VALUETRUST
FINANCIAL EXPERTS IN ACTION

European Capital Market Study

ANALYSIS OF COST OF CAPITAL PARAMETERS AND SECTOR MULTIPLES
FOR THE CAPITAL MARKETS IN EUROPE
AS OF 31 DECEMBER 2023

Volume 13, April 2024

Table of contents

Contact information

Prof. Dr. Christian Aders
Senior Managing Director | CEFA, CVA
+49 89 388 790 100
+49 172 850 4839
christian.aders@value-trust.com

Benedikt Brambs
Managing Director | ASA
+41 44 500 5900
+41 76 311 8030
benedikt.brambs@value-trust.com

Fredrik Müller
Vice President | CFA, CVA
+49 89 388 790 280
+49 176 189 689 18
fredrik.mueller@value-trust.com

VALUETRUST

VALUETRUST
FINANCIAL EXPERTS IN ACTION

PVT Financial Advisors SE
Theresienstraße 1
80333 Munich
www.value-trust.com

Prof. Dr. Christian Aders
Senior Managing Director
PVT Financial Advisors SE

Benedikt Brambs
Managing Director
PVT Financial Advisor SE

Dear business partners and friends of ValueTrust,

We are pleased to release our thirteenth edition of **the ValueTrust European Capital Market Study for Q4 2023**. Within this Study, we provide certain cost of capital inputs required to perform an enterprise valuation in Europe. The Study also shows trends of the analyzed data over time.

In this Study we provide:

- The relevant parameters used to calculate the cost of capital under the CAPM, including **risk-free rate**, **market risk premium** and **beta**.

- **Implied and historical market/sector returns**.

- Capital structure-adjusted implied sector returns, which serve as an indicator for the **unlevered cost of equity** (the **relevered cost of equity** can be calculated by adapting the company specific debt situation to the **unlevered cost of equity,** serving as an alternative to the CAPM).

- An analysis of empirical (ex-post) cost of equity in the form of **total shareholder returns** consisting of capital gains and dividends (total shareholder returns can be used as a plausibility check for the implied (ex-ante) returns).

- **A trading multiples overview**.

We examine the relevant cost of capital 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, Consumer Cyclicals, Consumer Non-Cyclicals, Healthcare, Technology, Utilities, Energy, Basic Materials, Industrials and Real Estate.

Historical data was compiled between the reference dates **31 December 2017** and **31 December 2023** and is **updated semi-annually** with the objective to track capital market performance over time.

Prof. Dr. Christian Aders   Benedikt Brambs

1) Based on Thomson Reuters Business Classification

VALUETRUST
FINANCIAL EXPERTS IN ACTION

PVT Financial Advisors SE
Theresienstraße 1
80333 Munich
www.value-trust.com

Prof. Dr. Christian Aders
Senior Managing Director
PVT Financial Advisors SE

Benedikt Brambs
Managing Director
PVT Financial Advisor SE

VALUETRUST

Prof. Dr. Christian Aders
Senior Managing Director

- Chris is the founder and board member of ValueTrust
- Previously he was a Partner at KPMG and Managing Director for the DACH region at Duff & Phelps
- He has more than 30 years of experience in corporate valuation and financial advisory
- He is Honorary Professor for "Practice of transaction-oriented company valuation and value-oriented management" at the LMU in Munich
- He is member of the DVFA Expert Group "Fairness Opinions" and "Best Practice Recommendations Corporate Valuation"
- He is also Co-Founder of the European Association of Certified Valuators and Analysts (EACVA e.V.)

VALUETRUST

Benedikt Brambs
Managing Director

- Benedikt leads the Swiss operations, the Financial Advisory business as well as the VC and Digital Valuation practice
- With more than 15 years of experience at the interface of corporate finance and strategy, he has extensive knowledge of valuations, financial modeling, as well as the development and implementation of corporate and functional strategies
- He advises clients on initiatives that drive shareholder value: capital allocation, assessment of strategic alternatives, forecasting and scenario planning
- He holds a degree in Business Administration from the LMU in Munich and is an Accredited Senior Appraiser (ASA) in Business Valuation

---

VALUETRUST

Fredrik Müller
Vice President

- Fredrik is Vice President at ValueTrust and gained more than 6 years of project experience in corporate valuation and financial advisory
- He has extensive experience in valuation and value management projects in various industries
- He holds a masters degree (M.Sc.) in Business Administration from the LMU in Munich and is a Chartered Financial Analyst (CFA) charterholder

VALUETRUST
FINANCIAL EXPERTS IN ACTION

PVT Financial Advisors SE
Theresienstraße 1
80333 Munich
www.value-trust.com

Prof. Dr. Christian Aders
Senior Managing Director
PVT Financial Advisors SE

Benedikt Brambs
Managing Director
PVT Financial Advisor SE

DISCLAIMER

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

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

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

ValueTrust and its co-authors do not assume any responsibility or liability for the up-to-datedness, completeness or accuracy of this Study or its contents.

01 Executive summary

The implied market risk premium decreased 110 bps to 5.7% in the last 6 months due to lower implied market returns and a higher risk-free rate

Market risk premium and trading multiples for Europe, Q4 2023

CAPM metrics	Europe		Multiples	
Historical market return[1]	10.5%	7.9%	EV/Revenue	1.7x / 1.6x
Implied market return	8.5%	9.2%	EV/EBIT	11.0x / 11.1x
Risk-free rate	2.8%	2.5%	P/E	13.4x / 12.3x
Implied market risk premium	5.7%	6.8%	P/B	2.2x / 1.9x

31 December 2023   30 June 2023
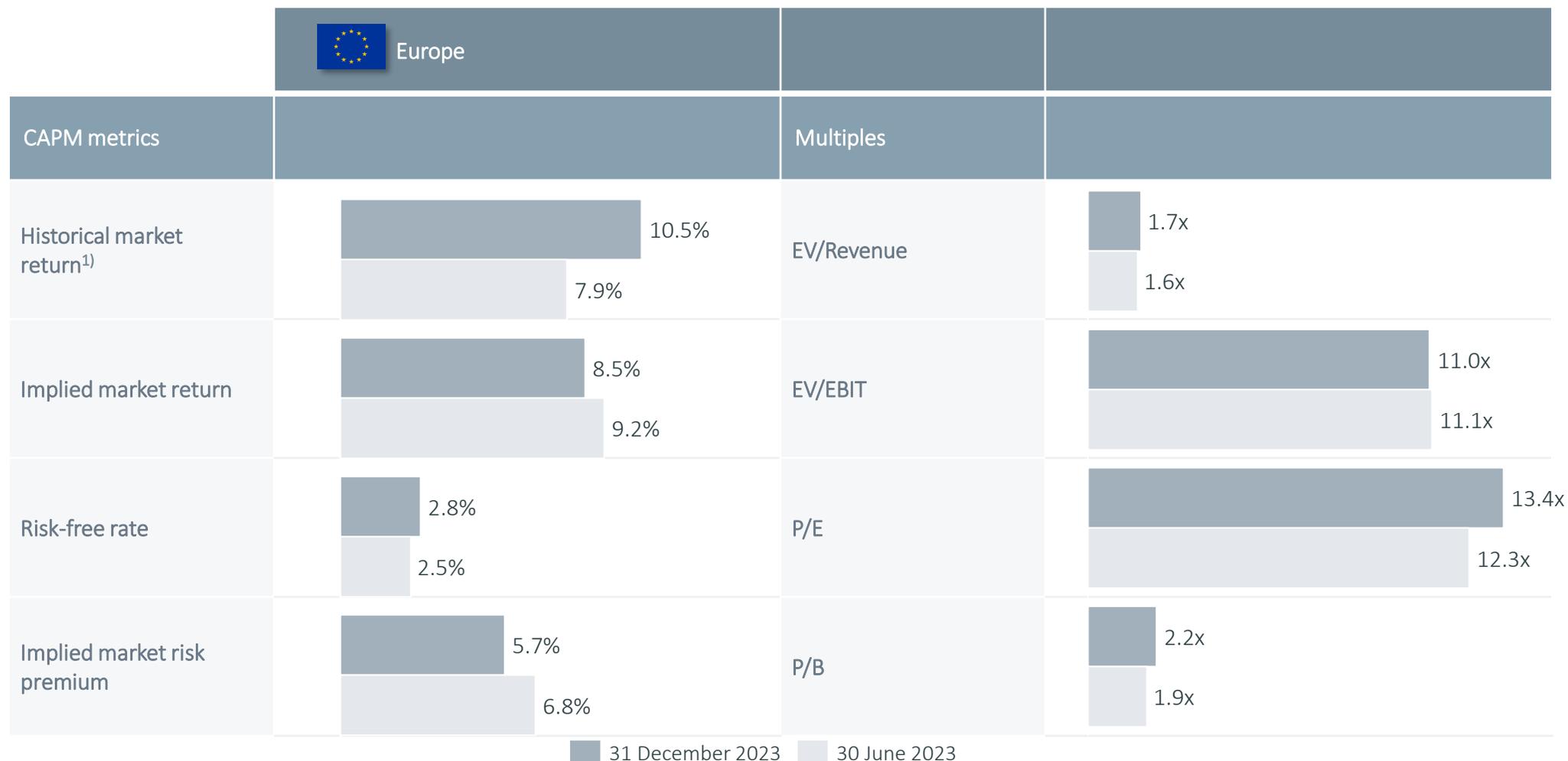
1. Arithmetic return of the STOXX Europe 600 between 2008 and 2023.

VALUETRUST

The Energy sector has the highest implied levered cost of equity at 13.7%, while the Real Estate sector has the lowest at 5.7%

Cost of equity by sector and methodology for Europe, Q4 2023

Sectors	Implied levered cost of equity	Levered cost of equity (CAPM) [1]	1 / PE-ratio (1yf)	Total shareholder return (Ø 6y) [2]
Financials	10.5%	9.9%	9.9%	10.6%
Consumer Cyclicals	8.8%	9.7%	7.7%	14.4%
Consumer Non-Cyclicals	7.6%	6.5%	6.2%	6.7%
Healthcare	7.5%	6.9%	5.9%	13.5%
Technology	6.4%	9.2%	5.1%	16.9%
Utilities	8.6%	6.8%	7.8%	14.5%
Energy	13.7%	9.3%	13.5%	14.1%
Basic Materials	7.6%	9.2%	6.9%	13.2%
Industrials	7.2%	9.4%	5.7%	16.2%
Real Estate	5.7%	9.1%	6.2%	7.6%

1. Based on 5-year sector beta, risk-free rate of 2.80% and implied market risk premium of 5.7% for the European market;
2. Total shareholder returns can be viewed as historic, realized cost of equity. However, it has to be considered that total shareholder returns vary widely, depending on the relevant time period.

VALUETRUST

The Technology sector shows high valuations, as long-term growth potential and scalability is not fully reflected in earnings estimates; Real Estate benefits from predictable recurring earnings

Trading multiples by sector for Europe, Q4 2023

Sectors	EV/Revenue 1yf	EV/EBIT 1yf	P/E 1yf	P/B LTM
Financials	n.a.	n.a.	10.1x	1.5x
Consumer Cyclicals	1.3x	11.2x	12.9x	2.1x
Consumer Non-Cyclicals	1.8x	13.9x	16.1x	3.2x
Healthcare	3.4x	13.9x	16.8x	4.8x
Technology	2.9x	16.6x	19.7x	2.9x
Utilities	1.4x	11.8x	12.9x	1.6x
Energy	0.7x	5.3x	7.4x	1.3x
Basic Materials	1.3x	11.7x	14.6x	1.6x
Industrials	1.6x	14.2x	17.4x	3.5x
Real Estate	17.2x	26.1x	16.1x	0.9x
Europe (All)	1.7x	11.0x	13.4x	2.2x
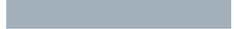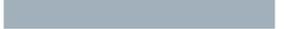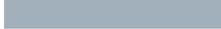
VALUETRUST

02 Risk-free rate

Europe's risk-free rate increased by almost 34 bps in the last 6 months, whereby its curve still reflected an inverted rate curve with the strongest increase at the long end of the curve

Interest rate curve based on long-term bonds and historical development of the risk-free rate in Europe (Svensson Method)

Interest rate curve based on long-term bonds (IDW S1)

Risk-free rates as of 31 December 2023 and 30 June 2023

—— 31 December 2023 — — 30 June 2022

2.80%
2.46%

Spot rates / Years

Historical development of the risk-free rate in %

Historical development of the risk-free rate in %

1.31%
1.26%
1.10%
0.61%
0.21%
0.06%
-0.14%
0.33%
0.09%
1.32%
2.12%
2.46%
2.80%

Dec-17 Jun-18 Dec-18 Jun-19 Dec-19 Jun-20 Dec-20 Jun-21 Dec-21 Jun-22 Dec-22 Jun-23 Dec-23
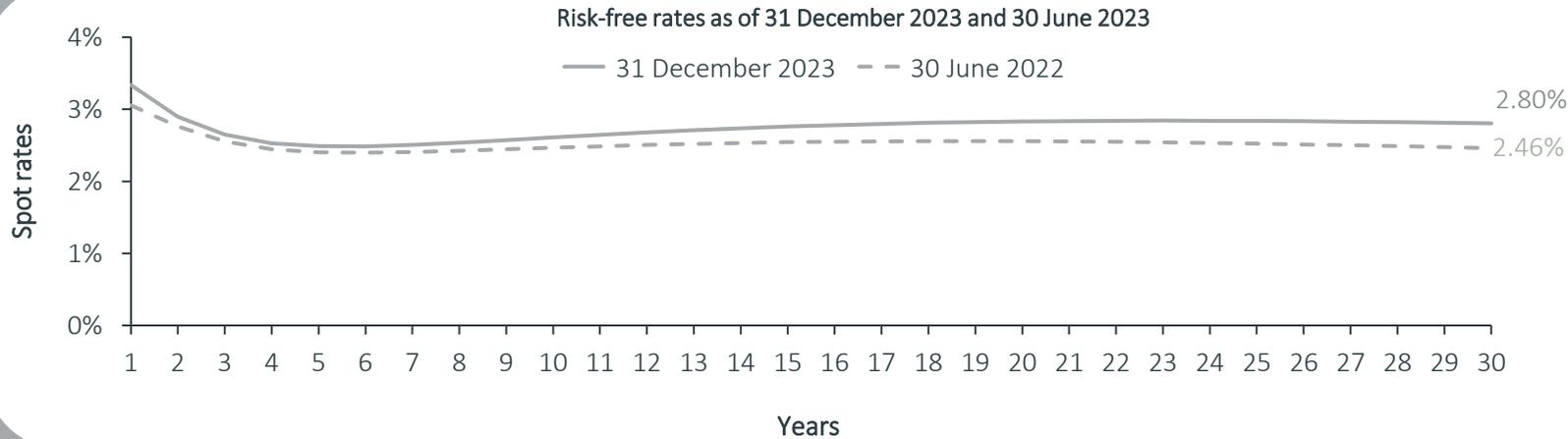
1. Note: Interest rate as of reference date using 3-month average yield curves in accordance with IDW S 1.

VALUETRUST

03

Market returns and risk premium
a. Implied returns (ex-ante analysis)

The implied market risk premium decreased 110 bps to 5.7% in the last 6 months due to a lower implied market return and a higher risk-free rate

Implied market risk premium for Europe since 30 June 2018

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 June 2018 to December 2023 the **implied market returns** ranged from **7.0% to 9.5%**. Subtracting the risk-free rate from the implied market return, we derive a **market risk premium** within the range of **5.7% to 9.0%**.

The **implied market return lies at 8.5%** as of the reference date 31 December 2023. Taking the **risk-free rate of 2.8%** into account, we determine an **implied market risk premium of 5.7%**. 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. 17) 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.

