

EUROPEAN STOCKS WITH THE SAFE-HAVEN ATTRIBUTES. DRAWDOWN BETA VS TRADITIONAL BETA FOR THE STOXX EUROPE 600 COMPANIES

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Abstract: The objective of the article is to calculate Conditional Drawdown-at-Risk Beta and Expected Regret of Drawdown Beta, accounting for the drawdowns of the STOXX Europe 600 index in the period 2014-2023. These drawdown betas show the impact of unprecedented events of the COVID-19 crisis, the Russian invasion of Ukraine, and the Israeli-Palestinian conflict. Similar to the standard beta, the drawdown betas relate the expected return of an asset to the expected return of the market, but are based on the concept of drawdown (decline in the value from a peak to a subsequent low). The numerical results show that drawdown betas are sensitive to market distress during unexpected events. The drawdown betas may have negative values and work as safe-haven assets for investors during financial crises, while the standard beta is positive. We provide a case study demonstrating the approach for European markets.

Keywords: CAPM, drawdown beta, STOXX Europe 600, safe-haven stocks

1. INTRODUCTION

The relationship between risk and expected return is a significant challenge in financial theory. Traditional Capital Asset Pricing Model (CAPM) explains how to measure risk and the relation between expected return and risk (Sharpe, 1964, Lintner, 1965, Mossin, 1966). CAPM proves that investors are rewarded for risk which is not diversifiable (systematic risk) and it is measured by beta. Beta is the tendency of the stock's return to respond to changes in the market represented by the stock market index.

However, in the single period CAPM, stocks' beta explains returns on the risky assets, it does not mean that the beta can capture all variation in expected returns. The beta parameter might be unstable for many reasons and international empirical studies have proved that e.g., the American market (Fabozzi and Francis, 1978), (Feder-Sempach et al, 2023), or the European market (Wells, 1994; Chaveau and Maillet 1998). The standard CAPM variance risk measure has a conceptual drawback because it does not differentiate between losses and gains of the portfolio. Various risk measures have been proposed as an alternative to variance with the latest drawdown based risk measures called Conditional Drawdown-at-Risk Beta (CdaR Beta) introduced by Zabaranin *et al.* (2014) and Expected Regret of Drawdown Beta (EroD Beta) proposed by Ding and Uryasev (2022). These two measures, like the standard or traditional beta, relate the returns of an asset to the returns of the market, but are based on the concept of drawdowns: the decline in the value of an asset from a peak to a subsequent low. CdaR Beta and EroD Beta differ in their approach to determining which drawdowns to include. The former is based on a percentage of worst case market drawdowns, while the latter is based on drawdowns with a known threshold.

The research sample consist of STOXX Europe 600 companies listed in euro and in domestic currencies. It is a stock market index of European stocks with a fixed number of 600 components representing large, mid, and small capitalisation companies among 17 European countries. The proposed index provides coverage for country and industry allocation offering portfolio of developed European economies, replicating almost 90% of the underlying investable market.

The main objective of the paper is to calculate the drawdown betas accounting for the drawdowns of the STOXX Europe 600 index according to the methodology proposed by Zabaranin *et al.* (2014) and Ding and Uryasev (2022) in the period 2014-2023 to show the impact of unprecedented events of the COVID-19 crisis, the Russian invasion of Ukraine, and the Israeli-Palestinian conflict. The drawdown beta evaluates portfolio performance during market drawdowns in Europe.

The article is structured as follows. After the introduction, Section 2 reviews the literature, and Section 3 presents the research sample and methodology. Section 4 discusses the empirical results, and the last section concludes the paper.

2. LITERATURE REVIEW

The standard Beta relates expected return of a security and expected excess return of a market index, and it is used as a key indicator of stock performance in portfolio management. Different non-symmetric risk measures have been proposed as an alternative to standard variance like Conditional Value-at-Risk (CVaR) that focuses on minimizing conditional value-at-risk (CVaR) rather than minimizing value-at-risk (VaR), which is highly desirable by investment companies, mutual funds and international investors that evaluates risk, (Rockafellar and Uryasev, 2000, 2002, 2013).

Classical CAPM has been reached out by non-symmetric risk measures named Generalized Deviations by Rockafellar et al. (2006) extending classical portfolio theory much beyond the case of standard deviation. The authors have remarked that CAPM equations are necessary optimality conditions for portfolio optimisation problems, whereas Beta was computed for CVaR and lower semi-deviation (the square root of Semi-Variance). The review paper proposed by Krokmal et al. (2011) discusses these non-symmetric risk measures and the most latest advances in the context of decision making under uncertainty. Some new formulas for the estimation of Beta were also proposed.

The main objective of the portfolio managers is to build the portfolio and avoid drawdowns, characterised by the most popular drawdown measure named the Maximum Drawdown. However, from the investors' perspective, the Maximum Drawdown is not the best risk measure because it accounts for only one specific event on a price sample-path. In addition, Goldberg and Mahmoud (2017) proposed the Conditional Expected Drawdown (CED), which is the tail mean of the maximum drawdown distribution. Chekhlov et al. (2003) suggested Conditional Draw Down at-Risk (CDaR) which averages a specified percentage of the largest portfolio drawdowns over the whole investment horizon. CDaR has been used to identify systemic dependencies in the financial market and it is defined as the CVaR of the drawdown observations of the portfolio cumulative returns. Authors Ding and Uryasev (2020) decided to use CDaR regression for measurement of systemic risk contributions of financial institutions and for funds style classification.

The capital asset pricing model with drawdown beta was proposed by Zabarankin et al. (2014) providing the necessary conditions for optimisation in the form of CAPM equations. Drawdown alpha and beta were introduced similarly to the classical CAPM. The new formula for CdaR Beta was derived similar to the standard Beta, which relates return of the market and

individual assets. Both the drawdown beta and alpha were used to prioritise hedge fund strategies aiming to hedge against market downturns. In summary, drawdown beta and standard beta have a clear distinction. The drawdown beta accounts only for periods when the market portfolio is in drawdown and ignores asset performance when the market portfolio goes up, helping investors identify the safe-haven assets contrary to the standard beta that evaluates correlation between returns of the asset and market portfolio over the whole period.

3. METHODOLOGY

In this paper, two drawdown betas are used: CdaR Beta and ERoD Beta, and compared with standard Beta. CdaR Beta is equal to average instrument losses *over a percentage of the largest* market drawdown periods, divided by the average losses of the market during those same drawdown periods, while ERoD Beta is calculated as the average losses of a security *during periods when the market experiences a drawdown exceeding a specified threshold ϵ* , divided by the average losses of the market during those same drawdown periods, Ding and Uryasev (2022). The formula for calculating ERoD Beta and CdaR Beta for security i are as follows:

$$\hat{\beta}_{CDaR,\alpha}^i = \frac{\sum_{t=1}^T q_t (w_{\tau(t)}^i - w_t^i)}{\sum_{t=1}^T q_t (w_{\tau(t)}^M - w_t^M)}$$

$$\hat{\beta}_{ERoD,\epsilon}^i = \frac{\frac{1}{T} \sum_{t=1}^T q_t^* (w_{\tau(t)}^i - w_t^i)}{\frac{1}{T} \sum_{t=1}^T q_t^* (w_{\tau(t)}^M - w_t^M)}$$

where:

i – index of security $i = 1, \dots, I$,

t – time, $t = 1, \dots, T$,

w_t^i - uncompounded cumulative return of asset i at time moment t ,

w_t^M - uncompounded cumulative returns of the market portfolio at time moment t ,

$d_t^M = w_{\tau(t)}^M - w_t^M$ drawdowns of the market portfolio,

q_t –indicator function which is equal to $1/((1 - \alpha)T)$ if d_t^M is one of the $(1 - \alpha)T$ largest drawdowns $d_1^M, d_2^M, \dots, d_T^M$ of the market portfolio, and equal to zero otherwise,

$q_t^* = 1(d_t^M \geq \epsilon)$ – indicator function which is equal to 1 for $d_t^M \geq \epsilon$, and 0 otherwise.

$\tau(t) = \max\{k | 1 \leq k \leq t, w_k^M = \max_{1 \leq l \leq t} w_l^M\}$.

In the case of CdaR Beta, $\alpha \in [0,1]$ control the percentage of the largest drawdowns to include, with $\alpha = 0$ representing all market drawdowns and $\alpha = 1$ representing the maximum (the largest) market drawdown. For example, CdaR_{0.9} Beta is accounting for the largest 10% of drawdowns of the market portfolio. In the case of ERoD Beta, $\epsilon \in (0, +\infty)$ determines the magnitude of evaluated drawdowns. Ding and Uryasev (2022) proposed the threshold $0 +$ with $\epsilon = 10^{-6}$ to account for all non-zero drawdowns.

4. DISCUSSION AND FINDINGS

The main idea is to evaluate the impact of unprecedented events like the COVID-19 crisis, the Russian invasion of Ukraine, and the Israeli-Palestinian conflict and compare ERoD, CDaR, and standard betas for European companies and find the safe-haven attributes of European stocks. The discussion of the drawdown betas vs. traditional beta can potentially prove that traditional beta is more stable, but it cannot provide significant information during the market distress. Drawdown betas are more sensitive to market distress during unexpected events while having negative values could work as safe haven assets for European oriented investors by having greater informative power.

