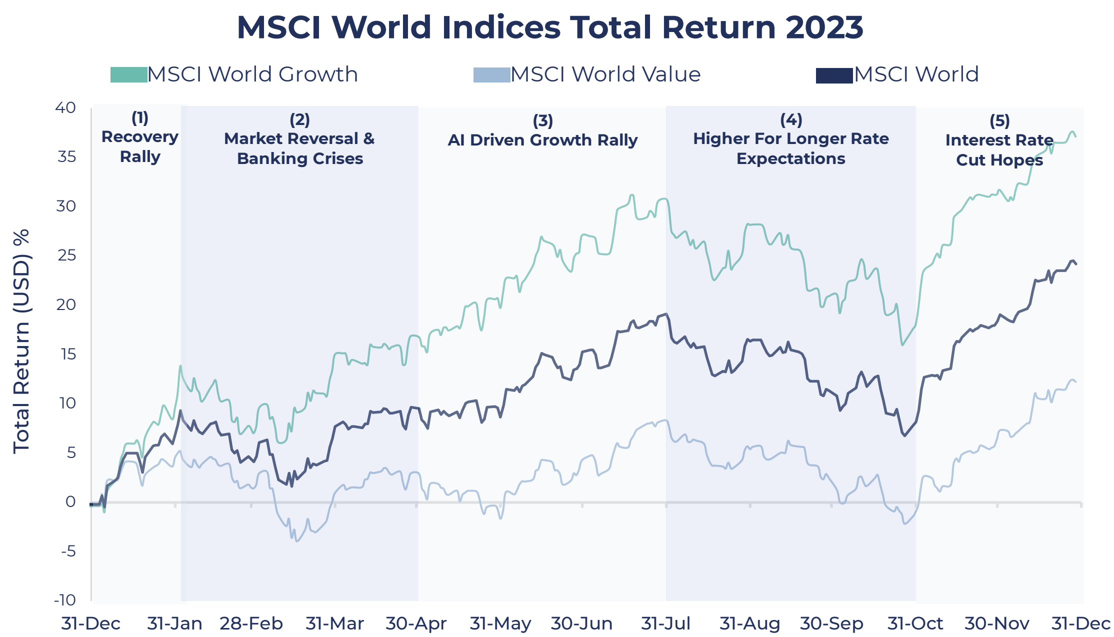
Guinness Atkinson
Global Innovators Fund
Managers' Update – January 2024

2023 – Market Overview

2023 can be split into a number of distinct performance periods, each with different drivers and leaders from both a style and sector perspective.



Source: MSCI, Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

(1) – Recovery Rally

Many of the key market concerns from 2022 abated (inflation, China's COVID-19 policy, recessionary risks and an energy crisis) during the period, with renewed hope of a soft-landing. As risk-on sentiment returned, the more cyclically orientated sectors that underperformed in 2022, outperformed. Paired with a market view of an earlier pivot towards looser monetary policy, this drove the outperformance of 'growth' during the period. *This rotation towards growth and cyclicals was a positive for Fund performance, relative to the benchmark.*

(2) – Market Reversal And Banking Crises

The market reversed course in early February. Employment and inflation data came in surprisingly 'hot' in the US and Europe, and Fed Chair Jay Powell followed with hawkish rhetoric over the future path of interest rates. The collapse of Silicon Valley Bank in early March initially spurred a sharp sell-off, as fears of financial contagion grew. A strong policy response from regulators restored a level of calm back into equity markets, which rebounded over the subsequent weeks. The crises led to a tightening of credit conditions, typically a headwind for economic growth, driving a rotation towards higher quality companies with strong balance sheets and margins. However, tighter credit conditions were also expected to play a part in reducing inflation, supporting growth stocks as expectations of an earlier 'pivot' surfaced once again. *Despite the outperformance of growth over the period, the Fund only performed in-line with the MSCI World,* *with weakness in the Fund's largest overweight industry (semiconductors) in the latter half of the period a key detractor to performance, as well as off-benchmark name Anta Sports also falling significantly.*

(3) AI Driven Growth Rally

Despite rising interest rate expectations, growth outperformed as a narrow selection stocks exposed to Artificial Intelligence (the Magnificent Seven), led the index higher. Renewed enthusiasm over AI was driven by the launch of Chat GPT earlier in the year, which had captured the imagination of consumers, media and businesses alike, and catalyzed management teams to investigate the best way to incorporate the technology into their revenue streams, business models and operations. Investment into Artificial Intelligence was not just evident in company earnings calls, but in company fundamentals too. Nvidia added $184bn to their market cap on the day following their Q1 earnings, as the firm guided for revenues over 50% higher than the $7bn estimated by analysts. Soaring demand for chips required for generative AI purposes was clearly much greater than the market expected, creating a tailwind for AI-exposed stocks in particular. While the market rally broadened to other areas of the market in the first month of Q3, momentum in equity markets continued on the improved prospects of a 'soft landing'. *Exposure to six of the 'Magnificent Seven, alongside significant overweight positions to industries, which were likely to benefit most from renewed Artificial Intelligence enthusiasm such as Semiconductors and Software, drove strong relative Fund performance. Having higher exposure to 'cyclically' orientated sectors benefited the fund, while having limited exposure to 'defensives' such as staples, utilities and energy was also a tailwind.*

(4) – Higher For Longer Rate Expectations

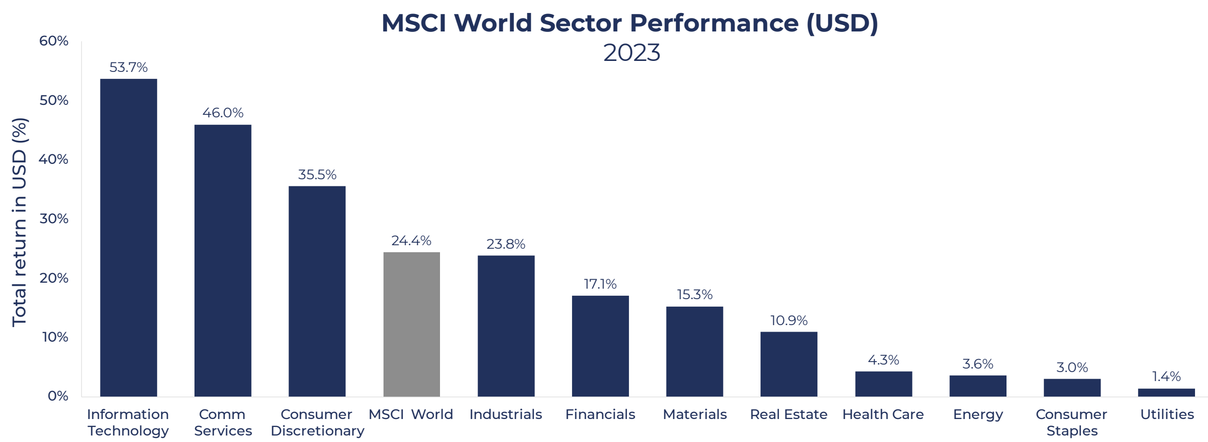
The strong equity performance seen in the prior periods faltered over the latter two months of Q3, with consecutive months of equity declines (in USD terms). Over the period, the 10 year US treasury yield rose to 5.0%, levels not seen since 2007. The core driver was expectations of higher-for-longer interest rates. This was supported by the Federal Reserve's September dot plot, which indicated just two rate cuts in 2024 from the four rate cuts estimated in the committee's June meeting. The increase in yields not only enticed investors away from equities, but created a headwind for 'high-duration' growth stocks in particular – both the high dividend yield sectors such as Utilities, and companies with valuation linked to higher future growth in the Information Technology sector. *With rising yields placing pressure on growth stocks in particular, the Fund slightly underperformed over the period. Defensives also outperformed, as markets began to price in higher for longer rates and an increasing view that the fed would need to implement rates hikes and bring the economy into recession – also a headwind to relative Fund performance over the period.*

(5) – Interest Rate Cut Hopes

Equity markets rapidly rebounded in November, as equities posted their strongest monthly returns in 3 years (in USD terms). This momentum continued into December, as the improving prospect of a 'goldilocks' scenario of falling inflation and a growing economy lifted both valuations and earnings expectations higher. The Federal Reserve held rates flat for a second and then a third consecutive meeting and minutes reflected dual concerns about higher-than expected inflation, and for the first time, the impact interest rates may have on economic growth. Markets focused on the latter, giving fuel to hopes of earlier-than-expected interest rate cuts. At the end of the year, markets were pricing in about six rate cuts by the end of 2024, compared to the approximately three priced at the beginning of November. The resulting bond rally and the broad downward shift in treasury yields across US maturities served to lift equity valuations higher. Third quarter earnings season saw an acceleration in earnings growth for the S&P 500 for the first time in 2 years (and a return to positive growth of 4.1% for the first time in a year), surprising to the upside by +7.8% - the largest surprise in 2 years. A strong earnings season and improved macro-outlook drove broad earnings upgrades across sectors, with a risk-on appetite driving the outperformance of cyclically orientated stocks. *As interest rate expectations reversed and the prospect of a 'goldilocks' scenario increased, all equities were driven higher, with cyclicals and growth leading the way, a benefit for the Fund. Positive earnings revisions, particularly within the tech sector/ semiconductor industry, served as a tailwind for relative Fund outperformance.*

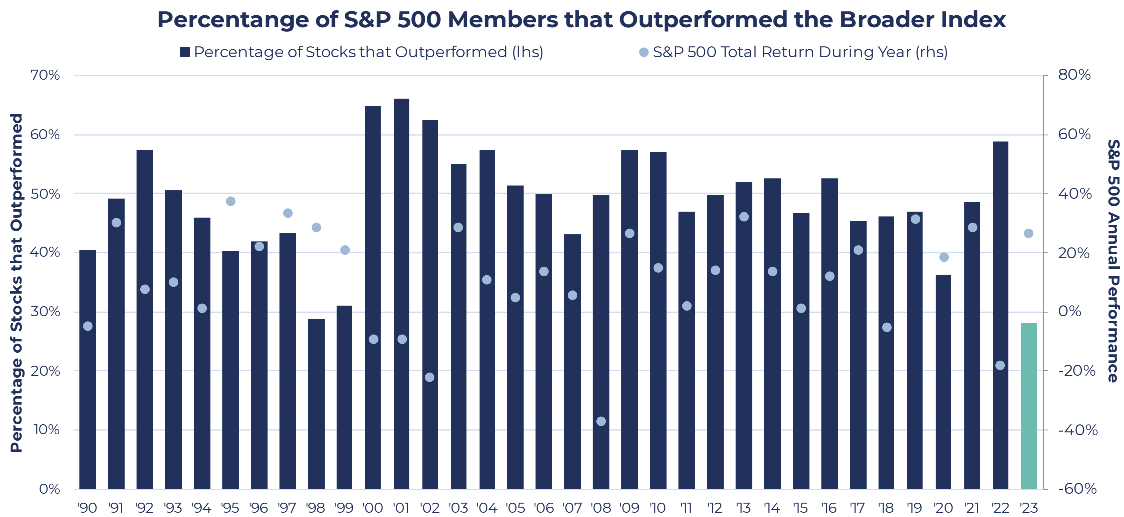
Strong Equity Performance Over 2023 Was Not Equally Shared

Market leadership was relatively narrow over 2023 with just three of the eleven GICS sectors outperformed the MSCI World. From a factor perspective, these sectors are all typically regarded as 'Growth' over 'Value'.



