S&P Dow Jones Indices

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Research

Natural Selection:

Tactics and Strategy with Equity Sectors

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In recent years, the S&P 500® sectors have exhibited elevated dispersion, including their **widest-ever spread between the best and worst** performers in 2022, highlighting an opportunity for studying the impact of sector selection (see Exhibit 1).[1] In a rapidly evolving global investment landscape, S&P 500 sectors remain tools in active and passive portfolio construction and worthy of consideration.

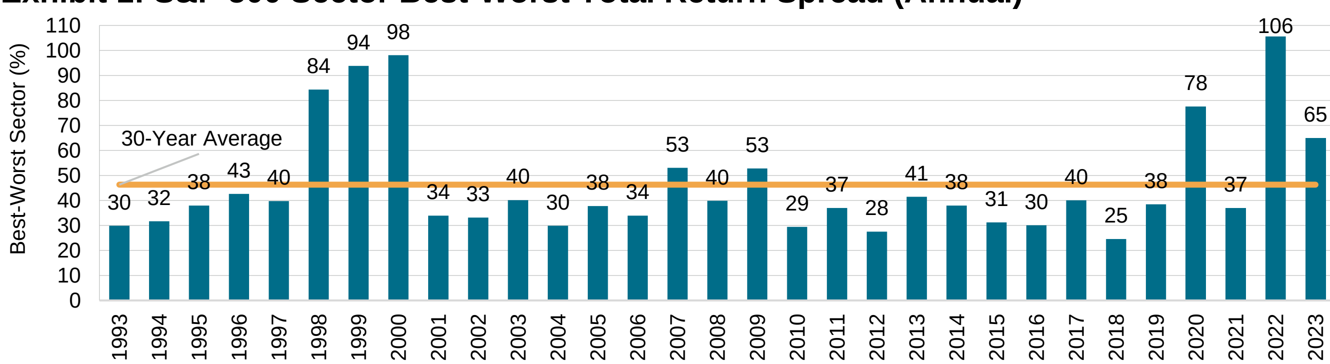
In this paper, we will:

– Review sector characteristics, performance and influence on stock returns;

– Evaluate the impact of skew on active selection of stocks, sectors and industries;

– Present case studies on strategic and tactical portfolio applications of sector indices.

Exhibit 1: S&P 500 Sector Best-Worst Total Return Spread (Annual)



Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

[1] The GICS® was created in 1999 and has evolved over time. All data and analyses based on historical as-reported index levels, inclusive of GICS changes and constituent reclassifications. See the GICS methodology for further details on GICS methodology and classifications.

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1. Introduction

"Look deep into nature, and then you will understand everything better."
Albert Einstein

Imagine equity markets as a deep rainforest, grown dense through the centuries with new ways of investing, constantly born out of soil made from those that came and went long before. Teeming with life and ripe for exploration, this nested series of complex systems perpetually lures intrepid investors seeking answers to the questions: What features drive the behavior of a stock, and how can those help us make sense of the world? As colorful and novel species in this evolving landscape attract the adventurer's curiosity, so too should a curiously old and large tree with many branches found towering above the canopy. Like sectors, this tree not only endures, but also remains intertwined with the ecosystem of stocks that surround it, providing clues on how to thrive in constantly evolving conditions.

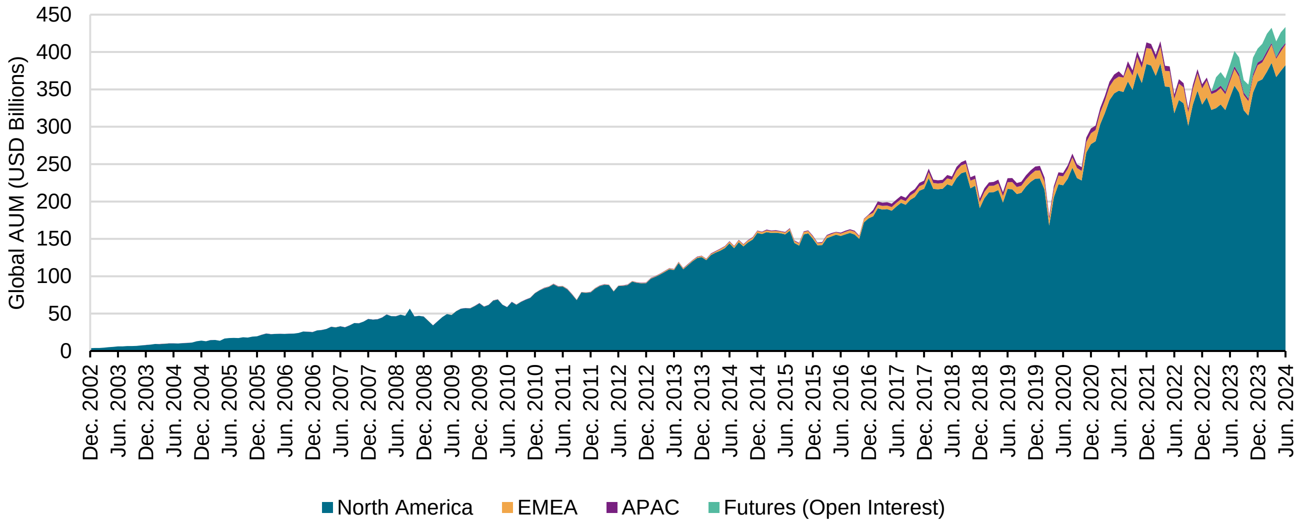
In this paper, we explore how the enduring power of sectors and industries helps to define markets and serve as the framework for myriad investing strategies. Just as the allure of active stock selection persists, so too does evidence that outperformance relative to indices is elusive. Decades of data suggest that **sectors and industries** may sometimes be more effective exposures than single stocks to diversify risk and express views on market and economic conditions around the world.

We will review past performance of sectors through the lens of 21st century market cycles, identify consistent patterns that continue to make sectors useful and highlight the potential of sectors to **improve diversification and performance in global portfolios**.

Sectors and industries concentrate securities with similar business models and risk factors, aligning company types around characteristics that largely transcend borders and make them relevant for investors worldwide.[2] The growing use of sectors and industries among diverse investor types in a wide and growing array of liquid index-based strategies and holding periods is reflected in asset levels for related exchange-traded funds (ETFs; see Exhibit 2). This paper examines historical sector and industry index performance and tests **strategic** long-term use of one or more sectors to gain consistent exposure or correct an unintended bias, as well as **tactical** use with the intent of adjusting allocations depending on market or economic conditions. The outcomes reaffirm the enduring power of sectors and industries as building blocks in modern equity allocations.

[2] See Edwards, Tim, Craig Lazzara, Hamish Preston and Francesca Bruna Pipino; "Global Applications of S&P 500 Sectors" S&P Dow Jones Indices, 2018.

Exhibit 2: AUM in Sector or Industry-Linked ETFs and Futures



Sources: S&P Dow Jones Indices LLC, Factset. Data as of June 28, 2024. Past performance is no guarantee of future results. Chart is provided for illustrative purposes. For a full list of ETFs included in the calculation of Exhibit 2, please see Appendix D.

2. GICS®: A Global Taxonomy

Kingdom, phylum, class, order, family, genus, species; many of us remember learning the taxonomic hierarchy that has been a foundation for categorizing over 1.2 million known organisms together in nested groups with similar characteristics since the 18th century. We may not commonly refer to the household dog as *canis lupus familiaris*, but intuitively we know what behaviors our furry friend shares in common with other canines on the block. Similarly with stocks, the comprehensive yet evolving Global Industry Classification Standard (GICS) helps bring order to understanding the business models, economic sensitivities and other characteristics that certain subsets of stocks have in common among tens of thousands of stocks worldwide.

With increasing specificity as categories branch off from the top level, GICS uses quantitative and qualitative rules to place stocks into one of 163 sub-industries, then 74 industries, 25 industry groups and 11 sectors, as shown in Exhibit 3.[3] For example, Harley Davidson generated over 80% of its 2023 revenue from motorcycle & related products sales, placing it in the GICS Motorcycle Manufacturers sub-industry, which itself is part of the Automobiles industry, a subset of the Automobiles & Components industry group, which finally folds into the top-level Consumer Discretionary sector.[4]

[3] Source: S&P Dow Jones Indices LLC. GICS grouping totals as of March 2023 classification changes.

[4] Source: Harley-Davidson 2023 Annual Report.

Exhibit 3: GICS Hierarchy – 11 Sectors, 25 Industry Groups, 74 Industries and 163 Sub-Industries

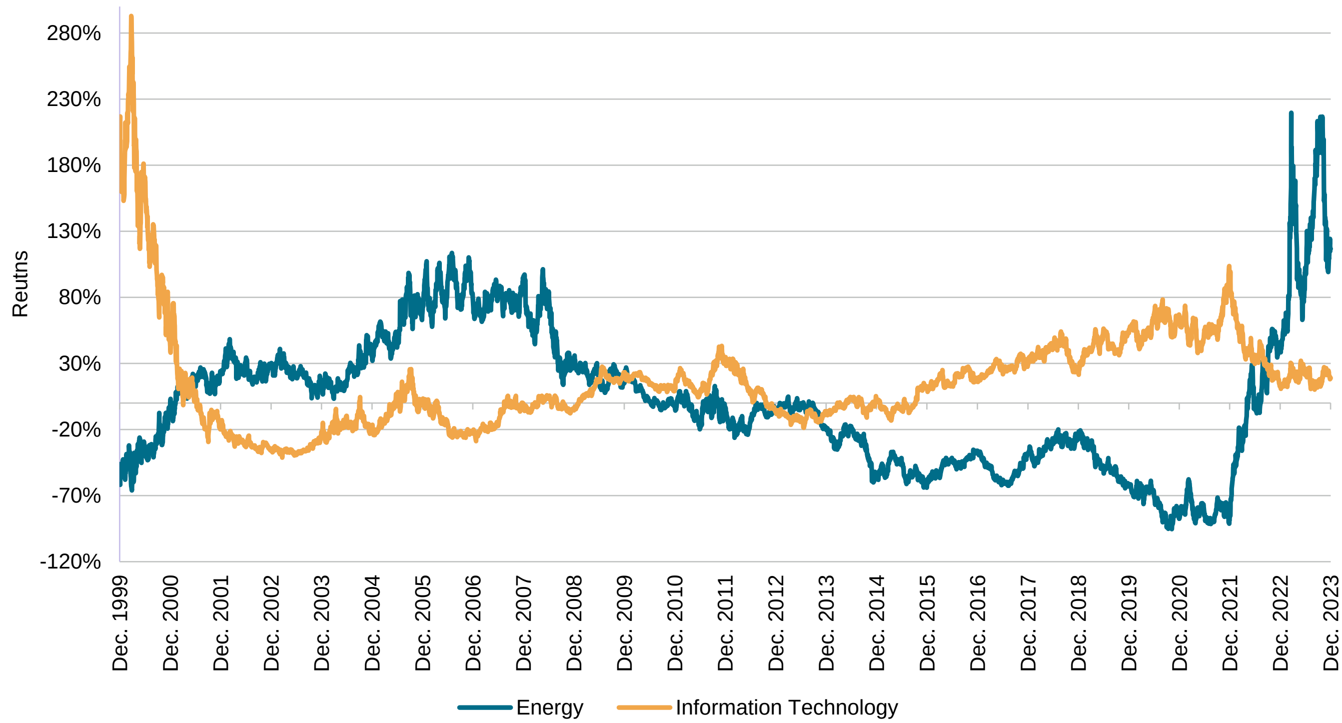
Source: S&P Dow Jones Indices LLC. GICS grouping totals as of March 2023 classification changes. Chart is provided for illustrative purposes.

This way, the **GICS structure aids an investor by making the first valuable assessment** of what kind of business a company is in and therefore how it can be compared to others and what types of global risk factors it is most sensitive to. These classifications have also allowed for the creation of sector and industry indices to support investment products such as ETFs rooted in universally understood categories.

3. Sector Performance Profiles

One of the enduringly elegant features of GICS is that it provides a universal nomenclature, essentially a shorthand for investors and researchers, to compare commonly understood and historically consistent groupings of stocks over time. If one person discusses performance of the "Financials" sector with another, there is an immediate understanding of the types of stocks being mentioned without the need to debate specific tickers. GICS facilitates such frameworks by assigning stocks into mutually exclusive economic groupings, each of which performs and responds to risk factors in ways that are internally aligned, while also externally being quite different from one another. For example, Information Technology and Energy are among sectors that both exhibit relatively high volatility yet are inversely correlated, outperforming at very different periods in the market cycle (see Exhibit 4).

Exhibit 4: Rolling Three-Year Excess Returns of Selected S&P 500 Sectors



Source: S&P Dow Jones Indices LLC. Data based on rolling three-year excess returns of selected S&P 500 sector indices relative to the S&P 500 from Dec. 31, 1999, to Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

4. The Influence of Sectors on Stock Performance

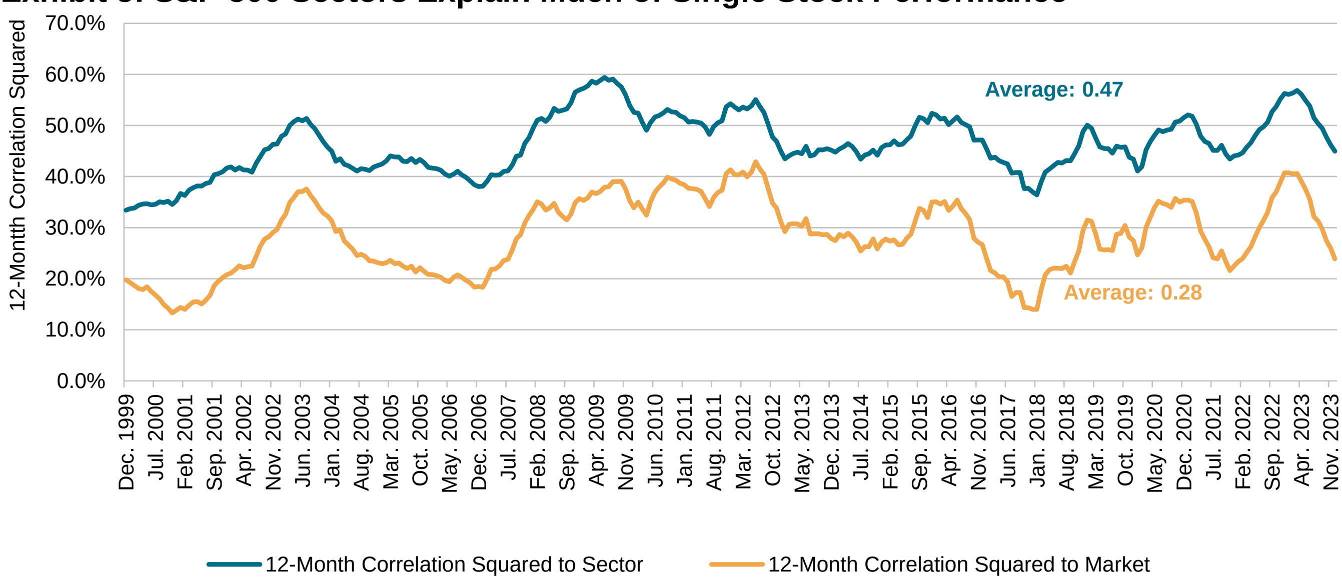
Sector perspectives can play a dual role in portfolio construction and analysis: **as indices, they represent passive exposures to distinct segments of the economy, yet they may also be (and are often) employed in the service of active views**. The aggregate interest from both types of investor appears further to be growing—at least in the case of products tracking S&P DJI's indices (see Exhibit 2).

For a passive investor, the breadth of available sectors and industry indices provides ample choices for building intentional and diversified portfolios. Conversely, active investors can use sector and industry products (such as ETFs) as building blocks in strategic and tactical applications expressing investment views. **The rationale for the active component of sector investing is supported by two factors of interest**, the first of which is well known, the second less so: 1) the extent to which stocks behave similarly to their categorization, which determines the importance of sector and industry bets to returns,[5] and 2) the skewness of stock returns within a given sector or industry, as compared to the skewness among all stocks, or all sector returns—which determines the chances of selecting a “winning” pick.

Revisiting Stock-to-Sector Correlation

The overall fates of sectors and industries can explain much of their constituents’ performance. For example, on average so far this century, **sector membership has statistically accounted for roughly half of the average S&P 500 constituent’s daily returns** (see Exhibit 5).[6]

Exhibit 5: S&P 500 Sectors Explain Much of Single Stock Performance



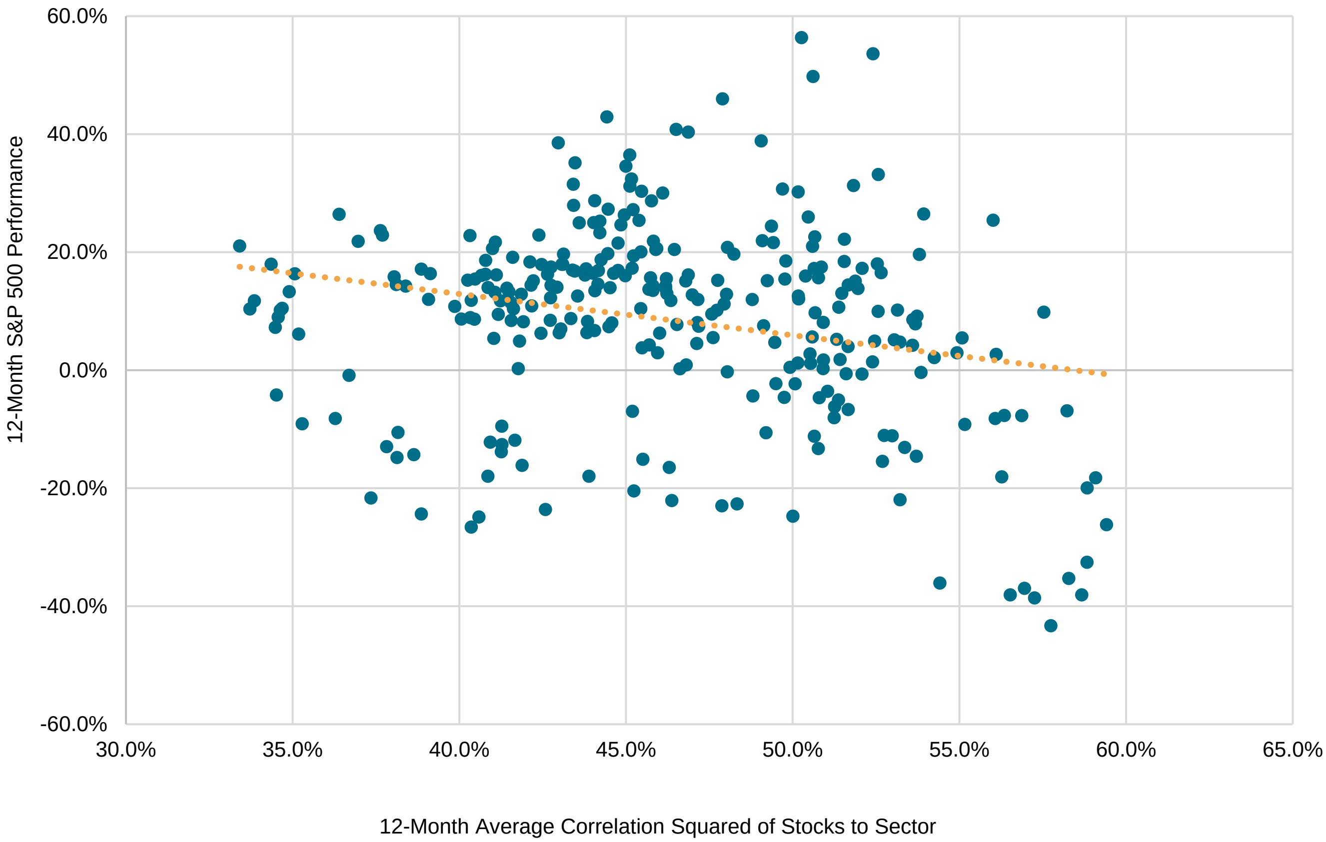
Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, through Dec. 31, 2023. Rolling 12-month data based on correlation of stocks to sectors and the S&P 500, calculated monthly.

A stock’s *industry* classification has proven to be even more important in its return, with a correlation squared average of 0.52 over the same time period. Meanwhile, exposure to the market (in this case, the S&P 1500®) had a correlation squared of 0.27 with single stock price movements. Exhibit 6 further shows that stock-to-segment correlations were particularly elevated during periods of market stress, meaning that **when the environment was most challenging for investors, sector trends were typically more important than the individual circumstances of each stock**.

[5] See Edwards, Tim, Craig Lazzara, Hamish Preston and Francesca Bruna Pipino; “Global Applications of S&P 500 Sectors” S&P Dow Jones Indices, 2018.

[6] Source: S&P Dow Jones Indices LLC. Based on monthly correlation statistics sourced from S&P Dow Jones Indices, from December 1999 to June 2022. The square of the correlation statistic, or “coefficient of determination,” here provides the proportion of variation in one variable that may be explained by variation in another. Stock correlation squared to sector was 0.47 and to market was 0.28.

