



Herald Investment Trust

Investment companies | Annual overview | 11 January 2023

Efficiency savings

While Herald Investment Trust (HRI), like many other technology and growth-focused strategies, has been caught up in the grips of 2022's market selloff, the fundamentals of many of the companies in its portfolio have remained largely unscathed. In fact, HRI's management team believes that today's market represents an opportunity, as falling prices and earnings strength push valuations to attractive levels.

HRI's team also highlights that the trust's **closed-ended** structure enables it to capitalise on forced sellers as they emerge. To exploit both these opportunities, HRI has a large (about 11%) position in liquid assets. Though HRI's **discount to net asset value (NAV)** did widen substantially at the start of the year, it has narrowed since the recent US inflation figures, which raised hopes that an end to fiscal tightening (cutting government spending) was in sight.

Small-cap technology, telecommunications and multi-media

HRI's objective is to achieve capital appreciation through investments in smaller quoted companies in the areas of telecommunications, multimedia and technology. Investments may be made across the world, although the portfolio has a strong position in UK stocks. The business activities of investee companies will include information technology, broadcasting, printing and publishing and the supply of equipment and services to these companies.

Sector	Global Smaller Companies
Ticker	HRI LN
Base currency	GBP
Price	1,810p
NAV	2,143.1p
Premium/(discount)	(15.1%)
Yield	Nil



HRI's closed-ended structure offers can be advantageous during market selloffs



HRI's has a substantial amount of 'dry powder' to capitalise on near-term opportunities



HRI has been able to generate considerable five-year outperformance





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Domicile	United Kingdom
Inception date	21 February 1994
Manager	Katie Potts
Market cap	1,125.3m
Shares outstanding (exc. treasury shares)	62.2m
Daily vol. (1-yr. avg.)	88.8k shares
Net gearing	11.5%

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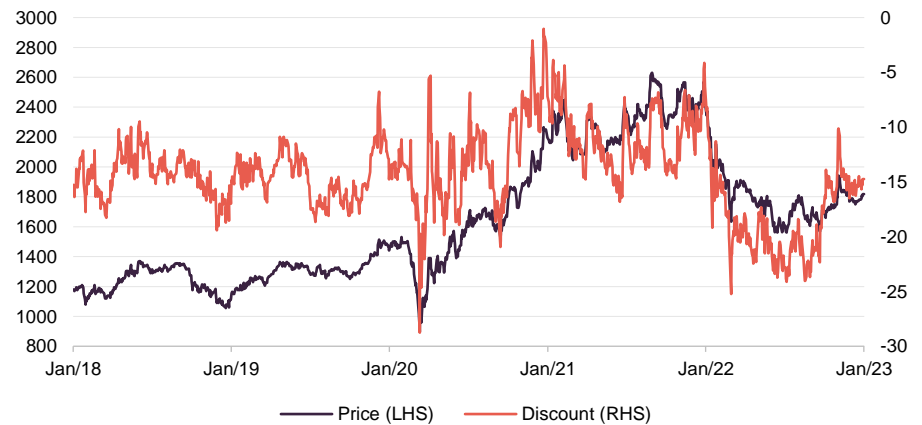


At a glance

Share price and discount

The rapid narrowing of HRI's discount over recent months is encouraging, as it is a clear sign of confidence in the strategy. If investors believe that the current macro-economic issues that drove the risk-off environment are likely to subside, HRI's discount could narrow further from here. Shifts in the factors that drove the earlier widening are likely to be the primary drivers of HRI's near term discount movements.

Time period 09/01/2018 to 09/10/2023

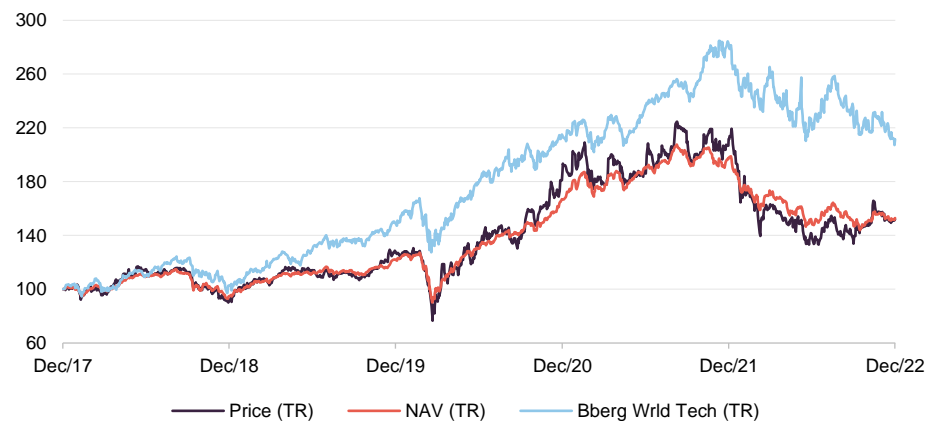


Source: Morningstar, Marten & Co

Performance over five years

HRI has managed to demonstrate a commendable five-year track record, generating a 52.7% NAV total return. Over the same period, HRI has been able to generate considerable outperformance relative to both a global small caps and the UK small cap universe. While HRI has provided a negative performance over the last 12 months, this has been a reflection of the selloff in global risk assets with small cap and technology factors, HRI's principal focus, being significantly impacted.

Time period 31/12/2017 to 31/12/2022



Source: Morningstar, Marten & Co

Year ended	Share price total return (%)	NAV total return (%)	Numis ex IC plus AIM (%)	B'berg World Tech TR (%)	MSCI World Index TR (%)
31/12/2018	(8.2)	(4.9)	(15.8)	2.9	(3.0)
31/12/2019	37.7	27.5	22.2	43.1	22.7
31/12/2020	51.7	37.4	4.9	44.4	12.3
31/12/2021	11.6	19.0	20.0	31.1	22.9
31/12/2022	(28.9)	(23.1)	(21.9)	(24.4)	(7.8)

Source: Morningstar, Marten & Co

Fund profile

More information can be found at the trust's website: www.heralduk.com.

Experience is important in markets such as these

HRI's closed-ended structure offers can be advantageous during market selloffs

Established in 1994, HRI invests globally in small technology, communications and multimedia companies with the aim of achieving capital growth. It is the only listed fund of its type. The trust invests globally, but has a strong bias towards the UK, which sets it apart from other global technology funds, which tend to be biased towards the US.

New investments in the fund will typically have a market capitalisation of \$3bn or less but are generally much smaller when the first investment is made. If successful, these can grow to be a multiple of their original valuation. This type of investing is longer-term in nature and so the trust's portfolio tends to have low turnover. Reflecting the risks inherent in this type of investing, and the liquidity constraints of having a small cap investment remit, the trust maintains a highly diverse portfolio of investments (typically in excess of 250) to help mitigate this risk.

While we outline numerous advantages of HRI in this note, one of the most consistent benefits the trust has offered has been the considerable experience offered by its lead fund manager Katie Potts, who has managed HRI since its launch. She was a highly-regarded technology analyst at SG Warburg (later UBS) prior to launching the fund. Katie owns a substantial stake in the company and a significant minority stake in the management company, and therefore is clearly motivated to ensure the success of the fund.

Under Katie's stewardship, HRI has navigated several downturns and has benefitted from the team's ability to select companies capable of weathering difficult conditions. HRI's closed-ended structure has also been used to great effect. Whilst open-ended funds (those who offer daily trading opportunities based on the fund's NV) are often forced sellers, HRI can capitalise on its ability to gear (borrow) to pick up lines of stocks at attractive prices (we discuss this further on page 8).

HRI's size, focus on smaller companies and the depth of expertise within the management team mean that it plays an important role as a provider of much-needed capital to listed technology companies looking for expansion capital. This is particularly valuable in a downturn and has offered HRI further opportunities to generate alpha (a performance measure) when others may not have been able to.

HRI offers a liquid means for investors to gain access to this part of the market. An investment in HRI might also complement an investment in one of the large-cap technology funds.

Management arrangements

HRI owns a 15.4% stake in its management company, Herald Investment Management Limited (HIML), which was valued at £5.1m as at 31 December 2021. HIML also manages an open-ended investment company (OEIC), The Herald Worldwide Technology Fund (which has more exposure to large-cap companies than the trust) and two venture capital funds, which have ceased to make new investments.

