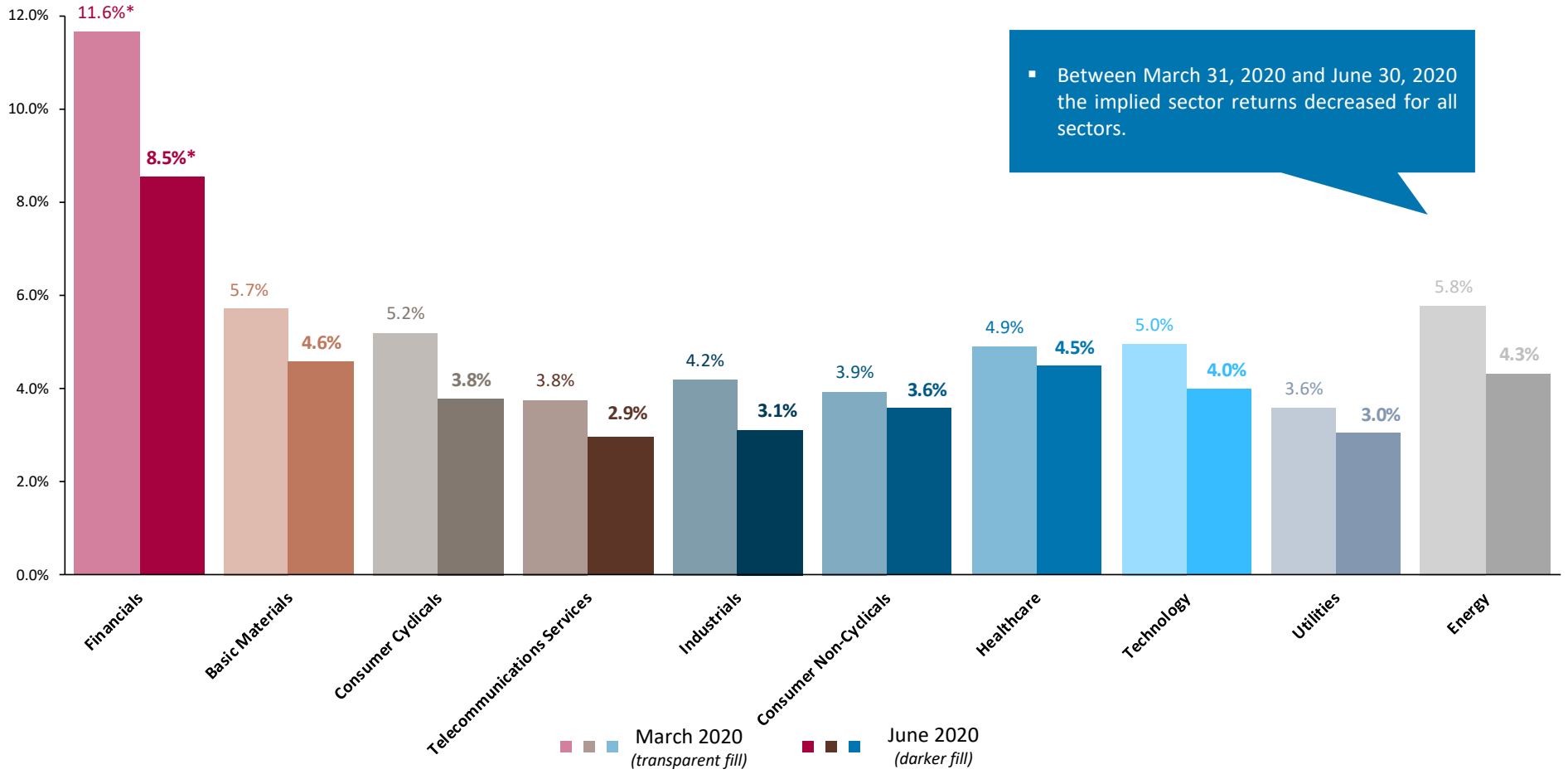
- Between December 31, 2019 and June 30, 2020 the development of the implied sector returns demonstrated a decreasing trend across all sectors.
- The implied sector return (unlevered) of the Energy sector decreased from 6.0% as of December 31, 2019 to 4.3% as of June 30, 2020, which is the largest decline (by 1.7%-points) compared with the other sectors.



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

Implied Sector Returns (unlevered)*

Overview as of June 30, 2020 vs March 31, 2020



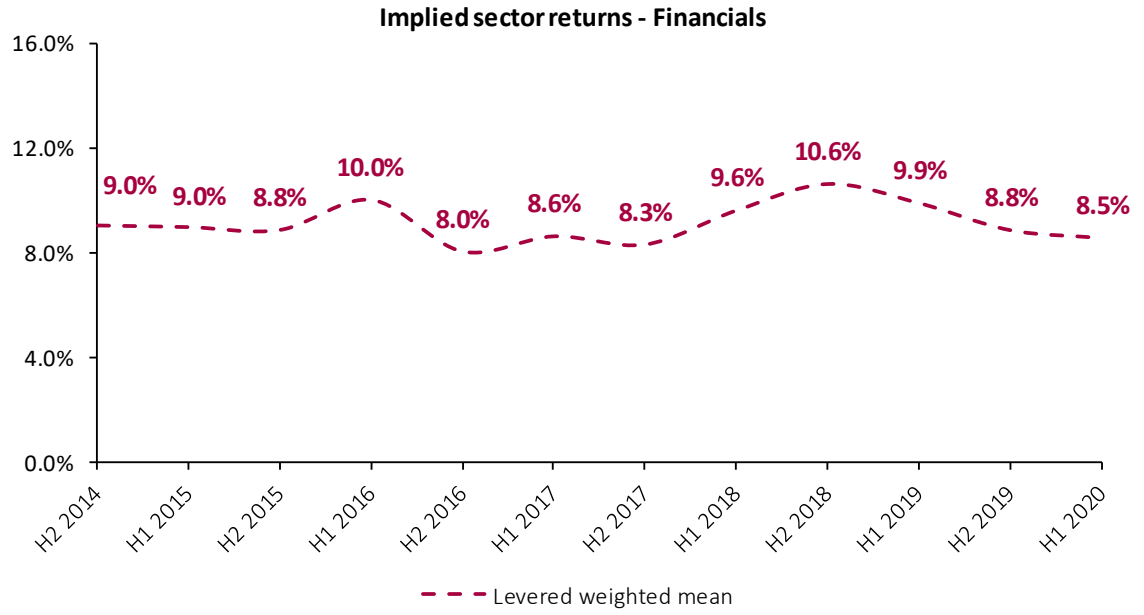
- Between March 31, 2020 and June 30, 2020 the implied sector returns decreased for all sectors.

* 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

	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020
	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**	**06/30/2020**
Levered weighted mean	9.0%	9.0%	8.8%	10.0%	8.0%	8.6%	8.3%	9.6%	10.6%	9.9%	8.8%	8.5%
Leverage	267.2%	226.9%	226.7%	210.2%	210.4%	206.0%	206.0%	191.7%	189.1%	199.3%	200.8%	196.6%



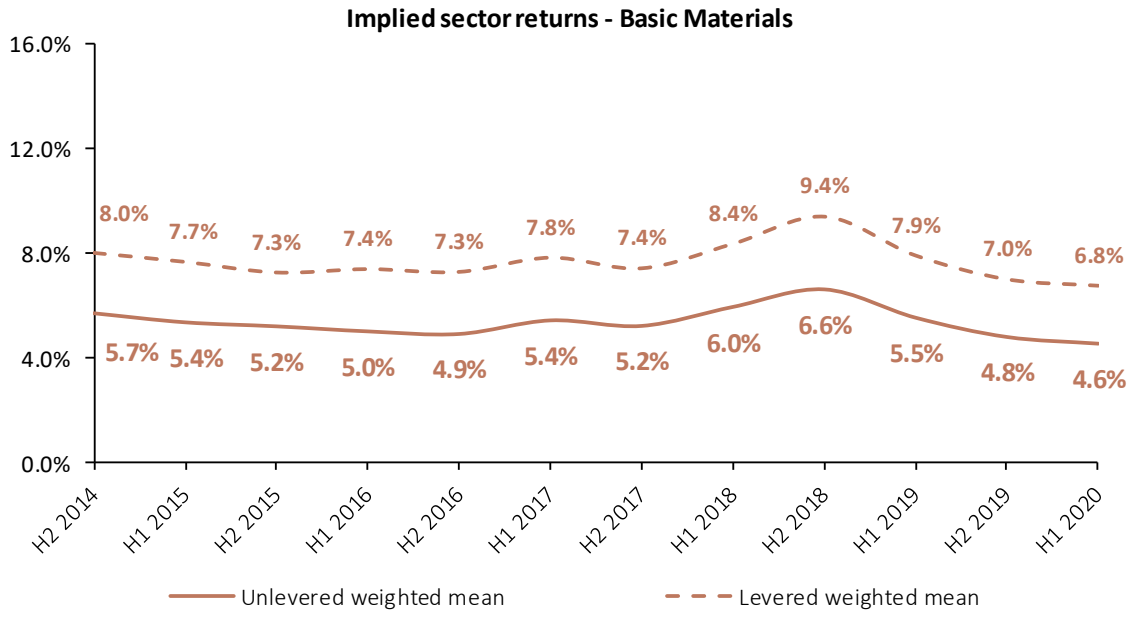
- The implied sector return of the Financials sector decreased from 8.8% as of December 31, 2019 to 8.5% as of June 30, 2020.
- In comparison to other sectors, the Financials sector still has the highest levered sector return as of June 30, 2019.
- Overall, we can observe a fluctuation between 8.0% and 10.6% of the levered weighted mean since December 31, 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

	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020
	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**	**06/30/2020**
Levered weighted mean	8.0%	7.7%	7.3%	7.4%	7.3%	7.8%	7.4%	8.4%	9.4%	7.9%	7.0%	6.8%
Leverage	58.3%	55.6%	55.9%	57.8%	59.3%	56.8%	55.7%	51.4%	50.8%	48.0%	47.3%	48.4%
Unlevered weighted mean	**5.7%**	**5.4%**	**5.2%**	**5.0%**	**4.9%**	**5.4%**	**5.2%**	**6.0%**	**6.6%**	**5.5%**	**4.8%**	**4.6%**

