

THE FUTURE STRATEGIST

NEWSLETTER | Q4 2024

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Q4 2024 COMMENT

MARK HAWTIN, HEAD OF THE GLOBAL EQUITIES TEAM

2024 was the first time the S&P Equal Weighted Index had underperformed the S&P 500 Index by more than 10% for two years running this century. Will this unprecedented run continue in 2025 or will there be a return to broader market participation? We believe the latter is highly likely and, therefore, stock selection will be more critical for 2025.

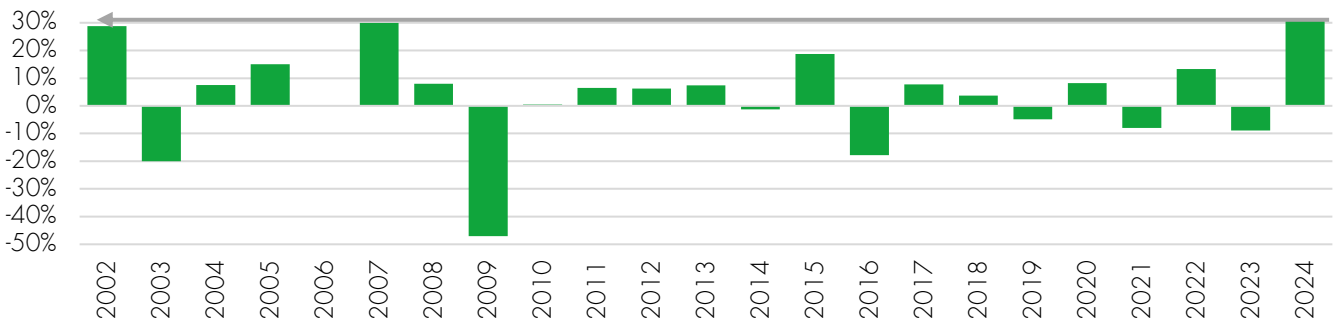
Mega rises for equities

Equities enjoyed strong returns in 2024, particularly in the US where the combined trends of momentum, passive investing and artificial intelligence (AI) led to a 23% gain for the S&P 500. In fact, US equities contributed 17% or almost 90% out of the 19.5% gain for the MSCI World Equity Index. Frankly, everything else represented a rounding error and so it is easy to see why US and international investors remained entrenched within the US equity wave.

Much of this wave was focused on the very largest companies, with Nvidia and Broadcom driving the biggest percentage gains, up 177% and 119% respectively. These two 'AI' titans contributed no less than 22% of total global equity returns. Add in the other mega caps – Apple, Alphabet, Amazon, Tesla, Meta and Microsoft – and together the (now) Magnificent 8 drove 50% of global equity returns.

The momentum wave

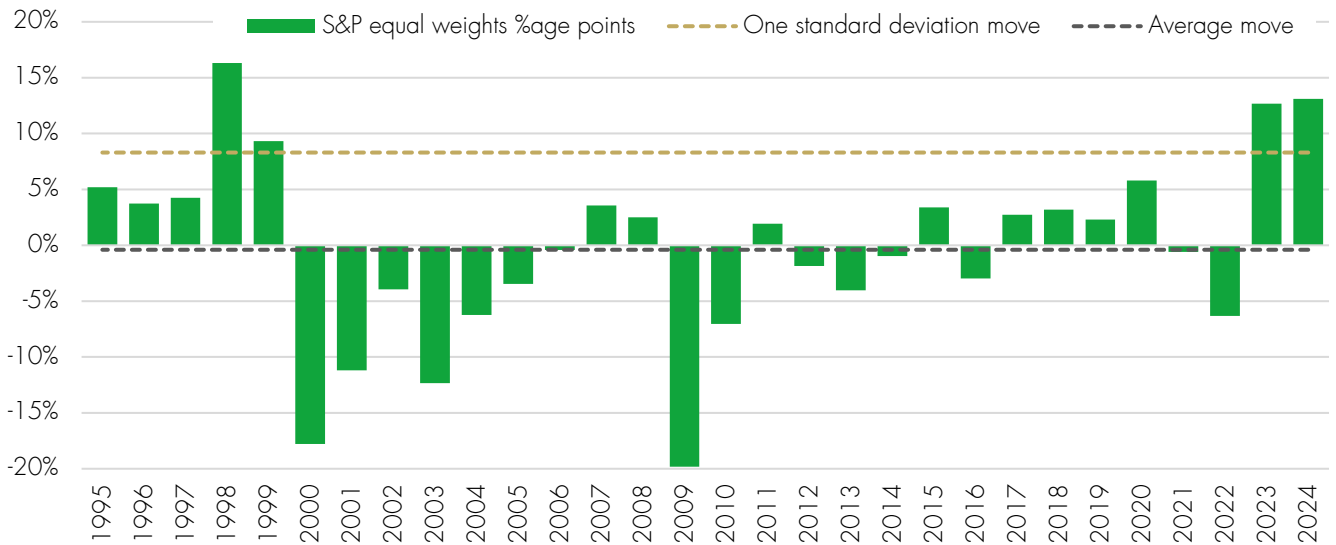
Just Ride the Wave: Momentum has had its best year in at least two decades



