S&P Dow Jones Indices

A Division of S&P Global

Research

Why Does the S&P 500® Matter to the U.K.?

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"Opportunity is everywhere. The key is to develop the vision to see it."

Jeremiah Say

Executive Summary

British equity funds tend to have less exposure to international equities than would be commensurate with the scale of the global opportunity set. A potential under-allocation to U.S. equities, in particular, means that U.K. investors may be foregoing a potentially useful diversification opportunity. This paper examines the S&P 500 from the perspective of a U.K.-based investor. We examine:

- The concentration and sectoral makeup of the U.K. equity market, as well as the motivations of U.K.-based market participants to diversify internationally;
- The role of the U.K. and the U.S. in the global economy and global equity markets;
- Potentially complementary aspects of an S&P 500-linked investment for a broad-based U.K. equity portfolio denominated in British pound sterling (sterling); and
- The differences between the S&P 500 and other indices or active portfolios tracking U.S. equities.

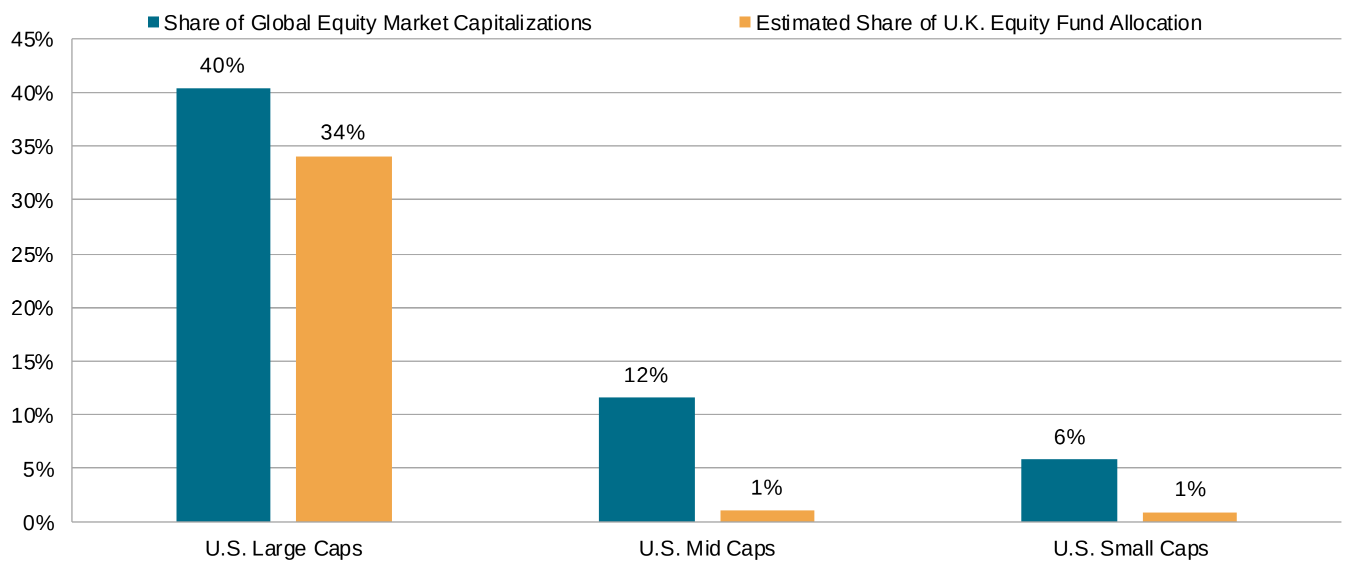
Although this paper provides a perspective on the S&P 500 through a specific filter of an investor with an expected existing bias toward U.K. equities, many of our observations hold more generally for international investors considering U.S. equities.

Introduction

Most market participants have encountered the S&P 500; it is a widely referenced gauge of U.S. equity performance and a popular benchmark for investments. The S&P 500 contains many of the world's largest and most recognizable companies, with a global reach of operations, customers and revenue sources. Further, as a consequence of an increasing popularity and scale of S&P 500-related products, including index funds, exchange-traded funds (ETFs) and listed derivatives such as futures and options, the typical cost and barriers to entry for S&P 500-linked investments have fallen over time.

For a market participant predominantly investing in U.K. equities, U.S. stocks arise in several investment contexts. Most importantly, U.S. equities represent a significant proportion of the global opportunity set for diversification, with the S&P 500 making up 50% of the S&P Global BMI float-adjusted market capitalization. However, Exhibit 1 illustrates that investors in U.K. equity funds have not yet taken full advantage of their diversification potential. Specifically, Exhibit 1 shows the estimated aggregate allocations within U.K.-based equity funds to U.S. large,- mid- and small-cap equities, as compared to the relative share of each segment in the S&P Global BMI. As of September 2022, U.K. funds had a cumulative "underweight" of 22%.

Exhibit 1: The U.K. Underweights a Major Global Segment

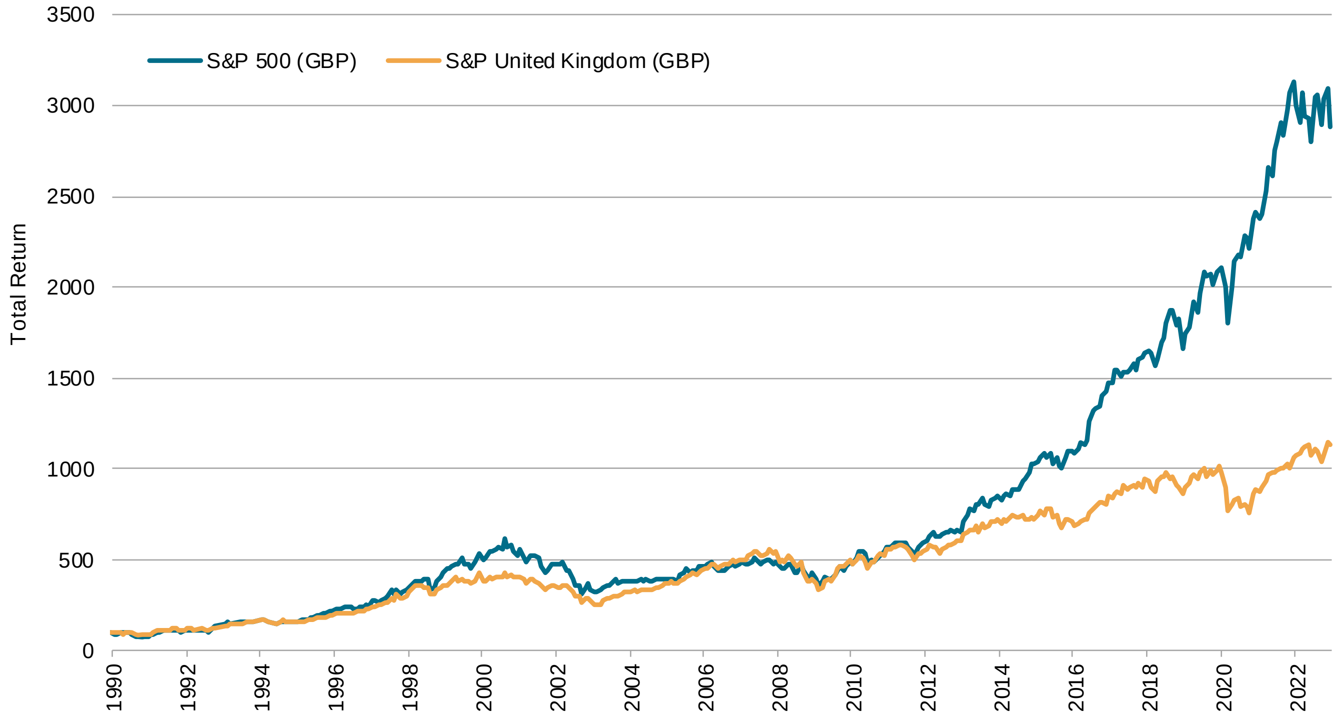


Sources: S&P Dow Jones Indices LLC, Morningstar. Fund data as of Sept. 30, 2022, and equity data as of Dec. 30, 2022. Based on index market capitalization, which is free-float adjusted. Chart is provided for illustrative purposes. See Exhibit 14 and the Appendix for further details.

