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MAGAZINE

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THE HEALTHCARE REVOLUTION

INVESTING FOR A HEALTHIER FUTURE WITH ORBIMED'S SVEN BORHO

PLUS...

RUN FOR THE HILLS?

JIM MELLON SEES A "SIGNIFICANT DOWNTURN" AHEAD FOR MARKETS

CYBER WARS II

HOW TO INVEST IN THE NEW ARMS RACE

COMPOUND RETURNS

THE COMPANIES THAT KEEP ON GIVING

RECOVERY STOCKS

HOW TO AUTOMATE YOUR STOCK-PICKING IN A TRICKY AREA

WELCOME

Dear Reader,

Over the past few years, the healthcare and biotech sector has put in a phenomenal performance, driven by some very powerful structural demographic trends, but also by some very exciting advances in technology.

To give a flavour of what kind of performance we're talking about, the Worldwide Healthcare Trust (an investment trust whose manager, Sven Borho, we interview on page 10) has returned 162 percent over the past five years, and a whopping 566 percent over the past ten years. That's the kind of performance that's only really rivalled by the tech sector!

But after the stunning performance of recent years, investors will be asking themselves whether there's more to come. Setting aside the short term, it appears that the sector has some of the strongest fundamentals around, and that the structural trends underpinning its outperformance will be with us for some time.

Just take the subject of ageing populations, for example. In his article on page 36, Filipe R. Costa explains that the global population of those aged 80 or above, which was mostly non-existent just a couple of decades ago, is expected to more than triple in absolute size over the next 35 years. What's more, by the end of this decade, the spending power of those aged 60 or more will hit $15 trillion globally, up from $8 trillion in 2010. These are long-term secular trends that will take time to play out. With that in mind, there appears to be a lot more to play for.

Those looking to capitalise but also wishing to spread the risk would do well to read Nick Sudbury's article on page 20. As Nick explains, this is a complex and specialist area where a knowledgeable fund manager should be able to add significant value via their stock selection decisions, but there are only a handful of investment trusts and open-ended funds that concentrate specifically on this part of the market.

Meanwhile, for those investors who like to take a more hands-on approach, the industry insights of Dr Andy Smith (pages 16 & 42) are an essential read in order to not come unstuck when it comes to picking a biotech stock. There's also my exclusive interview with John Dawson of Oxford BioMedica (page 32), a company which is making some very exciting progress in the cutting-edge field of gene-based therapies.

Whatever your investment persuasion, I'm sure you'll find this month's issue as insightful and as entertaining as ever.

Best regards,

James Faulkner
Editor

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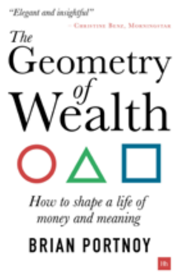

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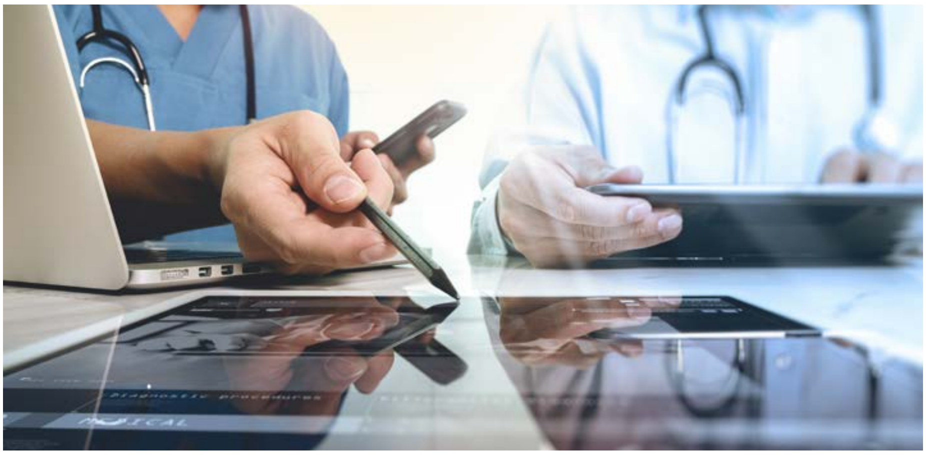

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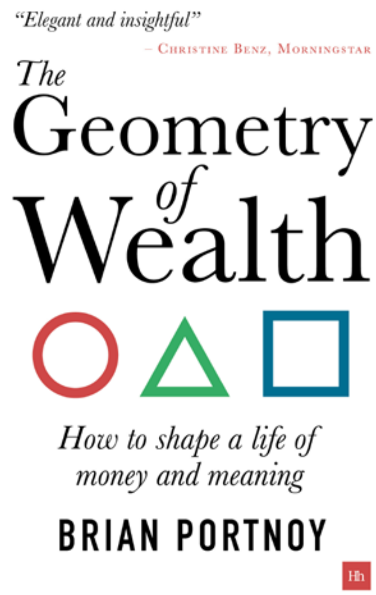

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BY JIM MELLON

MELLON ON THE MARKETS

I am in Ibiza enjoying the sun and the languor for a couple of days. Later this week I am due in Switzerland to talk about longevity, as well as the meatless future – both subjects which are connected and which I am increasingly convinced will come to dominate investment conversation in the relatively near future.

In the past month I have spoken at the Cog X AI conference in London, which I have to say was brilliantly organised and very well attended. Since my "I" is in tech terms somewhat lacking, I had to use the "A" part to get some factoids in order to appear well informed on the panel on which I was speaking.

Cog X, which looked at AI in medicine, was hosted and well moderated by Softbank's Sakshi Chhabra. I have said for a while that many doctors will soon be receptionists in front of smart computers, and so it is coming to pass. Here's a factoid example: mammograms are notoriously unreliable, for instance, sending one in two women to biopsies that in most cases are unnecessary and traumatic. Today, AI can assess the results of the mammogram with a 99 per cent accuracy, obviating the need for surgical intervention in both cases.