Table 1. Standard beta and drawdown beta estimation for STOXX Europe 600 companies

Ticker (LSEG EIKON)	Erod-Beta	Cda r-Beta	Standard-Beta	Max-Drawdown	Annual Return	U-ratio	Sector	Country_of_Exchange
A2.MI	-0,3473	0,5131	0,9448	51,11	5,91	0,3383	Electric Utilities	Italy
AAK.ST	-0,6775	0,0397	0,8335	36,08	9,6	0,5814	Starch, Vegetable Fat & Oil Manufacturing	Sweden
AALL	0,8328	1,7108	1,5955	86,17	1,36	0,0443	Diversified Mining	United Kingdom

AALB.AS	0,703 3	0,89 29	1,2577	59,82	5,5	0,3258	Industrial Machinery & Equipment	Netherlands
ABBN.S	0,699 7	0,88 7	1,0137	38,73	9,06	0,5919	Heavy Electrical Equipment	Switzerland
ABDN.L	3,437 6	1,88 79	1,5564	78,42	-9,3	-0,3188	Investment Management & Fund Operators	United Kingdom
ABF.L	1,939 6	1,08 96	1,0862	72,17	-2,99	-0,0934	Food Processing	United Kingdom
ABI.BR	1,633 4	0,90 17	1,0758	74,87	-3,04	-0,0798	Brewers	Belgium
ACCP.PA	1,621 7	1,45 5	1,2784	59,64	0,71	0,0277	Hotels, Motels & Cruise Lines	France
ACKB.BR	- 0,303 7	0,33 82	0,7446	34,33	6,42	0,4817	Construction & Engineering	Belgium
ACS.MC	- 0,294 6	0,97 87	1,2433	71,08	7,8	0,5579	Construction & Engineering	Spain
AD.AS	0,227 7	0,10 62	0,5212	32,99	7,31	0,4544	Food Retail & Distribution	Netherlands
ADDTb.ST	- 1,152 3	0,22 39	1,1078	45,77	23,04	0,6062	Consumer Goods Conglomerates	Sweden
ADEN.S	2,551 7	1,6	1,1915	65,68	-5,18	-0,2299	Employment Services	Switzerland
ADML.L	0,146 8	0,02 79	0,7769	50,46	8,93	0,3799	Insurance - Automobile	United Kingdom
ADP.PA	- 0,241 8	0,90 04	0,9347	64,33	3,66	0,1993	Airport Operators & Services	France
ADSGn.DE	- 2,183 9	- 1,04 32	1,0515	72,06	8,28	0,3423	Sports & Outdoor Footwear	Germany
AEGN.AS	2,564 6	1,84 89	1,443	78,2	-2,18	-0,1666	Life & Health Insurance	Netherlands
AFXG.DE	- 1,914 1	- 0,42 18	0,8277	62,81	18,02	0,4021	Advanced Medical Equipment & Technology	Germany
AGES.BR	0,104 5	0,63 64	1,0087	53,78	1,62	0,0935	Multiline Insurance & Brokers	Belgium
AHT.L	- 0,226 7	1,09 26	1,4964	58,24	20,19	0,5635	Industrial Equipment Rental	United Kingdom
AIBG.I	6,839 4	2,70 37	1,0012	98,15	- 19,11	-0,2648	Banks	Ireland; Republic of
AIR.PA	- 0,268 7	1,16 9	1,4272	64,7	11,08	0,5095	Commercial Aircraft Manufacturing	France

AIRP.PA	0,403 1	0,93 53	0,9278	29,28	10,91	0,5698	Commodity Chemicals	France
AIXGn.DE	- 0,955 9	1,00 44	1,1608	77,02	8,39	0,2549	Semiconductor Equipment & Testing	Germany
AKE.PA	0,206 8	0,60 74	1,2453	55,84	2,16	0,1669	Commodity Chemicals	France
AKRBP.OL	- 4,250 1	- 1,36 3	1,061	73,73	16,14	0,5356	Oil & Gas Exploration and Production	Norway
AKZO.AS	0,904 9	1,12 07	0,9553	47,85	2,28	0,1141	Paints & Coatings	Netherlands
ALFA.ST	0,976 9	1,26 79	1,2237	45,27	6,01	0,3458	Industrial Machinery & Equipment	Sweden
ALKb.CO	0,801 8	0,14 29	0,9544	64,23	10,48	0,4055	Pharmaceuticals	Denmark
ALLN.S	0,554 4	0,60 09	0,353	37,18	4,61	0,4688	Real Estate Rental, Development & Operations	Switzerland
ALSO.PA	0,921 3	1,14	0,9436	78,03	-2,64	-0,1467	Heavy Machinery & Vehicles	France
ALVG.DE	0,293 5	1,06 22	1,1054	48,71	6,86	0,5864	Multiline Insurance & Brokers	Germany
AM.PA	- 0,644 7	0,73 8	0,8222	63,26	6,26	0,4857	Commercial Aircraft Manufacturing	France
AMA.MC	- 0,491 2	0,74 18	1,079	57,08	5,99	0,2604	IT Services & Consulting	Spain
AMBUb.C O	- 1,993 4	- 0,58 35	1,005	84,28	18,44	0,3792	Medical Equipment, Supplies & Distribution	Denmark
AMPF.MI	- 1,800 2	- 0,13 55	0,804	50,14	21,63	0,4822	Medical Equipment, Supplies & Distribution	Italy
ANA.MC	0,245 9	0,51 91	0,957	52,28	6,34	0,2577	Construction & Engineering	Spain
ANDR.VI	1,247 9	0,91 84	0,8868	57,63	2,62	0,4138	Industrial Machinery & Equipment	Austria
ANTO.L	0,669 7	1,48 85	1,3313	60,1	6,87	0,3753	Copper Ore Mining	United Kingdom
AOO.BR	0,424 9	0,5	0,6498	63,06	1,52	0,0768	Healthcare REITs	Belgium
ARDS.AS	3,674 6	2,28 35	1,148	67,73	7,1	0,5362	Construction & Engineering	Netherlands

ASMI.AS	- 0,382 9	0,89 93	1,2976	54,27	36,5	0,8361	Semiconductor Machinery Manufacturing	Netherlands
ASML.AS	- 1,513 2	0,38 82	1,2191	48,42	30,37	0,8554	Semiconductor Equipment & Testing	Netherlands
ASSAb.ST	1,003 6	0,78 85	1,1105	38,63	7,93	0,4367	Construction Supplies & Fixtures	Sweden
ATCOa.ST	0,530 2	1,02 2	1,2645	44,14	16,22	0,5988	Industrial Machinery & Equipment	Sweden
AV.L	2,245 1	1,54 9	1,3188	71,13	-0,81	-0,0245	Life & Health Insurance	United Kingdom
AVANZ.ST	0,718	0,50 95	1,1252	62,42	13,71	0,391	Investment Banking	Sweden
AVOL.S	2,764 7	1,79 49	1,5112	87,74	- 10,74	-0,6802	Miscellaneous Specialty Retailers	Switzerland
AXAF.PA	0,833 8	1,10 95	1,2543	54,47	5,5	0,4076	Life & Health Insurance	France
AXFO.ST	- 1,196 9	- 0,76 73	0,497	39,41	9,78	0,4743	Supermarkets & Convenience Stores	Sweden
AZMT.MI	3,616 4	2,02 08	1,4174	67,76	0,93	0,0255	Investment Management & Fund Operators	Italy
AZN.L	0,142	0,56 49	0,7242	31,09	9,05	0,4342	Pharmaceuticals	United Kingdom
BAER.S	1,224 9	1,29 67	1,2428	57,56	3,95	0,242	Private Banks	Switzerland
BAES.L	0,019 4	0,54 62	0,7783	44,76	11,35	0,6474	Aerospace & Defense	United Kingdom
BAKKA.O L	- 3,353 6	- 1,94 76	0,6267	47,49	22,22	0,5793	Aquaculture	Norway
BALDb.ST	0,615 2	0,05 23	1,227	73,52	14,53	0,48	Real Estate Rental, Development & Operations	Sweden
BALF.L	0,541 4	0,58 37	1,0551	52,26	0,39	0,0779	Construction & Engineering	United Kingdom
BALN.S	0,347 7	0,82 63	0,8203	40,47	4,8	0,4008	Multiline Insurance & Brokers	Switzerland
BAMI.MI	6,107 7	2,55 32	1,551	91,23	-4,84	-0,2003	Banks	Italy
BANB.S	- 2,418 4	- 0,97 43	0,596	64,16	25,01	0,7079	Biotechnology & Medical Research	Switzerland
BARC.L	3,454 9	2,03 96	1,6158	78,46	-4,25	-0,1105	Banks	United Kingdom

BARN.S	- 0,380 6	0,28 19	0,5031	42,38	3,76	0,2622	Chocolate & Confectionery	Switzerland
BASFn.DE	2,086 3	1,38 9	1,2198	60,22	-5,38	-0,3893	Diversified Chemicals	Germany
BATS.L	0,736 2	0,18 12	0,7397	60,1	-3,62	-0,1442	Tobacco	United Kingdom
BAYGn.DE	2,497 7	1,33 84	1,1152	80,72	- 11,96	-0,3133	Pharmaceuticals	Germany
BBOXT.L	0,858 7	0,52 85	0,8323	52,84	3,55	0,2748	Industrial REITs	United Kingdom
BBVA.MC	2,329	1,87 12	1,393	76,51	1,56	0,213	Banks	Spain
BC8G.DE	- 1,838 9	- 0,55 95	0,9731	52,57	17,54	0,4379	IT Services & Consulting	Germany
BCP.LS	6,938 1	2,76 75	1,3294	96,16	- 15,68	-0,1918	Banks	Portugal
BCU.MI	- 1,113 6	0,55 64	0,8705	41,67	18,64	0,7753	Luxury Clothing	Italy
BCVN.S	- 1,306 1	- 0,40 37	0,4463	31,45	9,83	0,5883	Banks	Switzerland
BDEV.L	2,073 2	1,40 16	1,4394	65,14	1,77	0,1064	Homebuilding	United Kingdom
BEAN.S	- 1,313	- 0,12 62	0,721	44,03	16,1	0,5355	Fluid Power Cylinder & Actuators	Switzerland
BEIG.DE	- 0,588	0,17 63	0,6314	30,69	6,01	0,491	Personal Products	Germany
BEIJb.ST	- 1,766 6	- 0,03 3	1,1258	52,24	24,41	0,5515	Electric Equipment Wholesale	Sweden
BESI.AS	- 1,311 2	1,01 9	1,4057	64,49	41,86	0,8385	Semiconductor Machinery Manufacturing	Netherlands
BEZG.L	- 1,270 4	- 0,01 74	0,9509	55,03	10,51	0,4523	Property & Casualty Insurance	United Kingdom
BIOX.PA	- 2,527 4	- 0,85 47	0,5095	44,45	14,86	0,4169	Laboratory Diagnostic & Testing Substances	France
BIRG.I	2,160 8	1,61 32	1,4316	88,63	-3,28	-0,13	Banks	Ireland; Republic of
BKGH.L	0,468 7	0,74 23	1,1708	49,65	5,1	0,3347	Homebuilding	United Kingdom
BKT.MC	0,04	0,77 12	1,0544	67,42	3,51	0,28	Banks	Spain
BKWB.S	- 1,927 1	- 0,30 88	0,4294	25,11	18,34	0,7339	Electric Utilities	Switzerland