Implied market risk premium - Europe

	H1 2018	H2 2018	H1 2019	H2 2019	Q1 2020	H1 2020	H2 2020	H1 2021	H2 2021	H1 2022	H2 2022	H1 2023	H2 2023
Market-value weighted mean	8.4%	9.2%	8.4%	7.8%	9.1%	7.3%	7.0%	7.4%	7.5%	9.5%	9.4%	9.2%	8.5%
Implied market risk premium	7.2%	8.1%	7.8%	7.6%	9.0%	7.3%	7.1%	7.1%	7.4%	8.1%	7.2%	6.8%	5.7%

Legend: Negative risk-free rate | Risk-free rate | Implied market risk premium | – – Market-value weighted mean

03
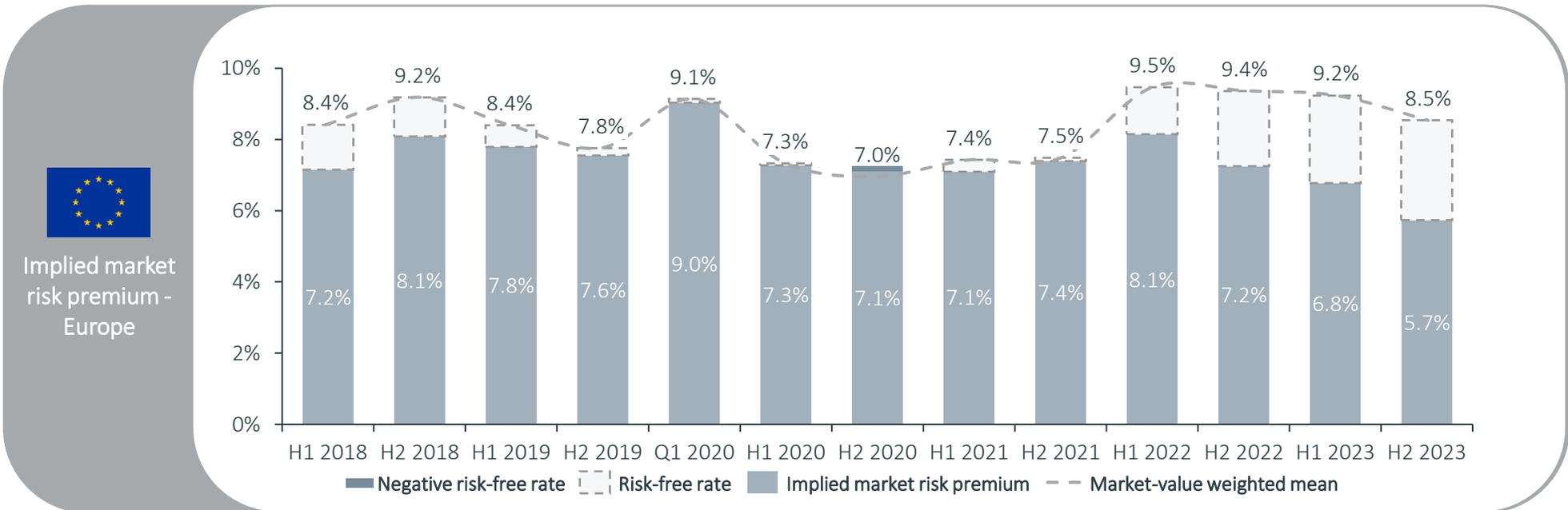
Market returns and risk premium
b. Historical returns (ex-post analysis)

The European capital market had long-term historical returns over an investment period of 15 years between 9.7% (geometric mean) and 10.5% (arithmetic mean)

Arithmetic and geometric mean of historical market returns as of 31 December 2023, over 15 years, 2008-23

In addition to the ex-ante analysis above, we also analyze **historical (ex-post) returns.** Historical returns over a **long-term observation period**, indicate an expected **return potential** of the European capital markets. The analysis of historical returns can be used for **plausibility checks of the cost of capital**, more specifically **return requirements**, which were evaluated through the CAPM.

To enable a precise analysis of the historical returns of the European capital market, we use the so-called **return triangle.**[1] It helps 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**.

As only **total return indices** capture both return on investments and dividend yields, our analysis is based on the **STOXX Europe 600.** The relevant total return index for **Europe is called the STOXX Europe 600 Gross Return ("STOXX Europe 600 GR")**.

The **observation period** is **15 years**. All ex-post returns are calculated using the **data as of the reference date 31 December 2023**.

The following slide serves as an introduction by showing the historical development of the **STOXX Europe 600 GR** as of **December 2017.** 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 the "fear index", higher levels are typically associated with more turbulent markets.

The following slides show the historical shareholder returns for different holding periods between 31 December 2008, and 31 December 2023, based on the arithmetic and geometric mean. For the longest **observation period** of **15 years** the average historical mean of the market return amounts to **10.5%.** Using geometrical averaging, we obtain a market return of **9.7%**.

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 Refinitiv Eikon 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

VALUETRUST

The performance of the STOXX Europe 600 increased significantly after the COVID-19 crisis, and the index reached its new all-time high at the end of December 2023, while volatility declined

Historical development of STOXX Europe 600 GR vs VSTOXX
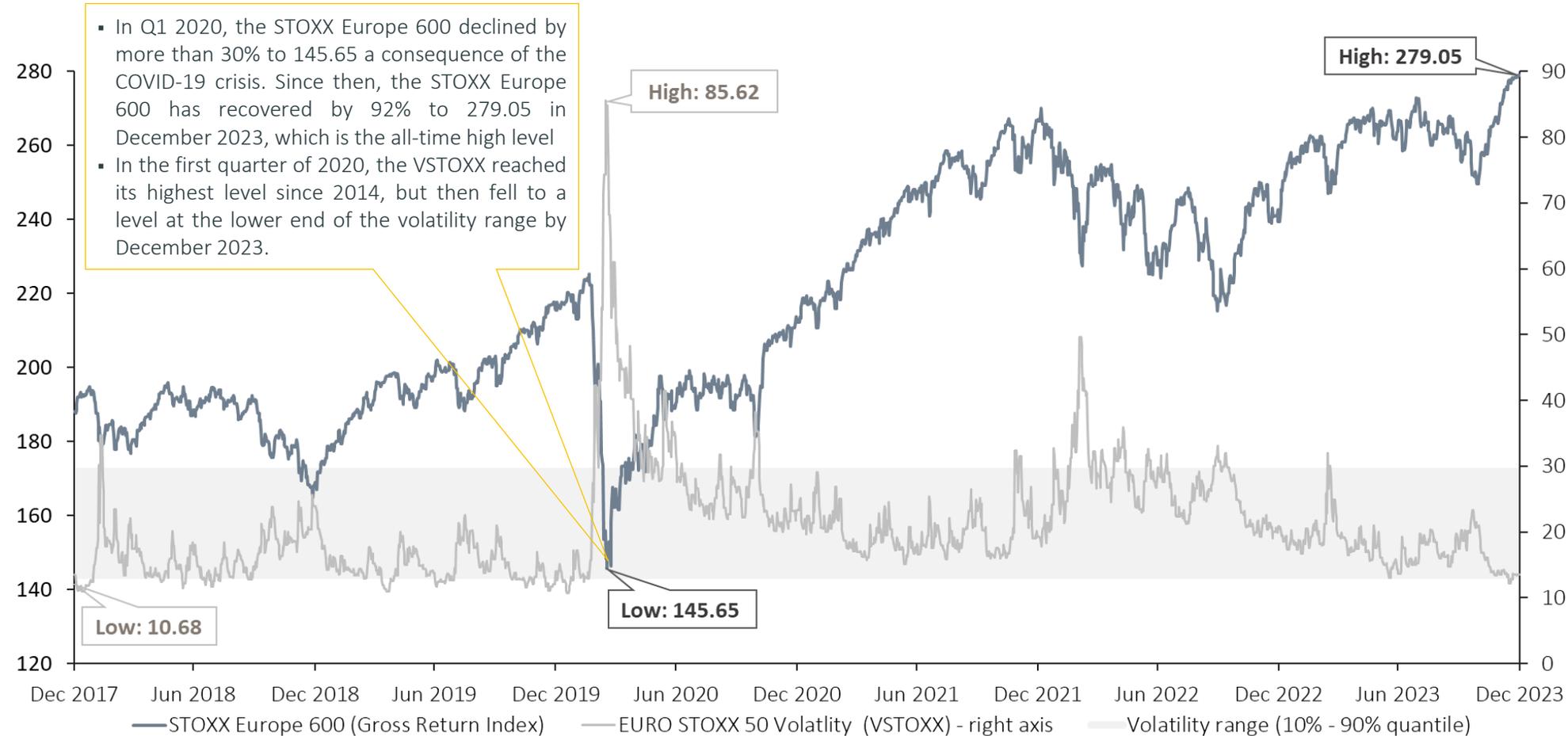
- In Q1 2020, the STOXX Europe 600 declined by more than 30% to 145.65 a consequence of the COVID-19 crisis. Since then, the STOXX Europe 600 has recovered by 92% to 279.05 in December 2023, which is the all-time high level
- In the first quarter of 2020, the VSTOXX reached its highest level since 2014, but then fell to a level at the lower end of the volatility range by December 2023.

High: 85.62

High: 279.05

Low: 145.65

Low: 10.68

STOXX Europe 600 (Gross Return Index) —— EURO STOXX 50 Volatlity (VSTOXX) - right axis —— Volatility range (10% - 90% quantile)

VALUETRUST

The strong performance of the STOXX Europe 600 in the last 12 months (16.5%) resulted in a significant improvement of the arithmetic mean return of an investment in 2017 from 6.3% to 8.0%

Arithmetic mean of historical market returns as of 31 December 2023, STOXX Europe 600 Performance Index, 2008-23
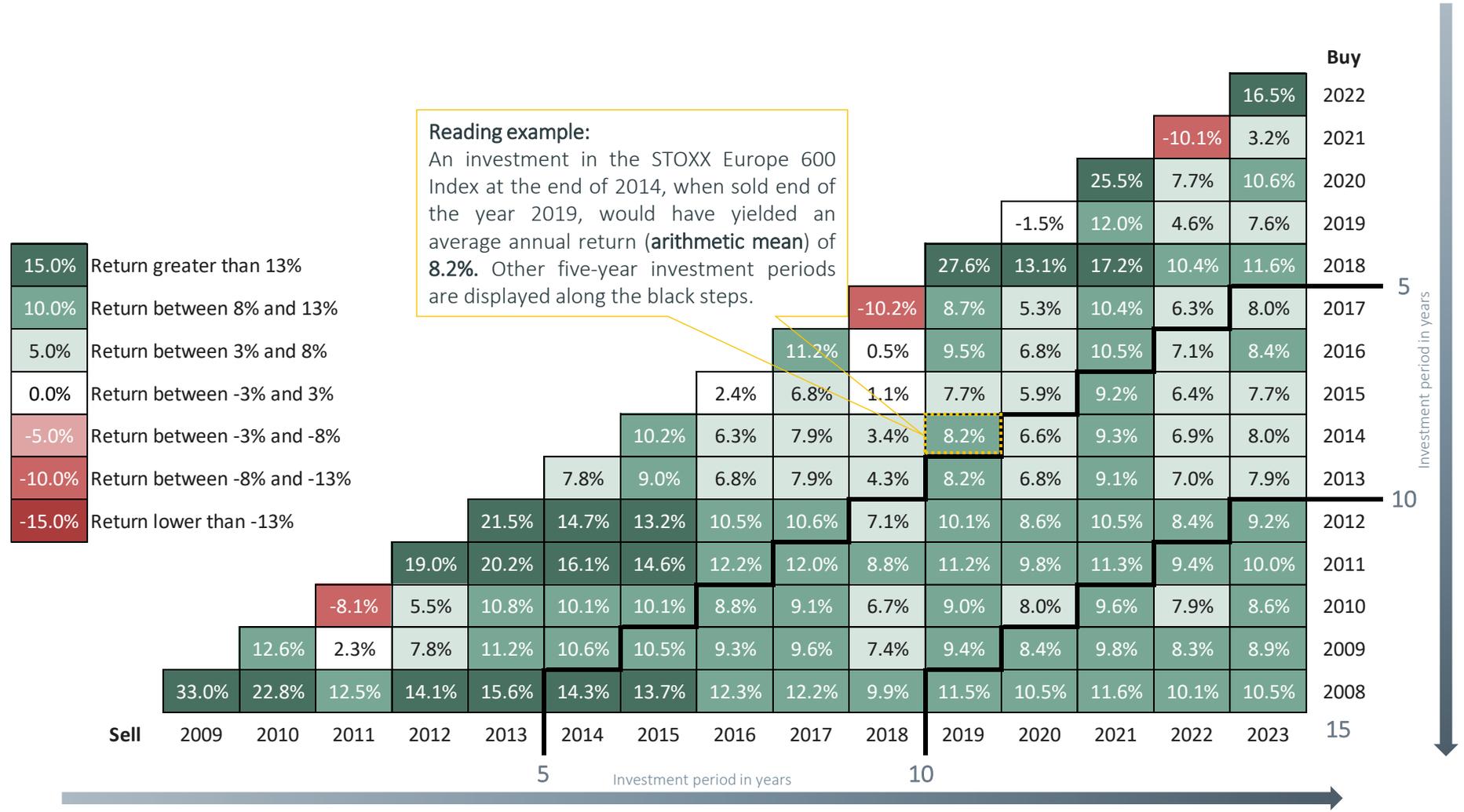
Legend:

Color value	Meaning
15.0%	Return greater than 13%
10.0%	Return between 8% and 13%
5.0%	Return between 3% and 8%
0.0%	Return between -3% and 3%
-5.0%	Return between -3% and -8%
-10.0%	Return between -8% and -13%
-15.0%	Return lower than -13%

Reading example:
An investment in the STOXX Europe 600 Index at the end of 2014, when sold end of the year 2019, would have yielded an average annual return (**arithmetic mean**) of **8.2%**. Other five-year investment periods are displayed along the black steps.

Buy \ Sell	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2022															16.5%
2021														-10.1%	3.2%
2020													25.5%	7.7%	10.6%
2019												-1.5%	12.0%	4.6%	7.6%
2018											27.6%	13.1%	17.2%	10.4%	11.6%
2017										-10.2%	8.7%	5.3%	10.4%	6.3%	8.0%
2016									11.2%	0.5%	9.5%	6.8%	10.5%	7.1%	8.4%
2015								2.4%	6.8%	1.1%	7.7%	5.9%	9.2%	6.4%	7.7%
2014							10.2%	6.3%	7.9%	3.4%	8.2%	6.6%	9.3%	6.9%	8.0%
2013						7.8%	9.0%	6.8%	7.9%	4.3%	8.2%	6.8%	9.1%	7.0%	7.9%
2012					21.5%	14.7%	13.2%	10.5%	10.6%	7.1%	10.1%	8.6%	10.5%	8.4%	9.2%
2011				19.0%	20.2%	16.1%	14.6%	12.2%	12.0%	8.8%	11.2%	9.8%	11.3%	9.4%	10.0%
2010			-8.1%	5.5%	10.8%	10.1%	10.1%	8.8%	9.1%	6.7%	9.0%	8.0%	9.6%	7.9%	8.6%
2009		12.6%	2.3%	7.8%	11.2%	10.6%	10.5%	9.3%	9.6%	7.4%	9.4%	8.4%	9.8%	8.3%	8.9%
2008	33.0%	22.8%	12.5%	14.1%	15.6%	14.3%	13.7%	12.3%	12.2%	9.9%	11.5%	10.5%	11.6%	10.1%	10.5%

Investment period in years (5, 10, 15)

VALUETRUST

The strong performance of the STOXX Europe 600 in the last 12 months (16.5%) improved the geometric mean return of an investment in 2017 by 1.9%-points to 6.8%

Geometric mean of historical market returns as of 31 December 2023, STOXX Europe 600 Performance Index, 1998-2023

Legend:

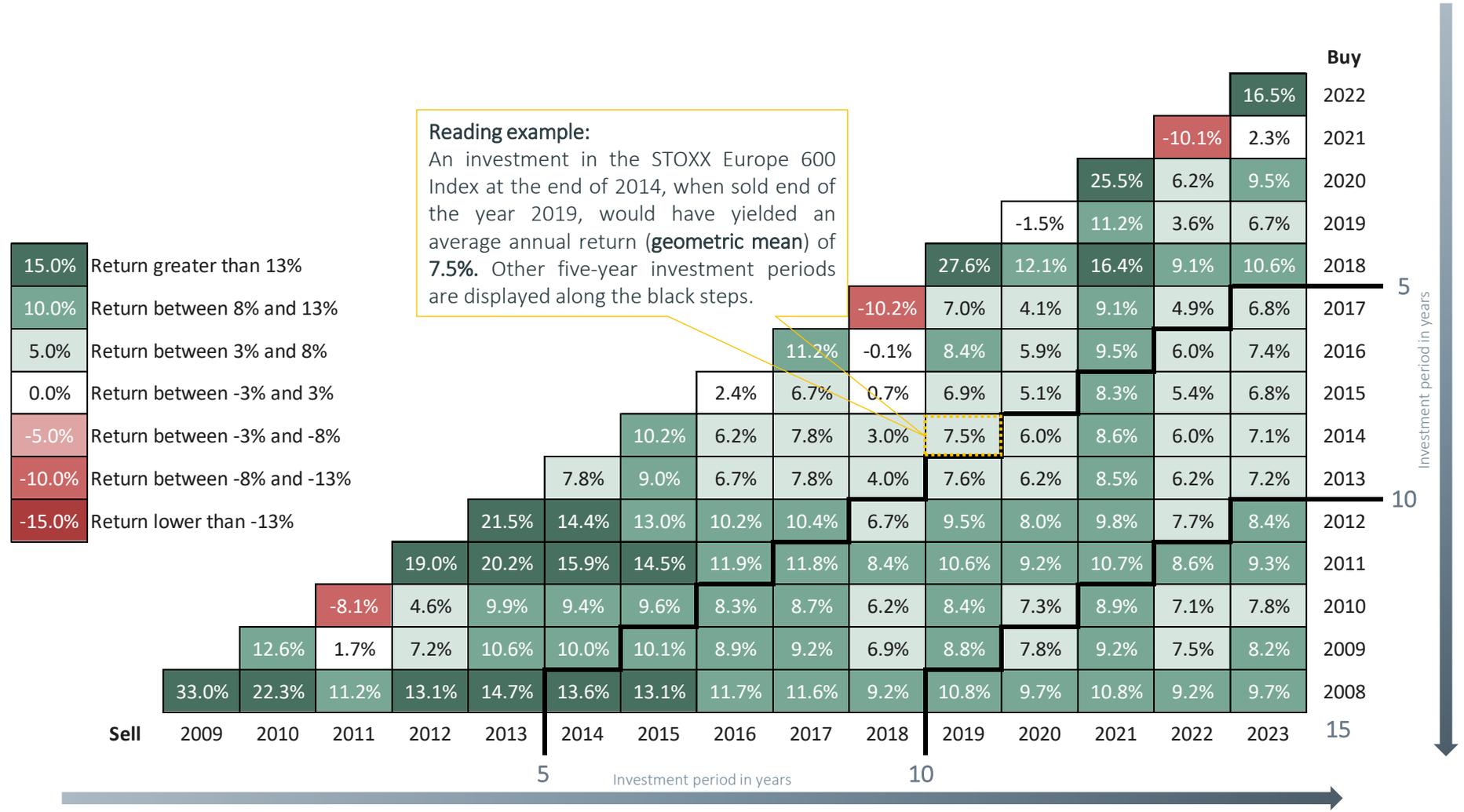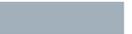|	
15.0%	Return greater than 13%
10.0%	Return between 8% and 13%
5.0%	Return between 3% and 8%
0.0%	Return between -3% and 3%
-5.0%	Return between -3% and -8%
-10.0%	Return between -8% and -13%
-15.0%	Return lower than -13%

Reading example:
An investment in the STOXX Europe 600 Index at the end of 2014, when sold end of the year 2019, would have yielded an average annual return (**geometric mean**) of **7.5%**. Other five-year investment periods are displayed along the black steps.