Source: Bloomberg, S&P Global, as at 31 December 2024.

Looking deeper into this move and as we stated earlier, the S&P 500 has had two successive years of outperforming the S&P Equal Weighted Index by a significant margin.

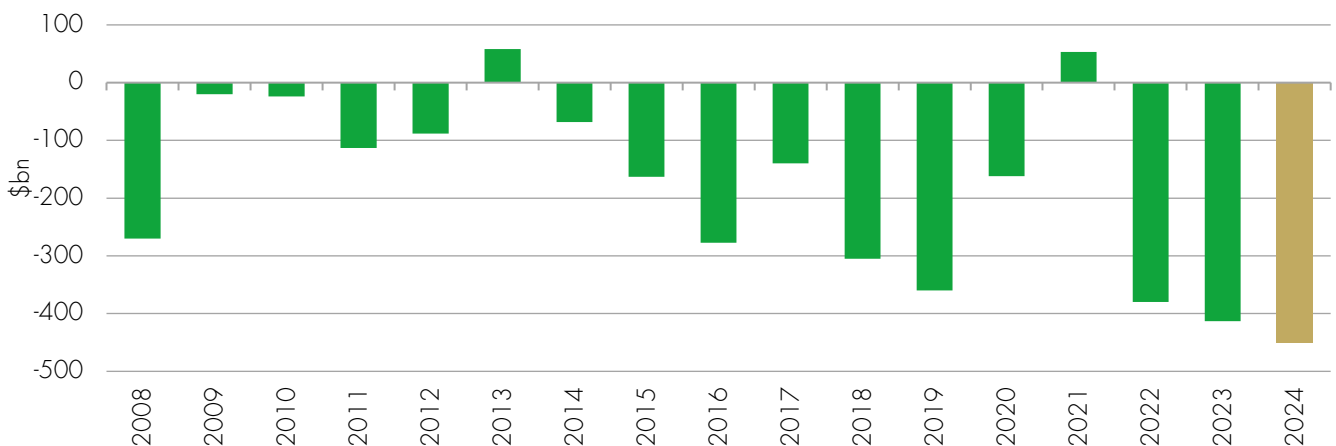
S&P 500 performance minus S&P Equal Weight (percentage points)



Source: Liontrust, as at 31 December 2024.

There have been two key factors driving this trend. The first is the ever-increasing move to passive investing. Since 2000, passive exchange traded funds (ETFs) have gone from almost nowhere to over half of all mutual fund investing. The impact on daily trading volumes is even more acute, with ETFs accounting for as much as one-third of trading volumes. Of course, the counter side of this is accelerated redemptions from active strategies. The Financial Times recently published the 2024 numbers to cap off a strong run of years for active outflows shown in the following chart.

Active equities funds suffer record outflows in 2024



Source: EPFR and Financial Times, as at 31 December 2024.

