Herald Worldwide Technology Fund

Investment Manager’s Report for the financial year ended 31 December 2020
February 3rd 2021

The objective of the Herald Worldwide Technology Fund (“Fund”) is to achieve capital growth while investing globally in information technology, communications and multimedia. The Investment Manager believes this area of the economy continues to offer growth greater than the world economy as a whole and presents attractive investment opportunities. In addition, the Investment Manager offers focused specialist management, with a 25 year history and an experienced team. The Fund was launched in April 1998 with an initial asset value per Class A share of £10.00. At the end of the period the net asset value per Class A share was £89.72. On the 9th June 2010, a Class B share was launched with an initial net asset value per share of £10.00. At the end of the period the net asset value per Class B share was £59.06.

Total return for the financial year ended 31st December 2020

Herald Worldwide Technology Fund NAV (Class A)	33.3%
Herald Worldwide Technology Fund NAV (Class B)	35.9%
Global	
S&P Dow Jones World Technology	42.0%
United States	
Russell 1000 (Large Cap) Technology	42.5%
Russell 2000 (Small Cap) Technology	38.8%
S&P 500	15.0%
Russell 2000 Small Cap	16.5%
United Kingdom	
iShares Core FTSE 100 UCITS ETF	-11.5%
Numis Smaller Companies plus AIM (ex Investment companies)	4.9%
Europe	
DAX	9.5%
Deutsche Bourse TECDAX	12.7%
CAC 40	0.5%
Asia Pacific	
NIKKEI 225	20.3%
KOSDAQ IT Composite	39.2%
Taiwan Electronics	45.7%

All percentage returns are in GBP
Source: Herald Investment Management Limited and Bloomberg.
The Fund is not managed by reference to any benchmark and the indices above are shown for comparative purposes only.
Past performance is not a guide to future performance.

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Summary

Despite all its challenges, 2020 proved to be a good year for the Fund, largely due to the strong performance of equities in the targeted sector. Cash holdings continued to be a drag as uncertainties due to Covid and US elections, as well as high valuations in parts of the technology sector, led to the Manager maintaining a higher level. Nevertheless, the Fund's performance over three and five years remains in the top 1% of nearly 5000 offshore funds on Trustnet.

To call 2020 an unusual year would be an understatement. In the global equity markets, the first half of the year was characterised by extreme volatility following the emergence of Covid and the unprecedented actions by governments around the world in reaction to the health, social and financial risks posed by the global pandemic. This led to a scramble for safety, towards companies with strong balance sheets and those benefiting from the work from home (WFH) trends. The second half of the year was characterised by a gradual rebuilding of investor confidence as supply chains normalised and more economies opened, leading to strong performance in the markets. By Q4, after Covid vaccine approvals looked to be emerging and uncertainty around US elections had subsided, investor optimism bordered on exuberance with equity markets rising across the world and rapid rotations into the under-performing sectors such as energy and finance, despite rising Covid numbers.

The data above shows a large divergence between the returns of the different indices as a result of the crisis. The Russell 1000 (Large Cap) Technology Index and the S&P Dow Jones World Technology Index have both appreciated over 40% during 2020 after having appreciated 41.5% and 39.0% respectively in 2019. By contrast indices with a smaller exposure to technology stocks have risen far more modestly or have declined during the period.

2020 was the year that technology companies across the world showed resilience, adaptability and that they could be relied on in serving customers and supporting employees despite unprecedented challenges.

2020 also saw a step change in the use of technology for almost everyone across all walks of life, especially in western countries where lockdowns were longest and most prevalent. In the consumer sectors spending across retail, healthcare, financial services, education and entertainment rapidly shifted from offline to online. Within the business sectors, WFH and lockdown necessitated at times a total change in business practices, driving the adoption of new communication and collaboration technologies, new marketing initiatives, more supply-chain management tools, and at the same time creating capacity management and sprawling security challenges for the IT teams across public and private organisations.

The combination of the pandemic and the economic and social schism it has unveiled is leading to mainstream questions about the value of globalisation and whether the pendulum has swung too far. The reverberations of the social and economic dislocations of 2020 are likely to be felt for years. The question is whether we recoil towards a bipolar world or whether the growing forces advocating sustainable and responsible investing lead to greater cooperation and better social and living standards for everyone. It is noteworthy that more than 200 employees at Alphabet announced the formation of a union, joining with the Communications Workers of America to organise full-time and contract workers alike.

