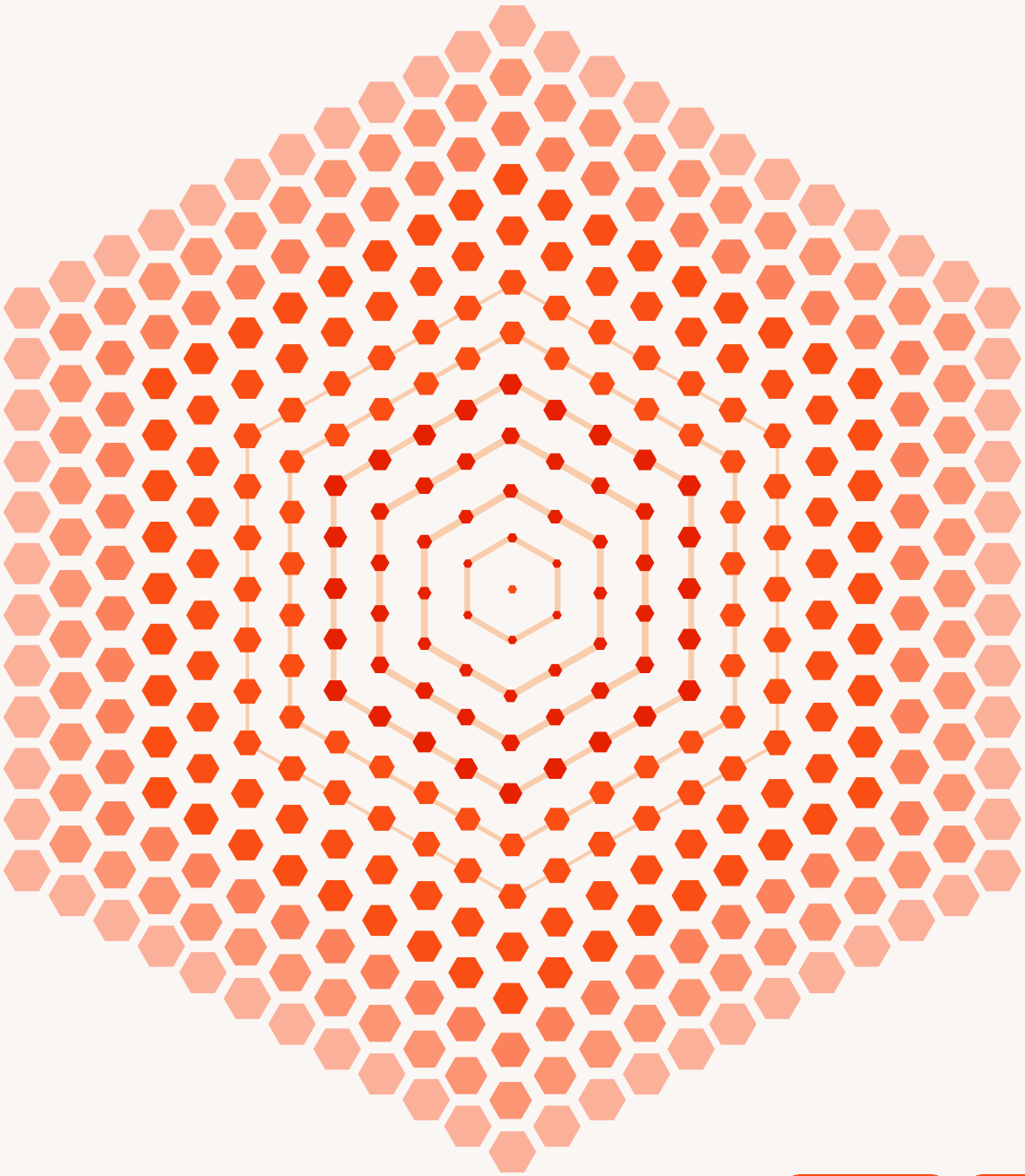
betashares

# Achieving better portfolio balance with the S&P 500 Equal Weight Index



ASX: QUS ASX: HQUS

S&P 500 Equal Weight ETF

# Why Smart Beta?

The launch of the first index funds in the 1970s and Exchange Traded Funds (ETFs) in the 1990s made low-cost passive investing accessible to the average investor. By far the most popular form of passive investment benchmarks are those where constituent stocks are weighted according to their size (market capitalisation). Some of the most well-known indices, such as the S&P 500 Index and the S&P/ASX 200 Index, are examples of such a weighting methodology.

Critics of market capitalisation-weighted indices highlight the fact that investors using such indices ultimately buy more of the overpriced stocks and less of the underpriced. The rise of 'smart beta' investing provided an alternative approach to passive investing. Smart beta refers to passive, rules-based strategies that seek to weight indices using a methodology other than market capitalisation, often by targeting a specific factor (e.g. value, size or momentum).

The ultimate objective of smart beta is therefore either to enhance returns relative to a standard benchmark, or to reduce the risk (or a combination of these two objectives). In this way, smart beta offers the dual benefit of the potential long-term outperformance which has historically been associated with active management, within a transparent, passive framework at lower fees.

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# Introducing the S&P 500 Equal Weight Index

In January 2003, S&P Dow Jones Indices (S&P DJI) launched the world's first equal-weight index, the S&P 500 Equal Weight Index. Given that stocks are not weighted purely by their market capitalisation, equal weighting is a form of smart beta, albeit not one that targets a specific factor.

The S&P 500 Equal Weight Index includes the same constituents as the market capitalisation-weighted S&P 500 Index, but each company in the S&P 500 Equal Weight Index is allocated an equal portfolio weight of 0.20% (1/500) of the index total at each quarterly rebalance. The table below shows a comparison of the weight for the top 10 holdings for the S&P 500 and S&P 500 Equal Weight Indices as at August 2024:

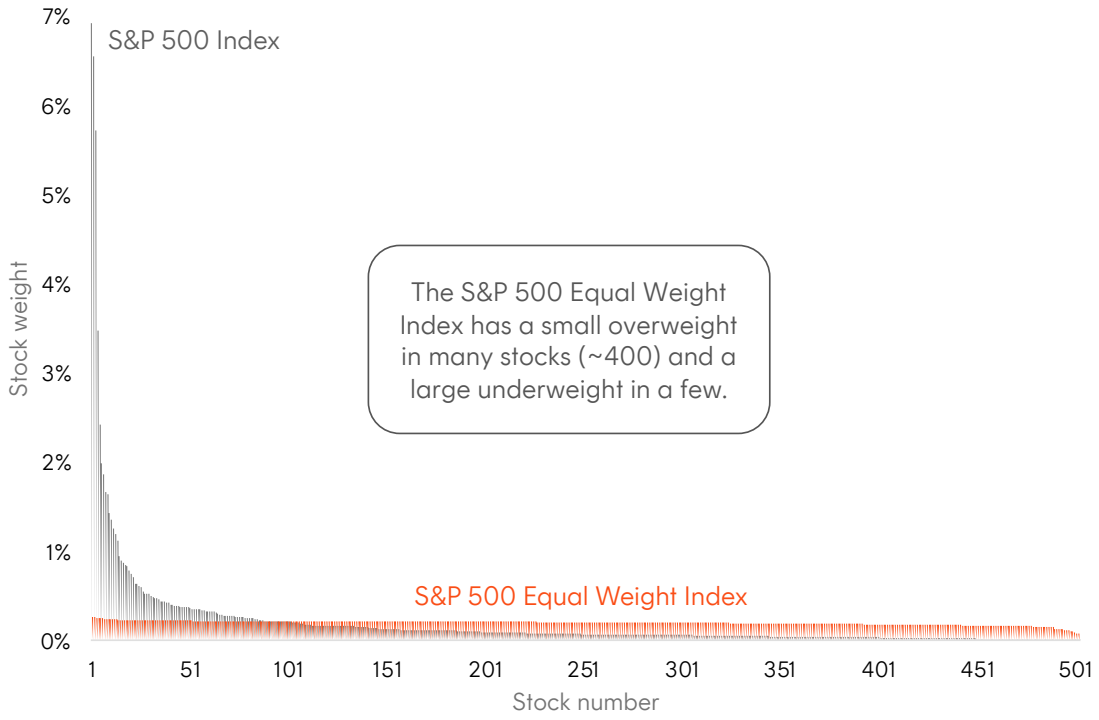
## Table 1: Top 10 holdings by % weight

| S&P 500 Index | | S&P 500 Equal Weight Index | |
|---|---|---|---|
| **Apple** | 6.96% | **Kellanova** | 0.26% |
| **Microsoft** | 6.54% | **Mohawk Industries** | 0.26% |
| **Nvidia** | 6.19% | **Globe Life** | 0.25% |
| **Amazon** | 3.45% | **3M Co** | 0.25% |
| **Meta Platforms** | 2.41% | **CBRE Group** | 0.25% |
| **Alphabet Inc Class A** | 2.02% | **DR Horton** | 0.24% |
| **Berkshire Hathaway** | 1.82% | **Newmont** | 0.24% |
| **Alphabet Inc Class C** | 1.70% | **Iron Mountain** | 0.24% |
| **Eli Lilly** | 1.62% | **Keycorp** | 0.24% |
| **Broadcom** | 1.50% | **Equifax** | 0.24% |

Sources: Bloomberg, Betashares. As at 31 August 2024.

The names on the left of Table 1 will be familiar to investors, whereas one cannot necessarily say the same the names on the right. The important point is this – the top stocks for the equal weight index will change frequently given that all stocks start from the same weight at each quarterly rebalance, and therefore stocks such as Apple and Microsoft will have a similar weight to the smallest market capitalisation stock in the index (uniform distribution).

## Chart 1: Stock distribution by weight (S&P 500 vs S&P 500 Equal Weight Index)

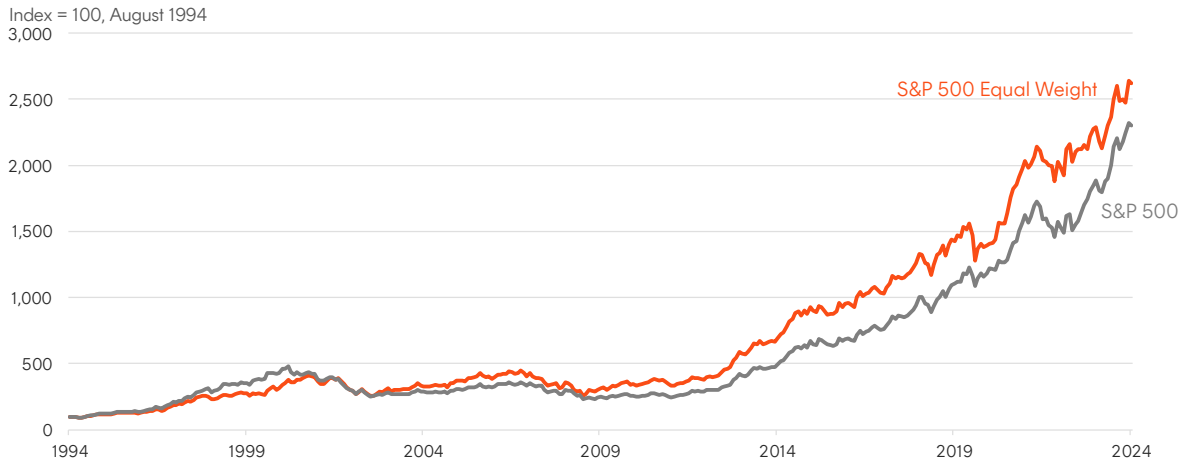



Source: Bloomberg, Betashares, data as at 31 August 2024.

# Performance of Equal Weight

Whilst not targeting any specific investment factor, indices based on equal weight have produced long-term outperformance relative to their market cap-weighted equivalents. In the case of the S&P 500 Indices, the outperformance over the past 30 years (to 31 August 2024) has been +0.48% p.a. This is remarkable considering the simplicity of equal weight and the depth of analyst research coverage of stocks within the S&P 500 Index, a market which would be considered highly efficient. However, the outperformance of equal weight over the long term has not been confined to the US and has also been evident in many other regions and countries[1].

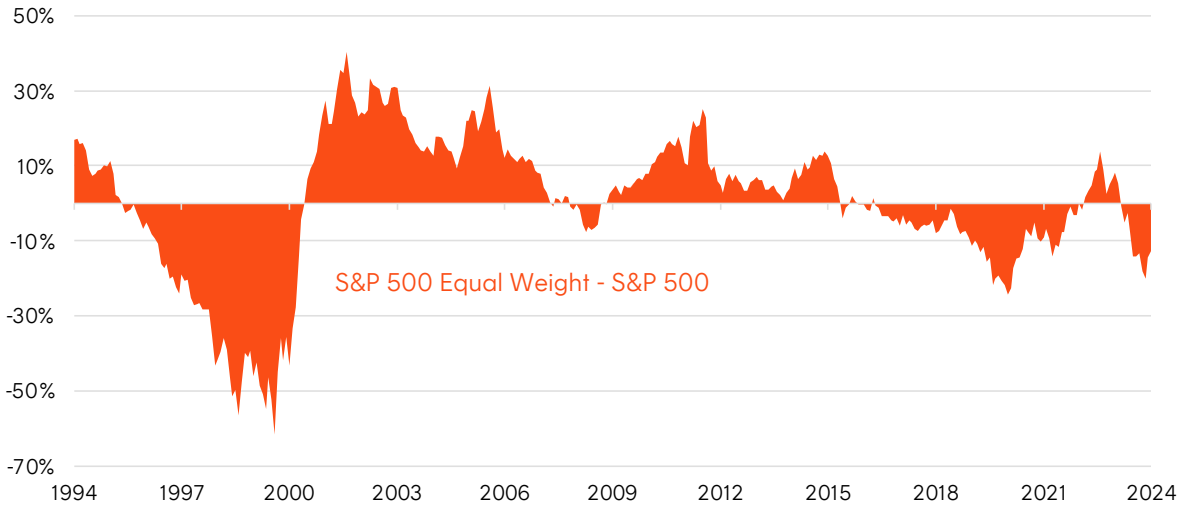
## Chart 2: Long term performance of S&P 500 and S&P 500 Equal Weight Indices




Source: Bloomberg, Betashares. Data as at 31 August 2024 and in AUD. You cannot invest directly in an index. Index performance does not take into account ETF fees and costs. Past performance is not an indicator of future performance of any ETF or index.