BLND.L	3,381 4	1,66 88	1,2062	73	-6,78	-0,201	Diversified REITs	United Kingdom
BMPS.MI	20,14 16	3,44 47	1,4608	99,99	-54,3	-0,41	Banks	Italy
BMWG.DE	2,054	1,45 44	1,2217	69,28	2,69	0,0669	Auto & Truck Manufacturers	Germany
BNPP.PA	1,251 3	1,41 82	1,4384	64,19	-0,57	-0,0389	Banks	France
BNRGn.DE	1,236 9	0,99 14	1,0258	49,62	6,69	0,6538	Diversified Chemicals	Germany
BNZL.L	0,043 3	0,27 16	0,7987	54,54	6,63	0,4522	Diversified Industrial Goods Wholesale	United Kingdom
BOL.ST	- 0,191 3	0,84 42	1,3469	58,16	9	0,3306	Specialty Mining & Metals	Sweden
BOLL.PA	1,336 7	1,39 37	0,9837	58,62	3,55	0,3259	Entertainment Production	France
BOSSn.DE	3,316 6	2,14 44	1,111	83,65	-4,03	-0,1291	Apparel & Accessories	Germany
BOUY.PA	0,884 5	1,04 9	1,0535	49,38	2,14	0,1049	Construction & Engineering	France
BP.L	1,081 2	1,20 05	1,1919	68,4	-1,04	-0,1073	Oil & Gas Refining and Marketing	United Kingdom
BPSI.MI	2,115 1	1,65 26	1,1676	74,38	7,31	0,5255	Banks	Italy
BRBY.L	1,742 1	1,62 77	1,2318	57,26	-2,15	-0,1866	Apparel & Accessories Retailers	United Kingdom
BT.L	3,857 9	1,13 89	0,9971	84,89	- 13,09	-0,3999	Integrated Telecommunica tions Services	United Kingdom
BUCN.S	0,152 9	0,78 98	0,8898	43,96	5,99	0,4283	Agricultural Machinery	Switzerland
BVI.PA	0,753	0,79 21	0,8641	37,46	3,07	0,3143	Business Support Services	France
BVIC.L	1,607	1,22 55	0,9042	47,71	0,6	0,0603	Non-Alcoholic Beverages	United Kingdom
BWY.L	0,778 3	0,81 39	1,2746	65,15	4,7	0,221	Homebuilding	United Kingdom
BYG.L	1,072 5	0,69 78	0,8895	49,87	5,74	0,2384	Self-Storage REITs	United Kingdom
BZU.MI	- 1,046 3	0,18 09	1,2757	45,66	7,87	0,542	Cement & Concrete Manufacturing	Italy
CABK.MC	0,964 8	1,48 74	1,1351	67,28	0,13	0,0032	Banks	Spain
CAGR.PA	2,024 9	1,89 99	1,3587	61,61	0,9	0,0336	Corporate Banks	France

CAPP.PA	- 0,292 1	0,47 63	1,162	51,77	14,77	0,6887	IT Services & Consulting	France
CARLb.CO	0,955 7	0,89 8	0,9365	49,32	1,79	0,0881	Brewers	Denmark
CARR.PA	2,581 8	1,12 21	0,778	62,42	-5,39	-0,2494	Supermarkets & Convenience Stores	France
CAST.ST	1,255 5	0,83 62	0,9959	61,26	2,18	0,1156	Real Estate Rental, Development & Operations	Sweden
CBKG.DE	2,366 7	2,02 15	1,5487	80,01	-1,89	-0,0184	Banks	Germany
CCC.L	- 0,479 6	0,40 26	0,9596	55,92	13,7	0,4838	IT Services & Consulting	United Kingdom
CCH.L	- 0,107 8	0,75 1	1,0547	52,85	5,43	0,2288	Non-Alcoholic Beverages	United Kingdom
CDR.WA	- 4,862 6	- 1,20 67	0,8903	84,17	19,78	0,3992	Application Software	Poland
CFR.S	1,349 4	1,36 24	1,1338	44,09	7,56	0,6071	Jewelry	Switzerland
CGCBV.H E	- 0,079 5	0,63 93	1,224	73,67	6,81	0,4604	Heavy Machinery & Vehicles	Finland
CLN.S	1,29	1,06 48	0,942	52,28	-1,91	-0,1447	Specialty Chemicals	Switzerland
CMBN.S	- 0,739 4	0,09 35	0,6928	52,98	4,83	0,2831	Retail & Mortgage Banks	Switzerland
CNA.L	3,012	1,55 16	1,0456	91,81	-9,18	-0,1536	Multiline Utilities	United Kingdom
COFB.BR	1,508 9	0,70 51	0,582	65,94	-3,82	-0,2664	Healthcare REITs	Belgium
COLOb.CO	1,629 9	0,96 56	0,8132	50,47	3,89	0,2307	Medical Supplies	Denmark
CONG.DE	2,379 5	1,32 4	1,343	80,08	-7,31	-0,8242	Auto, Truck & Motorcycle Parts	Germany
COTNE.S	0,466 8	1,05 68	0,992	60,95	23,35	0,7654	Electronic Equipment & Parts	Switzerland
CPG.L	0,098 2	0,62 87	0,9252	55,53	7,58	0,5715	Restaurants & Bars	United Kingdom
CPRI.MI	- 1,638 6	- 0,18 26	0,8304	39,97	11,85	0,4339	Distilleries	Italy
CRDA.L	0,498 8	0,51 62	0,8867	61,66	6,37	0,2356	Specialty Chemicals	United Kingdom
CRDI.MI	4,259 1	2,48 05	1,6392	81,95	0,71	0,0073	Banks	Italy

CVO.PA	2,056 8	1,38 53	0,9847	66,85	-5,01	-0,5956	Commercial REITs	France
CWK.L	- 1,392 8	- 0,57 64	0,7258	39,36	11,6	0,4585	Food Processing	United Kingdom
DANO.PA	0,467 5	0,51 04	0,6785	42,89	1,38	0,0914	Food Processing	France
DANSKE.CO	1,225 8	1,11 43	1,2115	80,2	0,36	0,0185	Banks	Denmark
DAST.PA	- 1,196 4	0,00 53	0,8577	41,84	17,78	0,627	Software	France
DB1Gn.DE	- 1,043 2	0,23 9	0,8045	36,97	12,49	0,6442	Financial & Commodity Market Operators & Service Providers	Germany
DBKGn.DE	4,853 1	2,28 89	1,5494	83,58	-8,33	-0,0516	Banks	Germany
DCC.L	- 0,508 7	- 0,32 11	1,0045	51,7	5,56	0,1842	Consumer Goods Conglomerates	United Kingdom
DEMANT.CO	- 0,009 1	0,73 73	1,0722	66,26	10,19	0,4031	Medical Prosthetics	Denmark
DGE.L	0,494 3	0,68 22	0,8199	41,59	4,27	0,2428	Distillers & Wineries	United Kingdom
DHLn.DE	0,896 5	0,98 98	1,1147	53,39	4,57	0,2532	Courier, Postal, Air Freight & Land-based Logistics	Germany
DIAS.MI	- 1,837 6	- 0,90 78	0,5594	60,23	10,62	0,3228	Laboratory Diagnostic & Testing Substances	Italy
DIOR.PA	- 1,194 7	0,72 1	1,1849	47,16	20,96	0,768	Apparel & Accessories	France
DKSH.S	1,172 4	0,81 71	0,6234	46,77	2,59	0,2166	Business Support Services	Switzerland
DLGD.L	1,308 7	0,57 74	0,8499	69,48	-0,65	-0,0174	Property & Casualty Insurance	United Kingdom
DLN.L	2,806 2	1,50 64	1,0459	60,91	-3,15	-0,0794	Commercial REITs	United Kingdom
DNB.OL	0,384 5	1,21 36	0,9089	44,3	6,96	0,4081	Banks	Norway
DPLM.L	0,149 9	0,95 15	0,9443	45,97	15,79	0,613	Industrial Machinery & Equipment Wholesale	United Kingdom

DRX.L	2,445 4	1,61 52	1,0129	86,41	-5,6	#LICZB A!	Electric Utilities	United Kingdom
DSV.CO	- 1,444 2	0,11 32	1,1492	52,91	16,57	0,3935	Integrated Logistics Operators	Denmark
DTEGn.DE	0,491 1	0,61 58	0,8453	39,97	5,98	0,4708	Integrated Telecommunica tions Services	Germany
EDEN.PA	- 0,232 9	1,02	0,9638	48,12	7,46	0,4575	Transaction & Payment Services	France
EDP.LS	1,112 3	0,94 15	0,7985	37,78	1,84	0,221	Electric Utilities	Portugal
EDPR.LS	- 0,630 6	0,06 3	0,7514	52,56	10,76	0,4748	Renewable IPPs	Portugal
EKTA b.ST	1,492 2	1,17 11	0,9873	62,97	-3,18	-0,2248	Advanced Medical Equipment & Technology	Sweden
ELE.MC	0,114 2	0,56 66	0,6832	45,37	2,59	0,1322	Electric Utilities	Spain
ELI.BR	- 1,138 3	- 0,31 39	0,5084	45,45	11,56	0,4834	Electric Utilities	Belgium
ELISA.HE	- 1,313 4	- 0,73 7	0,5296	32,78	7,56	0,3339	Integrated Telecommunica tions Services	Finland
ELUX b.ST	1,475 3	0,91 16	1,0931	67,47	-4,57	-0,2763	Appliances, Tools & Housewares	Sweden
EMG.L	2,634 7	1,67 38	1,2297	64,78	8,6	0,6965	Investment Management	United Kingdom
EMII.MI	3,220 4	2,06 28	1,5139	82,85	-3,19	-0,0394	Banks	Italy
EMSN.S	- 0,663	- 0,22 38	0,7331	38,54	8,85	0,4242	Specialty Chemicals	Switzerland
ENAG.MC	1,314 3	0,68 74	0,6204	53,75	-4,57	-0,1184	Oil & Gas Transportation Services	Spain
ENEL.MI	0,484 8	0,93 17	1,0533	55,26	4,71	0,2646	Electric Utilities	Italy
ENGIE.PA	2,042 2	1,43 97	1,0074	57,6	-2,05	-0,0387	Multiline Utilities	France
ENI.MI	1,371 7	1,27 04	1,1997	71,17	-1,97	-0,0496	Integrated Oil & Gas	Italy
ENT.L	- 0,577 7	0,21 16	1,0745	73,53	9,44	0,2848	Casinos & Gaming	United Kingdom
EONGn.DE	2,596 2	1,70 87	0,8893	55,5	-0,22	-0,008	Multiline Utilities	Germany

