Research
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Sector Rotation: Can the Approach Work in Different Countries?

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1 Sources: Bloomberg Finance L.P., State Street Global Advisors, as of 31 March 2020.
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Executive Summary

Research on sector rotation, which is a popular tactical asset allocation technique, often centres on using price momentum as the sole criterion to identify outperforming sectors. The aim here is to give investors ideas on implementing a tactical sector rotation strategy systematically using sector ETF building blocks. In this paper, we examine the viability of implementing a sector rotation strategy using a blend of parameters. These include macroeconomic indicators and fundamental information, in addition to price momentum.

The selection approach was simulated across different geographies (namely the US, Europe and World developed markets) and rebalanced at the end of every month. We call this approach the Sector Selection Research Model.

Results show that the sector rotation strategy beat its respective benchmarks across all regions over the entire period, and with diminished volatility. The tactical nature of the allocation means that the portfolio turnover, which is a major driver of transaction costs, was remarkably high (~200%).[2] Even so, the outperformance of the simulated sector rotation strategies remained robust after including estimated transaction costs. This suggests there may be merit in combining multiple criteria to select the most attractive sectors.

2 Source: State Street Global Advisors, as of 31 March 2020.

Sector Rotation Across Regions

Can Sector Rotation Work in Different Countries?

Sector allocation has been one of the main pillars in institutional equity portfolio management and is a key component of tactical asset allocation. The central principle of this investment technique relates to the ability of investors to back sections of the market that are experiencing favourable conditions while avoiding those in distress.

Most Existing Research is Based on Momentum Applied to the US

Much of the publicly available research concentrates on approaches to sector rotation in the US. However, its applicability to other regions attracts far less focus and is often overlooked. Commentators have offered various explanations for this observation. Some believe that regions outside of the US lack the sector diversity needed to implement a viable sector rotation strategy. In the past, these challenges were compounded by the limited availability of liquid and competitively priced sector building blocks needed to execute a rotation strategy successfully.

The rise of sector ETFs has eliminated that last hurdle. The ETF trend appears set to consolidate even further as a high dispersion of sector returns may give investors more profit-making opportunities. Indeed, the current spread between global sector returns continues to widen to its largest level since 2000.[1]

At the heart of sector rotation strategies is the tenet that return can be improved by timing or tilting to sectors on the strength of economic or other quantitative information. Of the different methods used to pick sectors, price momentum is by far the most studied. For instance, Moskowitz and Grinblat (1999)[2] reviewed the returns of single stocks and sectors between 1963 and 1995 and concluded that momentum strategies applied to sectors generated a higher return than those applied to individual stocks.

Other authors, such as Burch and Swaminathan (2001), found that institutional investors — most notably, insurance companies, banks, investment advisors and fund managers — often use momentum as a means of making their equity investment selections.

Besides momentum, another extensively employed technique is to consider macroeconomic data and the business cycle. The rationale behind this is that if the correct phase in the business cycle is identified, then it is possible to predict the performance of different sectors. Kouzmenko and Nagy (2014)[3] assessed the relationship between sector performance and business cycles between 1976 and 2009 using both inflation and the OCED Composite Leading Indicators. They found that the returns of cyclical sectors were higher in economic expansions than countercyclical ones.

In this paper, we seek to add to the current body of research in this area by examining the performance of a sector rotation technique that blends both macroeconomic, fundamental and quantitative data, including price momentum, in different regions. To test the feasibility across different geographies, the strategy — which is known as the Sector Selection Research Model — was created and tested in the US, Europe and World developed markets.

In our study, we also examined the impact of estimated trading costs on return. The initial selection universes used for the analysis include the 11 GICS sectors that make up the S&P 500, MSCI Europe and MSCI World Indices. These sectors are communication services, energy, materials, health care, industrials, consumer discretionary, consumer staples, financials, real estate, information technology and utilities. In addition to using publicly available sources for price and fundamental data, the analysis in this research also utilises proprietary information on investor positioning derived from anonymised custody data of institutional investors from State Street Global Markets.

Sector Selection Research Model

How Does the Model Work?

The Sector Selection Research Model deploys a rule-based, sector rotation approach that targets the most relatively attractive sectors using a blend of price, macroeconomic and fundamental factors. The importance of these selection factors is captured in the dynamic weighting scheme of the research model.

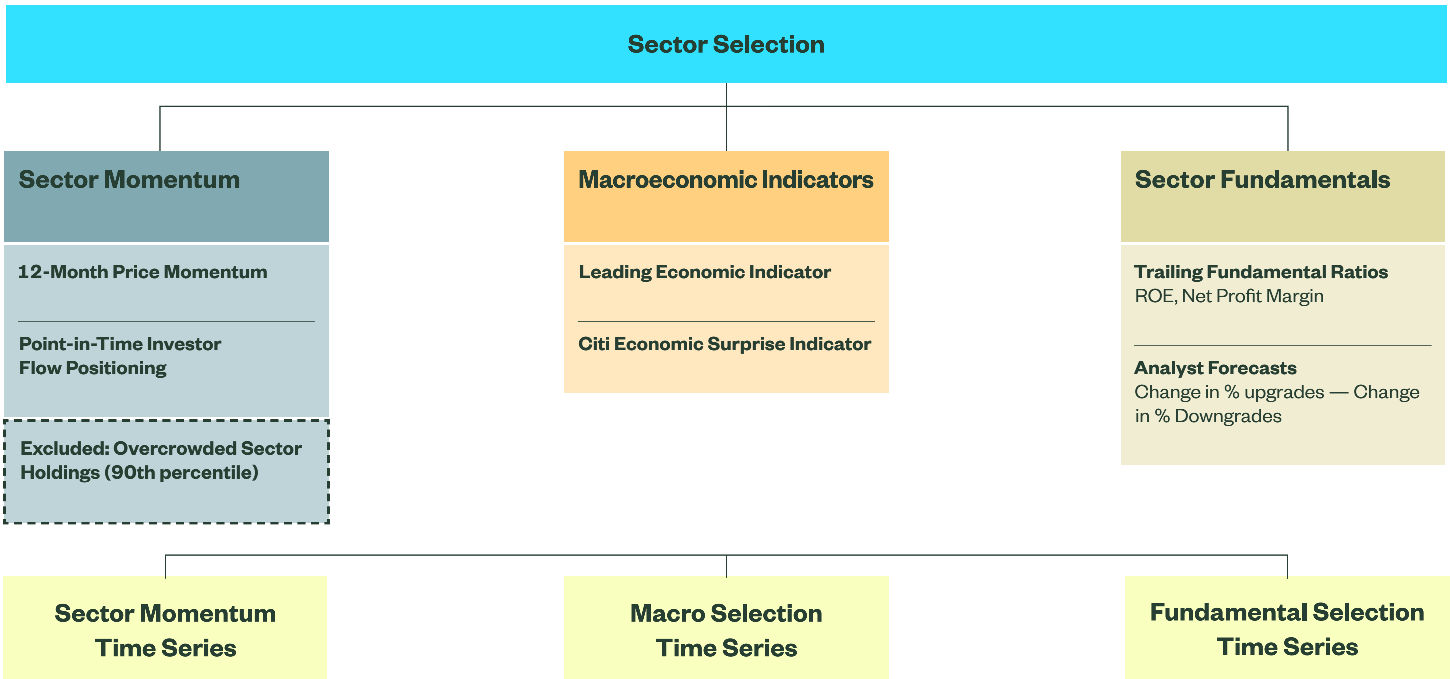
Furthermore, the model provides for a mechanism that ensures risk is controlled and opportunities arising from dispersion are seized. In all, the approach comprises two major steps: sector selection and sector weighting. This process is repeated on a monthly basis.