Exhibit 6: S&P 500 Performance and Average Correlation Squared of Stock to Sector



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, through Dec. 31, 2023. Rolling 12-month data based on correlation of stocks to sectors and the S&P 500, calculated monthly. Past performance is no guarantee of future results.

Offering another perspective, Exhibit 7 provides a sector-by-sector summary of the degree to which each constituent was correlated, on average, to its respective sector, highlighting the levels each also achieved during selected periods of market crisis.

Exhibit 7: Average Correlation Squared of Stock to Sector and Market

Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, through Dec. 31, 2023. Data based on average of monthly correlation squared of stocks to sectors and the S&P 500. Downturn average since 1999 includes peak-to-trough performance during dot-com crash, GFC, COVID-19 emergence and 2022 bear market. See Appendix for date details. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

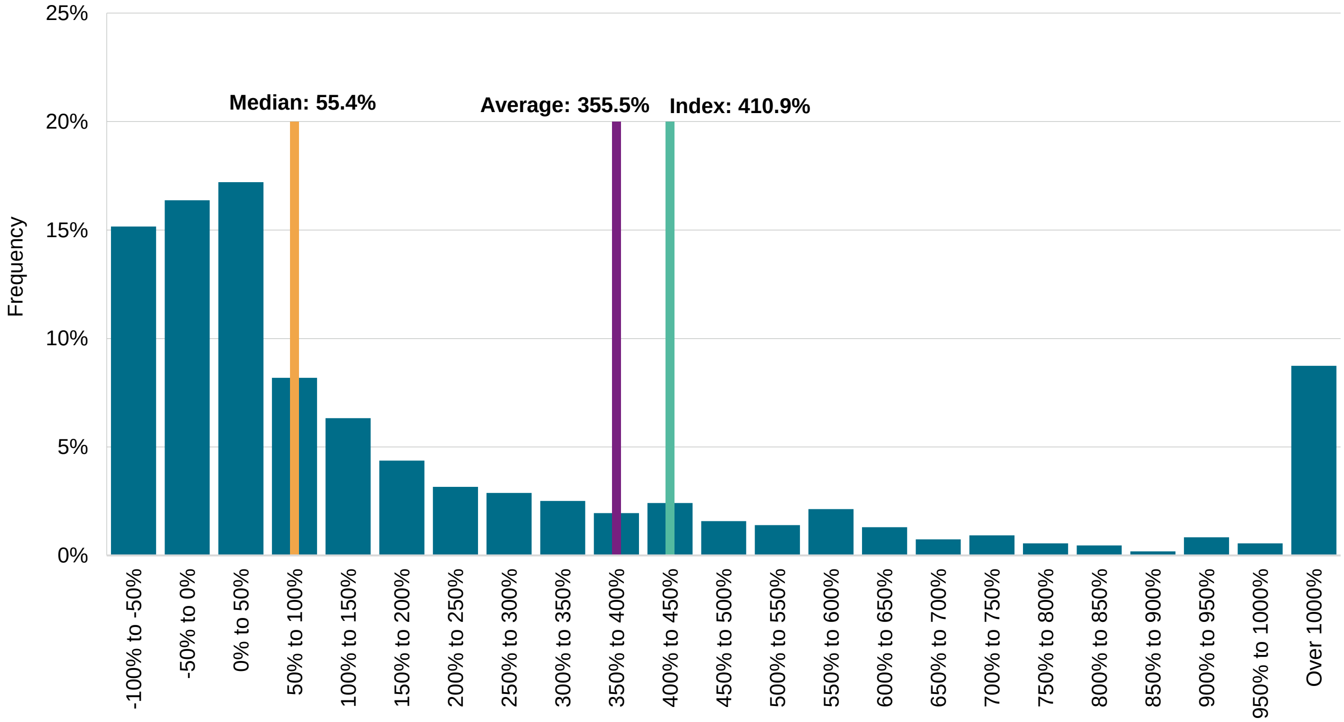
Skill in "stock picking" is purportedly magnified when equities are under pressure. But as the previous exhibits show, **the fortunes of sectors are more important in crises**. This suggests a particularly important question: **are sector-picking skills more valuable?** In contrast to the theoretical zero-sum game of stock versus benchmark performance, there is another dimension when considering the trade-offs between stock picking and sector picking. In the next section, we will see that the scales are not always evenly balanced; instead, they look very different when weighing sectors instead of stocks.

Predator or Prey? The Role of Skew in Stock and Sector Performance

In order to be successful, an active bet requires both the opportunity to outperform—that is, differentiated performance—and a decent chance of selecting an outperformer. The latter leads to an important distinction between the prospects of selecting among sectors, industries or stocks, because **the probability that any one choice might result in outperformance differs greatly.**

The key to distinguishing between the two approaches (stock or sector) lies in a consideration of the skew of available returns. The impact of positively skewed returns on the challenge of selecting outperforming stocks is relatively well known at the broad index level: absent skill or luck (or both), the probability of finding an outperforming stock within a broad-market benchmark is typically well below 50%, particularly when measured over longer-term horizons.[7] For example, as shown in Exhibit 8, in the period from December 1999 through December 2023, **76% of stocks appearing within the S&P 500 underperformed the average stock**. When so few stocks outperform, the chance of selecting a winner is naturally diminished.

Exhibit 8: Distribution of S&P 500 Stock Returns



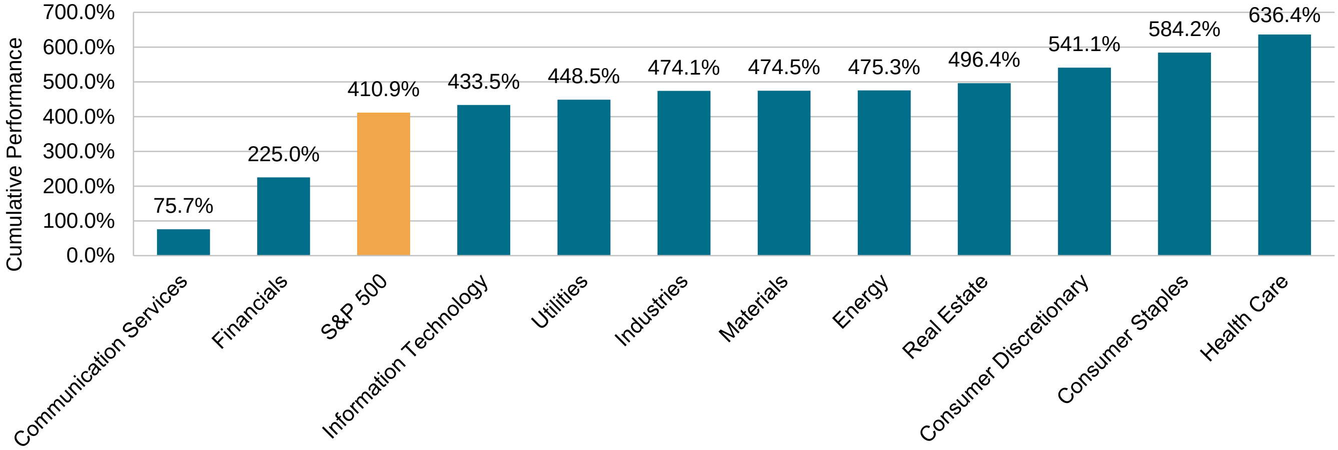
Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, to Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Exhibit 8 provides an example of positive skew among broad benchmark constituent returns; it is not immediately obvious whether a similar skew should be observed within each sector, or across sectors themselves. In fact, **sector returns displayed a negative skew**. More specifically, Exhibit 9 shows that **since December 1999, 8 out of 11 S&P 500 sectors have outperformed the S&P 500 itself**.[8] The fact that a majority of parts (sectors) have outperformed the whole (the benchmark) provides a clear indication that sector picking might be less challenging than stock picking.

[7] "Fooled by Conviction" (2015), "The Agony & Ecstasy" (JP Morgan), the Bessembinder paper ("Do Stocks Outperform Treasury Bills"), and Lazzara, Craig: "The Skew Is Not New" S&P Dow Jones Indices, 2020.

[8] S&P 500 Real Estate index levels available since Oct. 9, 2001, and compared to the S&P 500 over the concurrent period.

Exhibit 9: Cumulative Returns for S&P 500 Sectors



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, through Dec. 31, 2023, except for Real Estate from Oct. 9, 2001, through, Dec. 31, 2023. The S&P 500 total return for the concurrent period was 595.2%. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Of course, the positive skew observed among constituents in Exhibit 8 must come from somewhere, and Exhibit 10 illustrates that it arises from an even more strongly positive skew within most sectors. In every sector, the majority of stocks included between December 1999 and December 2023 underperformed the average stock in their sector, and a majority of constituents underperformed the average S&P 500 constituent. Overall, across all sectors, **an average of 74% of stocks underperformed the average stock in their sector**.

Exhibit 10: Average and Median Stock Returns by Sector

S&P 500 Sector	Sector Total Return (%)	Stock Returns (%)		Percent of Stocks Underperforming	
		Median	Average	Average Stock in Sector	Average Stock in S&P 500
Utilities	449	132	325	62.9	64.5
Consumer Staples	584	199	332	67.2	70.1
Financials	225	60	210	70.2	78.7
Real Estate*	496	48	150	71.4	83.3
Energy	475	36	189	72.3	78.5
Industrials	474	126	562	73.3	67.1
Health Care	636	99	429	76.1	72.6
S&P 500	411	55	356	76.4	76.4
Materials	474	45	263	78.6	84.3
Consumer Discretionary	541	24	403	80.5	79.3
Communication Services	76	17	116	81.4	88.4
Information Technology	433	24	445	83.0	88.9

Source: S&P Dow Jones Indices LLC, FactSet. Data from Dec. 31, 1999, to Dec. 31, 2023, with the exception of S&P 500 Real Estate from Oct. 9, 2001, to Dec. 31, 2023, during which time the average S&P 500 stock return was 420.0%. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

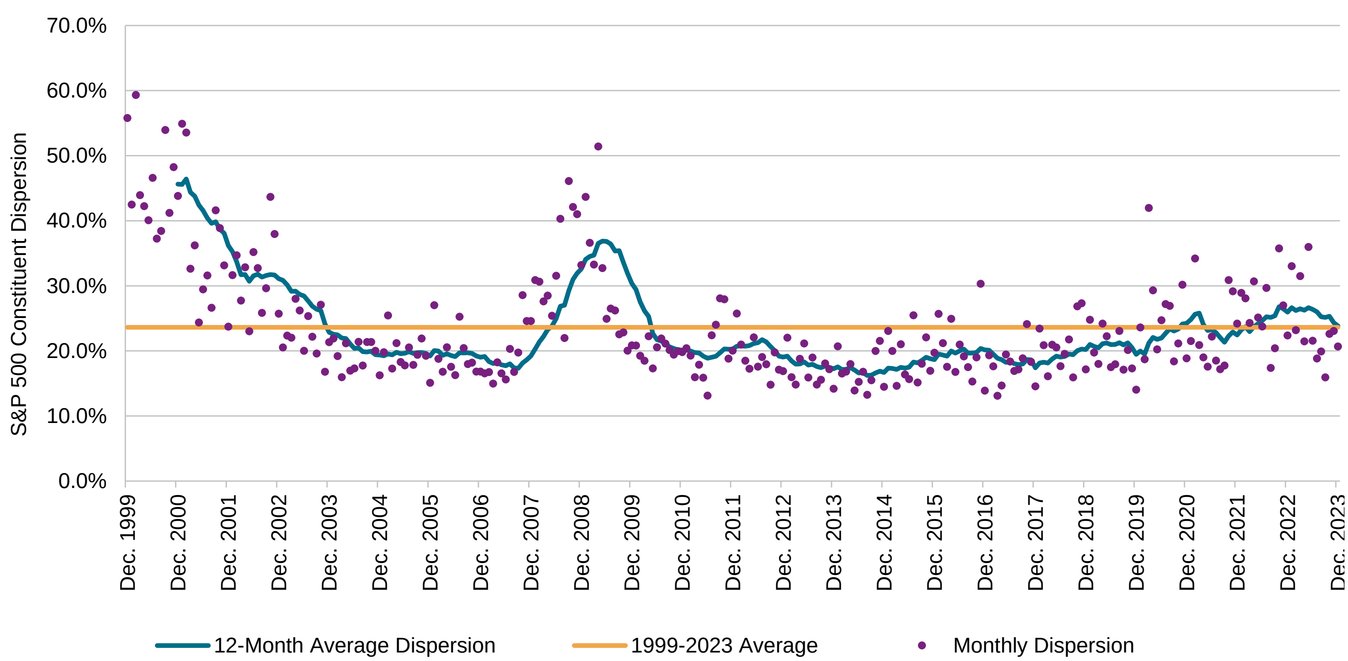
In sectors such as Consumer Discretionary, Communication Services and Information Technology, the landscape for stock pickers was especially dire: more than 80% of stocks underperformed the average stock in their respective sectors.

Managers seeking to outperform the market are faced with the necessity of objectively assessing their own ability to repeatedly identify and overweight stocks from a small pool of winners. The instinct to hold highly concentrated bets in a small number of stocks may be counterproductive in light of consistent evidence that holding all stocks in a sector—or industry—is statistically more likely to be a successful strategy, provided one can pick the right sector and provided one is rewarded for doing so.

5. Stock Skew and Dispersion in Sectors

While measurement of skew helps illustrate the random probability of selecting an outperforming stock from an index universe, an equally important measure of opportunity for active success is dispersion. In essence, dispersion is a measure of the magnitude of performance differences among index constituents. Higher dispersion means a wider gap between outperforming and underperforming constituents. As shown in Exhibit 11, constituent dispersion varies over time and the potential impact of a manager's stock-selection skill rises when dispersion is high, as a larger gap between winners and losers means that active stock selection makes a bigger difference in performance outcomes.

Exhibit 11: S&P 500 Dispersion Levels Vary Over Time

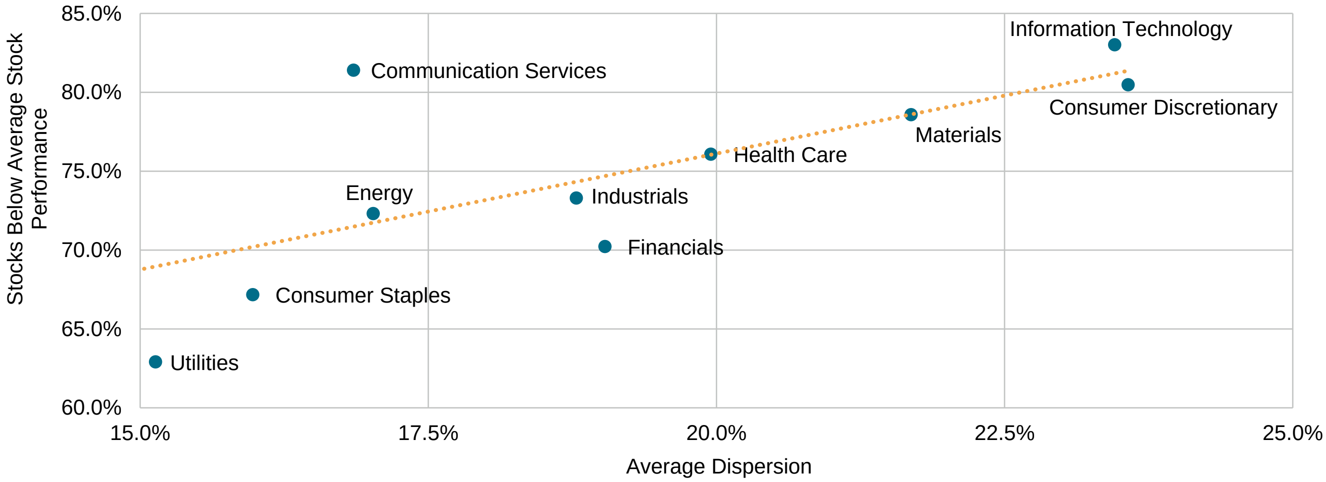


Source: S&P Dow Jones Indices LLC. Monthly data from December 1999 to December 2023. Dispersion is the annualized index-weighted standard deviation of the index constituents' full-month total returns. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

While higher dispersion may offer greater potential rewards to skillful stock pickers, it does not necessarily increase the probability of success and, in fact, may equally indicate a greater negative impact of poor stock selection.

Revisiting dispersion while now being mindful of skew, we find that the path to outperformance may be more often a minefield. Higher dispersion is not necessarily associated with a greater number of stocks beating the index return. In fact, based on past evidence, the opposite is true on average. **In higher-dispersion sectors, a slightly greater proportion of stocks underperformed the average stock return** (see Exhibit 12). In other words, the times when high dispersion makes prospects of selecting winning stocks particularly tempting are precisely the times when such winners tend to be in short supply due to positive skew. In this context, diversification via indices ensures exposure to an entire sector (including its highest-performing stocks) as a means of navigating an uncertain passage while resisting the siren song of pursuing alpha through concentrated bets that may lead to missed opportunities.[9]

Exhibit 12: Stock Dispersion and Proportion of Underperformers by Sector



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, to Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Nested within each of the 11 GICS sectors, industry indices more narrowly categorize stocks and also present many examples of positively skewed returns. Exhibit 13 shows the average and median returns for S&P 1500 industries (limited to those that contained at least 30 constituents), as well as the proportion of stocks in each index that underperform the average stock in their respective industry.

[9] With apologies to Homer for the analogy, despite its aptness. The perils of concentrated portfolios are well covered. See for example https://www.indexologyblog.com/2023/04/10/unwisely-concentrated/.

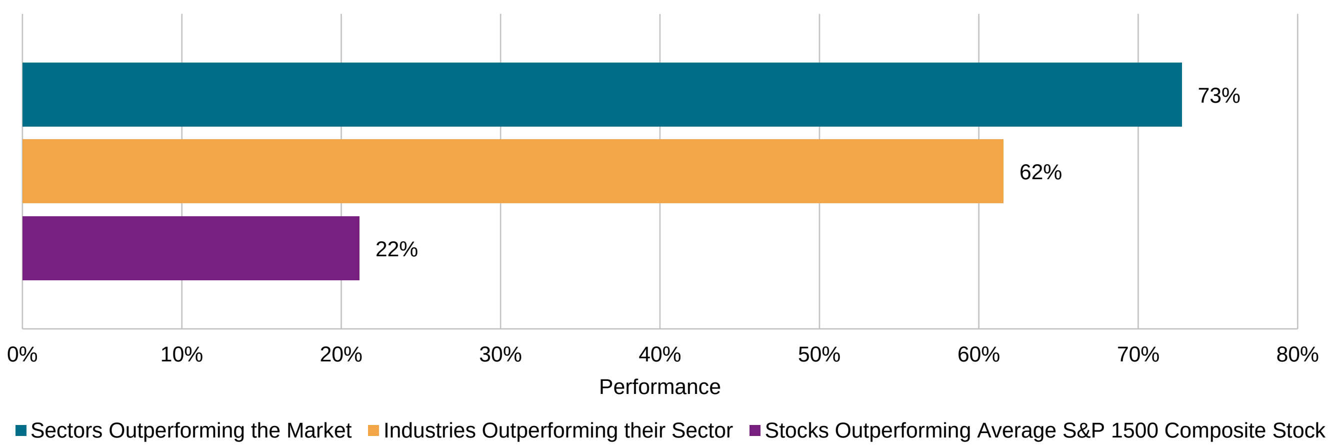
Exhibit 13: Average and Median Stock Returns by Industry

S&P 1500 Industry	Industry Total Returns (%)	Stock Returns (%)		Stocks Underperforming
		Median	Average	Average Stock in Industry (%)
Banks	283	75	129	52.9
Communications Equipment	-15	-17	67	54.0
Biotechnology	812	8	759	55.1
Chemicals	738	144	423	56.6
Software	764	33	534	57.1
Insurance	307	215	481	58.5
Electric Utilities	669	262	372	59.2
Food Products	713	154	318	59.4
Machinery	1397	428	835	63.1
Media	126	-6	60	63.2
Specialty Retail	688	98	659	64.2
Household Durables	807	106	610	68.5
Health Care Providers & Services	2164	186	663	73.8
Commercial Services & Supplies	626	56	422	74.3
Health Care Equipment & Supplies	951	86	578	79.7

Source: S&P Dow Jones Indices LLC. Includes 15 largest current S&P 1500 industries based on number of constituents over data period from Dec. 31, 1999, to Dec. 30, 2023. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Just as sectors on average have outperformed their broader benchmark index, more than half (62%) of industries have outperformed their respective sectors (see Exhibit 14). It appears that as an investor's choice of exposures becomes more granular as they move from sectors to single stocks, the frequency of outperformance may decrease considerably.