Katie leads a team of eight analysts, three of whom have regional responsibility for overseas investments. The team is based in London, except one member who is

based in New York to help support corporate access. US companies do not come to the UK as much as they used to, and HRI feels it necessary to have a US presence to enable frequent contact with companies. The HIML team can also draw on the knowledge of three consultants. We have included some biographical details on the team at the end of this note. Research responsibilities are organised along sector lines, but Katie has also delegated responsibility for managing the Asian portfolio to Fraser Elms (the deputy manager) and Hao Luo, the continental European portfolio to Taymour Ezzat and more recently the North American portfolio to Peter Jenkin.

Manager's view

HRI's secular trends remain largely intact despite the market downturn

The global economy is slowing, and many markets may already be in recession. Cost of living pressures, rising interest rates and quantitative tightening present real headwinds. In the UK, this is amplified by higher taxes, which will put further pressures on consumers.

However, as we have discussed in our previous notes, the manager's investment themes tend to be long-term in nature. In the team's view, the Technology, Media, and Telecommunications (TMT) space has attractive demand drivers that represent a source of secular growth in a world where the outlook for economic growth remains uncertain. Such opportunities include:

- Internet of things; architecture and platforms;
- Wireless charging technology;
- IT security
- 5G infrastructure
- Digital media;
- Graphene (an allotrope of carbon that is the thinnest material known to mankind and incredibly strong – around 200x stronger than steel);
- ADAS (advance driver assistance systems) – driver monitoring;
- 3D memory and 3D logic;
- Network functions virtualization (NFV) and software-defined networking (SDN)
- Data replication and analysis;
- Machine learning and artificial intelligence (AI);
- Robotics;
- Adaptive security architecture;
- Mesh app and service architecture;
- User programmable software;
- Spin-torque memory (STT MRAM);
- Cloud computing advancement;
- Advanced cyber defence;
- Solid State Drives (SSD);
- Falling cost of storage;
- Big data;

- Telehealth;
- Energy storage; and
- Hydrogen fuel cells.

Note: some of these themes are explored in greater detail in our previous notes (see page 25 of this note).

Within HRI's portfolio, some companies have experienced earnings downgrades, often supply-chain-related. However, the managers note that companies with strong intellectual property tend to have pricing power, and they are still seeing earnings upgrades within the portfolio too. Given the higher interest rate environment, it is helpful that few of HRI's investee companies are utilising debt. The managers think that this is also often true of their customer base - something which should, hopefully, limit the impact of rising interest rates on the viability of their business models.

Some areas exposed to a slowing economy

Semiconductors and advertising are obvious casualties of economic slowdown

The two sectors which are amongst the most likely to be hit by an economic slowdown are, in HIML's opinion, the semiconductor sector and the advertising sector.

Semiconductor shortages have eased and the sector has, in the managers' view, become oversupplied. In part due to over-eager management teams at semiconductor manufacturers but also due to a fall in demand. Consumer computer demand for semiconductors is expected to fall by about 15%, with the consumer personal computer market being a major source of demand for components such as graphics cards (a type of semi-conductor which is the bread-and-butter of Nvidia for example, which was previously one of the US most valuable companies prior to the market downturn). Semiconductor demand is also being impacted by the global supply chain issues, particularly around automobile manufacturing, as the lower volume of car production has had a knock-on effect on their need for semiconductors. Thankfully, any issues in the semiconductor sector have less of an impact on HRI than on other technology strategies, as HIML has been underexposed to the sector.

However, HRI holds niche fabless players which are less cyclically exposed

In part, this is a structural underexposure, given that the more attractive players in the sector typically trade on large enough market caps as to be outside of HRI's remit. HRI's semiconductor exposure tends to be constrained to niche fabless players (who focus on semiconductor design and sale and outsource fabrication). HIML feels that innovation within the sector will more than offset slowing demand for existing business.

The other near-term headwind for the sector is the impact of the economic cycle of certain services, particularly on advertising revenue. Whilst much of the products and services technology provides are structural in their growth (i.e. not dependent on the economic cycle), advertising remains a cyclical business, as advertising budgets are amongst the first to be cut when earnings are expected to fall. While there is still a structural shift towards digital advertising, given its greater reach and flexibility, and print advertising will likely be the first to be hit in a downturn, digital advertising will not be immune. This is something we have already seen in the

earnings announcements of Alphabet, which has reported a slowdown in the growth of Google's advertising arm, with its reported 4.2% growth missing its forecasted 8% (though it is still growing, reflecting the structural shift towards digital advertising).

Resilient demand in structural growth subsectors

Cyber security and digital transformation remain bright spots

Thankfully the team does see several bright spots, with certain subsectors still likely to see strong growth in the demand for their services. They highlight subsectors such as IT security, where demand increases as systems become more complex – with greater volumes of data, programs and physical infrastructure requiring protection – and as cyber-attacks become increasingly sophisticated. Cybersecurity also saw a surge in attention with the outbreak of the war in the Ukraine, as Russian attacks on Ukrainian digital infrastructure raised the profile of state-sponsored hacking.

Whilst the pace may slow, digital transformation will continue despite a more challenging economic environment, as digitising certain systems will almost always offer efficiency savings. With companies increasingly scrutinising their spending, the products that can provide the greatest degree of cost savings will be increasingly more attractive. One example of this is banks moving their IT systems to the cloud, which can lead to leaps in productivity as at times ailing systems are suddenly upgraded to faster, yet more cost-efficient cloud computers.

Valuation

Thanks to the combination of a market sell off, against a backdrop of sustained profit growth, the HIML team is presented with a clear valuation opportunity.

Share prices have fallen despite robust earnings

The top part of Figure 1 shows the total **price-earnings ratio (P/E ratio)** of HRI's portfolio as at 30 September 2022 and at various (31 December) financial year ends historically. The bottom of Figure 1 shows the cumulative performance of HRI's portfolio from those various calendar year ends to 30 September 2022; the return implied by the change in the aggregate P/E ratio of HRI's portfolio over the same periods; and the implied return from the manager's investment decision and underlying earnings growth (effectively the balancing figure).

A comparison of the rows in the bottom part of Figure 1 shows that, in aggregate, there has been a substantial disconnect between the share price movements of HRI's portfolio holdings and their earnings multiples. For each of the time periods provided, the change in valuations has implied a negative or zero return, yet, until recently, the trend has been one of significantly positive NAV growth (HRI's investments have demonstrated stable, or even growing, earnings over the various time periods). Figure 1 shows that one would need to go back to 2013 to find a period on which HRI's portfolio traded at a similar P/E ratio. However, it also illustrates that the last time HRI's portfolio was valued on this P/E, the subsequent eight years and nine-month period provided NAV growth of over 150%.

The managers highlight that the P/E derating since December 2021 has been substantial and that, while they are relieved to have better valuations, they are also pleased to have a significant cash pile to deploy should markets get cheaper.

Figure 1: The gap between HRI's NAV returns and valuation

	Sept 2022	2021	2020	2019	2017	2015	2013
HRI portfolio P/E ratio ¹	16.8	25.9	30.7	23.2	20.7	16.9	16.8
		Dec-21	Dec-20	Dec-19	Dec-17	Dec-15	Dec-13
Cumulative NAV return to 30 September 2022 (%)		(25.8)	(11.7)	21.0	46.8	128.9	151.4
Return implied by change in P/E ratio (%)		(35.1)	(45.3)	(27.6)	(18.8)	(0.6)	0.0
Return implied from manager's investment decisions and underlying earnings growth (%)		9.3	33.6	48.6	65.6	129.5	151.4

Source: Herald. **Note:** 1) Bloomberg P/E Data: Analyst earnings estimates, where available, aggregated using the Bloomberg weighted harmonic average calculation. This excludes loss-making companies from the P/E calculation. A weighted harmonic average will normally be lower than geometric or arithmetic average. By way of comparison the Sep 30th 2022, total Fund had a weighted average arithmetic P/E ratio of 65.4x and median P/E ratio of 19.6x.

Figure 2: Next Fifteen Communications (GBp)



Source: Bloomberg

HRI's has a substantial amount of 'dry powder' to capitalise on near-term opportunities

A perfect example of this disconnect is Next Fifteen Communications, the UK based technology and data consultancy firm, and HRI's third-largest holding. Next Fifteen is a clear beneficiary of the move towards corporate digitisation, as its advisory services include divisions like Consumer Engagement, which is direct reflection of the demand for digital services as it aids in the building of critical digital assets such as e-commerce platforms. Given that Next Fifteen is effectively at the heart of corporate digitisation, it is no surprise that its earnings-per-share have more than doubled between December 2020 and July 2022 (its financial half year). Yet despite demonstrating the ability to realise the structural growth potential, the market has seemingly downgraded it, ignoring the clear success Next Fifteen has shown.