Already, Juvenescence, the company founded by my partners and I a few months ago, has access to two superb AI platforms (Insilico and Netrapharma) to assist in drug discovery and commercialisation. As I keep on saying, in my various presentations around the place, AI for novel compound discovery in pharmacology didn't exist when Al Chalabi and I wrote *Cracking the Code* six years ago – and nor did cancer immunotherapy, a cure for Hep C, and CRISPR, the gene editing technique which is becoming the gold standard for genetic engineering.

What's going to happen in the next five years? No one knows – but surely, it's got to be good!

The coming bear market

Sadly, that doesn't apply to the immediate future for markets, be they for bonds or for equities. There is a fin de siècle feeling around at the moment; small rallies quickly fizzling out in favour of lower lows, in many – indeed most – prices for stocks and fixed income instruments. Growth is slowing everywhere, particularly in Europe and in China, and in some markets the boil has turned into, well, not exactly the freeze, but at least the cool-down. I think this is to be expected; you have had a debt-fuelled rally for many years now in most major markets, encouraged by central banks who are now, to almost a man (not many women so far in central banking), tightening the spigots.

Why anyone would think this would be positive for equities is beyond me. In fact, the assertions made by many pundits and fund managers also astonish; the view, for instance, that bank stocks always go up in an era of rising interest rates is one such shibboleth. All the major US bank stocks are down this year, including **Citigroup (NYSE:C)**, which is now off by 13 per cent.

I read recently that the average fund manager in the UK and in the US hasn't been in the job for very long: 40% for less than eight years, or in other words, 4 out of 10 for less than the period since the financial crisis. No wonder complacency abounds, and valuations that would normally be looked at askance – especially going into an era of slowing, rather than

"WE ARE AT THE BEGINNING OF A BIG FALL IN MARKETS."

> **"YOU ARE MUCH BETTER OFF WITH CASH IN THIS PHASE, OR VERY SHORT-TERM GOVERNMENT PAPER."**

rising, earnings – are fully stretched. That is not to say that there aren't opportunities – there are – but the rising-tide-lifts-all-boats scenario investors have gorged on for a few years is gone, and with it the gentle moonlight that they bathed in all these years.

I was recently on a financial TV channel saying that there would be a major correction. In a way, this statement was teased out of me, rather a priori I thought, but here I believe my own words/verbiage. We are at the beginning of a big fall in markets, and while I would love to say that stock X or stock Y will resist the tide of selling, in reality, weathered and battered by years of market turmoil, as I am, I know that no such thing will happen.

Run for the hills?

The good girls go down with the bad in the early stages of bear assaults, and that's what will happen soon. You are much better off with cash in this phase, or very short-term government paper. The inverse cycle of bonds up, stocks down, familiar to most investors is also about to be uncoupled. Bonds will fall in this cycle, as much as stocks, partly due to the sheer weight of public and private sector debt that has been built up in this continuous party we have been enjoying since 2009. Always, always, in my experience, you get plenty of warning about the beginning of a bear market. You know how on a roller coaster, it slowly ratchets its way up to the sheer fall – that's where we are. Don't doubt it – it's going to happen.

When the plunge happens, wow there will be some opportunities. Firstly, in the dead cat bounce that always accompanies these things, and secondly, when the cat lies prostrate once more, and we can sift through the rubble. Because the truth is that there is an abundance of value on markets waiting to be had; it's just hard to spot in the fever pitch of bullishness that has taken hold in such things as the FAANGS, the fast-moving consumer goods companies which have been priced as bond proxies, and the passing fads such as crypto currencies and so forth. (And by the way, in contrast to family and colleagues, I think crypto will go to zero.)

I am not too worried about trade wars, Brexit and the China-US stand-off (though I do urge, as I have for a while, caution on Italy). I am much more worried that we have inexperienced and unseasoned fund managers navigating choppy waters, at a time of economic inflection and peril. My own best advice is to do what most people aren't: stick to cash, or gold and silver. In the case of cash, I would hold the Japanese yen and yes, now the Swiss franc, which has been a terrible performer and is now a good proxy for the "hard" part of the euro.

I would put much lower buy limits on favourite stocks that you have really researched and would like to own for the long term. Don't be hesitant to put in really low limits – you will be surprised at the "sales" in equities when they come. This is the time for restraint. Get off the merry-go-round and wait for the music to stop. It's going to be exciting and lucrative. Just don't dive in at the first sign of distress. It takes time for bull markets to play out. Ditto bear markets.

Happy Hunting!

Jim Mellon

Click here to follow Jim's trades on Twitter

About Jim

Jim is an entrepreneur with a flair for identifying emerging global trends enabling him to build a worldwide business empire. He is amongst the top 10% in the "Sunday Times Rich List" (Britain's equivalent to the Forbes list). He is often described as the British Warren Buffett and he predicted the Credit Crunch of 2007-08 in a book entitled *Wake Up! Survive and Prosper in the Coming Economic Turmoil*. Jim followed this with *The Top 10 Investments for the Next 10 Years* (2008) and subsequently *Cracking the Code* (2012), *Fast Forward* (2014) and, most recently, *Juvenescence* (2017). His monthly "Mellon on the Markets" column in Master Investor Magazine has gained him cult status among investors. He holds a master's degree in Politics, Philosophy and Economics from Oxford University. He is on the Board of Trustees of the Buck Institute in California, a trustee of the Biogerontology Institute, and a Fellow of Oriel College, Oxford.

BY JAMES FAULKNER

SHARPE MINDS

IN HEALTHCARE WE TRUST

AN INTERVIEW WITH SVEN BORHO OF THE WORLDWIDE HEALTHCARE TRUST

This month, James Faulkner interviews Sven Borho, manager of the Worldwide Healthcare Trust (LON:WWH), one of the largest healthcare-focused investment vehicles on the London market. The interview covers a lot of ground, from company valuations, tax and regulatory issues, M&A activity and future advances in technology.