Exhibit 14: Sector, Industry and Stock Outperformance versus Benchmark Universe



Source: S&P Dow Jones Indices LLC. Data available from Dec. 31, 1999, to Dec. 31, 2023. Based on S&P 500 sectoral performance from Dec. 1999 except Real Estate (counted as an underperforming sector). Single stock performances based on total return in U.S. dollars during the period of index inclusion, as compared to the S&P 1500 Composite sample average. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

6. Modified Equal Weighting in Select Industries

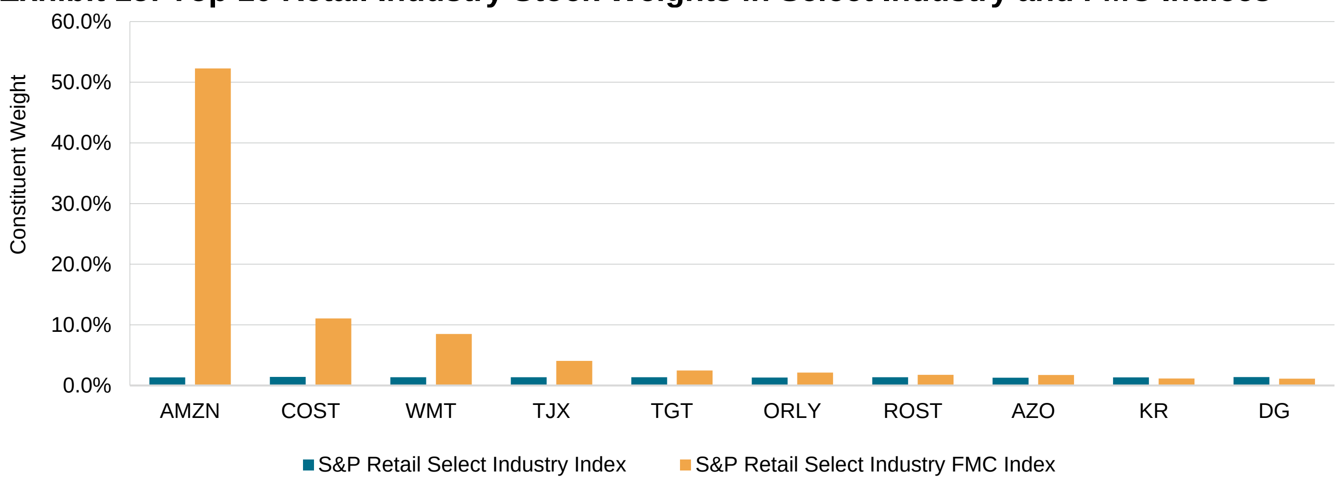
When there is an expectation of a positively skewed environment where the outperformance of a few big outliers drives up the market average, it becomes important to ensure participation. Absent any information about which constituents will eventually beat the benchmark, there is no justification to weight one constituent higher than another. In such instances, an equal-weighted approach may be appropriate to maximize exposure to eventual outperformers without prior knowledge of which ones they'll be.

The skew of stock returns within individual sectors or industries, when combined with the potential concentration levels that can arise in simple market-capitalization-weighting schemes, may lead some investors to periodically consider shifting to alternative weightings, such as equal weighting at the level of industries.

S&P DJI's most popular range of industry-level indices for U.S. equities, the S&P Select Industry Indices,[10] use equal or capped weightings at the security level to reduce concentration and thus mitigate the impact of positive skew.

The impact of these two weighting approaches over time are starkly visible through comparison of stock weightings in each index series. In Exhibit 15, for example, we show weightings of the top 10 stocks in the market-cap-weighted S&P Retail Select Industry Float-Adjusted Market Cap (FMC) Index and their weights in the (closer to equal weight) S&P Retail Select Industry Index.[11]

Exhibit 15: Top 10 Retail Industry Stock Weights in Select Industry and FMC Indices



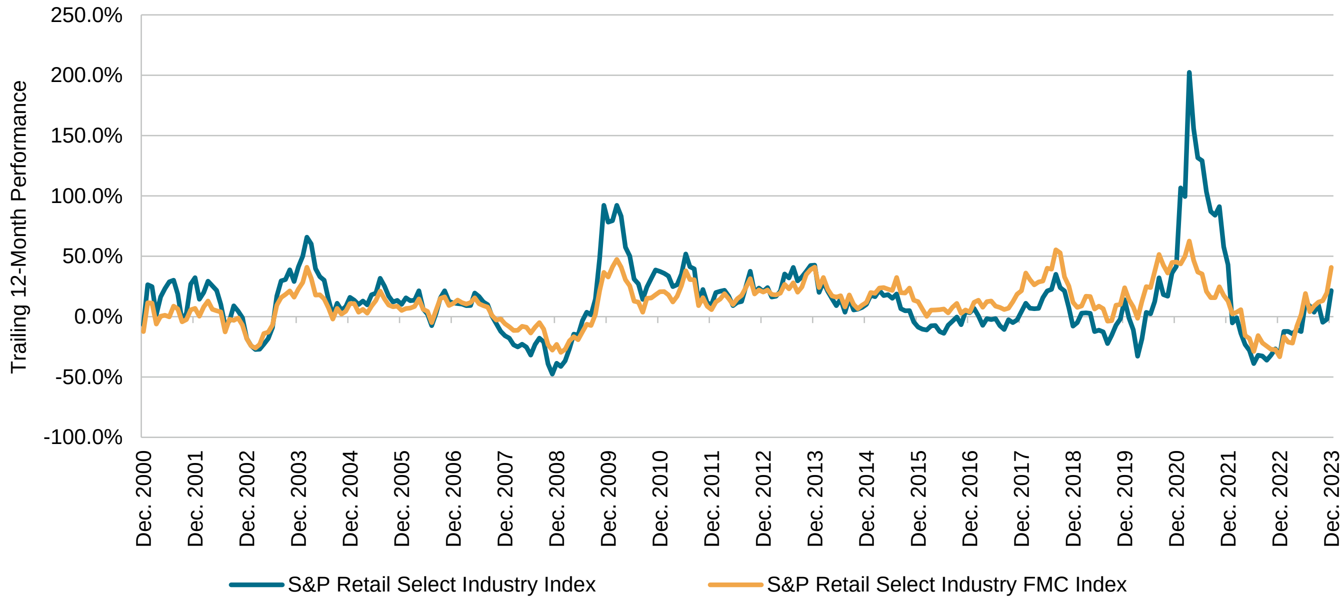
Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

[10] For details, refer to the index methodology.

[11] Retail is selected in this illustration due to the presence of a constituent with more than 50% weight.

Exhibit 16 illustrates the performance impact of different weightings across the same set of stocks through rolling 12-month periods when equal weighting (represented by the S&P Retail Select Industry Index) outperforms relative to market cap weighting (represented by the S&P Retail Select Industry FMC Index).

Exhibit 16: S&P Retail Select Industry and FMC Indices' Trailing 12-Month Returns



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, to Dec. 31, 2023. The S&P Retail Select Industry Index was launched on June 19, 2006. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. All information for an index prior to its launch date is hypothetical back-tested, not actual performance, based on the index methodology in effect on the launch date. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. This back-tested data may have been created using a "Backward Data Assumption." For more information on "Backward Data Assumption" and back-testing in general, please see the Performance Disclosure at the end of this document.

Historically, concentration within an index tends to ebb and flow over time, rising in some periods and mean-reverting in others. When concentration increases, market-cap-weighted indices tend to outperform equal-weight indices, and the opposite is true when concentration decreases. Ultimately, the availability of these two approaches allows an industry investor to choose index exposures that suit their view of the relative opportunity set for larger and smaller stocks.[12]

Data gathered in examining skew generally suggest that the majority of stocks often, but not always, underperform their sector's or industry's average stock return, as well as the total return of the index. When positive skew persists and performance is led by a small number of the largest stocks in an index, market-cap weighting stands out as a straightforward way to reflect index performance. Conversely, reversion of performance among large outperformers

[12] In this, they may be aided by a perspective on how concentrated each industry is, relative to history. See Ganti, Anu, and Craig Lazzara; "Concentration within Sectors and Its Implications for Equal Weighting," S&P Dow Jones Indices, 2022..

can eliminate positive skew and spread performance among a broader set of constituents, favoring equal weighting. Research suggests that performance cycles of the two approaches may be at least partially explained by factor cyclicality, with cap weighting covering the large size and momentum factors, for example, while the weighting scheme and rebalancing effect inherent in equal weighting deliver a smaller-size bias and an anti-momentum tilt.[13] **This makes the choice between cap weighting and equal weighting of stocks a powerful and meaningful decision**. Fortunately for investors, and as noted previously, equal-weighted sector and industry indices and ETFs have become widely available alongside capitalization-weighted versions.

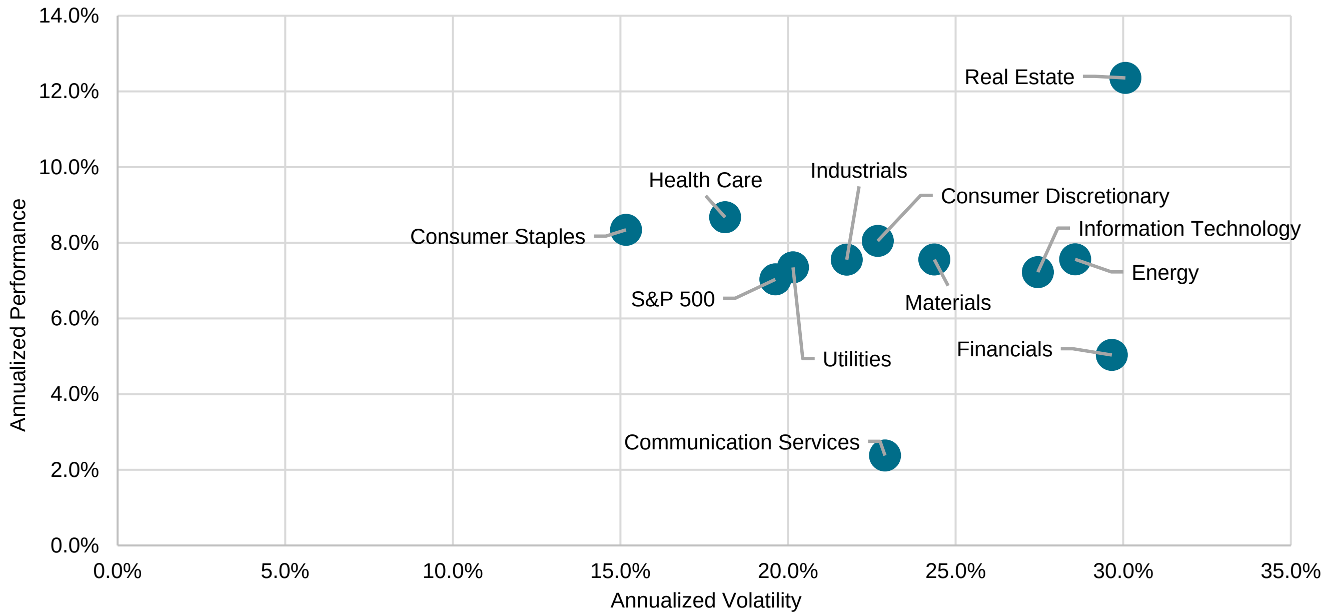
7. Sector Relations: Risk, Return & Correlations

For those tasked with outperforming the market, the fact (see Exhibit 9) that more than half of sectors generated higher returns than the S&P 500 might engender newfound optimism, particularly in comparison to the difficulty of selecting outperforming stocks. The differing market sensitivities, risk levels and potentially complementary correlations among different industries and sectors suggest that they might prove to be useful building blocks for portfolio applications above and beyond concentrated sector picks.

The potential advantages to be gained by tactically re-weighting between sectors are illustrated in theory by the fact that their risk/return profiles can vary greatly. Exhibit 17 shows their distinctive risk/return (volatility) levels over a period of 24 years, while Exhibit 18 compares volatility levels to degree of overall market participation, or beta.

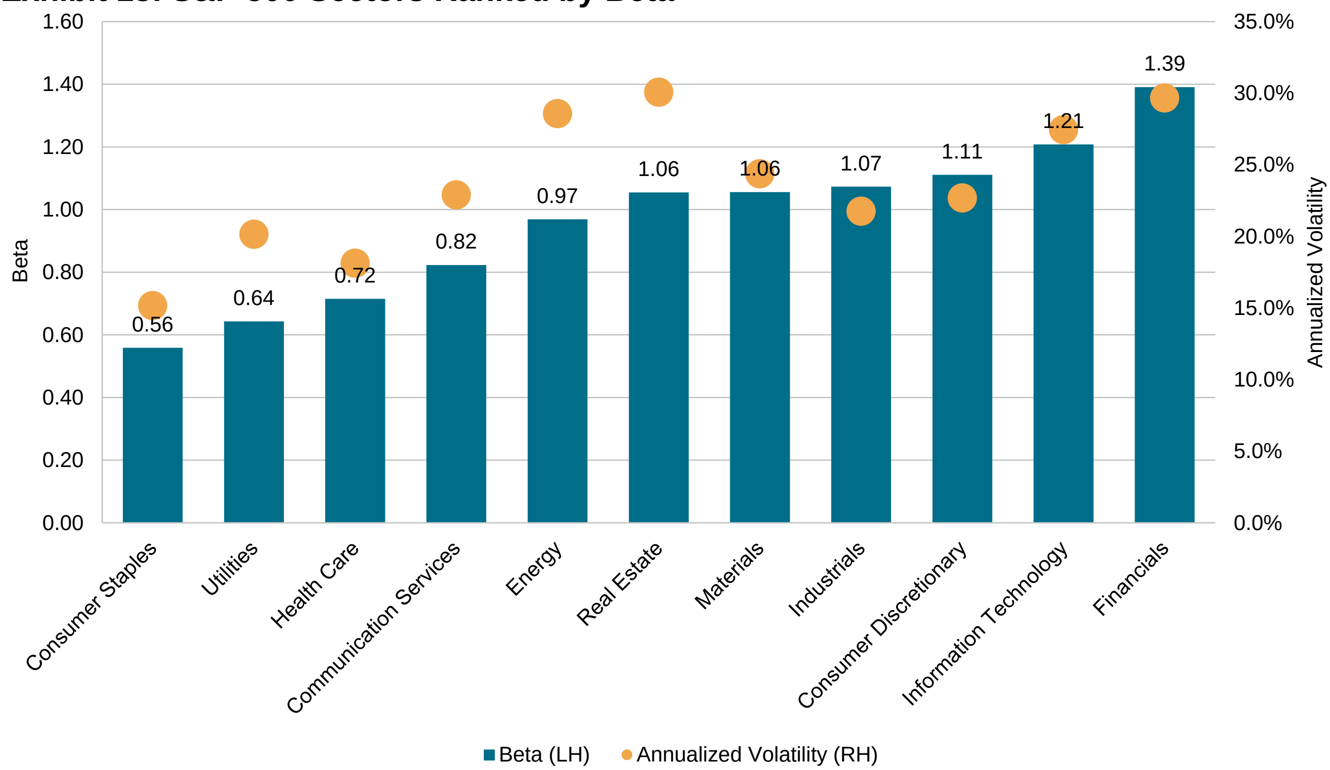
[13] See Edwards, Tim, Craig Lazzara, Hamish Preston and Oliver Pestalozzi; "Outperformance in Equal-Weight Indices," S&P Dow Jones Indices, 2018, p. 14.

Exhibit 17: S&P 500 Sector Risk/Return



Source: S&P Dow Jones Indices LLC. Data based on annualized risk and return of S&P 500 sectors from Dec. 31, 1999, to Dec. 31, 2023, with the exception of S&P 500 Real Estate from Oct. 9, 2001, to Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Exhibit 18: S&P 500 Sectors Ranked by Beta



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, through Dec. 31, 2023, except for Real Estate from Oct. 9, 2001, through Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

As Exhibit 18 shows, Consumer Staples and Utilities, for example, typically display lower volatility than other sectors. Accordingly, the ability of these two sectors to offer calmer waters can make them more attractive in times of market stress. Conversely, sectors such as Information Technology and Financials tend to offer a greater participation in bull market gains, but at the cost of a typically higher level of volatility than their sectoral peers.

Correlation Across Sectors

If some sectors are outperforming the market, then other sectors must be underperforming. Consequently, the performance of the S&P 500 sectors is particularly distinguished in relative terms. Exhibits 19 and 20 show that the relatively low correlations observed on average between the excess returns of sectors and industries, respectively, based on a rolling three-month comparison. As might be suggested by Exhibit 17, there are some natural pairs and opposites: Consumer Staples, Utilities and Health Care tend to swim together, while Information Technology and Consumer Staples, conversely, tend to offer opposite relative performance.

Exhibit 19: S&P 500 Sector Excess Return Correlations

Sector	Communication Services	Consumer Discretionary	Consumer Staples	Energy	Financials	Health Care	Industrials	Information Technology	Materials	Real Estate	Utilities
Communication Services	1.00										
Consumer Discretionary	-0.03	1.00									
Consumer Staples	0.07	-0.24	1.00								
Energy	-0.07	-0.26	0.01	1.00							
Financials	-0.26	0.02	-0.09	0.10	1.00						
Health Care	0.00	-0.29	0.59	-0.02	-0.10	1.00					
Industrials	-0.24	0.03	-0.01	0.15	0.36	-0.11	1.00				
Information Technology	-0.01	0.10	-0.59	-0.34	-0.39	-0.54	-0.30	1.00			
Materials	-0.22	0.08	-0.02	0.25	0.18	-0.11	0.42	-0.25	1.00		
Real Estate	-0.13	0.16	0.08	-0.15	0.24	-0.04	0.12	-0.21	0.09	1.00	
Utilities	0.09	-0.31	0.54	0.09	-0.14	0.40	-0.10	-0.42	-0.10	0.19	1.00

Source: S&P Dow Jones Indices LLC. Data based on correlation of one-month excess returns versus the S&P 500 from Dec. 31, 1999, to Dec. 31, 2023. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 20: S&P Select Industries Excess Return Correlations

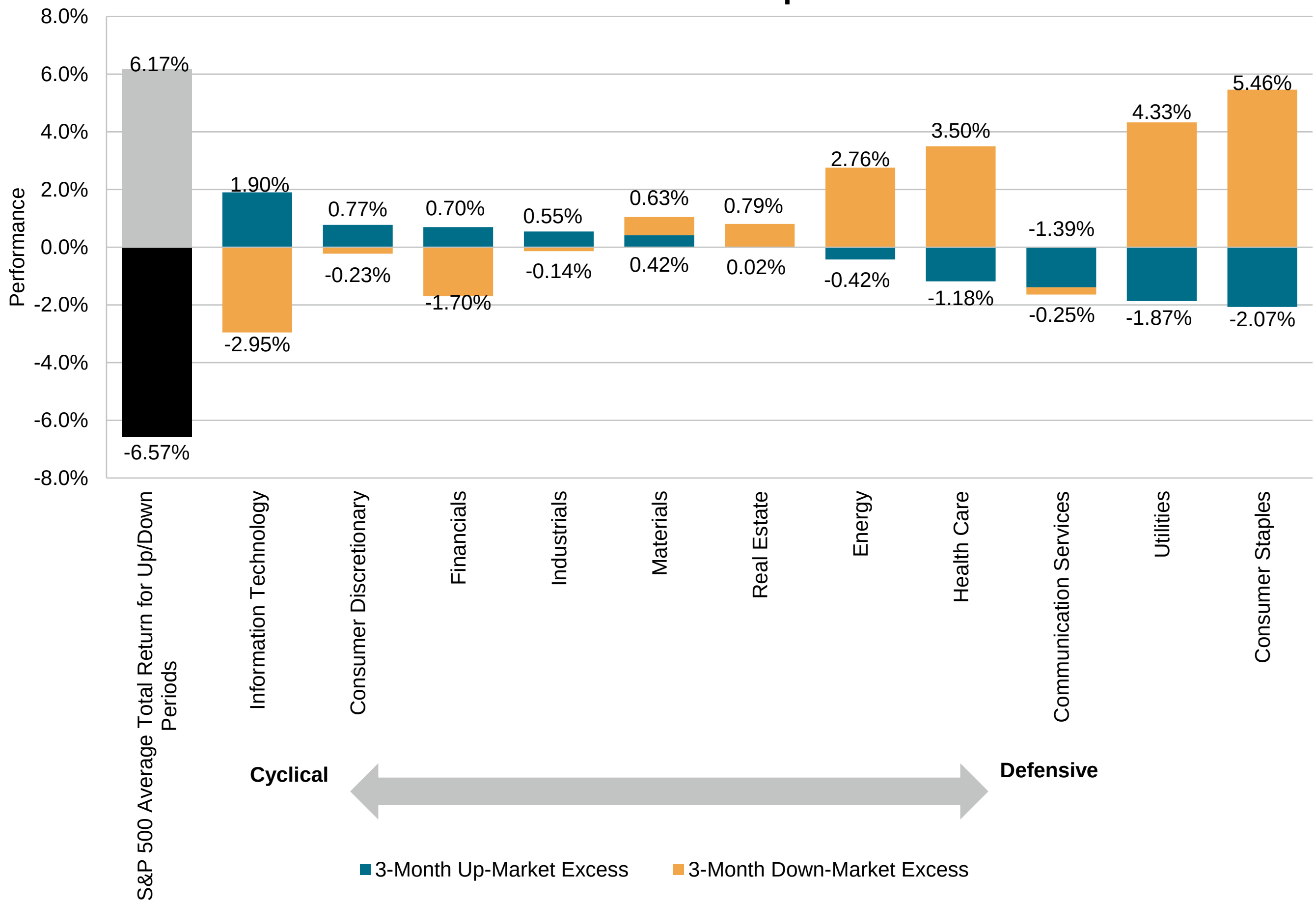
Sector	Aerospace & Defense	Biotechnology	Technology Hardware	Health Care Equipment	Home Builders	Health Care Services	Metals & Mining	Oil & Gas Exploration & Production	Oil & Gas Equipment	Pharmaceuticals	Retail	Semiconductors	Telecom	Transportation	Banks	Capital Markets	Insurance	Regional Banks	Software & Services	Internet
Aerospace & Defense	1.00																			
Biotechnology	-0.01	1.00																		
Technology Hardware	-0.04	0.40	1.00																	
Health Care Equipment	0.19	0.52	0.00	1.00																
Home Builders	0.12	-0.03	0.12	0.03	1.00															
Health Care Services	0.38	0.18	-0.17	0.53	0.19	1.00														
Metals & Mining	0.30	-0.07	0.14	0.00	0.09	0.14	1.00													
Oil & Gas Exploration & Production	0.18	-0.06	-0.01	0.01	0.03	0.10	0.49	1.00												
Oil & Gas Equipment	0.26	0.04	0.19	0.00	0.03	0.06	0.53	0.82	1.00											
Pharmaceuticals	0.07	0.44	-0.17	0.47	-0.09	0.38	-0.14	0.04	-0.05	1.00										
Retail	0.15	-0.02	0.24	0.04	0.47	0.17	0.16	0.10	0.16	-0.08	1.00									
Semiconductors	-0.11	0.41	0.74	0.01	0.11	-0.18	0.10	-0.03	0.12	-0.15	0.16	1.00								
Telecom	-0.10	0.30	0.61	0.04	-0.12	-0.11	0.11	-0.06	0.14	-0.08	0.15	0.59	1.00							
Transportation	0.37	-0.07	0.10	-0.05	0.37	0.14	0.25	0.02	0.05	-0.06	0.33	0.03	-0.10	1.00						
Banks	0.18	0.11	0.11	0.01	0.32	0.07	0.01	0.13	0.18	0.06	0.19	0.03	-0.04	0.42	1.00					
Capital Markets	0.18	0.18	0.37	0.06	0.33	0.14	0.22	0.12	0.18	0.01	0.27	0.26	0.25	0.35	0.51	1.00				
Insurance	0.25	-0.13	-0.10	-0.12	0.15	0.11	-0.02	0.01	0.12	0.00	0.00	-0.26	-0.12	0.20	0.44	0.31	1.00			
Regional Banks	0.19	0.16	0.11	0.06	0.32	0.13	-0.01	0.13	0.17	0.09	0.23	0.02	-0.06	0.45	0.95	0.46	0.42	1.00		
Software & Services	0.20	0.38	0.62	0.32	0.15	0.24	0.10	0.02	0.08	0.09	0.25	0.46	0.42	0.15	0.03	0.31	-0.10	0.06	1.00	
Internet	0.14	0.34	0.50	0.30	0.18	0.24	0.16	0.12	0.15	0.11	0.41	0.41	0.36	0.16	0.04	0.25	-0.14	0.06	0.78	1.00