Even if geographic diversification is not the primary objective, a moderate allocation to U.S. equities might arise through a desire to access the Information Technology sector, which is dominated by U.S. brands (see Section 3), or from a desire to benefit from exposure to the

U.S. dollar, which tends to appreciate during periods of financial crisis[1] (see Section 5). As Exhibit 2 shows, U.S. equities may also be considered simply due to their absolute performance: they have outperformed U.K. equities over medium- and long-term time horizons, with more than a "lost decade" for U.K. equities relative to their U.S. peers.

Exhibit 2a: Performance of the S&P United Kingdom (GBP) versus the S&P 500 (GBP) over Time



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1989, to Dec. 30, 2022. Index performance is based on monthly total return in GBP. Indices were rebased to 100 on Dec. 31, 1989. The S&P United Kingdom (GBP) was launched Dec. 31, 2001. All data prior to index launch date is 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 the document for more information regarding the inherent limitations associated with back-tested data.

[1] Welling, John. "The U.S. Dollar's Outperformance Makes Its Impact on Indices, Too." S&P Dow Jones Indices LLC. September 2022.

Exhibit 2b: Performance of the S&P United Kingdom (GBP) versus the S&P 500 (GBP) over Time

Period	S&P United Kingdom (GBP)	S&P 500 (GBP)	Difference
Annualized Total Return (%)			
3-Year	3.68	11.18	-7.50
5-Year	3.62	12.02	-8.40
10-Year	6.49	15.99	-9.50
15-Year	5.06	12.52	-7.46
20-Year	7.32	11.41	-4.09
Since Jun. 30, 2016	6.37	13.59	-7.22
Since Dec. 31, 1989	7.63	10.73	-3.10
Annualized Index Volatility (%)			
3-Year	15.97	16.43	-0.46
5-Year	14.07	15.10	-1.02
10-Year	12.35	12.89	-0.54
15-Year	14.04	14.23	-0.20
20-Year	13.08	13.35	-0.26
Since Jun. 30, 2016	13.01	13.66	-0.64
Since Dec. 31, 1989	13.82	15.67	-1.85
Annualized Risk-Adjusted Total Return (Return/Risk)			
3-Year	0.23	0.68	-0.45
5-Year	0.26	0.80	-0.54
10-Year	0.53	1.24	-0.71
15-Year	0.36	0.88	-0.52
20-Year	0.56	0.85	-0.30
Since Jun. 30, 2016	0.49	1.00	-0.51
Since Dec. 31, 1989	0.55	0.68	-0.13

Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1989, to Dec. 30, 2022. Index performance is based on monthly total return in GBP. The S&P United Kingdom (GBP) was launched Dec. 31, 2001. All data prior to index launch date is 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 at the end of the document for more information regarding the inherent limitations associated with back-tested data.

Exhibits 3 and 4 provide an example of the cumulative annualized total returns and the return/risk ratios[2] for various hypothetical combinations of the S&P 500 and S&P United Kingdom over various periods ending in December 2022. The results show that over each of the 3-, 5-, 10- and 25-year periods, and since Dec. 31, 1989, a hypothetical mix of U.K. and

[2] Annualized return divided by annualized volatility.

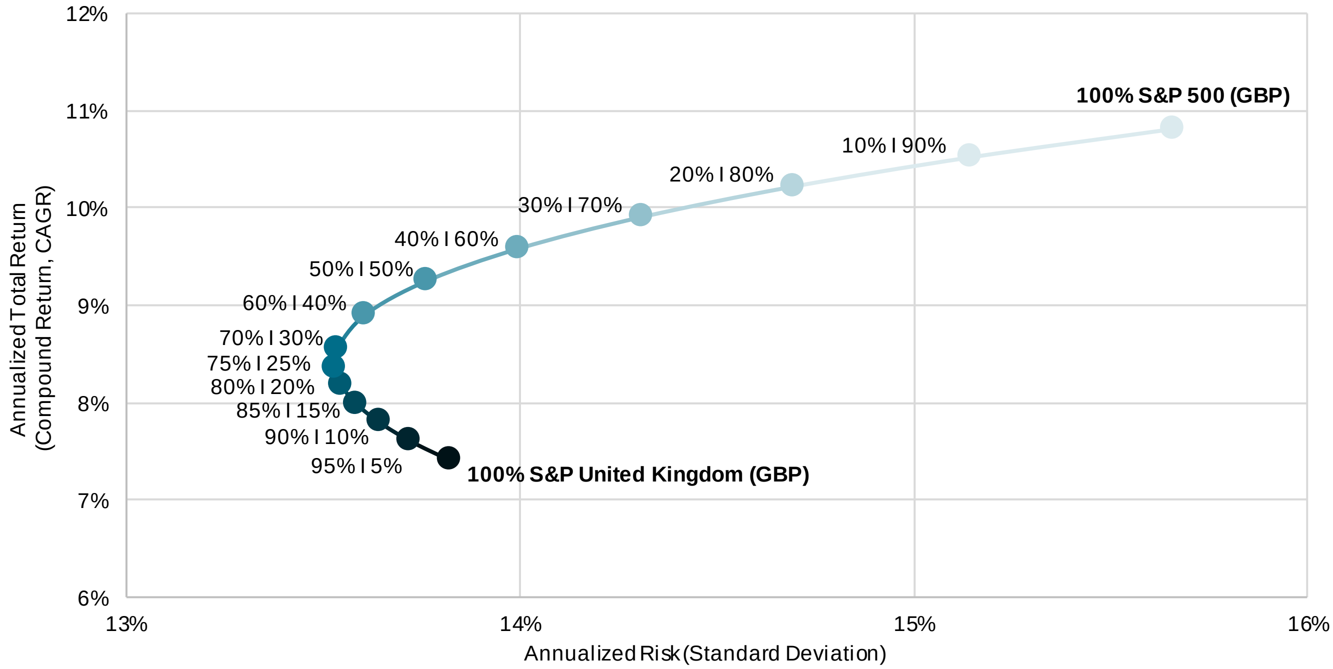
U.S. indices offered a better return and a more favorable risk profile, including improved drawdowns, than a U.K. investment in isolation.

Exhibit 3: Historical Performance of Hypothetical Combinations of U.S. and U.K. Equities

Portfolio	1-Year		3-Year		5-Year		10-Year		25-Year	
	Return (%)	Return/ Risk Ratio	Return (%)	Return/ Risk Ratio	Return (%)	Return/ Risk Ratio	Return (%)	Return/ Risk Ratio	Return (%)	Return/ Risk Ratio
S&P United Kingdom (GBP)	6.90	0.57	3.68	0.23	3.62	0.26	6.49	0.53	5.40	0.39
95% S&P United Kingdom (GBP)/5% S&P 500 (GBP)	6.17	0.51	4.10	0.26	4.07	0.29	6.98	0.57	5.61	0.41
85% S&P United Kingdom (GBP)/15% S&P 500 (GBP)	4.71	0.39	4.92	0.32	4.97	0.36	7.96	0.67	6.01	0.44
75% S&P United Kingdom (GBP)/25% S&P 500 (GBP)	3.25	0.26	5.73	0.38	5.85	0.43	8.93	0.76	6.40	0.47
50% S&P United Kingdom (GBP)/50% S&P 500 (GBP)	-0.42	-0.03	7.66	0.51	7.99	0.60	11.33	0.98	7.33	0.54
S&P 500 (GBP)	-7.79	-0.45	11.17	0.68	12.02	0.80	15.99	1.24	8.99	0.59

Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1989, to Dec. 30, 2022. Index performance is based on monthly total return in GBP. The hypothetical combinations are done using an index of indices (IOI) approach, with the weights rebalanced quarterly. Annualized risk is based on the annualized standard deviation of monthly returns. The S&P United Kingdom (GBP) was launched Dec. 31, 2001. All data prior to index launch date is 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 at the end of the document for more information regarding the inherent limitations associated with back-tested data.

Exhibit 4: Historical Risk/Return Characteristics of Hypothetical Portfolios Combining U.K. and U.S. Equities



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1989, to Dec. 30, 2022. Index performance is based on monthly total return in GBP. The hypothetical combinations are done using an IOI approach, with the weights rebalanced quarterly. Annualized risk is based on the annualized standard deviation of monthly returns. The S&P United Kingdom (GBP) was launched Dec. 31, 2001. All data prior to index launch date is 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 the document for more information regarding the inherent limitations associated with back-tested data.