Second, is the cycle of disruption that has taken on a new velocity with the advancement of AI. Hugely cash-rich mega companies have led a charge to build the biggest and best natural language models, necessitating massive levels of investment in infrastructure. This in turn has led to a sales and earnings momentum cycle rarely seen for mega caps, which adds even more fuel to the momentum fire.

The two trends of passives and disruption have together created a potent force in markets, leading to the highest level of stock concentration since the early 1900s. We believe this is set to abate in 2025 as investment opportunities broaden beyond the few and spread to the many that will benefit from advancing technology trends. This equates to a stock picker's dream and a great opportunity for active managers.

Crypto – pending regulation heralds further mainstream adoption

We saw the approval of Bitcoin ETFs in January 2024, the fourth Bitcoin halving in April and Bitcoin blasting through \$100,000 giving the currency a market cap of over \$2 trillion. With the incoming Trump administration, we see this as a positive catalyst for the crypto industry and crypto/blockchain assets.

During the campaign trail, Trump pledged to make the US the crypto capital of the planet and the Bitcoin superpower of the world. With the nomination of Paul Atkins, a crypto advocate, as the Securities and Exchange Commission (SEC) chair, we continue to see this momentum continuing into 2025, with a more favourable regulatory environment, greater clarity and less regulation by enforcement. The establishment of advisory councils for digital assets, David Sachs appointed as the 'crypto Tsar' and discussions of a strategic reserve are further positive catalysts.

At a recent meeting with Coinbase, the CFO, Alesia Haas, gave us an interesting perspective on the strategic reserve issue. Speculation among crypto insiders is increasingly suggesting that crypto may become nuclear arms-race-like. One of the reasons for the US looking at it as a reserve currency is because not to have it leaves the US vulnerable to digital asset exclusion. If this view pervades, then there could be an arms race move for all countries to ensure they have an appropriate level of crypto reserves.

We continue to see Bitcoin ETFs as an easy path for investors, including institutional, to gain exposure to Bitcoin and see it becoming a long-term allocation rather than tactical exposure. Currently, spot Bitcoin ETFs hold over 1.1 million BTC, representing just under 6% of current supply. Blackrock recently highlighted in their Investment Institute paper that *"giving Bitcoin a 1% to 2% weighting would produce a similar share of profile risk as the Magnificent Seven tech stocks in a standard 60/40 portfolio"*.

The market also takes optimism from the upcoming inclusion of MicroStrategy Inc to the Nasdaq-100 Index given around \$451 billion in ETFs around the world track the Nasdaq-100. We do not believe increased adoption of Bitcoin as a corporate treasury asset will be mainstream, however, as highlighted by the recent Microsoft vote against a Bitcoin investment.

Bitcoin has a unique HODL culture. Given Bitcoin's inherent scarcity, with a cap of 21 million coins, and considered a store of value like gold, it is no surprise that more than 60% of Bitcoin held has not been sold in the last 12 months. While we are positive on Bitcoin, we are excited more widely for the crypto industry going beyond the store of value to productive assets, including decentralised apps to finance.

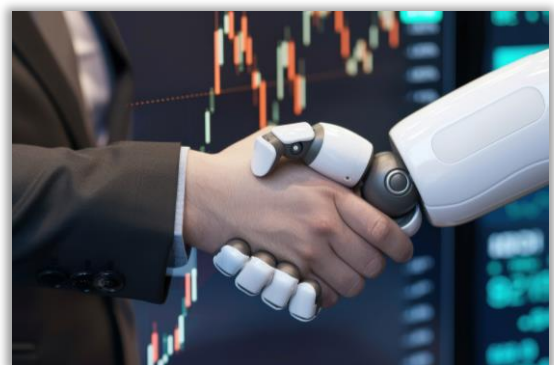


"AI is not going to take your job" – but people who know how to use it might

DAVID GOODMAN, INVESTMENT MANAGER, GLOBAL EQUITIES TEAM

A lot has been written about the negative aspects of AI. Rather than focusing negatively on AI's impact on jobs, we should consider the innovative ways individuals will become much more efficient thanks to AI – monotonous tasks will be automated, jobs will become more fulfilling and workers can bring greater value to their employers.