Sector Selection

Sectors are chosen based on three factors, hereafter known as 'components.' These components are: price momentum, macroeconomic environment and fundamental data (see Figure 1). Sector selections are conducted independently and are based solely on the criteria that make up the component and the best five sectors are selected in each component.

Once the selections are determined, a return time series is generated for that component. If all the sectors record a negative reading across most of the criteria in a given component, no sectors will be selected and the return for the month is assumed to be cash.

Figure 1 **How the Sector Selection Research Model Selects Sectors**



Source: State Street Global Advisors. For Illustrative purposes only.

Sector Selections are Done Independently Using Momentum, Macroeconomics and Fundamentals

- **Sector Momentum Component** In this component, sectors are ranked based on the historical 12-month price momentum as well as the most recent investor flow positioning metric, which is a proprietary State Street indicator that shows how real money investors are positioned. Sectors that are heavily held by investors, the so-called 'overcrowded sectors,' are also removed at this stage.

- **Macroeconomic Indicators Component** The current macroeconomic regime is determined principally by leading economic indicators, supported by the Citi Economic Surprise Index. Once the current regime is ascertained, sectors are chosen on the strength of their past performance whilst being in the same macroeconomic regime in the past.

- **Sector Fundamentals Component** Sector fundamentals account for both trailing fundamental information as well as forward-looking analyst consensus forecasts. Trailing information includes return on equity and net profit margin (or, in the instance of the finance sector, net interest margin). On the other hand, forward-looking information includes the percentage change between analyst upgrades and downgrades for a given sector. Sectors are then classified by means of a blend of trailing and forward-looking measures.

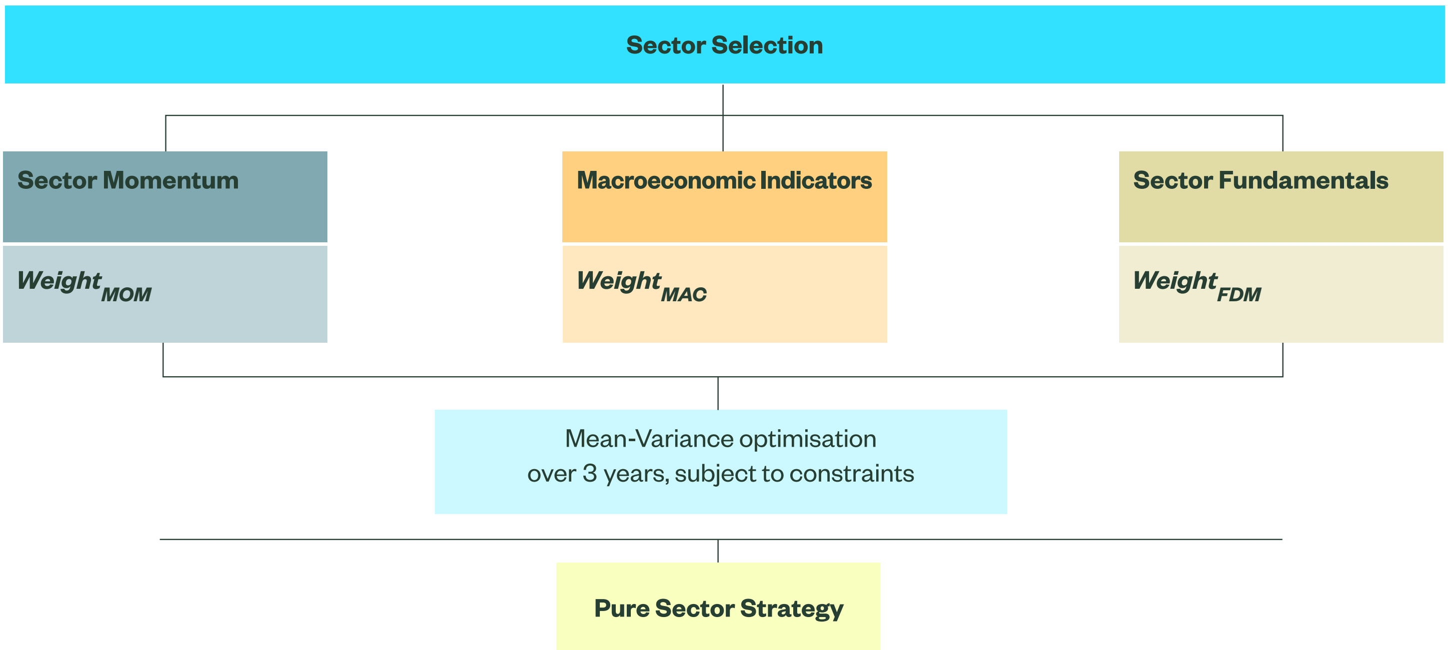
Sector Weighting

Sector weighting is influenced both by the dynamic weighting of the components as well as the subsequent calibration of final weights. This approach is designed to limit risk and capitalise on opportunities stemming from sector dispersion.