If we consider shorter holding periods, we can more clearly see the periods of under or outperformance by the Equal Weight Index. The chart below shows the rolling 3-year relative returns from August 1991 to August 2024 (the first 1994 data point indicating the 3-year relative returns to August 1994), and whilst there have been periods of equal weight underperformance (including the most recent period), equal weight outperformed its market capitalisation-weighted counterpart for the majority of the time (55%) over the comparison period. What is also evident is the magnitude of the excess returns over such holding periods, even though both indices comprise the same stocks.

## Chart 3: Rolling 3-year relative returns (August 1991 to August 2024)




Source: Bloomberg, Betashares. Rolling 3-year relative returns of the S&P 500 Equal Weight Index less the S&P 500 Index from August 1994 to August 2024. You cannot invest directly in an index. Index performance does not take into account ETF fees and costs. Past performance is not an indicator of future performance of any ETF or index.

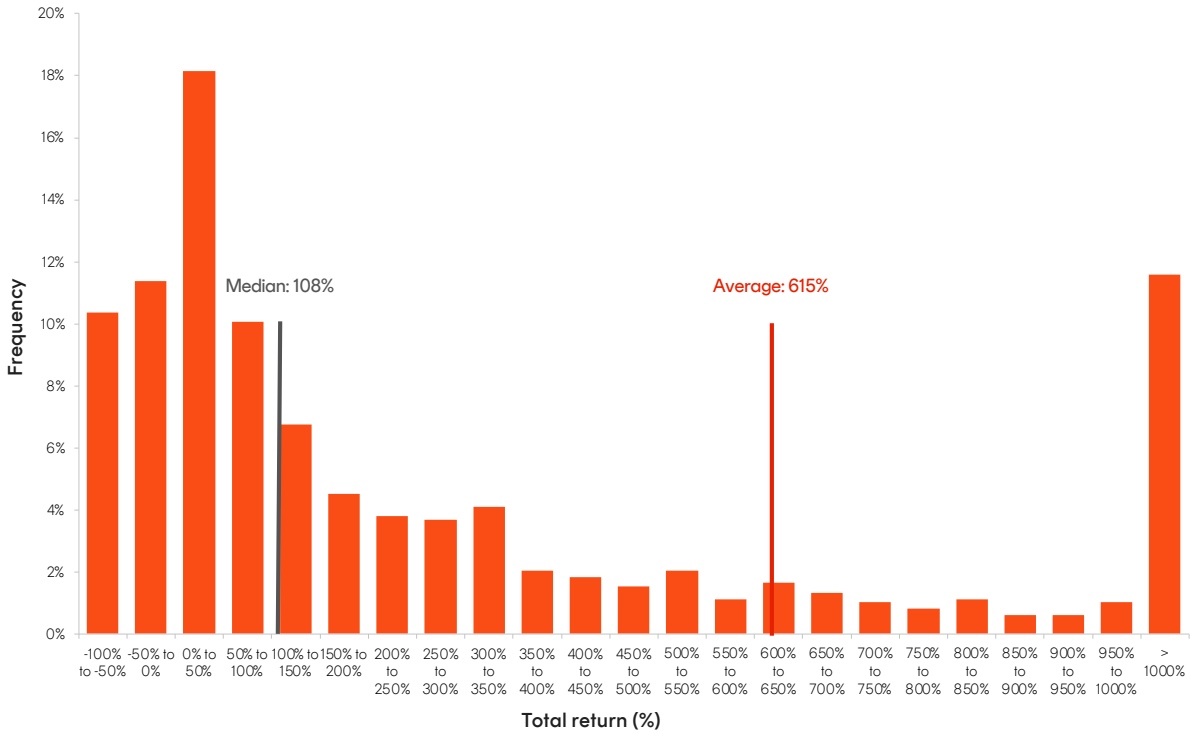
# What has driven the long-term outperformance of the S&P 500 Equal Weight Index?

As mentioned previously, equal weighting by itself does not provide targeted exposure to any specific risk factor. In fact, equal weighting assumes that we do not have any expectation for one stock to outperform another. By assigning the same weight to each stock, we effectively treat all constituents as having the same potential for risk and return, without favouring any based on forecasted performance or volatility. Given the simplicity of equal weighting, the question then becomes, what have been the drivers of this historical long-term outperformance?

## 1. Stock Return Skew

Most investors are aware that the most they can lose owning a stock is 100% of its value. However, not many are aware of the implications for stock selection given that upside performance is not limited and can extend well beyond positive 100% returns. Empirical evidence finds that the majority of returns within an index has tended to be clustered at the lower end of the return distribution, and that a smaller subset of stocks has typically delivered very large positive returns [2]. This means that the average return will generally be greater than the median return. In statistical terms, this means that stock returns are not normally distributed, but rather have displayed a positive skew [3]. Returns from the S&P 500 Index have been positively skewed in 29 out of the 33 years to 2024 and the existence of the skew is not limited to the US [4].

Chart 4: Stock return skew in S&P 500 Index (March 2023 to June 2024)




Source: S&P Dow Jones Indices LLC, FactSet. Data from 1 March 2003 to 28 June 2024. Index performance based on total return in USD. Past performance is not an indicator of future performance of any index or ETF. Chart is provided for illustrative purposes only.

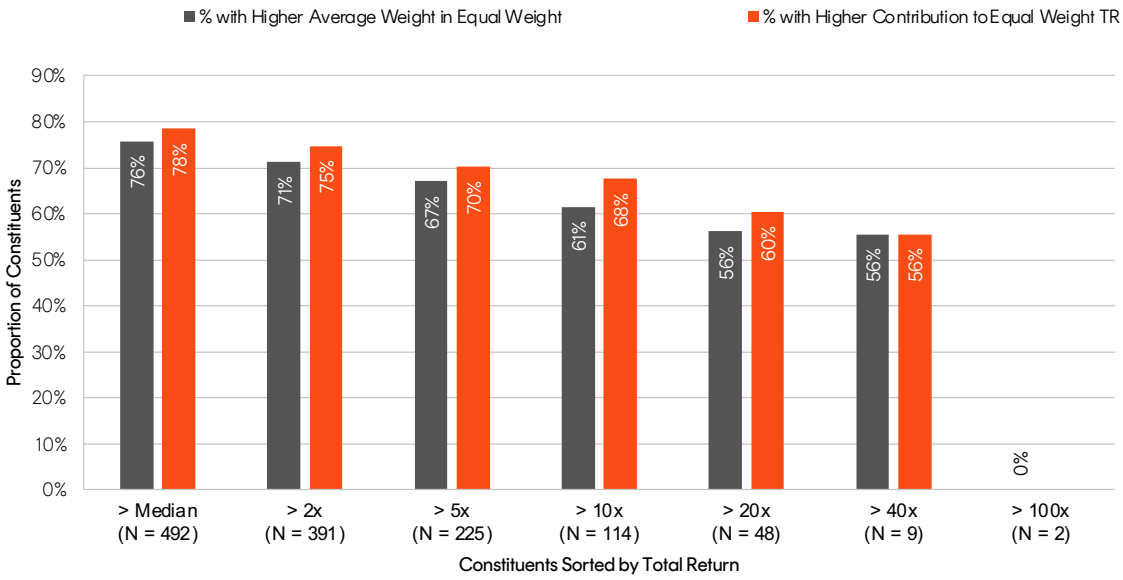
[2] Bessembinder H (2018). "Do Stocks Outperform Treasury bills?" Journal of Financial Economics.
[3] A normal distribution displays symmetrical properties with similar shaped left and right tails, the majority of returns clustered around both the average and the median.
[4] Edwards T (2019). "There's Nothing Equal About Equal Weight Performance"