James Faulkner: Hi Sven and thanks for taking the time to speak with Master Investor. The healthcare sector has been one of the most exciting and financially rewarding places to invest in recent years. What, to your mind, are the major factors that are driving returns right now – and how long can they continue?

Sven Borho: *First and foremost, the secular demand for healthcare related goods and services is unabating and is in fact accelerating given the ageing population and increased insistence of quality of life standards across the globe. Second, we are currently in a golden age of innovation. The fruits of the genomic revolution that became prominent at the turn of the century are now producing new drugs: the most efficacious treatments – and in some cases, cures – that we have ever seen.*

Meanwhile, as both demand and innovation increase, the complexity of drug discovery and development are at all-time highs, thus the need for business development has never been greater, leading to numerous investment opportunities across many healthcare subsectors. Physician and patient expectations continue to rise for new drugs that will not only address unmet medical needs but add quality years to their lives. We expect this trend to continue for some time.

JF: Which particular areas within the healthcare space do you find attractive right now – and how is this reflected in the portfolio?

> **"THERE ARE MULTIPLE SUBSECTORS WE FIND VERY INVESTIBLE RIGHT NOW."**

SB: *There are multiple subsectors we find very investible right now. First, biotechnology companies remain the nexus of innovation within therapeutic stocks. On one hand, the large capitalisation companies are probably oversold, with valuations close to historical trough levels. That said, we have become incrementally more selective within that space as these companies have matured over the past decade, while some have become "haves" and some "have nots" with respect to new product opportunities. On the other hand, the emerging biotechnology companies have created a plethora of potential new drugs that are in early, mid and late stage development. Finding the "next big thing" within those companies is our passion.*

Additionally, we are finding real value in some of the generic and specialty pharmaceutical companies that have been beaten up over the past two years. Fundamental concerns about generic pricing and the commoditisation of generic

"WE ARE CURRENTLY IN A GOLDEN AGE OF INNOVATION."

"PRESIDENT TRUMP HAS SHOWN A WILLINGNESS TO WORK WITH INDUSTRY STAKEHOLDERS TO CREATE IMPACTFUL BUT TOLERABLE CHANGES TO THE DRUG PRICING SYSTEM."

drugs (especially in the US) have pushed price-to-earnings multiples to all-time lows, in many cases into the mid-single digits. Some of the companies in this sector have heretofore undiscovered and undervalued new product opportunities that can drive earnings and multiples higher.

More broadly, the medical technology and device sector has experienced a renaissance of innovation, with novel developments in the cardiology and neurology spaces. Additionally, we see the space as ripe for consolidation and devoid of any major macro headwinds.

Finally, healthcare companies in emerging markets continue to grow faster than their counterparts in the West, driven by rising income levels, increases in the proportion of GDP spent on healthcare, and local government policy support. In China, for example, our investment strategy focuses on innovation and high-quality generics in the pharmaceutical sector. In India, our stock-picking formula takes into account the quality and timing of US pipelines, high quality compliant manufacturing facilities, sizeable domestic businesses with higher share of chronic therapies, and balance sheet health.