Weighting is Based on the Relative Importance of Components, as well as Risk Control and Dispersion

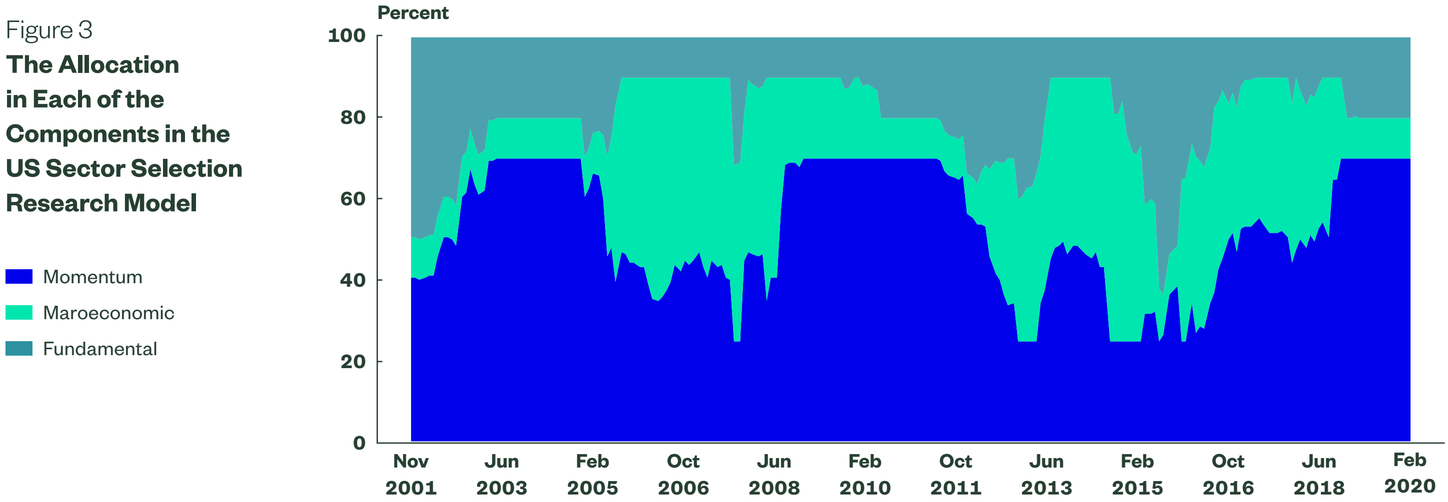
Having selected the most relatively attractive sectors in the previous step, the research model applies a dynamic weighting scheme to reflect the relative importance of the components. This ultimately affects the weight of the sectors that the strategy chooses and is achieved through a mean-variance optimisation process, which uses the time series of the components computed previously, in such a way as to maximise the portfolio risk-adjusted return (see Figure 2). The outcome of this process is what produces the 'pure sector strategy.'

Figure 2 **The Dynamic Weighting Scheme of the Components in the Research Model**



Source: State Street Global Advisors. For illustrative purposes only.

Figure 3
The Allocation in Each of the Components in the US Sector Selection Research Model



Source: State Street Global Advisors. Monthly weights as of March 2020.

The final step in determining the sector weights involves restricting the amount of risk the pure sector strategy incurs, as well as encouraging it to run more risk where opportunities from dispersion emerge. To avoid running excessive risk, the Sector Selection Research Model targets a tracking error of 10% p.a. and any excess tracking error is curbed through increasing the allocation in the benchmark.

In addition, the research model also evaluates whether there is a sizeable opportunity in making sector bets by examining the average sector dispersion. A high sector dispersion signifies that there is a material difference between the best and worst performing sector and that, if the sector bet is correct, there is potentially a substantial gain from it. For this reason, the research model has embedded a mechanism whereby if there is material sector dispersion, it will reduce the allocation in the benchmark and boost the allocation in the pure sector strategy and vice versa.

Recent Sector Allocation

Overview of Allocations Across Regions

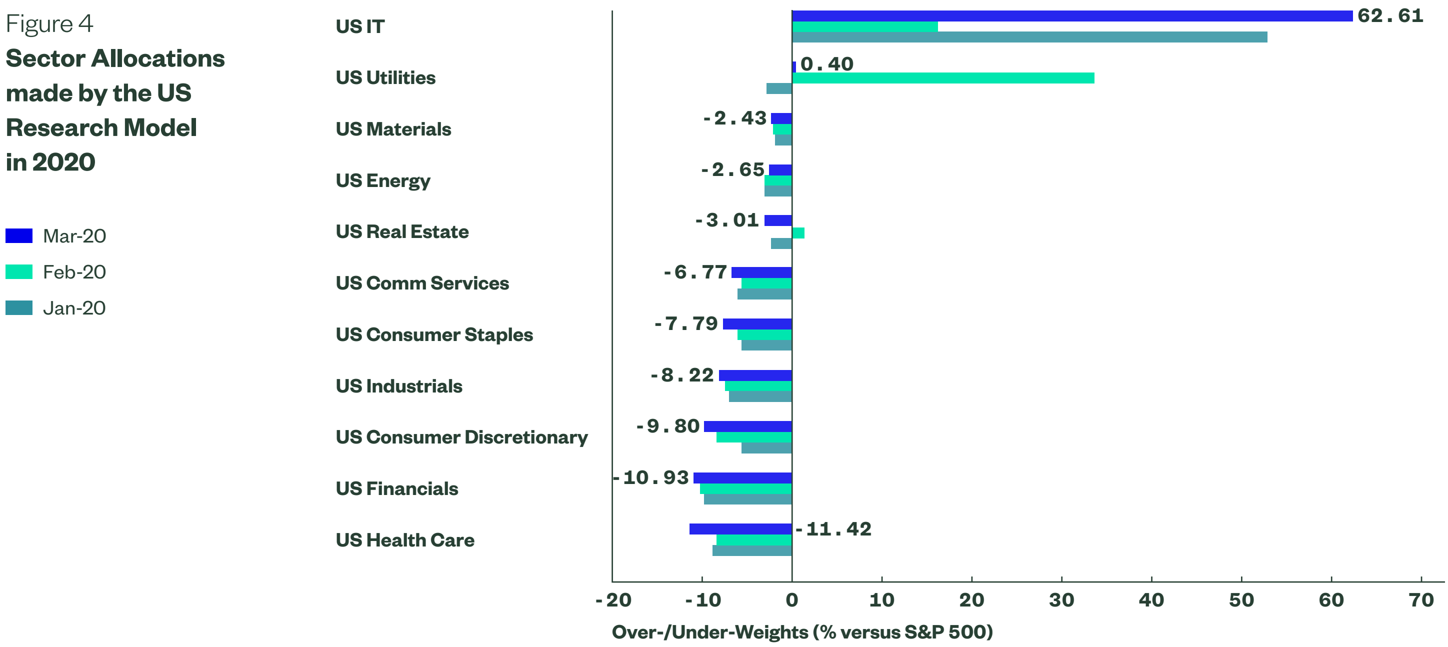
Next, we review how the sector allocations have changed so far in 2020 when the equity markets faced unprecedented volatility, principally as a result of COVID-19.