The relevance and implication for equal weighting is significant and helps explain not only the historical tendency for equal weight to outperform market capitalisation over the longer term, but also the persistent underperformance by active managers in general.

Given that the average return is higher than the median return, it means that more than half the stocks deliver a return below the average. Active managers with more concentrated portfolios therefore have a lower probability of picking above average performers. On the other hand, equal weight indices such as the S&P 500 Equal Weight Index, where 400 out of the 500 stocks have a higher weighting than the equivalent market capitalisation index, have a higher probability of an overweight position in the smaller subset of stocks with outsized returns.

Chart 5 below confirms that these stocks with above average returns historically have added more returns to the S&P 500 Equal Weight Index than to the S&P 500 Index.

Chart 5: Constituent Contributions and Average Weights (March 2003 to June 2024)




Source: S&P Dow Jones Indices LLC, FactSet. Data from 1 March 2003 to 28 June 28 2024. Index performance based on total return indices in USD. Past performance is not an indicator of future performance of any index or ETF. Chart is provided for illustrative purposes only.

## 2. Rebalancing Impact

Smart beta indices must be rebalanced regularly to a specific target weight that by definition is not market capitalisation weighted. For the S&P 500 Equal Weight Index, this means that on quarterly basis, each stock will simply be rebalanced to have the same weight, which means that stocks that have risen in value are sold and stocks that have fallen in value are bought. This systematic "buy low sell high" rebalancing strategy has tended to be value accretive over time, especially during times of mean reversion[5].

Momentum strategies, on the other hand, do exactly the opposite. Winners are generally added, and losers are sold. It is for this reason that equal weight strategies have tended to display negative-momentum properties.

[5] Perold, A. and Sharpe W. (1995), "Dynamic Strategies for Asset Allocation" Financial Analysts Journal

## 3. Size Impact

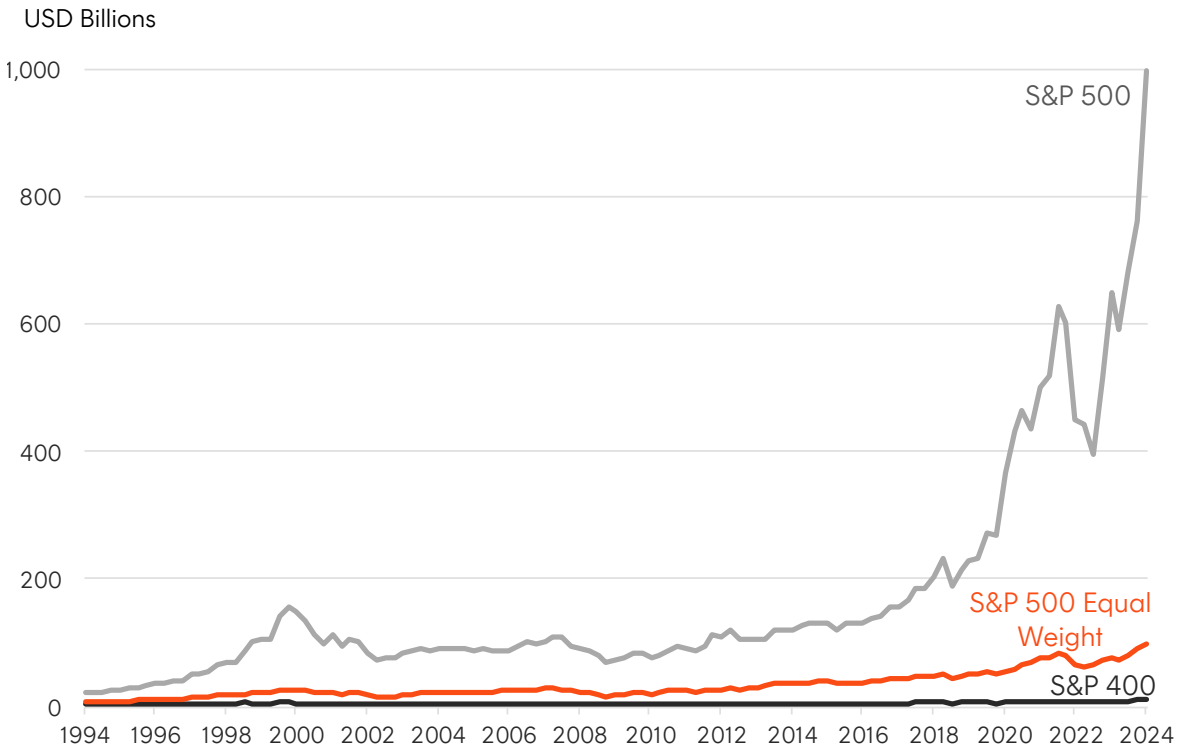
The size premium refers to the empirical evidence that smaller companies have tended to outperform larger capitalisation stocks over the long run. R.W. Banz was the first to highlight the superior risk adjusted returns of smaller capitalisation stocks relative to large capitalisation stocks [6]. However, landmark research by economists Eugene Fama and Kenneth French created the backdrop for the future attention to the size premium after showing that size, along with value and market beta, explains a significant part of the cross-sectional variation in stock returns[7].

Various explanations have been put forward as to why smaller size companies have tended to outperform over the longer term, including lower liquidity premium, greater sensitivity to macro factors, higher default risk, or even greater awareness of benchmark returns, which may lead institutional investors to only focus on larger cap names.

The size factor can of course be specifically targeted in the portfolio construction process by overweighting smaller sized companies and underweighting larger capitalisation stocks. However, another way to achieve a smaller size bias is simply to equal weight stocks. Chart 1 diagrammatically shows how this is achieved - equal weight has significantly underweighted the largest stocks in the S&P 500 Index, whilst at the same time overweighting a large number of the smaller constituents.