Source: S&P Dow Jones Indices LLC. Data based on correlation of one-month excess returns versus the S&P 1500 from Dec. 31, 1999, to Dec. 31, 2023. The index launch date for indices in this table range from Jan. 27, 2006, to Feb. 1, 2016. Past performance is no guarantee of future results. Chart is provided for illustrative purposes. All information for an index prior to its launch date is hypothetical back-tested, not actual performance, based on the index methodology in effect on the launch date. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. This back-tested data may have been created using a “Backward Data Assumption.” For more information on “Backward Data Assumption” and back-testing in general, please see the Performance Disclosure at the end of this document.

The differentiated and lowly correlated excess returns of sectors and industries present investors with an opportunity set for seeking outperformance, and there are myriad approaches to sector tilting or rotation. Nonetheless, some common ground can be found in the basic observation that certain sectors have tended to fare better or worse depending on whether the market is rising or falling. Knowing which sectors have historically outperformed in each phase, an investor may seek to forecast where their economy is headed and change their sector allocations accordingly.

For example, simple binary defensive/cyclical categorization can also be effective. Bucketing sectors into one of these two groups based on ranking their risk attributes and their excess returns during rising or falling markets (see Exhibit 21) can allow for rational tilts based on owning sectors that offer relatively better performance in each environment.

Exhibit 21: Sector Excess Performance in 3-Month Up and Down Periods



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, through Dec. 31, 2023, except for Real Estate from Oct. 9, 2001, through Dec. 31, 2023. Excess return for S&P 500 sectors versus the S&P 500 over rolling periods of 63 trading days (three months). Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

In the following section, we explore performance of sectors and blends of sectors through major market expansions and contractions since the turn of the 21st century, illustrating the power of sector-based approaches to navigating broader market cycles. We will look closer during seven sequential periods (see Exhibit 22) of differing market environments.[14]

Exhibit 22: Major Market Periods since December 1999

Market Period	Beginning & End Dates	S&P 500 Total Return (%)
The Dot-Com Crash of 2000	Sept. 1, 2000–Oct. 9, 2002	-47.4
Post-Crash Recovery	Oct. 9, 2002–Oct. 9, 2007	120.7
Global Financial Crisis (GFC)	Oct. 9, 2007–March 9, 2009	-55.3
Post-GFC Bull Market	March 9, 2009–Feb. 19, 2020	528.9
COVID-19 Crash	Feb. 19, 2020–March 23, 2020	-33.8
COVID-19 Recovery	March 23, 2020–Jan. 12, 2022	117.3
2022 Bear Market	Jan. 12, 2022–Oct. 12, 2022	-23.4
2022-2023 Recovery	Oct. 12, 2022–Dec. 31, 2023	36.1

Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, to Dec. 31, 2023. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

We begin with the following five groupings of typically defensive and cyclical sectors.[15]

The **Defensive Blend** combines five lower beta sectors, namely Consumer Staples, Health Care, Energy, Utilities and Communication Services, with the goal of harnessing their generally lower risk while diversifying away some single-sector risks.

The **Defensive Blend of Equal Weight** comprises the same five defensive sectors above, but each sector itself uses a methodology that equal weights the underlying constituents.

The **Cyclical Blend** comprises five sectors on the higher end of the beta spectrum, namely Consumer Discretionary, Industrials, Information Technology, Materials and Financials, which have tended to outperform in rising markets.

The **Cyclical Blend of Equal Weight** is comprised of the same five cyclical sectors above, but each sector itself uses a methodology that equal weights the underlying constituents.

Finally, we include a simple **Equal Weighted Blend** of all individually cap-weighted S&P 500 sectors (10 until the addition of Real Estate in 2001).

[14] Beginning and end dates are chosen based on peak and trough index values for the S&P 500 from Dec. 31, 1999, through June 30, 2022.

[15] For purposes of analysis, Real Estate is excluded not only because its performance generally lies between other sectors are clearly more defensive or cyclical, but also because the S&P 500 Real Estate sector was a relatively recent carve-out from Financials (in 2018) and does not have the same length of index history as its peers.

None of the sector blends described in Exhibit 23 are optimized for a specific investment outcome, thus they are not prescriptive. Instead, the blends are intentionally simple and naïve to any individual investor's objectives.

Exhibit 23: Simple Sector Blend Construction

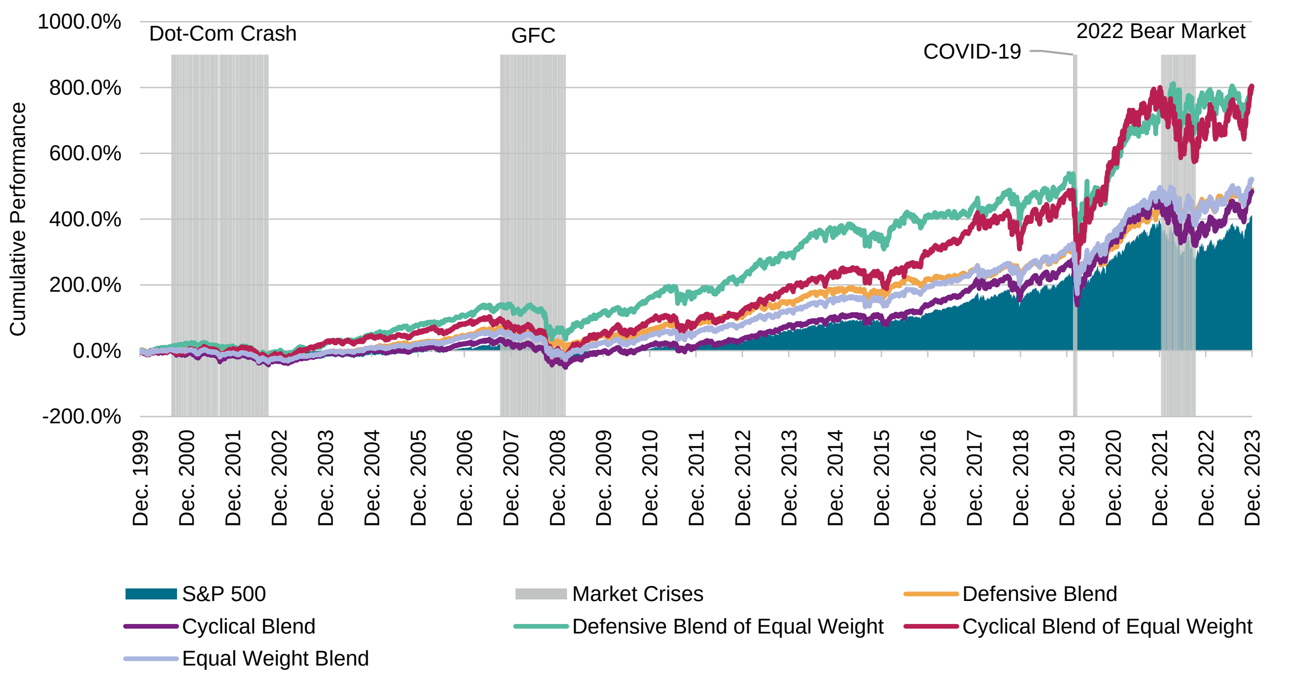
Sector Portfolio	Description
Defensive Blend	Equal-weighted combination of five cap-weighted defensive sectors (Utilities, Energy, Consumer Staples, Health Care and Communication Services) rebalanced monthly.
Defensive Blend of Equal Weight	Equal-weighted combination of five equal-weighted defensive sectors (Utilities, Energy, Consumer Staples, Health Care and Communication Services), rebalanced monthly.
Cyclical Blend	Equal-weighted combination of five cap-weighted cyclical sectors (Information Technology, Financials, Materials, Consumer Discretionary and Industrials), rebalanced monthly.
Cyclical Blend of EW	Equal-weighted combination of five equal-weighted cyclical sectors (Information Technology, Financials, Materials, Consumer Discretionary and Industrials), rebalanced monthly.
Equal Weighted Blend	Equal-weighted blend of cap-weighted S&P 500 sectors, rebalanced monthly*.

Source: S&P Dow Jones Indices LLC. *Equal weighted 10-sectors prior to October 2001 with beginning of Real Estate Sector index levels. Equal weighted 11-sectors including Real Estate for all periods after. Table is provided for illustrative purposes.

Full-Period Summary

While Exhibits 8 and 9 illustrated the cumulative performance of sectors throughout 21st century crises and recoveries, Exhibits 24-25 show how illustrative blends have led to different outcomes through simple yet intuitive combinations that harness sector cyclicality.

Exhibit 24: Cumulative Sector Blends Performance



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, through Dec. 31, 2023. The S&P 500 Equal Weight Sector Indices were launched on June 20, 2006. All data prior to index launch date are back-tested hypothetical data. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure linked at the end of this paper for more information regarding back-tested performance.

Exhibit 25: Periodic and Cumulative Performance of Sectors and Blends

Category	S&P 500 Sector	Dot Com Crash (%)	Dot Com Recovery (%)	Global Financial Crisis (%)	GFC Recovery (%)	COVID-19 2020 Crash (%)	Post-Crash Recovery (%)	2022 Bear Market (%)	2022-2023 Recovery (%)	Jan. 2000-Dec. 2023 Cum. Return* (%)	Jan. 2000-Dec. 2023 Ann. Vol.* (%)
Total Return.	**S&P 500**	**-47.40**	**120.70**	**-55.30**	**528.90**	**-33.80**	**117.30**	**-23.40**	**36.10**	**410.90**	**19.60**
Sector Excess Return	Energy	23.30	157.10	9.90	-451.30	-22.10	74.70	55.00	-27.40	475.30	28.60
	Utilities	-9.80	106.80	12.40	-151.70	-1.80	-52.80	13.80	-28.60	448.50	20.10
	Materials	37.10	73.80	-2.80	-188.30	-2.30	25.70	0.60	-7.70	474.50	24.40
	Financials	16.30	-2.40	-26.40	124.40	-9.10	26.60	-2.40	-8.50	225.00	29.70
	Information Technology	-32.90	31.50	3.00	423.40	2.60	26.10	-7.20	32.20	433.50	27.50
	Consumer Discretionary	13.80	-32.70	-1.50	355.30	2.10	7.50	-7.00	-5.20	541.10	22.70
	Consumer Staples	61.40	-64.00	26.60	-173.80	9.80	-49.40	13.10	-24.30	584.20	15.20
	Health Care	27.60	-67.90	17.30	-40.80	5.90	-29.00	13.80	-21.80	636.40	18.10
	Industrials	7.20	27.80	-8.40	51.50	-7.90	7.10	4.20	1.50	474.10	21.80
	Communication Services	-17.80	38.20	7.60	-264.20	5.20	-22.00	-15.20	18.20	75.70	22.90
	Real Estate*	-	80.60	-17.80	205.80	-3.90	-13.50	-5.60	-12.60	496.40	30.10
Total Return.	**S&P 500**	**-47.40**	**120.70**	**-55.30**	**528.90**	**-33.80**	**117.30**	**-23.40**	**36.10**	**410.90**	**19.60**
Blend Excess Return	Defensive Blend	12.90	23.50	15.20	-225.40	-0.90	-16.50	14.60	-17.00	489.70	16.70
	Cyclical Blend	3.90	20.30	-8.50	137.70	-2.90	19.90	-2.30	2.70	482.80	22.40
	Defensive Blend Equal Weighted	16.50	87.20	11.70	-157.10	-3.60	-6.00	15.20	-20.90	793.60	17.90
	Cyclical Blend Equal Weighted	14.50	69.80	-9.50	209.30	-7.10	39.50	-0.20	-3.50	801.20	23.40
	Equal Weighted Blend	9.60	29.00	0.20	-39.00	-2.10	0.00	4.80	-7.70	520.20	19.10

Source: S&P Dow Jones Indices LLC. Cumulative data from Dec. 31, 1999, to Dec. 31, 2023, except Real Estate from Oct. 9, 2001, to Dec. 31, 2023. Periodic data from Sept. 1, 2000, to Dec. 31, 2023. The S&P 500 Equal Weight Sectors indices were launched on June 20, 2006. All data prior to index launch date are back-tested hypothetical data. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure linked at the end of this paper for more information regarding back-tested performance.

Some key observations stand out when we look at the cumulative results for sectors and hypothetical blends. Over the entire sequence of crises and recoveries from 2000 through 2023:

- During each of the eight crisis and recovery periods, an average of 6 out of 11 sectors outperformed.
- Of the 11 sectors, 8 outperformed the S&P 500 on a cumulative basis.
- All five of the sector blends outperformed on a cumulative basis.
- Sector blends produced less volatile performance than their individual components, underscoring the historical diversification benefits of combining sectors in a portfolio.
- Across the eight periods examined from September 2000 through December 2023, the average defensive sector has outperformed in falling periods 75% of the time, and the average cyclical sector has outperformed in rising markets 70% of the time.

8. Conclusion

Sectors and industries have endured and indeed grown as popular tools for investors due to features including their precision of targeted exposure, low correlation to one another and utility to express active views on market and economic conditions.

Sector taxonomy (GICS) has allowed for the creation of new indices and, in turn, investment products and sector- or industry-based investment strategies. For global investors, S&P 500 Sectors remain powerful and efficient tools to strategically adjust for home biases, make tactical tilts and harness the diversification qualities that have allowed simple sector blends to outperform the majority of single stocks and the broader index itself.

The changes in sector leadership through time are not random, but instead evidence clear patterns of alignment with different market regimes. Harnessing these patterns and relationships has been a foundation of sector investing for decades and creates a framework with enduring utility.

Like species through time, thousands of stocks may come and go, adapting and thriving or petering out in extinction. Single securities may follow unpredictable paths, but sectors and industries endure because they bring order, enable better decisions and improve understanding of the equity ecosystem for investors around the world.

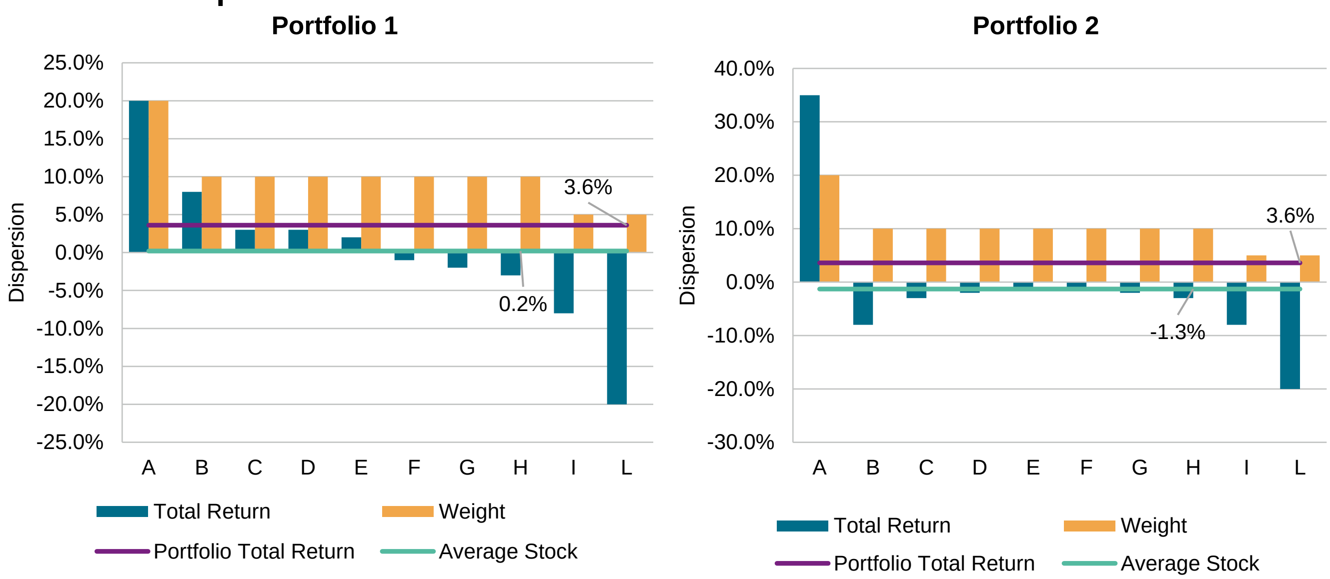
9. Appendices

Appendix A – Dispersion and Skew Illustration

To unravel how higher dispersion portfolios can actually present less opportunity for stock pickers, we offer the following simple illustration in Exhibit 26.

Consider two hypothetical 10-stock portfolios, Portfolio 1 and Portfolio 2, with weights and stock-level total returns below:

Exhibit 26: Dispersion in Two Illustrative Portfolios



Both portfolios are hypothetical.
Source: S&P Dow Jones Indices LLC. Charts are provided for illustrative purposes.

Both portfolios have the same total return, 3.6%. However, they differ in that Stock A has a higher return in Portfolio 2 while Stocks B, C, D and E are negative instead of positive.

As results indicate in Exhibit 27, Portfolio 2 has higher dispersion (16%) than Portfolio 1 (10%). Would it be wise to argue that higher dispersion makes Portfolio 2 the preferred hunting ground for stock pickers? Positively skewed returns suggest otherwise. In Portfolio 1, 50% of the stocks outperform the average stock return of 0.20%, but Portfolio 2’s -1.4% average return is surpassed by only 10% of the stocks. Outside of a manager possessing the skill to pick the one winner from Portfolio 2, others should wade carefully into higher-dispersion waters lest they fall prey to what lurks beneath.