Taking a step back, AI has long been painted as a villain in employment discourse, with fears of mass job displacement dominating headlines. Goldman Sachs has forecast that up to 300 million jobs globally could be affected by AI automation, with 14% of workers already displaced by such technologies. However, these figures often obscure a more nuanced reality. While AI will undoubtedly eliminate some roles, it will also create exciting new opportunities, especially for professionals – known as knowledge workers.



The job evolution

With the rise of AI already changing the employment landscape, knowledge workers who were once thought to be immune to automation are having to rethink their roles to survive. Professionals of every kind depend heavily on their intellectual output, from decision-making skills to strategic thought, all of which can be enhanced by adopting AI tools. The ambition is that when utilised constructively, AI can complement existing roles rather than purely replacing them. By automating tedious, repetitive tasks, AI will free knowledge workers to concentrate on higher-value activities, making them more productive and more valuable.

The key takeaway is simple. Adopt AI, make it work to your advantage – or risk being taken over by your colleagues and competitors who have embraced it.

A glimpse into the future

What will the office of the future look like? How much will AI transform our working lives? To give you a flavour, imagine an office in 2035. AI systems will be managing functions like customer service, data analysis and project management, with tasks performed in seconds. The systems will not just be chatbots or essential automation tools—they will be independent AI Agents that can sense their environment through various inputs and perform tasks from start to finish.

In addition, AI's ability to interpret ongoing discussions and prior task histories will enable a superior grasp of context, intentions and relationships, which will undoubtedly be a game-changer. This transformative capability will allow businesses to operate with greater efficiency and accuracy, with AI Agents making informed decisions quickly, adapting to new information in real-time and enhancing collaboration by understanding the nuances of human interaction.

The rise of the AI-enhanced worker

To counteract their potential exposure to AI disruption, savvy knowledge workers are already putting key human skills front and centre – from innovative problem-solving and relationship development to strategic planning – with the most creative and impactful ideas highly prized. By honing distinctively human capabilities and emphasising creativity and strategic thought, successful individuals will work with AI to reinvent their roles and the value they bring to an organisation. Even today, individuals who seamlessly integrate AI into their workflows, known as 'AI-augmented' workers, are already leveraging tools like Perplexity or Copilot to enhance their productivity and outperform those relying on traditional methods.

Indeed, the major challenge to overcome will be the disparity between those who adapt to AI and those who do not. For instance, job seekers who use AI to refine their resumes or simulate interviews are more likely to secure positions in today's tech-driven hiring landscape. Similarly, marketers who employ generative AI for content creation can produce campaigns more quickly and effectively than their peers.

New jobs on the horizon

Beyond the fact that some jobs will be replaced by AI and others transformed, it is also true that many new ones will be generated by it – with human skills vital for their success. For example, AI agent managers, specialists in AI-human collaboration, and digital workforce co-ordinators will all be in demand. Chief AI officers will be created, whose task will be to integrate AI into specific business processes, for example, by using AI to optimise HR procedures or increase the marketing team's productivity.

Enhancing performance at Liontrust!

At Liontrust, the Global Equities team now utilises AI agents—equivalent to five analysts—through specialised AI software. This technology monitors newsflow, company reporting and management calls 24/7, providing the team with timely updates in short, concise and referenced prompts. This empowerment through AI integration is a key factor in the changing job landscape, giving individuals more control over their work and enhancing their performance.

Conclusion: The human advantage

The narrative that "AI is coming for your job" misses the point. It is not about machines replacing humans but about humans using machines to outcompete one another. In this race, those who harness AI effectively will likely be the winners, while those who resist are at risk of being losers. Ultimately, the future of work is not a battle between humans and machines but a test of our ability to adapt and collaborate with technology. The question is no longer whether AI will disrupt jobs—it already is—but whether you will be the one wielding it or watching from the sidelines.



Beyond classical: Quantum computing's leap

PIERAN MARU, FUND MANAGER, GLOBAL EQUITIES TEAM

In the realm of science, few fields have sparked such intrigue, mystification and excitement with the public as quantum mechanics. From the famous thought experiment of Schrödinger's cat, the concept of superposition whereby a cat is simultaneously alive and dead in the box until it is opened and observed. Or quantum entanglement, where particles become interconnected in such a way that the state of one particle instantly influences the state of another, regardless of the distance between them. By applying these quantum principles to computing, amongst others, we can envision an era where challenges previously deemed unsolvable in our lifetime using classical computing may be addressed.