Source: MSCI, Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

At the stock level, narrowness in the market was even more stark with just 28% of the constituents outperforming the broader S&P 500 index. The only other time since 1990 that less than 30% of the stocks in the index outperformed was in 1998, in the lead up to the dot com bubble. While both years saw index returns greater than 20%, 2023 followed a year of a significant market contraction (nearly 20% in 2022).

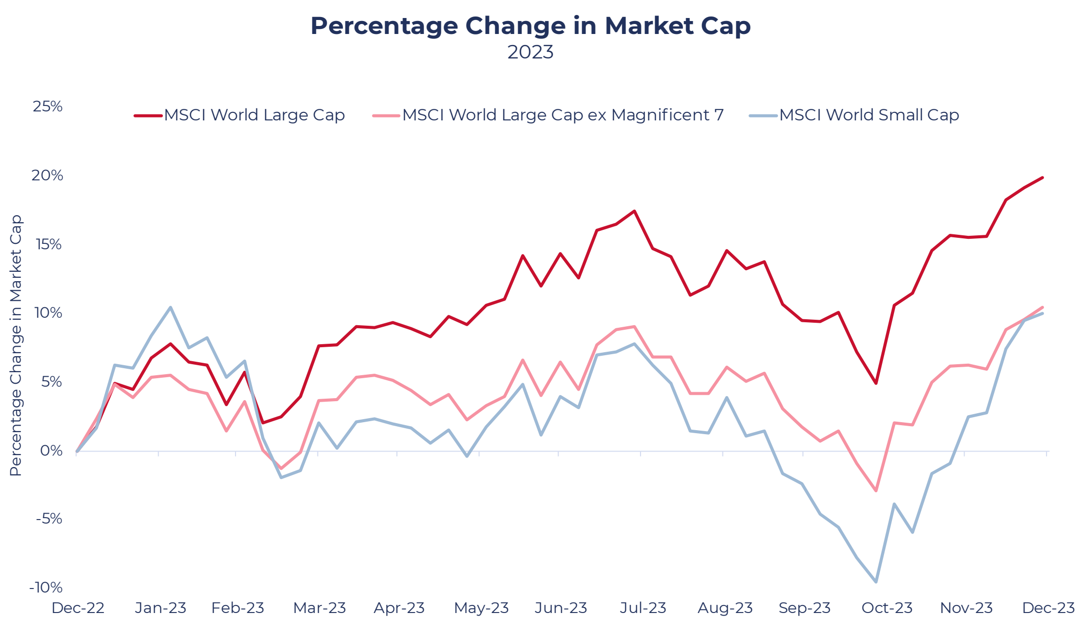


Source: Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

Comparing the market cap weighted MSCI World Index to its equally weighted counterpart, we can see significant outperformance over the year, suggesting that large-cap stocks were the driver of outperformance.

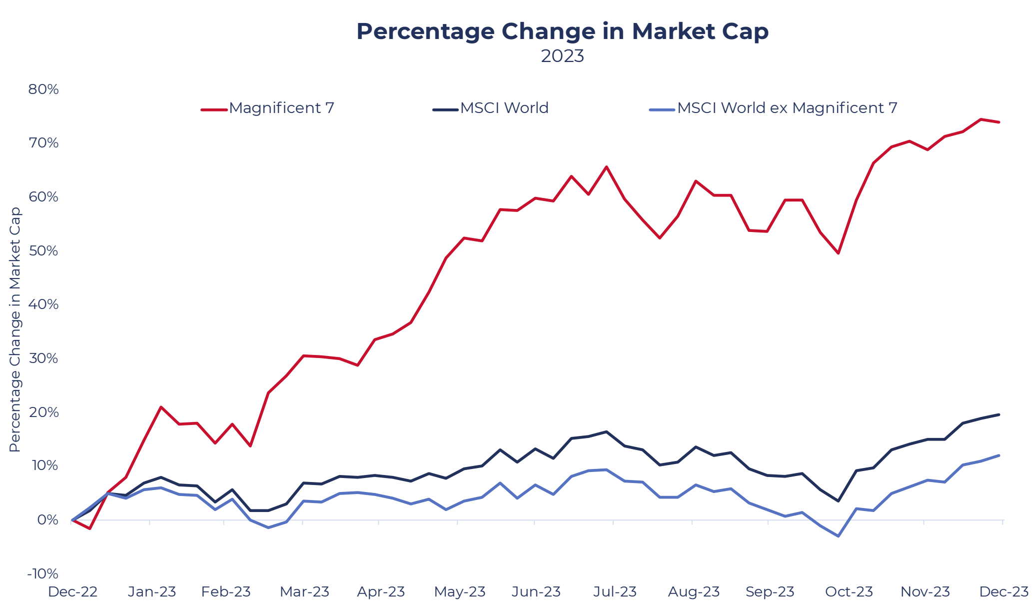
Source: MSCI, Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

But this was not the case. Strong equity performance for 2023 was not linked to the outperformance of large cap stocks in general, but was dragged higher by a small collection of the largest mega-caps. These stocks, given the name the Magnificent Seven, were Apple, Alphabet, Amazon, Meta, Microsoft, Nvidia and Tesla. Their impact on the MSCI World Large Cap index can be seen in the chart below. Over 2023, while the market cap of the MSCI World Large Cap significantly outperformed that of the Small Cap index, with the Magnificent Seven removed, the two indices ended the year moderately in line.



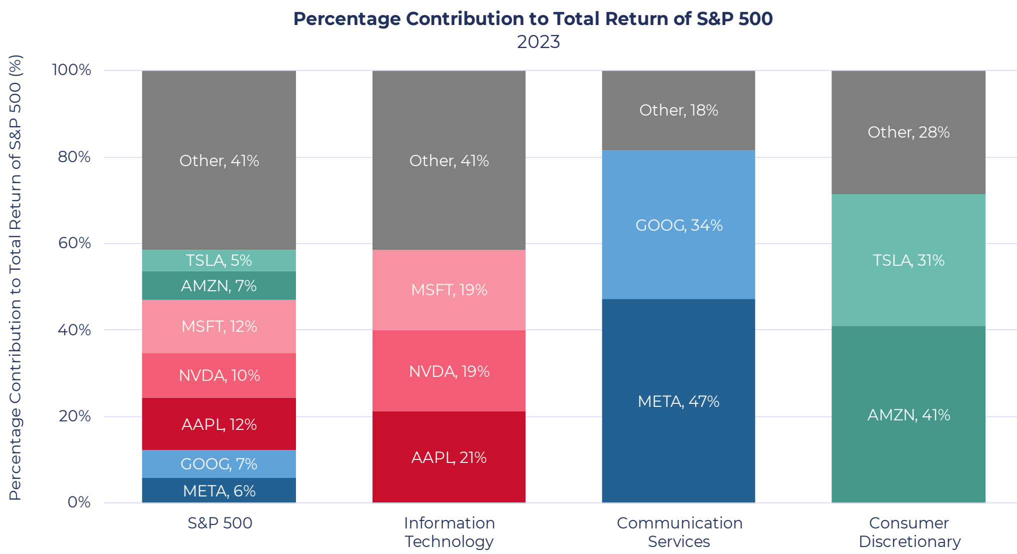
Source: MSCI, Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

Using similar analysis, the Magnificent Seven's impact on global equity performance throughout the year can be seen in the chart below, which tracks the total market caps of the seven stocks, the MSCI World, and the MSCI World excluding the Magnificent Seven. The majority of outperformance came in the first seven months of the year. By the end of October, the entirety of positive global equity performance could be attributed to these seven stocks.



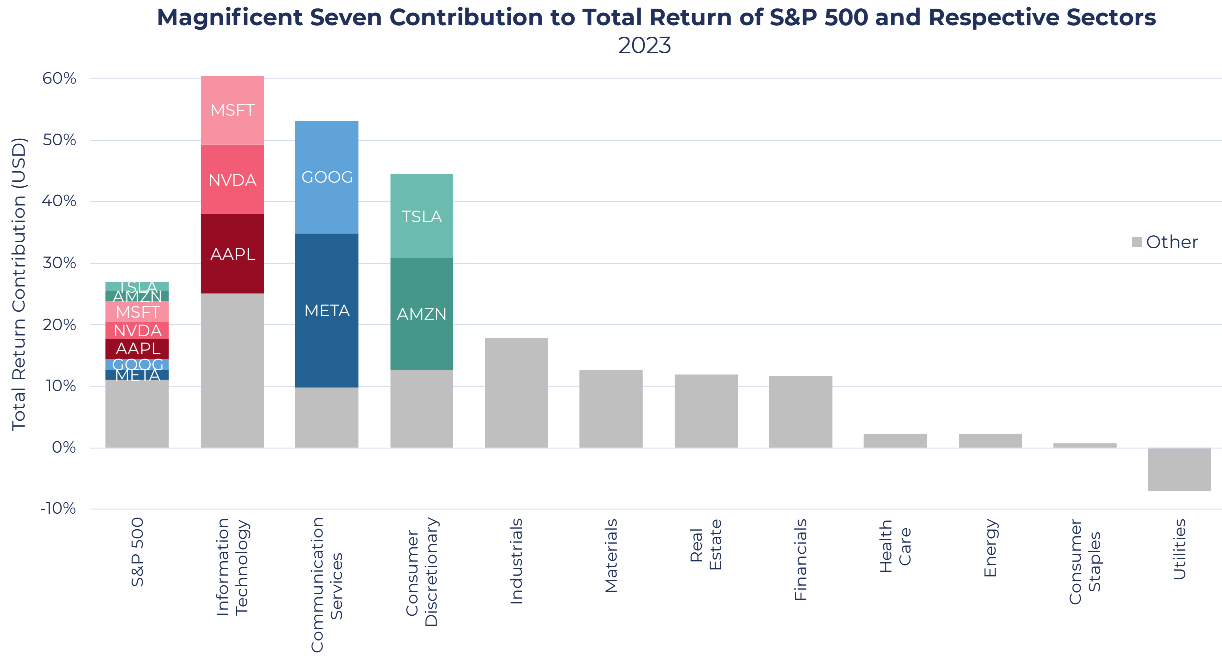
Source: MSCI, Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

Looking at US equities within the S&P 500, nearly 60% of the index's yearly total return was attributable to the Magnificent Seven. Looking at the only three sectors that outperformed the broader index (and quite significantly too), these were all sectors in which the Magnificent Seven were constituents, and the majority of sector performance was again attributable to the Magnificent Seven Stocks.