Section 1: U.K. Equities and U.K. Equity Indices

U.K. Equities and Country Classifications

The U.K. is the most significant equity market in Europe and the world's fifth largest, behind only the U.S., China, Japan and India.[3] **But what do we mean by "U.K. equities"?** The question is non-trivial: shares of foreign or quasi-foreign institutions have been listed and traded in London since the late 17th century. In modern times, the U.K. also provides the primary listing for a wide range of non-U.K. companies.

In order to benchmark equity markets in different countries, index providers such as S&P Dow Jones Indices (S&P DJI) associate every company to a particular home. The classification depends on a wide range of potential considerations, and some companies are more difficult to classify than others.[4] The precise process of allocating each company to a single home market differs from index provider to index provider, but in the majority of cases, the classifications are fairly obvious and consistent across index providers.

U.K. Equity Indices

The broadest benchmark that S&P DJI offers for the U.K. equity market is the S&P United Kingdom BMI (Broad Market Index). This index includes all U.K. companies with float-adjusted market values of USD 100 million or more and minimum liquidity criteria measured using two median daily value trade figures. The largest 100 or so companies are considered to be "blue chips" and form the basis of the S&P United Kingdom (which is a sub-index of the S&P Europe 350®), which, along with the S&P 500, forms part of the S&P Global 1200.[5]

Like any other developed equity market, the U.K. has many more small companies than large ones. As of Dec. 30, 2022, there were 367 stocks within the broad-based S&P United Kingdom BMI, more than three-quarters (77%) of which would fall under S&P Dow Jones Indices' definition of small cap, as shown in Exhibit 5.

[3] Source: S&P Dow Jones Indices LLC, as of Dec. 30, 2022, by total index market capitalization, no free-float adjustment. With a free-float adjustment, the U.K. is the third largest, behind the U.S. and Japan.

[4] Manchester United Football Club provides an example of the kind of subtlety that index providers must sometimes attempt. Manchester United is incorporated in the Cayman Islands, has its primary listing in New York, is majority owned by an American family and proudly boasts an international fan base, with a significant component of its revenue derived from Asia. It remains classified by S&P Dow Jones Indices as British. Details on how S&P Dow Jones Indices achieves its size and country classifications may be found in the S&P Global BMI methodology, available at https://www.spglobal.com/spdji/en/indices/equity/sp-global-bmi.

[5] The S&P United Kingdom contained 82 companies as of Dec. 30, 2022.

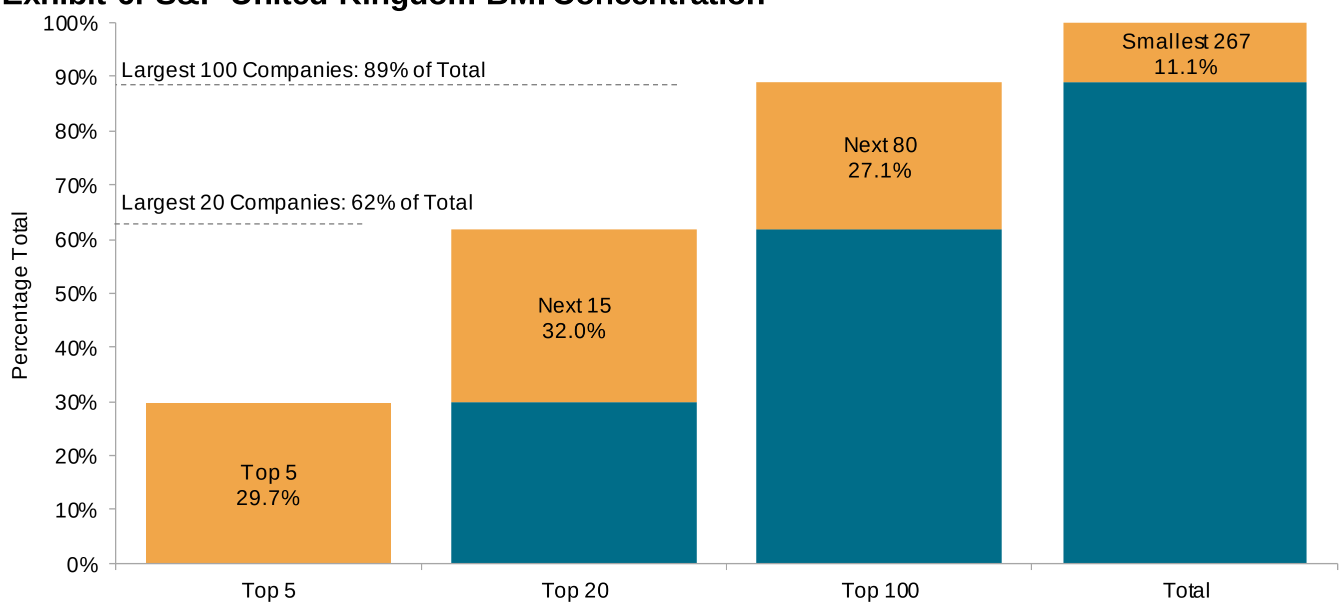
Exhibit 5: Description of U.K. Equity Indices Used

Index Name	Market Capitalization Range	Description	Number of Constituents
S&P United Kingdom (GBP)	Large Cap/Blue Chips Only	The S&P United Kingdom—a sub-index of the S&P Europe 350—includes all U.K.-domiciled stocks from the benchmark. The index is designed to be reflective of the U.K. market, yet efficient to replicate.	82
S&P United Kingdom LargeMidCap	Large- and Mid-Cap Portions of the S&P Global BMI	The S&P United Kingdom LargeMidCap is designed to measure large- and mid-cap constituents of the S&P United Kingdom BMI.	85
S&P United Kingdom BMI	Broad/Total Market Index	The S&P United Kingdom BMI is a country subindex of the S&P Global BMI that includes only U.K.-domiciled companies. The S&P Global BMI captures the full universe of institutionally investable stocks in developed and emerging markets with float-adjusted market capitalizations of at least USD 100 million meeting 6- and 12-month median value traded requirements.	367

Source: S&P Dow Jones Indices LLC. Data as of Dec. 30, 2022. The S&P United Kingdom (GBP) is part of the S&P Global 1200. The S&P United Kingdom LargeMidCap is part of the S&P Global BMI. Please note that approaches to index construction varies across index series. Table is provided for illustrative purposes.

However, by capitalization, the U.K. market is dominated by a select group of large companies (see Exhibit 6). More than one-half of the value of the U.K. equity market is accounted for by the largest 20 stocks, and the top five alone account for more than 30%.

Exhibit 6: S&P United Kingdom BMI Concentration



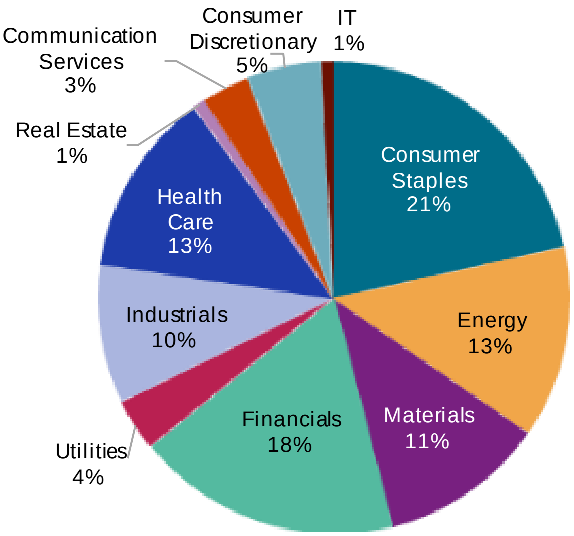
Source: S&P Dow Jones Indices LLC. Data as of Dec. 30, 2022. Chart is provided for illustrative purposes.