Investment period in years

Buy \ Sell	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2022															16.5%
2021														-10.1%	2.3%
2020													25.5%	6.2%	9.5%
2019												-1.5%	11.2%	3.6%	6.7%
2018											27.6%	12.1%	16.4%	9.1%	10.6%
2017										-10.2%	7.0%	4.1%	9.1%	4.9%	6.8%
2016									11.2%	-0.1%	8.4%	5.9%	9.5%	6.0%	7.4%
2015								2.4%	6.7%	0.7%	6.9%	5.1%	8.3%	5.4%	6.8%
2014							10.2%	6.2%	7.8%	3.0%	7.5%	6.0%	8.6%	6.0%	7.1%
2013						7.8%	9.0%	6.7%	7.8%	4.0%	7.6%	6.2%	8.5%	6.2%	7.2%
2012					21.5%	14.4%	13.0%	10.2%	10.4%	6.7%	9.5%	8.0%	9.8%	7.7%	8.4%
2011				19.0%	20.2%	15.9%	14.5%	11.9%	11.8%	8.4%	10.6%	9.2%	10.7%	8.6%	9.3%
2010			-8.1%	4.6%	9.9%	9.4%	9.6%	8.3%	8.7%	6.2%	8.4%	7.3%	8.9%	7.1%	7.8%
2009		12.6%	1.7%	7.2%	10.6%	10.0%	10.1%	8.9%	9.2%	6.9%	8.8%	7.8%	9.2%	7.5%	8.2%
2008	33.0%	22.3%	11.2%	13.1%	14.7%	13.6%	13.1%	11.7%	11.6%	9.2%	10.8%	9.7%	10.8%	9.2%	9.7%

Investment period in years: 5, 10, 15

VALUETRUST

04 Betas

The highest betas are observed in the Consumer Cyclicals and Energy sectors, the lowest in the Utilities and Consumer Non-Cyclicals

Levered and unlevered beta factors by sector as of 31 December 2023 (5-years monthly)

Sector	Beta levered [1]	Beta unlevered
Financials	1.24	n.a.
Consumer Cyclicals	1.20	0.71
Consumer Non-Cyclicals	0.65	0.46
Healthcare	0.71	0.52
Technology	1.11	0.64

Sector	Beta levered	Beta unlevered
Utilities	0.70	0.44
Energy	1.13	0.85
Basic Materials	1.11	0.82
Industrials	1.15	0.68
Real Estate	1.09	0.71

Sector specific debt ratio, leverage and rating

5-years 2018-2023 monthly		Financials [2]	Consumer Cyclicals	Consumer Non-Cyclicals	Healthcare	Technology	Utilities	Energy	Basic Materials	Industrials	Real Estate
	Debt ratio [3]	66.9%	50.0%	48.7%	38.1%	52.0%	59.9%	37.6%	34.6%	51.7%	45.3%
	Leverage	202.0%	100.1%	95.1%	61.4%	108.3%	149.2%	60.2%	53.0%	107.1%	82.7%
	Rating	BBB+	BBB+	BBB-	BBB+	BBB+	BBB-	BB-	BBB-	BBB	BBB-

1. The levered beta of the market does empirically not necessarily exactly amount to 1.00 due to the exclusion of statistically insignificant betas. We observe a levered beta for the market of 1.00.
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.
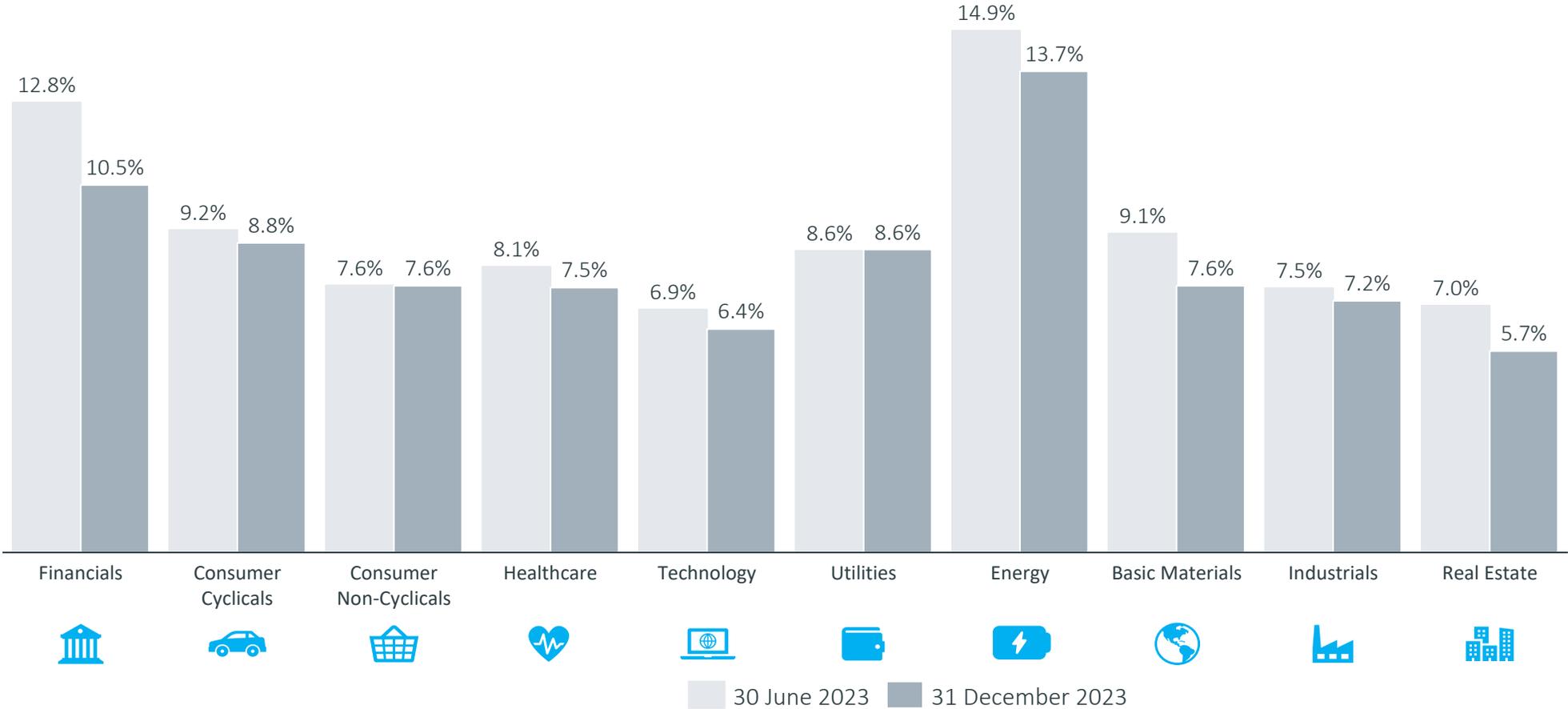3. The debt ratio corresponds to the debt-to-total capital ratio.

VALUETRUST

05

Sector returns

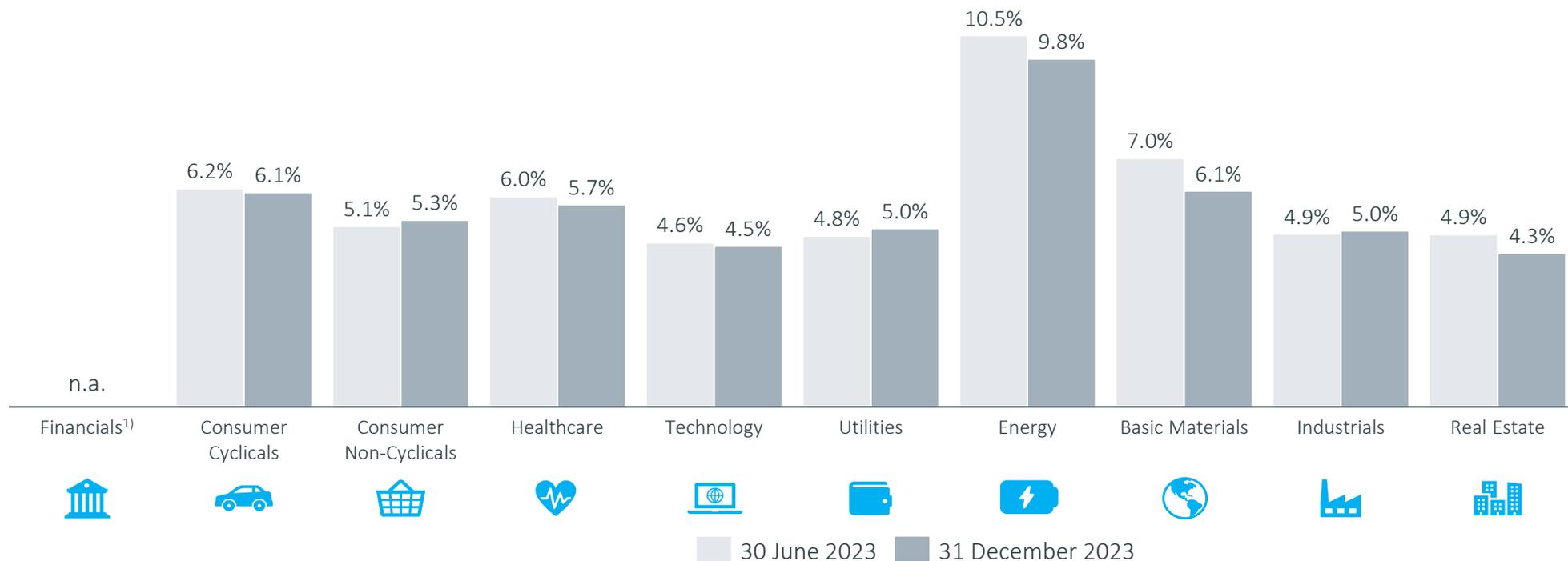### a. Implied returns (ex-ante analysis)

The implied levered returns declined for the past 6 months but remained stable for Consumer Non-Cyclical and Utilities sectors

Implied levered returns by sector, 31 December 2023, vs. 30 June 2023

	30 June 2023	31 December 2023
Financials	12.8%	10.5%
Consumer Cyclicals	9.2%	8.8%
Consumer Non-Cyclicals	7.6%	7.6%
Healthcare	8.1%	7.5%
Technology	6.9%	6.4%
Utilities	8.6%	8.6%
Energy	14.9%	13.7%
Basic Materials	9.1%	7.6%
Industrials	7.5%	7.2%
Real Estate	7.0%	5.7%

VALUETRUST

The implied unlevered returns remained mostly stable for the last 6 months, whereby the Energy, Basic Materials and Real Estate sectors show significant declines compared to other sectors

Implied unlevered returns by sector, 31 December 2023, vs. 30 June 2023
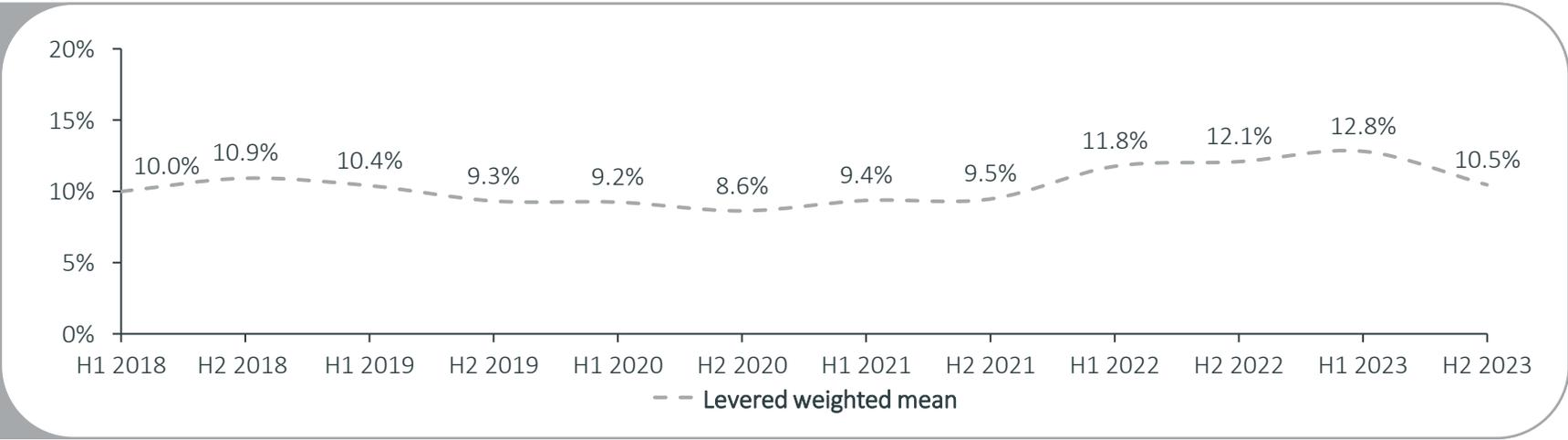

	Financials[1]	Consumer Cyclicals	Consumer Non-Cyclicals	Healthcare	Technology	Utilities	Energy	Basic Materials	Industrials	Real Estate
30 June 2023	n.a.	6.2%	5.1%	6.0%	4.6%	4.8%	10.5%	7.0%	4.9%	4.9%
31 December 2023		6.1%	5.3%	5.7%	4.5%	5.0%	9.8%	6.1%	5.0%	4.3%

1. No unlevered returns are reported for the Financial sector, as debt is part of operating activities

VALUETRUST

Implied sector returns decreased in both the Financials and Consumer Cyclical sectors, as earnings estimates decreased stronger than prices
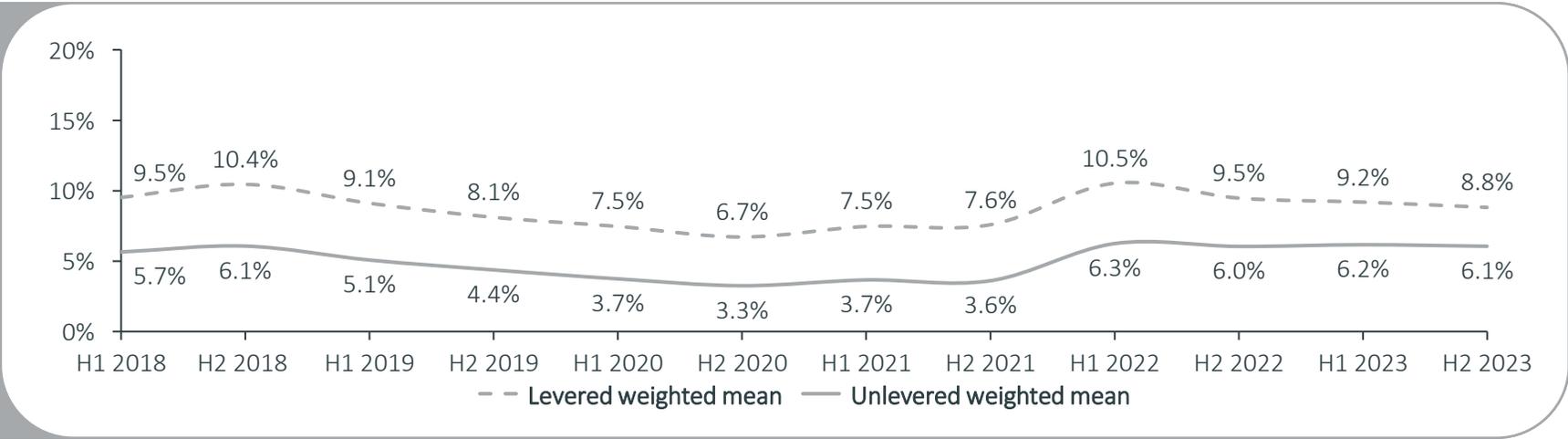
Implied levered and unlevered sector returns since 2018

Financials

Levered weighted mean values:
- H1 2018: 10.0%
- H2 2018: 10.9%
- H1 2019: 10.4%
- H2 2019: 9.3%
- H1 2020: 9.2%
- H2 2020: 8.6%
- H1 2021: 9.4%
- H2 2021: 9.5%
- H1 2022: 11.8%
- H2 2022: 12.1%
- H1 2023: 12.8%
- H2 2023: 10.5%

-- Levered weighted mean

Consumer Cyclicals

Levered weighted mean values:
- H1 2018: 9.5%
- H2 2018: 10.4%
- H1 2019: 9.1%
- H2 2019: 8.1%
- H1 2020: 7.5%
- H2 2020: 6.7%
- H1 2021: 7.5%
- H2 2021: 7.6%
- H1 2022: 10.5%
- H2 2022: 9.5%
- H1 2023: 9.2%
- H2 2023: 8.8%