EQNR.OL	- 0,553 6	0,40 68	0,779	57,7	5,25	0,2763	Integrated Oil & Gas	Norway
ERICb.ST	3,645 7	1,49 24	0,9958	66,3	-6,03	-0,2021	Communication s & Networking	Sweden
ERST.VI	0,251 4	0,84 94	1,2226	63,8	4,07	0,1878	Banks	Austria
ESLX.PA	0,491 5	0,52 41	0,9472	35,19	10,07	0,5885	Glasses, Spectacles & Contact Lenses	France
EUFI.PA	- 1,298 1	- 0,72 07	0,8516	63,82	10,12	0,3427	Healthcare Facilities & Services	France
EURA.PA	0,452 1	0,93 69	1,1223	54,1	6,51	0,4318	Investment Management & Fund Operators	France
EVDG.DE	- 0,112 9	0,67 85	1,0831	55,07	12,85	0,5259	Online Services	Germany
EVKn.DE	2,114 2	1,21 53	1,0659	58,79	-5,1	-0,1959	Specialty Chemicals	Germany
EXHO.PA	0,167 2	0,48 56	0,8864	59,09	2,7	0,1184	Restaurants & Bars	France
EXPN.L	0,029 1	0,47 27	1,051	41,54	11,58	0,3787	Financial Information Providers	United Kingdom
EZJ.L	4,319 6	2,22 39	1,6035	85,35	-9,46	-0,2506	Airlines	United Kingdom
FER.MC	0,426 1	0,77 12	0,9884	42,56	10,72	0,7411	Construction & Engineering	Spain
FHZN.S	- 0,334 7	0,39 12	0,7734	59,79	7,85	0,2679	Airport Operators & Services	Switzerland
FLS.CO	1,248 7	1,51 69	1,4182	76,44	-1,92	-0,1135	Mining Support Services & Equipment	Denmark
FLTRF.L	- 0,505 2	- 0,61 33	1,0226	58,57	13,9	0,718	Casinos & Gaming	United Kingdom
FMEG.DE	1,100 3	0,61 52	0,7485	71,76	-3,35	-0,1625	Healthcare Facilities & Services	Germany
FNOX.ST	- 5,886 9	- 2,63 19	1,0664	49,17	51,7	1,0828	Enterprise Software	Sweden
FNTGn.DE	1,225 8	0,82 22	0,8869	57,79	0,38	0,0122	Integrated Telecommunica tions Services	Germany
FORTUM. HE	2,290 6	1,49 04	0,9349	66,93	-4,02	-0,2549	Electric Utilities	Finland
FOUG.PA	- 0,930 1	0,14 02	1,1034	53,28	6,79	0,2836	Construction & Engineering	France

FPE3_p.DE	0,345 5	0,55 4	0,9464	52,57	1,1	0,0552	Commodity Chemicals	Germany
FREG.DE	0,474 6	0,22 5	0,9368	74,84	-3,68	-0,1287	Healthcare Facilities & Services	Germany
FRO.OL	1,650 9	0,59 93	0,7713	81,67	6,24	0,3061	Sea-Borne Tankers	Norway
FRVIA.PA	2,021 6	1,52 74	1,6843	84,11	-7,43	-0,3206	Auto, Truck & Motorcycle Parts	France
FUGR.AS	3,775 4	1,86 04	1,4319	94,17	- 10,34	-0,166	Oil Related Services and Equipment	Netherlands
G1AG.DE	2,069 6	0,84 97	1,0803	70,95	0,77	0,0376	Industrial Machinery & Equipment	Germany
GALP.LS	- 0,280 6	0,60 9	0,9918	61,93	2,01	0,115	Integrated Oil & Gas	Portugal
GASIMI	1,574	1,56 92	1,0687	48,53	3,03	0,3452	Life & Health Insurance	Italy
GAW.L	- 4,075 4	0,15 72	0,7744	55,44	33,92	0,6884	Toys & Children's Products	United Kingdom
GBLB.BR	0,725	0,76 2	0,9902	39,1	-0,27	-0,0304	Investment Holding Companies	Belgium
GEBS.S	0,764 3	0,59 52	0,8218	42,77	9,03	0,5067	Plumbing Fixtures & Fittings	Switzerland
GETIb.ST	3,417 7	1,12 6	0,9188	66,37	-1,43	-0,1274	Medical Equipment	Sweden
GETP.PA	1,227 9	1,25 09	0,9901	49,08	6,11	0,4112	Highways & Rail Tracks	France
GF.S	- 0,376 3	0,37 2	1,0851	55,74	9,19	0,4366	Industrial Machinery & Equipment	Switzerland
GFCP.PA	0,938 9	0,85 62	0,8755	58,24	-0,75	-0,0629	Diversified REITs	France
GFTU_u.L	2,811 9	1,87 54	1,3615	66,77	3,68	0,1938	Construction Supplies & Fixtures Wholesale	United Kingdom
GIVN.S	0,256 5	0,20 77	0,5832	40,18	13,05	0,5647	Specialty Chemicals	Switzerland
GJFG.OL	0,427 1	0,33 16	0,5958	34,95	3,32	0,2158	Multiline Insurance & Brokers	Norway
GL9.I	0,699 9	0,40 62	0,5384	60,61	4,67	0,1404	Dairy Products	Ireland; Republic of
GLEN.L	1,631 2	1,92 9	1,5799	80,49	1,62	0,1456	Diversified Mining	United Kingdom

GMAB.CO	- 2,905 4	- 1,98 74	1,1361	49,57	19,63	0,5285	Bio Therapeutic Drugs	Denmark
GN.CO	1,315 9	1,23 5	1,1737	83,52	-1,19	-0,0479	Household Electronics	Denmark
GRG.L	1,240 6	1,20 62	1,0979	58,27	18,45	0,5508	Restaurants & Bars	United Kingdom
GRLS.MC	0,698 6	0,65 16	0,7988	77,82	-7,99	-0,4916	Biopharmaceuti cals	Spain
GSK.L	1,599 9	0,78 79	0,6917	38,64	-0,39	-0,0252	Pharmaceuticals	United Kingdom
GTT.PA	0,373 2	1,44 32	0,7203	63,41	11,83	0,5613	Oil & Gas Transportation Services	France
GXIG.DE	- 1,092	- 0,45 58	0,7754	53,43	8,04	0,4215	Medical Equipment, Supplies & Distribution	Germany
HAYS.L	1,958 7	1,62 74	1,3174	55,93	-2,09	-0,0454	Executive Search Services	United Kingdom
HEIG.DE	0,495 8	0,75 94	1,2039	68,36	4,17	0,2164	Construction Materials	Germany
HEIN.AS	0,004 7	0,32 94	0,7178	32,56	5,68	0,3675	Brewers	Netherlands
HEIO.AS	- 0,056 1	0,38 04	0,7678	33,56	4,26	0,2145	Brewers	Netherlands
HELN.S	0,680 7	0,96 68	0,8835	53,33	5,75	0,474	Multiline Insurance & Brokers	Switzerland
HEXAb.ST	- 0,007 8	0,58 67	1,229	49,08	11,53	0,4096	Electronic Equipment & Parts	Sweden
HIK.L	2,263 4	0,61 52	0,7453	72,74	2,7	0,0415	Pharmaceuticals	United Kingdom
HLMA.L	- 0,635 6	- 0,08 42	0,9771	45,69	13,78	0,4378	Electronic Equipment & Parts	United Kingdom
HMb.ST	3,926 5	1,54 91	1,1798	76,76	-9,07	-0,3452	Apparel & Accessories Retailers	Sweden
HNKG_p.D E	0,740 3	0,56 5	0,6956	54,8	-1,37	-0,07	Adhesive & Epoxy	Germany
HNRGn.DE	- 0,122 3	0,62 04	0,9673	44,13	14,4	0,783	Property & Casualty Reinsurance	Germany
HOLMb.ST	- 0,287 5	0,45 88	0,9012	41,63	10,66	0,4222	Paper Products	Sweden
HOLN.S	1,892	1,55 24	1,1639	60,82	3,2	0,407	Cement & Concrete Manufacturing	Switzerland