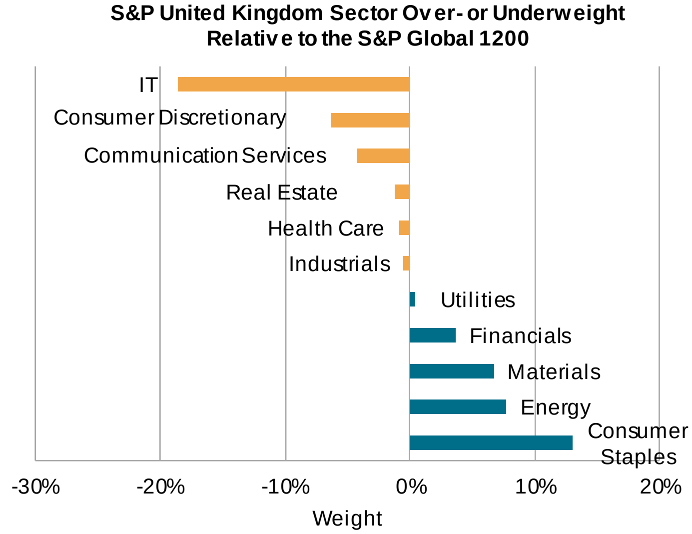
Sectoral Composition of the S&P United Kingdom

In addition to having a high degree of concentration within a few large companies, the U.K. equity market is also relatively concentrated by sector—specifically in Consumer Staples, Energy, Materials, Health Care and Financials. Conversely, the U.K. offers only limited exposure to other sectors, notably Information Technology, which amounts to only 1%.

Exhibit 7 displays the sectoral makeup of the U.K. blue chips from two perspectives. The pie chart shows the absolute weight of each sector within the S&P United Kingdom. The bar chart provides the difference—positive or negative—between those weights and their global equivalents, as represented by the sector weights of the S&P Global 1200.

Exhibit 7: Absolute and Relative Sector Weights of the S&P United Kingdom





Source: S&P Dow Jones Indices LLC. Data as of Dec. 30, 2022. Charts are provided for illustrative purposes.

Managing Concentration and Sector Risk

If investors holding primarily U.K. equities wish to limit their concentration or diversify across sectors, they can attempt to achieve this by investing abroad. However, they do not need to do so. One alternative is to simply buy fewer shares in the largest companies in the most dominant sectors and buy more shares in smaller companies; for example, in the U.K. Information Technology sector. Small- and mid-cap stocks typically carry more risk, so a disciplined portfolio construction approach might be advisable, picking carefully to provide an optimal mix of industry, size and risk.

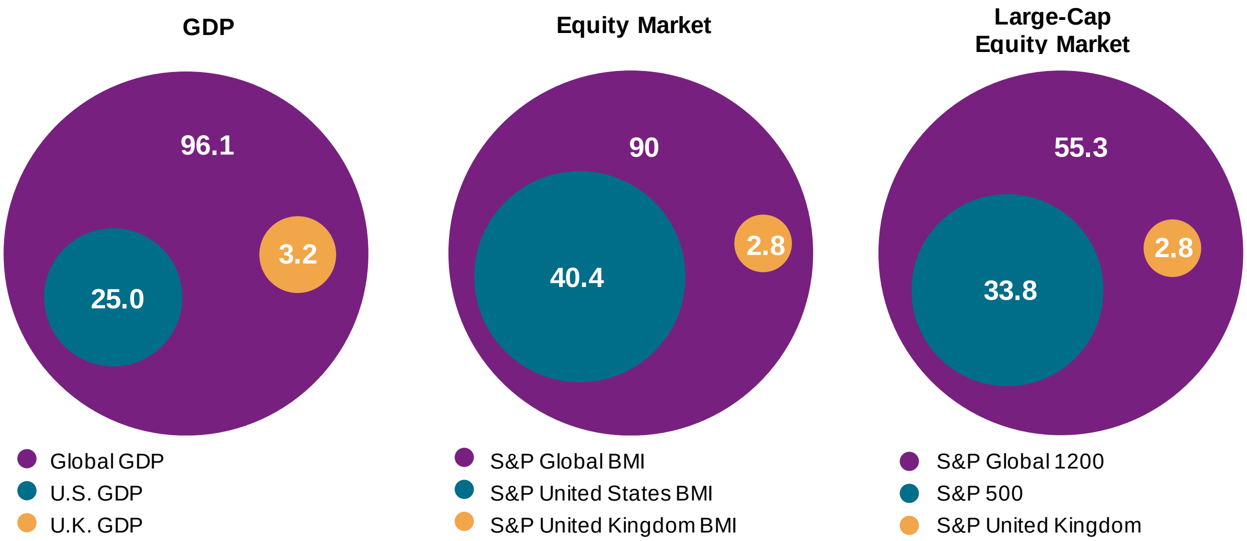
However, while stock picking within U.K. equities might provide greater diversification, it might also act to reduce returns. Finding a manager with enough skill to overcome the additional costs is not easy: according to the S&P Index Versus Active (SPIVA®) Europe Mid-Year 2022 Scorecard, in the 10-year period ending June 2022, **less than 3 out of 10 active funds** operating in the broad U.K. equity or blue-chip U.K. equity category outperformed an appropriate benchmark. For small-cap U.K. stocks, the record was essentially a coinflip, with less than half of U.K. small-cap active equity managers outperforming the S&P United Kingdom SmallCap.[6] So, an investor might also look abroad for diversification purposes. If they do so, they will find that a significant proportion of the investable opportunity set resides within U.S. equities.

[6] Source: SPIVA Mid-Year 2022 Europe Scorecard at https://www.spglobal.com/spdji/en/documents/spiva/spiva-europe-mid-year-2022.pdf

Section 2: The U.S. and Global Markets

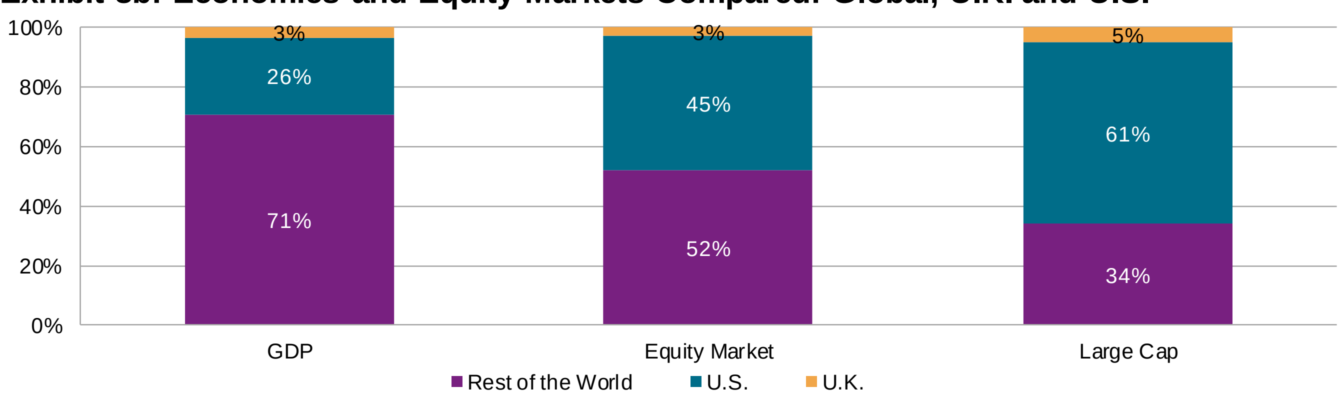
Exhibit 8 shows the relative size of gross domestic product, along with total and blue-chip equity capitalization for the U.S., the U.K. and the world. When U.K. investors make choices among countries, about half of their opportunity set is composed of U.S. stocks, with approximately 83% of capitalization in S&P 500 companies.

Exhibit 8a: Economies and Equity Markets Compared: Global, U.K. and U.S. (USD Trillions)[7]



Source: S&P Dow Jones Indices LLC, the World Bank. GDP as of December 2021. Total market cap, no adjustment for free-float of the S&P United States BMI, S&P United Kingdom BMI, S&P Global BMI, S&P 500, S&P Global 1200 and S&P United Kingdom as of Dec. 30, 2022. Charts are provided for illustrative purposes.

Exhibit 8b: Economies and Equity Markets Compared: Global, U.K. and U.S.