Classical versus Quantum Computing

Today's technology relies mainly on the principles of classical physics from the 17th to 19th century. Data is processed in a binary manner with bits having two states of 0 or 1. It is through the rapid changing of these bits that transistors execute commands. Text, music, images and movies can be described as a stream of numbers. However, in 1985, David Deutsch, a theoretical physicist, proposed the concept of a universal quantum computer whereby it could simulate any physical process, making it exponentially more powerful than classical computers for certain tasks.

Using the principles of quantum mechanics, quantum bits (qubits) can have a state of 0, 1 or exist in multiple states simultaneously via superposition. This allows quantum computers to process vast amounts of information in parallel. Early developments laid the groundwork for practical implementations, although we still have several different modalities, each leveraging unique physical systems to realise qubits.

Players such as Google, IBM and Rigetti Computing use superconducting qubits while IonQ and Quantinuum use ion trap. Each offers its own advantages and challenges, with superconducting qubits having faster operation speeds while ion qubits have higher fidelity and longer coherence times. One similarity, however, remains – error rates. When scaling up, for quantum computers to be useful, the number of stable qubits is key. Current machines can only achieve a few hundred error-free quantum operations, but at a million plus error-free quantum operations, quantum computers could surpass the limitations of classical supercomputers, enabling more powerful applications across various sectors.

Applications and implications

The potential applications of quantum computing span a wide range of fields. In the domains of scientific research and healthcare, quantum computing has the capacity to simulate intricate molecular interactions, thereby expediting breakthroughs in drug discovery and enhancing diagnostic precision. For instance, modelling a penicillin molecule, which consists of merely 41 atoms, on a classical computer would require more transistors



Photo: IBM Q System One Quantum Computer uses superconducting qubits.

than there are atoms in the observable universe. Currently, classical methods require researchers to depend predominantly on time consuming and costly approaches for drug optimization. The energy sector also stands to benefit from quantum simulations to optimize energy storage and distribution.

Quantum computing holds the promise of significant advancements in artificial intelligence, facilitating the development of more sophisticated machine learning algorithms and AI models. Quantum computers perform computations in a manner analogous to how nature computes. Consequently, when AI systems are trained on quantum computers, it could lead toward the achievement of Artificial General Intelligence, albeit how it is defined is still up for debate, especially with the Microsoft and OpenAI partnership defining it as a system that can generate \$100 billion in profits.

There has been considerable government interest in quantum computing globally. The UK has recently launched the National Quantum Computing Centre (NQCC), which aims to serve as a national hub for quantum computing research, infrastructure and talent development. One of its main objectives is to build scalable, reliable quantum computers through the advancement of quantum error correction.

The Surge in Quantum Stocks

The fourth quarter of 2024 saw a significant increase in quantum computing stocks, including IonQ (+418%), Rigetti Computing (+1,917%), and D-Wave Quantum (+818%). Factors contributing to the rise in the sector included government contract wins, private sector investments and investor interest following Google's announcement of its latest quantum chip called Willow. Google's announcement claimed that the chip could reduce errors exponentially as more qubits are used and highlighted its impressive benchmark computation in under five minutes — a task that would take some of the fastest supercomputers 10 septillion (10^{25}) years. There has been some criticism from the scientific community, however, pointing out that the test involved producing a random distribution with no practical use and did not account for set-up time prior to the test. Nevertheless, it demonstrates progress toward developing a large-scale computer capable of complex, error-corrected computations.

However, rationality has also gone out of the window, as shown by Quantum Corp jumping over 1,000% in the quarter, despite having no actual connection to quantum computing other than its name! Additionally, speculative retail trading has contributed to the rise in stock prices, with increased activity on the well-known Wall Street Bets subreddit.

Quantum Security

Quantum computers have the potential to change cryptography by providing unbreakable encryption methods and ensuring data security in an increasingly digital world. But how safe are today's current encryption standards against quantum computers?