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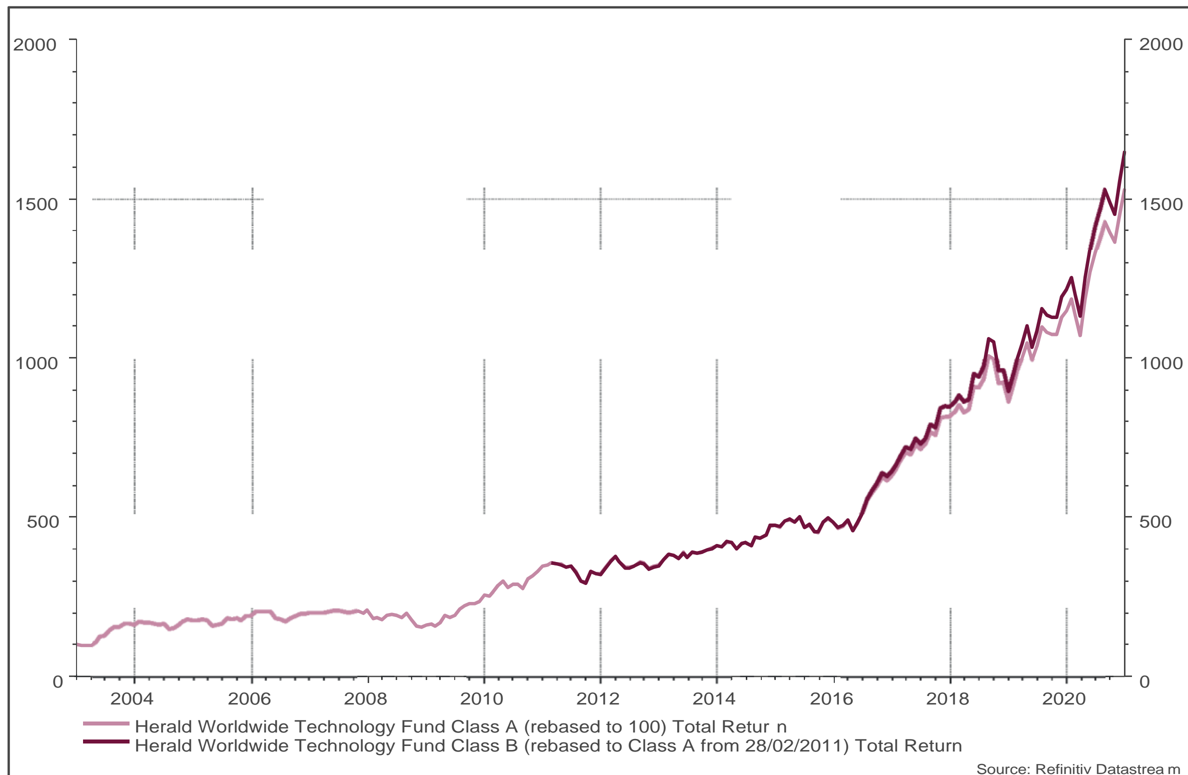
In hindsight, despite the strong absolute returns of the Fund during the period, we were too conservatively positioned by holding over 10% in cash throughout the year. In February supply chains for technology hardware were disrupted as Covid emerged in China. It has been both surprising and remarkably helpful for the sector that Asia has controlled the virus so much better than the West, and manufactured supplies resumed quite quickly. Meanwhile the technology companies in the West are more software orientated, and in general were able to function satisfactorily with WFH during the Covid lockdown environment, and some even benefited from stimulated demand. Furthermore, we were overly concerned about the macro-economic risks posed by the virus and underestimated the extent to which technology stocks would be favoured by investors as they sought safe havens and growth opportunities.

We continue to be optimistic about investing in the technology sector. We believe that despite economic and political uncertainties; the technology sector will continue to provide opportunities for long-term capital growth.

Companies in the sector have always focused on new and better ways of addressing problems and the rate of innovation, adoption, and disruption is accelerating. The pandemic has caused a tectonic shift in the operating practices across sectors and revealed the shortcomings of many existing solutions. In the same way that Zoom redefined the simple conference call and rose to become a multibillion dollar company or Slack redefined messaging or Revolut redefined the credit card, we expect a myriad of companies to reinvent better ways of operating across all sectors over the next decade and create attractive opportunities for long-term investors.