Source: S&P Dow Jones Indices LLC, the World Bank. GDP is as of December 2021. Total market cap, no adjustment for free-float of the S&P United States BMI, S&P United Kingdom BMI, S&P Global BMI, S&P 500, S&P Global 1200 and S&P United Kingdom as of Dec. 30, 2022. Chart is provided for illustrative purposes.

[7] The inclusion of GDP in Exhibit 8 allows for a sense of the relative global reach of each market. Both the U.S. and the U.K. have more significant equity markets than their global share of economic production would suggest; in part because many U.K. and U.S. companies have significant global operations (and hence their equity capitalization reflects economic activity in many countries). A second important factor is that many of the significant economic drivers of growth in developing markets are state owned (that is to say, not publicly listed).

Although the U.K. is the sixth-largest economy in the world and the third-largest stock market by float-adjusted market capitalization, Exhibit 8 highlights that it only represents a small portion of the global opportunity set, with the U.S. GDP and stock market being 8 and 15 times its size, respectively.

The S&P 500 also accounts for many of the world's more recognizable brands, many of which are listed on the Brand Finance Global 500 2022 report on the world's most valuable brands.[8] In addition, it is noteworthy that the brands identified as American are *all* owned by S&P 500 constituents.

Exhibit 9 highlights that the U.S. accounts for a staggering 70% of the top 10 companies, with around one-half of the top 50 being U.S. brands. Ranking at 23, only one British brand, Shell, is in the top 50.

Exhibit 9: World's Top 100 Most Valuable Brands by Location

Global Ranking	Brand	Location	Global Ranking	Brand	Location
1	Apple	United States	26	AT&T	United States
2	Amazon	United States	27	Tencent	China
3	Google	United States	28	Tesla	United States
4	Microsoft	United States	29	Starbucks	United States
5	Walmart	United States	30	Allianz Group	Germany
6	Samsung Group	South Korea	31	Aramco	Saudi Arabia
7	Facebook	United States	32	Moutai	China
8	ICBC	China	33	Volkswagen	Germany
9	Huawei	China	34	China Mobile	China
10	Verizon	United States	35	NTT Group	Japan
11	China Construction Bank	China	36	McDonald's	United States
12	Toyota	Japan	37	Mitsubishi Group	Japan
13	WeChat	China	38	UPS	United States
14	Agricultural Bank Of China	China	39	BMW	Germany
15	Mercedes-Benz	Germany	40	Costco	United States
16	State Grid	China	41	Bank of America	United States
17	Deutsche Telekom	Germany	42	Marlboro	United States
18	TikTok/Douyin	China	43	Accenture	United States
19	Disney	United States	44	Coca-Cola	United States
20	Home Depot	United States	45	Citi	United States
21	Ping An	China	46	Porsche	Germany
22	Taobao	China	47	Instagram	United States
23	Shell	United Kingdom	48	Lowe's	United States
24	Bank of China	China	49	Nike	United States
25	Tmall	China	50	UnitedHealthcare	United States

Source: S&P Dow Jones Indices LLC, Brand Finance "Global 500 2022" Report. Data as of 2021. Table is provided for illustrative purposes.

[8] Brand Finance, Global 500 2022 Report.

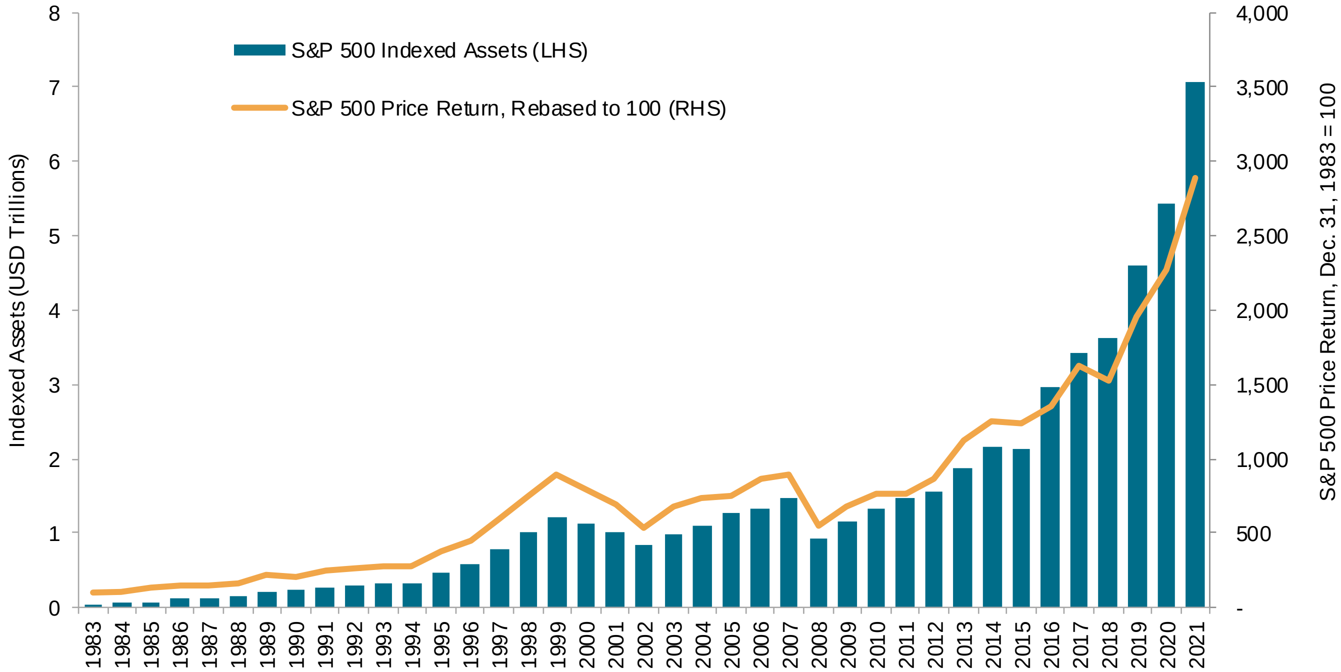
Section 3: Unique Characteristics of the S&P 500

Exhibits 8 and 9 show that the S&P 500 captures a significant proportion of the world's total equity capitalization and major brands. However, the same applies to many similar indices, portfolios or funds, provided they cover a suitably broad selection of major U.S. stocks. So why might a market participant prefer an investment linked to the S&P 500 in particular?

Unique Characteristics of the S&P 500

The S&P 500 is one of the world's most popular institutional benchmarks, with a significant amount of capital tied to its performance. Exhibit 10 shows the growth of assets passively tracking the S&P 500 over time. The growth of the S&P 500 itself is included for purposes of comparison.

Exhibit 10: S&P 500 Estimated Indexed Assets versus Price Returns



Source: S&P Dow Jones Indices' Annual Survey of Indexed Assets. Data as of year-end 2021. The S&P 500 was rebased to 100 as of Dec. 31, 1983. "Indexed Assets" do not include active funds or assets that are benchmarked to S&P DJI indices for performance measurement. Synthetically replicated index-based products, such as derivatives, are also not included. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Over time, and as a consequence of its usefulness to major investors and traders, a unique ecosystem of liquid and low-cost solutions has evolved.

– Interest in hedging S&P 500-related exposures has created a highly liquid market for related futures and options.

– Interest in investments tracking the S&P 500 has fueled the creation of related low-cost index funds and ETFs.

– Interest in predicting or comprehending the performance of the S&P 500 supports the availability of analysis, forecasts and commentary.

Exhibit 11 provides a holistic overview of why, when market participants look for a low-cost, liquid and transparent way to invest in or hedge exposures to U.S. equities, they might consider instruments linked to the S&P 500.

Exhibit 11: The Global Relevance of S&P 500, in Figures.