HOTG.DE	- 1,661 1	- 0,60 04	1,1811	74,51	5,03	0,1507	Construction & Engineering	Germany
HPOLb.ST	1,502 2	0,95 81	1,2474	63,54	5,27	0,4352	Advanced Polymers	Sweden
HRA.MI	0,222 8	0,43 54	0,755	55,09	5,7	0,3012	Multiline Utilities	Italy
HRGV.L	1,105 6	0,75 09	1,3278	70,88	-6,03	-0,2691	Investment Management	United Kingdom
HRMS.PA	- 1,314 8	0,17 62	0,8668	41,88	25,85	0,9684	Handbags & Luggage	France
HSBA.L	0,958 8	1,25 28	1,0063	65,82	-0,64	-0,0396	Banks	United Kingdom
HSX.L	- 0,688 9	0,38 96	0,8239	61,63	4,61	0,2189	Property & Casualty Insurance	United Kingdom
HUHIV.HE	0,192 6	0,10 21	0,8238	45,15	5,75	0,3162	Paper Packaging	Finland
HUSQb.ST	0,586 5	0,52 84	1,0983	62,81	4,03	0,1923	Appliances, Tools & Housewares	Sweden
HWDN.L	1,852 7	1,18 13	1,1825	52,24	8,07	0,4479	Kitchen Cabinets	United Kingdom
IBE.MC	- 0,898 8	0,21 37	0,7315	28,77	11,84	0,6371	Electric Utilities	Spain
ICAG.L	2,853 2	1,90 99	1,6951	82,39	-6,91	-0,2112	Airlines	United Kingdom
ICGIN.L	0,198	1,04 91	1,7008	73,44	15,3	0,4358	Investment Management & Fund Operators	United Kingdom
IDSIL	2,824 1	0,75 08	0,9399	81,38	-8,67	-0,5165	Courier, Postal, Air Freight & Land-based Logistics	United Kingdom
IETB.BR	- 0,122 5	0,29 13	0,8947	42,33	18,59	0,6811	Auto Vehicles, Parts & Service Retailers	Belgium
IFCN.S	0,202 5	1,04 19	0,8255	48,12	17,72	0,7429	Testing & Measuring Equipment	Switzerland
IFXGn.DE	- 1,134	0,16 75	1,4301	58,11	15,25	0,499	Semiconductors	Germany
IGG.L	1,257 5	0,22 16	0,7483	53,74	0,76	0,0221	Investment Banking & Brokerage Services	United Kingdom
IHG.L	- 0,478 4	0,85 55	1,2625	59,19	15,09	0,8196	Hotels, Motels & Cruise Lines	United Kingdom
III.L	- 0,875 1	0,87 37	1,38	54,71	19,09	0,7024	Investment Management & Fund Operators	United Kingdom

IMB.L	1,379 6	0,28 2	0,6746	73,75	-3,91	-0,0939	Tobacco	United Kingdom
IMI.L	2,408 9	1,61 16	1,2019	63,67	0,87	0,0975	Industrial Machinery & Equipment	United Kingdom
INCH.L	2,460 5	1,40 24	1,0386	62,89	0,57	0,0132	Auto & Truck Parts Wholesale	United Kingdom
INDT.ST	- 0,946 9	- 0,07 69	1,1851	45,74	20,62	0,5921	Industrial Machinery & Equipment	Sweden
INDUc.ST	0,443 5	0,94 45	1,142	40,17	8,53	0,5012	Investment Holding Companies	Sweden
INF.L	0,109 4	0,61 9	1,0947	61,86	5	0,2761	Exhibition & Conference Services	United Kingdom
INGA.AS	1,432 2	1,51 01	1,4928	74,2	1,88	0,1	Banks	Netherlands
INVEb.ST	0,642 8	0,95 65	1,1941	35,96	13,69	0,6551	Investment Holding Companies	Sweden
INVP.L	2,007 1	1,64 49	1,4644	80,41	4,06	0,0706	Diversified Investment Services	United Kingdom
IPN.PA	- 3,963 8	- 0,87 87	0,73	75,87	12,54	0,4109	Pharmaceuticals	France
ISOS.PA	0,258 6	0,74 87	0,8482	54,42	7,62	0,4141	Advertising & Marketing	France
ISP.MI	1,933 1	1,64 24	1,4738	63,29	2,95	0,06	Banks	Italy
ITPG.MI	- 0,599 8	0,78 2	1,1135	52,56	15,83	0,6026	Pump & Pumping Equipment	Italy
ITRK.L	- 0,381 2	0,30 05	0,9306	43,39	4,16	0,2263	Business Support Services	United Kingdom
ITV.L	4,112 2	1,74 85	1,3684	83,45	- 10,18	-0,2851	Broadcasting	United Kingdom
ITX.MC	0,624 4	0,63 97	1,0426	46,24	7,02	0,5745	Apparel & Accessories Retailers	Spain
JD.L	- 3,457 8	- 2,21 24	1,273	70,3	22,15	0,4987	Sports & Outdoors Retailers	United Kingdom
JMAT.L	2,013 9	1,29 37	1,1561	66,57	-7,27	-0,2595	Specialty Chemicals	United Kingdom
JMT.LS	- 0,537 1	- 0,24 06	0,6418	46,91	6,17	0,3247	Supermarkets & Convenience Stores	Portugal
JYSK.CO	0,969	1,15 07	1,1676	71,51	2,27	0,2156	Banks	Denmark
KBC.BR	0,967 8	1,19 09	1,255	51,14	3,66	0,2746	Banks	Belgium

KCRA.HE	0,762 8	1,37 16	1,1904	66,65	6,76	0,4019	Heavy Machinery & Vehicles	Finland
KEMIRA.H E	0,282 9	0,64 93	0,8749	45,56	4,14	0,37	Diversified Chemicals	Finland
KESKOB.H E	0,275 7	0,38 01	0,6513	59,65	8,18	0,3543	Supermarkets & Convenience Stores	Finland
KGF.L	2,697 1	1,07 58	0,9809	75,11	-5,39	-0,3668	Home Improvement Products & Services Retailers	United Kingdom
KGH.WA	1,764 9	1,82 68	1,3511	65,66	-1,05	-0,0963	Copper Ore Mining	Poland
KGX.DE	0,719 6	0,18 04	1,3013	81,3	2,71	0,1317	Heavy Machinery & Vehicles	Germany
KINVb.ST	2,019 7	1,09 04	1,3711	80,15	-1,51	-0,0747	Investment Holding Companies	Sweden
KNEBV.H E	0,494 2	0,31 56	0,7593	49,68	4,04	0,2035	Elevator & Conveying Equipment	Finland
KNIN.S	0,445 1	0,60 17	0,6742	37,73	10,02	0,5728	Integrated Logistics Operators	Switzerland
KOG.OL	0,067	0,80 92	0,4642	40,21	20,84	0,9609	Aerospace & Defense	Norway
KPN.AS	0,311 6	0,24 86	0,6135	47,67	3,64	0,3486	Integrated Telecommunications Services	Netherlands
KSP.I	- 1,420 4	- 0,12 18	1,0726	58,2	19,18	0,5009	Flooring & Interior Tile Manufacturers	Ireland; Republic of
KYGa.I	- 0,203 9	0,04 01	0,5223	45,28	4,03	0,2273	Food Processing	Ireland; Republic of
LAGRb.ST	- 1,006 2	- 0,14 96	1,1519	48,12	23,46	0,7482	Consumer Goods Conglomerates	Sweden
LAND.L	3,055 8	1,57 84	1,1388	72,14	-5,7	-0,1512	Diversified REITs	United Kingdom
LATOb.ST	- 0,324 3	- 0,10 34	1,1175	57,12	15,56	0,461	Investment Holding Companies	Sweden
LDOF.MI	0,014 9	0,90 03	1,2935	74,51	11,01	0,5192	Aerospace & Defense	Italy
LEGD.PA	0,321 7	0,72 75	1,0085	37,42	7,54	0,4182	Electrical Components & Equipment	France
LEGn.DE	0,652 5	0,34 2	0,703	65,74	4,07	0,2125	Residential Real Estate Rental & Development	Germany

LGEN.L	2,375 9	1,65 48	1,5521	63,45	-0,26	-0,0075	Investment Management	United Kingdom
LHAG.DE	- 0,617 5	0,70 05	1,2324	77,35	-6,04	-0,326	Airlines	Germany
LISP.S	0,148 4	0,24 07	0,5187	26,82	12,23	0,738	Chocolate & Confectionery	Switzerland
LLOY.L	2,866	1,69 12	1,3669	78,97	-5,61	-0,3064	Banks	United Kingdom
LMPL.L	1,559 1	1,03 68	0,9411	48,45	2,12	0,1649	Industrial REITs	United Kingdom
LOGN.S	- 2,986 8	- 0,69 62	0,8857	60,97	21,53	0,5729	Computer Hardware	Switzerland
LOIM.PA	2,170 7	1,26 41	1,1274	77,58	-2,49	-0,0829	Commercial REITs	France
LONN.S	- 2,131	- 0,66 71	0,8091	55,79	21,23	0,5376	Biotechnology & Medical Research	Switzerland
LOTB.BR	- 2,783 5	- 1,33 02	0,3846	24,83	26,68	1,1712	Bread & Bakery Product Manufacturing	Belgium
LPPP.WA	1,605 6	1,69 18	1,0661	63,16	5,62	0,2979	Apparel & Accessories Retailers	Poland
LSEG.L	- 1,091	0,39 4	0,9955	39,53	16,62	0,6033	Financial & Commodity Market Operators & Service Providers	United Kingdom
LTEN.PA	- 1,357 6	- 0,09 49	1,0388	51,61	13,66	0,5205	IT Services & Consulting	France
LUNDb.ST	- 0,860 1	- 0,23 08	1,0337	41,82	11,54	0,5164	Investment Holding Companies	Sweden
LVMH.PA	- 1,070 1	0,61	1,1904	34,42	21,42	0,7767	Apparel & Accessories	France
LXSG.DE	1,104 2	1,06 49	1,3593	72,22	-7,86	-0,5465	Diversified Chemicals	Germany
MAERSKb. CO	3,606	1,92 56	1,3249	75,33	-4,87	-0,2855	Marine Freight & Logistics	Denmark
MBGn.DE	2,052 6	1,39 16	1,399	77,2	2,74	0,109	Auto & Truck Manufacturers	Germany
MDBI.MI	0,986 9	1,54 79	1,3945	61,95	5,73	0,4098	Banks	Italy
METSO.HE	1,537 1	1,68 93	1,4313	71,36	3,36	0,2134	Heavy Machinery & Vehicles	Finland
MICP.PA	0,594 4	0,76 79	1,03	45,46	4,36	0,3283	Tires & Rubber Products	France