Total Return: 2020

Current Manager: Total Return 31/12/2002 – 31/12/2020



Total Return by Region*	1 year	3 years	5 years
Asia	33.9%	50.2%	246.7%
EMEA	-2.3%	-18.3%	19.6%
North America	47.2%	143.8%	339.0%
UK	40.2%	84.2%	348.4%

* Time Weighted Return

North America

The total return (TWR) for the US portfolio was 47.2% which compares very favourably with the Russell 1000 (Large Cap) Technology Index total return of 42.5% and is pleasing given the unprecedented uncertainty in the economy. It also comprises the majority of the fund (74.2%).

The star performers in percentage terms were Nvidia, Varonis Systems, and Advanced Micro Devices (AMD), which appreciated 115%, 104%, and 94% respectively (in sterling). The largest contributor to performance was Apple, which appreciated 77% and is the largest position in the portfolio. The launch of Apple's own M1 chip has been very successful, showing significant improvements in the performance of their laptops. The pandemic has also elongated replacement cycles for the iPhone. Near-term drivers for the stock will be laptop upgrades by the installed base to benefit from the M1 chip and iPhone replacements.

Longer term, we believe Apple is well positioned to expand into new markets such as healthcare. The recent re-emergence of speculation about the Apple car could be another longer-term driver. Apple is also one of the best positioned companies to address rising consumer privacy concerns, as the products have been built from the ground-up to ensure privacy and provide consumers with control over the data they choose to share with third parties. These privacy features will also serve them well as they explore more healthcare opportunities.

Other holdings which have been significant contributors to the returns of the North American portfolio include Amazon (+71%), Microsoft (+38%) and Cadence Design Systems (+91%). The negative contributors to returns were Yelp (-46%), NXP Semiconductors (-20%), and Intel (-17%). We sold Yelp and NXP in the first half of the year due to our concerns about the outlook for the companies. In hindsight we should not have sold NXP as the shares have bounced back sharply. Intel has had a challenging year, still grappling with technology migration and manufacturing yield issues but the recent change in CEO is likely to be beneficial. In H1-2018, we halved the holdings in Intel and reinvested the proceeds into AMD. Since then, AMD management have been executing almost flawlessly and capturing market-share from Intel and contributing to the Fund's positive returns. Overall, the negative contributors were mostly smaller positions and the aggregate negative contribution of the three combined was less than the positive contribution from each of the top three performers.

During the year, we used the proceeds from the sale of some of the investments in favour of increasing the positions in cybersecurity stocks. FireEye and Qualys are two of the new additions to the Fund. We know both companies quite well and as we have been investors in the companies through the Herald Investment Trust. Both are leaders in different segments of the cybersecurity market. The value of our holdings in both FireEye and Qualys have appreciated significantly since the purchase.

The P/E of the North American portfolio on Bloomberg forecasts was 31x on 31st December 2020 compared to 25x at the end of 2019 and 18x at the end of 2018. This expansion in P/E has been mostly due to the reratings of the Fund holdings as opposed to any substantial changes in its holdings.

Europe

The Fund's only European holding is SAP, with a weighting of 2.3%. SAP performed poorly during the year as the pandemic and global economic challenges reduced impetus for customers to embark on major Enterprise Resource Planning initiatives. The shares fell 4.5% in 2020. We increased this position during Q4. We continue to like the long-term outlook for SAP as it retains a strong competitive position in its core enterprise software markets, with scope for sustainable long-term growth, and a supportive valuation.

UK

The UK portfolio comprises 6.1% of the Fund and the total return was 40.2%. The Fund's largest UK holding was Herald Investment Trust, with a weighting of 3.2%. Herald Investment Trust appreciated 53% in the period, following a strong appreciation of 38% in 2019. Other UK stocks that have performed strongly include Avast and IQE which appreciated 22% and 16% respectively during the year.