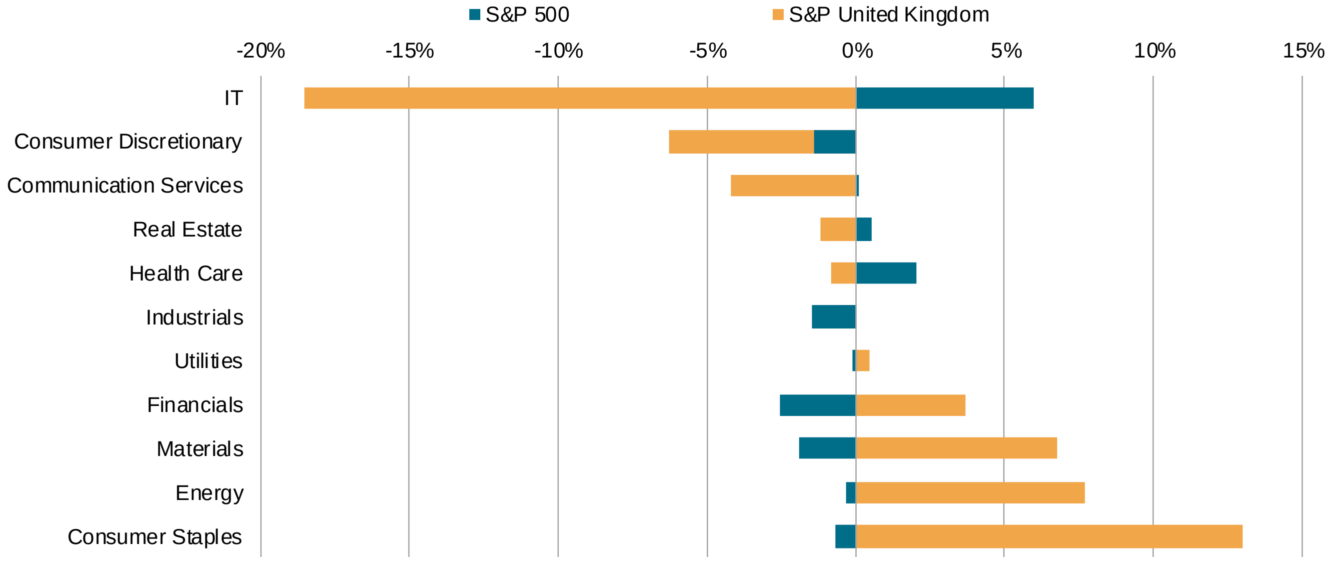
Category	S&P 500 Presence/Relevance	Selected Comparisons
Benchmark for Both Active and Passive Portfolios	**USD 8.5 trillion was benchmarked to the S&P 500** (as of year-end 2021).	Approximately USD 17.9 trillion benchmarked to FTSE Russell indices.
	Another **USD 7.1 trillion** was invested in products **directly indexed to the S&P 500.**	Approximately USD 13.5 trillion benchmarked to all MSCI equity indices.
ETFs	Over **USD 1 trillion** in ETFs linked to the S&P 500 listed across global exchanges.	Global ETF Industry approximately **USD 8.4 trillion.**
	Around USD **52 billion** of which was in London-listed ETFs.	Around **USD 466 billion** of which was in London-listed ETFs.
Typical Charges for Investment	The largest London-listed ETF linked to the S&P 500 currently charges **0.07%.**	European average annual cost for indexed-linked funds is **0.37%.**
Tradability/Liquidity	The ecosystem of products linked to the S&P 500 generated a one-year **USD 197 trillion** in index equivalent trading volume as of December 2021.	Around **USD 4.3 trillion** and **USD 6.3 trillion** in notional annualized value trading in the year to Sept. 30, 2022, in FTSE 100 derivatives and in H1 2022 in *all* MSCI index futures and options, respectively.
	Most liquid U.S.-based ETFs linked to the S&P 500 averaged **USD 30 billion traded every day in 2021.**	
Availability of Academic Analysis	JSTOR, a commercial provider of access to premier academic journals, lists **7,260 journal articles** and 931 books that reference the S&P 500. The broader ScienceDirect finds **10,889 journal articles** and 809 books.	The FTSE 100 is referenced in **648 journal articles** and 222 books accessible via JSTOR, while ScienceDirect offers **1,678 journal articles** and 182 book references.

Sources: S&P Dow Jones Indices LLC, the London Stock Exchange Group, MSCI, ETFGI, FIA, Bloomberg, JSTOR, ScienceDirect, CME and Cboe. Data as of December 2022 unless otherwise stated. Table is provided for illustrative purposes.

Section 4: Sectors of the S&P 500

As shown in Section 1, the U.K. equity market is somewhat concentrated in certain sectors and includes only a few companies in others. An allocation to the S&P 500 could alleviate these sectoral imbalances. Exhibit 12 provides the *relative* sector under- and overweights of each market compared to the global sector weights (represented by the S&P Global 1200).

Exhibit 12: Sector Tilts of the S&P 500 and S&P United Kingdom, relative to the S&P Global 1200



Source: S&P Dow Jones Indices LLC. Data as of Dec. 30, 2022. Chart is provided for illustrative purposes.

In comparison with global markets, the U.K. market skews heavily toward Consumer Staples, Energy, Materials and Financials, while significantly underweight in Information Technology and Real Estate. Contrastingly, the S&P 500 is overweight in Information Technology and Health Care, but underweight in Financials, Materials, Energy and Consumer Staples. In other words, **the U.S. market offers what the U.K. market lacks, and vice versa.**

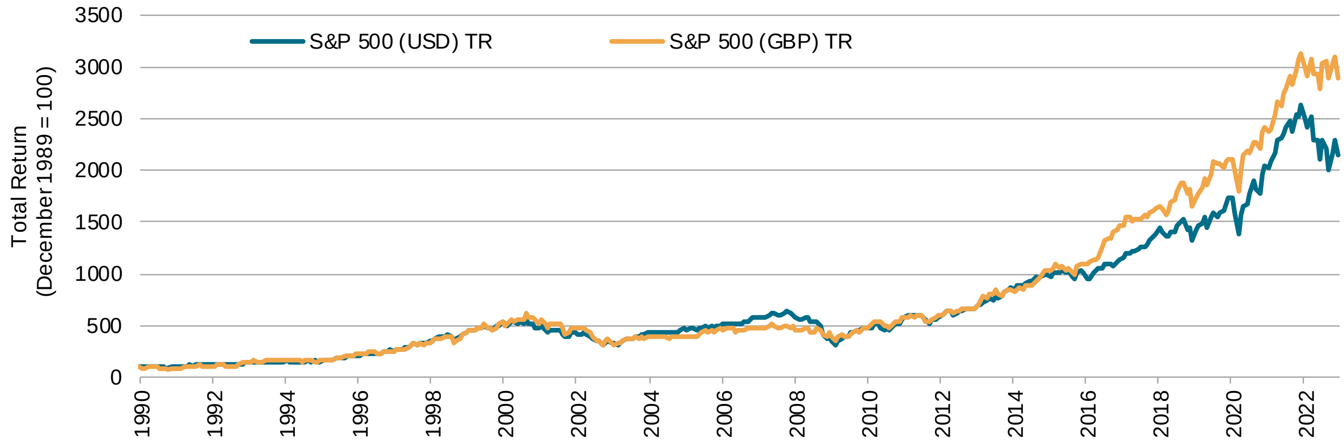
The only exception is Consumer Discretionary. However, even in that case, the S&P 500 is less significantly tilted than the S&P United Kingdom. Any combination of the S&P United Kingdom and the S&P 500 will have sector weightings that are closer to the global average than are the weights of the S&P United Kingdom alone.

Section 5: The S&P 500 and the U.S. Dollar

As well as fluctuating stock prices, international investors in the U.S. stock market are exposed to fluctuations in the U.S. dollar. Exhibit 13 compares the performance of the S&P 500 Total Return (TR) with the same index *expressed in sterling terms,* over the past 32 years. In other words, the only difference between these two return series is in the reporting currency.[9]

[9] The two series of Exhibit 13 are not directly comparable. Without currency hedging, only a USD-based market participant can earn the USD-based total return, and only a GBP-based one can earn the GBP-based total return.

Exhibit 13: The S&P 500 (USD) TR versus the S&P 500 (GBP) TR



Source: S&P Dow Jones Indices LLC. Data as of Dec. 30, 2022. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

The difference between the two is sometimes material. Exhibit 13 displays a notable divergence in 2016, when the sterling fell dramatically after the victory of the "Exit" campaign in the EU membership referendum, which persisted after the referendum.

In 2022, we can see another divergence when geopolitical uncertainty triggered by the Russia-Ukraine conflict was compounded by domestic political turmoil that sent the pound sterling to its lowest level against the U.S. dollar since 1985.[10]

When it comes to assessing the impact of a currency on investments, two questions naturally arise.