Dry powder

While low valuations can offer fantastic entry points, relative to their historic share price, they are of little use without the capital to take advantage of them. Thankfully HRI is well placed for the current market, sitting on a small cash pile that HIML is looking to deploy at the most opportunistic of times (such as providing liquidity to existing holdings when needed or buying stakes from forced sellers, as noted above).

This 'dry powder' is both a reflection of the team's increased defensiveness and the continuing spate of merger and acquisition (M&A) activity within the portfolio, with a number of HRI's holdings having been bought out recently, despite the market downturn. Over the first three quarters of 2022, HRI saw acquisitions totalling £118m, receiving £96m in cash – almost twice the amount that it received from M&A activity in 2021. This suggests that market participants remain just as bullish on the valuation opportunities as HIML.

Currently HRI has liquid assets and fixed interest holdings of 11.3% of its gross assets. This is the highest level in recent memory, and a sizable amount of liquid capital that can quickly be deployed when the opportunities arise. HRI remains ungeared, though it does retain a revolving credit facility through which it can increase its borrowing quickly if needed. Whilst HIML has historically been

successful in its use of gearing (such as during the 2008 financial crisis) HRI has been ungeared for several years now.

A market dip isn't just for Christmas

Throughout this note we have alluded to the opportunity to utilise HRI as an opportunity to capitalise on the current market downturn, 'buying the dip' as the term goes. This is an opportunity that has arisen thanks to the sweeping market selloff over 2022 which, thanks to a widespread fear of the impact of rising interest rates, has effectively captured the entire tech sector. This has, in the team's view, led to a disconnect between current share prices and their fair-value based on their long-term growth potential. Through many of our past notes we have outlined the long-term sectoral opportunities presented by technology companies, and whilst there have been cracks in certain sectors, specifically advertising and semiconductor manufacturing, the vast majority of technology companies continue to benefit from the same tailwinds that supported their growth prior to 2022. These growth opportunities are one of the reasons for the earnings component of HRI's P/E ratios having remained so stable over 2022.

The small-cap advantage

Extensive fundamental research

Bottom-up stock selection based on fundamental analysis. HRI's universe is vast with over 5,000 listed companies.

HIML's investment process is driven by **bottom-up stock selection**, based on extensive fundamental research of the universe of smaller companies that make up the telecommunications, multimedia, and technology sectors. HRI is unique amongst all other closed-ended strategies, as it is the only one to exclusively focus on small to mid-size companies in the aforementioned sectors. Where even its closest peers, based on size, style, or valuation metrics, lack the clear focus of HRI on this comparatively narrow band of companies. This means that irrespective of all the advantages we outline in this note, HRI is a truly unique offering. A fact which brings several advantages with it, such as diversification benefits and unique sources of alpha.

While HIML's investment process is designed to capture the most exciting opportunities within telecommunications, multimedia, and technology, it is far more nuanced than simply picking the most attractive growth stories. The most important factors besides a company's growth prospects are the team's sensitive approach to valuations and their commitment to diversification. In the case of valuations, they are looking for companies that are capable of making decent returns on the capital they invest, or those with earnings growth which will propel them to a single-digit P/E within a reasonable period. When it comes to diversification, the team holds a range of companies, not simply based on size or style, but also on less apparent factors like end-consumer type. Diversification is also achieved through HRI's large number of holdings (c.350), which helps to reduce the at-times-substantial idiosyncratic risk (i.e. specific to the company) of their investments.

HRI can capitalise on the liquidity issues faced by the equivalent open-ended strategies

Although we have covered the HIML team's approach in far greater detail in our previous notes, we believe that it is worth highlighting a few nuances of its approach to investing, given the advantages they present in the current market climate. The most obvious of these is the team's ability to leverage the benefits of HRI's closed ended structure. Whilst this has in the past taken the form of the effective use of gearing (though HRI is currently ungeared), a clear advantage in current markets is HRI's vastly lower liquidity requirements, relative to its open-ended peers.

By not being bound to meet the onerous requirements of daily liquidity (as a closed-end fund, HRI's managers do not need to buy and sell its holdings to meet shareholder redemptions), HRI is free to hold the most thinly traded companies (these are often at the smaller end of the market cap spectrum). This means that in times of market downturns (such as the one we are witnessing today), HIML has the capacity to be an opportunistic buyer, swooping to pick up company shares when their share prices are depressed by sudden, large sales. This allows it to capitalise on 'buy the dip' in a far more effective way than a large cap manager could.

The other pertinent point is the team's approach to unprofitable companies, given the increasing scrutiny company valuations are facing. The team's focus on quality, skilled management, and value creation has meant that it has historically approached unprofitable companies with caution. This is not to say that it avoids such companies, however, but it requires clarity around an unprofitable company's path to value-creation. Given the team's wealth of experience, it is aware of how certain types of companies react to challenging business environments, and as such has an insight into which of the cohort of unprofitable companies are likely to deliver on their promised growth. HRI currently has its lowest allocation to unprofitable companies for many years, a reflection of the challenging market environment that many companies are facing.

While many tech funds have well-resourced teams, the combination of HRI's large number of holdings and their small-cap focus places a particularly large degree of pressure on the team at HIML, given the lack of traditional analyst coverage in the space. However, HIML has shown no signs of being under-resourced. In fact, despite its global remit, it has on occasion been the first professional investment team to meet its companies in person post-COVID-19, even in overseas regions. This points not only to HIML's skill, but also to the team's ability to find undiscovered gems that the wider market has yet to pick up on.

Asset Allocation

Diversification is all the more important during a market downturn

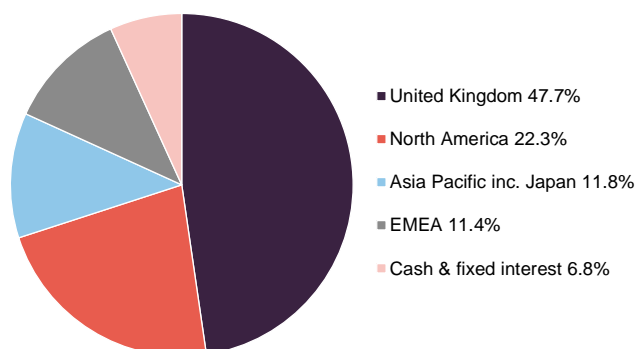
Whilst the typical 'growth' manager often takes a highly concentrated approach to equity investing, Herald is set apart by its highly diversified portfolio of 352 companies. The need for diversification in small cap investing is well documented, as each company carries elevated levels of idiosyncratic risks, be it through its greater sensitivity to local economic activity or as a result of its highly specialised business practices, relative to their large-cap equivalents. HRI's diversified portfolio is also a result of its long tail of smaller positions. HIML will add to a position once a company begins to realise the potential that it has forecasted for them. Small cap tech companies also have the ability to generate exponential levels of share price growth, given their lack of market coverage. Once they appear on the radar of the

broader investment community, investors flock to the company in ever larger numbers. Diversification has also become another advantage of HRI in the context of the current downturn, as it reduces the impact of stock specific risks, with certain companies having been particularly hard hit by the current climate. The performance of Facebook versus the wider FAANGs is an example that is likely familiar to most readers.

HRI's asset allocation has remained largely consistent since our last note, with the largest change being the increased weighting towards liquid assets, for reasons we described earlier in the note. Changes in HRI's portfolio are predominantly the result of broader market movements, as well as the impact of M&A activity leading to purchases of a number of HRI's holdings.

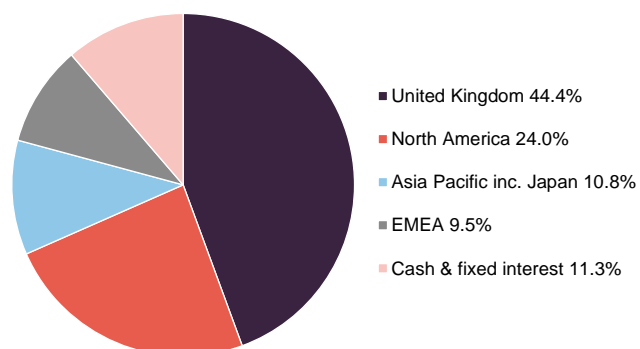
In our prior note, we commented that HML had intended to reduce their allocation to the US on valuation grounds. However, given the relative strength of the region over 2022 YTD, its allocation has begun to creep up again. Dollar strength has boosted the US allocation, relative to the rest of the world. This may be unwinding now.