Asia

The Asian portfolio comprises 6.1% of the Fund and the total return was 33.9%. Taiwan Semiconductor Manufacturing Company (TSMC) and Samsung Electronics, were the star performers, returning 87% and 52% respectively. Early in the year as news about the pandemic was emerging, we reduced the Fund's exposure to China. We sold out of CTrip.com, the leading online travel company and reduced the holding in Alibaba. Alibaba had a roller coaster run in the year, the shares appreciated strongly in H2 in anticipation of the ANT Financial initial public offering (IPO), but retraced much of the gains, when the Chinese regulator stopped the IPO.

We expect the Chinese technology sector to remain dynamic and volatile for the foreseeable future. The Chinese government will continue to fund and support its domestic champions across different segments of the technology sector. We believe it is important to follow the progress of these companies as they can pose meaningful competitive threats to non-Chinese companies as Huawei did to Ericsson, Nokia, Alcatel and Cisco during the last 10 years.

It is also valuable to understand the evolving business models of the leaders, as new models such as those of Tiktok and Ant Financial recently and Alibaba previously can point to opportunities and changes in other markets. Despite some of the attractive prospects of the domestic Chinese technology sector, we remain concerned about investing in these domestic companies due to corporate governance issues and the lack of protection for shareholders. In some ways, the risks of investing in Chinese companies are further magnified when investing in the Nasdaq listings of such companies. Foreign ownership of some business activities in China is prohibited and contractual arrangements via Cayman Islands corporate structures are often utilised. This can mean that in times of uncertainty the pricing of such Chinese ADRs listed on Nasdaq can be weak, enabling private equity to "persuade" management to go private at disappointingly low valuations for public market investors. This scenario occurred during 2020 with the Fund's holding in 58.com - the leading online classifieds business in China - which went private in September 2020. As shareholders, the Fund voted against this transaction. As investors, it remains a challenge to balance the potential rewards from investing in high growth Chinese technology companies with the regulatory and corporate governance risks of investing in an undemocratic country with effectively a President for life as the head of state.

The regulatory and corporate governance risks are less severe in the rest of Asia, in particular Taiwan which has been driving improvements in corporate governance for a number of years. TSMC has been a great long-term success story for both the Taiwanese economy and international investors.

Market Background

Markets in 2020 were marked by the onset of the Covid pandemic and unprecedented and rapid fiscal and monetary actions by governments in response to the crisis. Following the start of the global pandemic in early 2020 and market concerns about a global recession, the Fed adapted its playbook of the 2008 Financial crisis and reduced the Fed funds rate by a half-percent on March 3, from 1.50-1.75% to 1.00-1.25%, and by an additional percent on March 15, to 0-0.25% and pursued a policy of quantitative easing through buying bonds. Other central banks also pursued similar policies.

These actions led to a powerful market rally that began in late March and quickly caused the equity indices to regain the ground they had lost and, in some cases, reach new highs. As assets and asset classes are inherently interconnected, changing the risk-free rate reset the returns on most other securities, especially longer duration assets, leading to higher valuations. Reratings in some segments of the market, for example, cloud software companies trading on 30+ multiples of revenues, have reached levels where the embedded long-term growth expectations leave little room for any uncertainties, especially after accounting for annual stock dilutions used for employee compensation.

The US elections marked a turning point in US and global politics now with Democratic control of the White House and Congress. Biden is a proponent of clean energy and has outlined an ambitious policy. The possibility of corporate tax increases returns. Democrats have also been more aggressive with anti-trust reform. Reforms could include making it harder for big tech to acquire potential rivals and passing new rules around how corporations can muscle into new markets. At the very least Congress is likely to increase funding for the Federal Trade Commission and Department of Justice to support their antitrust lawsuits against the tech giants. Joe Biden and Kamala Harris have also pledged to focus on civil rights across all policy areas and technology is unlikely to be an exception. It is reasonable to expect that Congress will work to tackle issues ranging from consumer privacy to discriminatory and racially biased artificial intelligence (AI) algorithms.

The regulatory rumble is beyond just the US and the technology mega-caps. European regulators are also actively pursuing technology companies, with long-awaited "gate keeper" legislation proposed in December 2020. In July Apple won its appeal against a much fan fared 2016, European ruling requiring it to pay Ireland EUR 13bn in unpaid taxes, although the final outcome is uncertain as the European Commission has stated that it will appeal this decision and take it to the European Court of Justice. The Chinese authorities also remain vigilant against big tech, as was seen with their prevention of the Ant Financial initial public offering (IPO) in November which was expected to be one of the largest IPOs in history. Anti-China regulation, spear-headed and expanded by the Trump administration, remains in place with the pandemic highlighting the importance of reliable supply chains across sectors.