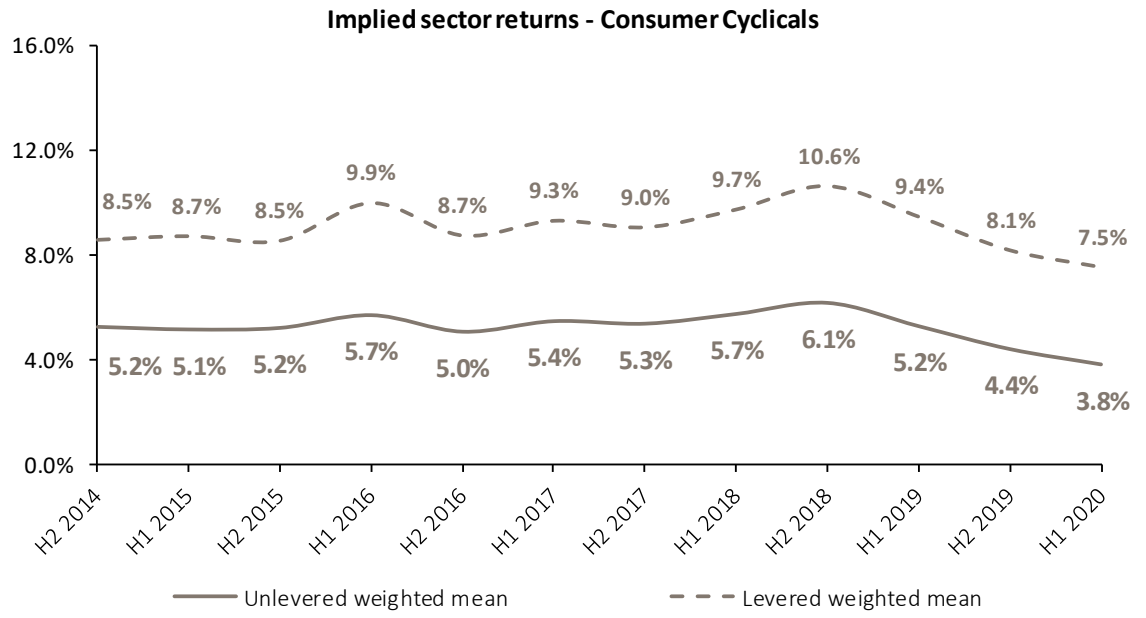


- The implied sector return (unlevered) in the Basic Materials sector decreased from 4.8% as of December 31, 2019 to 4.6% as of June 30, 2020.
- In comparison to other sectors, the Basic Materials sector has the highest unlevered implied sector return as of June 30, 2020.

Implied Sector Returns
Consumer Cyclicals

Implied sector returns - Consumer Cyclicals

	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020
	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**	**06/30/2020**
Levered weighted mean	8.5%	8.7%	8.5%	9.9%	8.7%	9.3%	9.0%	9.7%	10.6%	9.4%	8.1%	7.5%
Leverage	96.1%	91.8%	92.3%	90.7%	90.4%	91.3%	91.3%	89.5%	88.4%	90.2%	90.9%	100.1%
Unlevered weighted mean	**5.2%**	**5.1%**	**5.2%**	**5.7%**	**5.0%**	**5.4%**	**5.3%**	**5.7%**	**6.1%**	**5.2%**	**4.4%**	**3.8%**

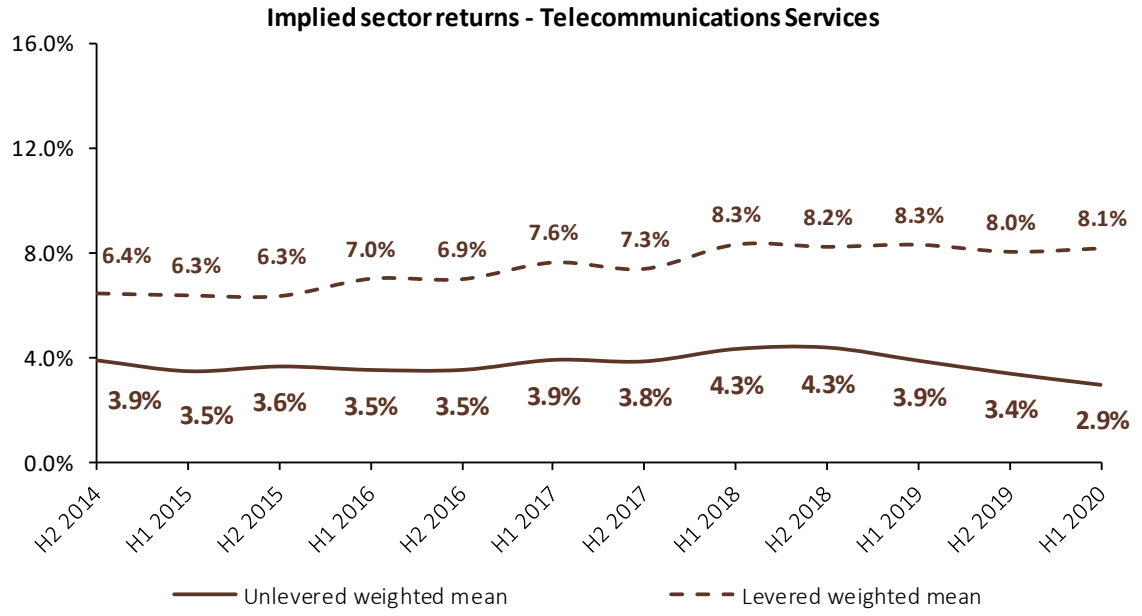


- The implied sector return (unlevered) in the Consumer Cyclicals sector further decreased to 3.8% as of June 30, 2020, reaching by far its lowest level in our observation period.
- Overall, the unlevered weighted mean has fluctuated between 3.8% and 6.1% since December 31, 2014.

Implied Sector Returns
Telecommunication Services

Implied sector returns - Telecommunications Services

	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020
	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	06/30/2020
Levered weighted mean	6.4%	6.3%	6.3%	7.0%	6.9%	7.6%	7.3%	8.3%	8.2%	8.3%	8.0%	8.1%
Leverage	120.8%	129.3%	129.1%	135.3%	135.5%	140.0%	139.6%	131.2%	118.1%	135.8%	146.2%	179.2%
Unlevered weighted mean	**3.9%**	**3.5%**	**3.6%**	**3.5%**	**3.5%**	**3.9%**	**3.8%**	**4.3%**	**4.3%**	**3.9%**	**3.4%**	**2.9%**

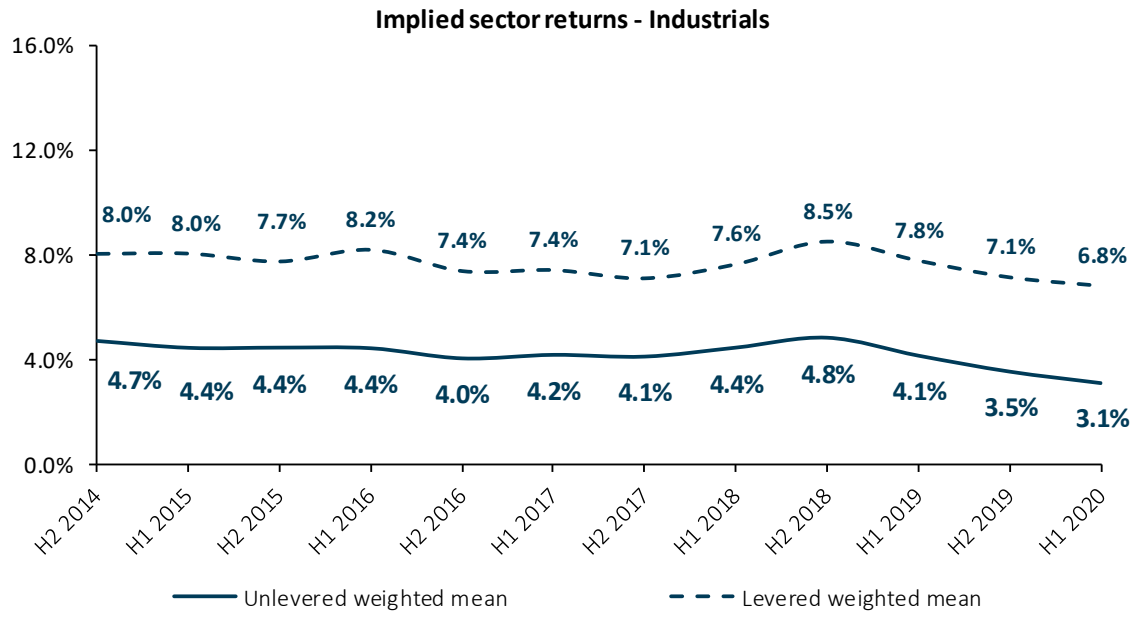


- In the Telecommunications Services sector the implied return (unlevered) further decreased to 2.9% as of mid 2020, reaching its lowest level in our observation period.
- In comparison to other sectors, the Telecommunications Services sector has the lowest unlevered weighted mean as of June 30, 2020.

Implied Sector Returns
Industrials

Implied sector returns - Industrials

	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020
	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**	**06/30/2020**
Levered weighted mean	8.0%	8.0%	7.7%	8.2%	7.4%	7.4%	7.1%	7.6%	8.5%	7.8%	7.1%	6.8%
Leverage	114.5%	113.2%	115.3%	108.7%	109.1%	111.0%	107.6%	100.8%	99.4%	103.0%	107.9%	121.2%
Unlevered weighted mean	**4.7%**	**4.4%**	**4.4%**	**4.4%**	**4.0%**	**4.2%**	**4.1%**	**4.4%**	**4.8%**	**4.1%**	**3.5%**	**3.1%**

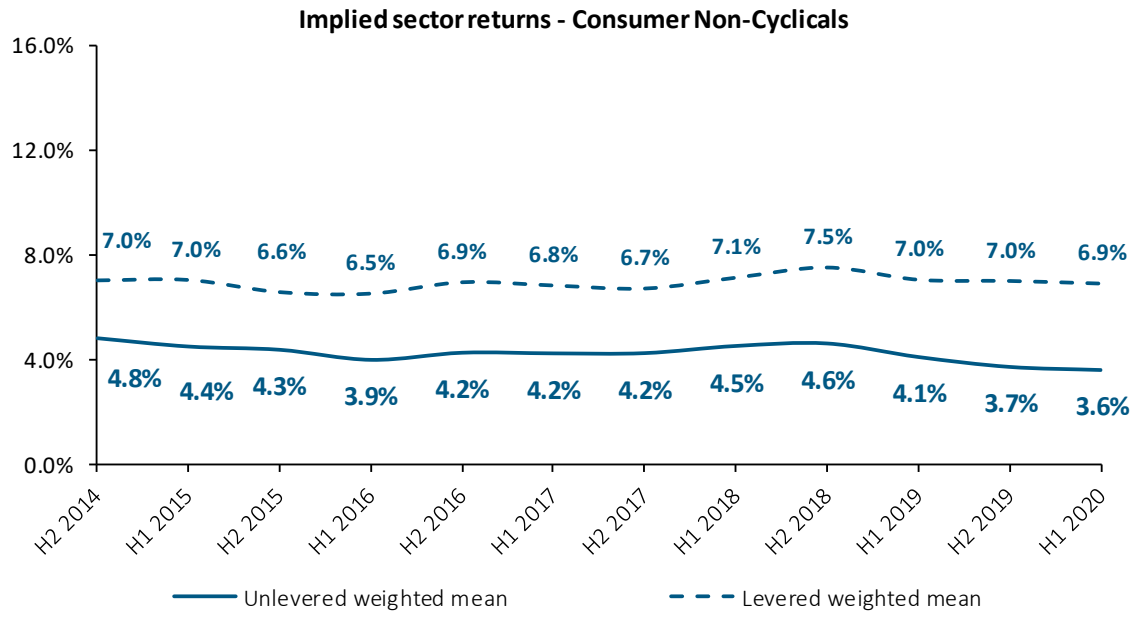


- The implied sector return (unlevered) in the Industrials sector further declined from an already low value of 3.5% as of December 31, 2019 to 3.1% as of June 30, 2020 which marks a new low.
- Since December 2014, the unlevered weighted mean varied within a range of 3.1% to 4.8%.