US Sector Allocation So far in 2020: IT has been in Vogue

Over the first three months of 2020, the US Sector Selection Research Model generated a paper loss of 17.16%, which is an outperformance of 3.60% compared with the S&P 500 benchmark.[4] Before the coronavirus hit international equity markets, the strategy was highly overweight in the IT sector because the sector enjoyed not only strong price momentum, but also investor flows and solid fundamentals. However, as the crisis worsened, utilities and, to a lesser extent, real estate rode on strong price momentum.

Market sentiment turned decidedly defensive and, as a result, the overweight in IT was substantially cut (see Figure 4). More recently, the US equity market has become less agitated as market participants expect that the challenges brought on by the pandemic are likely to last for a while. Against this backdrop, the research model returned to a strong overweight in IT, which continues to benefit from strong momentum and fundamentals.

Figure 4
Sector Allocations made by the US Research Model in 2020

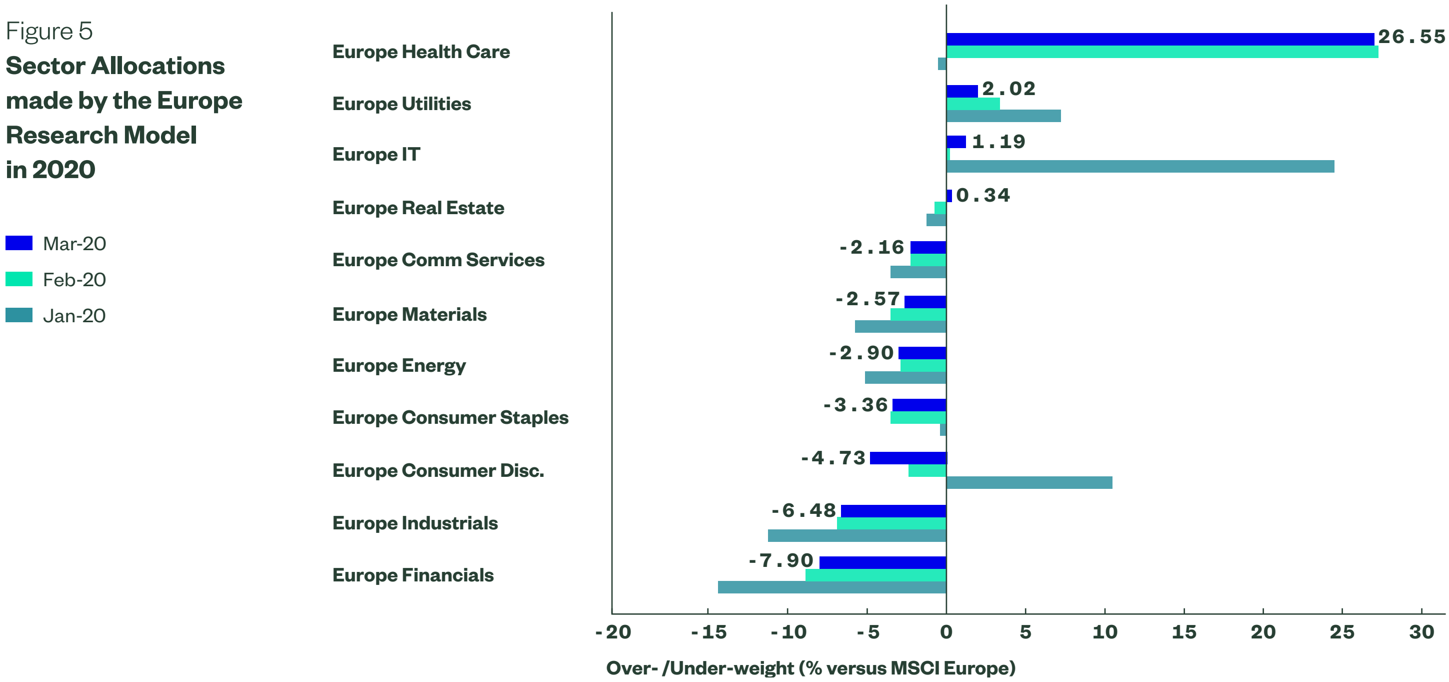


Source: State Street Global Advisors, as of March 2020. Allocations are as of date indicated and shouldn't be relied thereafter.

Europe Sector Allocation: Health Care went from an Underweight to a Strong Overweight

Like the US market, the European equity market also went into freefall earlier this year. MSCI Europe went down by 32% while the Sector Selection Research Model fell by 21%. Like the US, the IT sector was in vogue at the start of the year by virtue of strong momentum and fundamentals. As the coronavirus crisis developed, European health care companies skyrocketed amid hope that a vaccine against coronavirus would be invented eventually. That said, fundamentals for the health care sector were unremarkable throughout the period, especially in comparison with sectors such as IT and utilities (see Figure 5).