President Biden has been purposefully opaque on China policy. Despite the political rhetoric against big tech, there is meaningful resistance in the US to "breaking up" any of these companies, as they are recognised to be the leading US warriors in the battle against Chinese technology dominance.

Despite the global pandemic-related turmoil, equity capital markets were very active in 2020. According to Bloomberg, in 2020 the volume of equity and equity-linked offerings in the technology sector grew 90% year-on-year to $172bn. Much of the fund raising in the first half was for convertibles as companies' managements scrambled to shore up their balance sheets and avert any liquidity risks. After grinding to a halt at the beginning of the year, by Q3 the technology IPO market had opened up and gathered steam in Q4. Post-IPO performance was largely very strong. Snowflake, the data analytics company, and Unity Software, the game development platform provider, were two of the standout performers.

In 2020, we also saw a growing trend for many companies to go public using special purpose acquisition companies (SPACs). SPACs provide an avenue for companies to access liquidity without the burden of the IPO process. The downside for investors is that inherently there is poorer disclosure than with a typical IPO offering. According to SpacAnalytics, 55% of US IPOs in 2020 were through SPACs, raising $83bn of proceeds. This compares to 28% of SPAC IPOs in 2019 and $14bn of proceeds. Although we chose not to participate in any of the IPOs or SPACs, we benefited from the management meetings and investor education sessions.

Another notable aspect of the markets has been the growing interest in Environmental, Social and Governance (ESG) and Responsible Investing initiatives initially spearheaded by European institutions although Asian institutions, such as the Taiwan Stock Exchange, have also been actively promoting the agenda for years. According to Morningstar, in Q3-2020 alone, more than €50bn of capital flowed into European ESG funds. This represents 40% of the overall European fund flows. According to The Investment Association in the UK, there has also been a 275% increase in flows into ESG funds in the first nine months of 2020 compared to 2019. We expect this momentum to continue and act as a favourable tailwind for many companies in the technology sector.

Sector Outlook

The low barriers to scaling enabled by cloud computing, low cost funding, and the prominent shift in responsible investing sweeping the globe, all combine to create new opportunities to solve old problems. Developments such as 5G, artificial intelligence, machine learning and sensor networks, which we have talked about in prior years, remain pivotal building blocks for the development of new solutions. However, this year we believe the challenges caused by the pandemic have been an unprecedented accelerant for the adoption of diverse technologies.

Healthcare IT Market finally cracked

Healthcare is a prime example of this. The pandemic has been a watershed moment for the digital healthcare industry. For decades, tech entrepreneurs and investors have been looking at the trillions of dollars of healthcare costs and attempted different approaches for breaking into the market with efficient technological solutions. Suddenly, after decades of promise, bountiful opportunities have become mainstream. These opportunities target key functions such as diagnostics, prescriptions and monitoring as well as treatment trials and efficacy assessments. Like early generations of phones or enterprise applications, many of the healthcare applications of today are still in their infancy and will take generations to mature. The growing number of millennials in the healthcare industry will propel adoption rates of new solutions across the chain. Multi-billion-dollar platform leaders and category leaders will emerge over the next 5-7 years. It is ironic, or perhaps indicative of diverging perspectives, that Amazon, JP Morgan and Berkshire Hathaway dissolved their healthcare JV at the end of 2020.

Hybrid Online / Offline models expanding into new markets

Many of the emerging healthcare opportunities are likely to follow the hybrid online/offline model similar to services offered by Intuit's premium tax service. After years of experimentation, Intuit has succeeded in integrating technology with on-demand, personalised advice from certified public accountants (CPAs). This has allowed the company to build a scalable hybrid online/offline model which both the consumer and the CPAs find valuable. We expect more companies to build on Intuit's success and break into high value services markets such as healthcare with innovative and cost-efficient offerings attractive to both the consumer and the healthcare service providers. We anticipate the emergence of more of these amorphous tech companies spanning, hardware, software, and high-end services, allowing technology to increase the effectiveness and efficiency of highly skilled professionals.

Cloud goes mainstream and continues to flourish

We continue to see opportunities from the migration of on-premise IT infrastructure to cloud based systems despite the strong performance of the cloud infrastructure providers during the past few years.