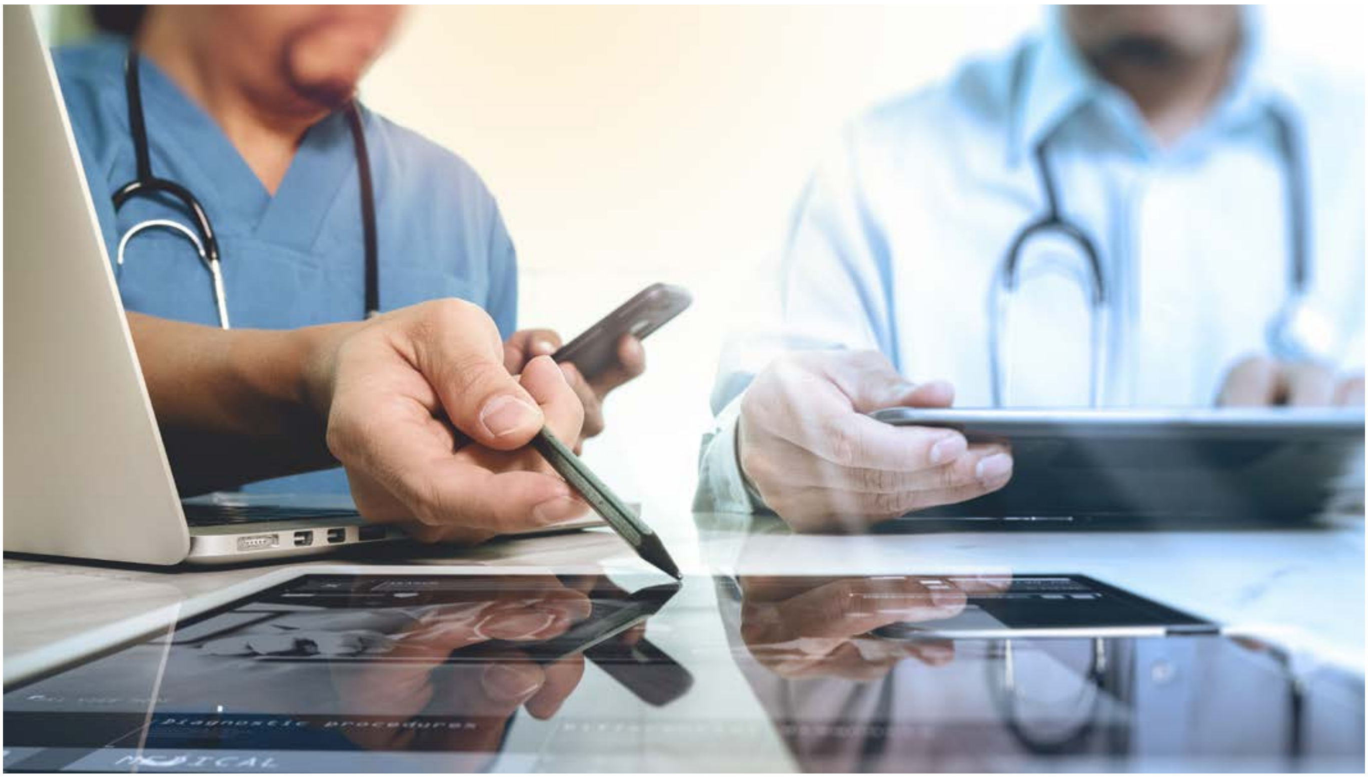
About Sven Borho

Sven H. Borho, CFA, is a founding Partner of OrbiMed. Mr Borho heads the public equity team and he is the portfolio manager for OrbiMed's public equity and hedge funds. Mr Borho has played an integral role in the growth of OrbiMed's asset management activities. Mr Borho started his career in 1991 when he joined OrbiMed's predecessor firm as a Senior Analyst covering European pharmaceutical firms and biotechnology companies worldwide. In 1993, Mr Borho was promoted to portfolio manager. Mr Borho studied business administration at Bayreuth University in Germany and received an M.Sc. (Econs.), Accounting and Finance, from The London School of Economics. He is a citizen of both Germany and Sweden.

JF: Pharmaceutical companies are getting ready for a regulatory shake-up as President Trump prepares to make good on his pledge to lower prices. How far-reaching do you expect this intervention to be? Will it be offset to some extent by the recent tax reforms?

SB: *We have been following the drug price debate in the United States for the past four years. Concerns over Federally mandated, industry changing legislation reached their zenith in 2016 during the US Presidential Election race. However, we believe the market has become somewhat numb to the continued headlines and "tweets" that have come and gone, and still no material legislation has passed that has unduly influenced drug pricing in the United States.*

That said, we DO expect legislation to be enacted before year end. Importantly, however, President Trump has shown a willingness to work with industry stake-



holders to create impactful but tolerable changes to the drug pricing system, with a clear primary intention to reduce out-of-pocket expenses for patients rather than simply trying to reduce prices just for the sake of it. Pharma and Biotech CEOs "have a seat at the table" with the President and many of the proposals being considered by Trump are, in fact, industry proposals.

Overall, our expectation is that President Trump just wants to "do something" in order to declare a populist victory in healthcare, after failing to repeal the Affordable Care Act (aka "Obamacare") in 2017. We think the net effect will be positive as the impact to bottom lines of drug companies will ultimately be minimal and the removal of this long-time headwind will help de-risk the space and generate new generalist interest.

JF: Global M&A activity among healthcare corporates surged in 2017, by 27% to $332 billion. What are the dynamics at play here? Is this mostly down to corporates looking to make efficiencies due to cost pressures? What is the outlook for M&A going forward?

SB: *We certainly saw an increase in healthcare M&A in 2017 that has thus far carried over into 2018. The reasons are multi-faceted. First, as discussed above, as both demand and innovation increase, the complexity of drug discovery and development are at all-time highs, thus, the need for business development has never been greater, leading to a bounty of M&A opportunities.*

Moreover, the Tax Cuts and Jobs Act of 2017, perhaps President Trump's signature legislation thus far in his tenure, has increased cash flows for major pharma and biotech companies alike. First, the new law lowered corporate tax rates. This has resulted in effective tax rates that have decreased anywhere from 100 to 1,000 basis points. The result has been an increase in earnings, dividends, share buybacks, and cash available for M&A. Second, the law also dramatically reduced the tax penalty for repatriating offshore cash and earnings, from well over 30% to approximately 15%. We expect the multinational pharma and biotech companies to take full advantage of this, and to mobilise tens of billions of dollars with a primary goal of increasing their M&A efforts.

Already in 2018, we have seen numerous "tuck-in" or "bolt-on" acquisitions in the therapeutics space, all with significant premiums and prices that are 5 to 10 times higher than their recent lows. For example, Swiss-pharma giant ***Novartis (VTX:NOVN)*** *recently acquired the gene therapy company AveXis for $218 per share in an $8.7 billion transaction. Only two years ago, AveXis was trading at $16 per share. Another exciting target is so-called CAR-T, a type of cell therapy used to treat specific forms of cancer. This January, global biotechnology company* ***Celgene (NASDAQ:CELG)*** *acquired one of the pioneers of CAR-T, Juno Therapeutics.*