Implied Sector Returns
Consumer Non-Cyclicals

Implied sector returns - Consumer Non-Cyclicals

	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020
	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**	**06/30/2020**
Levered weighted mean	7.0%	7.0%	6.6%	6.5%	6.9%	6.8%	6.7%	7.1%	7.5%	7.0%	7.0%	6.9%
Leverage	75.3%	80.7%	81.5%	85.8%	84.3%	89.3%	86.8%	82.7%	85.2%	86.9%	95.7%	95.3%
Unlevered weighted mean	**4.8%**	**4.4%**	**4.3%**	**3.9%**	**4.2%**	**4.2%**	**4.2%**	**4.5%**	**4.6%**	**4.1%**	**3.7%**	**3.6%**

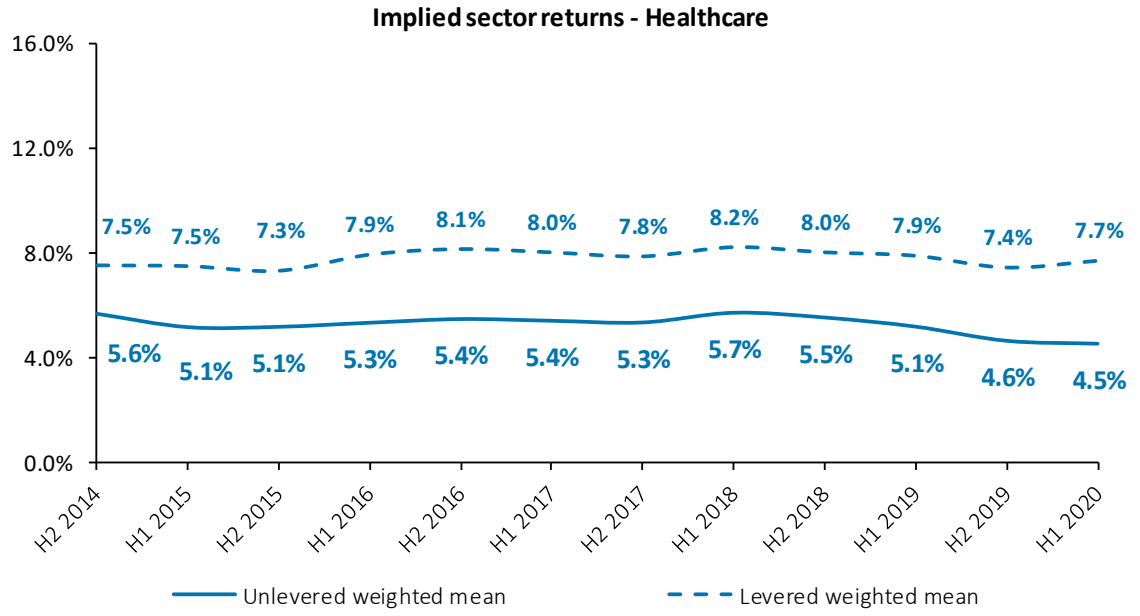


- In the Consumer Non-Cyclicals sector the implied sector return (unlevered) showed a steadily decreasing trend until June 30, 2016 and since then trended upwards to 4.6% at year end of 2018 before the trend reversed and a new low was reached at 3.6% as of June 30, 2020.

Implied Sector Returns
Healthcare

Implied sector returns - Healthcare

	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020
	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**	**06/30/2020**
Levered weighted mean	7.5%	7.5%	7.3%	7.9%	8.1%	8.0%	7.8%	8.2%	8.0%	7.9%	7.4%	7.7%
Leverage	47.9%	60.4%	60.5%	60.2%	60.1%	63.6%	63.5%	56.9%	56.9%	60.1%	64.4%	72.3%
Unlevered weighted mean	**5.6%**	**5.1%**	**5.1%**	**5.3%**	**5.4%**	**5.4%**	**5.3%**	**5.7%**	**5.5%**	**5.1%**	**4.6%**	**4.5%**

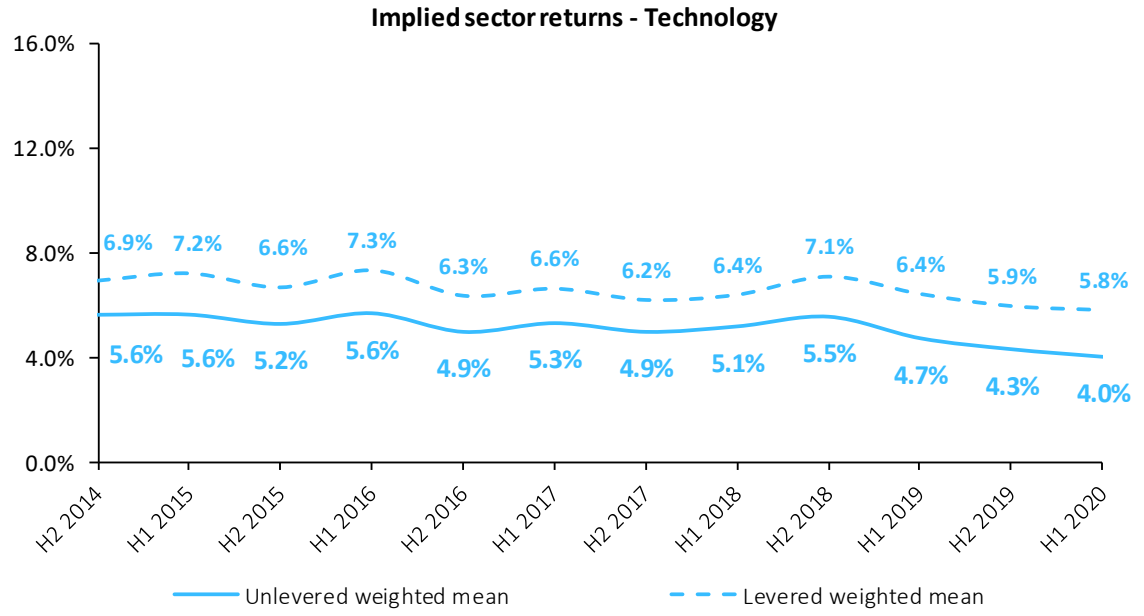


- The implied sector return (unlevered) in the Healthcare sector fluctuated between 5.7% and 5.1% until June 30, 2019. In the second half of the year in 2019 the implied sector return dropped from 5.1% to 4.6% and was nearly unchanged at 4.5% as of June 30, 2020.

Implied Sector Returns
Technology

Implied sector returns - Technology

	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020
	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**	**06/30/2020**
Levered weighted mean	6.9%	7.2%	6.6%	7.3%	6.3%	6.6%	6.2%	6.4%	7.1%	6.4%	5.9%	5.8%
Leverage	34.2%	36.3%	38.1%	35.1%	34.7%	32.7%	33.5%	31.1%	34.8%	41.4%	40.4%	45.2%
Unlevered weighted mean	**5.6%**	**5.6%**	**5.2%**	**5.6%**	**4.9%**	**5.3%**	**4.9%**	**5.1%**	**5.5%**	**4.7%**	**4.3%**	**4.0%**

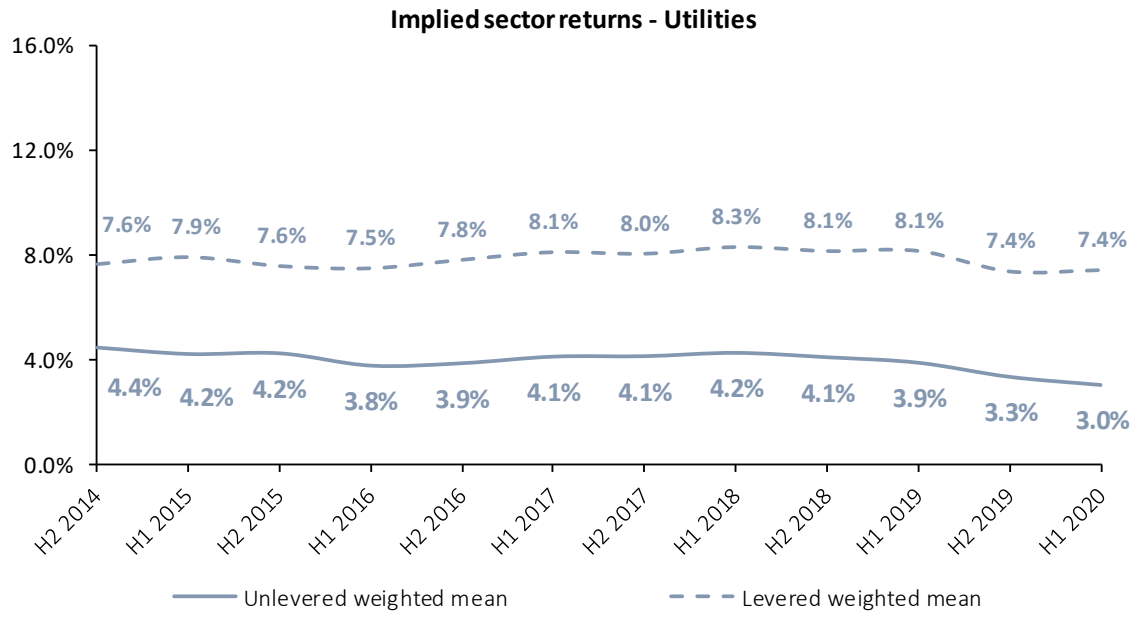


- The implied sector return (unlevered) in the Technology sector decreased from 4.3% as of December 31, 2019 to 4.0% as of June 30, 2020.
- The Technology sector has the lowest leverage of the analyzed sectors. This indicates less favorable financing conditions for companies within the Technology sector due to a more pronounced operational risk profile. However, the leverage is at the upper end within the observation period, reflecting the overall benign financing environment.