Unlevered weighted mean values:
- H1 2018: 5.7%
- H2 2018: 6.1%
- H1 2019: 5.1%
- H2 2019: 4.4%
- H1 2020: 3.7%
- H2 2020: 3.3%
- H1 2021: 3.7%
- H2 2021: 3.6%
- H1 2022: 6.3%
- H2 2022: 6.0%
- H1 2023: 6.2%
- H2 2023: 6.1%

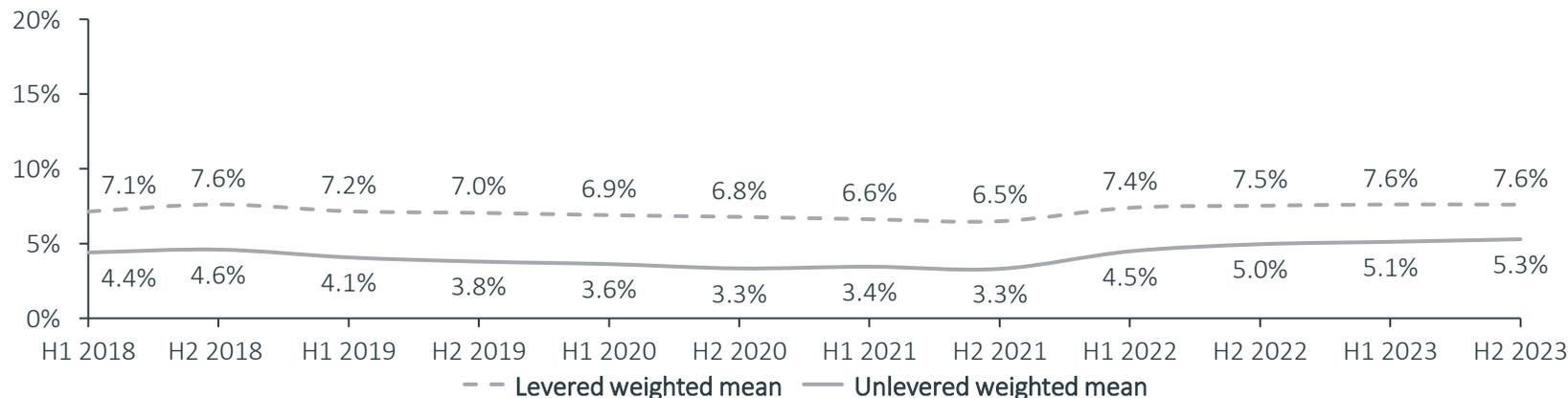-- Levered weighted mean   — Unlevered weighted mean

Implied sector returns for the Consumer Non-Cyclicals sector remained stable, while the Healthcare sector declined slightly, due to the rising of its P/E multiple over the last 6 months
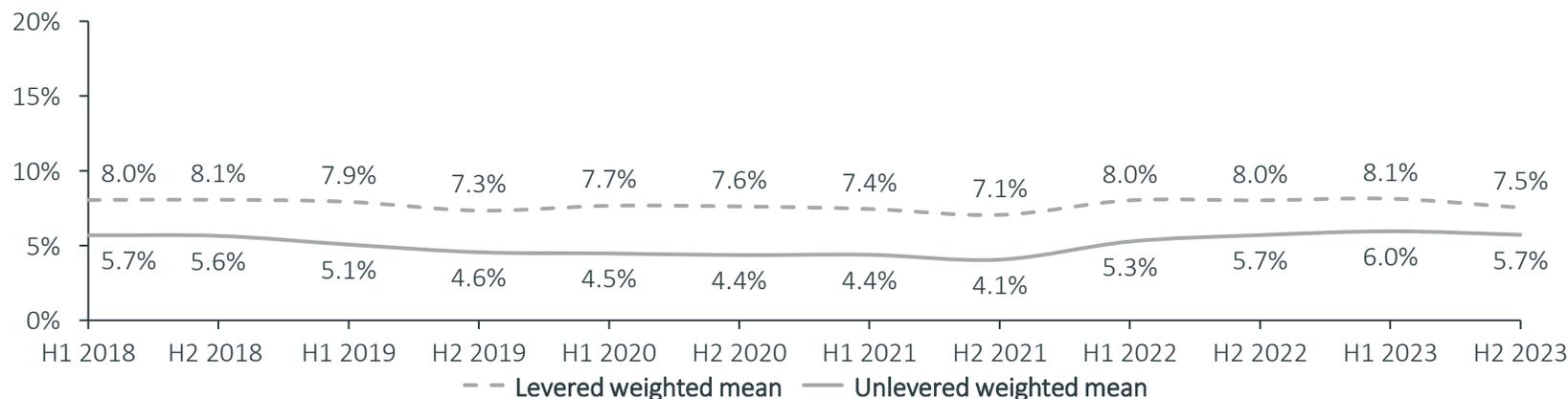
Implied levered and unlevered sector returns since 2018
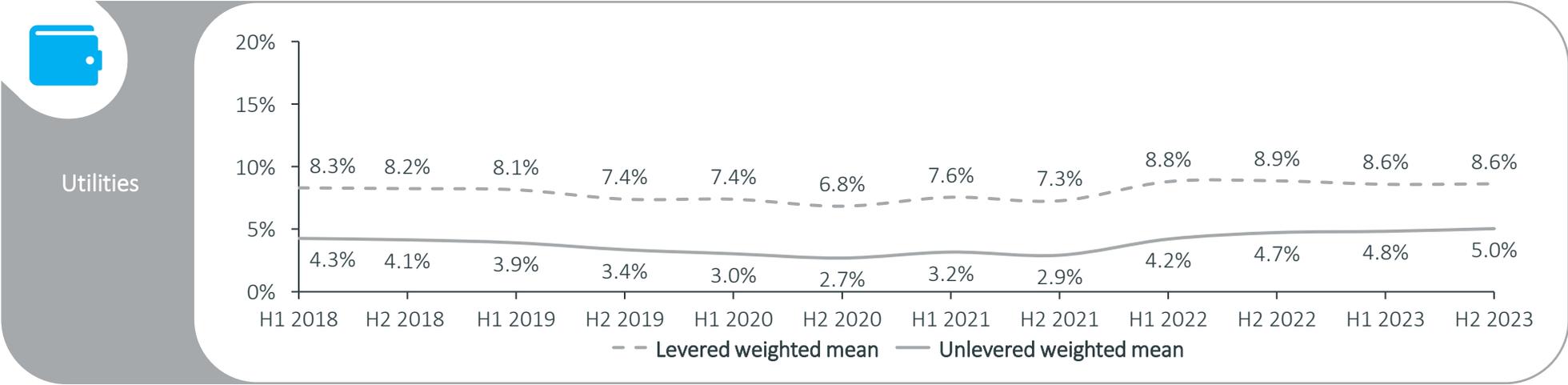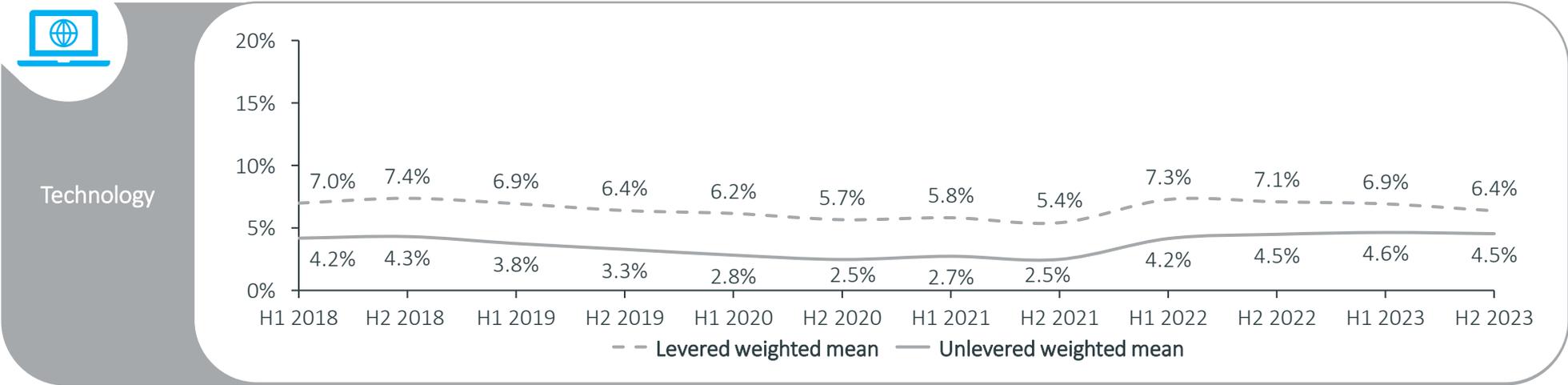
Consumer Non-Cyclicals

Levered weighted mean (dashed): 7.1%, 7.6%, 7.2%, 7.0%, 6.9%, 6.8%, 6.6%, 6.5%, 7.4%, 7.5%, 7.6%, 7.6%

Unlevered weighted mean (solid): 4.4%, 4.6%, 4.1%, 3.8%, 3.6%, 3.3%, 3.4%, 3.3%, 4.5%, 5.0%, 5.1%, 5.3%

X-axis: H1 2018, H2 2018, H1 2019, H2 2019, H1 2020, H2 2020, H1 2021, H2 2021, H1 2022, H2 2022, H1 2023, H2 2023

- - Levered weighted mean — Unlevered weighted mean

Healthcare

Levered weighted mean (dashed): 8.0%, 8.1%, 7.9%, 7.3%, 7.7%, 7.6%, 7.4%, 7.1%, 8.0%, 8.0%, 8.1%, 7.5%

Unlevered weighted mean (solid): 5.7%, 5.6%, 5.1%, 4.6%, 4.5%, 4.4%, 4.4%, 4.1%, 5.3%, 5.7%, 6.0%, 5.7%

X-axis: H1 2018, H2 2018, H1 2019, H2 2019, H1 2020, H2 2020, H1 2021, H2 2021, H1 2022, H2 2022, H1 2023, H2 2023

- - Levered weighted mean — Unlevered weighted mean

VALUETRUST

The implied levered returns decreased in the Technology sector in the second half of 2023 due to higher prices relative to earnings estimates, whereas the Utilities sector remained stable
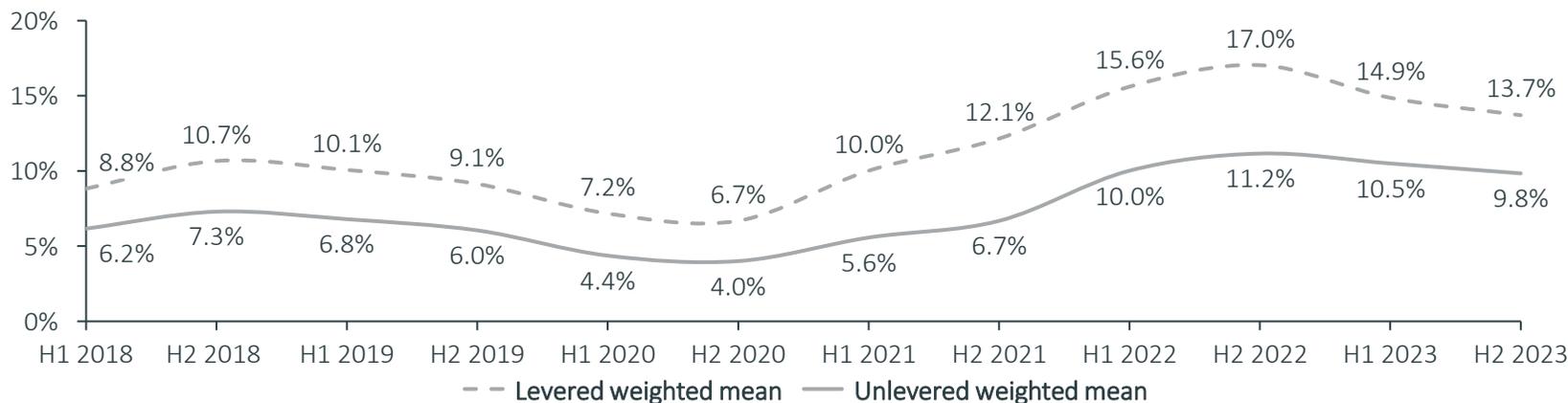
Implied levered and unlevered sector returns since 2018

Technology

	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020	H2 2020	H1 2021	H2 2021	H1 2022	H2 2022	H1 2023	H2 2023
Levered weighted mean	7.0%	7.4%	6.9%	6.4%	6.2%	5.7%	5.8%	5.4%	7.3%	7.1%	6.9%	6.4%
Unlevered weighted mean	4.2%	4.3%	3.8%	3.3%	2.8%	2.5%	2.7%	2.5%	4.2%	4.5%	4.6%	4.5%

- - Levered weighted mean   — Unlevered weighted mean

Utilities

	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020	H2 2020	H1 2021	H2 2021	H1 2022	H2 2022	H1 2023	H2 2023
Levered weighted mean	8.3%	8.2%	8.1%	7.4%	7.4%	6.8%	7.6%	7.3%	8.8%	8.9%	8.6%	8.6%
Unlevered weighted mean	4.3%	4.1%	3.9%	3.4%	3.0%	2.7%	3.2%	2.9%	4.2%	4.7%	4.8%	5.0%

- - Levered weighted mean   — Unlevered weighted mean

VALUETRUST

Implied levered sector returns continued to decrease in the Energy sector from its peak in 2022; the Basic Materials sector showed a significant decrease due to a higher P/E ratio

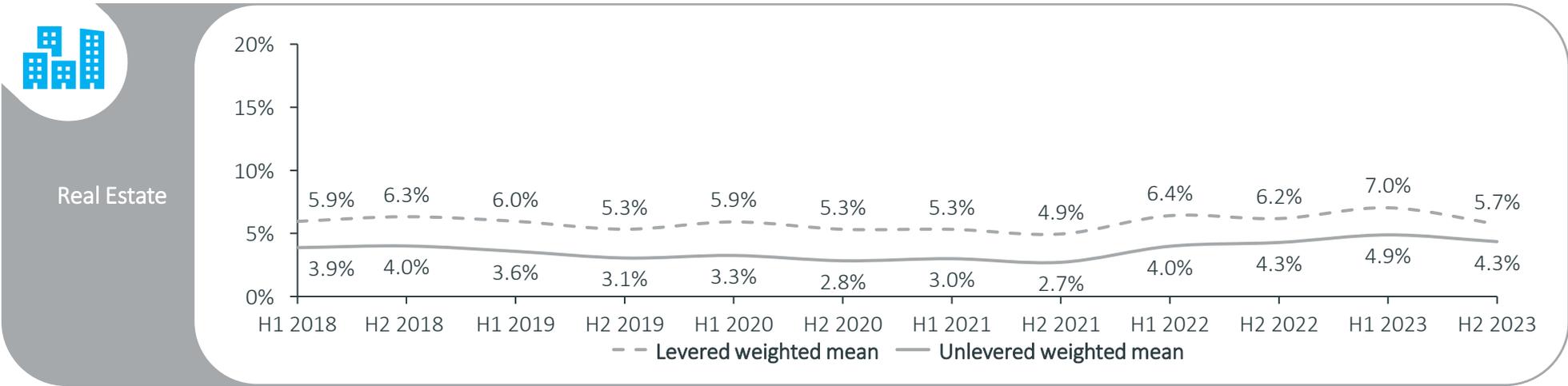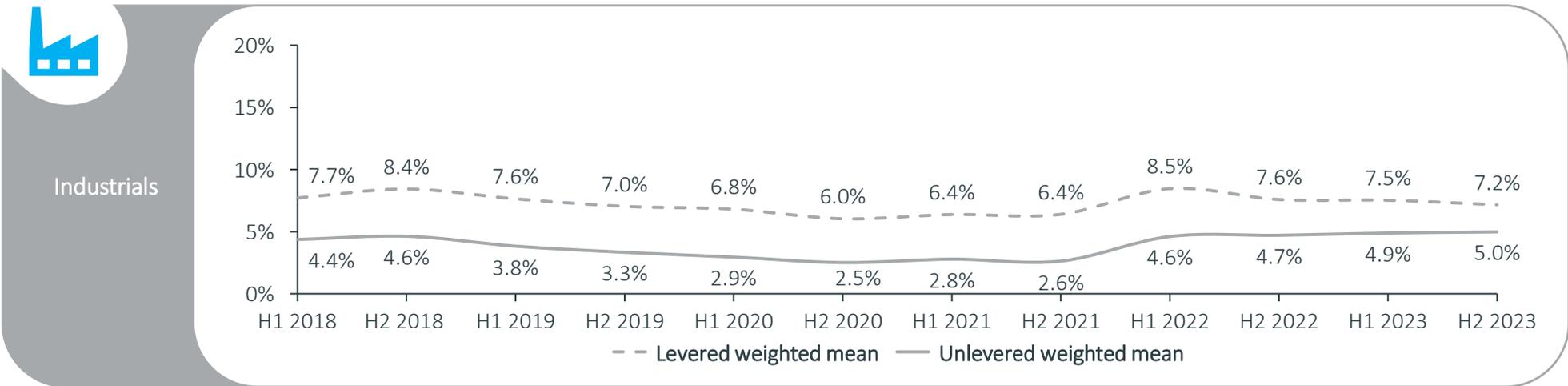Implied levered and unlevered sector returns since 2018