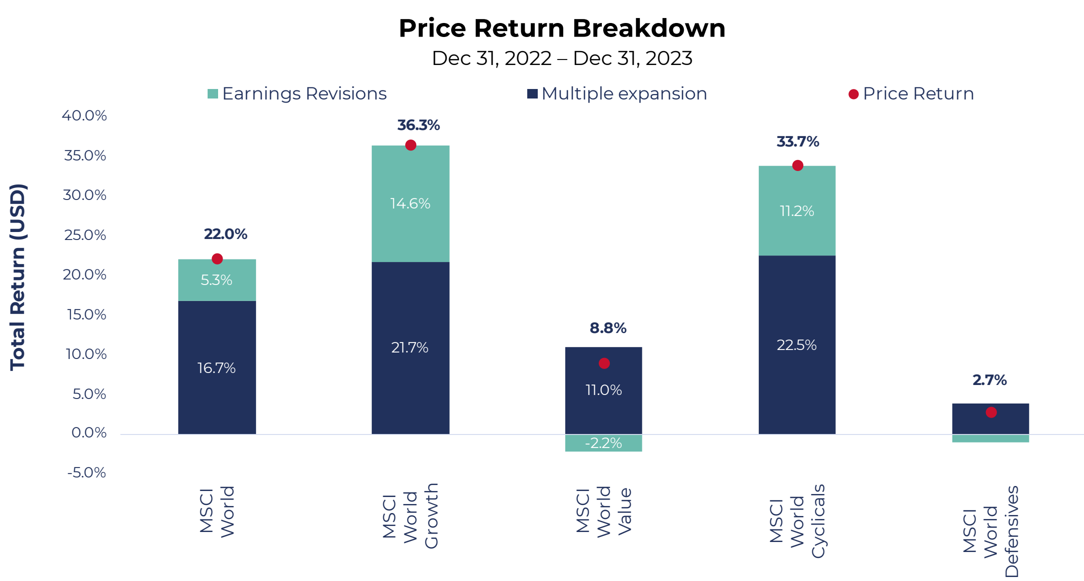
Source: Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

Excluding the performance of the Magnificent Seven (now looking only at the grey bars in the chart below), we see a rather different story to the sector performance chart previously seen. Of the three outperforming sectors, only Information Technology significantly outperformed the S&P 500 (this outperformance was likely driven by development in Artificial Intelligence – discussed later). Industrials, also outperformed, while Communication Services, Materials, Real Estate and Financials were relatively in-line. With the exception of Real Estate, these all have significant exposure to market cycles, and are generally accepted as relatively more cyclical. The three sectors typically labeled as 'defensive' - Health Care, Staples and Utilities - all significantly underperformed the rest of the market (as well energy, which had other material macro-influences). This split suggests markets potentially took a more 'risk-on' attitude, and the market was not just 'growth' driven (versus value), but 'cyclically' driven too.



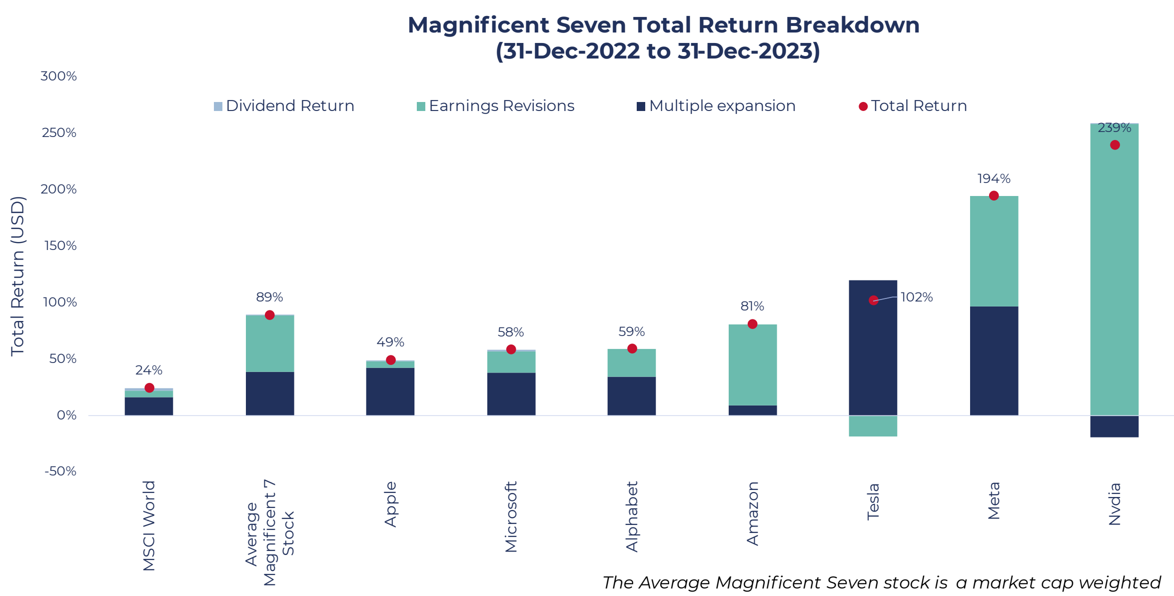
Source: Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

This could also be seen at the broader MSCI World level. Both the MSCI World Growth and MSCI World Cyclicals indices delivered price returns in excess of 30%, with over 20% driven by multiple expansion and strong earnings upgrades, albeit skewed upwards by the presence of the Magnificent Seven. The MSCI World Value and MSCI World Defensives Indices delivered just 8.8% and 2.7% price returns respectively, with just 11% multiple expansion for the Value index and for Defensives at just 3.8%, both with small earnings downgrades.



Source: MSCI, Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

Looking at the breakdown of Total Return for the Magnificent Seven, a market cap weighted average shows a relatively strong balance between earnings revisions and multiple expansion – although this differed moderately across the pack. Nvidia, Meta and Amazon were driven predominantly by earnings upgrades, whereas Alphabet and Microsoft benefited from a balance of the two, while Apple was driven predominantly by multiple expansion. Tesla, the only Magnificent Seven stock not held within the strategy, was the only stock to experience negative earnings revisions.

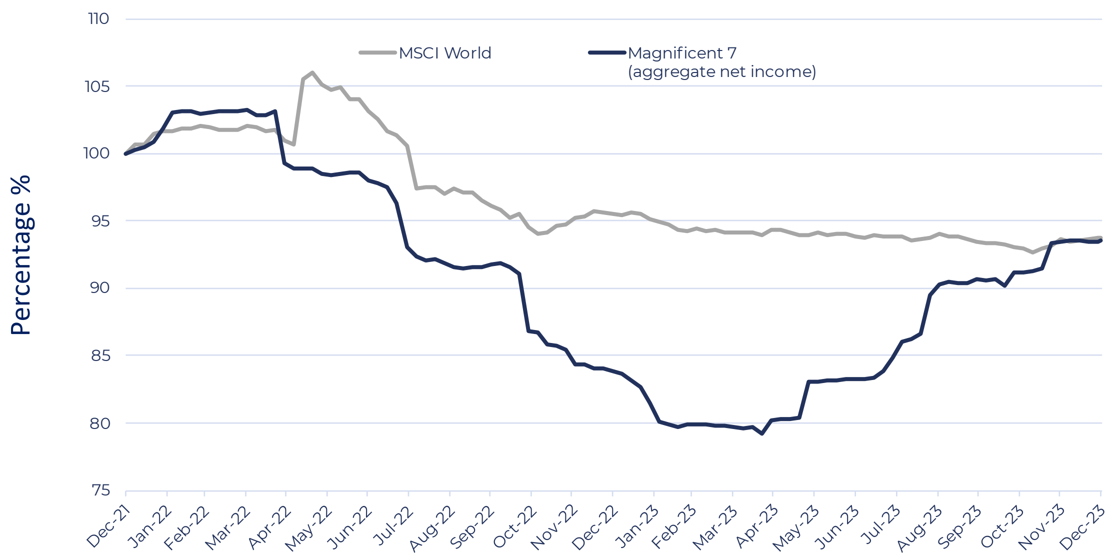


The Average Magnificent Seven stock is a market cap weighted average, with market cap calculated at 31st December 2022

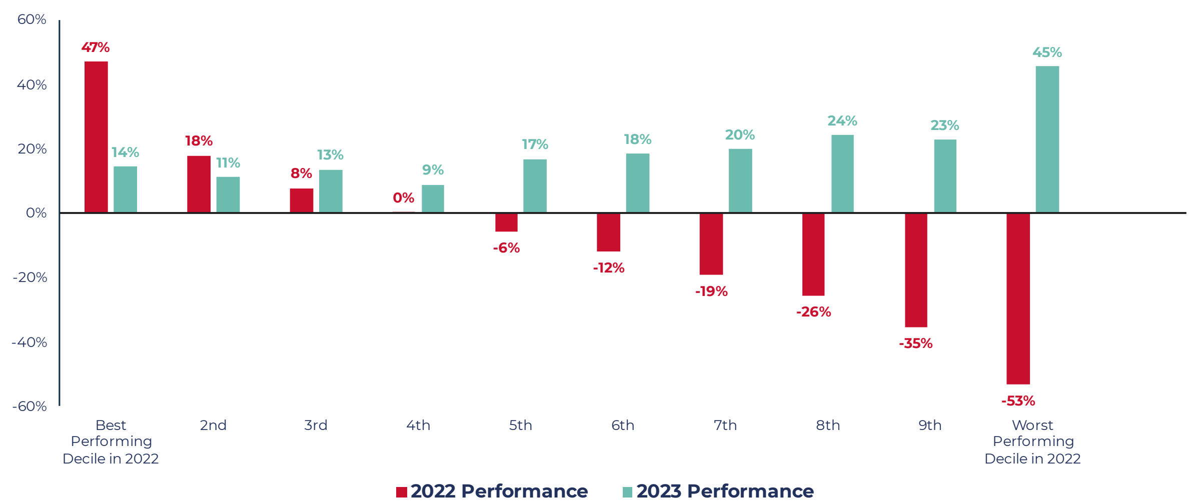
Source: MSCI, Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

We are cognizant that this year of significant outperformance followed a year of significant underperformance. While the equally weighted Bloomberg Magnificent 7 Index rose 107% over 2023, it is only up 13.2% over the two year period 2021-2023. Multiples fell in excess of 30% for all Magnificent Seven stocks in 2022, well ahead of the 23% decline seen by the MSCI World, and aggregate net income expectations for 2024 dropped ~20% between December 2021 and January 2023 – with the MSCI World falling ~5% over the same period. Since then, whilst the broader market has slipped slightly, expectations for the Magnificent Seven have expanded significantly to reach levels comparable to the broader market over a two-year period.

Net Income Full Year 2024 Expectations
Rebased to 100 on December 31, 2021



MSCI World: 2022 Performance vs 2023 Performance
Grouped by 2022 Performance Decile



Source: MSCI, Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

While we recognize that the positive performance seen by the Magnificent Seven is in part driven by a reversal in market sentiment (and perhaps a reversal of overselling last year) we believe that a core driver of this performance has been an improvement in the fundamental outlook for these stocks.