Implied Sector Returns
Utilities

Implied sector returns - Utilities

	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020
	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**	**06/30/2020**
Levered weighted mean	7.6%	7.9%	7.6%	7.5%	7.8%	8.1%	8.0%	8.3%	8.1%	8.1%	7.4%	7.4%
Leverage	118.6%	124.6%	125.2%	131.9%	136.5%	138.8%	138.8%	135.0%	135.6%	130.4%	128.3%	147.1%
Unlevered weighted mean	**4.4%**	**4.2%**	**4.2%**	**3.8%**	**3.9%**	**4.1%**	**4.1%**	**4.2%**	**4.1%**	**3.9%**	**3.3%**	**3.0%**

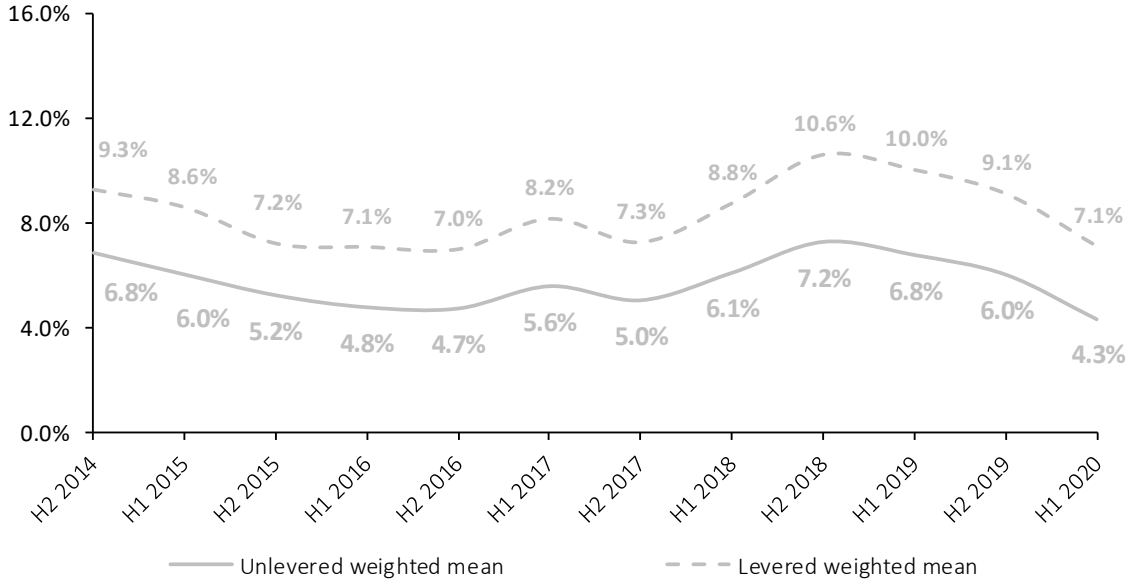


- In comparison to the other sectors, the Utilities sector has the second lowest unlevered implied sector return at 3.0% as of June 30, 2020.
- The high average leverage indicates favourable financing conditions for the companies in the Utilities sector. This can be attributed to the relatively low operational risk profile of the sector.

Implied Sector Returns
Energy

Implied sector returns - Energy

	H2 2014	H1 2015	H2 2015	H1 2016	H2 2016	H1 2017	H2 2017	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020
	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**	**06/30/2020**
Levered weighted mean	9.3%	8.6%	7.2%	7.1%	7.0%	8.2%	7.3%	8.8%	10.6%	10.0%	9.1%	7.1%
Leverage	48.2%	54.2%	54.2%	60.2%	60.2%	59.6%	59.4%	55.6%	54.8%	53.4%	53.6%	65.5%
Unlevered weighted mean	**6.8%**	**6.0%**	**5.2%**	**4.8%**	**4.7%**	**5.6%**	**5.0%**	**6.1%**	**7.2%**	**6.8%**	**6.0%**	**4.3%**



- The Energy sector, in comparison to other sectors, showed the strongest decline of the unlevered weighted mean (by 1.7%-points) to 4.3% as of June 30, 2020.
- Overall, the sector's implied return experienced a volatile development. In the recent years, we observed a declining trend from 7.2% as of December 31, 2018 to 4.3% as of June 30, 2020.

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**.

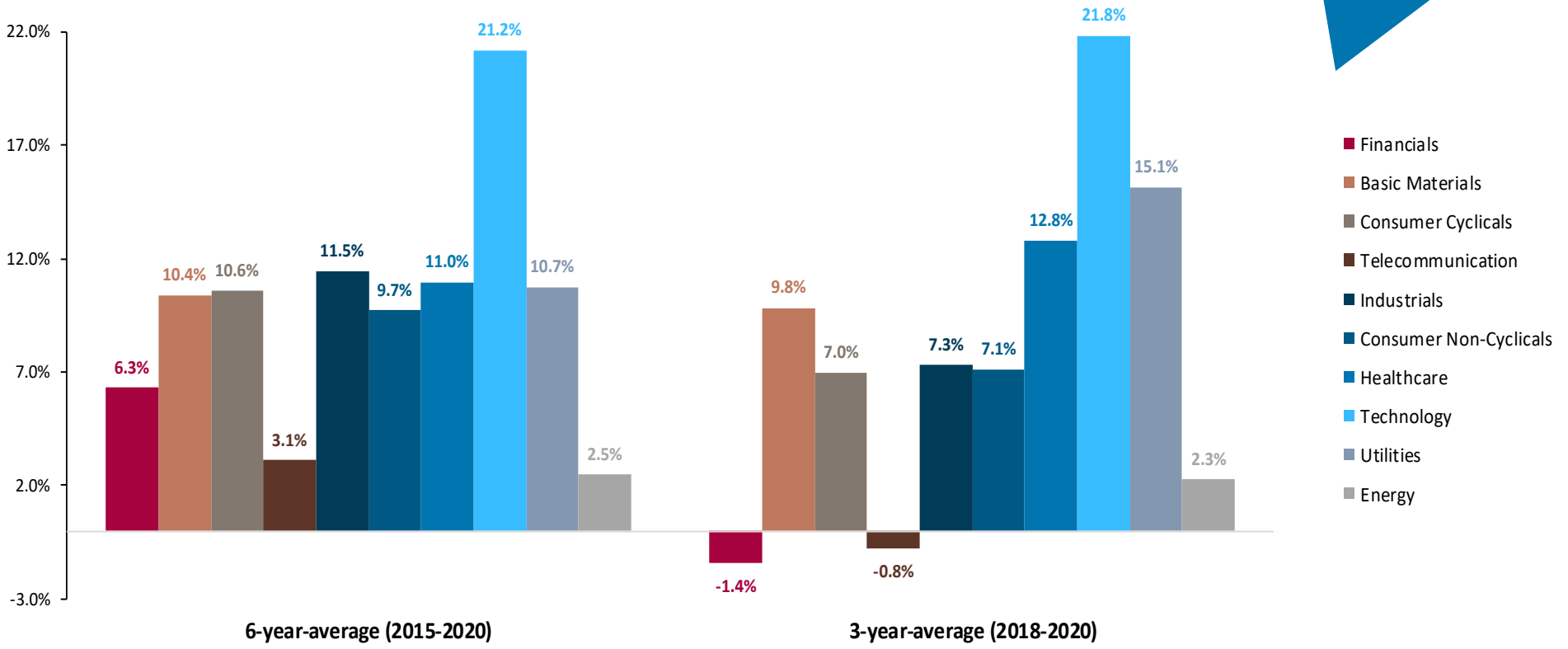
Our analysis contains so-called **total shareholder returns** (TSR) p.a. analogous to the return triangles for the European total return indices. This means, we consider the **share price development** as well as the **dividend yield,** whereas the share price development generally represents the main component of the total shareholder returns.

We derive the **annual total shareholder returns between end of 2014 and June 30, 2020** for every STOXX Europe 600 sector. 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, we additionally calculate the 3-year (2018-2020) and the 6-year (2015-2020) averages.

Historical Sector Returns

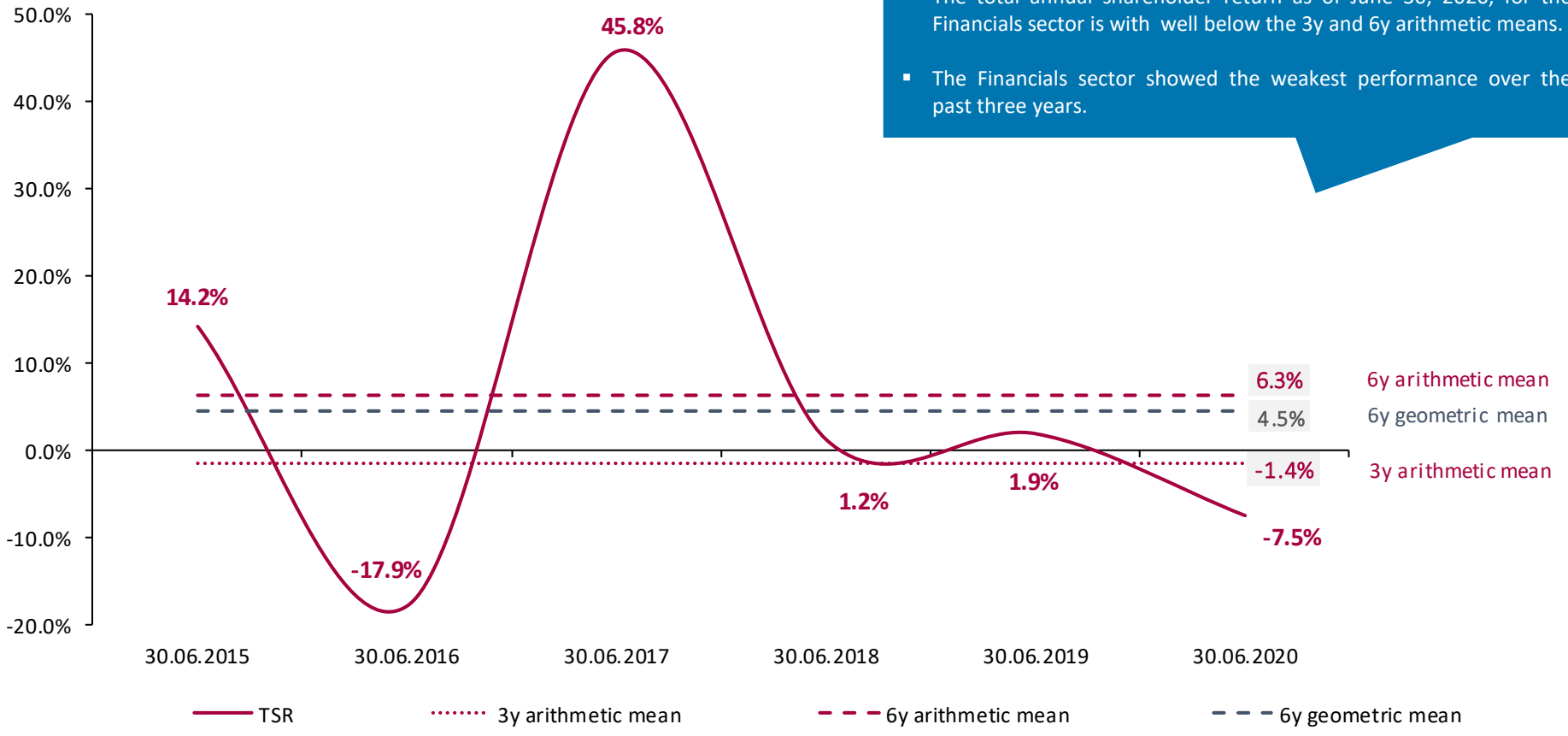
Average total shareholder returns as of June 30, 2019

- We see a mixed picture for average annual total shareholder returns in the European market. 3y mean is lower than the 6y mean of annual total shareholder returns for seven sectors and higher for three sectors. The widest difference is shown by the Financial sector (7.7%)