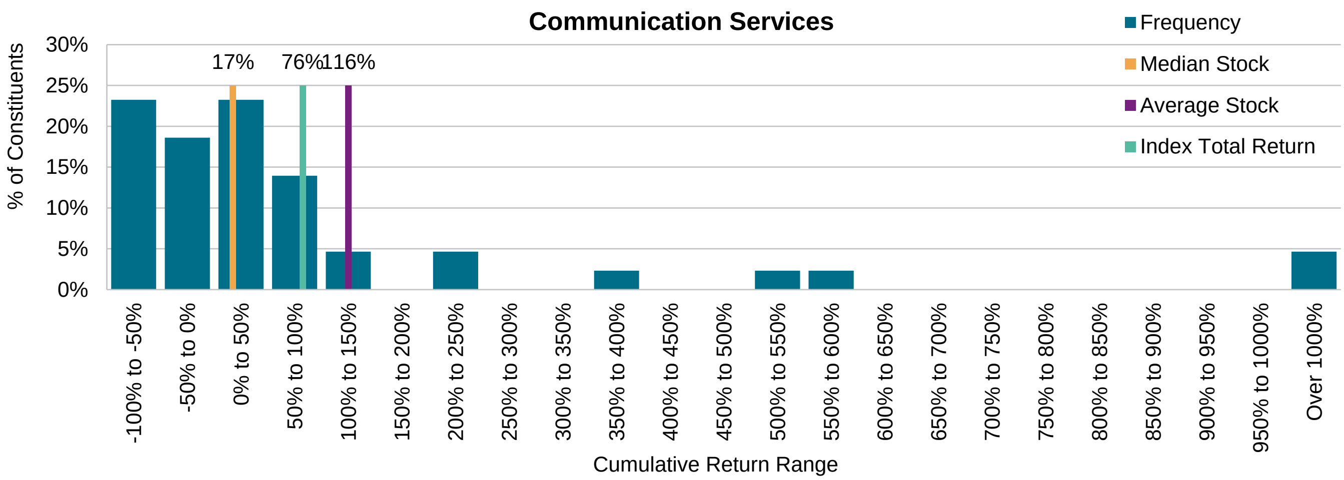
Exhibit 27: Illustrative Portfolio Comparisons

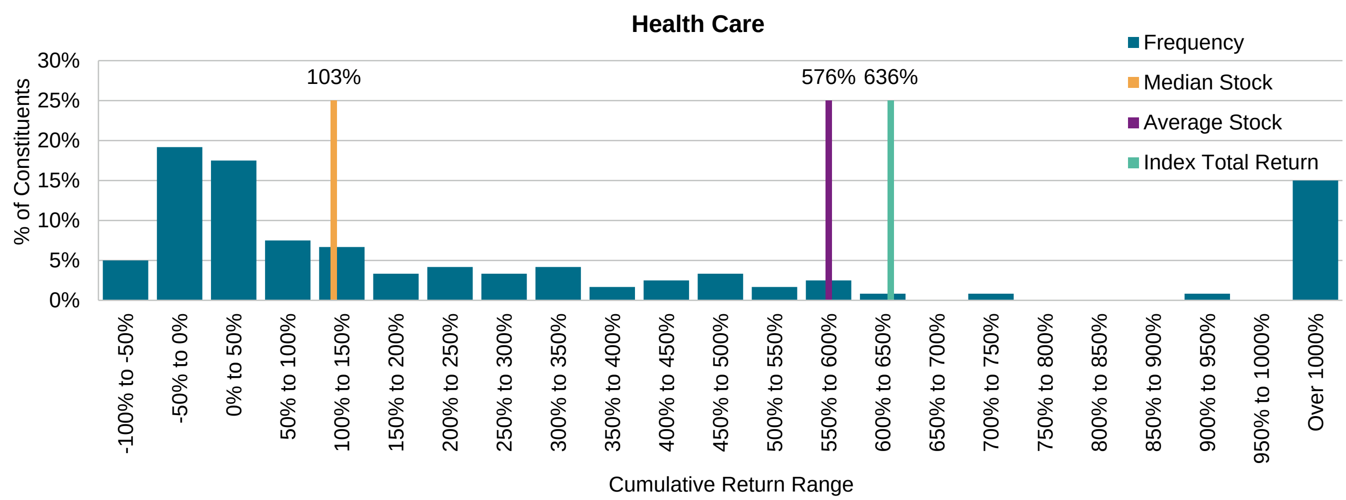
Stock	Portfolio 1		Portfolio 2	
	Total Return (%)	Weight (%).	Total Return (%).	Weight (%)
A	20.0	20.0	35.0	20.0
B	8.0	10.0	-8.0	10.0
C	3.0	10.0	-3.0	10.0
D	3.0	10.0	-2.0	10.0
E	2.0	10.0	-1.0	10.0
F	-1.0	10.0	-1.0	10.0
G	-2.0	10.0	-2.0	10.0
H	-3.0	10.0	-3.0	10.0
I	-8.0	5.0	-8.0	5.0
J	-20.0	5.0	-20.0	5.0
Total Return		3.6		3.6
Average Stock		0.2		-1.3
Dispersion		10.0		16.3
% Stocks > Average		50.0		10.0

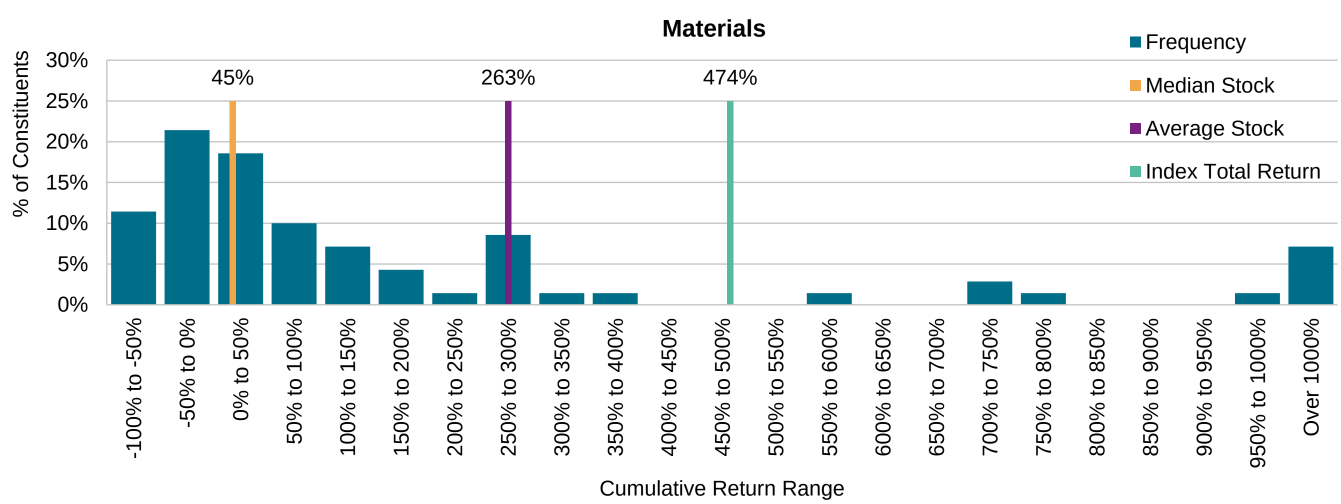
All portfolios are hypothetical.
Source: S&P Dow Jones Indices LLC. Table is provided for illustrative purposes.

Appendix B: Skew among S&P 500 Sector Constituents

Exhibit 28: Performance Skew by Sector

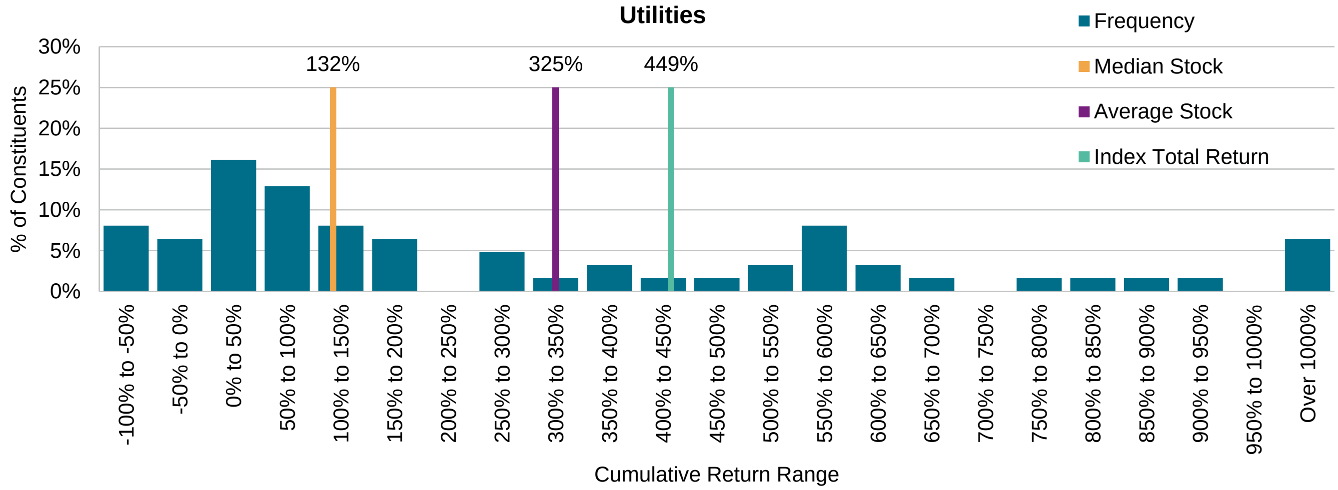


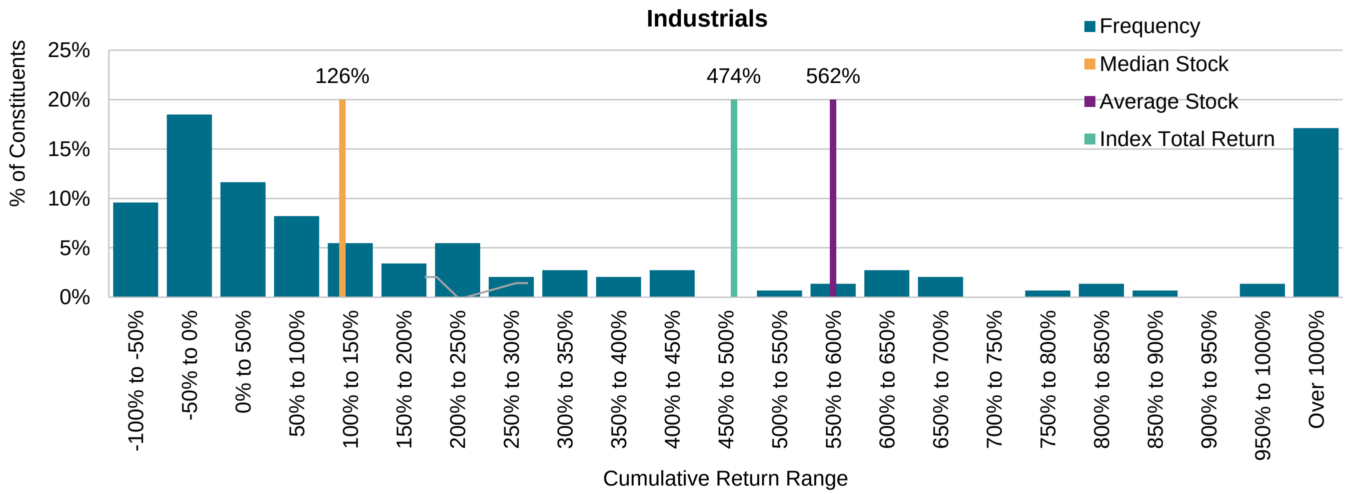


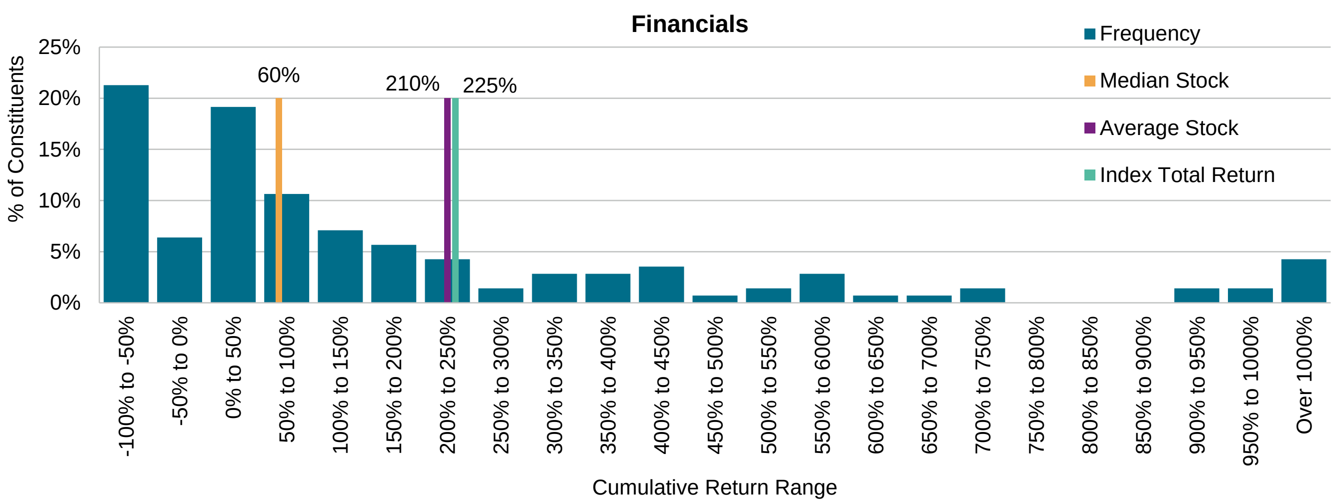


Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, to Dec. 31, 2023. Past performance is no guarantee of future results. Charts are provided for illustrative purposes.

Exhibit 28: Performance Skew by Sector (cont.)

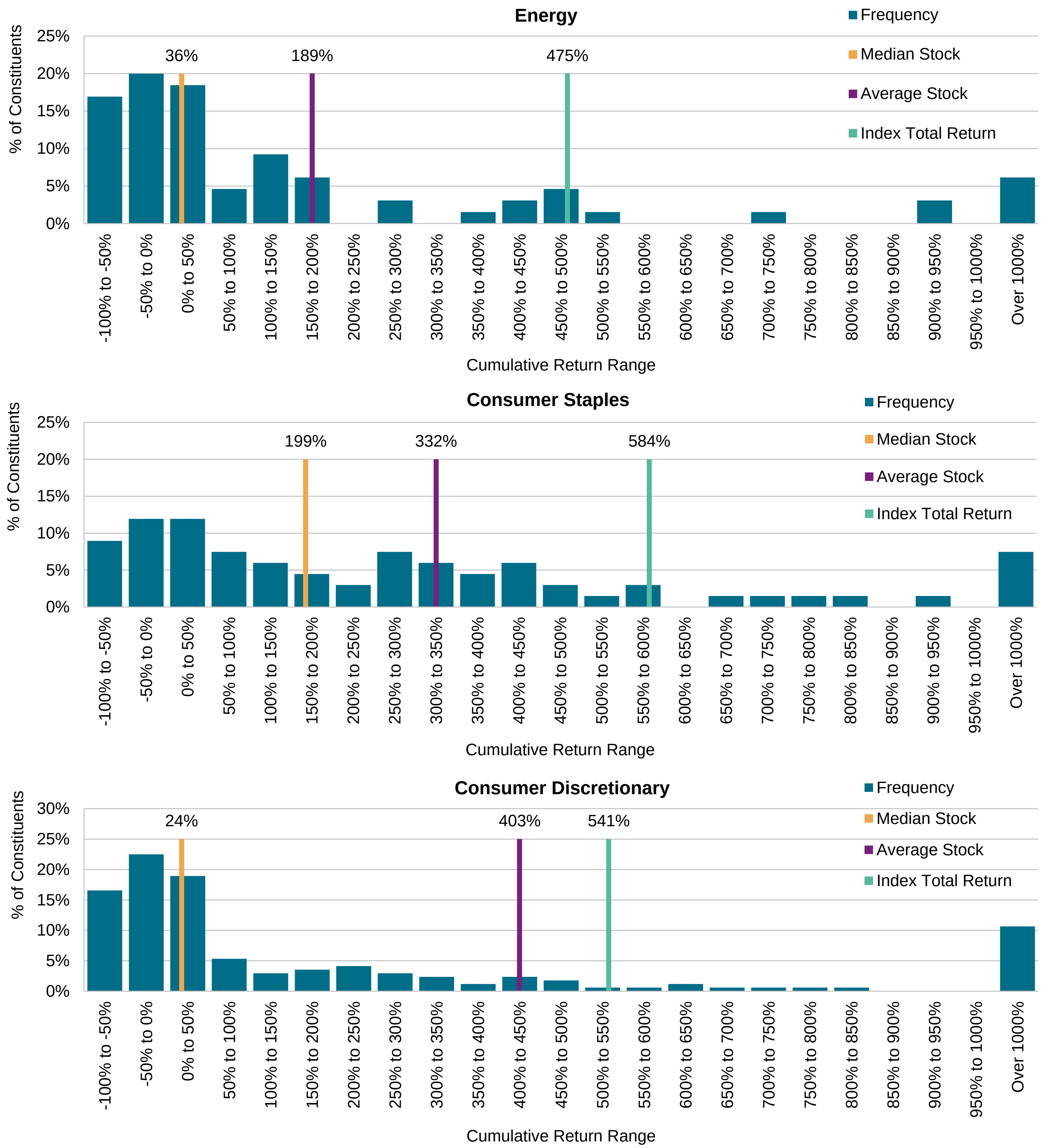






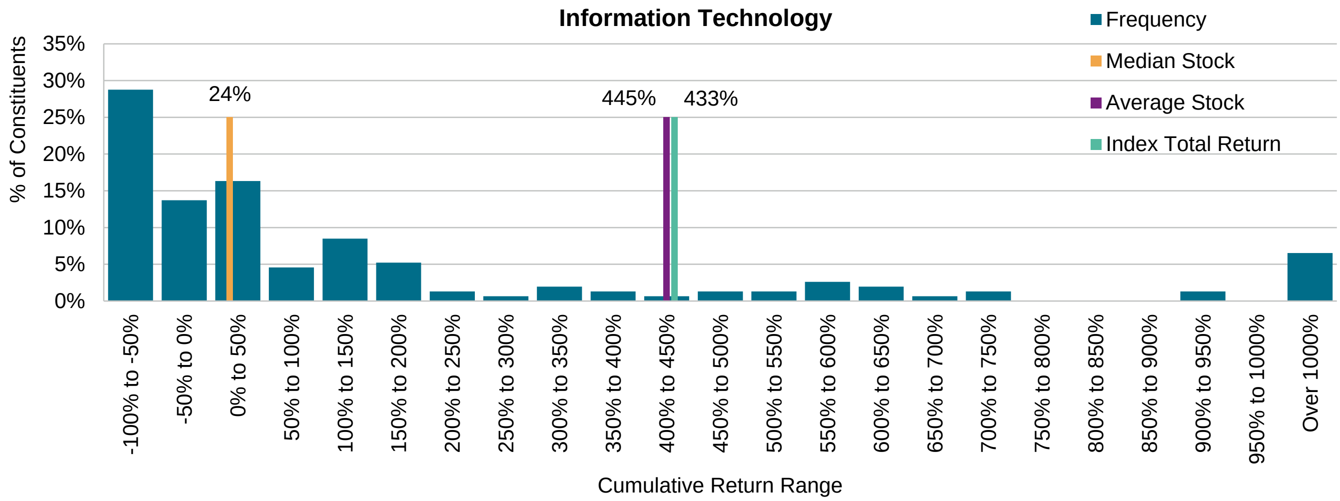
Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, to Dec. 31, 2023. Past performance is no guarantee of future results. Charts are provided for illustrative purposes.

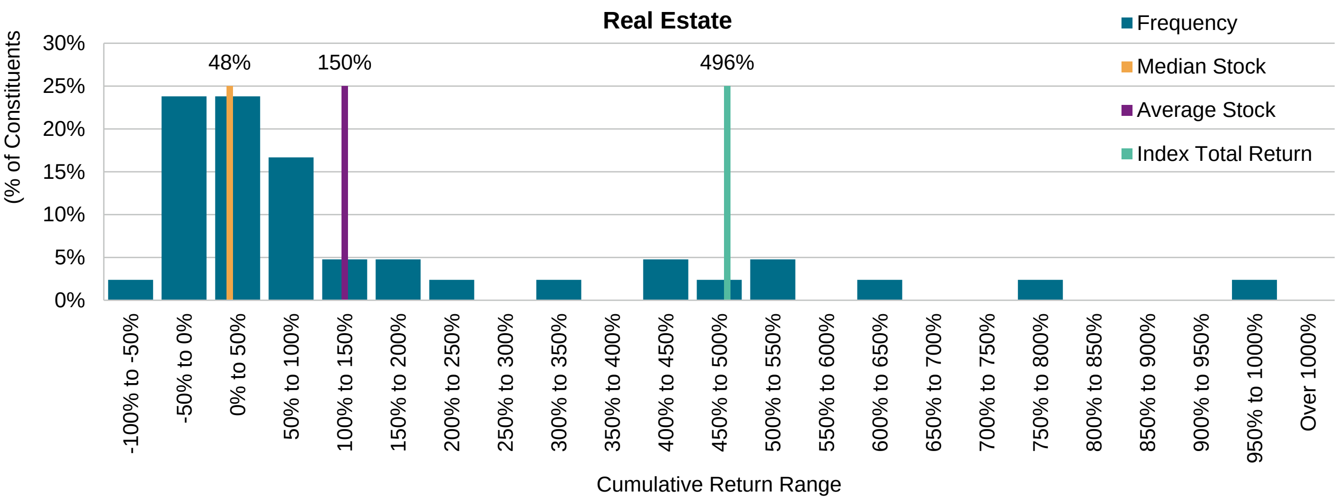
Exhibit 28: Performance Skew by Sector (cont.)



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, to Dec. 31, 2023. Past performance is no guarantee of future results. Charts are provided for illustrative purposes.

Exhibit 28: Performance Skew by Sector (cont.)





Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1999, to Dec. 31, 2023. Past performance is no guarantee of future results. Charts are provided for illustrative purposes.

Appendix C: Crisis and Recovery Case Studies

With daily index levels for individual sectors as well as the sector blends, we can take a deeper dive into the performance of each through four major crises and three periods of recovery in sequence since December 1999.

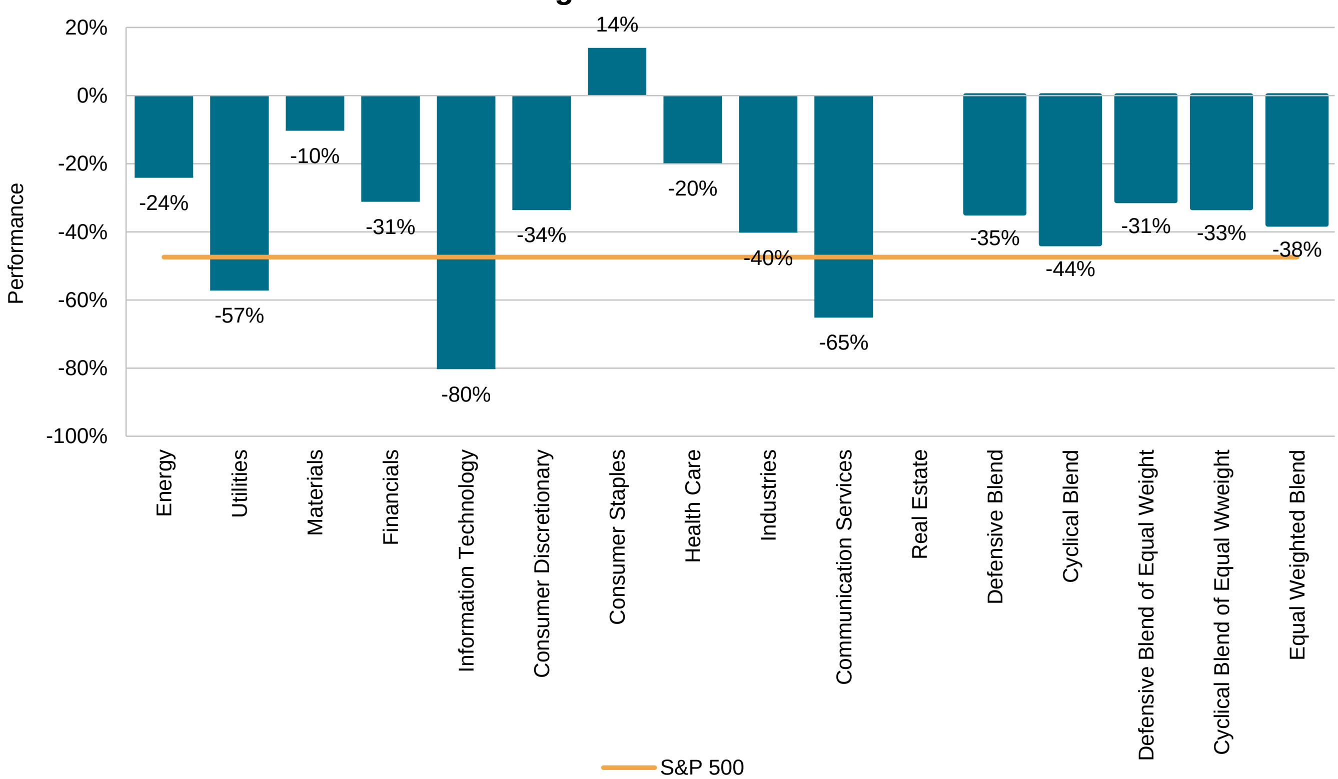
Walk Through the Wild: Two Decades of Crisis and Recovery

Dot-Com Crash of 2000

After peaking on Sept. 1, 2000, the S&P 500 began a 47% decline over the subsequent 25 months, mostly due to the Information Technology sector's precipitous 80% drop over the same period combined with its position as the largest sector weight in the benchmark.

Exhibit 29 details how 9 out of 10 sectors declined over this period, with only Consumer Staples remaining in positive territory with a 14% return. However, on a relative (excess return) basis, 7 out of 10 sectors outperformed the S&P 500. Among the five sector blends, all outperformed the S&P 500 as well, with the Defensive Blend of Equal Weight leading at 24% excess performance.

Exhibit 29: Sectors and Blends During the Dot-Com Crash

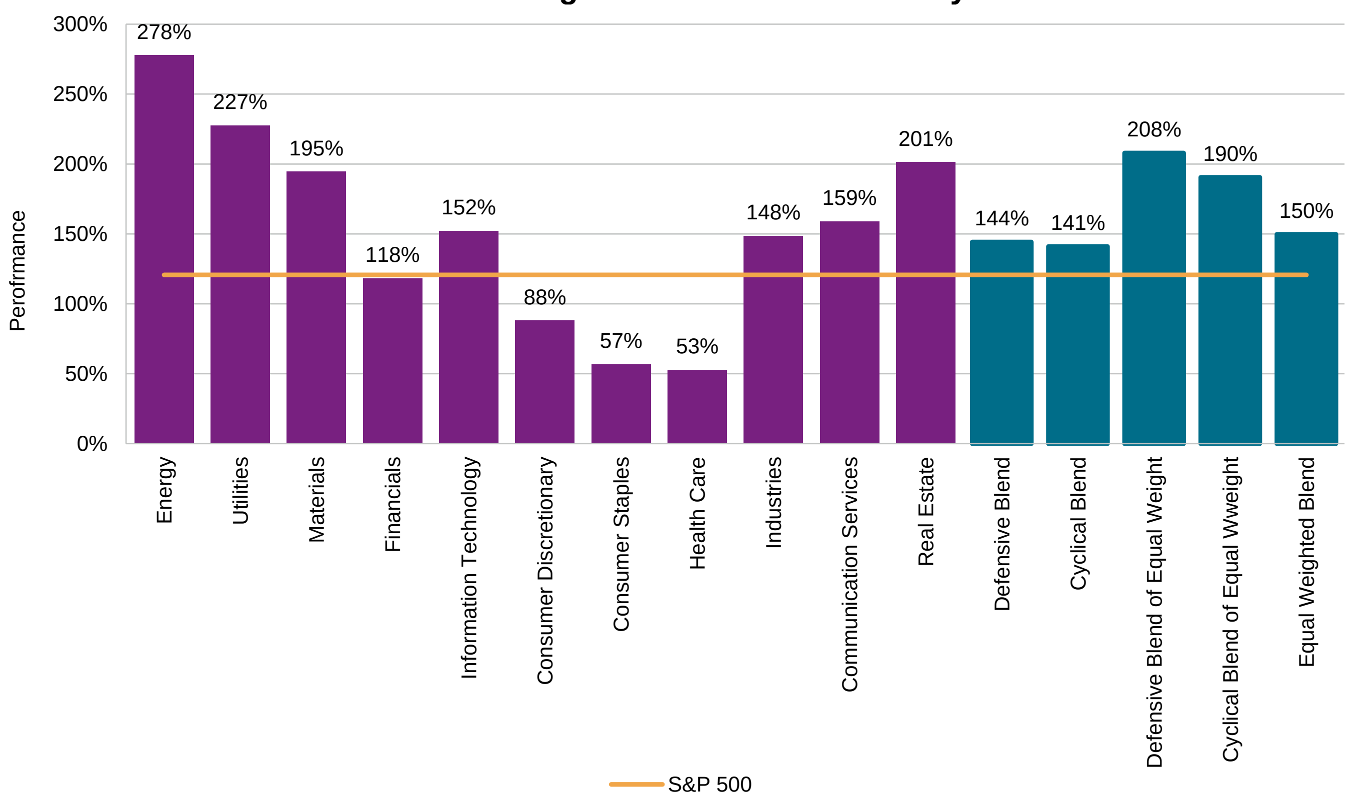


Source: S&P Dow Jones Indices LLC. Data from Sept. 1, 2000, through Oct. 9, 2002. Real Estate data excluded due to analysis date preceding availability of index levels. The S&P 500 Equal Weight Sectors indices were launched on June 20, 2006. All data prior to index launch date are back-tested hypothetical data. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding back-tested performance.

Post-Crash Recovery

After the S&P 500 reached its low point on Oct. 9, 2002, the market shifted into five years of recovery, generating 121% return over the whole period. Six out of 10 S&P 500 sectors outperformed the S&P 500, and Real Estate became the seventh as its index history began in 2001.[16] Interestingly, Energy and Utilities were the best-performing sectors, outperforming the S&P 500 by 157% and 107%, respectively, and underscoring the potential for typically defensive or cyclical sectors to thrive in opposite parts of the cycle under the right conditions (see Exhibit 30). All five blends of sectors also fared well in the recovery and generated excess return, with the Defensive Blend of Equal Weight outpacing the S&P 500 by 87%.

Exhibit 30: Sectors and Blends during the Post-Crash Recovery



Source: S&P Dow Jones Indices LLC. Data from Oct. 9, 2002, through Oct. 9, 2007. The S&P 500 Equal Weight Sectors indices were launched on June 20, 2006. All data prior to index launch date are back-tested hypothetical data. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding back-tested performance.

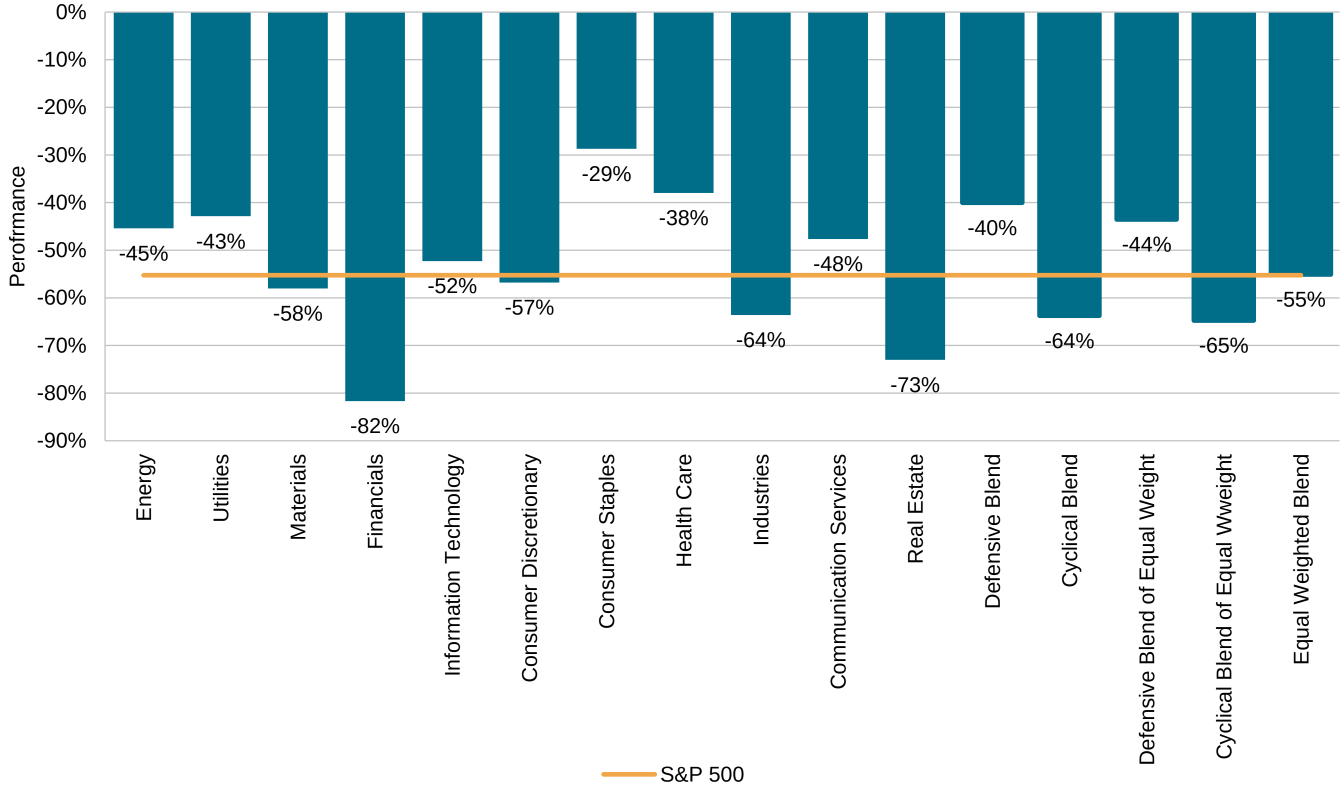
Global Financial Crisis

Although some warning signs emerged in mid-2007, it wasn't until October of that year that the S&P 500 peaked and began its descent during the Global Financial Crisis (GFC). While the S&P 500 declined 55% during the nearly two-year downturn, the Financials sector fell by an

[16] Although Real Estate became the 11th GICS sector in 2018, we begin including it in this analysis beginning with its earliest available index level data in October 2001.

additional 26% as banks and other institutions of all sizes suffered catastrophic losses. During the GFC, all five defensive sectors outperformed the broader market while Information Technology was the only outperformer among five cyclical sectors (see Exhibit 31). Across the five sector blends, both the Cyclical Blend and the Cyclical Blend of Equal Weight underperformed due to their large allocations to the Financials sector.

Exhibit 31: Sectors and Blends during the GFC



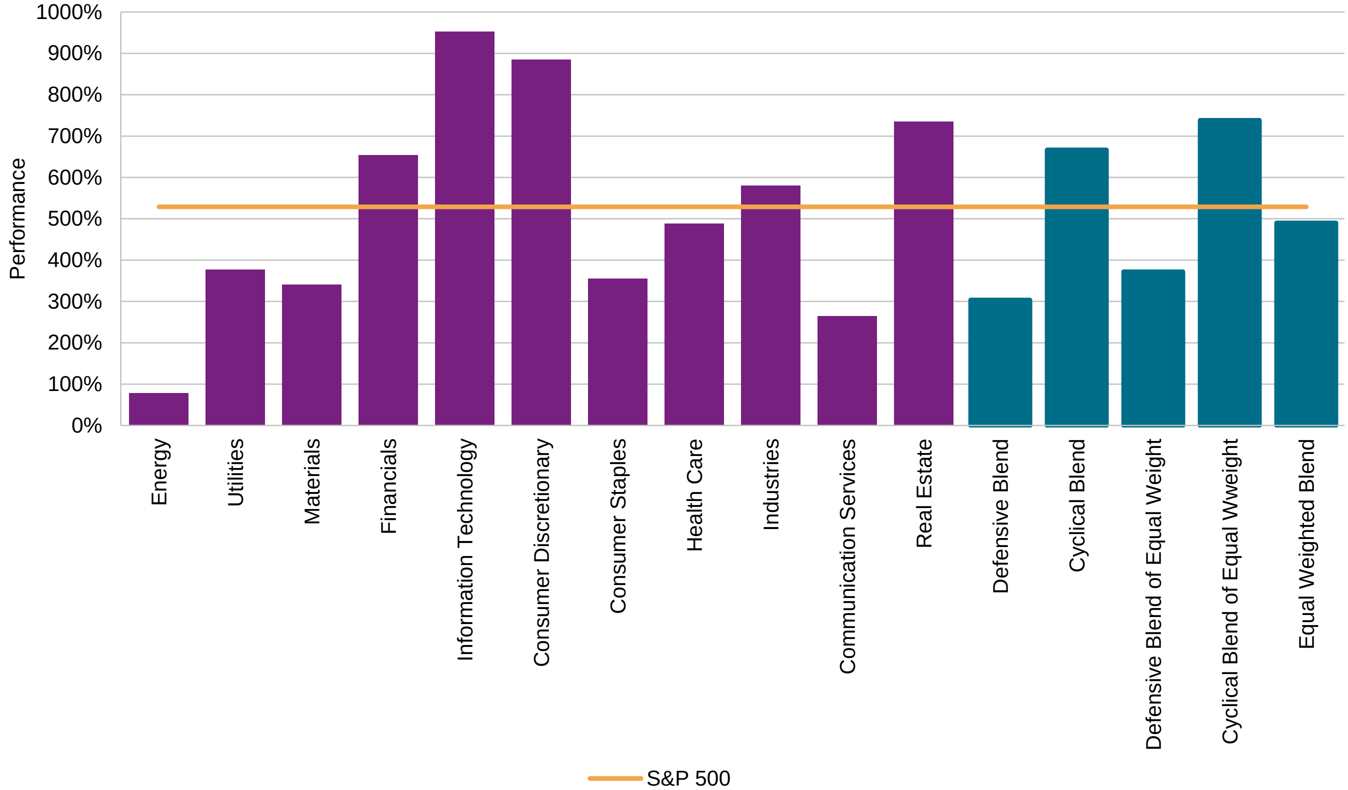
Source: S&P Dow Jones Indices LLC. Data from Oct. 9, 2007, through March 9, 2009. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Post-GFC Bull Market

Although the S&P 500 recovered after March 2009, generating a 529% return over the next 11 years, lingering effects of the GFC and a concurrent recession weighed heavily on some sectors more than others. In particular, Energy trailed the S&P 500 by more than 450% as plummeting oil and gas prices combined with a contraction in credit to squeeze energy company revenues. All four of the other traditionally defensive sectors also trailed the S&P 500. Among cyclical sectors, however, Materials was the only laggard while Information Technology led other outperforming sectors with a 124% excess return (see Exhibit 32).

Much of Information Technology's outperformance came in the latter five years of the recovery, leading to outperformance for the Cyclical Blend and Cyclical Blend of Equal Weight, while the other three trailed the S&P 500 due to their relative underweight of large-cap Information Technology companies.

Exhibit 32: Sectors and Blends in the Post-GFC Recovery

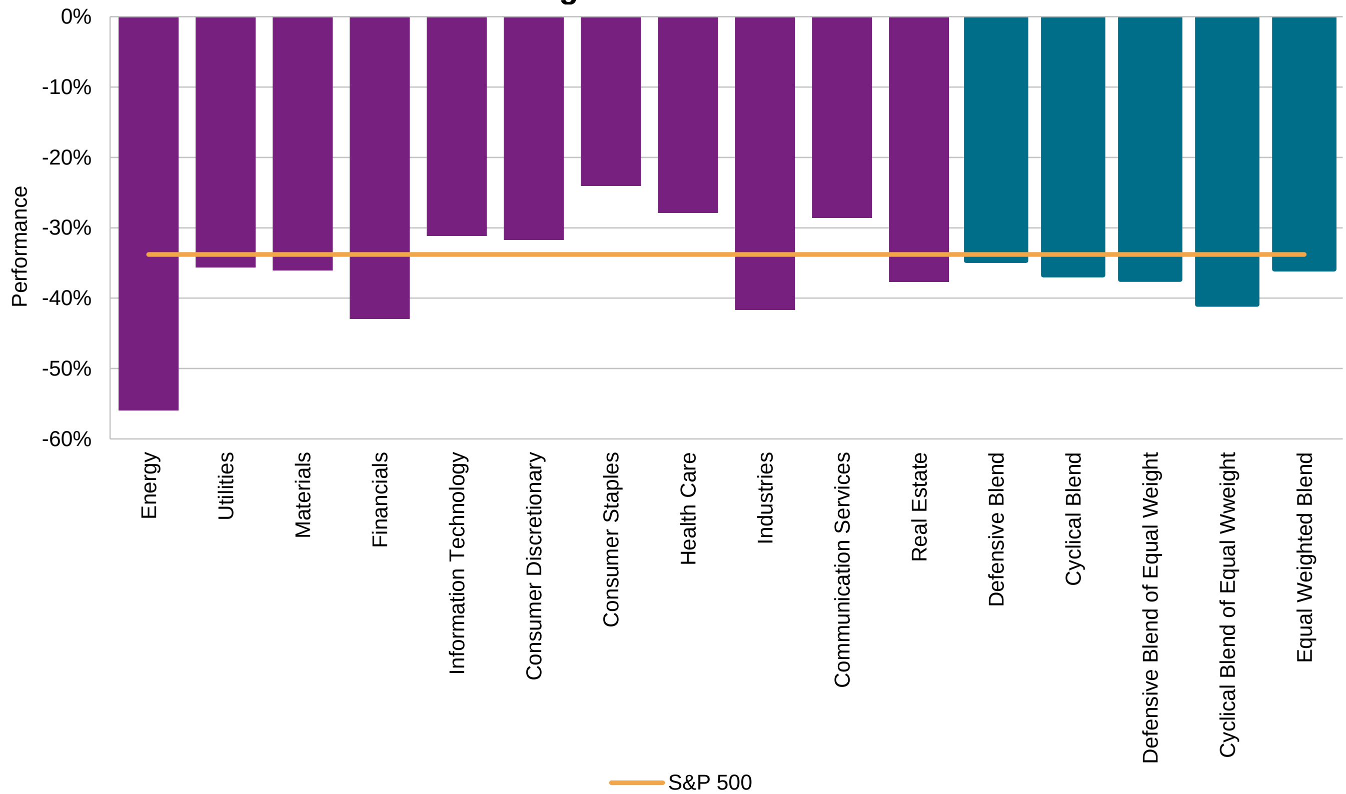


Source: S&P Dow Jones Indices LLC. Data from March 9, 2009, through Feb. 19, 2020. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

2020 COVID-19 Crash

After nearly 11 years of market expansion, the emergence of a global pandemic led to one of the most severe crashes in nearly a century. From a high on Feb. 19, 2020, the S&P 500 plummeted 34% over just 23 trading days. No sector was spared and correlation across the market spiked as investors headed for the exits. Energy fared the worst, falling an additional 22% as it became clear that a halt to normal activities would severely alter demand for fuel and energy. Conversely, Information Technology slightly outperformed as virtual connections became even more vital in daily life along with Consumer Staples and Health Care (see Exhibit 33). All five sector blends trailed the market by margins ranging from 1% to 7%.