Holding	How has 2023 impacted the fundamental outlook for the stock?
NVIDIA (+239%)	Nvidia is positioned at the center of exploding demand seen for Artificial Intelligence, possessing over 95% market share of the GPUs (graphics processing units) required for generative AI systems. This resulted in sales growth in excess of 200% year-on-year for the final reported quarter of 2023. While the growth rate will inevitably slow dramatically, Nvidia's long term fundamental outlook changed materially this year, placing it at the forefront of the long-term secular-growth theme of Artificial Intelligence, but also highlighting the firms superior technological edge. We review 2023 for Nvidia further below.
Meta (+194%)	Meta faced strong criticism following the 2022 announcement of heavy investment plans into the Metaverse, driving a share price slide for the year of 64%. This negative share price performance was more than offset in 2023, as the company not only scaled back these heavy spending plans, but put emphasis into improving profitability and efficiency, driving a rebound in gross and operating margins to their long-term average. More importantly, Meta improved both customer engagement (Daily Active users growing at +5% year-on-year) and monetization of products, driving Average Revenue's Per User towards all time high's (latest quarter was a second all-time high). In particular, their success in monetizing Reels has proven a real, long-term tailwind for the stock. We review 2023 for Meta further below.
TESLA (+102%)	Following a difficult operating environment in 2022, where economic uncertainty lead to soft demand and thus meant lofty delivery growth targets were missed, Tesla managed to fully offset share price declines during 2023. The long-awaited delivery of Tesla's Cybertruck, their investment in AI training capacity and their Optimus robot project have all contributed to positive investor sentiment, but the firm's +38% increase in deliveries was ahead of expectations, and a strong win for the stock. However, Tesla was the only Magnificent Seven stock to experience earnings downgrades over 2024 (and the only stock not held in the Fund). These downgrades were a consequence of Tesla reducing vehicle prices in 2023 to help ward off growing competition, notably from BYD, who overtook Tesla as the top-selling electric car seller globally in the fourth quarter. These lower prices led to significant margin compression (12.8% operating margin in 3Q23 vs 21.6% 3Q22), with margins expected to remain depressed in the face of increased competition and lower prices.
amazon.com (+81%)	Amazon delivered a significant step-up in profitability over 2023, with the company delivering operating income +33% ahead of their prior previous best quarter (1Q21). Following a year in which inflation, higher rates and a slowdown

in both consumer and business spending squeezed margins in 2022, the company put the focus on driving profitability higher in 2023 – and did so with great success, with cost-cutting, headcount rationalization and segment mix allowing operating margins to climb back towards pandemic era levels. On the top-line, another key overhang for the stock was largely removed, with the slowing growth rate in the firm's cloud segment, AWS, settling to around 12%. The segment now accounts for 62% of operating income, and with the significant opportunity that generative AI presents the cloud-computing business paired with all time high gross margins, the long-term outlook for Amazon looks fundamentally better than it did at the beginning of the year.

Alphabet
(+59%)

Following a challenging year in which macroeconomic headwinds pressured advertising spend across sectors, Alphabet's revenues rebounded in 2023 as recessionary fears subsided and business sentiment improved. YouTube ad revenue increased by 12.4% year-on-year, fuelled by increased viewership and engagement (2023 saw a 133% increase in daily number of views on 'Shorts'). Despite Google Cloud Platform (GCP) narrowly missing Q3 revenue forecasts, the division's growth over the year has remained relatively in-line with industry averages, reflecting strong demand for cloud-based solutions from enterprises. While the firm may lag Microsoft and Amazon with respect to Cloud solutions, the segment turned a profit for the first time in 2023 and, as is the case with Amazon, developments in Artificial Intelligence are expected to provide a significant tailwind to the Cloud Segment. The firm's dominant market share position in advertising, superior R&D spend and reputation as a leading technology innovator are likely to allow the firm to capitalize heavily on the long term artificial intelligence trend.

Microsoft
(+58%)

Microsoft struggled over 2022 as the weakened macro environment drove weaker demand in both consumer and business segments. Shares rebounded during 2023 as Microsoft's early move towards embracing the next wave of AI technology positioned the firm (along with Nvidia) firmly at the center of the Artificial intelligence revolution through a $10bn stake in OpenAI - the startup behind ChatGPT. While still in the early stages, Microsoft is leveraging OpenAI's technology through overhauling its entire lineup of Office apps (incl. Excel, PowerPoint, Outlook and Word) with generative AI technology, introducing tools such as Copilot. As is the case with Amazon and Alphabet, the AI opportunity within cloud is significant and is already yielding results, with AI integration into cloud services driving demand (Microsoft's Azure cloud segment revenues accelerated by 200bps to 27% in their latest quarter). Microsoft's early move into the technology and continual efforts to incorporate AI innovations into their product mix is likely to be a powerful driver of growth going forward.

Apple
(+49%)

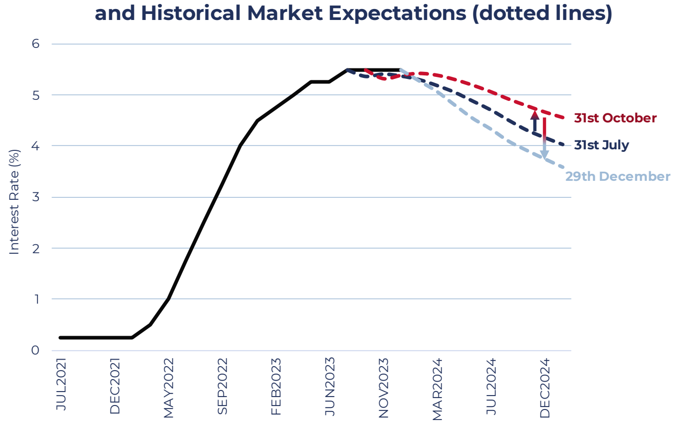
While Apple underperformed all other stocks in the Magnificent 7 over 2023, this was in the context of better relative performance in 2023. While Apple have remained famously secretive over product development, AI is a clear focus for the firm given more than two dozen acquisitions of AI companies since 2015. Research and development spend rose 14% year over year to $30 billion for the

2023 fiscal year, with Tim Cook explaining that the money is going to AI, new chips and the new Vision Pro headset. While it is not clear the extent to which Artificial Intelligence can be leveraged to benefit Apple's products, the firm's reputation as a leading innovator means the market is placing weight on the firm's potential in the technology. Over the year, the firms quality of revenues continued to improve. Services grew 9% over the year, representing an increase from 21% of the sales mix in 4Q22 to 25% in 4Q23. This not only provides a higher quality, recurring revenue stream, but improves the firm's overall margin profile - the services segment operates with a gross margin of over 70%, driving Apple's group gross margin to a record 45% (4Q23)

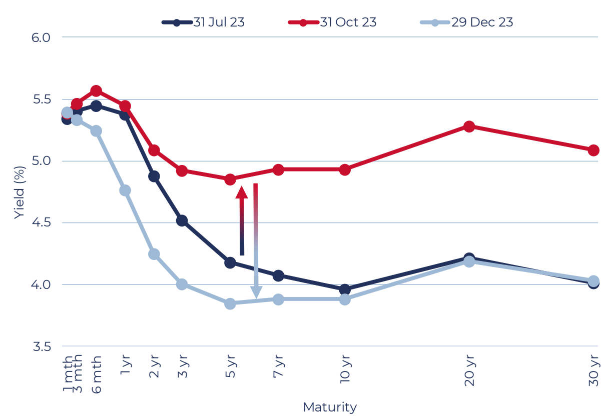
Market Narrowness Largely Ended by August

By the end of July, expectations over the future path of interest rates once again became the key driver of markets. Market narrowness for the most part was over, with the Magnificent Seven now largely tracking the broader market. Almost paradoxically, positive economic data was not translating into positive equity performance - the prospect that a strong economy may contribute to inflationary pressures (or at least embolden the Federal Reserve to maintain interest rates at elevated levels) fueled market expectations of 'higher-for-longer' interest rates – paired with markedly more hawkish rhetoric from the Fed at Jackson Hole. As a result of this change in rate expectations, we saw similarly dramatic shifts in the yield curve over both periods. The perceived impact this would have on valuations created a headwind for equities, as the 10-year yield rose to its highest level since 2007. In November, however, these expectations sharply reversed, with a corresponding shift in the yield curve. The Federal Reserve (Fed) held rates flat for a second consecutive meeting (and a third in December), and minutes revealed committee members' dual concerns about higher-than-expected inflation, as well as the impact interest rates may have on economic growth. Market participants appeared to focus on the latter, giving rise to hopes of earlier-than-expected interest rate cuts. At the beginning of December, markets were pricing in six rate cuts by the end of 2024, compared to the three priced in at the beginning of November.

Actual US Interest Rate (solid line) and Historical Market Expectations (dotted lines)

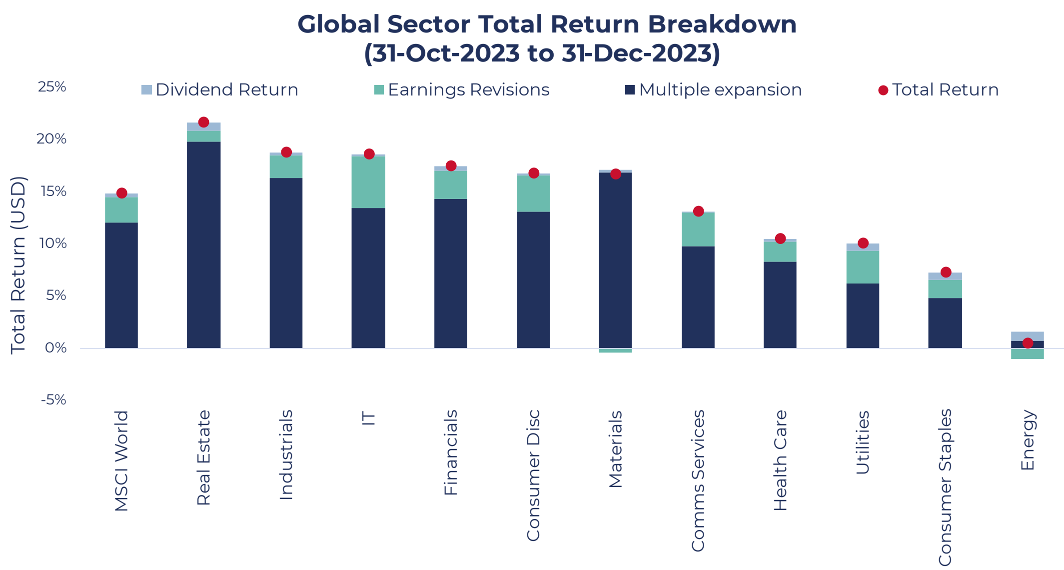


US Treasury Yield Curve



Source: Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

Historically, there has been a moderate negative correlation between yields and equity performance. This was no different over the November-December period, with the MSCI World experiencing multiple expansion of 12%, the core driver of equity performance. It was not only multiple expansion that drove broad equity strength across sectors however, but sector-wide earnings revisions reflecting a modest improvement in the macro outlook. The third-quarter earnings season saw an acceleration in earnings growth for the S&P 500 for the first time in two years (and a return to positive growth, of 4.1%, for the first time in a year), surprising to the upside by +7.8% – the largest surprise in two years. Within the MSCI World's 14.8% total return (in USD) over the months of November and December, a 2.4% contribution came from earnings revisions (1 year blended forward).