Energy

	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020	H2 2020	H1 2021	H2 2021	H1 2022	H2 2022	H1 2023	H2 2023
Levered weighted mean	8.8%	10.7%	10.1%	9.1%	7.2%	6.7%	10.0%	12.1%	15.6%	17.0%	14.9%	13.7%
Unlevered weighted mean	6.2%	7.3%	6.8%	6.0%	4.4%	4.0%	5.6%	6.7%	10.0%	11.2%	10.5%	9.8%

- - - Levered weighted mean ——— Unlevered weighted mean

Basic Materials

	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020	H2 2020	H1 2021	H2 2021	H1 2022	H2 2022	H1 2023	H2 2023
Levered weighted mean	8.4%	8.7%	7.9%	6.9%	6.7%	6.7%	7.8%	8.1%	10.3%	8.6%	9.1%	7.6%
Unlevered weighted mean	5.9%	6.1%	5.6%	4.8%	4.6%	4.5%	5.3%	5.3%	7.5%	6.6%	7.0%	6.1%

- - - Levered weighted mean ——— Unlevered weighted mean

The implied sector returns declined for both Industrials and Real Estate Sectors in the first half of 2023 due to lower earnings estimates

Implied levered and unlevered sector returns since 2018

Industrials

	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020	H2 2020	H1 2021	H2 2021	H1 2022	H2 2022	H1 2023	H2 2023
Levered weighted mean	7.7%	8.4%	7.6%	7.0%	6.8%	6.0%	6.4%	6.4%	8.5%	7.6%	7.5%	7.2%
Unlevered weighted mean	4.4%	4.6%	3.8%	3.3%	2.9%	2.5%	2.8%	2.6%	4.6%	4.7%	4.9%	5.0%

‑ ‑ Levered weighted mean   — Unlevered weighted mean

Real Estate

	H1 2018	H2 2018	H1 2019	H2 2019	H1 2020	H2 2020	H1 2021	H2 2021	H1 2022	H2 2022	H1 2023	H2 2023
Levered weighted mean	5.9%	6.3%	6.0%	5.3%	5.9%	5.3%	5.3%	4.9%	6.4%	6.2%	7.0%	5.7%
Unlevered weighted mean	3.9%	4.0%	3.6%	3.1%	3.3%	2.8%	3.0%	2.7%	4.0%	4.3%	4.9%	4.3%

‑ ‑ Levered weighted mean   — Unlevered weighted mean

VALUETRUST

05

Sector returns

b. Historical returns (ex-post analysis)

Historical returns are volatile and show varying impacts of interest rate hikes on sectors, with the Financials sector benefits the most from higher interest rates

Three- and six-year-average historical sector returns as of 31 December 2023

Sector	6-year-average (2018-2023)	3-year-average (2021-2023)
Financials	10.6%	21.4%
Consumer Cyclicals	14.4%	14.9%
Consumer Non-Cyclicals	6.7%	5.8%
Healthcare	13.5%	13.8%
Technology	16.9%	13.5%
Utilities	14.5%	9.7%
Energy	14.1%	25.8%
Basic Materials	13.2%	13.7%
Industrials	16.2%	19.5%
Real Estate	7.6%	5.2%

Legend: ☐ 6-year-average (2018-2023) ☐ 3-year-average (2021-2023)

VALUETRUST
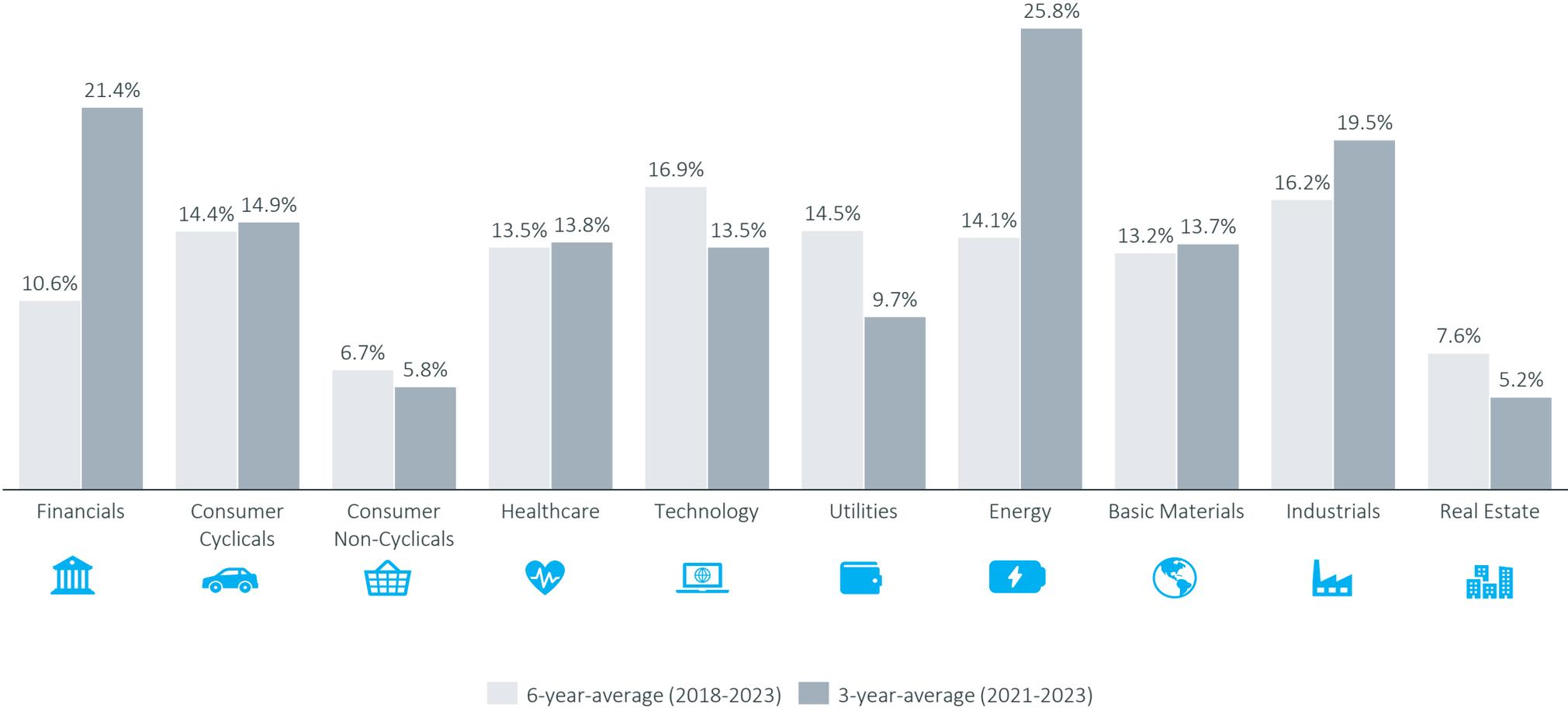
The Consumer Cyclical sector surged 24.9% over the past 12 months; the Financials sector also had a strong performance (27.0%)

Historical sector returns since 2018

Financials

50%
40%
30%
20%
10%
0%
-10%
-20%

33.3%
27.0%
24.0%
21.4%
10.6%
9.0%
3.8%
-9.5%
-15.1%

2018-12-31   2019-12-31   2020-12-31   2021-12-31   2022-12-31   2023-12-31

—— TSR   ········ 3y arithmetic mean   – – – 6y arithmetic mean   –– –– 6y geometric mean

Consumer Cyclicals

40%
30%
20%
10%
0%
-10%
-20%

38.4%
33.0%
24.9%
14.9%
14.4%
13.2%
12.6%
-13.1%
-9.8%

2018-12-31   2019-12-31   2020-12-31   2021-12-31   2022-12-31   2023-12-31

—— TSR   ········ 3y arithmetic mean   – – – 6y arithmetic mean   –– –– 6y geometric mean

VALUETRUST
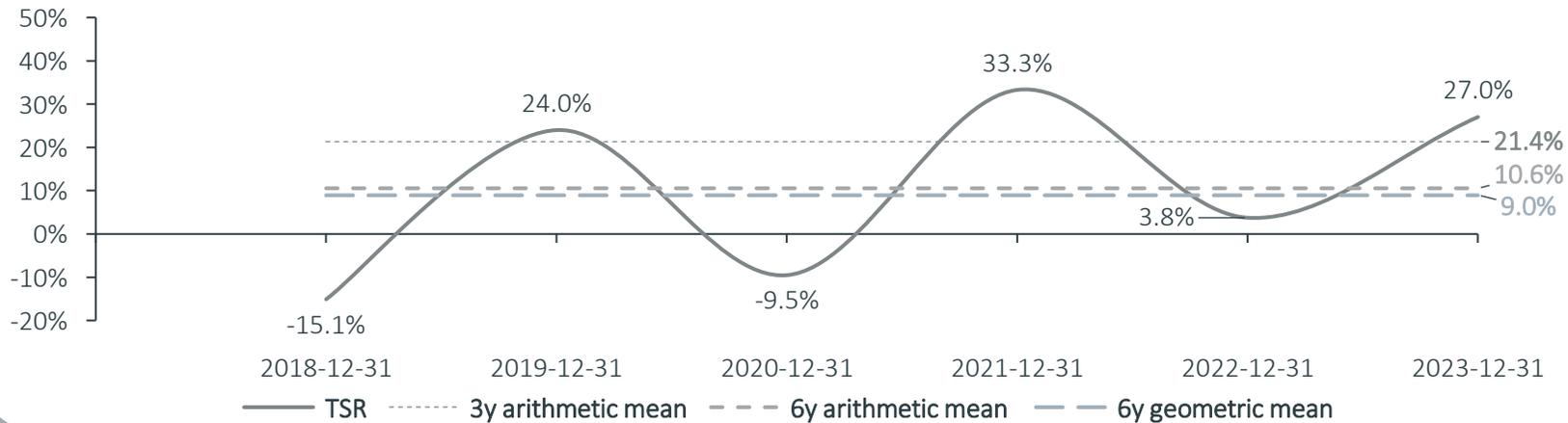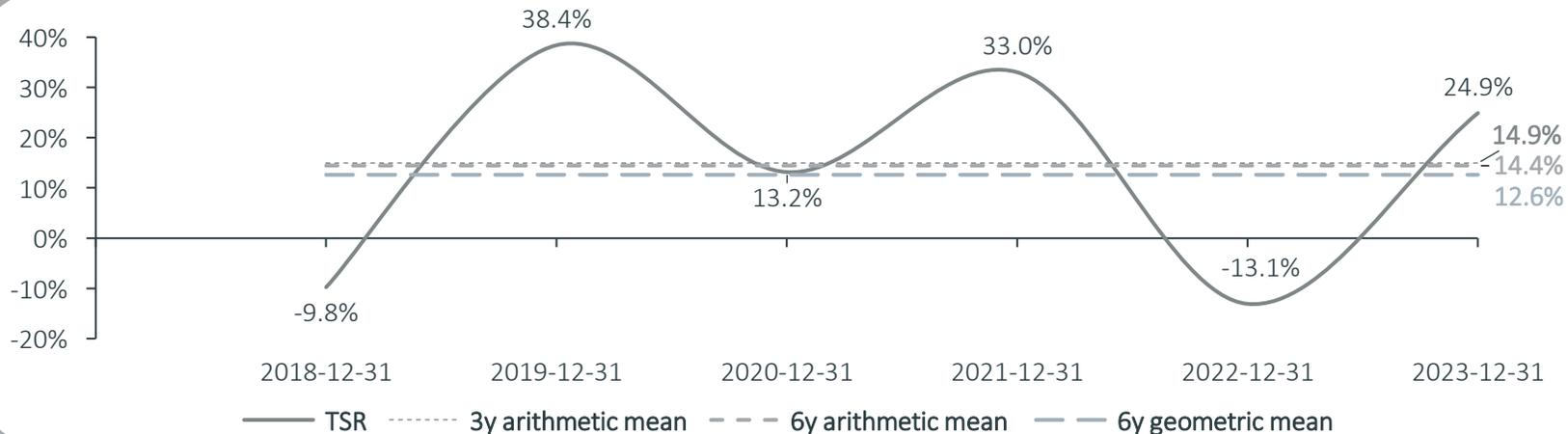
The Consumer Non-Cyclicals and Healthcare sectors had positive but relatively low performance over the last 12 months, showing generally lower volatility of returns over the last 6 years

Historical sector returns since 2018

Consumer Non-Cyclicals

- 25.3% (2019-12-31)
- 3.1% (2020-12-31)
- 20.3% (2021-12-31)
- 3.3% / 6.7% / 6.0% / 5.8% (2023-12-31)
- -5.5% (2018-12-31)
- -6.2% (2022-12-31)

Legend: TSR | 3y arithmetic mean | 6y arithmetic mean | 6y geometric mean

Healthcare

- 31.0% (2019-12-31)
- 5.1% (2020-12-31)
- 28.3% (2021-12-31)
- 3.6% (2018-12-31)
- 1.7% (2022-12-31)
- 13.8% / 13.5% / 12.9% / 11.5% (2023-12-31)

Legend: TSR | 3y arithmetic mean | 6y arithmetic mean | 6y geometric mean

VALUETRUST
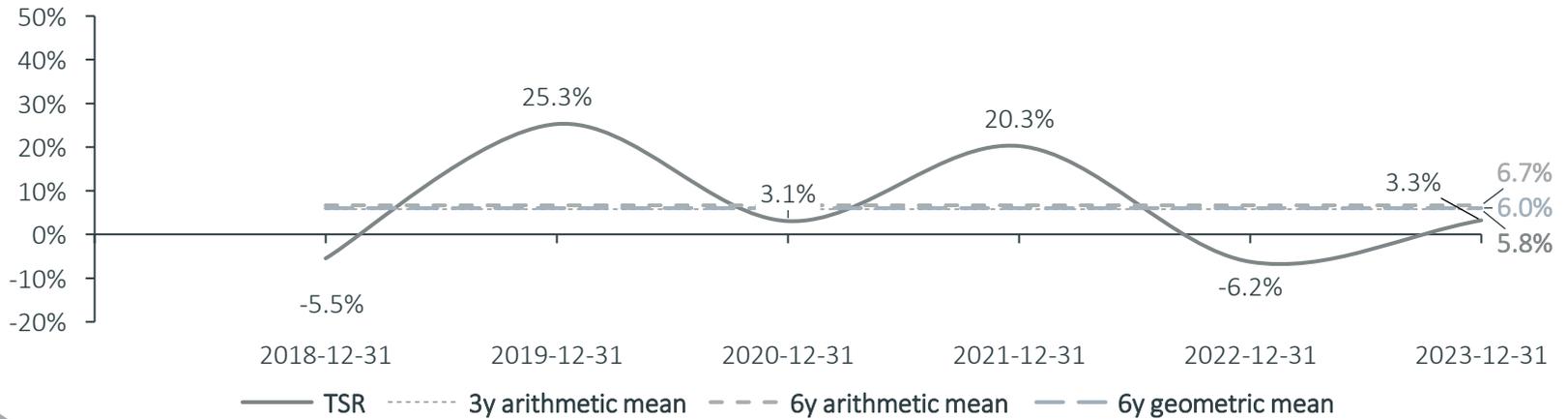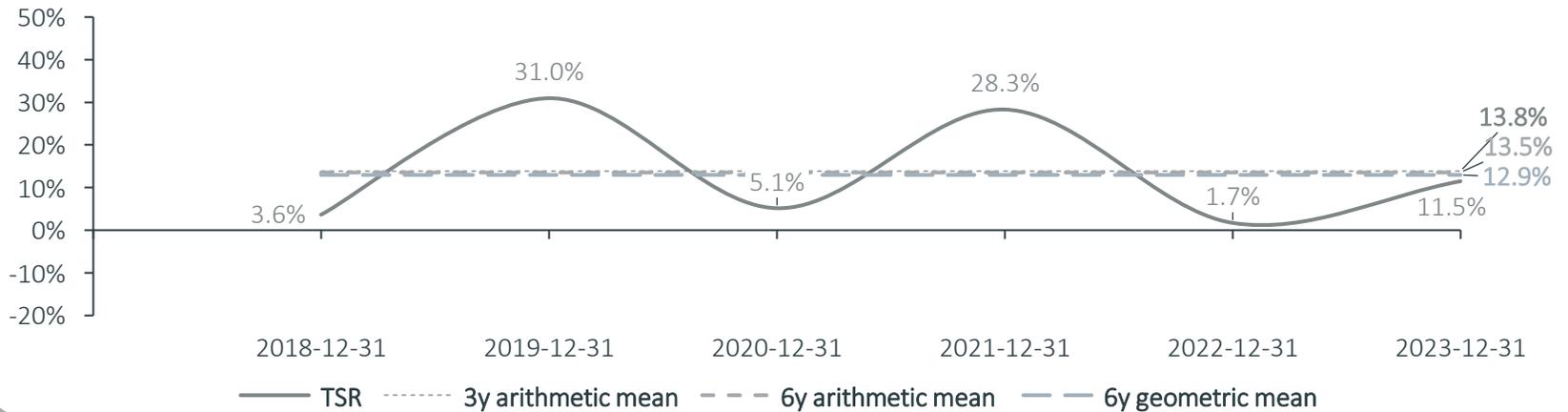
Technology sector recovered from a steep decline in the previous year; the less volatile Utilities sector was in the middle of the historical 1-year return range