Figure 5
Sector Allocations made by the Europe Research Model in 2020

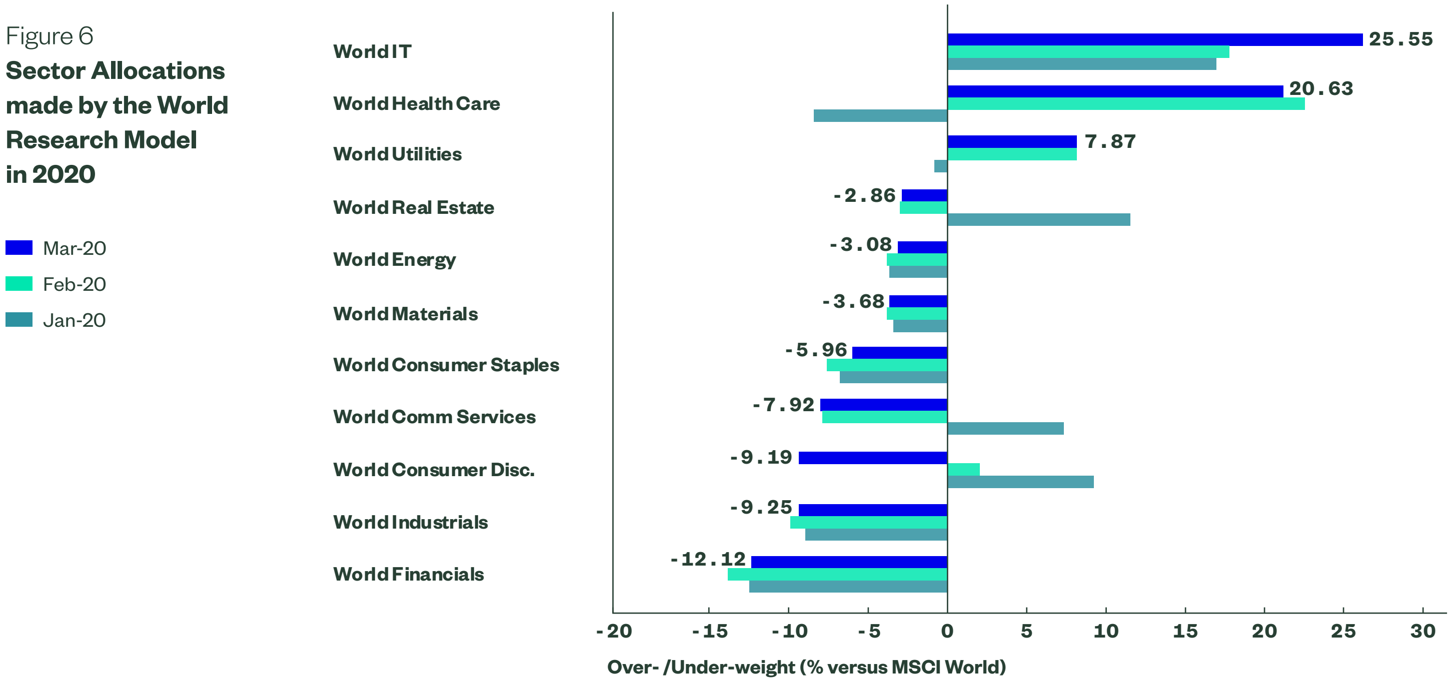


Source: State Street Global Advisors, as of March 2020. Allocations are as of date indicated and shouldn't be relied thereafter.

World Sector Allocation: IT and Health Care have been Favoured in World Developed Markets

In regards to world developed markets, the Sector Selection Research Model fell by 16%, which compares favourably the MSCI World drop of 22% during the same period. Similar to both the US and Europe, the research model started off by placing a substantial overweight in IT as well as real estate, and an underweight in financials. As the impact of the coronavirus was felt more acutely by the equity markets, the research model also backed health care, alongside the IT sector. The bearish sentiment also benefitted utilities, albeit to a lesser extent (see Figure 6).

Figure 6
Sector Allocations made by the World Research Model in 2020



Source: State Street Global Advisors, as of March 2020. Allocations are as of date indicated and shouldn't be relied thereafter.

Strategy Performance and Historical Allocation Outcomes

Overview

Here we examine the allocation sector decisions of the Sector Selection Research Model in each region. We also analyse how the strategies performed against their reference benchmarks over the entire study period, as well as during specific historical periods.

US Sector Selection

In the US, the model exceeded the S&P 500 benchmark over the entire study period and in the majority of the calendar years (see Figure 8). On an absolute basis, the model outperformed the S&P 500 benchmark by 3% p.a. with a correspondingly lower volatility and, together, this produced a strong risk-adjusted return of 0.7, which is nearly twice that of the benchmark (see Figure 7). This level of performance was achieved by virtue of the strategy's dynamic monthly rebalancing mechanism. Indeed, the strategy's portfolio turnover was about 180% p.a., which is typical of a tactical asset allocation strategy of this category.[5]

Another notable observation was the seemingly defensive nature of the sector strategy, which is evidenced by having a lower market beta of around 0.7 and a substantially lower maximum drawdown than its benchmark (-30% versus -51%). We can potentially attribute this observation to the strategy's capacity to allocate into cash during bear markets.

Industrials were Favoured in the First Half of the Study Period and IT the Second Half

That said, the strategy allocated only a modest weight to cash (16%) over the entire study period and tilted towards cyclical sectors (46%), especially industrials and IT. A closer examination of the strategy's sector allocation reveals significant differences between the first half of the study period (between December 1998 and July 2009) and the second half (August 2009 to February 2020).

During the first half of the analysis period, the highest average weight was found in the industrials sector. Sporadic bouts of significant overweighting in the sector were witnessed during much of 2003 and 2004; this period coincided with the Iraq war when the US government budgeted $50 billion[6] for the conflict.

By contrast, the IT sector was often in vogue in the second half of the analysis period, by virtue of the sector's strong momentum and stellar fundamentals. Another remarkable observation is that the strategy allocated an average weight of 10% in the energy sector in the first half of the study period and only a meagre 1% in the second half. This is broadly in line with the oil price, which had peaked at just under $150 in June 2008 and then struggled in the latter period.

Turning to 2019, the sector selection strategy outperformed the S&P 500 benchmark on a risk-adjusted basis but underperformed on an absolute basis. The year was defined by spells of extreme turbulence, notably in the first half. Equity market volatility more than doubled between the first half and the second half of the year. For this reason, the allocation to cash decreased from 43% in the first half of the year to 16%.

As most of the weight was initially allocated to cash, there was little active positioning in sectors. This changed in the second half of the year as the equity markets largely stabilised and there was a cautious tactical shift to certain sectors, such as consumer discretionary and information technology. The weight in consumer discretionary went up from an average of 4% to 20% and the weight in IT rose from 7% to 19%, a result of strong momentum in these sectors.