Figure 3: Geographic allocation as at 31 December 2021*



Source: Herald Investment Management *Note: as a proportion of gross assets

Figure 4: Geographic allocation as 30 September 2022*



Source: Herald Investment Management *Note: as a proportion of gross assets

Top 10 holdings

Figure 5 shows HRI's top 10 holdings as at 30 September 2022 and how these have changed over the previous 12 months. While the team typically takes a long-term approach to investing, with the companies that have the largest weightings often having been in the portfolio for over a decade, there has been a degree of movement in the trust's top 10 holdings since our last note. There have been four new entries into HRI's top 10 since our last note, a considerable increase on the one new holding we reported in our last note. We remind readers that new entrants into the top 10 are seldom new purchases by the team, as new positions typically take the form of small allocations which the team builds up over time as the company successfully realises their investment case. In the case of the current top 10, the new entrants are largely the result of their relative share price strength, with the company having its position topped up by the HML team in light of its improving outlook.

Figure 5: Top 10 holdings as at 30 September 2022

Holding	Sector	Country	Allocation 30 September 2022 (%)	Allocation 31 December 2021 (%)	Percentage point change
GB Group	Software & computer services	UK	2.2	1.9	0.3
Diploma	Support Services	UK	1.8	1.9	(0.1)
Next Fifteen Communications	Media	UK	1.8	2.4	(0.6)
Silicon Motion Technology	Tech hardware and semiconductors	US	1.6	1.4	0.2
Idox	Software & computer services	UK	1.6	1.2	0.4
Super Micro Computer	Technology hardware & equipment	US	1.5	0.7	0.8
YouGov	Media	UK	1.4	1.8	(0.4)
Descartes Systems	Software & computer services	Canada	1.4	1.1	0.3
Nordic Semiconductor	Tech hardware and semiconductors	Europe	1.3	1.8	(0.5)
Radware	Technology hardware & equipment	US	1.2	1.3	(0.1)
Total of top 10			15.8	11.2	4.6

Source: Herald Investment Management, Marten & Co

Figure 6: Idox share price (GBp)



Source: Bloomberg

Between the end of December 2021 and the end of September 2022, Esker, S4 Capital, Future, and Pegasystems have dropped out of HRI's top 10 holdings, with Idox, Super Micro Computer, Descartes Systems Group, and Radware replacing them.

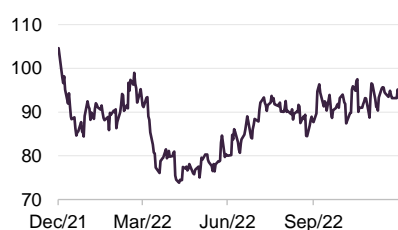
Idox is a UK-based software company, focusing on developing information management and solutions for the public and asset-intensive sector, with a presence across most developed countries. Its diverse range of product offerings include computer aided facilities management, transportation management, and electoral services. Idox is not a new holding for HRI (it first entered the portfolio in the early 2000), but its resilience during the recent downturn has seen it move up HRI's rankings, having fallen only 6% over 2022 (less than a third of HRI over the same period). Idox's resilience is due in part to the reliable nature of government contracts, which are often long-term, stable sources of revenue. In fact, Idox's EPS has remained hugely stable since 2021, despite the current downturn.

Figure 7: Super Micro Computer share price (US\$)



Source: Bloomberg

Figure 8: Descartes share price (CAD)



Source: Bloomberg

Figure 9: Radware share price (US\$)



Source: Bloomberg

Super Micro Computer is a Silicon Valley-based firm providing optimised server and storage systems for various markets, from cloud computing to 5G providers. The solutions include a raft of various types of software, such as AI and high-performance computing, data management, and hyperscale infrastructure. Super Micro Computer also provides physical products like workspace solutions and gaming products.

Having initiated a position in 2017, the team has been adding to it almost consistently since. This increased position size has been compounded by the fact that Super Micro Computer has seen a substantial rise in its share price since 2020, even over 2022. Super Micro Computer is by far the best-performing stock in HRI's top 10, retuning 86% over 2022. This impressive re-rating has been in part a result of strong earnings the company posted, effectively doubling over 2022.

Descartes is a Canadian company providing cloud-based software-as-a-service solutions for improving the productivity, performance and security of logistics-intensive businesses. Descartes solutions is an all-encompassing 'one-stop-shop' for logistic services, with products ranging from consumer and security filing to invoice payments and route and schedule mapping.

Descartes first entered HRI's portfolio in 2006 and has been steadily rising in share price since 2009, accelerating post COVID-19 given the surging demand for logistics. Descartes is effectively flat year to date, although it did report improved earnings at the start of the year. The HIML team have been taking profits in the company since 2016; however, the continuing strength of the firm has meant that it has crept up in value within the portfolio regardless.

Radware is a US-based cyber security firm. It offers its clients a range of different options for various forms of cyber-attacks, offering both network security products and application delivery. As we mentioned earlier, cyber-security has become increasingly in-vogue, with Radware being a clear beneficiary of the sectoral tailwind. The team have modestly increased their exposure to Radware based on market weakness over 2022.

Performance

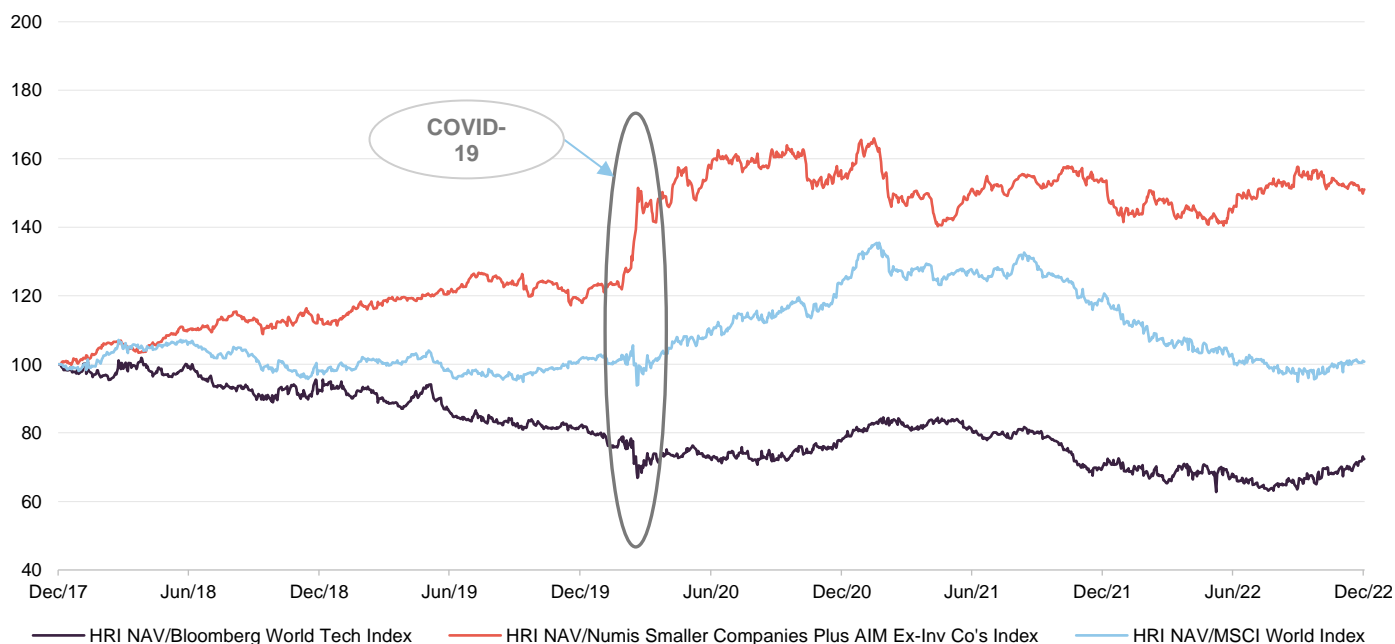
Over a five-year time period, HRI has managed to demonstrate a commendable track record, generating a 52.7% NAV return. HRI has been able to generate considerable five-year outperformance relative to both a global small cap index, with the MSCI World Small Cap returning 33.3%, and the UK small cap universe, with the Numis Small Companies plus AIM returning 1.1%. HRI's NAV returns are also commensurate with that of the wider global equity market over the last five years.