- Is the investor willing to be positively exposed to increases or decreases in the U.S. dollar/sterling exchange rate?
- What is the relationship between changes in the S&P 500 and the U.S. dollar/sterling exchange rate?

Investors who view U.S. dollar exposure as attractive should still be aware of the potential risks: if the S&P 500 rises, a U.K. investor in a related index fund might yet face a loss if the sterling has appreciated significantly against the dollar.[11]

Historically, two key drivers have acted to dampen the effect of currency fluctuations for international investors in U.S. equities: the role of the U.S. dollar as a "safe haven," and the international operations of S&P 500 constituents.

[10] Forbes. "The British Pound Has Fallen To Its Lowest Level Against The U.S. Dollar Since 1985 - Here's Why." Oct. 7, 2022.

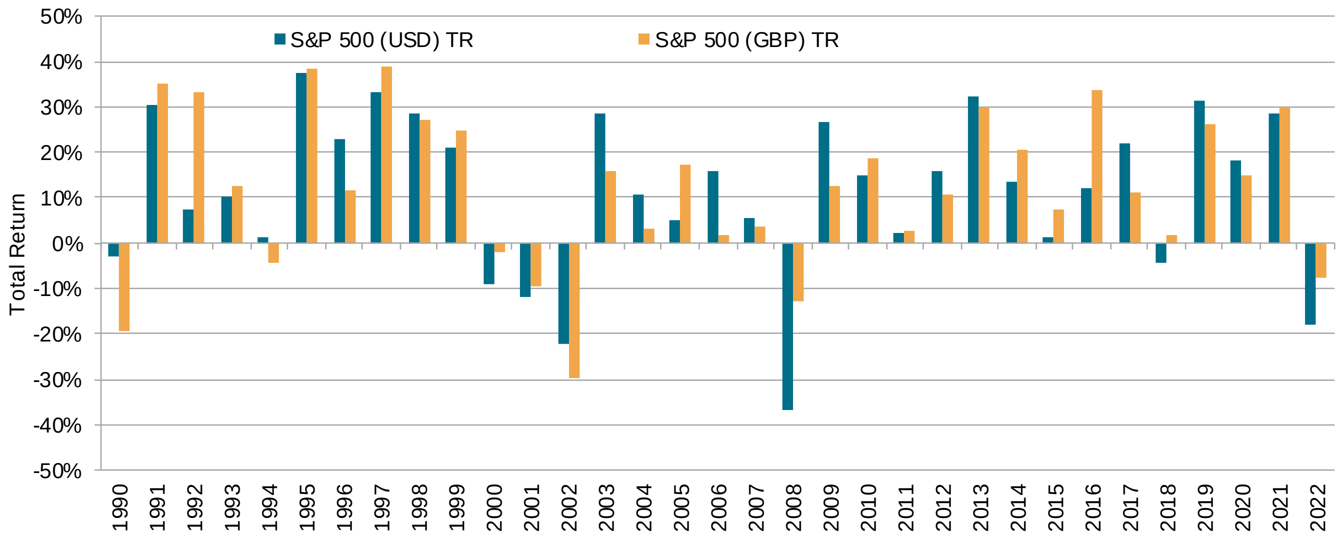
[11] The currency risk in equity investments can be "hedged" via currency forwards in an attempt to offer international investors a return that is more similar to the local performance, a process that forms the basis of S&P DJI's "currency hedged" indices. Several S&P 500-linked funds and ETFs that are hedged into sterling are locally available to U.K. investors.

The U.S. Dollar as a "Safe Haven"

In times of financial uncertainty, investors tend to buy more defensive assets, such as U.S. Treasuries, and make defensive changes to their portfolios, such as switching from emerging market equities to developed ones. These actions create a demand for the U.S. dollar and tend to increase its value during times of financial stress.

Therefore, foreign investors in U.S. equities might expect a degree of mitigation of extreme price swings. For example, if U.S. equities fell dramatically during a crisis, their value in sterling might be supported by an accompanying rise in the dollar. Conversely, during a persistent bull market in U.S. equities, the dollar may weaken and thereby diminish the gains for international investors. Exhibit 14 shows this from the perspective of a sterling-based investor.

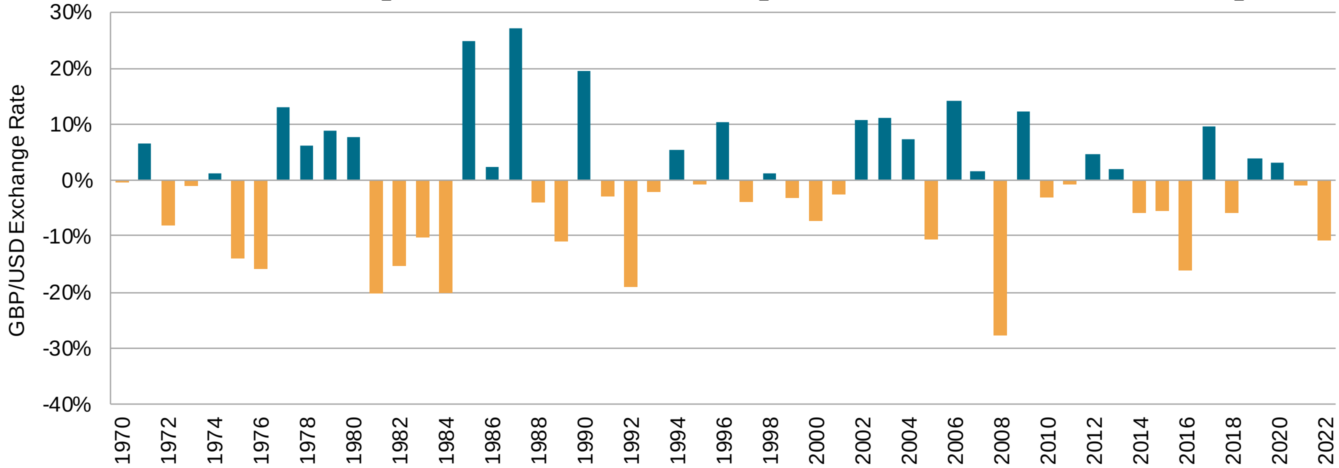
Exhibit 14: The S&P 500 TR in U.S. Dollar and British Pound Sterling Terms



Source: S&P Dow Jones Indices LLC. Data as of Dec. 30, 2022. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Exhibit 14 shows that in years such as 2002 and 2008, when the S&P 500 fell significantly, the rising dollar cushioned the fall. A further example was offered in 2022: the S&P 500 fell 18% in U.S. dollar terms over the course of the year, but an 11% move in the exchange rate meant that the U.S. benchmark limited its losses to just 8% when measured in pound sterling. In other years—particularly in the rebounding markets of 2003 and 2009—a falling dollar meant the U.K. investor's returns from the U.S. market were lower than those experienced on the other side of the Atlantic.

Exhibit 15: Pound Sterling and U.S. Dollar Exchange Rate – Year-Over-Year Change



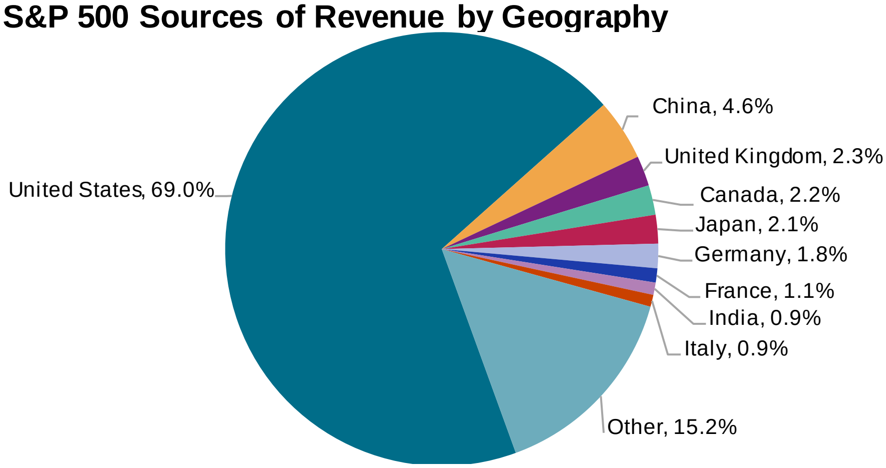
Source: S&P Dow Jones Indices, LLC, FactSet. Data as of Dec. 30, 2022. Chart is provided for illustrative purposes. Past performance is no guarantee of future results.