Exhibit 33: Sectors and Blends during the 2020 COVID-19 Crash



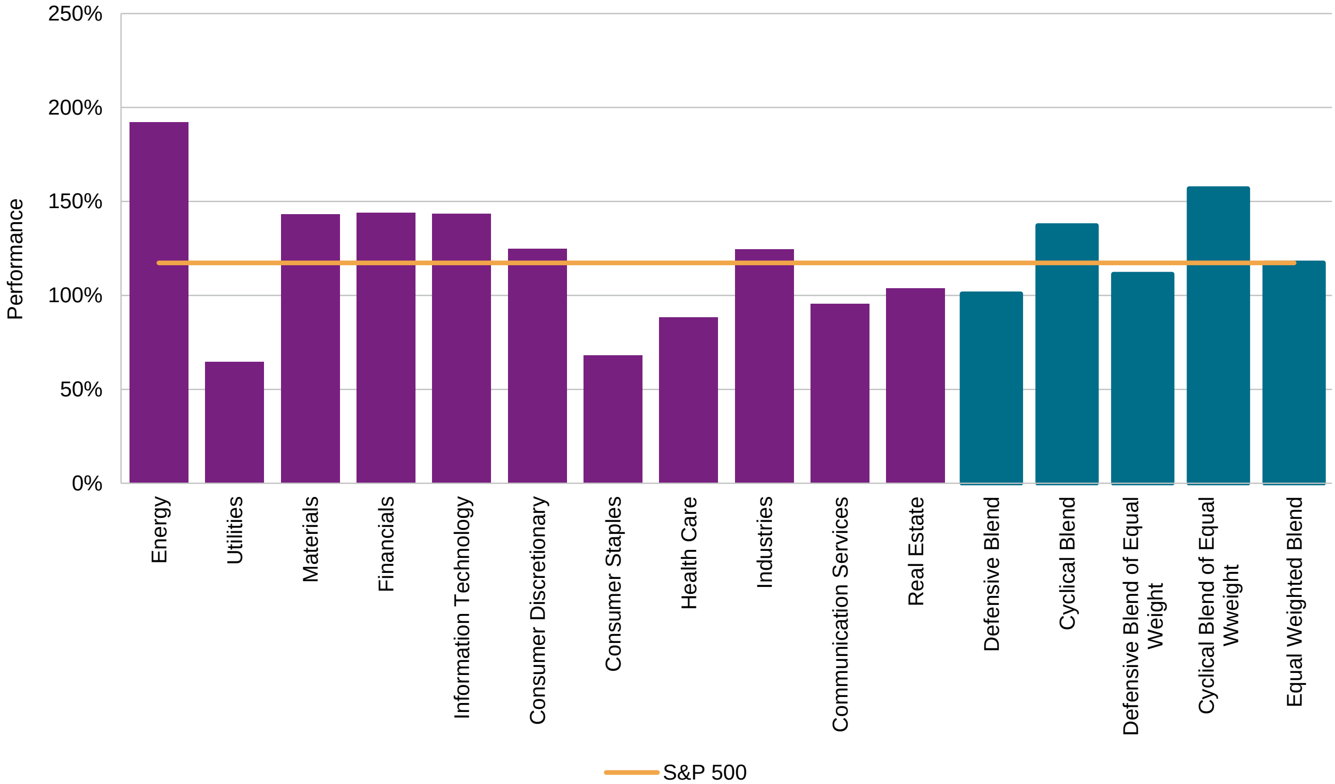
Source: S&P Dow Jones Indices LLC. Data from Feb. 19, 2020, through March 23, 2020. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

COVID-19 Recovery Rally

Although a timeline for getting back to “normal” was not yet clear, the market bottom on March 23, 2020, became a launch pad for a two-phased recovery. Initially, Information Technology continued to lead out of the bottom as a result of stay-at-home lifestyles combined with investors’ hunger for companies generating earnings growth. For the same reasons, Energy lagged as transportation and manufacturing demand slowed down significantly. However, announcements of successful virus prevention and treatments in late 2020 sparked a “reopening” rally based on hopes of a return to normal life. Energy stocks quickly shot upward and it soon became the best-performing sector since the March 2020 nadir, outperforming the S&P 500 by 77% through Jan. 12, 2022 (see Exhibit 34).

The Cyclical Blend of Equal Weight was the best-performing sector combination during the recovery, beating the S&P 500 by 40%, while the Cyclical Blend also outperformed. Defensive Blend trailed the market and the Equal Weight Blend was flat.

Exhibit 34: Sectors and Blends during the COVID-19 Recovery

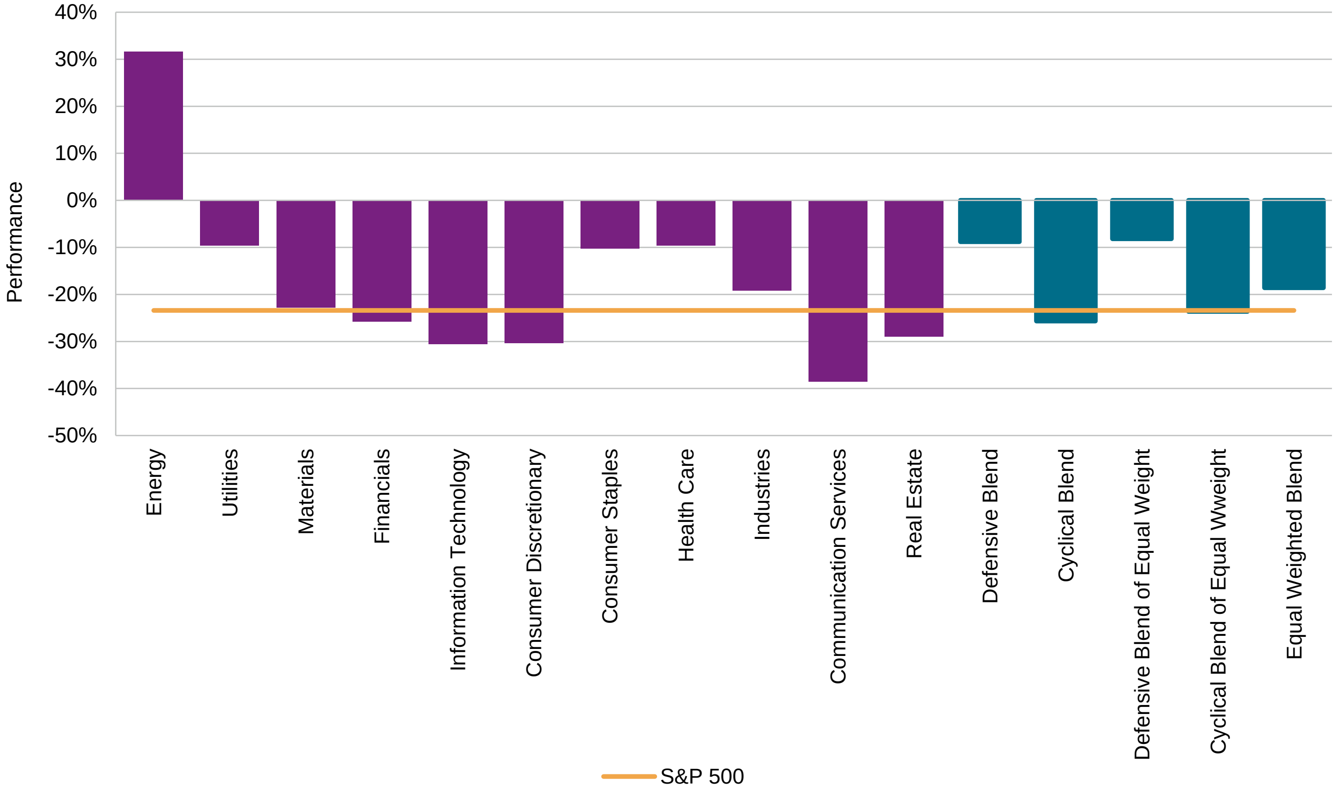


Source: S&P Dow Jones Indices LLC. Data from March 23, 2020, through Jan. 12, 2022. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

2022 Bear Market

The period analyzed and displayed in Exhibit 35 was the bear market beginning in January 2022. From a peak on Jan. 12, 2022, to a trough on Oct. 12, 2022, the S&P 500 dropped 23%. Although it previously led the market on the way up, Information Technology was the second-biggest decliner as the largest sector in the S&P 500 fell 31%. Energy was the only 1 out of 11 S&P 500 sectors to generate positive performance during this period, up 32% and 55% ahead of the S&P 500. The Defensive Blend and Defensive Blend of Equal Weight each outperformed by 15%, and the Equal Weight Blend surpassed the S&P 500 by 5%.

Exhibit 35: Sectors and Blends during the 2022 Bear Market

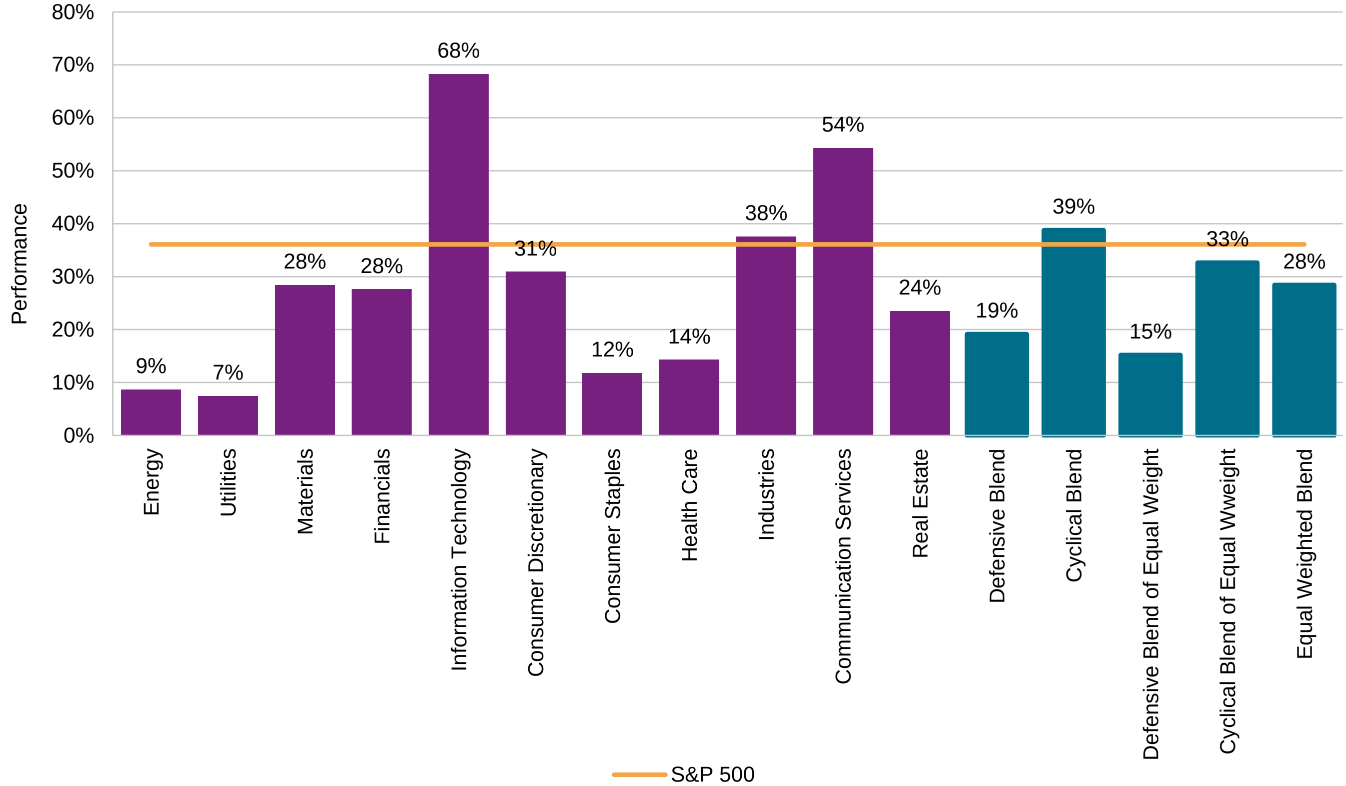


Source: S&P Dow Jones Indices LLC. Data from Jan. 12, 2022, through Oct. 12, 2022. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

2022-2023 Recovery

The period analyzed and displayed in Exhibit 36 illustrates the market recovery beginning on Oct. 12, 2022, as the S&P 500 climbed more than 50% through December 2023. Information Technology and Communication Services were the leading sectors, reversing their underperformance during the previous downturn. In fact, the disproportionate dominance of these two sectors combined with their heavy weights in the S&P 500 meant that most other sectors and blends lagged, with Industrials the only other sector and the Cyclical Blend the only blend outperforming, by 1.5% and 2.7%, respectively.

Exhibit 36: Sectors and Blends during the 2022-2023 Recovery



Source: S&P Dow Jones Indices LLC. Data from Oct. 12, 2022, through Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Appendix D: Sector, Industry and Thematics Futures and ETFs

Exhibit 37: Sector, Industry and Thematics-Listed ETFs Included in Exhibit 2

Name	Index
Amundi PEA S&P US Consumer Staples ESG UCITS ETF	S&P 500 Plus Sustainability Enhanced Consumer Staples Index (USD) NTR
Amundi S&P Global Industrials ESG UCITS ETF -DR- EUR	S&P Developed Ex-Korea LargeMidCap Sustainability Enhanced Industrials Index - Benchmark TR Net
Amundi S&P Global Information Technology ESG UCITS ETF -DR- EUR	S&P Developed Ex-Korea LargeMidCap Sustainability Enhanced Information Technology Index - EUR - Benchmark TR Net
Amundi S&P Global Materials ESG UCITS ETF EUR	S&P Developed Ex-Korea LargeMidCap Sustainability Enhanced Industrials Index - Benchmark TR Net
BetaPro S&P/TSX Capped Energy -2x Daily Bear ETF	S&P/TSX Capped / Energy
BetaPro S&P/TSX Capped Energy 2x Daily Bull ETF	S&P/TSX Capped / Energy
BetaPro S&P/TSX Capped Financials -2x Daily Bear ETF	S&P/TSX Capped / Financial
BetaPro S&P/TSX Capped Financials 2x Daily Bull ETF	S&P/TSX Capped / Financial
BMO Junior Gold Index ETF	Dow Jones North America Select Junior Gold Index - CAD
Capital Dow Jones U.S. Real Estate Index ETF	DJ Global United States (All) / Real Estate -SS
Comm. Services Select Sector SPDR Fund	S&P Communication Services Select Sector Index
Cons. Discretionary Select Sector SPDR Fund	Consumer Discretionary Select Sector
Cons. Staples Select Sector SPDR Fund	Consumer Staples Select Sector
Credit Suisse S&P MLP Index ETN	S&P MLP
Direxion Daily Aerospace & Defense Bull 3X Shares	DJ US Select / Aerospace & Defense
Direxion Daily Cons. Discretionary Bull 3x Shares	Consumer Discretionary Select Sector
Direxion Daily Energy Bear 2X Shares	Energy Select Sector
Direxion Daily Energy Bull 2x Shares	Energy Select Sector
Direxion Daily Financial Bear 3X Shares	Financial Select Sector
Direxion Daily Financial Bull 3x Shares	Financial Select Sector
Direxion Daily Healthcare Bull 3x Shares	Health Care Select Sector
Direxion Daily Industrials Bull 3X Shares	S&P Industrial Select Sector
Direxion Daily Metal Miners Bull 2X Shares	S&P TMI
Direxion Daily Pharmaceutical & Medical Bull 3X Shares	S&P Pharmaceuticals Select Industry
Direxion Daily Real Estate Bear 3X Shares	S&P Real Estate Select Sector
Direxion Daily Real Estate Bull 3x Shares	S&P Real Estate Select Sector

Source: S&P Dow Jones Indices LLC. Data as of March 28, 2024. Table is provided for illustrative purposes.

Exhibit 37: Sector, Industry and Thematics-Listed ETFs Included in Exhibit 2 (cont.)

ETF	Index
Direxion Daily Regional Banks Bull 3X Shares	S&P Regional Banks Select Industry
Direxion Daily S&P Biotech Bear 3X Shares	S&P Biotechnology Select Industry
Direxion Daily S&P Biotech Bull 3X Shares	S&P Biotechnology Select Industry
Direxion Daily S&P Oil & Gas Exp. & Prod. Bear 2X Shares	S&P Oil & Gas Exploration & Production Select Industry
Direxion Daily S&P Oil & Gas Exp. & Prod. Bull 2X Shares	S&P Oil & Gas Exploration & Production Select Industry
Direxion Daily Software Bull 2X Shares	S&P North American Expanded Technology Software Index
Direxion Daily Technology Bear 3X Shares	Technology Select Sector
Direxion Daily Technology Bull 3x Shares	Technology Select Sector
Direxion Daily Transportation Bull 3X Shares	S&P Transportation Select Industry FMC Capped Index - Benchmark TR Net
Direxion Daily Utilities Bull 3X Shares	Utilities Select Sector
Energy Select Sector SPDR Fund	Energy Select Sector
Financial Select Sector SPDR Fund	Financial Select Sector
First Trust S&P REIT Index Fund	S&P United States REIT
Fullgoal S and P Oil and Gas Exploration and Production Select Industry ETF QDII	S&P Oil & Gas Exploration & Production Select Industry Total Return Index
Global X S&P Biotech ETF	S&P Biotechnology Select Industry
Health Care Select Sector SPDR Fund	Health Care Select Sector
Horizons S&P/TSX Capped Energy Index ETF	S&P/TSX Capped / Energy
Horizons S&P/TSX Capped Financials Index ETF	S&P/TSX Capped / Financial
HSBC S&P INDIA TECH UCITS ETF	S&P India Tech Index (EUR) NTR
Industrial Select Sector SPDR Fund	S&P Industrial Select Sector
Invesco Dow Jones US Insurance UCITS ETF	Dow Jones U.S. Select Insurance Index NTR
Invesco Communications S&P US Select Sector UCITS ETF	S&P Select Sector Capped 20% Communication Services Index
Invesco Consumer Discretionary S&P US Select Sector UCITS ETF	S&P Select Sector Capped 20% Consumer Discretionary Index
Invesco Consumer Staples S&P US Select Sector UCITS ETF Accum USD	S&P Select Sector Capped 20% Consumer Staples Index
Invesco Energy S&P US Select Sector UCITS ETF	S&P Select Sector Capped 20% Energy Index
Invesco Financials S&P US Select Sector UCITS ETF	S&P Select Sector Capped 20% Financial Services Index- TR Net
Invesco Health Care S&P US Select Sector UCITS ETF	S&P Select Sector Capped 20% Health Care Index
Invesco Industrials S&P US Select Sector UCITS ETF	S&P Select Sector Capped 20% Industrials Net Total Return Index - USD

Source: S&P Dow Jones Indices LLC. Data as of March 28, 2024. Table is provided for illustrative purposes.

Exhibit 37: Sector, Industry and Thematics-Listed ETFs Included in Exhibit 2 (cont.)