This is important because within the technology space, at least over 2020 and 2021, the best-performing companies have often been the mega-cap technology names, and these have also driven a substantial amount of the MSCI All Cap World Index's return over the period. This makes it even harder to beat the performance of global equity markets over the period. Were we to use a longer, 10-year, period, HRI has in fact beaten the MSCI World by some 17% (see Figure 10).

Please click [here](https://www.quotedata.com) to visit QuotedData.com for a live comparison of the global smaller companies peer group.

The dominance of mega capitalisation technology also explained the underperformance of HRI relative to the Bloomberg technology index, which reflects the wider global technology market and is dominated by the likes of Apple, Amazon and Microsoft.

Figure 10: HRI's NAV total return relative to various indices, over five years to 31 December 2022



Source: Morningstar, Marten & Co

Figure 11: Cumulative total return performance over periods ending 31 December 2022

	1 month (%)	3 months (%)	6 months (%)	1 year (%)	3 years (%)	5 years (%)	10 years (%)
HRI NAV	(2.3)	3.9	3.0	(23.1)	25.8	52.7	232.7
HRI Share price	(1.4)	9.1	10.4	(28.9)	20.4	52.2	248.0
Numis Smaller Cos plus AIM ex IC	(1.2)	6.9	(0.6)	(21.9)	(1.7)	1.1	86.8
Bloomberg World Tech	(9.0)	(4.2)	(3.6)	(24.4)	43.1	110.8	472.2
MSCI World	(5.2)	1.9	4.0	(7.8)	27.3	51.5	215.6

Source: Morningstar, Marten & Co

12-month performance to 31 November 2022

HRI's recent 12-month performance has been a reflection of the selloff in global risk assets, with HRI's focus on small cap and technology factors, which are often considered amongst the higher risk-categories of equities, meaning that it was amongst one of the worst-exposed during the drawdown. Whilst HRI has substantially underperformed wider global equities, it has outperformed the UK small cap sector, and marginally outperformed global technology stocks.

As we alluded to earlier in the note, HRI's NAV performance has not, in the minds of the HIML team, been a result of stock-specific issues, but rather a wider sell-off of risk assets (those perceived to have higher volatility and market sensitivity, like stocks), with the market punishing almost all forms of equities irrespective of their long-term potential. Interest rate rises have increased the rate at which investors discount future earnings back to the present when valuing companies. This has a greater effect on growth companies who have a large proportion of their value discounted back from the future. However, current market valuations are likely not reflecting a rational re-valuation of future growth based on higher discount rates, given that several of HRI's holdings have only improved their long-term revenue profile yet still saw their share prices fall.

HRI's US allocation has been its best performing

The broad-based nature of this sell off can be seen by HRI's regional performance breakdown, with almost every region having fallen by roughly the same amount. The outlier in this case has been HRI's US portfolio, which has performed much better. This comparative resilience is partially a reflection of the healthier outlook the US economy had over 2022, with its rise in inflation being coupled with superior economic growth when compared to other economic nations. It is also due to factors such as a stronger consumer, full employment, and energy independence.

HRI's US exposure also benefited from the strengthening of the US dollar over the last 12 months, as the currency denomination of US investments offer direct exposure to the strengthening US dollar. In addition, there have been a number of takeovers within the HRI's US holdings as M&A activity picks up. It may be that the US is the first to emerge from the downturn. However, it is worth remembering that HRI's regional weightings do not map onto the earnings of these companies, which are often global in nature.

What does 'unique' mean for performance?

HRI's has a much lower beta to global technology than its closest peers

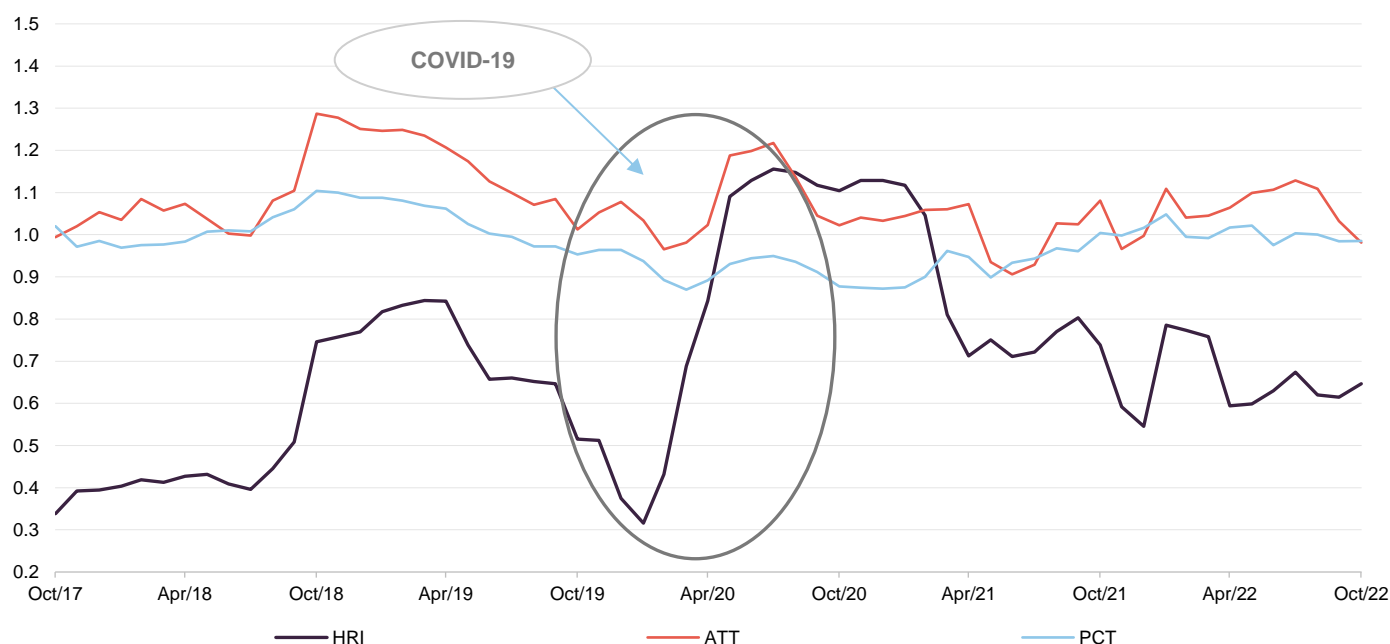
We have described HRI as a 'unique' investment strategy in many of our notes, a moniker that is the result of it being the only investment trust to exclusively focus on global small cap technology stocks. However, while the opportunity set is different, it is reasonable to ask what the degree of overlap might be with its larger cap peers.

The below chart shows the rolling 12-month beta (a measure of sensitivity to a reference index) of HRI to the Dow Jones Global Technology index, an index utilised by Allianz Technology Trust (ATT) and Polar Capital Technology (PCT), the two large cap technology trusts, with said index also being viewed as a proxy for the entire global technology sector, thus having an overwhelming bias to large cap companies.

As can be seen, HRI has exhibited a far lower beta to the index than those of ATT and PCT, bar a brief period during the COVID-19 crash. This shows that, over nearly all time periods, HRI's performance trajectory has shown less correlation to technology than one might expect – in effect, a mathematical representation of the 'uniqueness' we have long espoused. This is something which is important in not only distinguishing HRI but also in allowing it to fit within a wider equity portfolio, as a low beta implies superior diversification benefits. This is especially important considering that many investors may have seen their large-cap technology exposure increase over recent years given the strong momentum behind the sector.

As is clear from Figure 12, HRI offers strong diversification when compared to other London-listed technology-focused strategies.