There are concerns that quantum computers could break current standards and be the biggest threat to cybersecurity. RSA is an asymmetric encryption algorithm that functions based on prime factorisation and is widely used for the majority of internet connections, transactions and signatures. By using mathematician Peter Shor's quantum algorithm developed in 1994, we can efficiently factor large numbers and solve discrete logarithm problems which are the basis for RSA. Although Shor's algorithm is effective, RSA has not been broken due to current hardware limitations of quantum computers, specifically the number of stable qubits required.

Regardless of whether it will be feasible in the near term, a number of players, including PQShield, have been at the forefront of contributing to quantum-resistant cryptographic standards. The US Department of Commerce's National Institute of Standards and Technology recently finalised its principle set of encryption algorithms, following an eight-year period of submission, research and analysis. This highlights the commitment to advancing quantum security and protecting sensitive information in the post-quantum era.

Future Outlook

Despite the potential of quantum computing, several significant challenges must still be addressed. Transitioning to the era of quantum computing requires scaling up the number of stable qubits and developing robust error-

correcting mechanisms to ensure reliable computation, integrating into existing infrastructure and creating quantum software. As researchers make strides in overcoming these technical obstacles, quantum computers are becoming increasingly accessible and practical for real-world applications.

At present, there is no clear consensus on which modality will win, such as superconducting or ion-based approaches, although it is likely that a multimodal approach will emerge, leveraging the unique strengths of each system alongside classical computing systems. As quantum computers become more advanced, it is expected that AI/ML (artificial intelligence/machine learning) will utilise quantum systems due to their probabilistic parallel nature. Public-private partnerships and national security initiatives are expected to play a crucial role in the advancement of quantum computing. Nonetheless, we are still several years away from achieving practical quantum computers, as underscored by NVIDIA's CEO, Jensen Huang, who recently stated: *"If you kind of said 15 years for very useful quantum computers, that would probably be on the early side. If you said 30, it's probably on the late side."*



The future of data centres: Embracing liquid cooling technology

LINNEA BENGTSSON, INVESTMENT ANALYST, SUSTAINABLE INVESTMENT TEAM

As the digital age continues to evolve, the demand for more efficient and effective data centre cooling solutions has never been greater. Traditional air cooling methods are reaching their limits, especially with the rise of AI workloads that demand higher rack densities. Enter liquid cooling technology, a game-changer that promises to revolutionize the way data centres manage heat dissipation.

Liquid cooling is not a new concept, but its importance has surged in recent years due to the increasing power requirements and heat generation in data centres. Unlike air cooling, which relies on fans to dissipate heat, liquid cooling leverages the superior thermal transfer properties of water or other fluids. This method can be up to 3,000 times more effective than air cooling, making it an ideal solution for high-density racks.

There are three primary liquid cooling technologies that are gaining traction in the industry: direct-to-chip cooling, immersion cooling and rear door heat exchangers. Each of these technologies offers unique advantages and challenges, but all share the common goal of improving cooling efficiency and reducing energy consumption.

Direct-to-chip cooling involves circulating coolant through cold plates mounted directly on high-heat components like central processing units (CPUs) and graphics processing units (GPUs). This method is highly efficient, removing 70% to 75% of heat, and is more scalable and flexible than immersion cooling. However, it does come with moderate to high initial costs and the risk of leaks.



Immersion cooling takes a different approach by fully submerging servers in a bath of coolant. Immersion is the most efficient of the three methods, removing over 95% of heat, and is particularly effective in high-temperature and high-humidity environments. However, it requires specialized servers and involves high upfront capital expenditure, maintenance costs and often the use of PFAS (man-made forever chemicals).

Rear door heat exchangers are a more straightforward solution, involving the installation of a liquid-cooled door on the rear of a server rack. As hot air exits the servers, it passes through the

heat exchanger, transferring its heat to the liquid. This method is the easiest to retrofit but it is also the least efficient of the three, removing only 50% of heat.