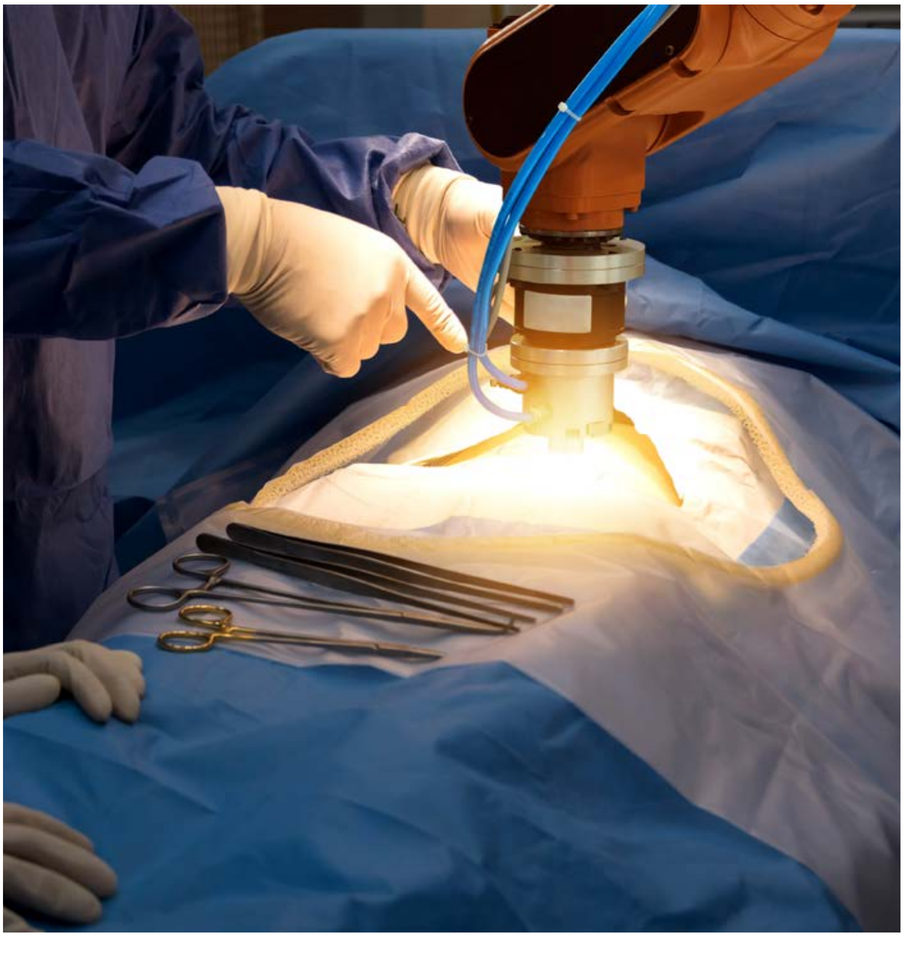
JF: How are the disruptive forces of AI and robotics transforming the healthcare sector, and how is WWH participating?

SB: *Overall, healthcare companies remain at the very early stages of incorporating AI into their businesses, with companies such* ***IBM (NYSE:IBM)*** *(Watson) and* ***Alphabet (NASDAQ:GOOGL)*** *looking at ways to use their advances in this field to improve patient management and wellness initiatives and advance the predictive capabilities of medical devices and robotics programs. Several partnerships have already occurred, with IBM/***Medtronic (NYSE:MDT)*** *in diabetes and Alphabet/***J&J (NYSE:JNJ)*** *in surgical robotics for example.*

More specifically, AI is helping to improve the development of algorithms for many electronic implantable devices, especially within the cardiovascular market, and has the potential to advance robotic surgery over time as machine learning bet-

About the Worldwide Healthcare Trust

Worldwide Healthcare Trust PLC (LON:WWH) is a London-listed investment trust that invests in the global healthcare sector with the objective of achieving a high level of capital growth. In order to achieve its investment objective, the company invests worldwide in a diversified portfolio of shares in pharmaceutical and biotechnology companies and related securities in the healthcare sector. It uses gearing, and derivative transactions to mitigate risk and also to enhance returns.



> **"THE NUMBER OF AMERICANS AGED 65 AND OLDER IS PROJECTED TO MORE THAN DOUBLE FROM 46 MILLION TODAY TO OVER 98 MILLION BY 2060."**

ter understands efficient robotic movements and allows the surgeon to unload portions of the procedure to the robot. Moreover, many MedTech companies are providing greater levels of support service with their devices as part of their overall value proposition to hospitals. A key part is increased patient connectivity through the service, which should lead to better patient management. In these situations, AI can assist in managing these large data sets and provide predicative capabilities.

OrbiMed is well positioned to take advantage of evolving trends in AI with our overweight exposure to innovative cardiovascular companies as well as general surgical robotics.

JF: Many market commentators, our very own Jim Mellon among them, are suggesting that ageing populations are here to stay as life expectancy looks set to improve markedly. What is your own view on the potential for increasing human life expectancy in the coming decades? What are the implications for stock markets and investors?

SB: *Certainly, the preponderance of evidence is highly suggestive that the global population is ageing and with it, the increase in consumption of healthcare goods and services. According to the US Center for Medicare and Medicaid Services, seniors (age 65 and older) accounted for nearly 65% of healthcare spending (according to a 2012 survey). Moreover, healthcare spending for individuals over the age of 85 is almost 8% of the total despite this age group representing less than 2% of the population (source: CMS).*

This situation is expected to become even more entrenched in the future. The number of Americans aged 65 and older is projected to more than double from 46 million today to over 98 million by 2060, and the 65-and-older age group's share of the total population will rise to nearly 24 percent from 15 percent (source: US PRB).

The implication is clear: secular demand for healthcare will remain strong and only increase significantly going forward. This is a powerful tailwind for healthcare related equities.

JF: WWH has outperformed its benchmark by a considerable margin since inception. What in-house resources do you possess that enable you to gain an edge in the market?

SB: *As one of – if not the – largest dedicated healthcare asset managers in the world, our primary edge is the comprehensive team that we have assembled at OrbiMed. We have over 80 investment professionals dedicated to finding the best investment ideas around the globe. We have over two dozen personnel who possess an M.D. or a Ph.D. (and sometimes both), and many others sourced* *from industry (including 15 former CEOs or company founders). In short, we have the in-house expertise that allows to do primary due diligence and alpha generation that is incomparable.*

Additionally, we believe that OrbiMed is distinguished by the breadth of its investment activities across the healthcare sector, which range from seed-stage venture capital investments up to large multinational public corporations globally. Furthermore, OrbiMed is an active investor across the capital structure, including private equity, private debt, public equity, public debt and exotic assets such as healthcare royalty streams.

The scale of our platform and team offer competitive advantages to our public equity team in many respects: deep proprietary research capabilities from our diverse team members, idea sourcing from private market professionals, and research/analytic resources shared broadly across the firm in areas such as prescription trend data.

JF: The portfolio is overwhelmingly focused on the US, which is pretty much par for the course when it comes to investing in healthcare. But aside from the US, where do you see the biggest opportunities in the healthcare market globally? Emerging markets? China?