Figure 12: Rolling 12-month beta to Dow Jones Global Technology Index

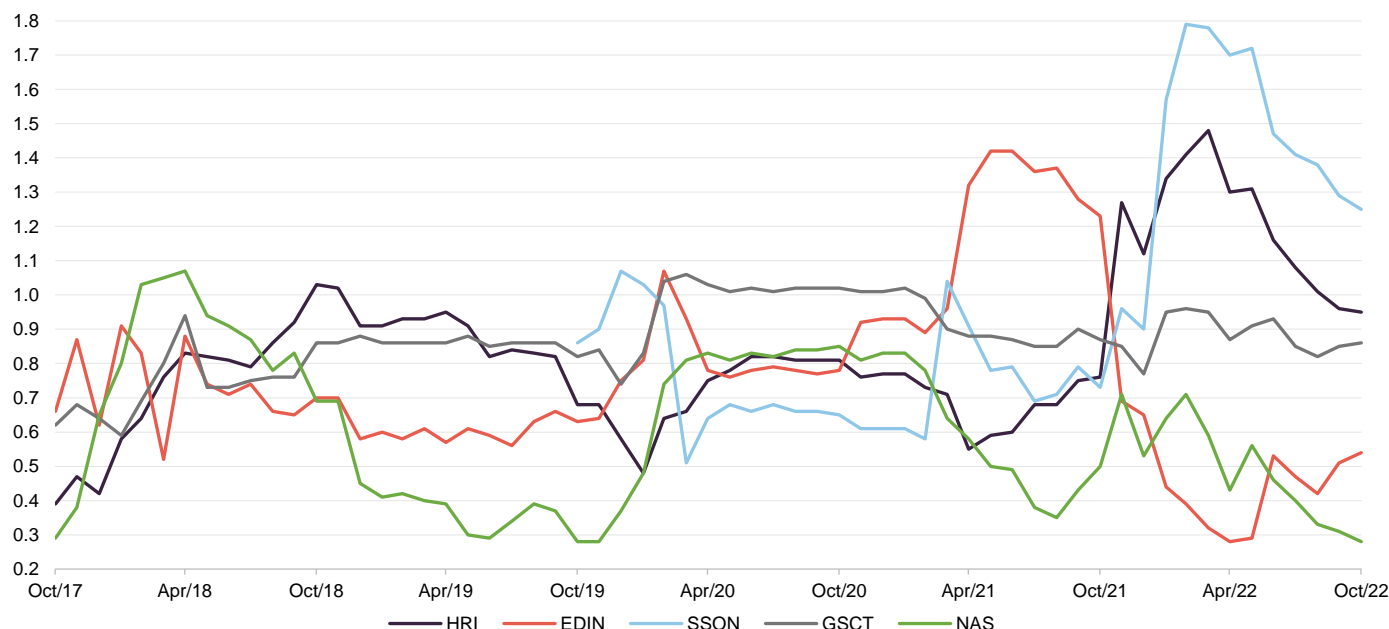


Source: Morningstar, Marten & Co

Another reasonable question is what diversification benefits does HRI offer when compared to its UK Smaller companies peer group? Figure 13, which compares the beta of HRI relative to the MSCI Global Small Cap index to those of its peers in the AIC global Smaller Company sector, provides an illustration.

While HRI offers a strong diversification benefit (it has an average rolling 12-month beta of 0.84 over the last five years), this is less than that offered by some of its peers (for example, Edinburgh Investment Trust and North American Investment Trust). The primary cause is that HRI exhibited a greater sensitivity to the wider market during periods of market turmoil than many of its peers, as we have seen during 2022. This is likely due to the fact that Herald's process focuses on companies which epitomise the advantages of small cap investing – highly disruptive, nimble strategies which can offer outsized growth potential. However, for similar reasons these tend to be at the forefront of investors' minds during a market sell off, be it due to their illiquidity, high valuations, or perceived likelihood of being more exposed to risk during periods where the market is risk-off.

Figure 13: Rolling 12-month beta to MSCI World Small Cap



Source: Morningstar, Marten & Co

Dividend

HRI is focused primarily on generating capital growth, and dividend income makes up only a small part of returns. The consequence of this is that HRI only declares a dividend where this is necessary to retain investment trust status, and in practice, no dividend has been declared since 2012.

HRI had revenue reserves of -£9.09m (12.6p) per share as at 30 June 2022 (December 2021: -£8.16m, or -12.6p per share). We believe it is unlikely that HRI will generate a positive revenue reserve for the current financial year. As such, we do not expect there will be any requirement for HRI to pay a dividend for the year ended 31 December 2022.

Discount

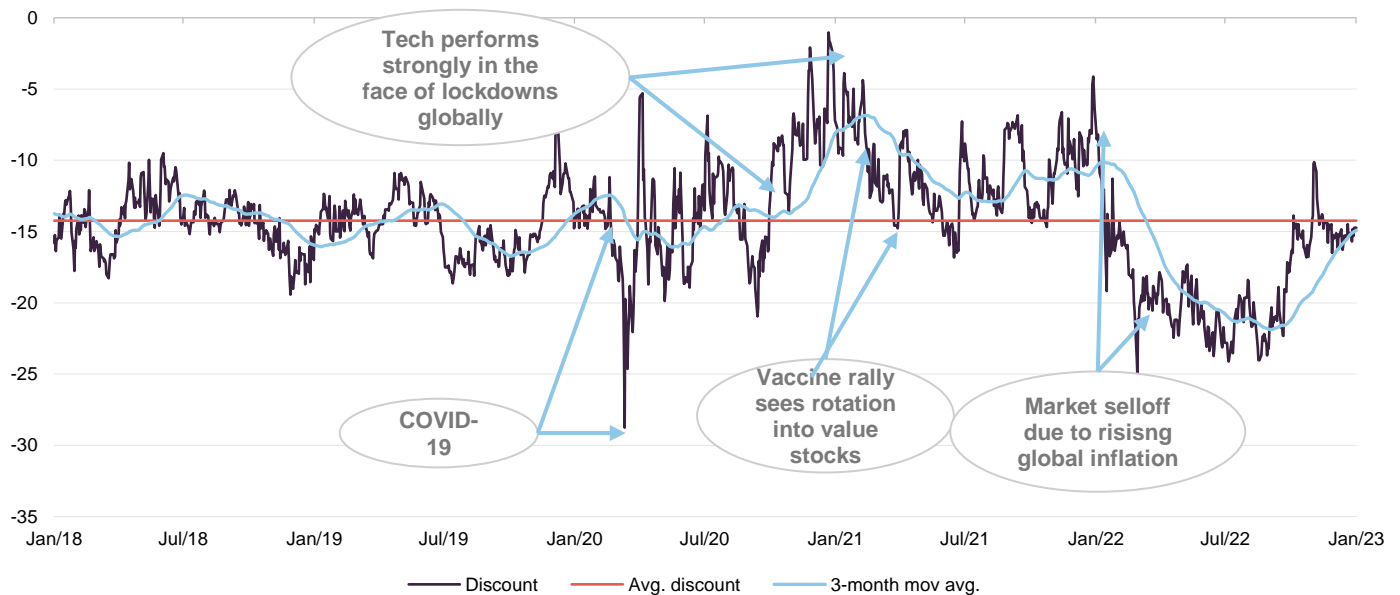
HRI's discount has narrowed recently, back in line with its long-term average

While HRI has traded at a discount throughout the entirety of the last five years, the size of its discount has historically been a reflection of the strength of its style of investing, narrowing during periods of strong performance. This can be seen clearly during the post-pandemic-crash period, which saw a substantial outperformance of technology stocks, with HRI trading at its narrowest discount of the last five years at the end of 2020.

For the same reason, HRI saw its discount sharply widen during the start of 2022 as investors began to take stock of structurally higher inflation, selling out of high-growth strategies like HRI. Thankfully, HRI's discount been narrowing recently. This

is due in part to investors regaining confidence in the sector, possibly viewing it as oversold, and due to inflation expectations beginning to soften. HRI currently trades on a 15.2% discount and over the past year, HRI has traded on a discount ranging between 8% and 25%, with an average discount of 18.4%.

Figure 14: HRI premium/(discount) over five years

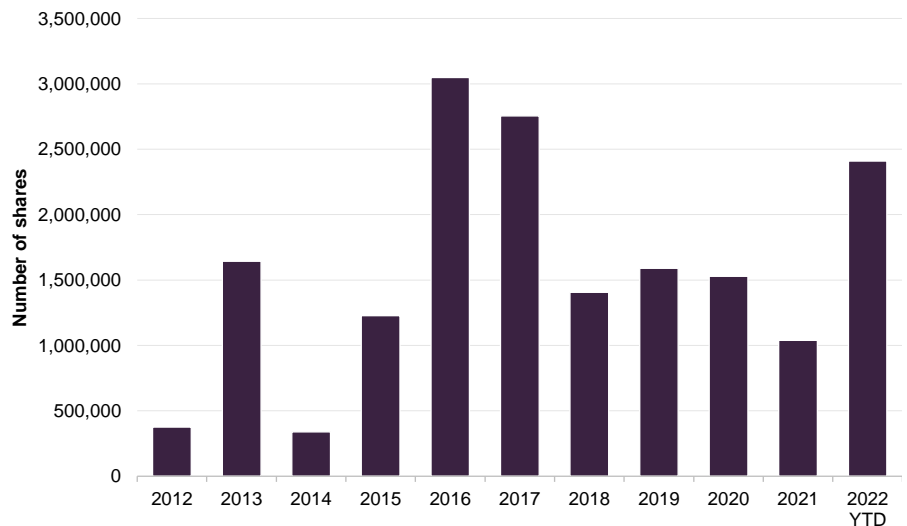


Source: Morningstar, Marten & Co

The rapid narrowing of HRI's discount over recent months is encouraging, as it is a clear sign of confidence in the strategy. While HRI has generated positive NAV returns over the last month, we believe that the narrowing of HRI's discount is more likely a reflection of investors' confidence in the future of HRI, rather than a reflection of short-term performance. As we have outlined throughout this note, there is a clear disconnect between the earnings of HRI's investments, and their share prices. It stands to reason that, for the same reason that HIML believes its own investments are oversold, and will, over the longer term, see their share prices positively re-rate to reflect their fundamental strengths, HRI's share price should also eventually re-rate to reflect the potential of its underlying holdings. If investors believe that the current macro-economic issues that drove the risk-off environment are likely to subside, there may be further potential for HRI's discount to narrow further. Such factors that drove the original widening are likely to be the primary driver of HRI's near term discount movements.