Total Shareholder Returns
Financials

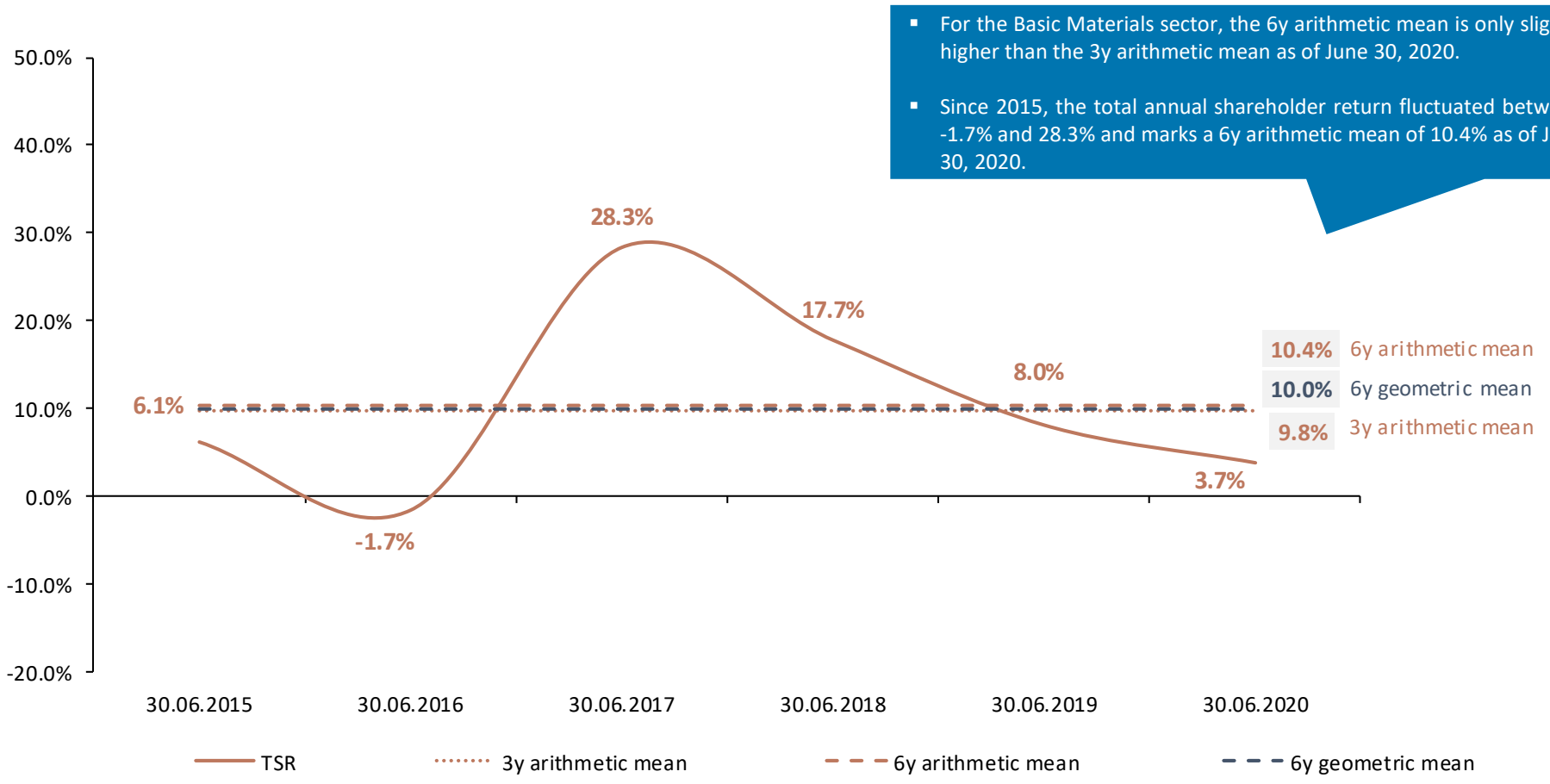
Total shareholder returns - Financials



- The total annual shareholder return as of June 30, 2020, for the Financials sector is with well below the 3y and 6y arithmetic means.
- The Financials sector showed the weakest performance over the past three years.

Total Shareholder Returns
Basic Materials

Total shareholder returns - Basic Materials

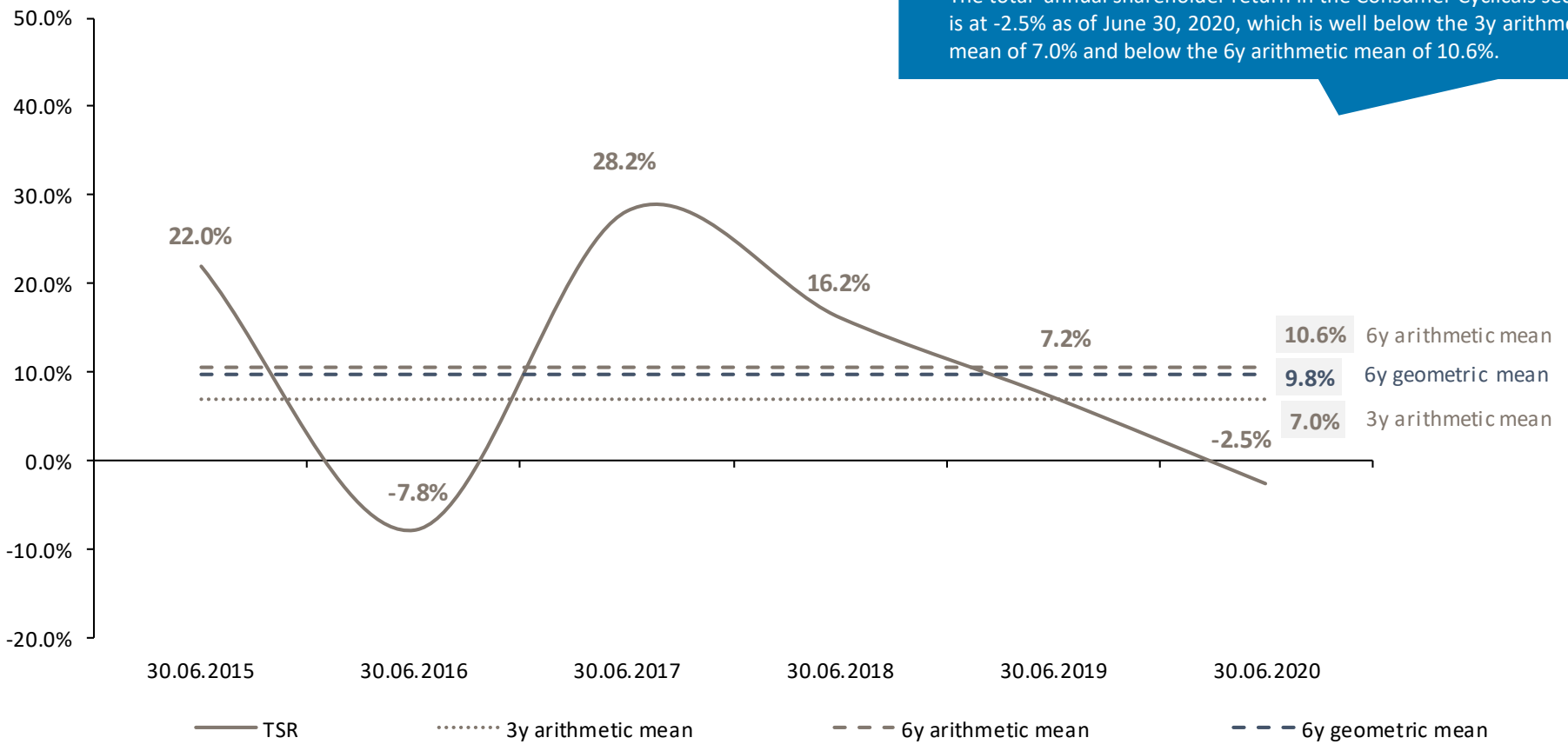


- For the Basic Materials sector, the 6y arithmetic mean is only slightly higher than the 3y arithmetic mean as of June 30, 2020.
- Since 2015, the total annual shareholder return fluctuated between -1.7% and 28.3% and marks a 6y arithmetic mean of 10.4% as of June 30, 2020.

Total Shareholder Returns
Consumer Cyclicals

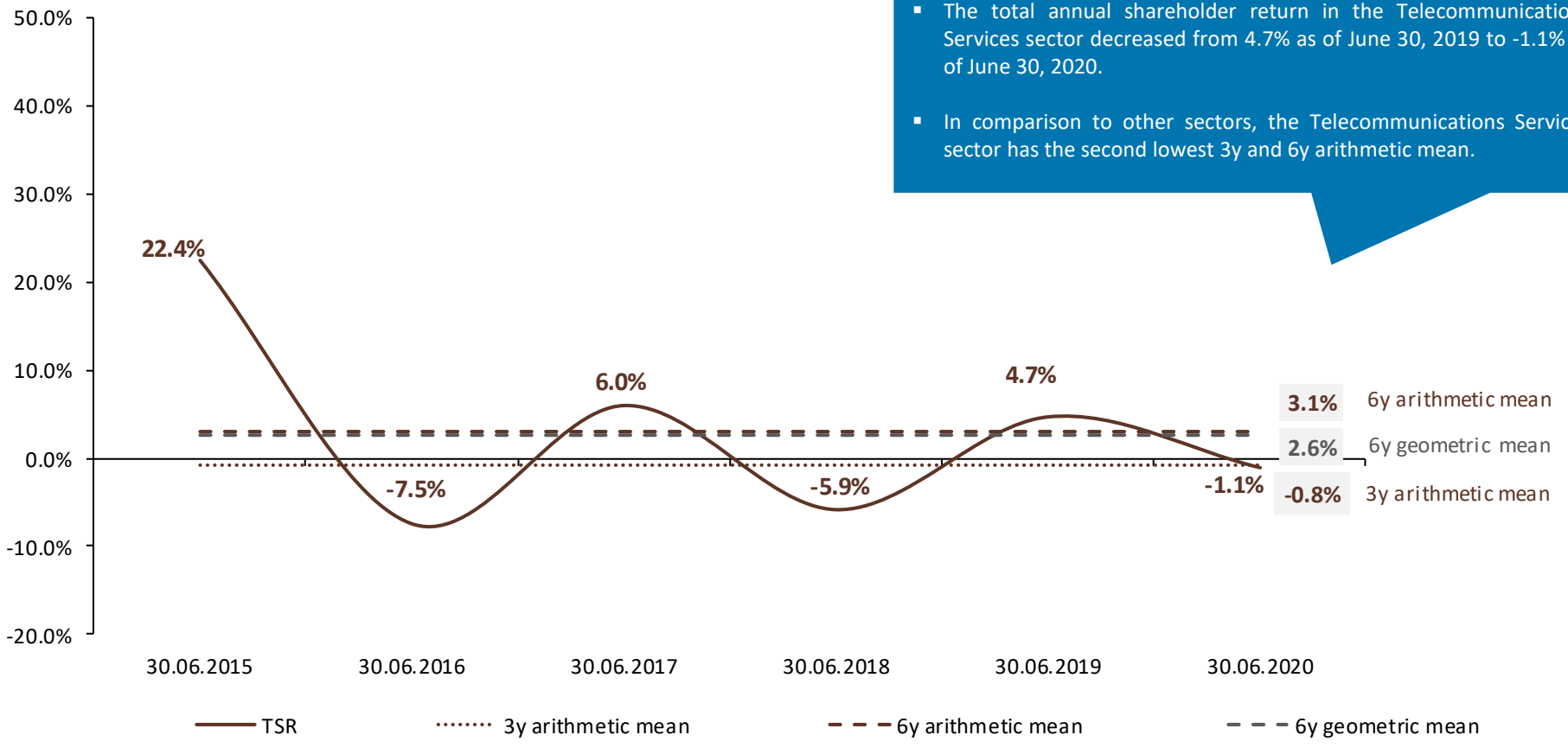
Total shareholder returns - Consumer Cyclicals

- The total annual shareholder return in the Consumer Cyclicals sector is at -2.5% as of June 30, 2020, which is well below the 3y arithmetic mean of 7.0% and below the 6y arithmetic mean of 10.6%.