One can also view the equal weight outcome in terms of the average index weighted market capitalisation. Chart 6 compares the index weighted market capitalisation for the S&P 500 Index, the S&P 500 Equal Weight Index, and the S&P MidCap 400 Index. Despite the S&P 500 Equal Weight Index consisting of the same stocks as the S&P 500 Index, its index weighted market capitalisation has remained much closer to that of the S&P MidCap 400 Index.

### Chart 6: Index weighted market capitalisation



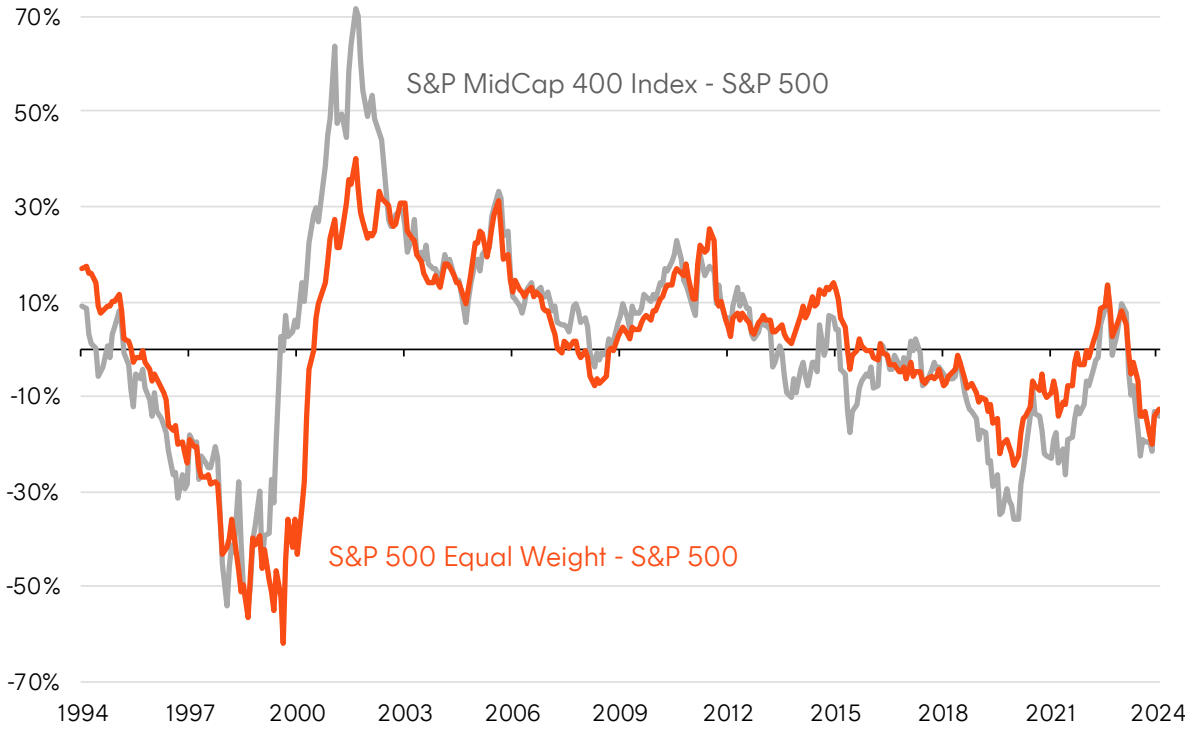

Source: Bloomberg, S&P Dow Jones LLC. Quarterly data from December 1991 to June 2024.

[6] Banz, R.W. (1981). "The Relationship between Return and Market Value of Common Stocks." Journal of Financial Economics
[7] Fama, E. F.; French, K. R. (1992). "The Cross-Section of Expected Stock Returns". The Journal of Finance

Chart 7 shows the same information as presented in Chart 3 above, namely the rolling 3-year excess returns between the S&P 500 Equal Weight Index and the S&P 500 Index, but in this chart we also overlay the same rolling relative returns between the S&P MidCap 400 Index and the S&P 500 Index. It is clear the size impact is captured in the S&P 500 Equal Weight Index, and statistical analyses consistently show that after market beta, size explains the largest residual component of excess returns in equal weight. This also explains why equal weight has tended to exhibit slightly higher volatility than market capitalisation indices.

Over the last seven years, larger companies have generally outperformed strongly against a global backdrop of lower economic activity and greater uncertainty regarding the growth outlook. Smaller companies tend to be more cyclical in nature and the relative performance may well mean-revert in the event of an increase in global economic activity as interest rates are lowered globally.

Chart 7: Rolling 3-year return comparison (August 1991 to August 2024)




Source: Bloomberg, Betashares. Rolling 3-year relative returns of the S&P 500 Equal Weight Index less the S&P 500 Index and the S&P MidCap 400 Index less the S&P 500 Index from August 1994 to August 2024. You cannot invest directly in an index. Index performance does not take into account ETF fees and costs. Past performance is not an indicator of future performance of any ETF or index.

## 4. Increased Diversification/Lower Concentrations

Although still the most popular form of indexing, market capitalisation-weighted indices tend to suffer from the drawback that a large portion of the returns and risk can be driven by a small subset of very large companies. This will benefit the passive investor in times when these very large companies do particularly well and when momentum is strong.

This is exactly what has occurred in recent times – the S&P 500 Index's five largest names were up significantly over the 18 months to 31 August 2024 (Apple +56.57%, Microsoft +69.21%, Nvidia +414.47%, Amazon +89.43%, Alphabet +81.62%). The weighted average return of the remaining stocks was only 25.15% over the same time period[8]. This of course helps explain the recent underperformance for both equal weight, given its large underweight position in these stocks, and size (as a factor) in general. Stock concentration has also increased significantly of late and is now at the highest level since the 1960s when the top 5 stocks were AT&T, General Motors, Standard Oil, IBM and Texaco.