Historical sector returns since 2018

Technology

- 36.3% (2019-12-31)
- 26.1% (2020-12-31)
- 34.2% (2021-12-31)
- 28.3% (2023-12-31)
- -1.6% (2018-12-31)
- -21.8% (2022-12-31)
- 16.9%
- 13.5%
- 14.7%

X-axis: 2018-12-31, 2019-12-31, 2020-12-31, 2021-12-31, 2022-12-31, 2023-12-31

Legend: —— TSR · · · · · 3y arithmetic mean – – – 6y arithmetic mean – – – 6y geometric mean

Utilities

- 32.5% (2019-12-31)
- 19.3% (2020-12-31)
- 13.5% (2021-12-31)
- 17.5% (2023-12-31)
- 6.0% (2018-12-31)
- -1.9% (2022-12-31)
- 14.5%
- 14.0%
- 9.7%

X-axis: 2018-12-31, 2019-12-31, 2020-12-31, 2021-12-31, 2022-12-31, 2023-12-31

Legend: —— TSR · · · · · 3y arithmetic mean – – – 6y arithmetic mean – – – 6y geometric mean

VALUETRUST

After last year's strong performance, the return of the Energy sector decreased significantly due to falling inflation and energy price, while the Basic Materials sector recovered

Historical sector returns since 2018

Energy

- TSR ⋯⋯ 3y arithmetic mean – – 6y arithmetic mean – – 6y geometric mean

Basic Materials

- TSR ⋯⋯ 3y arithmetic mean – – 6y arithmetic mean – – 6y geometric mean
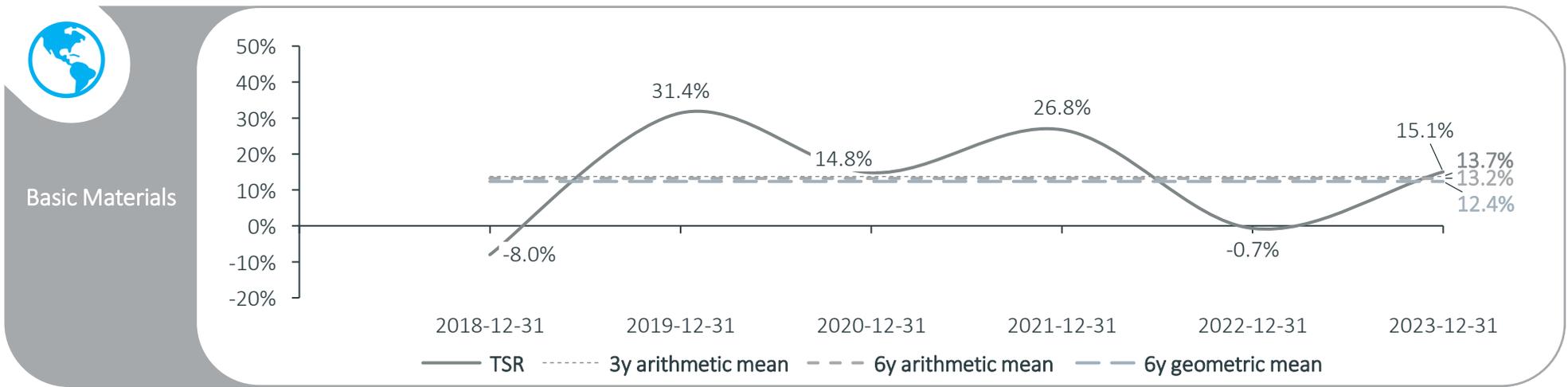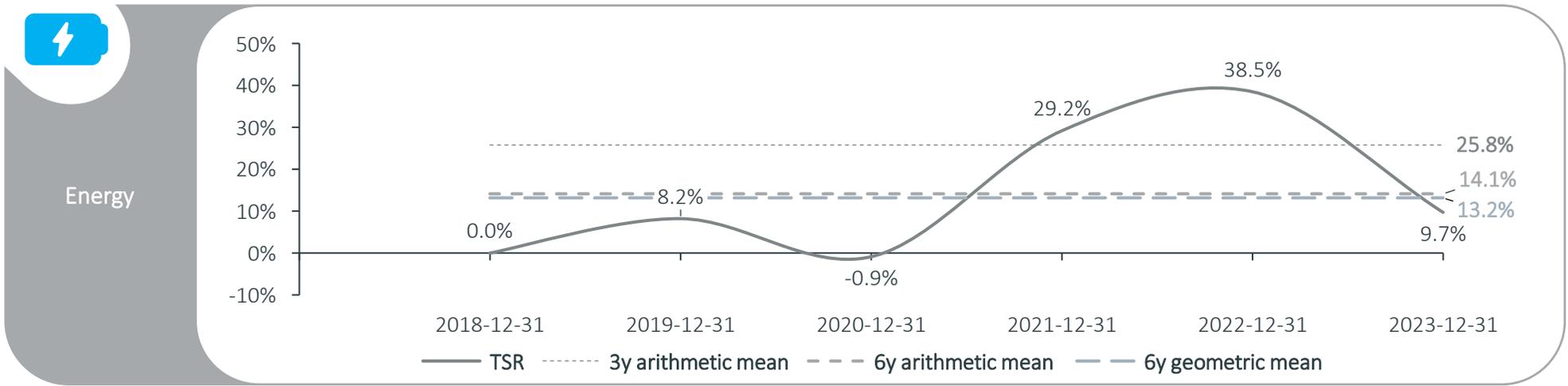
Real Estate sector return surged to 22.4% after a big decline in 2022, whereas Industrials had the best performance this year (32.3%) after recession fears subsided

Historical sector returns since 2018

Industrials

TSR ····· 3y arithmetic mean − − − 6y arithmetic mean − − 6y geometric mean

Data points: -7.9% (2018-12-31), 40.5% (2019-12-31), 6.0% (2020-12-31), 33.4% (2021-12-31), -7.2% (2022-12-31), 32.3% (2023-12-31); 19.5%, 16.2%, 14.5%

Real Estate

TSR ····· 3y arithmetic mean − − − 6y arithmetic mean − − 6y geometric mean

Data points: -3.2% (2018-12-31), 32.8% (2019-12-31), 0.6% (2020-12-31), 23.5% (2021-12-31), -30.4% (2022-12-31), 22.4% (2023-12-31); 7.6%, 5.3%, 5.2%
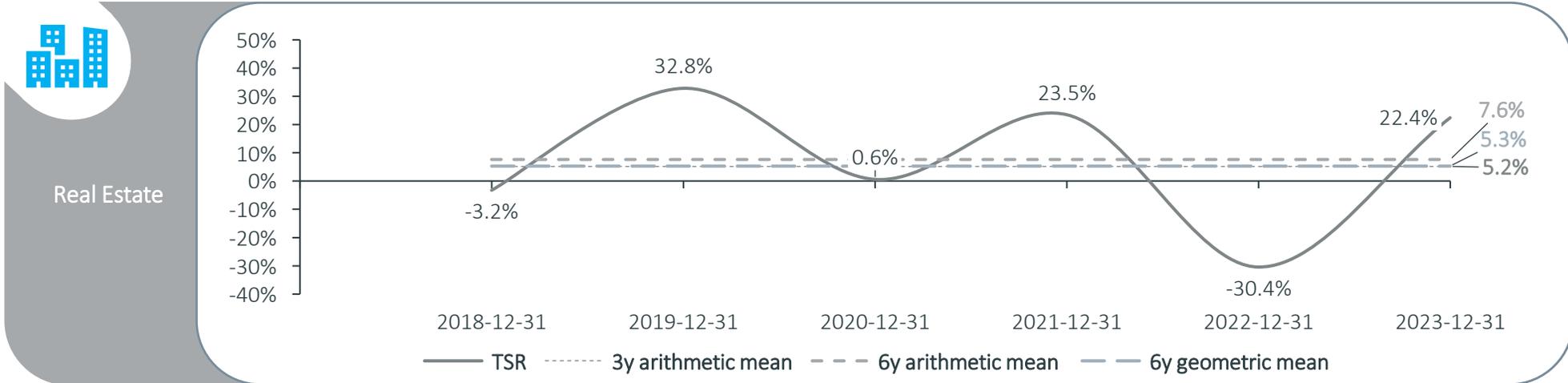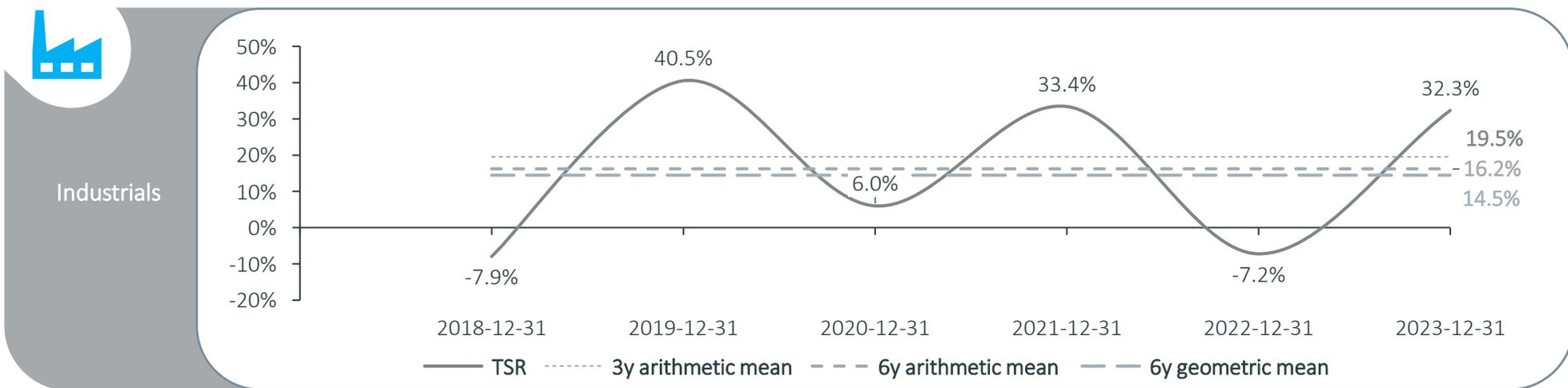
06 Trading multiples

The Financials and Technology sectors' P/E multiples increased, due to the higher market capitalizations and lower earnings estimates over the past 6 months

Median forward multiples by sector, 31 December 2023, and 30 June 2023

Sector	EV / Revenue	EV / EBIT	P / E	P / B
Financials[1]	n.a.	n.a.	10.1x / 7.7x	1.5x / 0.9x
Consumer Cyclicals	1.3x / 1.3x	11.2x / 11.6x	12.9x / 12.9x	2.1x / 2.0x
Consumer Non-Cyclicals	1.8x / 1.8x	13.9x / 14.1x	16.1x / 16.6x	3.2x / 3.3x
Healthcare	3.4x / 3.5x	13.9x / 14.0x	16.8x / 16.3x	4.8x / 3.7x
Technology	2.9x / 2.7x	16.6x / 16.3x	19.7x / 18.2x	2.9x / 2.8x
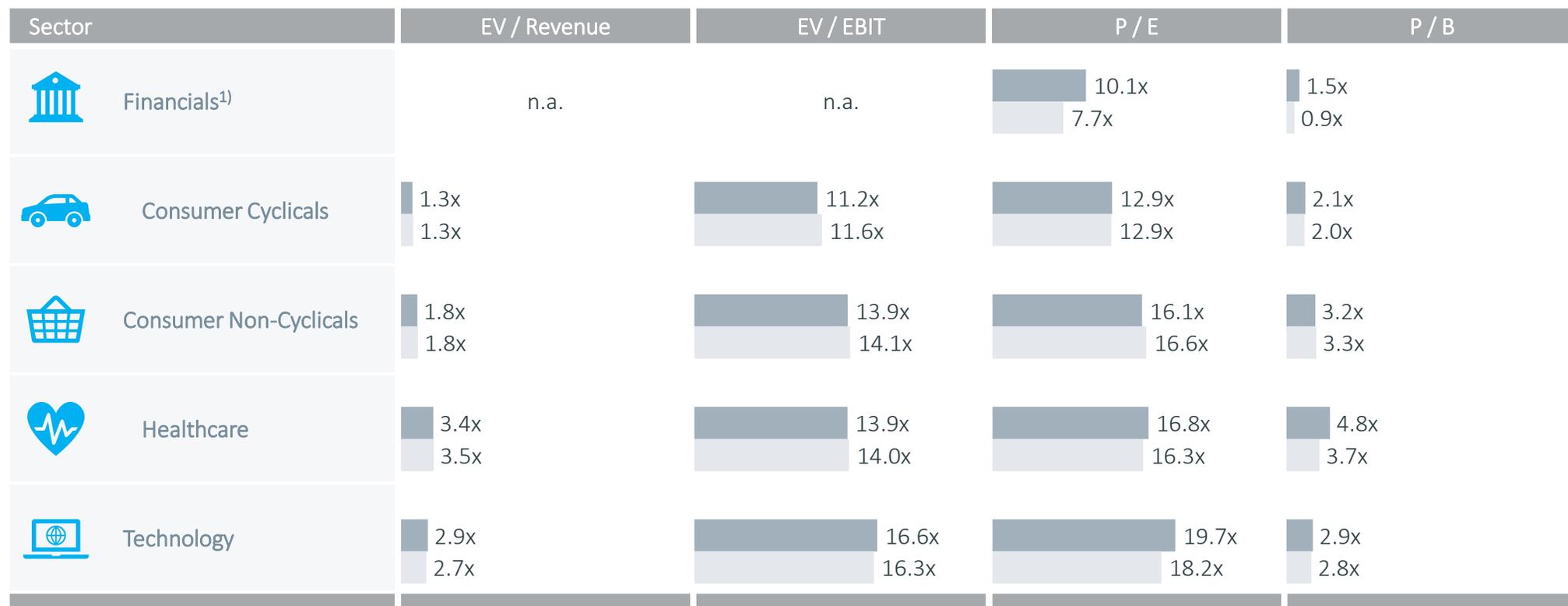
■ 31 December 2023   ▢ 30 June 2023

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

VALUETRUST

Despite stable earnings estimates, the Real Estate sector's P/E multiple increased significantly, as market capitalization increased sharply over the past 6 months

Median forward multiples by sector, 31 December 2023, and 30 June 2023

Sector	EV / Revenue	EV / EBIT	P / E	P / B
Utilities	1.4x / 1.4x	11.8x / 11.9x	12.9x / 13.2x	1.6x / 1.6x
Energy	0.7x / 0.7x	5.3x / 4.7x	7.4x / 6.5x	1.3x / 1.2x
Basic Materials	1.3x / 1.0x	11.7x / 9.7x	14.6x / 12.1x	1.6x / 1.6x
Industrials	1.6x / 1.5x	14.2x / 14.0x	17.4x / 16.9x	3.5x / 3.2x
Real Estate	17.2x / 16.1x	26.1x / 22.8x	16.1x / 12.6x	0.9x / 0.7x
Europe	1.7x / 1.6x	11.0x / 11.1x	13.4x / 12.3x	2.2x / 1.9x
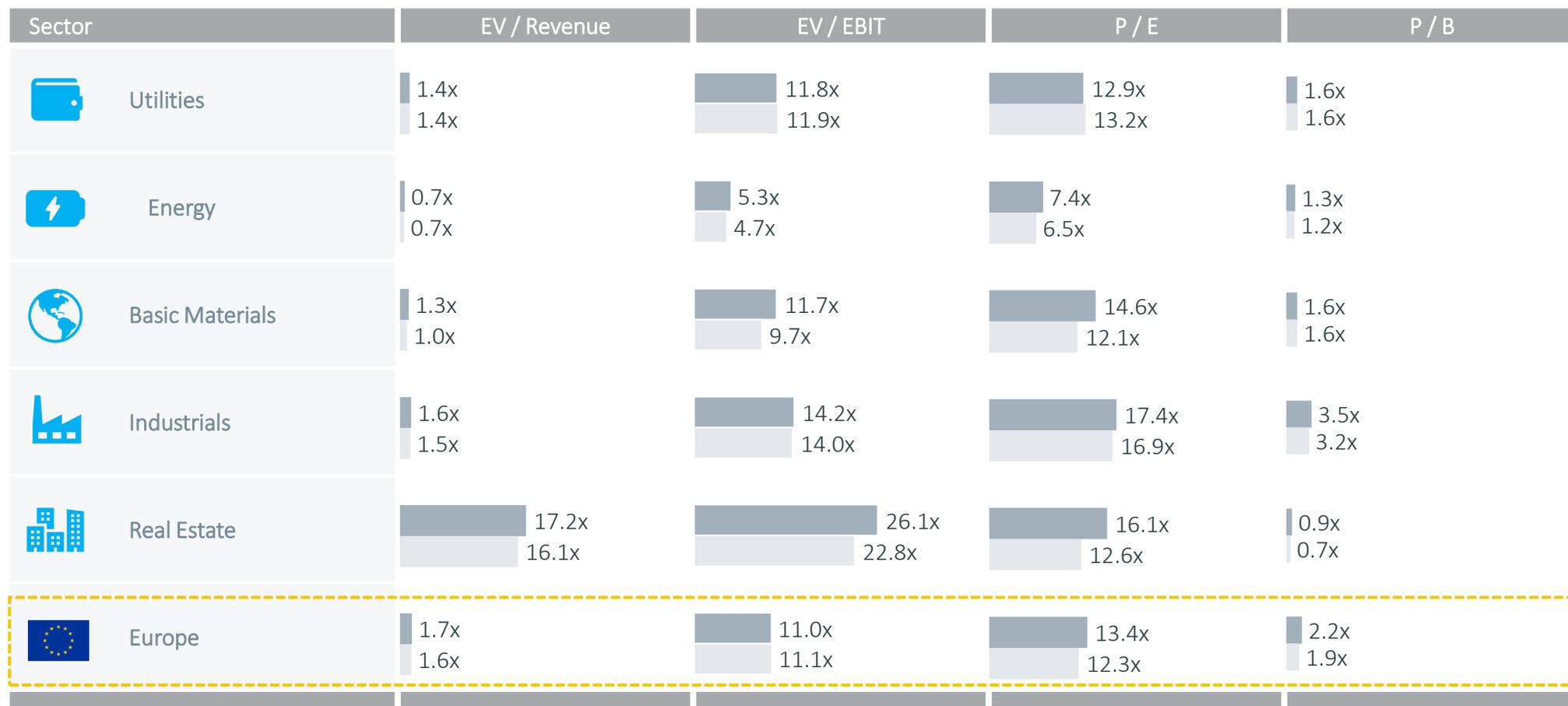
Legend: ■ 31 December 2023 ■ 30 June 2023

Overall, based on median sector multiples, Energy ranks lowest and Technology together with Healthcare rank highest, while Real Estate shows a mixed picture

Sector multiples ranking based on median, 1yf as of 31 December 2023

	EV/Revenue 1yf	EV/EBIT 1yf	P/E 1yf	P/B LTM	Ø Ranking
Financials	n.a.	n.a.	9	8	8.5
Consumer Cyclicals	8	8	7	5	6.9
Consumer Non-Cyclicals	4	4	4	3	4.1
Healthcare	2	5	3	1	2.6
Technology	3	2	1	4	2.6
Utilities	6	6	8	6	6.6
Energy	9	9	10	9	9.3
Basic Materials	8	7	6	7	7.1
Industrials	5	3	2	2	3.6
Real Estate	1	1	5	10	2.9

The Energy sector has the least expensive valuation level of all sectors

The P/B multiple of the Utilities sector ranks 6th highest in a sector comparison. Overall, the average ranking of the Utilities sector is 6.6, indicating a medium valuation level.