Active in repurchasing its own shares

Figure 15: HRI share repurchases over the past 10 calendar years



Source: Herald Investment Trust

Whilst HRI's policy is not to attempt to control the discount, because it is not considered appropriate given the limited liquidity available within the underlying portfolio companies, the trust will repurchase shares opportunistically. Where repurchases are undertaken, the aim is to enhance the NAV per share for remaining shareholders.

Fees and costs

Tiered management fee structure with no performance fee element

1% annual management fee up to assets of £1.25bn and 0.8% thereafter.
No performance fee.

HIML is entitled to an annual management fee of 1% of HRI's net assets up to £1.25bn and 0.8% of HRI's net assets above this level.

The NAV is calculated monthly using mid-market prices, which is somewhat unusual, as most NAVs are calculated at bid prices. However, given that many of HRI's underlying holdings trade on wide spreads, the mid-market valuation gives a better indication of the true value of the portfolio. There is no performance fee. The management fee also covers the cost of company secretarial services, which HIML has delegated to Law Debenture Corporate Services.

In the year to the end of December 2021, HRI's **ongoing charges ratio** was 1.02%, down modestly from 1.08% the year before. The asset management contract is subject to 12 months' notice.

Capital structure and life

Simple capital structure

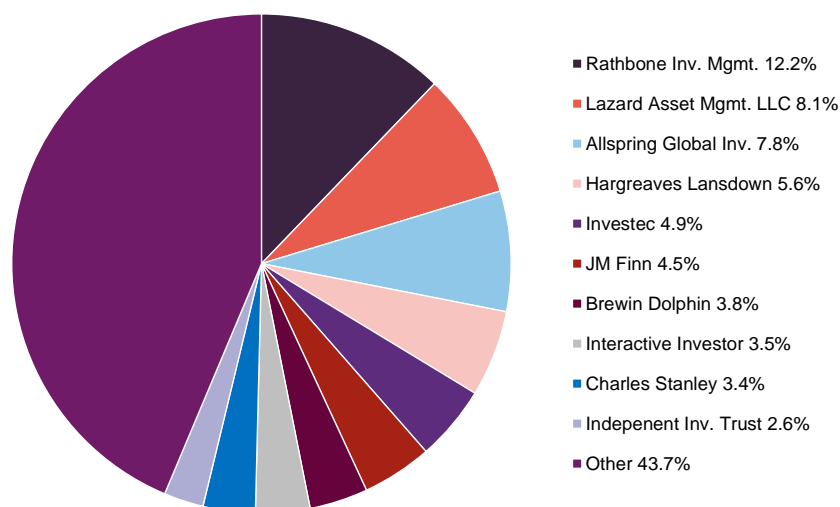
HRI has one class of ordinary share in issue. It can gear up to 50% of net assets.

HRI has a simple capital structure with one class of ordinary shares in issue. Its ordinary shares have a premium main market listing on the London Stock Exchange and, as at 31 December 2022, there were 62,173,223 in issue with no shares held in treasury.

The trust is permitted to borrow up to 50% of net assets and previously had a £25m multi-currency revolving loan facility (like a bank overdraft) with RBS that matured on 31 December 2019. The facility was undrawn prior to its maturity, as HRI has been running with net cash for some time, and so the decision was taken not to renew the facility. The facility has not yet been replaced. As at 30 November 2022, HRI had net liquidity of 11.5% of its total net assets.

Major shareholders

Figure 16: Major shareholders as at 3 January 2023



Source: Bloomberg, Marten & Co

Unlimited life with three-yearly continuation votes

HRI does not have a fixed life, but shareholders are offered a continuation vote every three years. The next continuation vote is scheduled for the trust's annual general meeting (AGM) in April 2025.

Board

HRI's board has undergone a modest refresh during the last couple of years and its size has expanded from four to six directors.

HRI's board is composed of five directors, all of whom are non-executive and considered to be independent of the investment manager. The current chairman, Tom Black, was appointed as chairman in April 2021, following the retirement of Ian Russell. Prior to this, Tom had been the senior independent director and James Will was appointed to this role.

Tom has indicated his intention to retire from HRI's board at the conclusion of its AGM in April 2023 and Andrew Joy has been recruited with the intention that he will take over as chairman when Tom retires. In advance of this, Andrew was appointed as an independent non-executive director and chairman-designate of HRI on 1 October 2022. Tom and Andrew are working closely together to ensure an orderly transition. Short biographies of all board members are provided below. Other than HRI's board, its directors do not have any other shared directorships.

Figure 17: Board member – length of service and shareholdings

Director	Position	Date of appointment	Length of service (years)	Annual fee (GBP) ¹	Shareholding ²	Years of fee invested ³
Tom Black	Chairman	1 May 2013	9.7	39,590	6,900	3.2
Andrew Joy	Director and chairman-designate	1 October 2022	0.3	39,590	6,000	2.7
Stephanie Eastment	Chairman of the audit committee	1 December 2018	4.1	32,100	3,200	1.8
James Will	Senior independent director	21 April 2015	7.7	29,750	6,000	3.7
Henrietta Marsh	Director	1 September 2019	3.3	26,250	1,000	0.7
Karl Sternberg	Director	21 April 2015	7.7	26,250	9,826	6.8
Average (service length, annual fee, shareholding, years of fee invested)			5.5	32,255	5,488	3.1
Average excluding Andrew Joy (service length, annual fee, shareholding, years of fee invested)			6.5	30,788	5,385	3.2

Source: Herald Investment Trust, Marten & Co 1) Fee rate from 1 July 2022 (assumed that Andrew Joy would qualify for the chairman's fee rate for the purpose of this analysis). 2) Note: shareholdings as per most recent company announcements as at 9 January 2023. 3) Years of fee invested based on HRI's ordinary share price of 1,810.00p as at 9 January 2023.

Shareholders approved an increase in the cap on total fees for the directors from £200,000 to £250,000 at HRI's AGM in April 2022. Figure 17 shows the current composition of the board and provides some information on members' length of service and shareholdings in the company. It is board policy that all serving directors retire and offer themselves for re-election annually.

As illustrated in Figure 17, with the exception of Andrew Joy who is a very recent addition to the board, all of the directors have made significant personal investments in HRI's ordinary shares (an average of 3.2 years' worth of their fees, including Andrew Joy). This is in our view favourable, as it shows significant commitment and helps to align directors' interests with those of shareholders.

Recent transactions by directors in HRI's shares

There were no share disposals by HRI directors during the last 12 months. In terms of purchases, Karl Sternberg bought 1,000 ordinary shares, in July 2022, at a cost of £16.80 per share, 1000 in May 2022 at £17.27 per share, and a 1,000 share at £18.41 per share in April 2022, taking his beneficial interest to 9,826 HRI shares.

Henrietta Marsh has completed her first purchase of HRI stock, acquiring 1,000 shares at £16.45p per share in July 2022. Andrew Joy has also completed his first purchase of HRI shares, purchasing 6,000 shares at £18.80 per share.

Stephanie Eastment purchased 300 shares in May 2022, at a price of £17.42 per share. This took her beneficial interest to 3,200 shares of HRI.