SB: *Emerging Markets has become an important part of the Trust's strategy over the past number of years. We have team members situated in those geographies, so our edge there is notable.*

And yes, China is key. Of course, the demographics and population size there make it ripe for almost all global industries, but it is particularly so for healthcare. In addition to basic demand for better healthcare, the regulatory authorities there have made the new drug approval process much more stringent, adopting Western best practices. Not only does this favour multinational companies in which we are already invested, but also domestic companies with industry leading capabilities, including drug discovery, development, manufacturing, and commercial capabilities, thereby creating novel investment opportunities which we can consider.

JF: The biotech sector was subjected to a pretty harsh sell-off in 2015 but has since recovered rather robustly. How do valuations in the sector currently compare with the wider market, and how concerned are you about the risk of a major correction in light of the fact that this bull market is now one of the longest on record?

SB: *Valuations for major biotech stocks are currently undemanding. In fact, these stocks are trading well below their historical averages. So, while we have seen some recovery in share prices, we have also seen some multiple compression. There is additional upside opportunity going forward.*

For emerging biotech stocks, valuation calls are more nebulous. Here, our catalyst-driven strategy is key. Our continued focus on clinical and regulatory events can see share prices re-rate multi-fold regardless of other market dynamics. Plus, we believe this sector will continue to witness accelerating M&A activity which can also drive share prices higher.

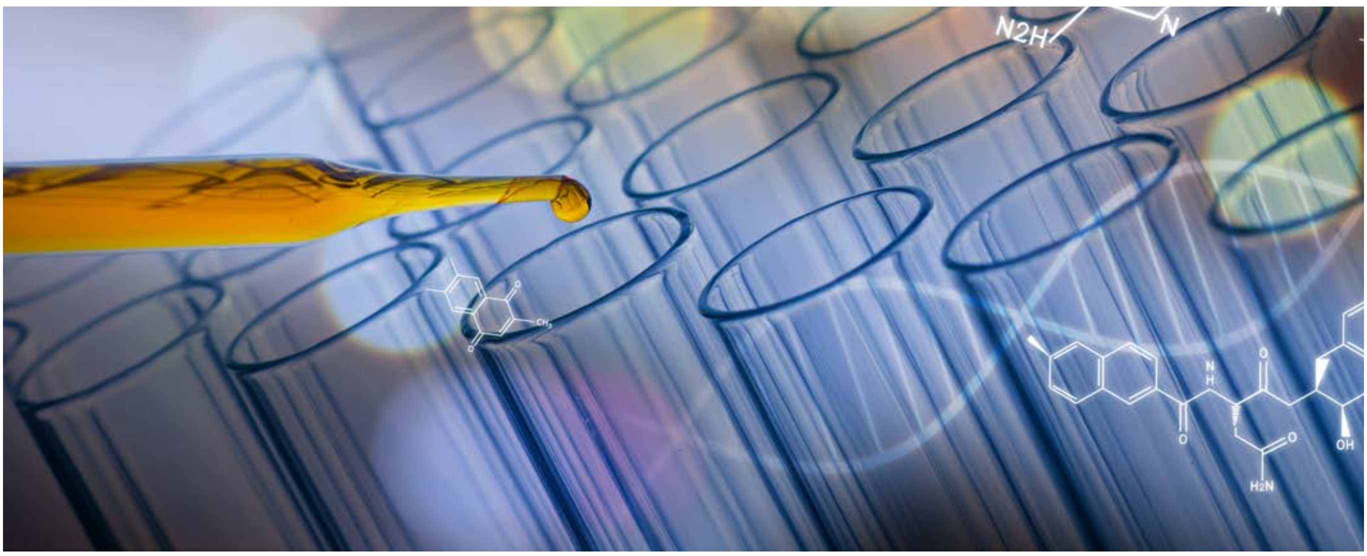
JF: Looking across your portfolio right now, which particular drug/product/technology under development excites you the most in terms of its potential to improve human lives and wellbeing?

SB: *Innovation is a critical theme in healthcare. Oncology is one particular therapeutic category that is in the throes of a revolution, with new technologies and drugs that are offering cures to patients, in some cases. And commercial success is also being observed with mega-blockbuster launches now being seen.*

Other areas are also seeing exciting leaps forward in terms of new-found efficacy for compounds in development. Cystic fibrosis, haemophilia, immunology, diabetes, rheumatology, and even Alzheimer's disease have all bore witness to improved therapies or are perhaps about to see material advances in the treatment of these maladies.

About James

Our Editorial Director, James Faulkner, began investing in the stock market in his early teens. With over a decade of experience covering the stock market under his belt, he has also been a judge at the Small Cap Awards, and is an Associate of the Chartered Institute for Securities & Investment.



BY ANDY SMITH

WHY THE BIOTECH M&A 'BOOM' HAS LOST ITS LUSTRE

At the start of this year, investors were looking forward to a golden age of M&A as the tax reforms in the US, headlined by a lower corporate tax rate, bolstered the cash balances of big pharma and big biotech companies. Increased cashflow from a lower tax on profits was expected to result in many more acquisitions of biotech companies. However, the reality has been much lower than expected because there appears to be a pecking order for windfalls, even if they are recurring.

That priority starts with share buybacks (which enhance earnings per share and on which management are typically remunerated), then increased dividends (good news for pharma investors), capital expenditure, and then, right at the bottom of the list, M&A. Many management teams at big pharma have stated in their recent quarterly earnings calls that it is the high price of attractive assets that is putting them off transacting. With pharmaceutical productivity at an all-time low and investors and pharma business development teams chasing the same late-stage assets, there is some element of truth in this.

There is also an interesting subtext in this lower than expected number of biotech acquisitions which explores the disconnect in the expectations of investors and pharma buyers for the same stock. If pharmaceutical companies with all the specialist scientific, regulatory, clinical and commercial expertise at their disposal think a biotech company is over-valued, why don't investors?