MKS.L	4,96	2,23 01	1,2027	88	-7,18	-0,2822	Food Retail & Distribution	United Kingdom
MNDI.L	0,595 5	0,80 09	1,2607	49,32	2,64	0,1182	Paper Packaging	United Kingdom
MONC.MI	- 1,039 9	0,65 08	1,1981	46,56	17,66	0,6359	Apparel & Accessories	Italy
MOWI.OL	- 1,914 3	- 0,80 08	0,5159	49,91	12,08	0,389	Seafood Product Preparation & Packaging	Norway
MRCG.DE	1,427 2	0,99 9	0,8613	40,83	9,55	0,4922	Proprietary & Advanced Pharmaceuticals	Germany
MRON.L	- 3,190 5	- 0,89 04	1,47	71,41	16,36	0,8737	Aerospace & Defense	United Kingdom
MT.AS	1,590 8	1,85 7	1,7253	78,91	-1,02	-0,0686	Iron & Steel	Netherlands
MTXGn.D E	- 0,950 2	0,96 2	1,1994	62,85	13,66	0,5575	Aircraft Parts Manufacturing	Germany
MUVGn.D E	0,526	0,99 16	1,0003	48,43	10,35	0,8237	Property & Casualty Reinsurance	Germany
MWDP.PA	1,071 5	1,20 85	1,2002	58,86	-1,81	-0,1141	Investment Holding Companies	France
MYCR.ST	- 2,046 1	- 0,77 77	1,0058	58,66	34,51	0,807	Semiconductor Equipment & Testing	Sweden
NAFG.DE	0,484 9	0,98 98	1,0656	62,48	3,88	0,1486	Nonferrous Metal Processing	Germany
NDASE.ST	1,824 1	1,30 81	1,1296	63,68	0,89	0,0363	Banks	Sweden
NEKG.DE	- 3,304 5	- 1,53 09	1,1732	61,87	34,38	0,6557	Enterprise Software	Germany
NESN.S	0,336 8	0,40 74	0,4919	23,34	5,83	0,521	Food Processing	Switzerland
NESTE.HE	- 2,775 3	- 0,73 48	0,8942	60,47	17,27	0,4219	Oil & Gas Refining and Marketing	Finland
NEXS.PA	- 0,269 2	- 0,20 82	1,3702	60,03	9,56	0,3374	Wires & Cables	France
NG.L	1,099 3	0,44 17	0,6303	39,13	1,76	0,2208	Multiline Utilities	United Kingdom
NHY.OL	0,538 6	1,08 52	0,9758	68,35	6,34	0,2527	Aluminum	Norway
NIBEb.ST	- 1,006 2	- 0,28 51	1,2657	62,92	16,33	0,4519	Heating, Ventilation & Air	Sweden

							Conditioning Systems	
NKT.CO	1,532 9	1,14 35	1,2526	74,66	10,58	0,4092	Electrical Components & Equipment	Denmark
NOKIA.HE	2,637 1	1,27 52	1,05	71,08	-4,6	-0,1201	Communications & Networking	Finland
NOVN.S	1,214 9	1,04 62	0,6393	35,94	6,39	0,6193	Pharmaceuticals	Switzerland
NOVOb.CO	1,034 1	0,85 97	0,8915	48,21	16,99	0,9802	Pharmaceuticals	Denmark
NSISb.CO	2,292 9	1,17 3	0,8821	56,39	1,26	0,1305	Industrial Biotechnology Chemicals	Denmark
NTGY.MC	0,961 7	1,17 29	0,8098	46,64	1,27	0,1328	Natural Gas Utilities	Spain
NWG.L	3,132 4	2,03 51	1,4105	79,82	-2,32	-0,0445	Banks	United Kingdom
NXT.L	2,729 2	1,60 6	1,197	64,56	3,2	0,0971	Apparel & Accessories Retailers	United Kingdom
OCDO.L	0,879 6	0,76 63	1,1626	87,41	-2,02	-0,0864	Internet & Mail Order Department Stores	United Kingdom
OCLAS	2,076 4	1,61 89	1,2301	73,26	-1,57	-0,1022	Agricultural Chemicals	Netherlands
OMVV.VI	- 0,327 8	0,95 83	1,169	70,97	2,16	0,1742	Integrated Oil & Gas	Austria
ORAN.PA	0,621 1	0,48 98	0,7201	48,46	1,55	0,0506	Integrated Telecommunications Services	France
OREP.PA	0,024 2	0,50 86	0,889	30,23	13,67	0,7043	Cosmetics & Perfumes	France
ORK.OL	- 0,383 2	- 0,31 83	0,385	30,11	4,85	0,2236	Frozen Food Manufacturing	Norway
ORNBV.HE	- 1,444 4	- 0,79 62	0,5352	61,07	4,37	0,1904	Pharmaceuticals	Finland
PEO.WA	3,481 5	1,92 27	1,0883	81,47	-1,45	-0,1089	Banks	Poland
PERP.PA	0,233 2	0,71 01	0,726	35,23	6,23	0,3764	Distillers & Wineries	France
PGHN.S	- 1,769 6	- 0,44 51	0,9771	51,77	21,48	0,5571	Private Equity	Switzerland
PHG.AS	0,770 9	0,82 89	0,9664	76,13	-2,34	-0,1078	Advanced Medical Equipment & Technology	Netherlands
PHNX.L	1,308 7	0,91 59	1,1244	49,49	-1,69	-0,0521	Life & Health Insurance	United Kingdom

PKN.WA	- 0,467	0,54 22	0,8301	74,04	3,37	0,0913	Petroleum Refining	Poland
PKO.WA	1,707 4	1,81 07	1,078	64,34	2,08	0,2248	Banks	Poland
PNDORA.CO	2,010 2	0,32 06	1,3137	85,22	8,57	0,167	Jewelry	Denmark
PNN.L	2,101 9	0,76 72	0,6881	58,95	-1,68	-0,1185	Water & Related Utilities	United Kingdom
PRTP.PA	- 1,449 1	0,49 36	1,2134	56,31	11,87	0,4403	Apparel & Accessories Retailers	France
PRU.L	1,977 6	1,55 49	1,6301	63,18	-3,8	-0,1005	Life & Health Insurance	United Kingdom
PRY.MI	- 0,368 2	0,37 14	1,2151	51,81	9,77	0,5023	Wires & Cables	Italy
PSHG_p.D E	3,816 2	2,11 47	1,4017	67,8	-4,3	-0,3128	Auto & Truck Manufacturers	Germany
PSN.L	1,784	1,07 26	1,4062	72,09	0,3	0,0125	Homebuilding	United Kingdom
PERSON.L	2,896 9	1,44 79	0,8267	77,11	-0,36	-0,0076	Consumer Publishing	United Kingdom
PSPN.S	0,477 8	0,54 81	0,4622	35,49	5,85	0,6452	Real Estate Rental, Development & Operations	Switzerland
PUBP.PA	1,334 9	1,10 57	1,0009	72,11	4,43	0,4804	Advertising & Marketing	France
PUMG.DE	- 0,929 4	0,33 01	1,0275	67,22	7,38	0,2705	Footwear	Germany
PZU.WA	2,063 8	1,83 4	0,854	64,39	0,81	0,0263	Multiline Insurance & Brokers	Poland
QIA.DE	- 0,653 7	0,17 97	0,614	36,85	9,34	0,3627	Biotechnology & Medical Research	Germany
QQ.L	- 0,506 9	0,08 68	0,7313	43,26	4,61	0,3627	Aerospace & Defense	United Kingdom
RAAG.DE	- 0,888 6	- 0,19 68	0,8988	59,94	11,83	0,4032	Kitchen Appliances	Germany
RAND.AS	1,436 6	1,28 81	1,2538	55,98	1,15	0,1088	Employment Services	Netherlands
RBIV.VI	0,914 8	1,27 25	1,3195	71,69	-2,32	-0,0973	Banks	Austria
RBREW.CO	- 0,062 9	0,48 1	0,982	56,72	6,66	0,2588	Brewers	Denmark
RECI.MI	- 1,647 2	- 0,63 01	0,7752	38,54	14,57	0,5608	Pharmaceuticals	Italy

REDE.MC	0,771 8	0,44 03	0,5359	36,29	0,44	0,0183	Electric Utilities	Spain
REL.L	- 0,339 2	0,35 53	0,8133	36,42	13,63	0,6511	IT Services & Consulting	United Kingdom
RENA.PA	1,418 6	1,09 91	1,587	85,27	-6,05	-0,1685	Auto & Truck Manufacturers	France
REP.MC	1,023 7	1,50 87	1,177	66,3	1,59	0,1571	Oil & Gas Refining and Marketing	Spain
REY.MI	- 1,923	- 0,53 04	0,92	55,58	23,37	0,5535	Technology Consulting & Outsourcing Services	Italy
RHMG.DE	- 3,935 5	- 0,90 64	1,051	62,37	22,86	0,8961	Aerospace & Defense	Germany
RILBA.CO	0,162 3	0,83	0,9005	50,68	13,42	0,6741	Corporate Banks	Denmark
RIO.L	0,133 5	1,13 76	1,1106	53,51	4,69	0,2486	Diversified Mining	United Kingdom
RKT.L	0,632 6	0,17 96	0,5821	36,95	0,31	0,0177	Household Products	United Kingdom
RMV.L	0,295 1	0,38 7	1,0956	48,25	7,07	0,3289	Online Services	United Kingdom
ROCKb.CO	- 0,254 8	0,38 61	1,2542	72,27	3,65	0,1583	Construction Supplies	Denmark
ROG.S	1,402 2	0,63 13	0,5663	39,67	0,86	0,0659	Pharmaceuticals	Switzerland
ROR.L	1,785 3	1,61 4	1,1739	48,58	1,11	0,0769	Fluid Power Cylinder & Actuators	United Kingdom
RR.L	2,670 7	2,09 86	1,4013	90,86	1,63	0,053	Aerospace & Defense	United Kingdom
RSIR.L	- 1,129 1	0,44 22	1,1727	49,41	10,65	0,5142	Electronic Equipment & Parts	United Kingdom
RTO.L	- 1,920 8	- 0,29 23	0,8457	39,67	12,26	0,458	Pest Control Services	United Kingdom
RUBF.PA	- 1,076 5	- 0,03 19	0,8252	69,48	-0,25	-0,0107	Petroleum Product Wholesale	France
RWEG.DE	1,600 6	1,62 83	1,0258	71,96	1,04	0,0589	Multiline Utilities	Germany
RXL.PA	1,693 4	1,53 4	1,4614	70,45	3,98	0,3822	Electric Equipment Wholesale	France
RYA.I	- 0,341	0,22 26	1,1425	57,07	10,79	0,7896	Airlines	Ireland; Republic of
SAABb.ST	- 2,227 7	- 0,33 3	0,9747	66,28	14,79	0,8374	Aerospace & Defense	Sweden