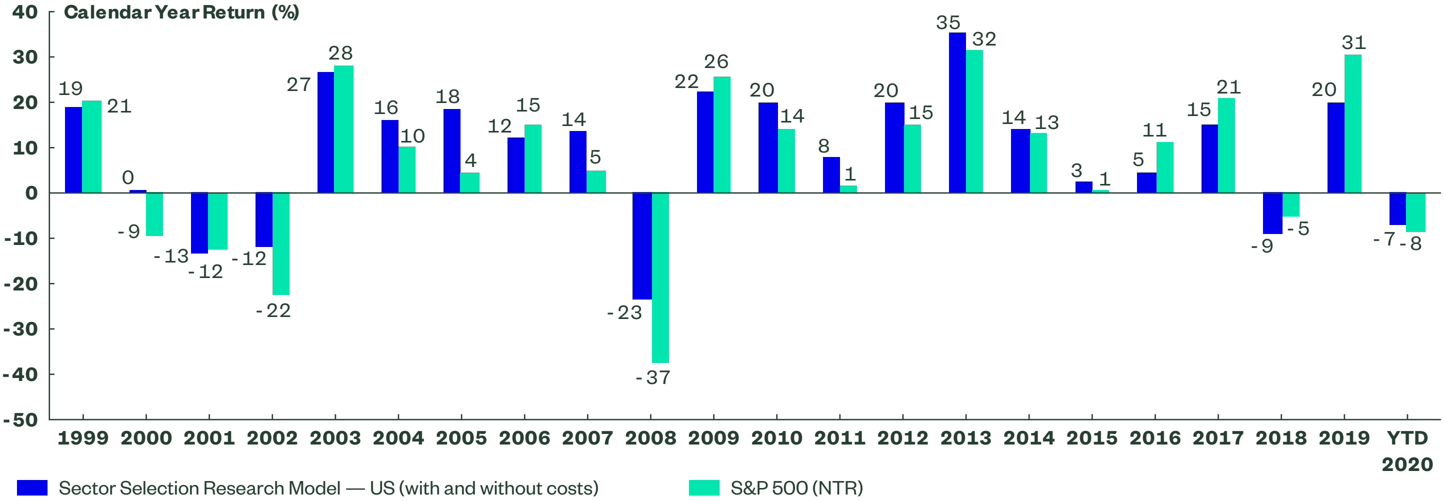
Overall, because the strategy was overweight towards real estate by about 10% and consumer discretionary by 4%, the strategy lagged the benchmark given these sectors registered sub-par performance. Indeed, during 2019, among the best performing sectors were IT and consumer discretionary, which beat the S&P 500 benchmark by 20% and 2%, respectively.

Figure 7
Risk-Return Characteristics of US Sector Selection Research Model Over the Entire Period

	Sector Selection Research Model (with and without costs)*	S&P 500 Net Total Return
Annual Return (%)	8.07	4.95
Annual Volatility (%)	11.47	14.75
Return per unit Volatility	0.70	0.34
Maximum Drawdown (%)	-29.63	-51.44

Source: Bloomberg Finance L.P., State Street Global Advisors. Monthly data from January 1999 to March 2020.
Past performance is not a reliable indicator of future performance. Index returns are unmanaged and do not reflect the deduction of any fees or expenses. This information should not be considered a recommendation to invest in a particular sector or to buy or sell any security shown. It is not known whether the sectors or securities shown will be profitable in the future. The results shown represent current results generated by our Sector Selection Research Model. The results do not reflect actual trading and do not reflect the impact that material economic and market factors may have had on SSGA's decision-making. The results shown were achieved by means of a mathematical formula, and are not indicative of actual performance which could differ substantially. The performance reflects management fees, transaction costs, and other fees expenses a client would have to pay.
*Transaction costs, which include taxes, commissions and trading costs, are assumed to be minimal, such that there is little to no impact on the categories above.

Figure 8 **Calendar Year Return of Sector Selection Research Model Compared to its Benchmark**



Source: Bloomberg Finance L.P., State Street Global Advisors. Monthly data from January 1999 to March 2020. Past performance is not a reliable indicator of future performance. Index returns are unmanaged and do not reflect the deduction of any fees or expenses. The results shown represent current results generated by our Sector Selection Research Model. The results do not reflect actual trading and do not reflect the impact that material economic and market factors may have had on SSGA's decision-making. The results shown were achieved by means of a mathematical formula, and are not indicative of actual performance which could differ substantially. The performance reflects management fees, transaction costs, and other fees expenses a client would have to pay.

Finally, we look at how the sector rotation strategy fared during the dot-com bubble. In the six months preceding the crisis,[7] the strategy had an average weight of 25% in the IT sector, and this weight culminated in January 2000. Correspondingly, there was a growing belief in the market that the prices in the IT sector shot up to unsustainably high levels and stock prices in the sector began to falter.

The Strategy Increased Cash Allocation During Dot-Com Bubble

As the crisis intensified, allocation to the IT sector tumbled and this underweight was maintained for much of the crisis. Indeed, not only did the strategy allot more to cash but it also maintained a higher weight to defensive sectors, including consumer staples (9%) and health care (8%) owing to periodically strong fundamentals and positive momentum.

There were also extended periods in which no sector had positive momentum, which explains why there was on average a high cash allocation in the strategy. In all, the strategy was overweight the real estate sector by 4% and the consumer staples sector by 3%, both of which outpaced the benchmark convincingly. There was also an overall tilt away from IT, which unsurprisingly was the worst performer during the period.

European Sector Selection

The sector selection strategy in Europe surpassed its MSCI Europe benchmark on an absolute basis over the study period, which spans from February 2001 to February 2020 (see Figure 9). Risk-adjusted performance of the sector selection research model was equally robust at more than double that of the benchmark. The more anticyclical nature of the strategy also means that its maximum drawdown over the entire study period was much shallower. As seen in the US model, the European counterpart was dynamic and racked up a portfolio turnover of 200% p.a., owing to its embedded monthly rebalancing feature.

Judged over the entire period, the strategy only assigned a modest weight to cash and did not have any material sector biases. A careful examination of the strategy's allocation decisions shows that it was overweight consumer staples, especially in the second half of the period when we saw heightened turbulence in the equity markets.

The European Strategy Saw a Rise in Allocation to Materials and Defensive Sectors During European Debt Crisis

Last year, the strategy underperformed its benchmark marginally on an absolute basis but saw outperformance on a risk-adjusted basis. Whereas the performance of the strategy trailed that of the benchmark at the beginning, it rebounded strongly in the second half of the year to produce an overall positive excess return for the year. However, there was strong resemblance between the allocations in the first half and the second half of the year as the strategy banked on the consumer staples, IT and health care sectors, with each sector receiving an allocation of around 15%. The cash allocation was also modest. In terms of sector bets, the strategy was overweight in health care, utilities and consumer staples by about 5–6%, and these sectors delivered only a modest outperformance versus the benchmark.

Next we look at how the sector strategy behaved during the European debt crisis that occurred between May 2010 and September 2011. Six months prior to the start of the crisis, the strategy favoured cyclical sectors over defensive sectors and allocated three times more weight to the former. This is particularly true of the industrials and consumer discretionary sectors, which had an average weight of 18% and 10%, respectively, during the first half of the analysis period.

As the debt crisis unfolded, the strategy predictably retrenched into more defensive sectors, with a rise in the allocation to consumer staples and health care. However, during this period, the more significant bet that the strategy made was in the materials sector, whose constituent companies are not usually known for their anticyclical properties.