Differences in perspective

There is more than one reason for this difference in perspective. The first is not a contemporary issue and has always been the case. Investors, unlike pharmaceutical companies, can take small positions in a biotech company and nothing has to be disclosed. In addition, most investors are less risk-averse than the average pharmaceutical company CEO, so can invest in a biotech company at an earlier stage, ahead of, or in hope of, price-moving data. But there is a contemporary issue that links investors' expectations of M&A and pharmaceutical companies' reluctance to engage in it, and it can be termed the illusion of the 'positive clinical trial'.

When I was a fund manager, life was much more binary: when a drug didn't work, the company had to announce the failure and the stock price immediately suffered. These days, there are many more shades of grey and it seems that as long as there is the tiniest piece of 'positive' information in the clinical study – like the drug being as safe as the placebo arm even if it failed to show efficacy – the study can be termed 'positive'.

I used to think that only the algorithms were fooled by biotech companies announcing 'positive' clinical trial results when they weren't, but some investors, (although not

"MANY MANAGEMENT TEAMS AT BIG PHARMA HAVE STATED IN THEIR RECENT QUARTERLY EARNINGS CALLS THAT IT IS THE HIGH PRICE OF ATTRACTIVE ASSETS THAT IS PUTTING THEM OFF TRANSACTING."

"THERE IS A CONTEMPORARY ISSUE THAT LINKS INVESTORS' EXPECTATIONS OF M&A AND PHARMACEUTICAL COMPANIES' RELUCTANCE TO ENGAGE IN IT."

potential pharmaceutical acquirers) may also have been. There is another weapon in the armoury of 'positivity' that is hitting new highs in 2018 after building momentum for many years within pharmaceutical companies. This is the surrogate marker.

Surrogate versus functional markers

The surrogate marker is a biochemical or immunological test result that is supposed to be correlated with clinical efficacy. Of course, surrogate markers are cheaper and much easier to measure than a hard clinical endpoint like overall survival (in oncology) or the six minute walk test (in Duchenne muscular dystrophy), but many biotech companies present their surrogate marker data to their investors as a substitute for the approvable and functional clinical endpoints.

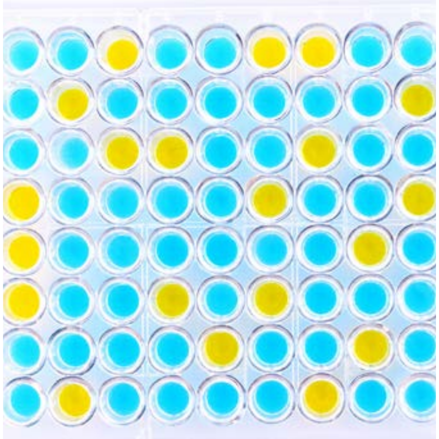
For many years this practice proliferated amongst pharmaceutical companies and can be traced back to lipid-lowering drugs. The logical correlation was that if good lipid levels were raised by a drug, or bad lipids were lowered, that would translate into lower mortality or death – perhaps the archetypal observed hard clinical outcome. Only recently have drug regulators asked for the functional mortality rate, rather than surrogate (blood lipid levels) evidence that prove the clinical claims.

Five of the biggest pharmaceutical companies spent billions of dollars on the development of drugs to raise the levels of HDL or 'good' cholesterol, which all of the CETP inhibitor drugs demonstrated in early studies. However, when tested in cardiovascular outcome clinical trials, one of the class actually increased deaths, two demonstrated no meaningful benefit and one showed such a modest benefit that it joined the other four members of the class in being discontinued. In addition, many investors will find it surprising that of all the drug classes that have been approved to lower blood glucose in diabetic patients, only two drugs in each of two classes (the SGLT2 inhibitors and GLP-1 receptor agonists) have demonstrated a mortality benefit while others, like the DPP-IV inhibitors have shown neither a cardiovascular benefit or liability.

These are the reasons why drug regulators now demand cardiovascular outcome trials (CVOTs) in order to demonstrate the positive outcomes of the drug, rather than relying on surrogate markers that may or may not be related to real clinical outcomes. One of the reasons why the biotech company acquisition spree is not underway could be that pharmaceutical companies are also not convinced by surrogate markers, and instead want to see some demonstration of clinical benefit. The other reason why biotech and pharmaceutical companies conduct CVOTs is so that payers will reimburse the drugs on the basis of the value generated. (More on how this is evaluated while the drug is still in development is explained in a separate feature in this issue.)

Surrogate markers and NASH

This battle of surrogate markers versus functional markers is coming to prominence in a reasonably new indication – non-alcoholic steatohepatitis (NASH). NASH is the disease that results in liver damage and ultimately death due to inflammation, fat accumulation and fibrosis in the liver. NASH patients have a history that includes obesity and di-



abetes, but there are also some investors who do not believe it is a real (read commercially viable) indication.

In NASH, the ability of the liver to regenerate is overcome by many years of hyperglycaemia (high blood glucose) and or high blood lipids (both you'll note are surrogate markers) which can lead to non-alcoholic fatty liver disease (NAFLD) and then NASH, where the severe cases are associated with liver failure and death. With the increasing prevalence of obesity and diabetes, the prevalence of NAFLD and NASH are expected to rise from about 12% and 2%, respectively.

There are a few problems in investing in biotech companies that are developing drugs to treat NASH, the first being that a definitive diagnosis is currently made by a liver biopsy, which very few patients elect to undergo. Clinical trials are made even harder, since at least some of the patients enrolled will be required to have more than one liver biopsy. So, there is a search for biomarkers or surrogate markers that can replace liver biopsies, and while they measure the component disease effects in NASH – blood lipids, inflammation and fibrosis (the latter by imaging) – they are still un-validated surrogates. What could be a trickier area in which to invest than one that some think is not even a real market?