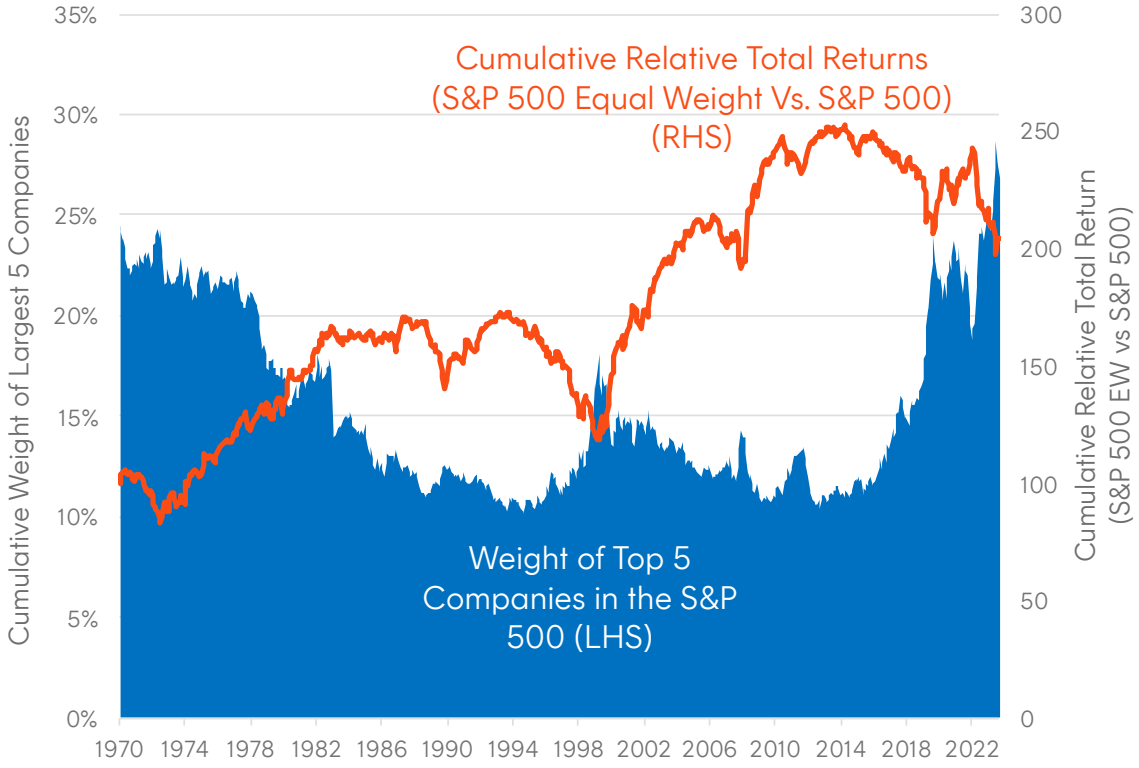
[8] Source: Betashares, Bloomberg, returns in USD.

If history is anything to go by, the current level of stock and sector concentration is unlikely to continue in its current form. Whether based on shorter-term reasons such as valuation reversals or longer-term structural adjustments due to healthy competition in free markets, or even regulatory/anti-competitive enforcement, the composition and level of concentration has tended to change over time.

Equal weight by design is more diversified at a single stock weight level, and the associated sector weights have also shown greater diversification over time. Diversification is often said to be the only free lunch in investing and on this basis alone makes equal weight a compelling consideration as a longer-term investment approach for US equities.

Considering the rapid recent increase in concentration levels, strategies such as equal weight may benefit even more on a relative basis once the concentration profile changes – either due to shorter or longer-term drivers. Historically, as depicted by the orange line in Chart 8, the equal weighted S&P 500 Index has experienced its greatest periods of relative outperformance when concentration in the market capitalisation weighted S&P 500 Index was high and subsiding. For example, from August 2020 to December 2022, when top 5 concentration in the S&P 500 fell by 5%, the S&P 500 Equal Weight Index outperformed the S&P 500 Index by 16%.

## Chart 8: Concentration in S&P 500 Index and cumulative relative performance of the S&P 500 Equal Weight Index versus S&P 500 Index



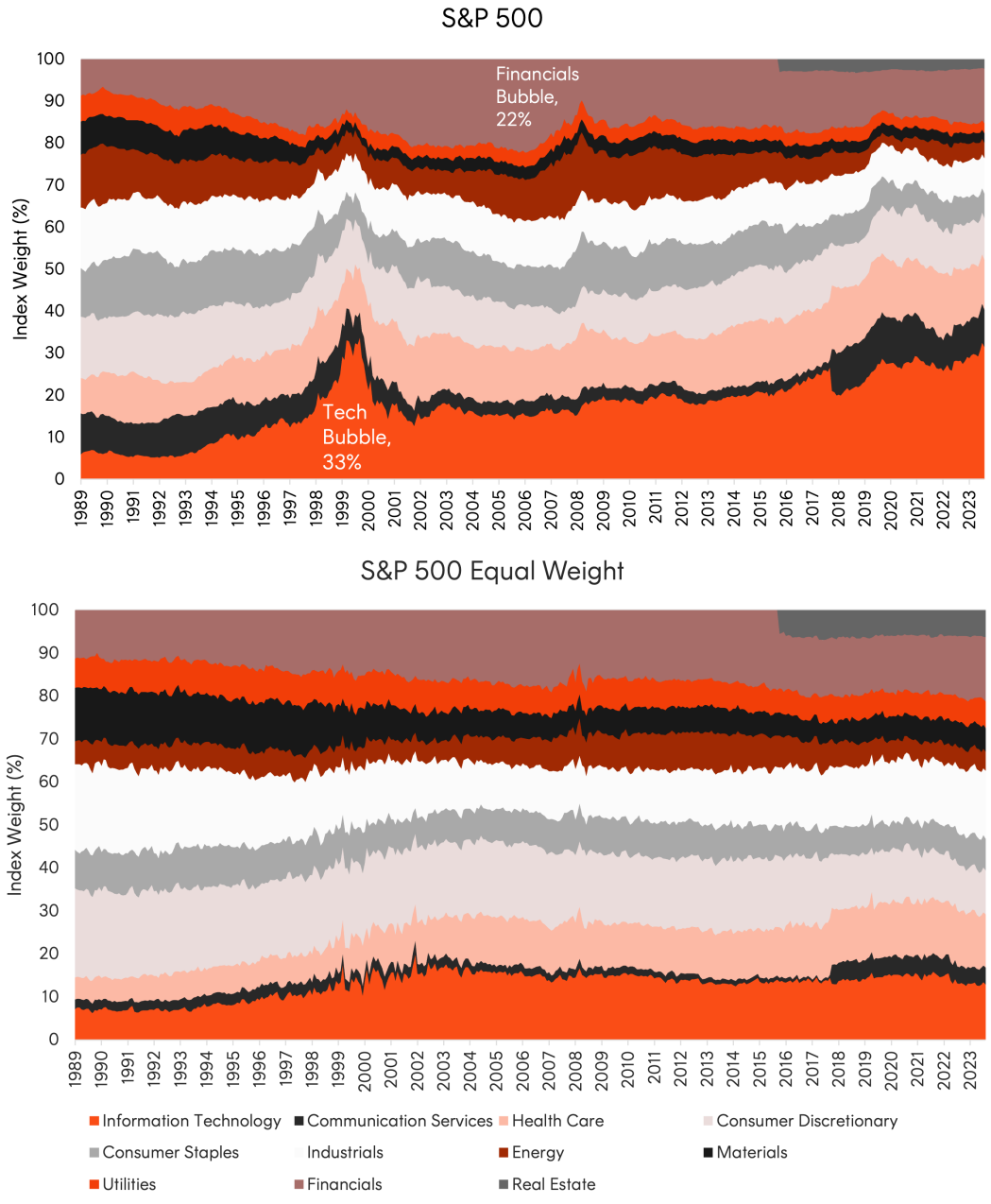

Source: S&P Dow Jones Indices LLC, Betashares. Chart shows cumulative relative returns for the S&P 500 Equal Weight Index versus the S&P 500, based on monthly total returns between December 1970 and August 2024. Cumulative weight of largest five S&P 500 companies based on month-end constituents. Index performance does not take into account ETF fees and costs. Past performance is not an indicator of future performance of any index or ETF. Chart is provided for illustrative purposes only.