Total Shareholder Returns
Telecommunications Services

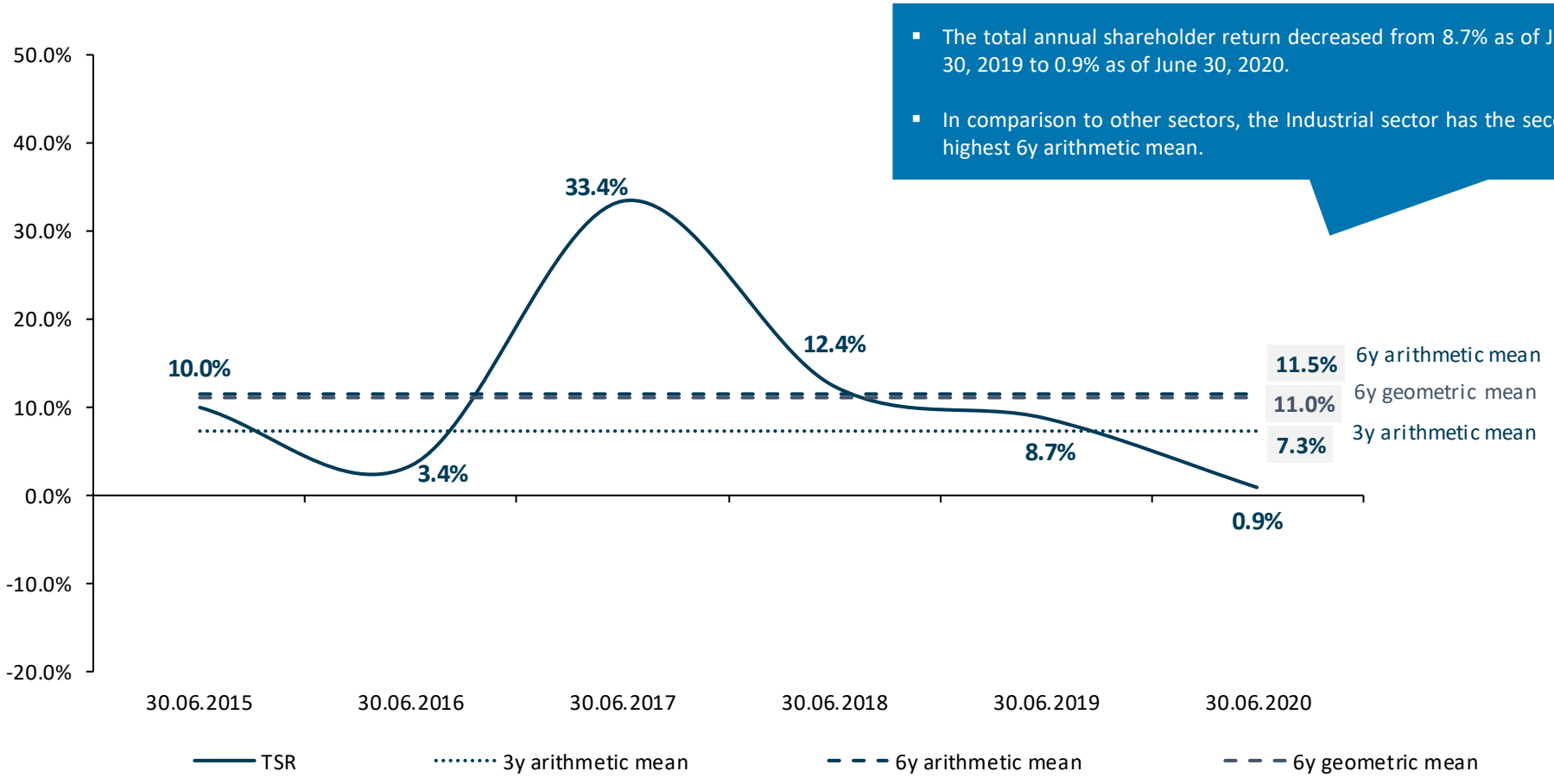
Total shareholder returns - Consumer Cyclicals



- The total annual shareholder return in the Telecommunications Services sector decreased from 4.7% as of June 30, 2019 to -1.1% as of June 30, 2020.
- In comparison to other sectors, the Telecommunications Services sector has the second lowest 3y and 6y arithmetic mean.

Total Shareholder Returns
Industrials

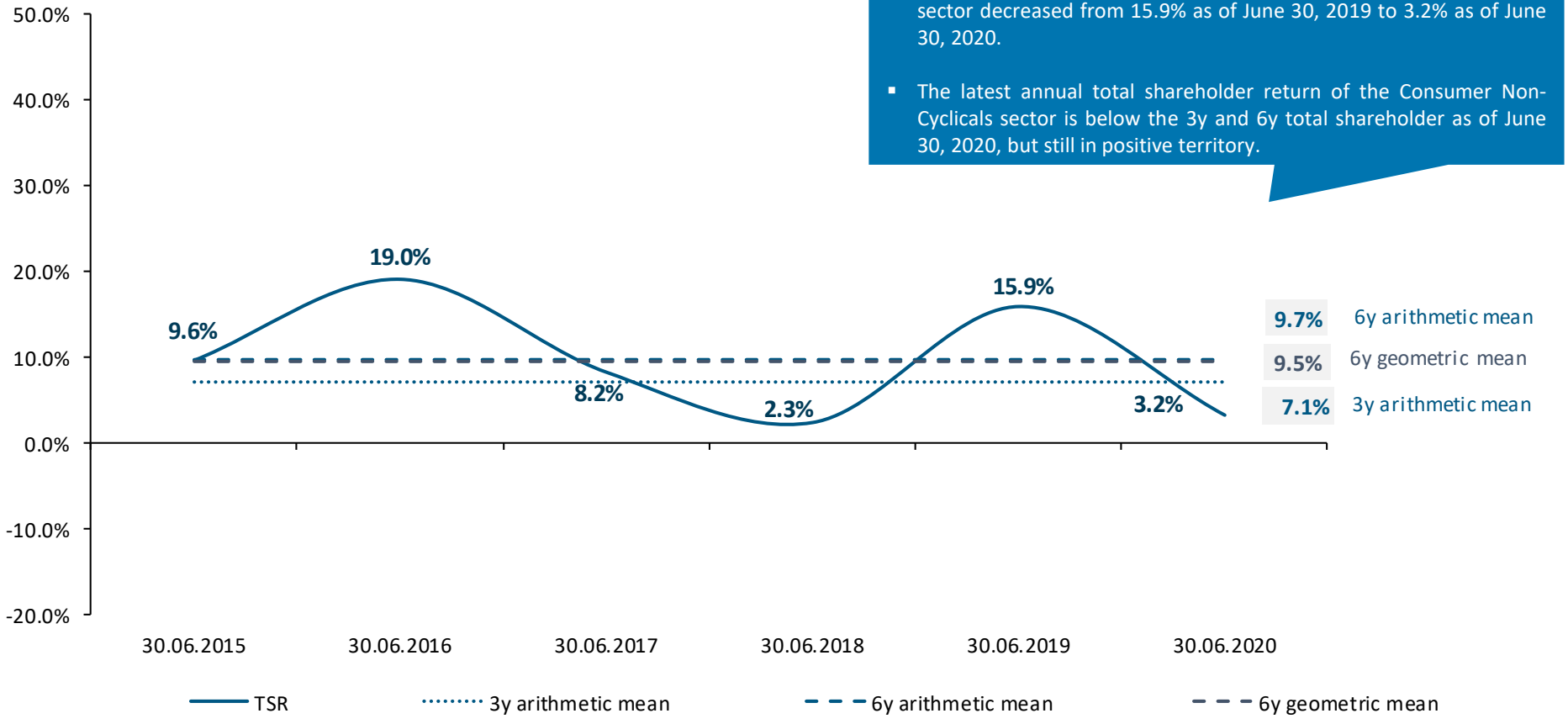
Total shareholder returns - Industrials



- The total annual shareholder return decreased from 8.7% as of June 30, 2019 to 0.9% as of June 30, 2020.
- In comparison to other sectors, the Industrial sector has the second highest 6y arithmetic mean.