SABE.MC	2,527 7	1,82 31	1,3779	88,84	-4,88	-0,0667	Banks	Spain
SAF.PA	- 0,784 5	0,94 65	1,3306	64,63	14,26	0,6459	Aircraft Parts Manufacturing	France
SAFE.L	- 0,068 4	0,37 75	0,9783	55,87	12,28	0,395	Self-Storage REITs	United Kingdom
SAGAb.ST	- 1,565 1	- 0,17 81	1,1176	60,16	28,89	0,6821	Industrial Real Estate Rental & Development	Sweden
SALM.OL	- 3,606	- 2,41 85	0,5142	59,96	24,23	0,671	Seafood Product Preparation & Packaging	Norway
SAMPO.H E	1,001 8	0,93 29	0,9227	52,68	2,76	0,4727	Property & Casualty Insurance	Finland
SAN.MC	2,372 1	1,97 4	1,4798	78,43	-3,32	-0,1055	Banks	Spain
SAND.ST	0,062 1	0,91 51	1,3543	44,47	8,08	0,3756	Industrial Machinery & Equipment	Sweden
SAPG.DE	- 0,717 3	0,26 94	0,9804	42,71	11,53	0,588	Enterprise Software	Germany
SASY.PA	1,201 2	0,93 01	0,7117	37,2	1,54	0,1841	Pharmaceuticals	France
SATG_p.D E	- 4,211 4	- 2,59 13	0,9695	64,12	30,49	0,5025	Medical Diagnostic & Testing Equipment	Germany
SBRY.L	1,844 8	1,03 09	0,7759	53,64	-3,14	-0,0668	Supermarkets & Convenience Stores	United Kingdom
SCAb.ST	- 1,916 9	- 0,43 14	0,9762	41,43	12,78	0,4471	Paper Products	Sweden
SCHN.PA	0,902	1,06 53	1,2573	38,75	12,48	0,5816	Electrical Components & Equipment	France
SCHP.S	- 0,042 5	0,28 64	0,7157	44,77	8,41	0,4482	Elevator & Conveying Equipment	Switzerland
SCMN.S	1,038 8	0,72 33	0,4552	32,05	2,05	0,251	Integrated Telecommunica tions Services	Switzerland
SCOR.PA	0,831 7	1,14 43	1,102	68,07	0,79	0,0416	Reinsurance	France
SDFGn.DE	2,260 3	1,46 84	1,1564	86,82	-6,02	-0,1769	Agricultural Chemicals	Germany
SDR.L	2,384 7	1,52 28	1,4314	51,48	-1,94	-0,0621	Investment Management & Fund Operators	United Kingdom

SEBa.ST	1,349 9	1,17 66	1,1734	53,38	3,02	0,3821	Banks	Sweden
SEBF.PA	- 2,032 9	- 1,00 1	0,7382	62,26	7,67	0,2916	Appliances, Tools & Housewares	France
SECTb.ST	- 1,500 8	0,05 68	0,9154	58,09	28,83	0,6673	Medical Software & Technology Services	Sweden
SECUb.ST	0,720 3	0,56 77	1,05	50,44	4,37	0,2593	Security Services	Sweden
SESFd.PA	3,792 6	1,74 99	0,7514	86,55	- 13,27	-0,4898	Satellite Service Operators	France
SFZN.S	- 2,209 8	- 0,37 27	0,6131	36,12	21,19	0,9058	Pharmaceuticals	Switzerland
SGE.L	- 0,194 9	0,05 29	0,869	39,41	10,75	0,6204	Enterprise Software	United Kingdom
SGEF.PA	- 0,978 9	0,12 17	1,1458	46,6	8,15	0,4811	Construction & Engineering	France
SGOB.PA	0,900 8	0,95 05	1,3697	65,69	4,66	0,4077	Construction Supplies & Fixtures	France
SGRO.L	0,799 2	0,89 08	0,9458	54,38	9,31	0,3785	Commercial REITs	United Kingdom
SGSN.S	0,385 5	0,30 26	0,6926	36,12	2,12	0,1632	Testing Laboratories	Switzerland
SHBa.ST	1,640 4	0,98 46	1,0455	55,61	-0,79	-0,04	Banks	Sweden
SHEL.AS	0,607 9	1,04 25	1,1139	67,75	1,08	0,1494	Integrated Oil & Gas	Netherlands
SIEGn.DE	0,365 9	0,74 03	1,223	54,29	7,59	0,4465	Electrical Components & Equipment	Germany
SIKA.S	- 1,501 2	- 0,08 57	0,9215	45,15	19,74	0,5823	Specialty Chemicals	Switzerland
SJP.L	2,037 9	1,26 98	1,4739	71,68	-5,58	-0,4712	Wealth Management	United Kingdom
SKAb.ST	1,843 1	0,92 51	1,1835	52,23	0,92	0,0793	Construction & Engineering	Sweden
SKFb.ST	2,754 8	1,64 58	1,2683	58,05	0,39	0,043	Industrial Machinery & Equipment	Sweden
SLHN.S	- 0,480 6	0,72 24	0,9676	49,61	14,24	0,7608	Life & Health Insurance	Switzerland
SMDS.L	1,154 3	0,79 98	1,2364	55,42	-0,43	-0,022	Paper Packaging	United Kingdom
SMIN.L	0,336 9	0,88 03	1,192	58,9	1,33	0,0896	Consumer Goods Conglomerates	United Kingdom

SN.L	0,948 9	0,80 29	0,9518	56,49	0,59	0,039	Medical Devices & Implants	United Kingdom
SOBIV.ST	- 1,493 5	- 0,06 53	0,884	56	9,79	0,5077	Biopharmaceuti cals	Sweden
SOF.BR	0,057 9	0,12 7	0,7816	60,29	8,94	0,3976	Investment Holding Companies	Belgium
SOGN.PA	2,780 9	1,78 13	1,646	78,98	-7,27	-0,4486	Banks	France
SOIT.PA	- 3,798 4	0,26 84	1,099	83,63	15,29	0,3028	Semiconductors	France
SOON.S	0,392	0,84 92	0,793	43,42	10,92	0,4203	Medical Prosthetics	Switzerland
SOPR.PA	- 1,822 6	- 0,29 55	1,0529	59,08	10,03	0,6138	IT Services & Consulting	France
SPLI.WA	1,855 6	1,75 52	1,0934	74,9	2,34	0,2274	Banks	Poland
SPSN.S	0,847 2	0,64 41	0,4739	39,93	4,28	0,5671	Real Estate Rental, Development & Operations	Switzerland
SPX.L	- 0,019 2	0,59 12	0,9616	54,31	12,35	0,4037	Industrial Machinery & Equipment	United Kingdom
SQN.S	0,076 4	0,91 27	0,9483	53	23,53	0,7475	Financial & Commodity Market Operators & Service Providers	Switzerland
SRENH.S	1,206 9	1,06 16	0,9188	52,87	5,07	0,6416	Reinsurance	Switzerland
SRG.MI	0,352 5	0,27 64	0,812	37,63	2,53	0,1736	Natural Gas Pipeline Transportation	Italy
SRP.L	2,279	1,30 79	0,932	80,24	-6,91	#LICZB A!	Business Support Services	United Kingdom
SSABb.ST	0,815 8	1,59 64	1,4005	76,08	6,67	0,4309	Iron & Steel	Sweden
SSE.L	1,754 8	0,96 52	0,933	51,87	1,21	0,034	Electric Utilities	United Kingdom
STAN.L	2,840 1	1,96 53	1,3284	76,69	-5,76	-0,1162	Banks	United Kingdom
STB.OL	- 1,751 2	0,21 49	1,1003	53,91	9,65	0,5806	Investment Management & Fund Operators	Norway
STD.M.PA	- 3,058 1	- 2,03 77	0,8175	70,45	26,09	0,5665	Medical Equipment,	France

							Supplies & Distribution	
STERV.HE	0,523 7	1,05 14	1,2238	59,33	3,63	0,1986	Paper Packaging	Finland
STLAM.MI	0,256	1,68 93	1,5524	67,59	21,02	0,8612	Automobiles & Multi Utility Vehicles	Italy
STMMI.MI	-0,85	1,33 85	1,4711	52,73	20,78	0,5526	Semiconductors	Italy
STMN.S	- 2,010 3	- 0,23 06	0,9668	54,33	25,33	0,6132	Medical Prosthetics	Switzerland
SUBC.OL	- 1,247 1	0,70 47	1,075	72,26	3,35	0,2306	Oil Related Services	Norway
SVT.L	1,291 5	0,61 3	0,6745	40,53	2,71	0,247	Water & Related Utilities	United Kingdom
SWECb.ST	- 1,086 8	- 0,36 06	1,09	55,78	10,07	0,3451	Civil Engineers & Architects	Sweden
SWEDa.ST	1,225 8	0,90 92	1,0724	61,68	0,03	0,0025	Banks	Sweden
SXS.L	1,376	1,21 08	1,0643	45,31	2,8	0,1513	Electronic Equipment & Parts	United Kingdom
SY1G.DE	- 0,044 9	0,22 18	0,7092	32,76	10,45	0,4078	Specialty Chemicals	Germany
SYDB.CO	1,705 2	1,52 42	1,1753	78,42	6,58	0,5762	Banks	Denmark
TATE.L	0,987 8	0,72 99	0,7493	40,46	-1,02	-0,1713	Food Ingredients	United Kingdom
TCFP.PA	- 2,989 5	- 1,11 48	0,7675	55,01	10,9	0,542	Satellite Design & Manufacture	France
TECN.S	- 0,865 2	- 0,20 62	0,6532	54,05	15,44	0,4763	Scientific & Precision Equipment	Switzerland
TEF.MC	2,608	1,49 43	0,9668	78,78	-8,02	-0,2339	Integrated Telecommunications Services	Spain
TEGG.DE	1,198 2	0,82 22	0,7725	80,15	2,8	0,1338	Residential Real Estate Rental & Development	Germany
TEL.OL	0,935 9	0,84 91	0,5208	53,74	-1,03	-0,0685	Wireless Telecommunications Services	Norway
TEL2b.ST	1,444 3	1,27 25	0,8068	52,55	0,78	0,0592	Wireless Telecoms Service Providers	Sweden
TELIA.ST	2,253 2	1,08 77	0,7883	69,8	-8,74	-0,3713	Integrated Telecommunications Services	Sweden