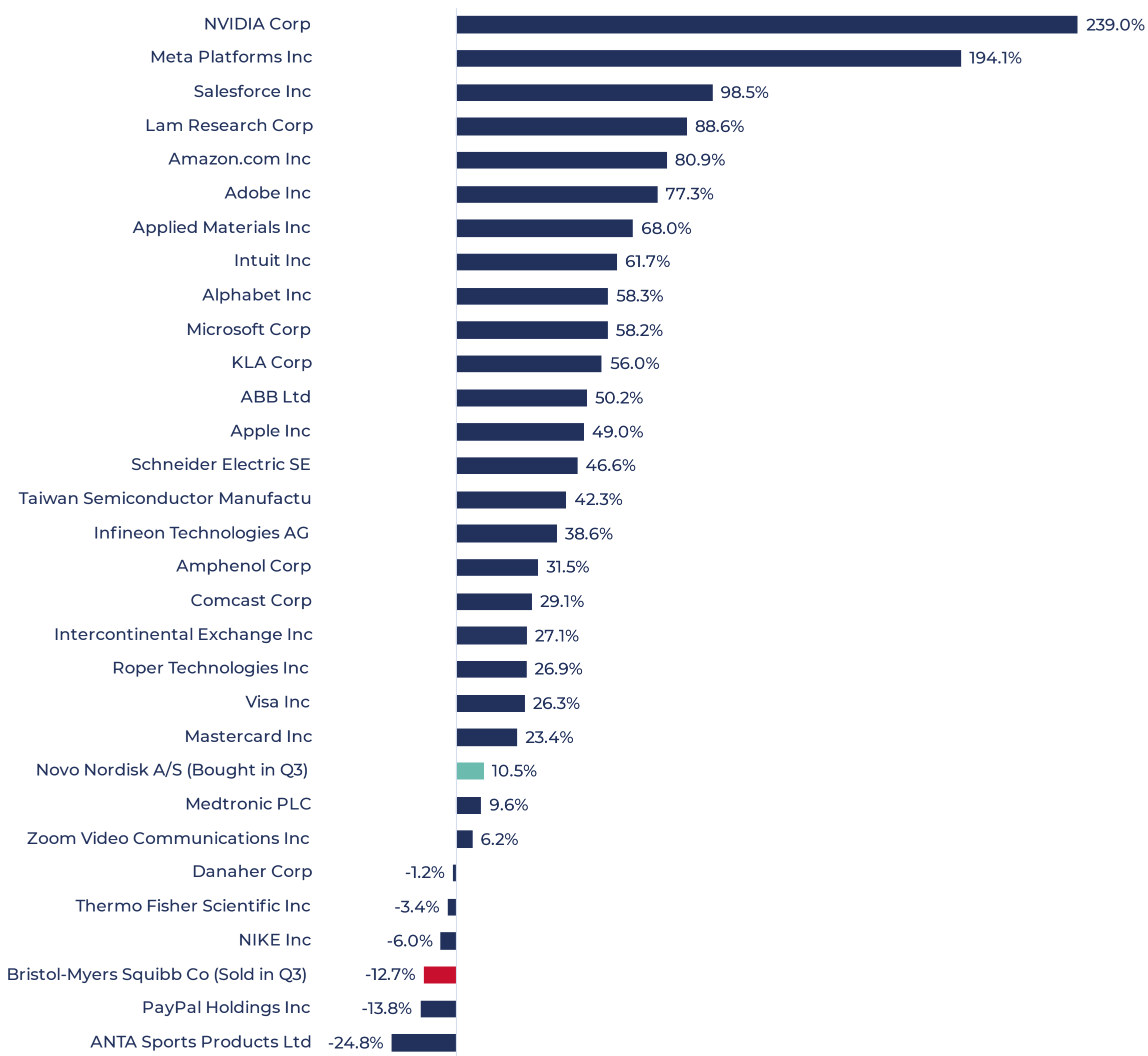


Source: MSCI, Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

With earnings season better than expected, inflation continuing to moderate, wage inflation and the job markets softening, a consumer in good health, and expectations that peak interest rates have been achieved, macro-economic sentiment has improved. We have also seen a slight softening in relations between China and the US, and the fact that OPEC failed to agree a production cut has allowed the oil price to weaken. While the Israel-Hamas war and the upcoming US election continue to pose unforeseen risks, ultimately, the market is seemingly more confident that further monetary tightening will not be required and thus imagining a situation where inflation is no longer front of mind. This has driven a rotation towards more cyclically orientated sectors, as risk-on sentiment takes hold. Interestingly, without the 'everything' rally seen in the final months of the year, global equities excluding the Magnificent Seven would have ended largely flat over 2023.

Individual stock performance in 2023

The chart below shows the fund constituents' performance over 2023 in USD.



Source: Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

Nvidia (+239.0% USD)

Nvidia was the Fund's top performer in 2023, delivering a standout total return of +239.0% USD over the year. As mentioned above, the chip designer's unique position (about 95% share) in supplying GPU chips that can handle the computing power required for Generative AI drove the stock to new heights, breaching the $1trn market cap threshold for the first time on the 30th of May. The chip in question, the H100, was released in 2022 and costs around $40,000 per chip, promising higher performance and reduced training costs for AI learning systems. Excitement over the technology demonstrated by Chat GPT led to a rush in tech firms across sectors attempting to purchase the chip, driving a positive read-across for the Semiconductor industry in general, with Semiconductor Equipment manufacturers such as Applied Materials, Lam Research and KLA all benefiting, and foundries such as TSMC also being dragged upwards. While excitement over the potential for the technology was certainly the spark that started Nvidia's extraordinary climb over the year, the firm's success at translating these developments into revenue growth was the core driver. A vast amount of Nvidia's outperformance was at the end of May following Nvidia's blowout earnings release, where guidance of $11bn for the next quarter was $4bn ahead of expectations (+10.4% to consensus), yet the firm was to surprise to the upside twice more over the year – and impressively, by even larger 'beats' to consensus (+22.3% and +12.6%). The Fund's overweight position to the semiconductor industry is based on the view that these stocks have significant exposure to a number of the Fund's long term secular growth themes, not just Artificial Intelligence and Big Data, but themes such as Cloud Computing, Internet of Things, and Internet, Media and Entertainment which are likely to drive long-term growth in the industry. The common push-back on Nvidia is the valuation, yet with a blended 1 year forward P/E of just 25x (below the 10 year average of 32x), we think this is a very reasonable price to pay for a company a unique, defensible market leading position, track-record as an innovator, exposure to numerous long-term secular growth themes, paired with high quality fundamental characteristics, and we are confident the firm can continue to outperform the broader market.

Meta (+194.1% USD)

After suffering a tumultuous 2022, in which the stock ended the year as the Fund's bottom performer (-64.2% USD in 2022), Meta offset all of this negative performance in what was a stellar 2023 (+194.1% USD). Meta faced a number of headwinds over the course of 2022, battling not only a rotation away from technology and growth, but increasing competition, a slowdown in advertising spend sparked by recessionary fears, and shareholder discontent over the firm's spending outlook. However, with 'growth' back in favor and a vastly improved macro-economic outlook, advertising spend returned alongside positive momentum to the stock. Perhaps the biggest catalyst, however, was the firm's strategic shift to spending. In February, Meta shifted their focus towards their cost structure, cutting back on large-scale spending plans on Metaverse through their Reality Labs program, alongside making significant headcount reductions. This appeased core investor concerns on the outlook for Free Cash Flow. More promisingly, from our perspective, was the underlying strength in the firm's core platform. After three consecutive quarters of negative top-line growth, revenues accelerated consecutively across the year, from -4.8% in 4Q22 (released in Q1) to 23.2% in 3Q23 (released in Q4). Daily Active Users and Average Revenues per User also accelerated throughout the year, driving 3Q23 advertising revenues of +23.5% year-on-year in 3Q23 – surprising to the upside for the 5th successive quarter. The firm's 'reels' product has been a key driver of this improvement, proving itself to be highly effective at driving greater engagement, while Meta has proven highly successful at monetizing nascent products, which should offer a continued tailwind into 2024. At it's core, Meta achieved better engagement, more effective monetization, alongside a leaner cost base over 2023, allowing operating margins to return from all time-lows at the end of last year to a level slightly ahead of their long run average by 3Q23. This is all while being subjected to a better operating environment. While we recognize that the firm's 2023 performance is off the back of easier comps, Meta's fundamental characteristics are looking stronger than ever, and we continue to see long term growth for the firm.

ANTA

<u>**Anta Sports (-24.8% USD)**</u>

Despite outperforming the MSCI World in Q1 and Q3, regional headwinds were significant over the year, with weakness in Q2 and Q4 meaning Anta Sports ended the year as the Fund's bottom performer. At the end of 2022, investors piled into the stock off the back of the Chinese reopening, yet this "reopening trade" was perhaps over-optimistic and failed to meet expectations, with a weaker than hoped Q1 earnings release. Later in Q2, the firm's "top-up" placement of $1.5bn, issued at an 8.8% discount to the share price at the time, weighed heavily on the stock. The proceeds of the placing were to be used for paying down some outstanding debt, investment in the South-East Asia business, and adding to the firms general working capital. While creating an overhang for the stock, we viewed the decision on the whole as a positive, giving management the flexibility to continue investing in the business and allowing the firm to take advantage of long term opportunities. Anta actually ended Q3 as the Fund's top performer following a very strong 1H earnings. The firm delivered a record high operating margin for the firm's FILA and outdoor brands, record-high cash flow (134% operating cash flow growth) and strong inventory management. Adjusted first half profits were up 40% from a year prior, with the top-line also growing 14.2%. The firm also increased the dividend to HK$0.82, 32% higher than the year prior. However, regional pressures, and weakness in the Chinese Consumer Discretionary sector in particular, offered a significant headwind for the remainer of the year. In what was a relatively light news-flow period for the stock, share price weakness was predominantly driven by a negative read-across from Adidas, whose Greater China region disappointed over the quarter, growing at just 5.7% (year-on-year) vs 8.4% expected – a meaningful drop from the 16% seen the prior quarter. While we recognize the regional risks associated with the Chinese region, from a stock perspective, we remain confident in the long term outlook of Anta Sports, which benefits from a number of long-term structural tailwinds. Beijing continues to promote exercise and sports, pouring billions into initiatives such as the "Healthy China 2030" Plan, which should serve to lift the sports industry's contribution to GDP. China's per capita spending on sportswear remains comparatively low at $31, but as the middle class emerges, analysts expect this to rise to a similar level as Japan ($110) by 2030 (US $307), and the country is experiencing rising participation rates in sports. The firm has a number of meaningful growth opportunities including geographical expansions as well as forays into the premium segment of the market. All in all, we believe the fundamentals behind the company remain strong, and underlying secular trends should serve to boost Anta's revenue profile into the long term.

PayPal

PayPal (-12.1% USD)

PayPal ended 2023 as the Fund's second bottom performer. The majority of PayPal's underperformance occurred on two separate occasions - both a result of disappointing earnings releases, but both of which failed to justify, in our opinion, the resulting negative share price reactions. During 2022, the firm pivoted in strategy – moving away from high targets of user growth and instead towards a more engaged user. The impact of this shift could be seen throughout the earnings releases of 2023. While growth in Active Accounts largely stalled, an improvement in the quality of their Account members was clear, with Total Payment Volume accelerating in each quarter since 4Q22 to reach all time highs, driven by the Number of Payment Transactions and Number of Transactions per Active Account both offering double digits year-on-year growth in each quarter over the year. Yet despite raising full year EPS guidance twice during the year and seeing modest year-on-year revenue growth (and all time high revenues) across quarters, Q1 and Q2 earnings saw the stock fall significantly following results. This negative price reaction has been driven by weaker Transaction Margins, which have slid from pandemic-era highs (52%-58% during 2021) to 45.4% in 3Q23. Gross Profit growth was also relatively light. Weaker margins were driven by the firm's unbranded suite of products, PCP and Braintree, an unbranded checkout alternative to the firm's traditional payment button. The product is aimed at small businesses, and allows them to accept cards, digital wallets, and even Apple Pay. While currently lower margin, the product is a 'strategic imperative' for the firm since it is growing faster than the market (nearly 30% year-on-year) and allowing the firm to take share of new market with approximately $750 million in TAM (total addressable market). More importantly, the unbranded suite offer a *"significantly enhanced margin structure compared with the largest enterprise customers"*, an area that should allow the firm to demonstrate margin expansion over the long term. While we understand market frustrations around immediate profitability, we do believe the firm has the right tools and trajectory to execute on both improving top-line growth and profitability. We believe new CEO Alex Chriss is focusing the company in the correct direction – in particular, driving profitability of Braintree and being more focused in their growth efforts – both pain points for the company, but both with material upside potential. The company maintains solid fundamentals, and we continue to view PayPal as an attractive opportunity.