Tom Black (chairman)

Tom joined HRI's board in May 2013 and became the chairman on 20 April following the retirement of Ian Russell at the conclusion of the trust's AGM that day. Tom was previously chief executive of Detica Group Plc, a leading company in the field of large-scale information collection and analysis for intelligence and counter fraud applications. As such, he understands HRI's smaller companies remit, having grown an early stage technology company and listed it on the London Stock Exchange. He also has advisory roles with a number of smaller unlisted businesses. Tom is chairman of Thruvision Group Plc (formerly Digital Barriers Plc), and is a non-executive director of CloudCoCo Group Plc. He is also chairman and trustee of the Black Family Charitable Trust, which is focused on supporting disadvantaged young people with their educational needs.

Andrew Joy (non-executive director and chairman-designate)

Andrew is highly regarded for his extensive knowledge of the financial sector and of the high-growth part of the smaller company sector. He was one of the founding partners of Cinven, a leading private equity firm investing in Europe and U.S. and has been chairman or director of numerous growth companies over the past 30 years. He was previously chairman of The Biotech Growth Trust Plc, a position he has held since July 2016 and retired from in July 2022. He is also a senior advisor of Stonehage Fleming, chairman of the investment committee of FPE Capital and is a trustee of several charities.

Stephanie Eastment (chairman of the audit committee)

Stephanie Eastment is a chartered accountant and company secretary with over 30 years' experience in the financial services industry. She has considerable experience in the investment trust sector and is a member of the AIC's Technical Committee. Stephanie qualified with KPMG and held various accounting and compliance roles at Wardley and UBS before joining Invesco Asset Management in 1996 as Manager, Investment Trust Accounts. When she left Invesco in July 2018, she was Head of Specialist Funds Company Secretariat and Accounts. Stephanie is a non-executive director and audit chair of Murray Income Trust Plc.

James Will (senior independent director)

James joined HRI's board in April 2015 and became the senior independent director on 20 April 2021 following Tom Black's appointment as chairman at the conclusion

of the trust's AGM that day. James was, until 2014, chairman and a senior corporate finance partner of law firm Shepherd and Wedderburn LLP, where he also headed the law firm's financial sector practice. During his career as a lawyer, James was involved in advising smaller quoted technology companies, for over 20 years, on a range of corporate transactions, including flotations, secondary fundraisings and mergers and acquisitions. He is chairman of both The Scottish Investment Trust Plc and Asia Dragon Trust Plc.

Henrietta Marsh (director)

Henrietta has a background in fund management, having worked in UK small cap and private equity investment over several decades. From 2005 until 2011, she was AIM fund manager at Living Bridge Equity Partners and, prior to that, she spent 14 years at 3i in several roles, including as fund manager of 3i Smaller Quoted Companies Trust Plc (1997–2002). Henrietta spent her early career with Morgan Stanley and Shell. She is currently a non-executive director of Gamma Communications Plc (AIM listed), a trustee of 3i Group Plc's pension fund and a member of London Stock Exchange's AIM Advisory Group.

Karl Sternberg (director)

Karl spent much of his earlier career at Morgan Grenfell (which became Deutsche Asset Management), where he rose to become chief investment officer, Europe & Asia Pacific. Subsequently, he was a founding partner of Oxford Investment Partners Limited, where he worked from 2006 until 2013, when it was acquired by Towers Watson. Karl is a non-executive director of Clipstone Logistics REIT Plc, Monks Investment Trust Plc, Lowland Investment Company Plc, Alliance Trust Plc, JP Morgan Elect Plc, Island House Investment LLP and Jupiter Fund Management Plc.

Management team

Katie Potts

Katie is the managing director and also the lead fund manager for HIML. She established HIML in December 1993 to manage HRI, which was launched in February 1994. Katie read Engineering Science on a GKN Group scholarship at Lady Margaret Hall, University of Oxford. She worked for five years in investment management at Baring Investment Management Limited, before joining S.G. Warburg Securities's UK electronics research team in 1988. The team was consistently voted top team in the Extel survey of analysts in the sector, and she was voted top analyst by finance directors of electronics companies canvassed by *The Treasurer* magazine. In addition, Katie had responsibility within S.G. Warburg's UK research department for commenting on accounting issues.

Katie is supported in managing the funds by a team of eight other investment professionals and three consultants.

Fraser Elms

Fraser Elms joined HIML in May 2000. He is the deputy manager of HRI and has lead responsibility for managing HIML's Asian portfolios. Prior to joining HIML,

Fraser was a technology analyst with Dresdner Kleinwort Benson, where he covered the European technology sector. Before this he worked at Prudential for three years as member of a team of three UK unit trust fund managers that managed £5bn in equities, with Fraser having lead responsibility for three funds collectively worth £400m. He graduated from Lancaster University with a degree in Economics and initially joined Prudential as a product manager for their unit trusts, before completing an MSc in Investment Analysis at the University of Stirling and re-joining Prudential in an investment role. Fraser covers the semiconductor sector.

Taymour Ezzat

Taymour joined HIML in November 2004. He is a portfolio manager on the venture funds, sitting on the venture committee and taking lead responsibility for a number of the investments in the venture portfolios. He also has analytical responsibility for the media sector across all HIML's quoted and unquoted portfolios, as well as responsibility for the European portfolio. Previously he spent a year appraising a number of venture capital opportunities for E.D. Capital Partners. Prior to that, Taymour spent six years at Northcliffe Newspapers, the regional newspapers division of Daily Mail and General Trust (DMGT), latterly as finance director of its electronics publishing arm. Prior to this, he worked for Reuters in London and Eastern Europe for four years. Taymour qualified as an accountant with Price Waterhouse, and studied Economic History at the London School of Economics and Political Science.

Hao Luo

Hao joined HIML in 2004 and works with Fraser Elms on managing the Far East portfolios. He also has analytical responsibility for the manufacturing sector globally. Hao obtained a BA in Economics from Hunan University in China and a Masters degree in Finance from Manchester University, and worked for J&A Securities in Shanghai from 2000-2002. He is a CFA charterholder.

Peter Jenkin

Peter joined HIML as an analyst in 2015. He covers the software sector and contributes to the overall investment selection. Previously, Peter worked jointly on the European portfolio, but now has responsibility for HRI's North American portfolio. Before joining HIML, he studied Construction Engineering Management at Loughborough University.

Bob Johnston

Bob was recruited in 2016 to establish a US office for HIML. He has more than 20 years' experience in the technology sector on the sell-side, and he has worked with the HIML team for roughly 15 years. Most recently, Bob was with the technology specialist Pacific Crest. He previously also worked for Hambrecht & Quist and SoundView Technology Group. Bob has taken responsibility for telecommunications, networking and security analysis.

Danny Malach

Danny joined HIML in June 2016 and, since April 2017, has acted as the funds dealer. He obtained a First Class Honours in his undergraduate degree in

Accounting at Northumbria University, and subsequently achieved a Merit in his MSc in International Economics and Finance.

Fati Naraghi

Fati joined HIML towards the end of 2019 to focus on the Herald Worldwide Technology Fund and to cover some of the larger technology companies. Prior to joining HIML, she spent 20 years at Newton Investment Management where she was responsible for the global tech sector. Fati has a Ph.D. in Communications Systems and is qualified as an AWS Cloud Practitioner.

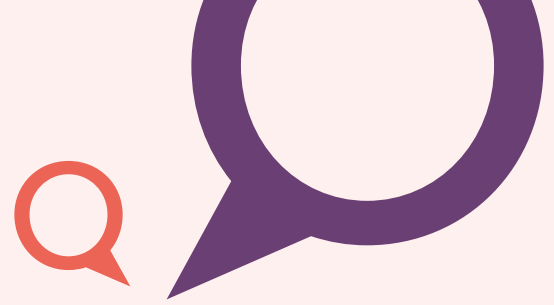
Previous publications

Readers interested in further information about HRI may wish to read our previous notes (details are provided in Figure 18 below). You can read the notes by clicking on them in Figure 18 or by visiting our website.

Figure 18: QuotedData's previously published notes on HRI

Title	Note type	Published
Invest in the future	Initiation	16 August 2016
Tech bids demonstrate value	Update	20 December 2016
Backing growing businesses	Update	11 July 2017
Who wants to be a billionaire?	Annual overview	7 December 2017
From small acorns....	Update	12 June 2018
Shifting sentiment	Annual overview	12 February 2019
"Profits are only profits when they are realised"	Update	8 October 2019
Change is a coming	Annual overview	4 April 2020
Hot chips	Update	5 November 2020
The future is bright	Annual review	2 February 2022

Source: Marten & Co



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