Over the whole crisis period, the strategy tilted towards materials and communication services by 8% and 5%, respectively, and this can mainly be attributed to the strong price momentum and fundamentals in these two sectors. The overweight in materials proved to be unsuccessful as the performance of the sector was poor and ranked as one of the worst among its peers. On the other hand, the overweight in communication services provided a boost as the sector returned over 14% more than the benchmark.

Figure 9
Risk-Return Characteristics of European Sector Selection Research Model Over the Entire Period

	Sector Selection Research Model (without costs)*	Sector Selection Research Model (with costs)*	MSCI Europe Net Total Return
Annual Return (%)	5.59	4.59	2.92
Annual Volatility (%)	13.25	13.25	15.86
Return per unit Volatility	0.42	0.35	0.18
Maximum Drawdown (%)	-43.29	-44.71	-53.72

Source: Bloomberg Finance L.P., State Street Global Advisors, data from February 1999 to March 2020. Past performance is not a reliable indicator of future performance. Index returns are unmanaged and do not reflect the deduction of any fees or expenses. This information should not be considered a recommendation to invest in a particular sector or to buy or sell any security shown. It is not known whether the sectors or securities shown will be profitable in the future. The results shown represent current results generated by our Sector Selection Research Model. The results do not reflect actual trading and do not reflect the impact that material economic and market factors may have had on SSGA's decision-making. The results shown were achieved by means of a mathematical formula, and are not indicative of actual performance which could differ substantially. The performance reflects management fees, transaction costs, and other fees expenses a client would have to pay.
*Transaction costs, which include taxes, commissions and trading costs, are assumed to be 8bps per month and are included in the calculations above.

World Sector Selection

Similar to both the US and Europe, the World Sector Selection Research Model outperformed the MSCI World benchmark on both an absolute and relative basis (see Figure 10). This can partly be attributed to the monthly rebalancing mechanism, which has allowed it to react to prevailing market conditions. As a result, the strategy incurred an average portfolio turnover of about 185% p.a., which is a typical feature of highly tactical allocation strategies.

When viewed over the whole period, sector allocations were anodyne as they were largely evenly spread, and no single sector stood out among the rest. During this period, the sectors with the largest allocations were the indsutrials, consumer discretionary and IT sectors, which had around a 10% weight apiece. However, once the entire period is parsed into two 10-year periods, the differences in the selections that the strategy made become more obvious.

In fact, during the first half of the time period, which was marked by several major crises, the strategy held roughly 3.5 times more cash than it did in the second half, although allocation in cash was low in both periods. In the second half of the period, which covered mainly the bull market over the last decade, allocations were most notable in cyclical sectors (namely the IT and consumer discretionary sectors) as well as in the health care sector, which is somewhat unexpected.

Figure 10
Risk-Return Characteristics of World Sector Selection Research Model Over the Entire Period

	Sector Selection Research Model (without costs)*	Sector Selection Research Model (with costs)*	MSCI World Net Total Return
Annual Return (%)	6.69	6.25	4.58
Annual Volatility (%)	12.25	12.25	15.21
Return per unit Volatility	0.55	0.51	0.30
Maximum Drawdown (%)	-36.79	-37.14	-54.03

Source: Bloomberg Finance L.P., State Street Global Advisors, data from March 2001 to March 2020. Past performance is not a reliable indicator of future performance. Index returns are unmanaged and do not reflect the deduction of any fees or expenses. This information should not be considered a recommendation to invest in a particular sector or to buy or sell any security shown. It is not known whether the sectors or securities shown will be profitable in the future. The results shown represent current results generated by our Sector Selection Research Model. The results do not reflect actual trading and do not reflect the impact that material economic and market factors may have had on SSGA's decision-making. The results shown were achieved by means of a mathematical formula, and are not indicative of actual performance which could differ substantially. The performance reflects management fees, transaction costs, and other fees expenses a client would have to pay.
*Transaction costs, which include taxes, commissions and trading costs, are assumed to be 4bps per month and are included in the calculations above.

As for last year, the strategy trailed the MSCI World Index on both an absolute and relative basis. The strategy mainly tilted towards the communication services, utilities and consumer discretionary sectors. The IT sector, which returned 47.6% over the year and far exceeded all its other peers, only received a meagre overweight in the strategy. Additionally, the significant bets placed on utilities and consumer discretionary did not pay off. These two factors contributed to the lacklustre performance of the strategy during the period.

The World Strategy did not Make any Significant Bets Immediately After GFC

Finally, we review the performance of the sector strategy against the benchmark during the Global Financial Crisis (GFC). Over the period, the strategy outperformed the benchmark. Before the crisis started, the strategy allocated mainly to cyclical sectors, especially the energy sector (15%), which coincided with the period when oil prices reached new highs. Interestingly, the strategy did not select the financials sector from May 2007 until March 2009.

As the financial crisis deepened, the strategy also assigned an increasingly high weight to defensive sectors, such as consumer staples, utilities and health care. Cash allocations also rose substantially and averaged 30% during this period. Immediately following the crisis, the Federal Reserve announced quantitative easing and the market regained confidence. The equity markets rallied but the strategy did not make any significant bets during the period.

In all, the strategy was overweight in real estate and utilities by 13% and 6%, respectively, and was underweight in financials by 16%. The underweight in financials, as well as the overweight in utilities, added to performance during the crisis.

Conclusion

In summary, the results show that the sector rotation strategy beat its respective benchmarks across all regions over the entire period, and with diminished volatility. The tactical nature of the allocation model means that the portfolio turnover, which is a major driver of transaction costs, was remarkably high (~200%).

Even so, the outperformance of the simulated sector rotation strategies remained robust after including estimated transaction costs. This suggests there may be merit in combining multiple criteria to construct a sector rotation strategy.

Endnotes

1 *Paying attention to your sector selection pays,* State Street Global Markets, April 2020.

2 Moskowitz T. and Grinblatt M., "Do Industries Explain Momentum?" *Journal of Finance, 1999*.

3 Kouzmenko R. and Nagy Z., "Sector Performance Across Business Cycles," MSCI, 2009.

4 Source: Bloomberg Finance L.P., State Street Global Advisors, as of 31 March 2020.

5 Source: Bloomberg Finance L.P., State Street Global Advisors, as of 31 March 2020.

6 *The Cost of the Iraq War*, Council on Foreign Relations, 2006. https://cfr.org/backgrounder/cost-iraq-war.