Gartner estimates overall IT budgets fell 3.2% in 2020 and forecasts a growth of 6.2% in 2021 to $3.9Tn. Within the broad budgets, spending on cloud is expected to grow at a CAGR of 17-18% during the next four years, from $294bn in 2020 to $565bn in 2024. This compares with a mid-single digit growth expectation for overall IT budgets during the same period.

Amazon and Microsoft retain their leadership positions in the cloud services market, while Google continues to invest aggressively to catch-up, having a somewhat differentiated offering for AI focused applications. Alibaba remains the leading non-US provider. We believe in the strength of the cloud business models and that all four companies remain well positioned to drive and benefit from this secular growth trend.

An emerging trend is that hyperscalers are also investing in developing their own semiconductor chips. Similar to Apple, their growing scale justifies the R&D expense associated with chip design. Having their own proprietary chips will allow them to reduce operating costs, increase power efficiency, increase security, and increase the differentiation between their offerings.

Another interesting development we are seeing in the cloud space is the emergence of a marketplace, mirroring aspects of the Apple App Store model.

Some of the key attributes which led to the success of the Apple App Store were that it removed these three critical barriers to software adoption, trust, distribution and payments. Customers know that the software in the App Store has been vetted by Apple to ensure it meets security and privacy requirements. They also know there is little risk that the software will damage their devices. For the developers, Apple provide a distribution platform, reducing historical packaging and channel costs. The Apple App Store also simplifies payment processing, including issues like foreign currency and tax handling in diverse jurisdictions for the developers.

The shift to cloud architectures has spurred an ecosystem of cloud-native infrastructure software vendors. Amazon AWS, Microsoft, Google and Alibaba have been working on creating a similar app store model to support the growth of these cloud-native companies whose businesses are symbiotic to that of the cloud vendors. The same way that the Apple App Store created extra trust, reduced distribution costs, and reduced friction associated with contracts and payments etc, the cloud infrastructure providers are seeking to provide similar services to the new breed of cloud software vendors.

These cloud app stores will enable a new range of specialty or niche software vendors to grow scalable and profitable businesses. Our interactions with the managements of diverse software companies, including some of the holdings in the Herald Investment Trust, have allowed us to see the progression of companies distributing their products through these cloud app stores. The ecosystem is rich and is likely to provide attractive investment opportunities.

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Security problems are not going away

2020 was notable for many events, one of the most concerning being the revelation in December that the security of almost all US government departments and over 300,000 corporations had been compromised because of malicious software embedded in a widely used SolarWinds Orion Platform.

Attribution is known to be very hard in the cyber-security world, but experts believe the SolarWinds breach had been orchestrated by Russian state actors.

In addition to the SolarWinds debacle, 2020 was notable for the number of sophisticated ransomware attacks on large corporations. Many of these were also alleged to be have been orchestrated by RYUK, known Russian operatives.

It is getting harder to distinguish between cyber security and the broader security market. The lines continue to blur as more and more technology permeates the physical security market. This provides increased opportunities for infiltration by cybercriminals.

The cybersecurity market is estimated to be $151bn in 2020 and expected to grow to over $210bn by 2024. With the global cost of cyber-crime cited at over $900bn per annum, still far exceeding the remediation spend, we remain optimistic about opportunities for investing in these markets. In H2-2020 we increased the Fund's exposure to the market by adding FireEye and Qualys to the portfolio and continue to look for other interesting companies.

Semiconductors remain the enablers and beneficiaries of digitalisation

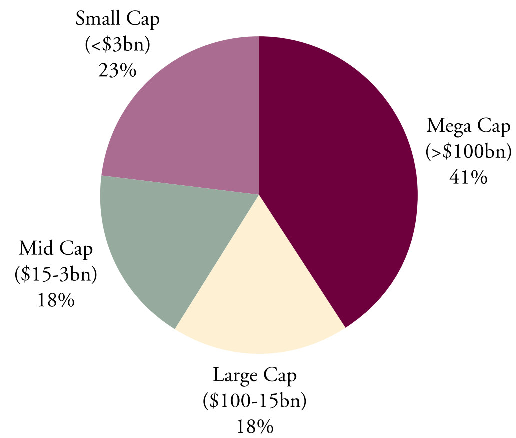
At Herald we have always looked across supply chains for risks and opportunities. As the use of technology expands across the economy, and industries such as healthcare, education and entertainment embrace more digitalisation initiatives, they drive demand for computing capacity, memory and storage. Regardless of the particular solution a company or sector adopts, digitalisation drives demand, and the semiconductor sector is therefore a core beneficiary. Although we have reduced some of the Fund's positions in the semiconductor stocks due to concerns about stretched valuations, we continue to favour the subsector and have substantial exposure through investment in AMD, Nvidia, Intel, Micron Technology, Samsung Electronics, TSMC, Cadence Design Systems, Xilinx and Teradyne. It is conspicuous that there is currently very high utilisation in many semiconductor fabrication facilities.