Changes to the portfolio

We sold one position and initiated one new position over the course of 2023. This switch occurred during Q3.

Number of changes to the portfolio

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Buys	6	7	4	5	3	5	3	3	1
Sales	6	7	4	5	3	5	3	3	1
Total Holdings	30	30	30	30	30	30	30	30	30

Buy - Novo Nordisk

Novo Nordisk is an innovative industry leader characterised by high R&D / sales and world class new product innovation, driving sector beating cash returns. The firm has shown strong momentum in recent quarters, with their weight loss drug Wegovy exhibiting positive early results and looks set to be a meaningful growth driver for the business going forward. Additionally, they are also showing a broadening out of strength from the rest of the portfolio, particularly in Cardio Vascular which has a much wider addressable market. Sales growth has been accelerating with a 2yr forward sales CAGR of 22% and a 2yr forward EPS CAGR of 30%. The firm's CFROI (cash flow return on investment) stands at 20.4%, the firm has strong dividend growth (5 year dividend CAGR is 10%) and the balance sheet remains solid (debt has grown to $25bn but is ~ 0.3X EBITDA, a very manageable figure). The firm's has a very strong mix of both quality and growth characteristics, paired with a number of long term secular drivers – characteristics we look for within the Fund strategy.

Sell - Bristol Myers Squibb

Over the holding period, Bristol-Myers Squibb returned +9.6% vs the MSCI World +34.4%. Our sell decision was based on a view of a weakened outlook. In Q2 2023, management downgraded guidance for FY2023, previously seeing 2% topline growth and now seeing low single digit declines, primarily due to generic competition from biosimilars which hurt demand for its myeloma therapy, Revlimid. Revlimid sales are tracking weaker than expected and there are additional headwinds on the horizon, with BMS patents expiring on drugs such as Opdivo, a cancer drug, and Eliquis, a blood thinner.

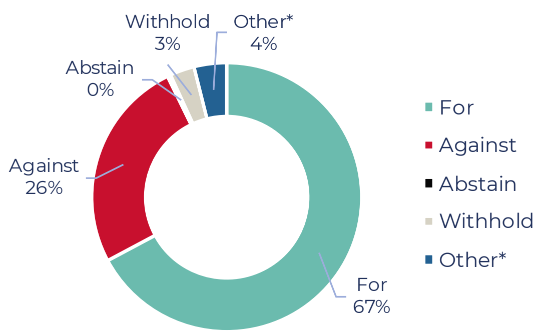
This somewhat weaker relative performance, comes on the back of very strong performance in 2022 - where the stock rallied +19% vs the benchmark MSCI World Index which fell -18% and made Bristol-Myers Squibb the best performer in the fund over the period. Generally healthcare did better in that period (along with defensive sectors more broadly) but the stock also benefited from improved expectations of new pipeline drugs. In 2022, the multiple expanded from 8.5x to 10.5x, but we have seen that de-rate in 2023 back towards 8.5x on lowered growth expectations. We do not currently see strong potential for this to reverse, although we note any positive news flows on their pipeline progress would likely challenge that view (but is by definition hard to predict). We therefore felt there were better opportunities offering superior growth and quality characteristics that we seek.

Proxy Voting

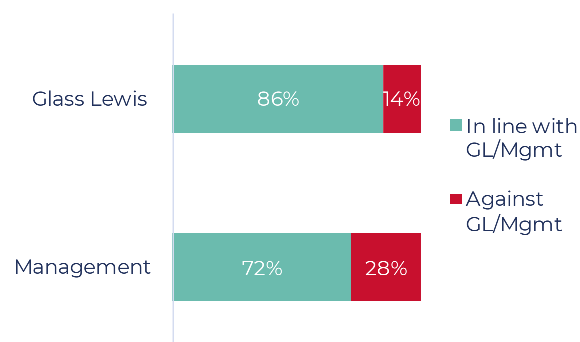
At Guinness Atkinson Asset Management, we manage the voting rights of the shares entrusted to us. Our voting philosophy reflects our corporate values, our long-term perspective, and our focus on sustainable returns. Over 2023, we voted in 95% of the 539 proposals allocated to holdings within the Guinness Atkinson Global Innovators Fund. It is important to note that in order to vote in some markets, such as Switzerland, some markets require shares to be temporarily immobilized from trading until after the shareholder meeting has taken place. In these instances, we decided it would be in clients' best interests to refrain from voting – these 'non-voted' proposals accounted for the remaining 5% of proxy votes.

Of the proposals voted, 28% were 'Against' management, and 14% were 'Against' the recommendations of Glass Lewis, our proxy voting provider.

Proxy Voting Results
Guinness Global Innovators



Voting Decisions
Guinness Global Innovators

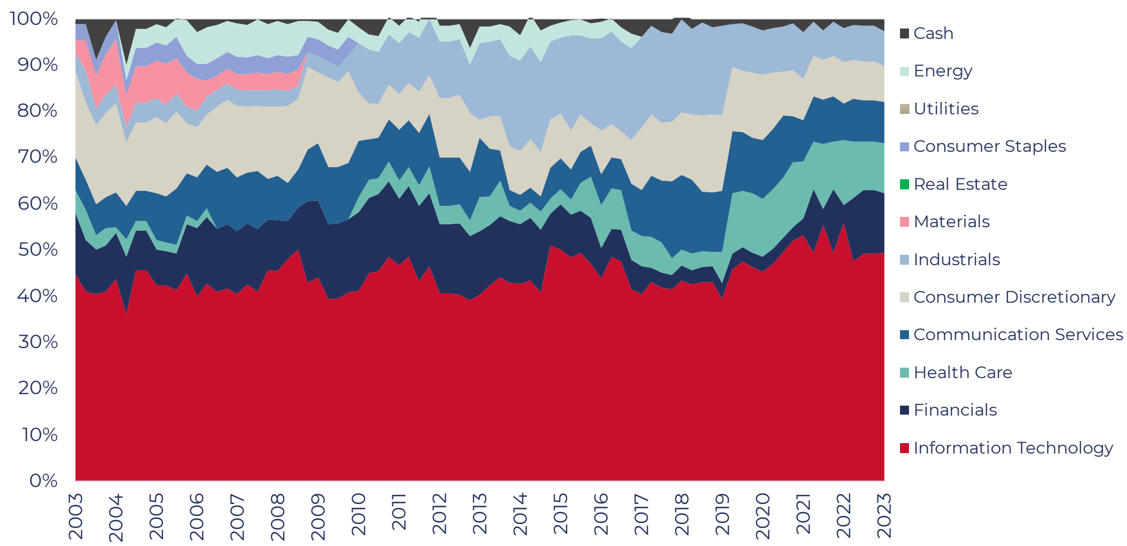


**Other includes votes such as '1 year', 'take no action', and 'do not vote'.*

Portfolio characteristics

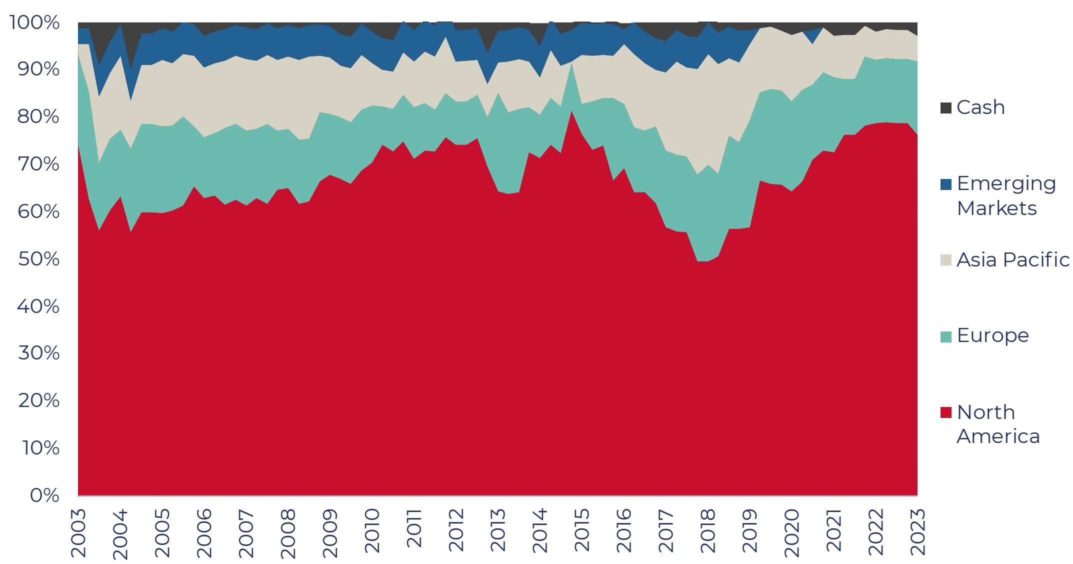
The charts below show the sector and geographic breakdown of the portfolio at the end of each quarter since the strategy's inception.