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

VALUETRUST

Appendix
Background and approaches

Government bonds of European countries with AAA-rating (Germany, Luxembourg and the Netherlands) are used to derive risk-free rates for Europe

Risk-free rate

The **risk-free rate** is a return available on a security that the market generally regards as free from 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 ratings. 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]

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

VALUETRUST

The concept of implied cost of capital recently gained momentum

Market returns and market risk premium: Implied returns

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

The **ex-ante method** offers an **alternative** to the **ex-post approach** of calculating the cost of capital by means of a regression analysis through the **CAPM**. The ex-ante analysis method seeks cost of capital which represent the **return expectations of market participants**. The approach assumes that the estimates of financial analysts reflect the expectations of the capital market.

The concept of **implied cost of capital** recently gained momentum. For example, when 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**.

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

In the analysis, we use – a simplified annual formula – the formula of the Residual Income Valuation Model by *Babbel*:[2]

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

With the following parameter definitions:

r_t = Cost of equity at time t

NI_{t+1} = Expected net income in the following time period t+1[3]

MC_t = Market capitalization at time t

BV_t = Book value of equity at time t

g = Projected growth rate

By solving the model for 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 all data (i.e. expected annual net income, market capitalization, and book value of equity, etc.) of the analyzed companies from the data supplier Refinitiv Eikon. As a typified growth rate, we apply the European Central Bank target inflation rate of **2.0% as a typified growth rate**.

We determine the **implied market returns** for the STOXX Europe 600. We consider this index as a valid approximation for the European market. Subtracting the risk-free rate from the implied market returns results in the implied market risk premium.

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

1. cf. Castedello/Jonas/Schieszl/Lenckner, Die Marktrisikoprämie im Niedrigzinsumfeld – Hintergrund und Erläuterung der Empfehlung des FAUB (WPg, 13/2018, p. 806-825).
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 next twelve months are applied.
4. cf. Reese, 2007, Estimation of the cost 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 30 June 2023.

VALUETRUST

Betas are calculated based on regressions and adjusted to take the capital structure into account

Betas

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

Beta factors are estimated based on **historical returns of securities** in comparison to an **approximate market portfolio**. Since a company valuation is **forward-looking**, it has to be examined which risk factors from the past also apply to the future, and to which extent. In valuing non-listed companies or companies without meaningful share price performance, it is common practice 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 similar risk profile ("**pure play beta**"). Within this Capital Market Study, we have used **sector betas** which are computed as **arithmetic means of the statistically significant beta factors of all companies** of a particular sector.

The calculation of beta factors is usually accomplished through a **linear regression analysis**.

It is important to set a time period over 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 **five years** with the regression of **monthly returns**.

In the CAPM, company specific **risk premiums** include **business** risk, and financial **risk**. The beta factor of 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.

Various adjustment formulas are available to calculate the **unlevered beta**. We prefer to use the **adjustment formula by Harris/Pringle** which assumes a value-based financing policy, stock-flow adjustments without time delay, uncertain tax shields and a so-called **debt beta**. We calculate the debt beta based on the respective company's rating or the average sector rating (if a company's rating is not available) through the application of the **credit spread** derived from the expected cost of debt. We do not adjust the credit spread for unsystematic risks. Capital market data, in particular historical market prices, is provided by the data supplier Refinitiv Eikon and its Aggregates App. Due to data availability, we only apply the five-year observation period.

Implied sector returns simplify the calculation of the levered cost of equity

Sector returns: Implied returns

Besides the future-oriented calculation of **implied market returns**, we also calculate **implied returns for sectors**. This offers an **alternative** to and a simplification of the **ex-post analysis** of the subject company's cost of capital via the **CAPM**. Using this approach, the calculation of sector betas via regression analyses are not necessary.

The **implied sector returns** can be used as an **indicator** for the **sector specific levered cost of equity, which** already consider **sector specific leverage**.

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

We unlever the implied returns with the following **equation** for the **cost of equity**[2] to take into account the specific leverage[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 the **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 accomplished without using the CAPM.

---

1. cf. Babbel, Challenging Stock Prices: Share prices and implied growth expectations (Corporate Finance, n. 9, 2015, p. 316-323, especially p. 319); cf. Aders/Aschauer/Dollinger, Die implizite Marktrisikoprämie am österreichischen Kapitalmarkt (RWZ, 6/2016, p. 195-202).
2. In situations in which the debt betas in the market are distorted, we would have to adjust these betas to avoid unsystematic risks. For simplification reasons, we deviate from our typical analysis strategy to achieve the enterprise value (Debt beta > 0) and assume that the cost of debt are at the level of the risk-free rate. This process is designed by the so-called Practitioners formula (uncertain tax shields, debt beta = 0), cf. Pratt/Grabowski, Cost of Capital, 5th ed., 2014, p. 253.
3. We assume that the cash and cash equivalents are used entirely for operational purposes. Consequently, we do not deduct excess cash from the debt.
4. "Debt" is defined as all interest-bearing liabilities. The debt illustration of the companies in the Financials sector only serves an informational purpose. We will not implement an adjustment to these companies' specific debt (unlevered) because their indebtedness is part of their operational activities and economic risk.

VALUETRUST

An exemplary calculation of relevered cost of equity to adjust for the company specific capital structure

Sector returns: Implied returns

Calculation example:

As of the reference date 31 December 2023, we observe the sector specific, levered cost of equity of **7.6%** (market-value weighted mean) in the European Basic Materials sector. Taking the sector-specific leverage into account, we derive an unlevered cost of equity of **6.1%.** For the exemplary company X, which operates in the European Basic Materials sector, the following assumptions were made:

- Debt-to-equity ratio of X: **40%**

- Risk-free rate: **2.8%**

Based on these inputs, we can calculate the relevered cost of equity for company X with the adjustment formula:

$$r_E^L = 6.1\% + (6.1\% - 2.8\%) * 40\% = 7.42\%$$

7.42% is the company's relevered cost of equity. In comparison, the levered cost of equity of the Basic Materials sector is **7.6%**, reflecting the sectors' higher average leverage.

VALUETRUST

Historical sector returns are calculated using market-weighted aggregated sector indices

Sector returns: Historical returns

In **addition** to **historical market returns**, we calculate **historical sector returns**. Our analysis contains **total shareholder returns** including **share price development** and the **dividend yield**.

We calculate **total annual shareholder returns as of 31 December** for every market-value weighted sector index of STOXX Europe 600. Our calculations comprise the time period between 2018 and 2023.

Since total annual shareholder returns tend to fluctuate to a great extent, their explanatory power is limited. Therefore, we do not only calculate the 1-year market-value weighted means, but 3-year (2021-23) as well as the 6-year (2018-23) averages.

VALUETRUST

The multiples approach can be used for company valuation

Trading multiples

Besides income-based valuation models (earnings value, DCF), the **multiples approach** offers a practical approach for an enterprise value estimation. The multiples method estimates a subject company's value **relative** to another company's value. The enterprise value is derived by multiplying a reference value (revenue or earnings values are frequently used) of the company by the respective multiples of **comparable companies**.

Within this Study, we calculate the following **multiples for the sectors indices** as well as **for the European market**:

- Revenue-Multiples ("EV[1]/Revenue")

- EBIT-Multiples ("EV[1]/EBIT")

- Price-to-Earnings-Multiples ("P/E")

- Price-to-Book Value-Multiples ("P/B")

Multiples are presented for the reference dates 31 December 2023 and 30 June 2023. The reference values are based on one-year forecasts of analysts (so called forward multiples, in the following "1yf"). Solely the Price-to-Book Value-Multiples are calculated with book values as of the reference dates. We present **median** values.

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

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

We source the data (i.e. market capitalization, revenue, EBIT, etc.) from the data provider Refinitiv Eikon. Based on the availability of data, especially in terms of forecasts, the number of companies underlying each specific multiple varies.

Additionally, we present a **ranking table** of the sector multiples. 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 dark **green color** to the **highest rank** and a **red color** to the **lowest rank**. Thus, a green colored high rank indicates a high valuation level, whereas a red colored low rank suggests a low valuation level. We then 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.
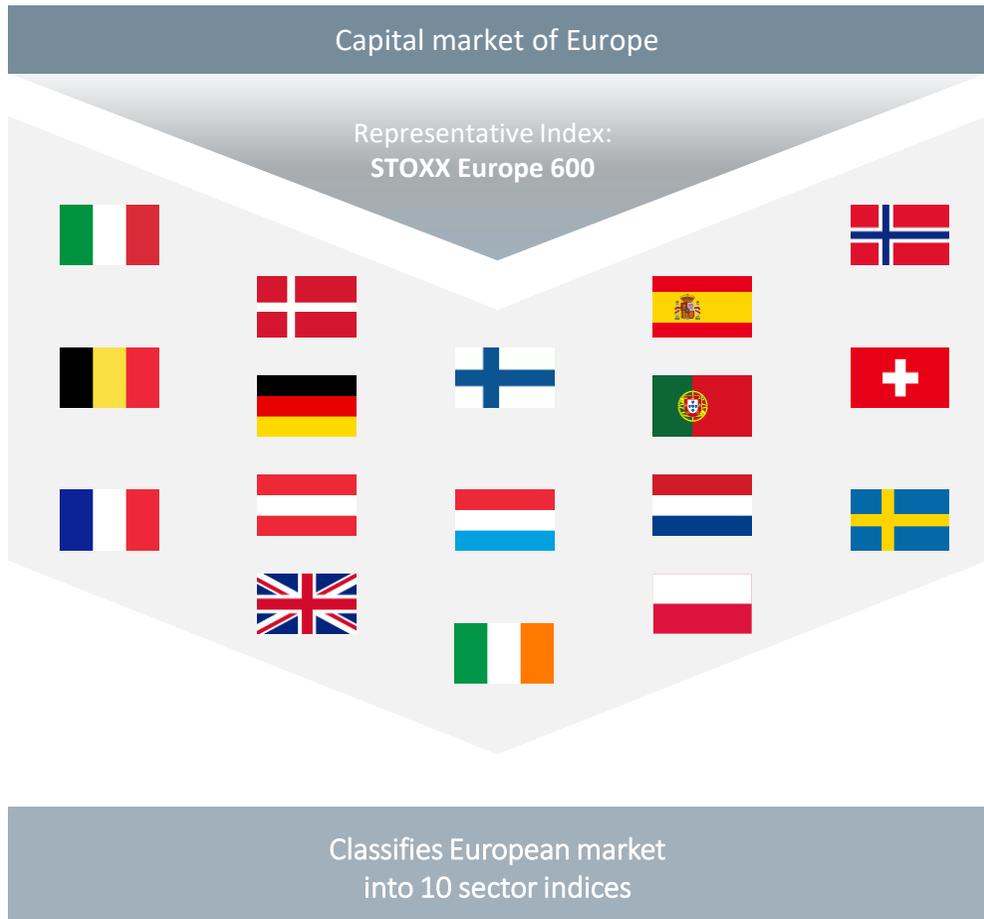
1. Enterprise value

VALUETRUST

Appendix
Composition of the sectors as of 31 December 2023

The chosen capital market index for Europe comprises 600 listed companies that are allocated to ten sector indices

Sector indices for Europe

Capital market of Europe

Representative Index:
STOXX Europe 600

Classifies European market into 10 sector indices

The sector indices aim to cover the **entire capital market of Europe**. Therefore, this Study contains all equities of the **STOXX Europe 600** as listed in the Refinitiv Eikon 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:

- Financials
- Consumer Cyclicals
- Consumer Non-Cyclicals
- Healthcare
- Technology   sector indices
- Utilities
- Energy
- Basic Materials
- Industrials
- Real Estate
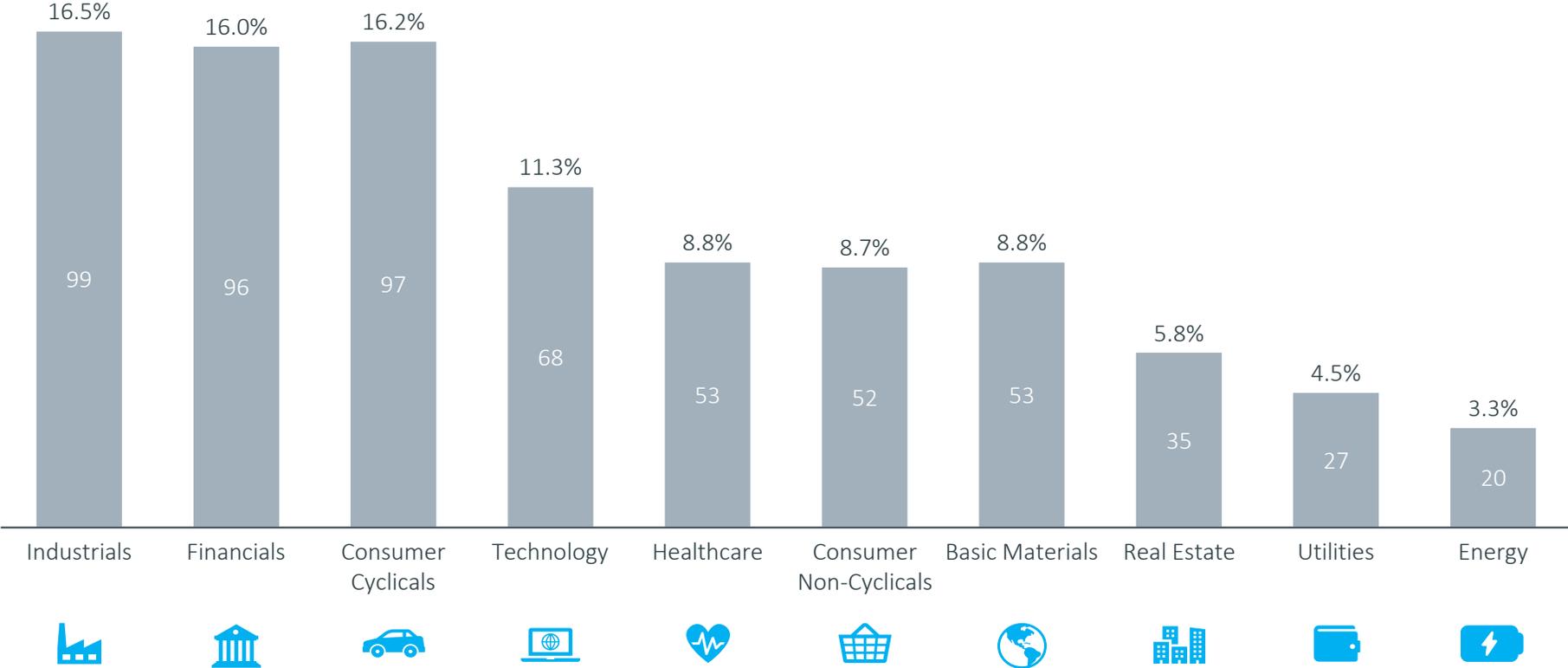
1. The Refinitiv Eikon Aggregates App offers analyst forecasts and historical values of key financials on an aggregated sector level

VALUETRUST

The Industrials, Financials and Consumer Cyclicals sectors represent about half of the European companies included in the STOXX Europe 600

Sector indices of STOXX Europe 600 as of 31 December 2023 (Number and percentage distribution of the 600 companies)