Summary

We remain enthusiastic about the outlook for investing in the technology sector. Technology is more pervasive than ever and the impact of Covid has further driven its ubiquity to the advantage of many companies within the portfolio. As the capability of cloud-based AI or machine learning computing platforms continues to evolve, an ever-growing proportion of the global economy and traditional business are vulnerable to disruption. In 2020, the pandemic caused an unprecedented catalyst for activities to move from offline to online across diverse aspects of business and personal lives. Much of this momentum is likely to persist for the next 4-5 years and create compelling long-term investment opportunities.

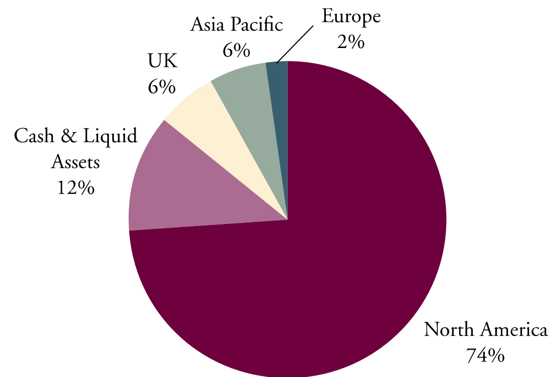
BREAKDOWN OF EQUITY INVESTMENTS BY MARKET CAP

	31/12/2020	31/12/2019
Mega Cap (>$100bn)	41%	41%
Large Cap ($100-15bn)	18%	19%
Mid Cap ($15-3bn)	18%	27%
Small Cap (<$3bn)	23%	13%
	100%	100%



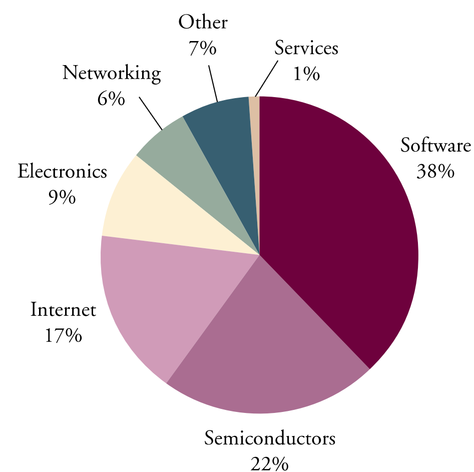
GEOGRAPHICAL BREAKDOWN

	31/12/2020	31/12/2019
North America	74%	78%
Cash & Liquid Assets	12%	5%
UK	6%	7%
Asia Pacific	6%	8%
Europe	2%	2%
	100%	100%



SECTOR BREAKDOWN

	31/12/2020	31/12/2019
Software	38%	35%
Semiconductors	22%	26%
Internet	17%	19%
Electronics	9%	9%
Networking	6%	5%
Other	7%	5%
Services	1%	1%
	100%	100%



Source: Herald Investment Management Limited
Date: 31/12/2020

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Important Information

Market and currency movements may cause the value of shares, and the income from them, to fall as well as rise, and you may get back less than you invested when you decide to sell your shares. Certain statements in this report constitute ‘forward-looking’ statements. Such statements, including the intended actions and performance objectives of the Fund, involve unknown risks, uncertainties and other factors which may cause actual results, performance or achievements of the Fund to differ materially from those implied by such forward-looking statements.

This report has been issued on behalf of Herald Worldwide Technology Fund, and has been approved by Herald Investment Management Limited, its investment manager. Herald Investment Management Limited is authorised and regulated by the Financial Conduct Authority. Contact details:

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