7 Between March 2000 and October 2002.

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SPDR ETF Information	ISIN	TER (%)	Euro-next	LSE	Xetra	Borsa Italiana	SIX	Mexico BMV	March Net SPDR Flows ($MN)	Q1 Net SPDR Flows ($MN)	SPDR AUM ($MN)
World Sector Funds											
SPDR MSCI World Communication Services UCITS ETF	IE00BYTRRG40	0.30	WTEL	WTEL	–	–	WTEL	WTELN	-42	-39	17
SPDR MSCI World Consumer Discretionary UCITS ETF	IE00BYTRR640	0.30	WCOD	WCOD	–	–	WCOD	CDISN	0	-5	16
SPDR MSCI World Consumer Staples UCITS ETF	IE00BYTRR756	0.30	WCOS	WCOS	–	–	WCOS	–	2	2	38
SPDR MSCI World Energy UCITS ETF	IE00BYTRR863	0.30	WNRG	WNRG	–	–	WNRG	WNRGN	24	14	163
SPDR MSCI World Financials UCITS ETF	IE00BYTRR970	0.30	WFIN	WFIN	–	–	WFIN	WFINN	-2	-8	80
SPDR MSCI World Health Care UCITS ETF	IE00BYTRRB94	0.30	WHEA	WHEA	–	–	WHEA	–	-103	-105	192
SPDR MSCI World Industrials UCITS ETF	IE00BYTRRC02	0.30	WIND	WNDU	–	–	WIND	–	-8	-8	26
SPDR MSCI World Materials UCITS ETF	IE00BYTRRF33	0.30	WMAT	WMAT	–	–	WMAT	WMATN	0	0	12
SPDR Dow Jones Global Real Estate UCITS ETF	IE00B8GF1M35	0.40	–	GLRE	SPYJ	GLRE	GBRE	–	79	158	787
SPDR MSCI World Technology UCITS ETF	IE00BYTRRD19	0.30	WTCH	WTEC	–	–	WTEC	WTECN	24	48	206
SPDR MSCI World Utilities UCITS ETF	IE00BYTRRH56	0.30	WUTI	WUTI	–	–	WUTI	–	0	-6	12
US Sector Funds											
SPDR S&P U.S. Communication Services Select Sector UCITS ETF	IE00BFWFPX50	0.15	–	SXLC	ZPDK	SXLC	SXLC	SXLCN	-4	-15	163
SPDR S&P U.S. Consumer Discretionary Select Sector UCITS ETF	IE00BWBXM278	0.15	–	SXLY	ZPDD	SXLY	SXLY	SXLYN	-36	-38	56
SPDR S&P U.S. Consumer Staples Select Sector UCITS ETF	IE00BWBXM385	0.15	–	SXLP	ZPDS	SXLP	SXLP	SXLPN	47	83	222
SPDR S&P U.S. Energy Select Sector UCITS ETF	IE00BWBXM492	0.15	–	SXLE	ZPDE	SXLE	SXLE	SXLEN	-62	25	58
SPDR S&P U.S. Financials Select Sector UCITS ETF	IE00BWBXM500	0.15	–	SXLF	ZPDF	SXLF	SXLF	SXLFN	-312	-310	124
SPDR S&P U.S. Health Care Select Sector UCITS ETF	IE00BWBXM617	0.15	–	SXLV	ZPDH	SXLV	SXLV	SXLVN	-12	15	160
SPDR S&P U.S. Industrials Select Sector UCITS ETF	IE00BWBXM724	0.15	–	SXLI	ZPDI	SXLI	SXLI	SXLIN	-7	-2	51
SPDR S&P U.S. Materials Select Sector UCITS ETF	IE00BWBXM831	0.15	–	SXLB	ZPDM	SXLB	SXLB	SXLBN	-6	-2	7
SPDR S&P U.S. Technology Select Sector UCITS ETF	IE00BWBXM948	0.15	–	SXLK	ZPDT	SXLK	SXLK	SXLKN	2	28	225
SPDR S&P U.S. Utilities Select Sector UCITS ETF	IE00BWBXMB69	0.15	–	SXLU	ZPDU	SXLU	SXLU	SXLUN	0	9	31
Europe Sector Funds											
SPDR MSCI Europe Communication Services UCITS ETF	IE00BKWQ0N82	0.30	STT	TELE	SPYT	STTX	STTX	TELEN	1	6	11
SPDR MSCI Europe Consumer Discretionary UCITS ETF	IE00BKWQ0C77	0.30	STR	CDIS	SPYR	STRX	STRX	–	-87	-113	23
SPDR MSCI Europe Consumer Staples UCITS ETF	IE00BKWQ0D84	0.30	STS	CSTP	SPYC	STSX	STSX	CSTPN	94	117	561
SPDR MSCI Europe Energy UCITS ETF	IE00BKWQ0F09	0.30	STN	ENGY	SPYN	STNX	STNX	ENGYN	3	-238	81
SPDR MSCI Europe Financials UCITS ETF	IE00BKWQ0G16	0.30	STZ	FNCL	SPYZ	STZX	STZX	FNCLN	74	138	600
SPDR MSCI Europe Health Care UCITS ETF	IE00BKWQ0H23	0.30	STW	HLTH	SPYH	STWX	STWX	HLTHN	-16	-21	328
SPDR MSCI Europe Industrials UCITS ETF	IE00BKWQ0J47	0.30	STQ	NDUS	SPYQ	STQX	STQX	NDUSN	-16	-19	213
SPDR MSCI Europe Materials UCITS ETF	IE00BKWQ0L68	0.30	STP	MTRL	SPYP	STPX	STPX	MTRLN	1	4	16
SPDR FTSE EPRA Europe ex UK Real Estate UCITS ETF	IE00BSJCQV56	0.30	0.00	EURE	ZPRP	EURE	EURE	–	-4	4	66
SPDR MSCI Europe Technology UCITS ETF	IE00BKWQ0K51	0.30	STK	ITEC	SPYK	STKX	STKX	ITECN	3	6	29
SPDR MSCI Europe Utilities UCITS ETF	IE00BKWQ0P07	0.30	STU	UTIL	SPYU	STUX	STUX	UTILN	-2	51	68

1 Sources: Bloomberg Finance L.P., State Street Global Advisors, as of 31 March 2020.
* Frequent trading of ETFs could significantly increase commissions and other costs such that they may offset any savings from low fees or costs.

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- Build from breadth
- Invest as stewards
- Invent the future

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