Sector	Percentage	Number
Industrials	16.5%	99
Financials	16.0%	96
Consumer Cyclicals	16.2%	97
Technology	11.3%	68
Healthcare	8.8%	53
Consumer Non-Cyclicals	8.7%	52
Basic Materials	8.8%	53
Real Estate	5.8%	35
Utilities	4.5%	27
Energy	3.3%	20

VALUETRUST

Financials and Consumer Cyclicals

Europe Capital Market Study

Financials

3I GROUP PLC.	DIRECT LINE IN.GP.PLC.	PHNX.GHG.PLC.
ABN AMRO BANK NV	DNB ASA	PKO BANK SA
ABRDN PLC.	EQT AB	PRUDENTIAL PLC.
ADMIRAL GROUP PLC.	ERSTE GROUP BANK AG	PZU GROUP SA
AEGON	EURAZEO SE	QUILTER PLC
AGEAS SA	EURONEXT	RAIFFEISEN BANK INTL.AG
ALLIANZ SE	FINECOBANK SPA	RINGKJOBING LANDBOBANK
AMUNDI	GJDG.FORSIKRING ASA	SAMPO PLC.
ASR NEDERLAND	GROEP BRUSSEL LAMBERT NV	SCHRODERS PLC.
ASSICURAZIONI GENERALI	HANNOVER RUCK.AG	SCOR SE
AVANZA BANK HOLDING AB	HARGREAVES LANSDOWN PLC.	SEB 'A' SA
AVIVA PLC.	HELVETIA HOLDING AG	SOCIETE GENERALE SA
AXA	HISCOX DI LTD.	SOFINA SA
BALOISE HOLDING AG	HSBC HOLDINGS PLC.	ST JAMES S PLACE PLC.
BANCO DE SABADELL SA	IG GROUP HOLDINGS PLC.	STD.CHARTERED PLC.
BANCO POPOLARE	INDUSTRIVARDEN AB	STOREBRAND ASA
BANCO SANTANDER SA	ING GROEP	STORSKOGEN GROUP AB
BANK OF IRELAND	INTERMEDIATE CAP.GP.PLC.	SVENSKA HANDBKN.'A' PLC.
BANK PKA.KASA OPIEKI SA	INTESA SANPAOLO	SWEDBANK AB
BANKINTER SA	INVESTOR AB	SWISS LIFE HOLDING AG
BARCLAYS PLC.	JULIUS BAER GRUPPE AG	SWISS RE AG
BAWAG PSK BK.AG	KBC GROEP NV	TRYG A/S
BBV.ARGT.SA	KINNEVIK 'B'	UBS GROUP
BEAZLEY PLC.	LEGAL & GENERAL GP.PLC.	UNICREDIT
BNP PARIBAS	LIFCO B	VIRGIN MONEY UK PLC.
BRIDGEPOINT GROUP WI	LLOYDS BANKING GP.PLC.	ZURICH INSURANCE GP.AG
CAIXABANK SA	LONDON STOCK EX.GP.PLC.	
CLOSE BROTHERS GP.PLC.	M&G PLC.	
CNP ASSURANCES	MAN GROUP PLC.	
COMMERZBANK AG	MEDIOBANCA BC.FIN SA	
CREDIT AGRICOLE SA	MUNCH.RVRS.GESELL.IN	
CREDIT SUISSE GROUP AG	NATWEST GROUP PLC.	
DANSKE BANK A/S	NN GROUP	
DEUTSCHE BANK AG	NORDEA BANK AB	
DEUTSCHE BOERSE AG	PARTNERS GROUP HOLDING	

Consumer Cyclicals (1/3)

ACCOR
ADIDAS AG
ALLEGRO EU SA
ASSA ABLOY AB
B&M EUR.VAL.RET.PLC.
BARRATT DEVS.P L C
BELLWAY PLC.
BERKELEY GROUP HDG.PLC.
BMW AG.
BOLLORE SE
BURBERRY GROUP PLC.
CD PROJECT RED SA
CHRISTIAN DIOR SA
CMPG.DES ETS.MICH.SCA
COMPASS GROUP PLC.
CONTINENTAL AG
COUNTRYSIDE PROPS.PLC.
CTS EVENTIM AG
D IETEREN GROUP NV
DAIMLER AG
DAIMLER TRUCK HOLDING AG
DOMETIC GROUP
DR MARTENS PLC.
DUFRY AG
ELECTROLUX AB
ENTAIN PLC.
ESSILORLUXOTTICA SA
EVOLUTION AB
EXOR
FAURECIA SE
FERGUSON PLC.
FERRARI NV
FLUIDRA SA
FLUTTER ENTM.PLC.
FUTURE PLC.

Source: Refinitiv

Consumer Cyclicals (cont'd) and Consumer Non-Cyclicals

Europe Capital Market Study

Consumer Cyclicals (2/3)
GAMES WORKSHOP GP.PLC.
GEBERIT AG
GRAFTON GROUP UTS.PLC.
GREGGS PLC.
H&M HENNES & MAURITZ AB
HERMES INTERNATIONAL
HOWDEN JOINERY GP.PLC.
HUSQVARNA AB
ICTL.HOTELS GROUP PLC.
INCHCAPE PLC.
INDITEX SA
INFORMA PLC.
ITV PLC.
JD SPORTS FASHION PLC.
KERING SA
KINDRED GROUP PLC
KINGFISHER PLC.
KINGSPAN GROUP PLC.
LA FRANCAISE DES JEUX SA
LPP SA
LVMH
MARKS & SPENCER GP.PLC.
MIPS AB
MONCLER
NDC.ENTM.GP.AB
NEXT PLC.
NOKIAN RENKAAT OYJ
OCADO GROUP PLC.
PANDORA A/S
PEARSON PLC.
PERSIMMON PLC.
PORSCHE AML.HLDG.SE
PROSIEBENSAT 1 MEDIA AG
PUBLICIS GROUPE SA
PUMA SE

Consumer Cyclicals (3/3)
RATIONAL AG
RENAULT SA
RHEINMETALL AG
RICHEMONT N SA
ROCKWOOL INTL.A/S
S4 CAP.ORD.SHS.
SAINT GOBAIN
SCHIBSTED A
SEB SA
SIGNIFY NV
SODEXO
STELLANTIS NV
SWATCH GROUP AG
TAYLOR WIMPEY PLC.
THULE GROUP
TRAVIS PERKINS PLC.
TUI AG
UNIVERSAL MUSIC GROUP NV
VALEO SE
VISTRY GROUP PLC.
VIVENDI SE
VOLKSWAGEN AG
VOLVO CAR AB
WATCHES OF SWITZ.GP.PLC.
WHITBREAD PLC.
WPP PLC.
ZALANDO

Consumer Non-Cyclicals
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 NV
DCC PLC.
DIAGEO PLC.
DINO POLSKA SA
ESSITY AB
GALENICA SANTE
GLANBIA PLC.
HEINEKEN HOLDING PLC.
HEINEKEN NV
HELLOFRESH SE
HOMESERVE PLC.
IMPERIAL BRANDS PLC.
INVESTMENT AB LATOUR
JDE PEETS NV
JERONIMO MARTINS SA
KERRY GROUP PLC.
KESKO OYJ
KON.AHOLD DLHZ.NV
L'OREAL
MELROSE INDUSTRIES

MOWI ASA
NESTLE AG
ORKLA ASA
PERNOD-RICARD
RECKITT BENCKISER GP.PLC
REMY COINTREAU
ROYAL UNIBREW A/S
SAINSBURY J PLC.
SALMAR ASA
SIEMENS AG
SMITHS GROUP PLC.
SWEDISH MATCH AB
TATE & LYLE PLC.
TESCO PLC.
UNILEVER PLC.
WARTSILA OYJ ABP
ZUR ROSE

Source: Refinitiv

Healthcare and Technology

Europe Capital Market Study

Healthcare

ADDLIFE AB	ORPEA SA
ALCON AG	OXFORD NANOPORE TECHS.
ALK-ABELLO A/S	QIAGEN NV
AMBU 'B'A/S	RECORDATI INDUA.CHIMICA
AMPLIFON SPA	ROCHE HOLDING AG
ARGENX SE	SANOFI
ASTRAZENECA PLC.	SARTORIUS AG
BACHEM HOLDING AG	SARTORIUS STEDIM BIOTECH
BAYER AG	SECTRA AB
BIOMERIEUX SA	SIEGFRIED HOLDING AG
CARL ZEISS MEDITEC AG	SIEMENS HEALTHINEERS
COLOPLAST A/S	SMITH & NEPHEW PLC.
CONVATEC GROUP PLC.	SONOVA HOLDING AG
DECHRA PHARMS.PLC.	STRAUMANN HOLDING AG
DEMANT A/S	SWED.ORPHAN BIOVITRUM AB
DIASORIN	UCB SA
ELEKTA AB	VIFOR PHARMA
EVOTEC SE	VITROLIFE AB
FRESENIUS	
FRESENIUS MED.CARE AG	
GENMAB A/S	
GENUS PLC.	
GERRESHEIMER AG	
GETINGE AB	
GLAXOSMITHKLINE PLC.	
GN STORE NORD A/S	
GRIFOLS SA	
HIKMA PHARMS.PLC.	
IPSEN SA	
KON.PHILIPS ELTN.NA	
LONZA GROUP AG	
MERCK KGAA	
NOVARTIS AG	
NOVO NORDISK A/S	
ORION OYJ	

Technology

ADEVINTA ASA	NETCOMPANY HOLDING I A/S
ADYEN NV	NOKIA OYJ
ALLFUNDS GROUP PLC.	NORDIC SEMICONDUCTOR ASA
ALTEN	ORANGE SA
AMADEUS IT GROUP	PROSUS NV
AMS OSRAM AG	PROXIMUS SA
ASM INTERNATIONAL	QT GROUP OYJ
ASML HOLDING NV	REPLY SPA
ATOS	RIGHTMOVE PLC.
AUTO TRADER GROUP PLC.	SAP AG
AUTO1 GROUP SE	SCOUT24 SE
AUTOSTORE HOLDINGS LTD.	SES SA
AVAST PLC	SIMCORP A/S
AVEVA GROUP PLC.	SINCH AB
BE SEMICONDUCTOR INDS.	SOFTCAT PLC.
BECHTLE AG	SOITEC
BT GROUP PLC.	SOPRA STERIA GROUP
CAPGEMINI SE	SPECTRIS PLC.
CELLNEX TELECOM	STMICROELECTRONICS NV
DASSAULT SYSTEMES SE	SWISSCOM
DELIVEROO PLC.	TECAN GROUP AG
DELIVERY HERO AG.	TELAB.LM ERIC.
DEUTSCHE TELEKOM AG	TELE2 AB
ELECTROCOMP.PLC.	TELECOM ITALIA
ELISA OYJ	TELEFONICA SA
FREENET AG	TELENOR ASA
HALMA PLC.	TELIA COMPANY AB
HEXAGON AB	TEMENOS AG
INFINEON TECHNOLOGIES AG	THE SAGE GROUP PLC.
INFRASTRUTTURE WIRELESS	UBISOFT ENTERTAINMENT SA
JUST EAT TAKEAWAY COM NV	UNITED INTERNET AG
KONINKLIJKE KPN NV	VODAFONE GROUP PLC.
LOGITECH INTL.SA	WORLDLINE
MILLICOM INTL.CELU.SA	
NEMETSCHEK AG	

Source: Refinitiv

Utilities, Energy and Basic Materials

Europe Capital Market Study

Utilities

A2A SPA
CENTRICA PLC.
E ON SE
EDP ENERGIAS DE PORTL.SA
EDP RENOVAVEIS
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
PENNON GROUP PLC.
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.
DET NORS.OLJESELSKAP ASA
ENAGAS SA
ENI
EQUINOR ASA
GALP ENERGIA SGPS
LUNDIN ENERGY AB
NESTE
OMV AG
PLKNC.NAFTOWY ORLEN
REPSOL YPF SA
ROYAL DUTCH SHELL
RUBIS
SIE.GAMESA RENWEN.SA
SIEMENS ENERGY AG
SNAM SPA
TECHNIPFMC PLC.
TENARIS SA
TOTALENERGIES SE
VESTAS WINDSYSTEMS A/S

Basic Materials

AKZO NOBEL NV
ANGLO AMERICAN PLC.
ANTOFAGASTA PLC.
ARCELORMITTAL
ARKEMA
BASF SE
BILLERUD KORSNAS AB
BOLIDEN AB
BRENNTAG SE
CLARIANT AG
COVESTRO AG
CRH PLC.
CRODA INTERNATIONAL PLC.
EMS-CHEMIE HOLDING AG
EVONIK INDUSTRIES AG
EVRAZ PLC.
FUCHS PETROLUB AG
GIVAUDAN SA
GLENCORE PLC
HEIDELBERGCEMENT AG
HENKEL PREFERENCE AG.
HEXPOL AB
HOLCIM AG
HOLMEN AB
HUHTAMAKI OYJ
IMCD GROUP
JOHNSON MATTHEY PLC.
KGHM POLSKA MIEDZ SA
KONINKLIJKE DSM
L AIR LQE.SC.ANYME.POUR
LANXESS AG
LINDE PLC.
LUNDBERGFORETAGEN AB
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.
VOESTALPINE AG
WIENERBERGER AG
YARA INTERNATIONAL ASA

VALUETRUST

Industrials and Real Estate

Europe Capital Market Study

Industrials

A P - MAERSK A/S	EPIROC AB NPV A	REXEL
AALBERTS NV	EUROFINS SCIENTIFIC AG	ROLLS-ROYCE HOLDINGS PLC
AB SKF	EXPERIAN PLC.	ROTORK PLC.
ABB LTD N	FERROVIAL SA	ROYAL MAIL PLC.
ACCIONA SA	FLUGHAFEN ZURICH AG	RYANAIR HOLDINGS PLC.
ACKERMANS & VAN HAAREN	GEA GROUP AGMOLLER	SAFRAN SA
ACS ACTIV.CONSTR.Y SERV.	GEORG FISCHER AG	SANDVIK AB
ADDTECH AB	GETLINK SE	SCHINDLER HOLDING AG
ADECCO SA	HAYS PLC.	SCHNEIDER ELECTRIC SE
ADP	IMI PLC.	SECURITAS AB
AENA SME SA	INDUTRADE AB	SGS SA
AFRY AB	INPOST SA	SKANSKA AB
AIRBUS SE	INTERPUMP GROUP	SPIE SA
ALFA LAVAL AB	INTERROLL HOLDING AG	SPIRAX-SARCO ENGR.PLC.
ALSTOM SA	INTERTEK GROUP PLC.	SUEZ CO.
ANDRITZ AG	INTL.CONS.AIRL.GROUP SA	SWECO AB
ARCADIS NV	ISS AS	TELEPERFORMANCE
ASHTEAD GROUP PLC.	IVECO GROUP	THALES SA
ATLANTIA	IWG PLC	TOMRA SYSTEMS ASA
ATLAS COPCO AB	KION GP.AG PREREIN.	TRELLEBORG AB
BAE SYSTEMS PLC.	KNORR BREMSE AG	VALMET OYJ
BEIJER REF AB	KONE OYJ	VAT GROUP
BELIMO HOLDING AG	KUEHNE+NAGEL INTL.G	VINCI SA
BOUYGUES SA	LEGRAND	VOLVO AB
BUCHER INDUSTRIES AG	LEONARDO SPA	WEIR GROUP PLC.
BUNZL PLC.	MEGGITT PLC.	WENDEL
BUREAU VERITAS INTL.	METSO OUTOTEC CORP.	WISE PLC.
CNH INDUSTRIAL NV	MTU AERO ENGINES HLDG.AG	WIZZ AIR HOLDINGS PLC.
DEUTSCHE LUFTHANSA AG	NEXI SPA	WOLTERS KLUWER NV
DEUTSCHE POST AG	NIBE INDUSTRIER AB	
DIPLOMA PLC.	POSTE ITALIANE	
DSV A/S	PRYSMIAN	
EDENRED SE	RANDSTAD NV	
EIFFAGE	RELX PLC.	
ELIS	RENTOKIL INITIAL PLC.	

Real Estate

AEDIFICA NV
ALLREAL HOLDING AG
ALSTRIA OFFICE REIT AG
AROUNDTOWN
BIG YELLOW GROUP PLC.
BRITISH LAND CO.PLC.
CASTELLUM AB
COFINIMMO
COVIVIO SA
DERWENT LONDON PLC.
FABEGE AB
FASTIGHETS BALDER AB
GECINA
INMB.COLO.SOCIMI SA
KLEPIERRE
KOJAMO OYJ
LAND SECURITIES GP.PLC.
LEG IMMOBILIEN SE
LONDONMETRIC PR.PLC.
MERLIN PROPERTIES REIT
PRIMARY HLTH.PROPS.PLC.
PSP SWISS PROPERTY AG
SAFESTORE HOLDINGS PLC.
SAGAX AB
SAMHALLS.I NRDN.AB
SEGRO PLC.
SWISS PRIME SITE
TAG IMMOBILIEN AG
TRITAX BIG BOX REIT PLC.
UNITE GROUP PLC.
VONOVIA SE PRE
WALLENSTAM AB
WAREHOUSES DE PAUW NV
WFD UNIBAIL RODAMCO NV
WIHLBORGS FASTIGHETER AB

Source: Refinitiv

VALUETRUST

FINANCIAL EXPERTS IN ACTION