TEMN.S	- 2,580 5	- 0,77 27	1,0333	69,05	10,56	0,2213	Software	Switzerland
TENR.MI	0,543 8	0,95 28	1,2089	78,11	1,32	0,0364	Oil Related Equipment	Italy
TEPRF.PA	- 1,251 3	- 0,33 76	0,845	74,94	9,18	0,2989	Business Support Services	France
TIETO.HE	- 0,151 1	0,14 88	0,7876	43,05	1,7	0,0865	IT Services & Consulting	Finland
TIGOsdb.S T	2,763 3	1,80 82	1,0858	82,49	-11,9	#LICZB A!	Wireless Telecommunica tions Services	Sweden
TKAG.DE	3,090 5	1,85 18	1,6274	86,77	- 13,31	-0,6707	Iron & Steel	Germany
TLIT.MI	3,826 5	1,61 23	1,1831	86,51	-10,1	-0,2546	Integrated Telecommunica tions Services	Italy
TLXGn.DE	0,134 4	0,91 65	0,9682	53,74	10,01	0,6659	Multiline Insurance & Brokers	Germany
TOM.OL	- 1,625 6	- 0,72 61	0,7544	74,17	16,83	0,4047	Industrial Machinery	Norway
TPK.L	3,959 3	1,72 61	1,3807	78,67	-8,7	-0,3671	Builder Merchants	United Kingdom
TRElb.ST	0,954 7	1,02 11	1,2803	64	9,14	0,5537	Industrial Components	Sweden
TRN.MI	- 0,491 4	- 0,00 33	0,7328	30,56	6,98	0,4064	Electric Utilities	Italy
TRYG.CO	1,507 5	1,24 56	0,9007	47,4	3,1	0,2673	Insurance - Automobile	Denmark
TSCO.L	2,476 8	1,45 63	0,7927	54,78	-2,04	#LICZB A!	Food Retail & Distribution	United Kingdom
TTEF.PA	0,347	0,83 54	1,143	61,34	2,43	0,2339	Integrated Oil & Gas	France
TUIIn.DE	3,788 2	1,89 39	1,5351	92,72	- 16,82	-1,1184	Leisure & Recreation	Germany
TW.L	1,691 3	1,09 6	1,4085	65,89	2,49	0,159	Homebuilding	United Kingdom
UBIP.PA	- 3,762	- 1,87 62	0,78	81,82	5,81	0,1355	Software	France
UBSG.S	1,379	1,22 88	1,2513	66,63	5,54	0,6214	Investment Management & Fund Operators	Switzerland
UCB.BR	0,503 3	0,33 3	0,6472	42,95	6,44	0,5415	Biopharmaceuti cals	Belgium
UHR.S	2,213 1	1,44 7	0,9889	68,28	-7,52	#LICZB A!	Watches	Switzerland

ULVR.L	- 0,214 8	0,28 72	0,6285	31,97	4,32	0,233	Personal Products	United Kingdom
UMI.BR	- 1,195 5	- 0,01 91	0,9283	67,85	1,08	0,0485	Specialty Chemicals	Belgium
UNPI.MI	2,166 6	1,90 76	1,2881	66,2	3,79	0,9803	Multiline Insurance & Brokers	Italy
UPM.HE	- 0,457 4	0,50 46	1,0009	39,29	8,93	0,416	Paper Products	Finland
URW.PA	2,831 4	1,32 14	1,2833	88,53	-9,67	-0,3517	Commercial REITs	France
UTG.L	0,449 5	0,86 56	1,0346	57,71	7,58	0,3722	Residential REITs	United Kingdom
UU.L	1,853 9	0,85 26	0,6782	47,64	2,32	0,0717	Water & Related Utilities	United Kingdom
VALMT.H E	0,005 6	0,69 17	1,0281	47,57	13,93	0,4443	Industrial Machinery	Finland
VERB.VI	- 1,199	0,76 3	0,8025	47,44	15,89	0,4713	Electric Utilities	Austria
VID.MC	- 1,502	-0,03	0,5166	43,2	13,76	0,6009	Glass Containers & Packaging	Spain
VIE.PA	0,716 2	0,58 05	1,0283	45,16	8,18	0,4793	Multiline Utilities	France
VIS.MC	0,583 4	0,44 15	0,4941	38,27	4,43	0,5364	Non-Paper Containers & Packaging	Spain
VIV.PA	1,296 8	1,13 07	0,8188	44,33	2,03	0,1619	Entertainment Production	France
VLLP.PA	7,525 1	3,01 09	1,4713	98,87	- 27,07	-0,4772	Oil Related Services and Equipment	France
VLOF.PA	1,748 8	0,92 48	1,5251	84,42	- 11,04	-0,4788	Auto, Truck & Motorcycle Parts	France
VNAn.DE	0,554 7	0,40 05	0,7693	73,16	4,3	0,2014	Residential Real Estate Rental & Development	Germany
VOD.L	2,494 2	0,96 63	0,9279	79,35	- 12,19	-0,7103	Wireless Telecommunica tions Services	United Kingdom
VOES.VI	1,177 5	1,15 41	1,1613	76,12	-2,45	-0,1128	Iron & Steel	Austria
VOLVb.ST	- 0,149 6	0,91 79	1,273	50	9,56	0,6032	Heavy Trucks	Sweden
VOWG_p. DE	3,750 6	2,08 94	1,3905	65,83	-4,51	-0,1767	Auto & Truck Manufacturers	Germany
VTYV.L	2,553 7	1,72 51	1,3961	67,46	2,42	0,1605	Homebuilding	United Kingdom

VWS.CO	- 1,018 6	- 0,39 94	1,2797	61,34	13,9	0,3933	Wind Systems & Equipment	Denmark
WALLb.ST	1,744 1	0,98 02	0,9548	64,01	3,61	0,1542	Residential Real Estate Rental & Development	Sweden
WBSV.VI	- 0,150 1	0,66 87	1,1891	58,99	8,93	0,3573	Construction Materials	Austria
WCHG.DE	1,045 2	1,36 54	1,266	81,02	0,71	0,0443	Advanced Polymers	Germany
WDPP.BR	- 0,518	0,11 65	0,7537	45,98	12,26	0,4415	Industrial REITs	Belgium
WEIR.L	2,012 4	1,80 06	1,4584	78,47	-3,57	-0,0708	Industrial Machinery & Equipment	United Kingdom
WIHL.ST	0,794 6	0,84 35	1,0421	51,63	7,83	0,3479	Real Estate Rental, Development & Operations	Sweden
WLSNc.AS	- 1,448 6	- 0,17 89	0,6346	20,94	21,38	0,7181	Professional Information Services	Netherlands
WPP.L	2,980 6	1,21 07	1,2525	76,72	-6,23	-0,3615	Advertising & Marketing	United Kingdom
WRT1V.H E	1,258 3	1,15 84	1,1676	74,65	0,14	0,011	Industrial Machinery & Equipment	Finland
WTB.L	2,698 6	1,81 77	1,256	70,32	-2,1	-0,0734	Hotels & Motels	United Kingdom
YAR.OL	1,303	1,05 86	0,7562	41,77	3,98	0,3163	Fertilizers	Norway
ZELA.CO	0,062 2	0,56 99	1,1972	75,94	20,11	0,7968	Bio Therapeutic Drugs	Denmark
ZURN.S	0,808 4	1,20 42	0,8819	43,33	8,19	0,623	Multiline Insurance & Brokers	Switzerland

Source: own elaboration based on LSEG Refinitiv EIKON data.

5. CONCLUSIONS

The drawdown beta goes beyond the traditional beta, which measures volatility relative to the market and specifically focusses on an asset's performance during market downturns. The drawdown beta evaluates portfolio performance during market drawdowns. The study revealed that drawdown betas are more sensitive to market drawdowns than traditional ones. For some European stocks, drawdown betas are negative, while traditional beta is always positive, thus these stocks generate positive returns when the market was in drawdown and work as safe-haven assets.

At the same time, the traditional beta is positive and the safe- haven effect might be missing. Drawdown betas have quite different characteristics compared to traditional betas.

It seems apparent that the research sample is relatively small and should be extended to larger numbers of European listed companies. The drawdown beta offers valuable insights to construct more resilient portfolios, effectively manage risk, and evaluating performance amidst market volatility. This gives rise to a legitimate hope of using the drawdown beta in other highly developed markets in European countries or perhaps emerging economies.

In turn, more effective beta parameter estimates, as well as their greater informative power, can be used to more accurately estimate investment risk, which will certainly interest all investors who build and manage investment portfolios, especially during the market distress. It is recommended to use drawdown betas for constructing portfolios with controlled drawdown. A more precisely estimated investment risk is highly desirable and effective in financial market analysis and it allows one to achieve better returns on investments. Generally, the findings could help investors quantify investment risk between European companies when unprecedented events, like the COVID-19 crisis, bring challenges for both investors and financial analysts.

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