Total Shareholder Returns
Consumer Non-Cyclicals

Total shareholder returns - Consumer Non-Cyclicals

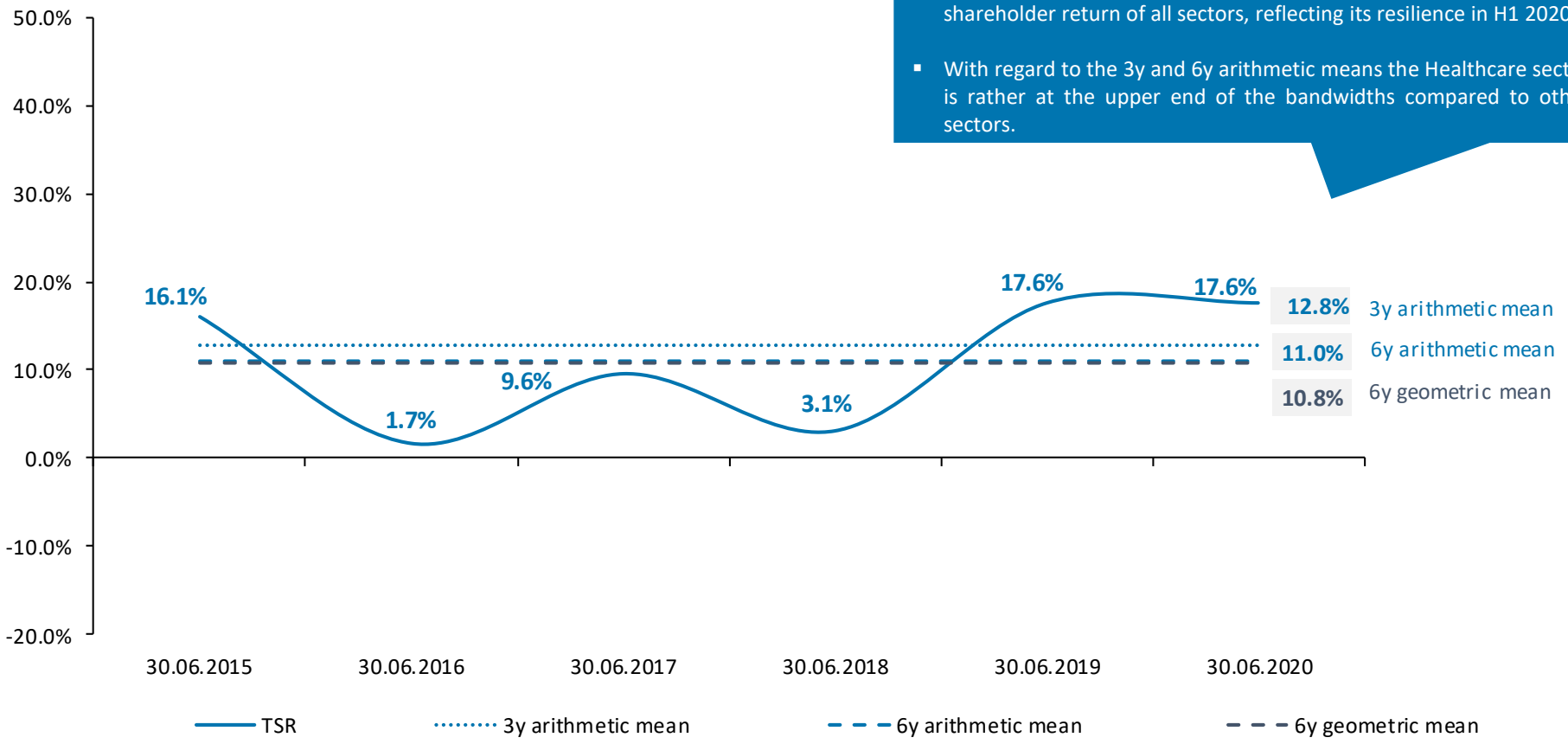


- The total annual shareholder return in the Consumer Non-Cyclicals sector decreased from 15.9% as of June 30, 2019 to 3.2% as of June 30, 2020.
- The latest annual total shareholder return of the Consumer Non-Cyclicals sector is below the 3y and 6y total shareholder as of June 30, 2020, but still in positive territory.

9.7%	6y arithmetic mean
9.5%	6y geometric mean
7.1%	3y arithmetic mean

Total Shareholder Returns
Healthcare

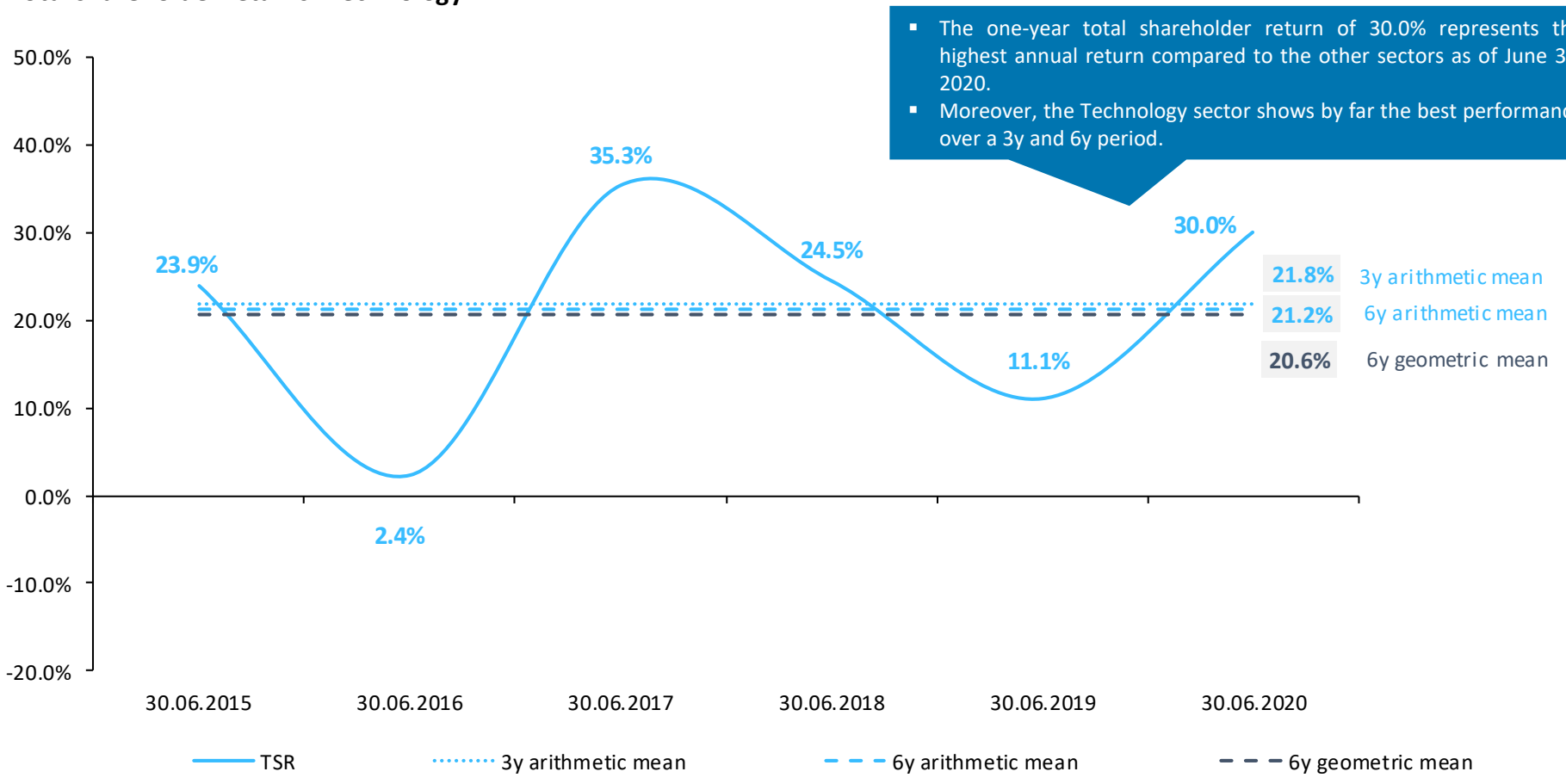
Total shareholder returns - Healthcare



- At 17.6% the Healthcare has the second highest one-year total shareholder return of all sectors, reflecting its resilience in H1 2020.
- With regard to the 3y and 6y arithmetic means the Healthcare sector is rather at the upper end of the bandwidths compared to other sectors.

Total Shareholder Returns
Technology

Total shareholder returns - Technology

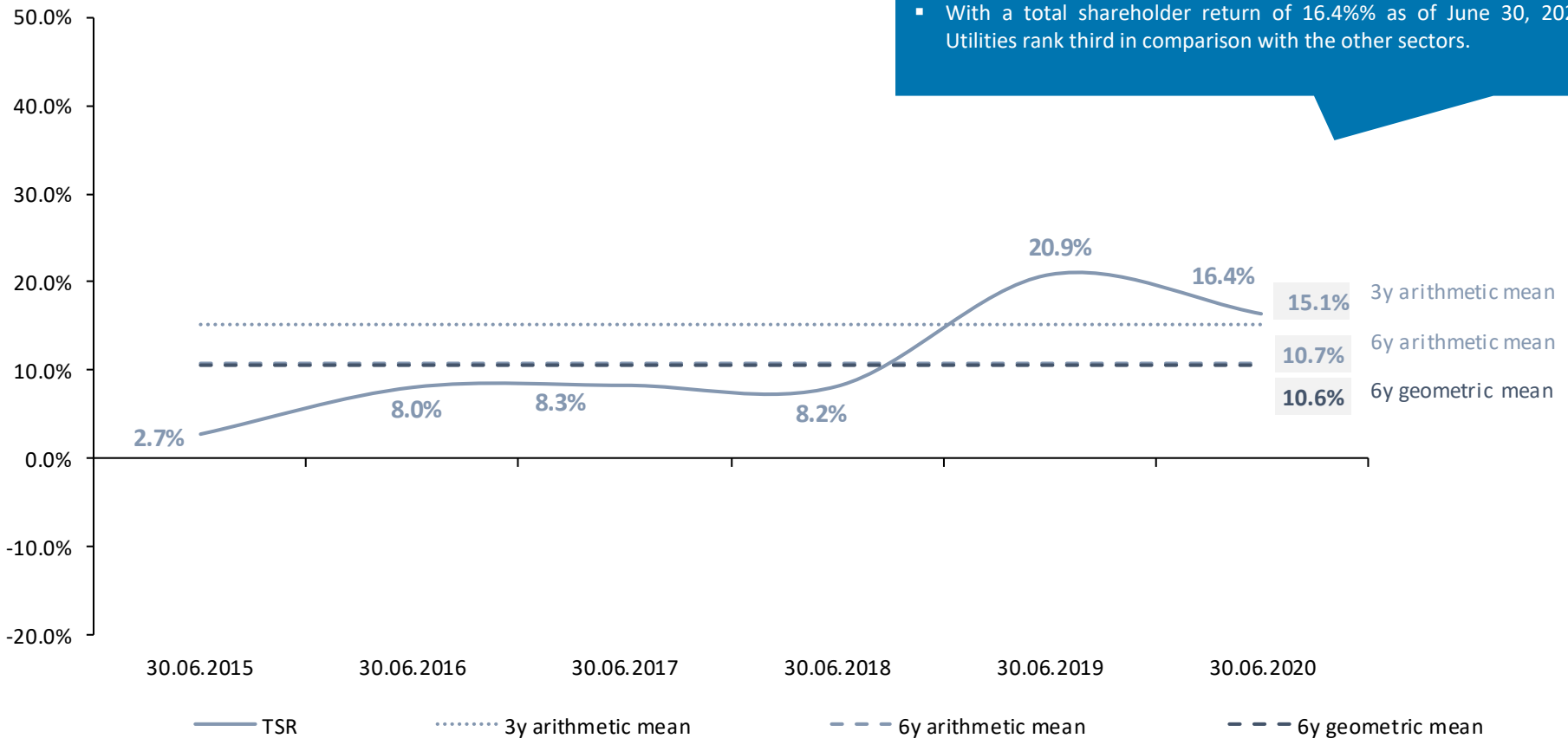


- The one-year total shareholder return of 30.0% represents the highest annual return compared to the other sectors as of June 30, 2020.
- Moreover, the Technology sector shows by far the best performance over a 3y and 6y period.