# What do we know about sector diversification and the impact of equal weight?

Unlike a market capitalisation-weighted index, where the sector weight comprises the total market capitalisation for that sector, the sector weight for an equal weight index is represented by the total number of stocks in that sector. Therefore, equal weight indexing does not necessarily mean equal sector weights. From a diversification point of view, it is worthwhile noting that the S&P 500 Equal Weight Index's sector weight distribution is more closely aligned with equally weighted sectors, and, on this basis, as well as the individual stock basis described above, could therefore be considered as more diversified than the market capitalisation equivalent index.

Over time, equal weight sector weights also tend to avoid large increases in concentration - an issue that presents itself in market capitalisation weighting from time to time due to stocks within popular sectors becoming more expensive. The diagram below shows a more consistent distribution of sector weights over time for the S&P 500 Equal Weight Index.

Chart 9: Sector weights over time (S&P 500 vs S&P 500 Equal Weight) (December 1998 to July 2024)




Source: S&P Dow Jones Indices LLC. Monthly data from December 1989 to July 2024. Prior to September 2018, Communication Services was called Telecommunication Services. Real Estate became a standalone sector in September 2016. Past performance is not and indicator of future performance of any index or ETF. Chart is provided for illustrative purposes only.

# How can investors use equal weight within their portfolios?

## 1. Long term core allocation

The mean reversion impact of systematic rebalancing, greater portfolio diversification, favourable stock return skew properties, and constant exposure to the size factor, all have tended to benefit equal weight over market capitalisation weighting over time and this is reflected in the long-term historical outperformance in many regions and country specific exposures (though over the shorter run there has been periods of underperformance, as discussed earlier in this paper, where larger cap stocks have had periods of overperformance).

The associated volatility is slightly higher (mainly due to the size impact), but so are the overall risk adjusted returns over the long-term. Hence an investment that seeks to track the performance of the S&P 500 Equal Weight Index, which still includes the 500 largest companies in the US, can be considered by investors for a core allocation to US equities.

## 2. Shorter/medium term tactical allocation

Historic analyses have shown that periods of equal weight underperformance, due to strong price momentum in particular segments of the market (leading to increased stock and/or sector concentration levels), are unlikely to last, and the mean reversion profile offers attractive risk/return opportunities for equal weight exposures.

## 3. Blending complementary portfolio exposures

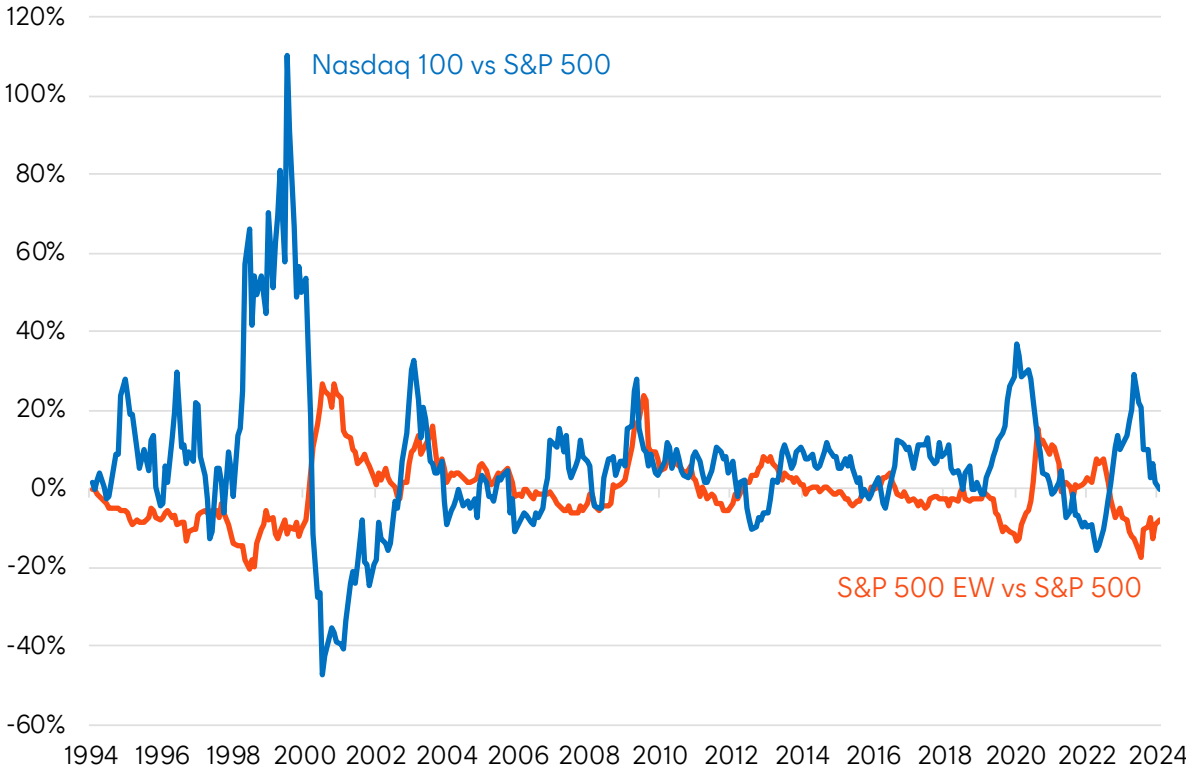
Even though equal weight has displayed attractive long-term excess returns, investors can also use the exposure's risk/return characteristics as a complementary allocation to seek to improve an equity portfolio's overall risk adjusted returns. Equal weight's anti-momentum rebalancing characteristics and performance behaviour during up/down markets can complement other risk premia exposures such as momentum and low volatility, or even market capitalisation indices, due to their inherent momentum profile. It may also make sense to blend an equal weight exposure to portfolios with already large weightings to the largest US stocks, particularly those in the technology sector, as a way to improve overall portfolio diversification.

For example, using the S&P 500 Index as our benchmark, in chart 10 we examine the rolling 1-year excess return of the Nasdaq 100, an index with higher technology, growth, and momentum characteristics, and the S&P 500 Equal Weight Index. Over the past 30-years there has been a strong inverse relationship between the two excess return series – illustrating the point above.

Over the 30-year time period, this relationship has meant that an evenly blended exposure to the Nasdaq 100 and S&P 500 Equal Weight Index would have provided investors with better risk adjusted returns than the individual indexes themselves[9]. Professional investors often look for these types of relationships when constructing portfolios to benefit from diversification and to balance their desired risk and return characteristics. Depending on their circumstances, investors could consider using different blended amounts of investments that provide exposure to the Nasdaq 100 and S&P 500 Equal Weight Index with the aim of achieving desired risk and return characteristics, noting that past performance is not an indicator of future performance of any index or fund.

[9]Source: Bloomberg, Betashares. May 1994 to May 2024. Sharpe ratio: S&P 500 0.43, S&P 500 EW and Nasdaq 100 blend 0.45. Average risk-free rate over period of 3.99% used. You cannot invest directly in an index. Past performance is not an indicator of future performance of any index or ETF. Does not take into account ETF fees and costs.