The market for liquid cooling is growing rapidly. Valued at \$2.8 billion, it is forecasted to grow at a compound annual growth rate (CAGR) of 27% through 2027. Vertiv, a leading player in the industry, predicts that liquid cooling will grow from 5% of the data centre cooling market today to approximately 20% by 2028.

This growth is driven by the increasing power requirements of data centres, which are expected to standardize at 80-120 kilowatts (kW) per rack in the next few years, up from the current average of 12 kW.

The environmental and operational benefits of liquid cooling are significant. It is not only more efficient but also quieter than air cooling, reducing noise pollution in data centres. This is particularly important for the health and well-being of data centre employees, who are often exposed to the constant hum of traditional cooling systems. Moreover, liquid cooling allows for more precise heat management, which is crucial for the reliability and longevity of data centre equipment.

However, the adoption of liquid cooling is not without its challenges. High initial costs, potential for leaks and the need for specialised equipment and maintenance are significant barriers. *Given the industry is still in its early stages*, many customers are highly risk-averse due to the financial repercussions and downtime associated with equipment failures.

Despite these challenges, the future of liquid cooling looks promising. It is unlikely that liquid cooling will fully replace air cooling, but it will play a complementary role, especially for high-density servers. *A hybrid solution* of both technologies ensures redundancy and reliability in data centre operations. If one system experiences an issue, the other can take over, preventing overheating and downtime.

In conclusion, liquid cooling technology represents a significant advancement in data centre cooling solutions. Its superior efficiency, environmental benefits and potential for market growth make it an attractive option for data centres facing increasing power requirements and heat dissipation challenges. As the industry continues to evolve, liquid cooling will undoubtedly play a crucial role in shaping the future of data centre operations.

2025 OUTLOOK

MARK HAWTIN, HEAD OF THE GLOBAL EQUITIES TEAM



We believe the opportunity set in equities will differ in 2025 from the momentum of 2024. Two factors make the US slightly less straightforward than last year: increased volatility resulting from uncertainty over the exact path and timing of inflation and interest rates along with the early period of the new Trump regime and the concentration risk in the US market. Add in peak expectations on AI infrastructure, and we believe that 2025 will see a rotation into a broader range of US market opportunities as well as a better backdrop at the margin for equities in other geographies.

In the US, our key selection criteria revolve around finding companies that will utilise the newfound benefits of AI effectively as well as those companies set to benefit from Trump policies on tax cuts and spending priorities. We specifically reduce exposure to the AI infrastructure build cycle, as well as to mega cap names, and favour sectors like healthcare, industrials and fintech.

In portfolio construction terms, we have increased exposure to healthcare and industrials where the use of AI creates a clear differentiated opportunity or where the digital lenses that we apply across the investment universe find moats that are hard to cross. For example, in robotic surgery, Intuitive continues to benefit from the network effect in a way that the market underappreciates.

One additional theme that is likely to play out in 2025 is that of mobility including autonomous driving and last mile delivery. We have for some time talked about the demise of traditional auto manufacture and we would expect to see this accelerate with a shift towards structural consolidation like the year-end announcement of the Honda/Nissan merger. This will not be restricted to the traditional original equipment manufacturers (OEMs) –

we see consolidation likely to build potential ride sharing and autonomous platforms with a significant moat. Waymo and Tesla both need to accelerate their positioning so we think it is likely that broader tie-ups will occur, such as an attempt to take over Uber to turbo boost access to customers.

Elsewhere, the Trump administration's support for crypto and digitalisation also makes digital fintech a clear opportunity for 2025.

The wild card may prove to be China, where shares have been crushed by the poor growth outlook and continued tensions on a geopolitical level. If measures to stimulate growth align with a less aggressive stand from the new Trump administration, China could offer a very cheap and well diversified equity opportunity. In addition, any push to weaken the US dollar would add further support for investing in China and emerging markets more broadly. Given the unique nature of emerging market economies because of their rapid and comprehensive use of digital technologies, we can see a scenario in which diversification away from the very concentrated US exposure could generate significant relative returns.

 www.liontrust.com

For a comprehensive list of common financial words and terms, see our glossary at:
www.liontrust.com/benefits-of-investing/guide-financial-words-term

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