ETF	Index
Invesco Materials S&P US Select Sector UCITS ETF	S&P Select Sector Capped 20% Materials Index
Invesco Real Estate S&P US Select Sector UCITS ETF	S&P Select Sector Capped 20% Real Estate Index
Invesco S&P 500 Equal Weight Communication Services ETF	S&P 500 Equal Weight Communication Services Plus Index
Invesco S&P 500 Equal Weight Consumer Discretionary ETF	S&P 500 Equal Weighted / Consumer Discretionary -SEC
Invesco S&P 500 Equal Weight Consumer Staples ETF	S&P 500 Equal Weighted / Consumer Staples -SEC
Invesco S&P 500 Equal Weight Energy ETF	S&P 500 Equal Weight Energy Plus Index
Invesco S&P 500 Equal Weight Financials ETF	S&P 500 Equal Weighted / Financials -SEC
Invesco S&P 500 Equal Weight Health Care ETF	S&P 500 Equal Weighted / Health Care -SEC
Invesco S&P 500 Equal Weight Industrials ETF	S&P 500 Equal Weighted / Industrials -SEC
Invesco S&P 500 Equal Weight Materials ETF	S&P 500 Equal Weighted / Materials -SEC
Invesco S&P 500 Equal Weight Real Estate ETF	S&P 500 Equal Weighted / Real Estate - SEC
Invesco S&P 500 Equal Weight Technology ETF	S&P 500 Equal Weighted / Information Technology -SEC
Invesco S&P 500 Equal Weight Utilities ETF	S&P 500 Equal Weighted / Utilities Plus
Invesco S&P SmallCap Cons. Discretionary ETF	S&P Small Cap 600 / Consumer Discretionary -SEC
Invesco S&P SmallCap Consumer Staples ETF	S&P Small Cap 600 Capped Consumer Staples
Invesco S&P SmallCap Energy ETF	S&P Small Cap 600 / Energy -SEC
Invesco S&P SmallCap Financials ETF	S&P SmallCap 600 Capped Financials & Real Estate Index
Invesco S&P SmallCap Health Care ETF	S&P Small Cap 600 / Health Care -SEC
Invesco S&P SmallCap Industrials ETF	S&P Small Cap 600 / Industrials -SEC
Invesco S&P SmallCap Information Tech. ETF	S&P Small Cap 600 / Information Technology -SEC
Invesco S&P SmallCap Materials ETF	S&P Small Cap 600 / Materials -SEC
Invesco S&P SmallCap Utilities & Communication Services ETF	S&P SmallCap 600 Capped Utilities & Telecommunication Services
Invesco S&P/TSX REIT Income Index ETF	S&P/TSX Capped REIT Income Index - CAD
Invesco Tech. S&P US Select Sector UCITS ETF	S&P Select Sector Capped 20% Technology Index
Invesco Utilities S&P US Select Sector UCITS ETF	S&P Select Sector Capped 20% Utilities Index
Invesco S&P World Energy ESG UCITS ETF	S&P World ESG Enhanced Energy Index (USD) NTR
Invesco S&P World Financials ESG UCITS ETF	S&P World ESG Enhanced Financials Index (USD) NTR
Invesco S&P World Health Care ESG UCITS ETF	S&P World ESG Enhanced Health Care Index (USD) NTR
Invesco S&P World Info. Tech. ESG UCITS ETF	S&P World ESG Enhanced Info. Tech. Index (USD) NTR

Source: S&P Dow Jones Indices LLC. Data as of March 28, 2024. Table is provided for illustrative purposes.

Exhibit 37: Sector, Industry and Thematics-Listed ETFs Included in Exhibit 2 (cont.)

ETF	Index
iPath S&P MLP ETN	S&P MLP
iShares Cohen & Steers REIT ETF	S&P Cohen & Steers US Realty Majors Portfolio
iShares Essential Metals Producers UCITS ETF	S&P Global Essential Metals Producers Index (USD) NTR
iShares Expanded Tech-Software Sector ETF	S&P North American Expanded Technology Software Index
iShares Global Comm Services ETF	S&P Global 1200 Comm. Services 4.5/22.5/45 Capped
iShares Global Consumer Discretionary ETF	S&P Global 1200 Consumer Discretionary (Sector) Capped Index (USD)
iShares Global Consumer Staples ETF	S&P Global 1200 Consumer Staples (Sector) Capped Index
iShares Global Consumer Staples ETF Cert.	S&P Global 1200 / Consumer Staples -SEC
iShares Global Energy ETF	S&P Global 1200 / Energy -SEC
iShares Global Financials ETF	S&P Global 1200 / Financials -SEC
iShares Global Healthcare ETF	S&P Global 1200 / Health Care -SEC
iShares Global Healthcare ETF CDI	S&P Global 1200 Healthcare Sector Index - AUD
iShares Global Industrials ETF	S&P Global 1200 / Industrials -SEC
iShares Global Materials ETF	S&P Global 1200 / Materials -SEC
iShares Global Tech ETF	S&P Global 1200 / Information Technology -SEC
iShares Global Utilities ETF	S&P Global 1200 Utilities (Sector) Capped Index
iShares Gold Producers UCITS ETF USD	S&P Commodity Producers Gold Index - USD
iShares International Dev. Property ETF	S&P Developed x United States Property
iShares Listed Private Equity UCITS ETF	S&P Listed Private Equity Index
iShares Listed Private Equity UCITS ETF USD	S&P Listed Private Equity Index
iShares North American Tech-Multimedia Networking ETF	S&P North American Technology Sector Multimedia Networking
iShares Oil & Gas Exploration & Production UCITS ETF USD	S&P Commodity Producers Oil & Gas Exploration & Production Index - USD
iShares S&P 500 Communication Sector UCITS ETF	S&P 500 Capped 35/20 Communication Services Sector Index
iShares S&P 500 Consumer Discretionary Sector UCITS ETF	S&P 500 Consumer Discretionary Index - USD
iShares S&P 500 Consumer Staples Sector UCITS ETF	S&P 500 Capped 35/20 Consumer Staples Index - USD
iShares S&P 500 Energy Sector UCITS ETF	S&P 500 Energy Index - USD

Source: S&P Dow Jones Indices LLC. Data as of March 28, 2024. Table is provided for illustrative purposes.

Exhibit 37: Sector, Industry and Thematics-Listed ETFs Included in Exhibit 2 (cont.)

ETF	Index
iShares S&P 500 Financials Sector UCITS ETF	S&P 500 CAPPED 35/20 FINANCIALS NTR
iShares S&P 500 Health Care Sector UCITS ETF	S&P 500 CAPPED 35/20 HEALTH CARE NTR
iShares S&P 500 Health Care Sector UCITS ETF	S&P 500 CAPPED 35/20 HEALTH CARE NTR
iShares S&P 500 Industrials Sector UCITS ETF	S&P 500 Capped 35/20 Industrials Sector Index
iShares S&P 500 Information Technology Sector UCITS ETF	S&P 500 CAPPED 35/20 INFORMATION TECHNOLOGY NTR
iShares S&P 500 Materials Sector UCITS ETF	S&P 500 Capped 35/20 Materials Sector Index - USD
iShares S&P 500 Utilities Sector UCITS ETF	S&P 500 Capped 35/20 Utilities Sector Index - USD
iShares S&P Global Consumer Discretionary Index ETF (CAD-Hedged)	S&P Global 1200 Consumer Discretionary Hedged to CAD Index - CAD
iShares S&P Global Healthcare Index Fund (CAD-Hedged)	S&P Global 1200 Health Care Hedged to CAD Index - CAD
iShares S&P Global Industrials Index ETF (CAD-Hedged)	S&P Global 1200 Industrials Hedged to CAD Index - CAD
iShares S&P U.S. Banks UCITS ETF USD	S&P 900 Banks (Industry) 7/4 Capped Index
iShares S&P US Banks UCITS ETF	S&P 900 Banks (Industry) 7/4 Capped Index
iShares S&P US Financials Index ETF	Financial Select Sector Index (CAD) TR
iShares S&P/TSX Capped Consumer Staples Index Fund	S&P/TSX Capped Consumer Staples Index - CAD
iShares S&P/TSX Capped Energy Index ETF	S&P/TSX Capped / Energy
iShares S&P/TSX Capped Financials Index ETF	S&P/TSX Capped / Financial
iShares S&P/TSX Capped Information Technology Index ETF	S&P/TSX Capped Information Technology Index - CAD
iShares S&P/TSX Capped Materials Index ETF	S&P/TSX Capped Materials Index - CAD
iShares S&P/TSX Capped REIT Index ETF	S&P/TSX Capped REIT Index - CAD
iShares S&P/TSX Capped Utilities Index Fund	S&P/TSX Capped Utilities Index - CAD
iShares S&P/TSX Energy Transition Materials Index ETF	S&P/TSX Energy Transition Materials Index (CAD) TR
iShares S&P/TSX Global Base Metals Index Fund	S&P/TSX Global Base Metals Index - CAD
iShares S&P/TSX Global Gold Index ETF	S&P/TSX Global Gold
iShares U.S. Aerospace & Defense ETF	DJ US Select / Aerospace & Defense
iShares U.S. Broker-Dealers & Securities Exchanges ETF	DJ US Select / Investment Services
iShares U.S. Healthcare Providers ETF	DJ US Select / Health Care Providers
iShares U.S. Insurance ETF	DJ US Select / Insurance

Source: S&P Dow Jones Indices LLC. Data as of March 28, 2024. Table is provided for illustrative purposes.

Exhibit 37: Sector, Industry and Thematics-Listed ETFs Included in Exhibit 2 (cont.)

ETF	Index
iShares U.S. Medical Devices ETF	DJ US Select / Medical Equipment
iShares U.S. Oil & Gas Exploration & Production ETF	DJ US Select / Oil & Gas Exploration & Production
iShares U.S. Oil Equipment & Services ETF	DJ US Select / Oil Equipment & Services
iShares U.S. Pharmaceuticals ETF	DJ US Select / Pharmaceutical
iShares U.S. Real Estate ETF	Dow Jones U.S. Real Estate Capped Index
iShares U.S. Regional Banks ETF	DJ US Select / Regional Banks
iShares US Financial Services ETF	Dow Jones U.S. Financial Services Index
iShares US Medical Devices UCITS ETF USD	Dow Jones U.S. Select Medical Equipment Capped 35/20 Index
iShares US Transportation ETF	S&P Transportation Select Industry FMC Capped Index - Benchmark TR Gross
KB KBSTAR Global 4th Industry Revolution IT ETF(SYNTH H)	S&P Global 1200 / Information Technology -SEC
KB KBSTAR SYNTH-US Oil&Gas E&P Company ETF(H)	S&P Oil & Gas Exploration & Production Select Industry
KIM KINDEX SYNTH-Dow Jones US Real Estate ETF	Dow Jones U.S. Real Estate Index
Kiwoom HEROES Global REITs IGIS Active ETF Units	S&P Global REIT Index
Leverage Shares 3x Long Financials ETP Securities	Financial Select Sector
Leverage Shares 3x Long Oil & Gas ETP Securities	Energy Select Sector
Leverage Shares -3x Short Oil & Gas ETP Securities	Energy Select Sector
Listed Index Fund Australian REIT (S&P/ASX200 A-REIT)	S&P/ASX 200 A-REIT Index - AUD
Materials Select Sector SPDR Fund	Materials Select Sector
MTF Sal 4D S&P Semiconductors Select Industry	S&P Semiconductors Select Industry Index Net TR
NH-Amundi HANARO Global Luxury S&P ETF (Synth)	S&P Global Luxury Index
Nuveen Short-Term REIT ETF	Dow Jones U.S. Select Short-Term REIT Index
ProShares S&P Kensho Smart Factories ETF	S&P Kensho Smart Factories Index
ProShares S&P Technology Dividend Aristocrats ETF	S&P Technology Dividend Aristocrats
ProShares Short Financials	DJ Global United States (All) / Financials -IND
ProShares Short Real Estate	DJ Global United States (All) / Real Estate -SS
ProShares Ultra Basic Materials	DJ Global United States (All) / Basic Materials -IND

Source: S&P Dow Jones Indices LLC. Data as of March 28, 2024. Table is provided for illustrative purposes.

Exhibit 37: Sector, Industry and Thematics-Listed ETFs Included in Exhibit 2 (cont.)

ETF	Index
ProShares Ultra Consumer Goods	DJ Global United States (All) / Consumer Goods -IND
ProShares Ultra Consumer Services	DJ Global United States (All) / Consumer Services -IND
ProShares Ultra Financials	DJ Global United States (All) / Financials -IND
ProShares Ultra Health Care	DJ Global United States (All) / Health Care -IND
ProShares Ultra Industrials	Dow Jones U.S. Industrials Index
ProShares Ultra Oil & Gas	DJ Global United States (All) / Oil & Gas -IND
ProShares Ultra Real Estate	DJ Global United States (All) / Real Estate -SS
ProShares Ultra Semiconductors	DJ Global United States (All) / Semiconductors -SUB
ProShares Ultra Technology	Dow Jones U.S. Technology Index
ProShares Ultra Utilities	DJ Global United States (All) / Utilities -IND
ProShares UltraShort Basic Materials	DJ Global United States (All) / Basic Materials -IND
ProShares UltraShort Consumer Goods	DJ Global United States (All) / Consumer Goods -IND
ProShares UltraShort Consumer Services	DJ Global United States (All) / Consumer Services -IND
ProShares UltraShort Financials	DJ Global United States (All) / Financials -IND
ProShares UltraShort Health Care	DJ Global United States (All) / Health Care -IND
ProShares UltraShort Industrials	DJ Global United States (All) / Industrials -IND
ProShares UltraShort Oil & Gas	DJ Global United States (All) / Oil & Gas -IND
ProShares UltraShort Real Estate	DJ Global United States (All) / Real Estate -SS
Proshares Ultrashort Semiconductors	DJ Global United States (All) / Semiconductors -SUB
ProShares UltraShort Technology	DJ Global United States (All) / Technology -IND
ProShares UltraShort Utilities	DJ Global United States (All) / Utilities -IND
Real Estate Select Sector SPDR Fund	S&P Real Estate Select Sector
Roundhill S&P Global Luxury Etf	S&P Global Luxury Net Total Return Index
SAMSUNG KODEX DJI US REITs ETF(H) Units	Dow Jones U.S. Real Estate Index
Samsung KODEX SYNTH-US Biotech ETF	S&P Biotechnology Select Industry
Samsung KODEX SYNTH-US Energy ETF	Energy Select Sector
Samsung KODEX SYNTH-US Industrial ETF	S&P Industrial Select Sector
SAMSUNG KODEX WTI Crude Oil Futures Inverse ETF(H)	S&P GSCI Crude Oil
Schwab U.S. REIT ETF	Dow Jones Equity All REIT Capped
Shin Kong S&P Electric Vehicles ETF	S&P Kensho Capped Electric Vehicles Index (USD) TR
Smartshares Australian Financials ETF	S&P/ASX 200 Financials Ex-A-REIT - AUD
Smartshares Australian Property ETF	S&P/ASX 200 A-REIT Equal Weight Index - AUD
Smartshares NZ Property ETF	S&P/NZX Real Estate Select Index - NZD

Source: S&P Dow Jones Indices LLC. Data as of March 28, 2024. Table is provided for illustrative purposes.

Exhibit 37: Sector, Industry and Thematics-Listed ETFs Included in Exhibit 2 (cont.)

ETF	Index
SP Funds S&P Global REIT Sharia ETF	S&P Global All Equity REIT Shariah Capped Index
SP Funds S&P Global Technology ETF	S&P Global 1200 Shariah Information Technology (Sector) Capped (USD)
SPDR Dow Jones Global Real Estate ETF	DJ Global Select Real Estate Securities Index (RESI)
SPDR Dow Jones Global Real Estate ETF Exchange Traded Fund Units	DJ Global Select Real Estate Securities Index (RESI)
SPDR Dow Jones Global Real Estate UCITS ETF	DJ Global Select Real Estate Securities Index (RESI)
SPDR Dow Jones Global Real Estate UCITS ETF Accum Unhedged USD	DJ Global Select Real Estate Securities Index (RESI)
SPDR Dow Jones International Real Estate ETF	DJ Global x US Select Real Estate Securities Index (RESI)
SPDR Dow Jones REIT ETF	Dow Jones US Select REIT
SPDR S&P Aerospace & Defense ETF	S&P Aerospace & Defense Select Industry
SPDR S&P ASX 200 Financials EX A-REIT Fund	S&P/ASX 200 Financials Ex-A-REIT - AUD
SPDR S&P Bank ETF	S&P Banks Select Industry
SPDR S&P BIOTECH ETF	S&P Biotechnology Select Industry
SPDR S&P Capital Markets ETF	S&P Capital Markets Select Industry
SPDR S&P Health Care Equipment ETF	S&P Healthcare Equipment Select Industry
SPDR S&P Health Care Services ETF	S&P Health Care Services Select Industry
SPDR S&P Insurance ETF	S&P Insurance Select Industry
SPDR S&P Metals & Mining ETF	S&P Metals and Mining Select Industry
SPDR S&P Oil & Gas Equip. & Services ETF	S&P Oil & Gas Equipment Select Industry Index
SPDR S&P Oil & Gas Exp. & Prod. ETF	S&P Oil & Gas Exploration & Production Select Industry
SPDR S&P Pharmaceuticals ETF	S&P Pharmaceuticals Select Industry
SPDR S&P Regional Banking ETF	S&P Regional Banks Select Industry
SPDR S&P Semiconductor ETF	S&P Semiconductors Select Industry
SPDR S&P Software & Services ETF	S&P Software & Services Select Industry
SPDR S&P Transportation ETF	S&P Transportation Select Industry
SPDR S&P US Communication Services Select Sector UCITS ETF	S&P Communication Services Select Sector Daily Capped 25/20 Index
SPDR S&P US Consumer Discretionary Select Sector UCITS ETF	S&P Consumer Discretionary Select Sector Index
SPDR S&P US Consumer Staples Select Sector UCITS ETF	S&P Consumer Staples Select Sector Daily Capped 25/20 Index - Benchmark TR Net
SPDR S&P US Energy Select Sector UCITS ETF	S&P Energy Select Sector Daily Capped 25/20 Index
SPDR S&P US Financials Select Sector UCITS ETF	S&P Financials Select Sector Daily Capped 25/20 Index

Source: S&P Dow Jones Indices LLC. Data as of March 28, 2024. Table is provided for illustrative purposes.

Exhibit 37: Sector, Industry and Thematics-Listed ETFs Included in Exhibit 2 (cont.)

ETF	Index
SPDR S&P US Health Care Select Sector UCITS ETF	S&P Health Care Select Sector Daily Capped 25/20 Index
SPDR S&P US Industrials Select Sector UCITS ETF	S&P 500 Index - EUR
SPDR S&P US Materials Select Sector UCITS ETF	S&P Materials Select Sector Daily Capped 25/20 Index
SPDR S&P US Technology Select Sector UCITS ETF	S&P TECHNOLOGY SELECT SECTOR DAILY CAPPED 25/20 NTR
SPDR S&P US Utilities Select Sector UCITS ETF	S&P Utilities Select Sector Daily Capped 25/20 Index - USD
SPDR S&P/ASX 200 Listed Property Fund	S&P/ASX 200 A-REIT Index - AUD
Technology Select Sector SPDR Fund	Technology Select Sector
Utilities Select Sector SPDR Fund	Utilities Select Sector
Vanguard Australian Property Securities Index ETF	S&P ASX 300 / A-REIT -SEC
Vanguard Global ex-U.S. Real Estate ETF	S&P Global x United States Property
WOORI US SP AerospaceDefense ETF Units	S&P Aerospace & Defense Select Industry

Source: S&P Dow Jones Indices LLC. Data as of March 28, 2024. Table is provided for illustrative purposes.

Exhibit 38: Index Futures

Name	Exchange
S&P E-mini Financial Select Sector Futures	Chicago Mercantile Exchange
S&P E-mini Energy Select Sector Futures	Chicago Mercantile Exchange
S&P E-mini Utilities Select Sector Futures	Chicago Mercantile Exchange
S&P E-mini Consumer Staples Select Sector Futures	Chicago Mercantile Exchange
E-mini S&P Real Estate Select Sector Stock Index Futures	Chicago Mercantile Exchange
S&P E-mini Health Care Select Sector Futures	Chicago Mercantile Exchange
S&P E-mini Materials Select Sector Futures	Chicago Mercantile Exchange
S&P E-mini Technology Select Sector Futures	Chicago Mercantile Exchange
S&P E-mini Industrial Select Sector Futures	Chicago Mercantile Exchange
E-mini Communication Services Select Sector Futures	Chicago Mercantile Exchange
S&P E-mini Consumer Discretionary Select Sector Future	Chicago Mercantile Exchange
E-mini S&P Regional Banks Select Industry Futures	Chicago Mercantile Exchange
E-mini S&P Biotechnology Select Industry Futures	Chicago Mercantile Exchange
E-mini S&P Oil & Gas Exploration & Production Select Industry Futures	Chicago Mercantile Exchange
E-mini S&P Insurance Select Industry Futures	Chicago Mercantile Exchange
E-mini S&P Retail Select Industry Futures	Chicago Mercantile Exchange

Source: S&P Dow Jones Indices LLC. Data as of March 28, 2024. Table is provided for illustrative purposes.

Performance Disclosure/Back-Tested Data

The S&P 500 Equal Weight Sector Indices were launched June 20, 2006. The S&P Biotechnology Select Industry Index, S&P Home Builders Select Industry Index, S&P Semiconductors Select Industry Index were launched on January 27, 2006. The S&P Aerospace & Defense Select Industry Index, S&P Technology Hardware Select Industry Index, S&P Health Care Equipment Select Industry Index, S&P Health Care Services Select Industry Index, S&P Metals & Mining Select Industry Index, S&P Oil & Gas Exploration & Production Select Industry Index, S&P Oil & Gas Equipment Select Industry Index, S&P Pharmaceuticals Select Industry Index, S&P Retail Select Industry Index, S&P Telecom Select Industry Index, and S&P Transportation Select Industry Index were launched on June 19, 2006. The S&P Banks Select Industry Index, S&P Capital Markets Select Industry Index, S&P Insurance Select Industry Index, and S&P Regional Banks Select Industry Index were launched on September 9, 2011. The S&P Software & Services Select Industry Index was launched on September 19, 2011. The S&P Internet Select Industry Index was launched on February 1, 2016. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. Complete index methodology details are available at www.spglobal.com/spdji. Past performance of the Index is not an indication of future results. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results. Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations. Back-tested performance is for use with institutions only; not for use with retail investors.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate S&P DJI's ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using "Backward Data Assumption" (or pulling back) of ESG data for the calculation of back-tested historical performance. "Backward Data Assumption" is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as "product involvement") were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on "Backward Data Assumption" please refer to the FAQ. The methodology and factsheets of any index that employs backward assumption in the back-tested history will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used.

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