## Chart 10: Rolling 1-year rolling excess return vs S&P 500 (market cap) Index (1994 to 2024)




Source: Bloomberg, Betashares. You cannot invest directly in an index. Provided for illustrative purposes only. Not a recommendation to make any investment decision or adopt any investment strategy. Does not take into account ETF fees and costs. Past performance is not indicative of future performance of any index or ETF.

## Chart 11: S&P 500 Equal Weight Index, Nasdaq 100, and blended strategy return characteristics.

| | S&P 500 EW | Nasdaq 100 | S&P 500 EW and Nasdaq 100 blend (50:50) |
|---|---|---|---|
| **Return (p.a)** | 10.12% | 14.58% | 12.75% |
| **Volatility (p.a.)** | 16.86% | 24.10% | 19.04% |
| **Sharpe ratio** | 0.36 | 0.44 | 0.46 |

Source: Bloomberg, Betashares. S&P EW & Nasdaq Blend is a portfolio comprising a 50:50 allocation between the S&P 500 Equal Weight Index and Nasdaq 100 Index, rebalanced monthly. For the calculation of the Sharpe Ratios an average risk-free rate of 3.99% was used. Not a recommendation to invest or adopt any investment strategy. You cannot invest directly in an index. Past performance is not indicative of future performance of any index or ETF. Does not take into account ETF fees and costs.

# Currency hedging and the S&P 500 Equal Weight Index

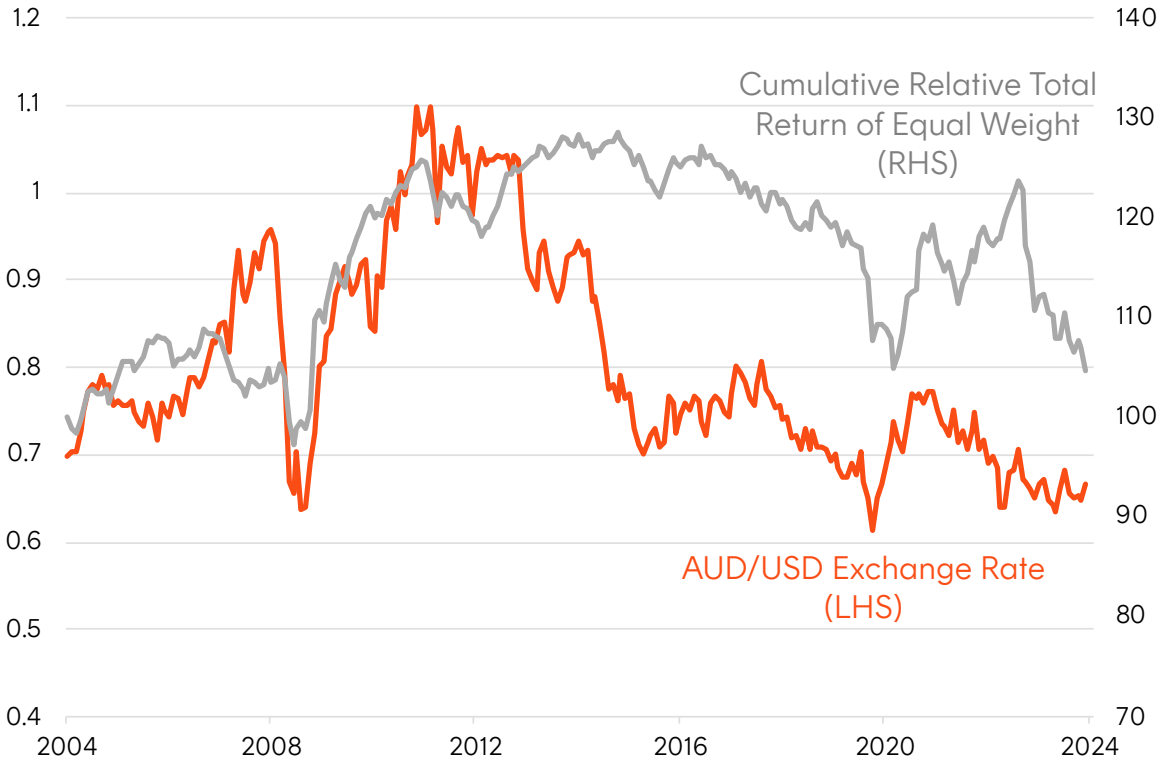
Australian investors considering an allocation to the S&P 500 Equal Weight Index may also want to consider the impact of currency.

Investing in international equities on an unhedged basis introduces currency risk. Investors returns will be determined by the local currency return of the investments and any currency movements between the Australian dollar and the currency the investments are in (in the case of the S&P 500 Equal Weight Index, the US dollar).

All else remaining equal, a decrease in the value of the Australian dollar leads to an increase in returns of overseas assets, when converting returns back into Australian dollars and vice versa for an increase in the value of the Australian dollar.

When examining a 20-year period (August 2004 to August 2024) of relative returns between the S&P 500 and S&P 500 Equal Weight Indices and the AUD/USD exchange rate, we can see a mild positive relationship between the two. This means that when the Equal Weight Index has tended to outperform (underperform) the S&P 500 Index the Australian dollar has tended to appreciate (depreciate) versus the US dollar.

Chart 12: AUD/USD exchange rate (LHS) and cumulative relative performance of the S&P 500 Equal Weight Index versus S&P 500 Index (RHS)




Source: Bloomberg. August 2004 to August 2024. Past performance is not an indicator of future performance of any index or ETF. Does not take into account ETF fees and costs. Provided for illustrative purposes only and not a recommendation to invest or adopt any investment strategy.

# Conclusion

Whilst a very simple concept, the power of equal weighting has been demonstrated historically in long-term excess performance results against a number of country specific and regional market capitalisation weighted indices.

Unlike other alternative indices, equal weighting takes an agnostic approach to factor exposure and treats all constituents as having the same potential for risk and return, without favouring any based on forecasted performance or volatility. Given this profile and the mean-reversion impact from systematic rebalancing, an equal weight exposure historically has tended to benefit when markets reveal from time to time that they are not always efficient.

Notwithstanding the strong relative outperformance of the S&P 500 Equal Weight Index over the long-term, the recent performance has been underwhelming. It is unusual to get excited when short term performance has lagged, but when considering the backdrop of significant price appreciation and momentum in a narrow set of US mega cap, sector-specific stocks, it is conceivable that an alternatively weighted strategy such as the S&P 500 Equal Weight Index will be very well-placed to outperform upon any mean reversion.

Betashares S&P 500 Equal Weight ETF trades under the ASX code 'QUS', with a currency hedged version trading under the ASX code 'HQUS', and, like all ETFs, both can be bought and sold like any share on the ASX.

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There are risks associated with an investment in QUS and HQUS, including market risk, index methodology risk, country risk and, in the case of QUS, currency risk. For more information on risks and other features of each fund, please see the applicable Product Disclosure Statement and Target Market Determination, available at www.betashares.com.au.

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