Portfolio sector breakdown (all dates at quarter-end)



Source: Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

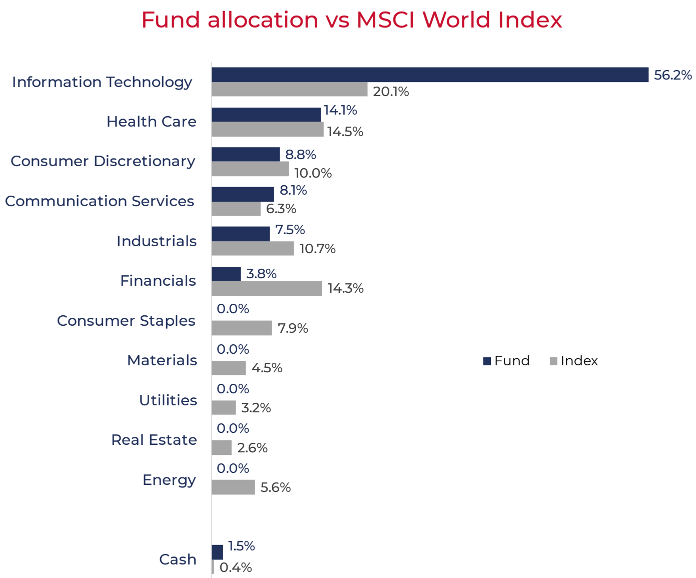
Portfolio geographic breakdown (all dates at quarter-end)

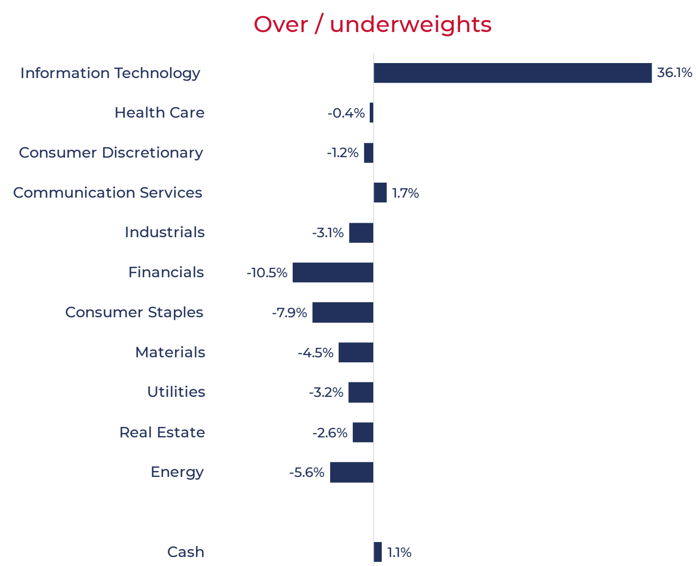


Source: Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

Over 2023, the net effect of purchasing Novo Nordisk whilst selling Bristol Myers-Squibb had no effect on the Fund's sector exposures, with both stocks within the Healthcare sector. This did, however, slightly shift geographic exposure towards Europe and away from North America, although the portfolio continues to have a bias to the U.S and an underweight position to Europe and Asia.

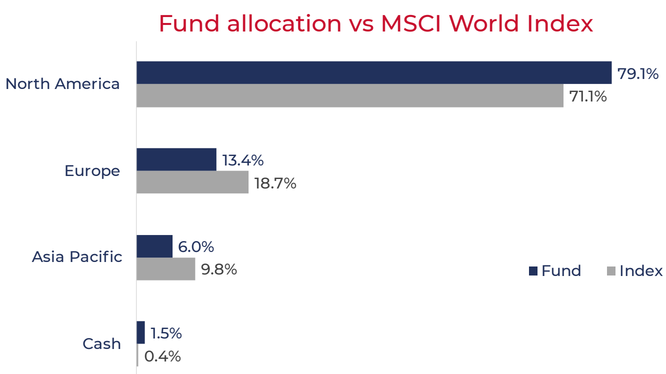
Sector breakdown of the fund versus MSCI World Index

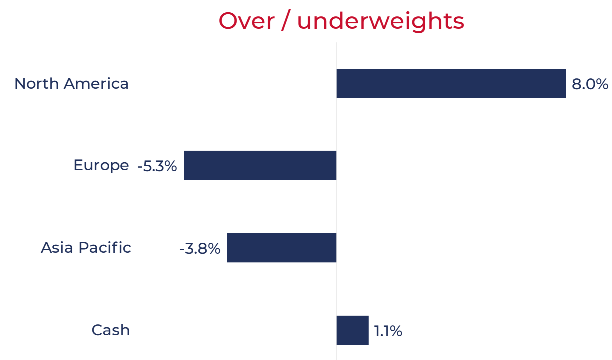




Source: Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

Geographic breakdown versus MSCI World Index





Source: Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

Outlook

The Guinness Atkinson Global Innovators fund seeks to invest in high-quality, innovative growth companies trading at reasonable valuations. By doing so, we seek to invest in companies that are experiencing faster profit growth, larger margins and with less susceptibility to cyclical pressures.

During the year, the Fund benefited from a number of tailwinds, including a rotation back towards 'growth' over 'value', greater 'risk-on' sentiment driving the outperformance of 'cyclicals' vs 'defensives', alongside developments in Artificial Intelligence – one of the nine key innovation themes in which the Fund has significant exposure to. While we would expect the Fund to outperform in such an environment, we are pleased with the magnitude of outperformance over the year, with returns not just ahead of the MSCI World Index, but the MSCI World Growth index too. Our focus on quality growth-at-a-reasonable-price has helped the Fund in more difficult market environments, not only benefiting from businesses who are able to withstand more difficult demand periods with strong balance sheets and higher margins, but also avoiding the volatile non-profitable tech businesses that have swung between large rises and falls, and often underperforming over longer time frames.

In addition, the Fund has good exposure to the long term secular trend that it Artificial Intelligence, investing in a number of the leading enablers and integrators within the space, and this has been the key driver of performance over 2023. However, the Fund is diversified across a number of other long term secular themes, that we believe should benefit from continued growth prospects with less sensitivity to the broader economic cycle. In our view, a diversified approach helps protect the Fund against the boom/bust cycles that a single theme (such as AI) may experience, reducing volatility of returns while also capturing the long-term growth trends that these companies are exposed to. While we identify companies with exposure to a number of themes that are driving growth, disrupting incumbent business models or technology, or significantly improving current products or services, our focus is on high quality businesses with strong fundamental characteristics, rather than those at the more speculative end of the spectrum.

The table below illustrates how the portfolio at year-end reflects the four key tenets of our approach: growth, quality, value, and conviction. The Fund has superior growth characteristics to the broader market, with both a higher trailing revenue growth rate, alongside higher estimated growth over 2024 (vs 2023). Fund holdings, on average, offer higher quality attributes than the broader index, with a significantly greater Return on Capital and more robust balance sheets. The fund currently trades at a 28.2% premium to the benchmark on a 1 year forward P/E basis which we believe is a small price to pay for this attractive set of characteristics.

Portfolio metrics versus MSCI World Index

		Fund	MSCI World Index
Growth	Trailing 5-year sales growth (annualised)	14.2%	3.8%
	Estimated earnings growth (2024 vs 2023)	17.4%	9.4%
Quality	Return-on-Capital	24.3%	5.8%
	Weighted average net debt / equity	14.8%	76.2%
Valuation	PE (2024e)	22.8x	17.6x
	PE (2024e) vs MSCI World Growth*	22.8x	24.8*
Conviction	Number of stocks	30	1480
	Active share	80%	-

Source: Guinness Atkinson Asset Management, Bloomberg, as of 31st December 2023

Over the course of 2023, many of the key concerns held by the market at the start of the year had largely abated, and the outlook is certainly more positive than it may have looked a year ago. Economic growth in the US has proven far stronger than expected, propped up by resilient consumer spending and strong jobs numbers, and recessionary risks appear to have faded significantly. At the same time, inflation has continued to trend towards targeted levels, more than halving at the headline level over 2023 in the US (3.1% for November 2023), and the Fed's preferred measure, Core PCE (Personal consumption expenditures), dropping to 3.2% in November (year-on-year seasonally adjusted figure) vs 4.9% at the beginning of the year. It appears that the Federal Reserve has greatly improved the chances of achieving a "goldilocks" scenario - both taming inflation and avoiding a recession, and ultimately bringing the economy into a soft-landing, with positive (albeit low) economic growth now appearing to be the most likely outcome. Having held rates constant for three consecutive meetings and inflation continuing to return to target levels, interest rate cuts appear very likely during 2024, which should act as a tailwind for equities.

Whilst there is much to be positive about with respect to the outlook, we do not expect these positive trends to translate into a strong cyclical upswing in growth but a moderate demand environment, and we are certainly aware of a number of risks: the market had already priced in six interest rate cuts at the beginning of the year over the course of 2024, with the downside risk to equities being any number of rate-cuts less than this; equity market valuations remain ahead of long-run averages, and a correction may yet occur; even if inflation continues to fall and rates are cut as expected (neither of these are a given), if this is driven by substantially lower economic growth (i.e. a recession is not yet avoided), this has the potential to weigh on equity performance. While these situations would not necessarily be our 'base case' scenario, we are certainly cognizant of the risk they may pose.

We believe there is a good argument for high quality stocks with exposure to long term secular growth themes in this current market environment, as these companies should continue to be able to grow even in a lower growth environment, while being protected by better fundamental characteristics in terms of margins and balance sheets but also performing well during cyclical upswings. We are confident that the Fund's focus on high quality growth stocks, underpinned by structural changes stands us in good stead going forward. Our bottom up approach helps to identify these quality growth companies, while also maintaining a valuation discipline. In addition, our equally weighted positions limit over-reliance on any single company. We continue to focus on these key tenets in the Fund and remain confident of this process over the long term.

May we wish you a happy and prosperous New Year, and we look forward to updating you on the progress of the fund over the course of 2024.

Portfolio Managers

Matthew Page, CFA

Dr Ian Mortimer, CFA

Fund Summary

In 2023, the Guinness Atkinson Global Innovators Fund produced a total return of 39.3% (TR in USD), compared to the MSCI World Net TR Index return of 24.4% therefore outperforming by 14.9%.

Performance data quoted represents past performance and does not guarantee future results. The investment return and principal value of an investment will fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original cost. Current performance of the Fund may be lower or higher than the performance quoted. For most recent month-end and quarter-end performance, https://www.gafunds.com/our-funds/global-innovators-fund/#fund_performance or call (800) 915-6566.

Developments in Artificial Intelligence, a surprisingly resilient US economy and continued progress in bringing inflation towards target levels allowed global equities to rebound strongly in 2023, offsetting the steep declines seen the prior year. But while equity market returns over the year were significant, gains were by no means consistent throughout the year, nor evenly shared.

Following a volatile start to 2023 in which equity markets initially rebounded off of an improving macro-outlook before faltering after a short-lived banking crisis, enthusiasm over developments in Artificial Intelligence drove a remarkably strong rally at the end of the first quarter. This rally, however, was driven by a narrow selection of mega-caps, 'the Magnificent Seven', many of which were perceived to be the most exposed (or were expected to benefit from) the long-term secular trend of artificial intelligence. With 'narrowness' and Artificial Intelligence exposure concentrated particularly within the technology sector (one of three sectors to outperform the MSCI World over the year), 'growth' stocks outperformed, despite interest rate expectations and yields increasing meaningfully over the period.

By the end of July, expectations over the future path of interest rates were once again the key driver of equity performance. Market narrowness for the most part was over, with the Magnificent Seven now largely tracking the broader market. Almost paradoxically, positive economic data was not translating into positive equity performance - the prospect that a strong economy may contribute to inflationary pressures (or at least embolden the Federal Reserve to maintain interest rates at elevated levels) fueled market expectations of "higher-for-longer" interest rates. The perceived impact this would have on valuations created a headwind for equities, as the 10 year yield rose to its highest level since 2007. In November, however, these expectations sharply reversed, driving yields lower and fuelling an extraordinary two-month market bounce that offset all of the declines seen over the prior period. This lifted almost all corners of the markets higher. Without the "everything" rally seen in the final months of the year, equities excluding the Magnificent Seven would have ended largely flat over 2023.

Over the year as a whole, equities performed well, with the MSCI World gaining 24.4% (USD). Overall performance remained narrow, however. Growth outperformed, initially driven by Artificial Intelligence enthusiasm, and in the final two months of the year, falling yields as markets priced-in a rising level of rate cuts for 2024. An improved macro-outlook and improving chances of a soft-landing also served to create greater "risk-on" sentiment, leaving "cyclically" orientated sectors in favor, and a rotation away from more "defensive" areas of the market.