Total Shareholder Returns
Utilities

Total shareholder returns - Utilities

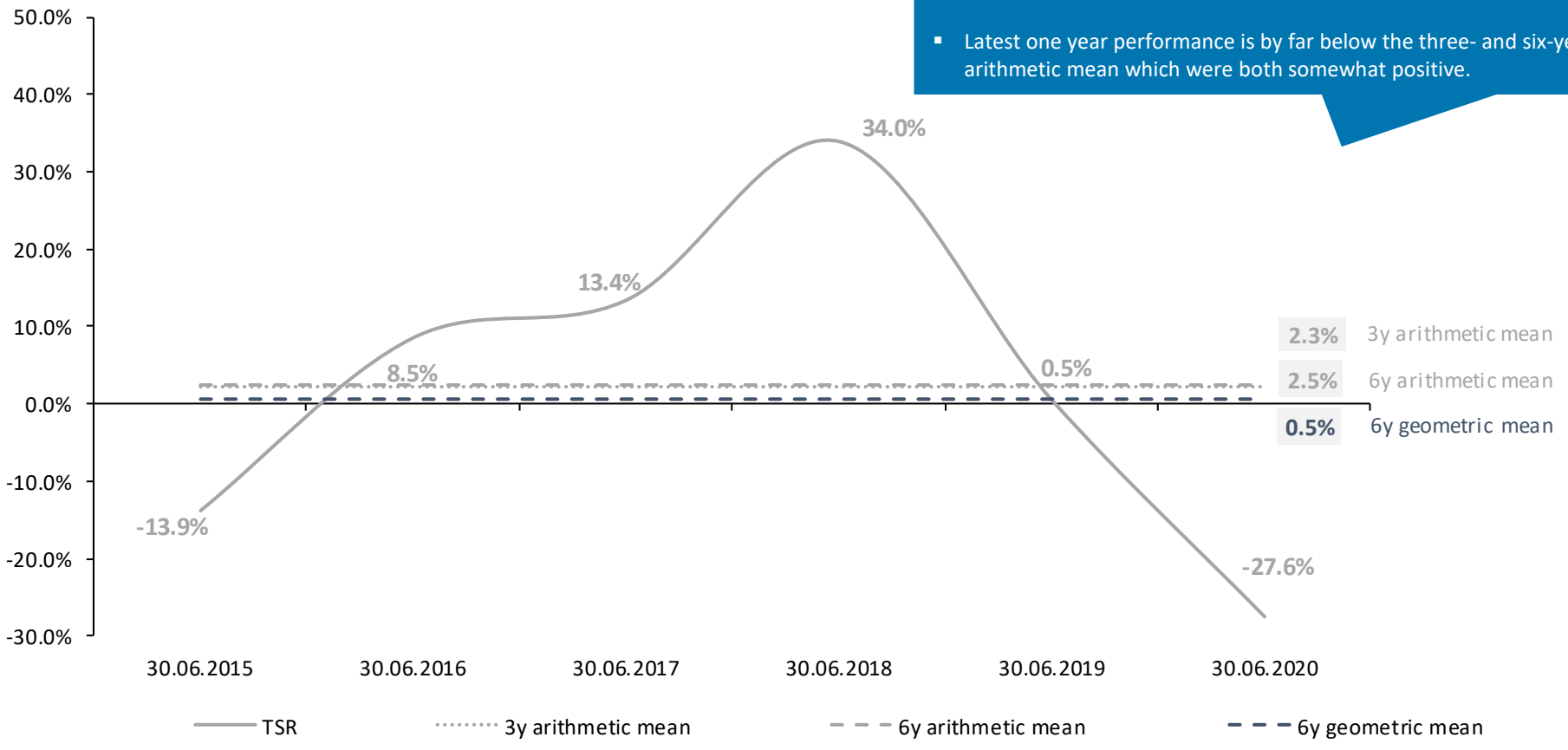
- With a total shareholder return of 16.4%% as of June 30, 2020, Utilities rank third in comparison with the other sectors.



Total Shareholder Returns
Energy

Total shareholder returns - Energy

- The Energy sector displays the weakest one-year total shareholder return performance at -27.6%.
- Latest one year performance is by far below the three- and six-year arithmetic mean which were both somewhat positive.



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 (June 30, 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 June 30, 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 June 30, 2020 and March 31, 2020

	EV/Revenue 1yf		EV/EBIT 1yf		P/E 1yf		EqV/BV LTM	
Sector	31.03.2020	30.06.2020	31.03.2020	30.06.2020	31.03.2020	30.06.2020	31.03.2020	30.06.2020
Financials	n.a.	n.a.	n.a.	n.a.	8.1x	12.0x	0.6x	0.7x
Basic Materials	1.4x	1.8x	11.2x	14.7x	13.7x	18.5x	1.5x	1.8x
Consumer Cyclicals	1.1x	1.3x	12.1x	18.9x	11.7x	19.7x	1.4x	1.7x
Telecommunications Services	2.0x	2.0x	13.9x	15.1x	11.3x	13.5x	1.2x	1.3x
Industrials	1.2x	1.6x	12.6x	18.2x	14.0x	21.0x	2.3x	2.9x
Consumer Non-Cyclicals	1.9x	2.2x	14.4x	16.3x	16.3x	18.6x	2.9x	3.4x
Healthcare	3.4x	3.7x	13.9x	15.2x	15.7x	17.3x	3.5x	3.9x
Technology	2.8x	3.6x	15.3x	20.5x	19.0x	26.4x	3.4x	4.5x
Utilities	1.3x	1.5x	13.0x	14.8x	13.5x	16.1x	1.5x	1.8x
Energy	0.7x	0.7x	10.6x	14.8x	13.5x	19.0x	0.8x	0.9x
All	1.7x	1.9x	12.7x	15.5x	12.6x	17.2x	1.4x	1.6x

Reading example:

The weighted average of the Telecommunications Services EV/EBIT-ratio calculated based on 1yf EBIT is 15.1x.

EUR 200 m in EBIT over the next year hence result in an enterprise value of EUR 3,020 m.

Forward P/E multiple of the Energy sector increased strongly despite the continuing global surplus of crude oil and lower demand in connection with the COVID-19 crisis.

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 June 30, 2020 and March 31, 2020

	EV/Revenue 1yf		EV/EBIT 1yf		P/E 1yf		EqV/BV LTM		Ø Ranking
Sector	31.03.2020	30.06.2020	31.03.2020	30.06.2020	31.03.2020	30.06.2020	31.03.2020	30.06.2020	
Financials	n.a.	n.a.	n.a.	n.a.	10	10	10	10	10.0
Basic Materials	5	5	8	9	5	6	6	5	6.1
Consumer Cyclicals	8	8	7	2	8	3	7	7	6.3
Telecommunications Services	3	4	4	6	9	9	8	8	6.4
Industrials	7	6	6	3	4	2	4	4	4.5
Consumer Non-Cyclicals	4	3	2	4	2	5	3	3	3.3
Healthcare	1	1	3	5	3	7	1	2	2.9
Technology	2	2	1	1	1	1	2	1	1.4
Utilities	6	7	5	8	6	8	5	6	6.4
Energy	9	9	9	7	7	4	9	9	7.9

The Financials sector continue to have 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 6th highest in a comparison of all sectors. Overall, the average ranking of the Utilities sector is 6.4, 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 June 30, 2020

Appendix
Composition of as the STOXX sectors of June 30, 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
ASSURA PLC.
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
BANQUE CANTON.VE.
BARCLAYS PLC.
BAWAG PSK BK.AG
BBV.ARGT.SA
BEAZLEY PLC.
BNP PARIBAS
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
GRAINGER PLC.
GRAND CITY PROPERTIES SA
GREAT PORTLAND ESTS.PLC.
GRENKE N AG
HANNOVER RUCK.AG
HARGREAVES LANSDOWN PLC.
HELVETIA HOLDING AG
HISCOX DI LTD.
HSBC HOLDINGS PLC.
ICADE
IG GROUP HOLDINGS PLC.
INDUSTRIVARDEN AB
ING GROEP
INMB.COLO.SOCIMI SA
INTERMEDIATE CAP.GP.PLC.
INTESA SANPAOLO
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.
LIFCO B
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
PARTNERS GROUP HOLDING
PHNX.GHG.PLC.
PKO BANK SA
PRIMARY HLTH.PROPS.PLC.
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.
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.
VONOVIA SE PRE
WALLENSTAM AB
WDP - WHSES.DE PAUW

Appendix
Composition of as the STOXX sectors of June 30, 2020

Financials (2/2)
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.
BILLERUD KORSNAS AB
BOLIDEN AB
BRENNTAG AG
CENTAMIN PLC.
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
UMICORE SA
UPM-KYMMENE OYJ
VICTREX PLC.
VISCOFAN SA
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
COMPASS GROUP PLC.
CONTINENTAL AG
CTS EVENTIM AG
DAIMLER AG
DOMETIC GROUP
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
HERMES INTERNATIONAL
HOWDEN JOINERY GP.PLC.
HUSQVARNA AB

Appendix
Composition of as the STOXX sectors of June 30, 2020

Consumer Cyclicals (2/2)

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
ROCKWOOL INTL.A/S
SAINT GOBAIN
SCHIBSTED A
SEB SA
SIGNIFY NV
SODEXO
SWATCH GROUP AG
TAYLOR WIMPEY PLC.
THULE GROUP
TRAINLINE PLC.
TRAVIS PERKINS PLC.
TUI AG
UBISOFT ENTERTAINMENT SA
VALEO
VISTRY GROUP PLC.
VIVENDI
VOLKSWAGEN AG
WHITBREAD PLC.
WPP PLC.
ZALANDO

Telecommunications Services

ALTICE EUROPE NV
BT GROUP PLC.
CELLNEX TELECOM
DEUTSCHE TELEKOM AG
ELISA OYJ
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.
ADDTECH AB
ADECCO SA
ADP
AENA SME SA
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.
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
EUROFINS SCIENTIFIC AG

Appendix
Composition of as the STOXX sectors of June 30, 2020

Industrials (2/2)

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
INVESTMENT AB LATOUR
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
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.
SWECO AB
TELEPERFORMANCE
THALES SA
TOMRA SYSTEMS ASA
TRELLEBORG AB
VALMET OYJ
VAT GROUP
VINCI SA
VOLVO AB
WARTSILA OYJ ABP
WEIR GROUP PLC.
WENDEL
WOLTERS KLUWER NV

Consumer Non-Cyclicals (1/2)

AARHUSKARLSHAMN AB
ANHEUSER-BUSCH INBEV SA
ASSOCIATED BRIT.FDS.PLC.
AXFOOD AB
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
CRANSWICK PLC.
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
MORRISON(WM)SPMKTS.PLC.
MOWI ASA

Appendix
Composition of as the STOXX sectors of June 30, 2020

Consumer Non-Cyclicals (2/2)
NESTLE AG
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.
GERRESHEIMER AG
GETINGE AB
GLAXOSMITHKLINE PLC.
GN STORE NORD A/S
GRIFOLS SA
H LUNDBECK A/S
HIKMA PHARMS.PLC.
IDORSIA LIMITED
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)
ADEVINTA ASA
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
CANCOM 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
NETCOMPANY HOLDING I A/S
NOKIA OYJ
PROSUS NV
RIGHTMOVE PLC.
SAP AG
SCOUT24 AG
SINCH AB
SOPRA STERIA GROUP
SPECTRIS PLC.

Appendix
Composition of as the STOXX sectors of June 30, 2020

Technology (2/2)
STMICROELECTRONICS NV
TEAMVIEWER AG
TECAN GROUP AG
TELAB.LM ERIC.
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
SBM OFFSHORE NV
SIE.GAMESA RENWEN.SA
SNAM SPA
TECHNIPFMC PLC.
TENARIS SA
TGS-NOPEC GEOPHS.CO.ASA
TOTAL SA
VESTAS WINDSYSTEMS A/S

VALUETRUST

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