The Importance of S&P 500 Foreign Sales

If a U.S. company has significant, profitable foreign operations, then if the U.S. dollar depreciates, those foreign profits will be worth more to that company. Vice versa, if the dollar appreciates, those foreign profits will be worth less in dollar terms. To stress the point from an international investor's perspective, significant foreign operations are designed to mitigate the impact of currency movements on stock prices.

Some—but not all—companies provide a degree of transparency in the location and importance of their international operations. Exhibit 16 shows aggregated statistics for these data were available for the constituents of the S&P 500, providing a summary of the geographical sources of revenue as of Sept. 30, 2022.

Exhibit 16: S&P 500 Sources of Revenue by Geography



Sources: S&P Dow Jones Indices LLC, FactSet. Data as of Sept. 30, 2022, and compiled on Dec. 21, 2022. Sales-weighted average of exposures. Past performance is no guarantee of future results. Chart is provided for illustrative purposes. Please see The Impact of the Global Economy on the S&P 500 and How Global Is the S&P 500 for further details.

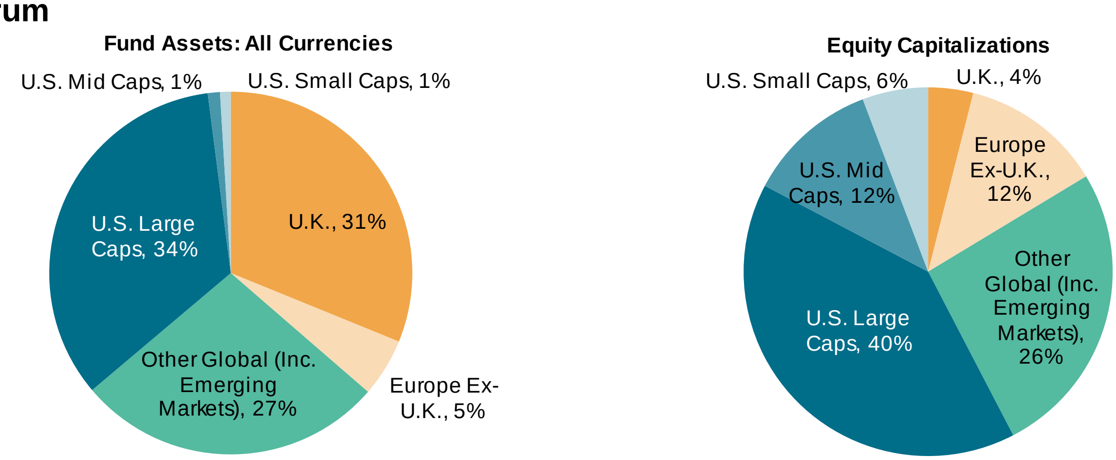
Exhibit 16 shows that **about 31% of sales by S&P 500 companies were made to customers outside of the U.S.** And the distribution of foreign sales was wide; Europe and Asia together represent one-quarter of total sales, with the rest of the world accounting for 8%, while Africa and the Middle East make up 3%.

Section 5: Active and Passive Investments In U.S. Equities

Using Morningstar's U.K. fund database, Exhibit 17 illustrates the asset allocations of U.K.-domiciled equity funds (actively or passively managed), along with their allocation to various geographic and size segments as derived from Morningstar classifications.[12]

For comparison, the right-hand chart of Exhibit 17 illustrates the capitalization of each market segment within the S&P Global BMI using Morningstar's definition of large, mid, and small caps, representing the largest 70%, the next 20% and the smallest 10% of stocks by total segment capitalization, respectively.

Exhibit 17: U.K. Fund Investors Overlook U.S. Equities across the Capitalization Spectrum



Source: S&P Dow Jones Indices LLC, Morningstar. LHS fund data as of Sept. 30, 2022. RHS capitalization data is as of Dec. 30, 2022, and uses index market capitalization which is float-adjusted. Charts are provided for illustrative purposes. See the Appendix for details on how fund assets were assigned to the respective categories. Equity capitalizations based on Morningstar's definition of large, mid and small caps as representing the largest 70%, the next 20%, and the smallest 10% of stocks by total segment capitalization, respectively.

Exhibit 17 shows that U.K. funds have allocated about 36% in aggregate to *all* U.S. equities, compared to a U.S. equity weight of 58% within the global opportunity set. The resulting 22% "under" allocation of U.K. funds to U.S. equities is almost equal to the equity market capitalization of all equity markets outside the U.K., U.S. and Europe markets. In the aggregate, this suggests a potential opportunity for U.K. investors to gain access to a market relatively overlooked by their peers.

[12] See Appendix for more details on the allocation of fund assets to size and geographic categories.

The question of whether to invest passively or actively in U.S. equities—via an index fund or an active stock-picker, for example—is of significant importance to an investor's eventual outcomes. The observations made in and accompanying Exhibit 11 indicate why an S&P 500 index fund might be cheaper and easier to understand than an active fund, but neither cost nor comprehensibility are frequently cited as reasons to invest actively. Instead, the hope for outperformance and better risk management are more common.

Exhibit 18 highlights a few statistics from the SPIVA Europe Mid-Year 2022 and the SPIVA U.S. Mid-Year 2022. The data suggest that outperformance in the large-cap U.S. market is uncommon for fund managers based in either market. Moreover, outperformance appears to become rarer as the measurement period increases.

Exhibit 18: Percentage of U.S. Equity Funds Outperforming the S&P 500 in the U.S. and the U.K.

Time Period	Large-Cap U.S. Equity Funds Offered in the U.S. (%)	All U.S. Equity Funds Based in Europe and Offered in Pound Sterling (%)
1-Year	44.47	20.83
3-Year	14.12	11.16
5-Year	15.53	7.08
10-Year	9.97	2.56

Source: S&P Dow Jones Indices LLC. Data as of Mid-Year 2022. Table is provided for illustrative purposes.

In a sense, such results are unsurprising. Active managers hope to exploit market inefficiencies, the identification of which can arise through an informational advantage or a particular insight. The challenge for active managers operating in large-cap U.S. stocks is the widespread availability of data and analysis on those companies. While it is not easy to agree that the U.S. market is perfectly efficient, **the evidence suggests that it is difficult to gain a persistent advantage over passive investors in large-cap U.S. equities.**

Conclusion

U.S. equities cover a broad segment of the global equity landscape and are likely to form a part of any investor's thoughts, especially if they wish to gain exposure to the Information Technology sector. Investing in a diversified basket of U.S. equities has been made significantly easier, cheaper and more transparent due to the widespread availability of S&P 500 index funds and ETFs, as well as other access vehicles such as options and futures. For a U.K. investor, the sector makeup of the S&P 500 offers a particularly complementary blend for a broad-based U.K. equity portfolio, and one that has historically improved both the return and return/risk ratio.

Appendix: Notes for Exhibits 1 and 17

In order to construct Exhibit 17 (and Exhibit 1, which highlights selected statistics from Exhibit 17), we first obtained assets under management and fund categorizations for all equity funds available in the U.K. from Morningstar, LLC as of Sept. 30, 2022. Each fund's assets were converted into a common currency, and the assets of each fund were allocated to or distributed proportionally as appropriate across the categories of the exhibit according to the fund classification. Europe Emerging Markets Equity is classified as Europe Ex-U.K., while Europe Equity size classifications Europe Equity Large and Europe Equity Mid/SmallCap are split between the U.K. and Europe Ex-U.K.in a 25% and 75% allocation, respectively. In cases where the fund classification covered multiple geographies and size classifications (e.g., broad-based Global Equity funds), the assets were distributed into geographies according to the weight of each region in the S&P Global BMI and into sizes according to the Morningstar size bands, which dictate that 70%, 20% and 10% of each equity market's capitalization is defined as large, mid and small, respectively.

Performance Disclosure/Back-Tested Data

The S&P United Kingdom (GBP) was launched Dec. 31, 2001. 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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