Over 2023, fund performance relative to the MSCI World Net TR Index can be attributed to a number of factors:

- The Fund held six of the 'Magnificent Seven' stocks that contributed to the majority of positive developed market equity performance during the year. The fund held Apple, Alphabet, Amazon, Meta, Microsoft and Nvidia but did not own Tesla. Collectively the Fund had a higher weight in these names than the benchmark providing a significant contribution to relative performance.

- Falling interest rate expectations, Artificial Intelligence enthusiasm and a more resilient economy than expected drove a strong rotation towards "growth" and cyclical stocks during the year, all benefiting Fund performance over 2023. The Fund philosophy aims to identify "growth" stocks that are subject to long-term secular trends and hence lower variability of revenue growth, yet these "growth" stocks are often identified in perceivably more "cyclical" sectors. Hence, these rotations impacted performance positively from an attribution perspective.

- From an allocation perspective, the Fund's two largest overweight positions were to two of the three sectors that outperformed the MSCI World over 2023 – Information Technology and Communication Services. These positions were the biggest contributors to Fund performance over the year. However, having no exposure to the bottom three performing sectors, Consumer Staples, Energy and Utilities, as well as underperforming sectors Materials and Real Estate, also offered a material benefit to performance.

- Strong stock selection within the Fund provided a tailwind to relative Fund performance. Of the 29 stocks that were held throughout the duration of the year, 21 outperformed the MSCI World benchmark. From a sector perspective, stock selection was particularly strong within Communication Services (Meta +194.1% USD, Alphabet +58.3% USD) Information Technology (Nvidia +239.0%, Salesforce +98.5%) and Industrials (ABB +50.2% USD and Schneider +46.6% USD). Our Semiconductor equipment manufacturers were also significant contributors to relative performance last year, (Lam Research +88.6% USD, Applied Materials +68.0% USD and KLA 56.0% USD).

- Stock selection within the Consumer Apparel industry was the greatest detractor to relative Fund performance. Our only Chinese holding and off-benchmark holding, sportswear retailer Anta Sports (-24.8% USD), was the Fund's weakest performer over the year - in part due to regional headwinds. Nike (-6.0% USD) also struggled over the year, in part due to weakness in the Chinese end-market, a key exposure for the stock.

Guinness Atkinson
Global Innovators Fund
Managers' Update – January 2024

GUINNESS ATKINSON FUNDS

as of 12.31.2023 (in USD)	1 year	3 years annualized	5 years annualized	10 years annualized
Global Innovators, Investor Class[1]	39.34%	5.99%	17.31%	11.52%
Global Innovators, Institutional Class[2]	39.70%	6.26%	17.60%	11.75%
MSCI World Index NR	23.79%	7.27%	12.80%	8.60%

All returns after 1 year annualized.

[1] Investor class (IWIRX)	Inception 12.15.1998	Expense ratio*	1.24% (net); 1.27% (gross)
[2] Institutional class (GINNX)	Inception 12.31.2015	Expense ratio*	0.99% (net); 1.10% (gross)

[2] Performance data shown for Global Innovators, Institutional Class (GINNX), prior to its launch date on 12/31/15, uses performance data from the Global Innovators, Investor Class (IWIRX).

Performance data quoted represents past performance and does not guarantee future results. The investment return and principal value of an investment will fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original cost. Current performance of the Fund may be lower or higher than the performance quoted. For most recent month-end and quarter-end performance, https://www.gafunds.com/our-funds/global-innovators-fund/#fund_performance or call (800) 915-6566.

*The Advisor has contractually agreed to reimburse expenses (excluding Acquired Fund Fees and Expenses, interest, taxes, dividends on short positions and extraordinary expenses) in order to limit the Fund's Total Annual Operating Expenses to 1.24% for the Investor class and 0.99% for the Institutional class through June 30, 2026. To the extent that the Advisor absorbs expenses to satisfy this cap, it may recoup a portion or all of such amounts absorbed at any time within three fiscal years after the fiscal year in which such amounts were absorbed, subject to the expense cap in place at the time recoupment is sought, which cannot exceed the expense cap at the time of waiver. The expense limitation agreement may be terminated by the Board of the Fund at any time without penalty upon 60 days' notice.

Mutual fund investing involves risk and loss of principal is possible. Investments in foreign securities involve greater volatility, political, economic and currency risks and differences in accounting methods. These risks are greater for emerging markets countries. The Fund also invests in medium and smaller companies, which will involve additional risks such as limited liquidity and greater volatility. The Fund's focus on the technology, internet and communications sectors are extremely competitive and subject to rapid rates of change.

Securities mentioned are not recommendations to buy or sell any security.

Current and future portfolio holdings are subject to risk.

Top 10 holdings for Global Innovators Fund, as of 12/31/2023:

1.	NVIDIA Corp	4.31%
2.	Lam Research Corp	4.02%
3.	KLA-Tencor Corp	4.01%
4.	Microsoft Corp	3.99%
5.	ABB Ltd	3.97%

6.	Amphenol Corp	3.95%
7.	Intuit Inc	3.94%
8.	salesforce.com Inc	3.78%
9.	Applied Materials Inc	3.67%
10.	Mastercard Inc	3.66%

For a complete list of holdings for the Global Innovators Fund, please visit: https://www.gafunds.com/our-funds/global-innovators-fund/

The Fund's investment objectives, risks, charges and expenses must be considered carefully before investing. The statutory and summary prospectuses contain this and other important information and can be obtained by calling 800- 915-6565 or visiting www.gafunds.com. Read and consider it carefully before investing.

Earnings growth is not representative of the Fund's future performance.

MSCI World Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets.

MSCI World Value Index captures large and mid-cap securities exhibiting overall value style characteristics across 23 Developed Markets countries. The value investment style characteristics for index construction are defined using three variables: book value to price, 12-month forward earnings to price and dividend yield.

MSCI World Growth Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of large and mid-cap securities exhibiting overall growth style characteristics across developed markets.

The MSCI World Equal Weighted Index represents an alternative weighting scheme to its market cap weighted parent index, the MSCI World Index. The index includes the same constituents as its parent (large and mid-cap securities from 23 Developed Markets countries). However, at each quarterly rebalance date, all index constituents are weighted equally, effectively removing the influence of each constituent's current price (high or low). Between rebalances, index constituent weightings will fluctuate due to price performance.

The MSCI World Small Cap Index captures small cap representation across 23 Developed Markets (DM) countries. With 4,177 constituents, the index covers approximately 14% of the free float-adjusted market capitalization in each country.

The Consumer Price Index (CPI) is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. Indexes are available for the U.S. and various geographic areas.

One basis point is equal to 1/100th of 1%, or 0.01%, or 0.0001, and is used to denote the percentage change in a financial instrument. The relationship between percentage changes and basis points can be summarized as follows: 1% change = 100 basis points and 0.01% = 1 basis point (bp).

The Nasdaq-100 (NDX) is a large-cap growth index. It includes 100 of the largest domestic and international non-financial companies listed on the Nasdaq Stock Market based on market capitalization.

The MSCI USA Cyclical Sectors Index is based on MSCI USA Index, its parent index and captures large and mid-cap segments of the US market. The index is designed to reflect the performance of the opportunity set of global cyclical companies across various GICS® sectors. All constituent securities from Consumer Discretionary, Communication Services, Financials, Industrials, Information Technology, Materials & Real Estate are included in the Index.

The MSCI World Defensive Sectors Capped Index is based on MSCI World Index, its parent index and captures large and mid-cap representation across 23 Developed Markets countries. The index is designed to reflect the performance of the opportunity set of global defensive companies with equal sector weights across various GICS® sectors.

The Bloomberg Magnificent 7 Total Return Index is an equal-dollar weighted equity benchmark consisting of a fixed basket of 7 widely-traded companies classified in the United States and representing the Communications, Consumer Discretionary and Technology sectors as defined by Bloomberg Industry Classification System (BICS).

Duration: The duration number is a complicated calculation involving present value, yield, coupon, final maturity and call features. Fortunately for investors, this indicator is a standard data point provided in the presentation of comprehensive bond and bond mutual fund information. The bigger the duration number, provided in years, the greater the interest-rate risk or reward for bond prices. It can also be used to describe equities in a similar manner: a higher duration suggests most cash flows are expected far into the future, with a lower duration suggesting more stable cash flows over the short and long term.

Gross domestic product (GDP) is the total monetary or market value of all the finished goods and services produced within a country's borders in a specific time period.

Earnings per share (*EPS*) is calculated as a company's profit divided by the outstanding shares of its common stock.

Price-Earnings (P/E) ratio is a valuation ratio of a company's current share price compared to its per-share earnings. Forward earnings differ from trailing earnings, which is the figure quoted more often, as they are a projection and not a fact.

Forward price-to-earnings (forward P/E) is a version of the ratio of price-to-earnings (P/E) that use forecasted earnings for the P/E calculation. While the earnings used in this formula are just an estimate and not as reliable as current or historical earnings data, there are still benefits to estimated P/E analysis

Free cash flow (FCF) is the cash a company generates after taking into consideration cash outflows that support its operations and maintain its capital assets. In other words, free cash flow is the cash left over after a company pays for its operating expenses (OpEx) and capital expenditures (CapEx).

Cash Flow is the total amount of money,in cash, being transferred into and out of a business.

The MSCI World Information Technology Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of large and mid-cap equities across 23 developed markets, all classified within the Information Technology sector.

The S&P 500 Index features 500 leading U.S. publicly traded companies, with a primary emphasis on market capitalization.

Capital expenditures (CapEx) are funds used by a company to acquire, upgrade, and maintain physical assets such as property, technology, or equipment. CapEx is often used to undertake new projects or investments by a company.

The MSCI World Semiconductors and Semiconductor Equipment Index is composed of large and mid-cap stocks across 23 Developed Markets (DM) countries*. All securities in the index are classified in the Semiconductors and Semiconductor Equipment Industry Group (within the Information Technology sector)

The MSCI World Quality Index is based on MSCI World, its parent index, which includes large and mid cap stocks across 23 Developed Market (DM) countries. The index aims to capture the performance of quality growth stocks by identifying stocks with high quality scores based on three main fundamental variables: high return on equity (ROE), stable year-over-year earnings growth and low financial leverage.

Total addressable market (TAM) is the overall revenue opportunity available or foreseen for a specific product or service, taking into account the future expansion scenarios.

Compound annual growth rate, or CAGR, is the mean annual growth rate of an investment over a specified period of time longer than one year. It represents one of the most accurate ways to calculate and determine returns for individual assets, investment portfolios, and anything that can rise or fall in value over time.

EBITDA, or earnings before interest, taxes, depreciation, and amortization, is an alternate measure of profitability to net income

Personal consumption expenditures (PCE), also known as consumer spending, is a measure of the spending on goods and services by people of the United States. According to the Bureau of Economic Analysis (BEA), a U.S. government agency, PCE accounts for about two-thirds of domestic spending and is a significant driver of gross domestic product (GDP)

CFROI is defined as the average economic return on all of a company's investment projects in a given year. CFROI assumes that the financial markets set the prices of stocks based on a company's cash flow, rather than primarily on earnings or other metrics. CFROI = Operating Cash Flow divided by Capital Employed

One cannot invest directly in an index.

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