An additional complication in NASH comes from a French company, GenFit, which ran a Phase IIb clinical study a few years ago only to find that in the placebo and active drug arms, some NASH patients' disease was reversed by the supervised programme of diet, exercise and (cheap) medication given to all patients in the trial. This potential to reverse a disease by the standard of care, rather than a very expensive new drug intervention, is just the sort of information that payers will point to when deferring and denying reimbursement.

So, the backdrop for investors in biotech companies, which started the year so brightly with a potential wall of cash waiting to be deployed on M&A, has turned into something much more complicated. Pharmaceutical companies continue to worry about the meaning of surrogate rather than functional data at the companies with which they would like to partner, and in new indications that are only a few years old but where the questions of surrogate versus functional markers are already being asked.

> **"WHAT COULD BE A TRICKIER AREA IN WHICH TO INVEST THAN ONE THAT SOME THINK IS NOT EVEN A REAL MARKET? "**

About Dr Andy Smith

Andy joined the Healthcare team at Edison in November 2017 after a period as a senior principal in ICON's Pricing & Market Access consultancy. Prior to ICON he was chief investment officer at Mann Bioinvest and managed healthcare and biotech funds at AXA Framlington, SV Life Sciences, Schroders and 3i Group. Andy is a scientist by training and completed his PhD with Glaxochem after working for ICI and in the NHS. Between working as a lecturer at Guy's Medical School, he worked in R&D management at SmithKline Beecham, before moving to the Strategic Product Development group in SB Pharmaceuticals to be a global product manager. Andy also has an MBA from the University of Greenwich and teaches the finance module on the Master's in Bioscience Enterprise course at the University of Cambridge.

BY NICK SUDBURY

FUNDS IN FOCUS

HEALTHCARE AND BIOTECH FUNDS A PROMISING PROGNOSIS

If you had to choose one part of the market with the potential to change the world for the better, it would have to be the healthcare and biotech sector. The scientific advances in areas such as immuno-oncology and gene therapy are likely to produce numerous breakthroughs in the treatment of a whole range of diseases, improving patient outcomes and generating huge returns in the process.

New diagnostic technology will also have a key role to play. A prime example of how these sorts of cutting edge advancements can improve people's lives is provided by Axumin, a prostate cancer imaging instrument that has been developed by Blue Earth Diagnostics.

Prostate cancer affects around 2 million men in the US, of which approximately 70,000 experience recurrence each year. It is absolutely vital that any return of the disease is accurately diagnosed as it could represent the last opportunity to cure it with surgery. The development of Axumin was a major breakthrough in this process as it provides dramatically clearer images of the location of secondary tumours and thereby enables them to be treated more effectively.

Oxford-based Blue Earth Diagnostics is owned by the investment trust **Syncona (LON: SYNC)** and is the first of their unlisted Life Sciences companies to reach the commercial stage. Sales of Axumin have exceeded expectations and enabled the business to become profitable earlier than anticipated. This has resulted in a significant revaluation of the company, producing a 6.4% uplift in Syncona's Net Asset Value (NAV) in early May.

The development of radically improved diagnostic tools and treatments is likely to create numerous investment opportunities in the healthcare and biotech sector. These could be further enhanced by the gathering pace of drug approvals in the all-important US market, with the Food and Drug Administration (FDA) approving 46 new drugs in 2017 and a further 15 being approved so far this year.

One of the main concerns is the potential impact of President Trump's new policy to lower drug prices, although the measures don't seem to be as draconian as initially feared. The President has been highly critical of the industry for allowing prices to go through the roof and has tried to address this by encouraging new companies to enter the marketplace to increase competition.

Specialist opinion

The healthcare sector contains a wide range of companies that offer radically different investment opportunities. At the large cap end of the scale there are the pharmaceutical stocks like **AstraZeneca (LON:AZN), GlaxoSmithKline (LON:GSK)** and **Pfizer (NYSE:PFE)** with their steady earnings and attractive dividend yields. These are complemented by the Biotech giants such as **Amgen (NASDAQ:AMGN), Gilead Sciences (NASDAQ:GILD)** and **Celgene (NASDAQ:CELG)** with their huge growth potential.

There are also many smaller biotech businesses and start-ups with a single product under development that

"THIS IS A COMPLEX AND SPECIALIST AREA WHERE A KNOWLEDGEABLE FUND MANAGER SHOULD BE ABLE TO ADD SIGNIFICANT VALUE VIA THEIR STOCK SELECTION DECISIONS."

could produce a radical new treatment or fail without trace, as well as lots of more established companies providing healthcare equipment and managed healthcare services.

This is a complex and specialist area where a knowledgeable fund manager should be able to add significant value via their stock selection decisions, but there are only a handful of investment trusts and open-ended funds that concentrate specifically on this part of the market.

According to data from Winterflood Securities, there are just six investment trusts operating in the sector, and between them they have total assets of almost £4 billion. The two largest, at over £1 billion each, are Syncona and the **Worldwide Healthcare Trust (LON:WWH)**. Over the last five years, the six funds have generated an average share price total return of 117%.

Investment trusts are closed-ended, with investors able to buy and sell the shares on the London Stock Exchange without any cash flow implications for the underlying holdings. This gives them a major advantage as it enables the fund managers to invest a greater proportion of their assets in illiquid securities such as the thinly traded small caps or the unquoted biotech businesses that offer the greatest potential returns.

Safe pair of hands

The Worldwide Healthcare Trust has the most diversified portfolio in the sector with 75 separate holdings, of which the top ten account for 35% of the assets. It was launched in April 1995 and has been managed throughout by OrbiMed, a leading global healthcare investor with around $14 billion of assets under management.

Sam Islay, OrbiMed's founder and managing partner, announced his retirement last December following allegations of improper behaviour, but Sven Borho (see the interview on page 10), WWH's long-term co-manager, remains in place, so there should be little impact on the day to day running of the fund. OrbiMed is well-resourced with around 82 investment professionals and this enables it to identify opportunities right across the sector.

A key part of their strategy is to identify catalysts that will lead to a major re-rating of the shares, such as a successful clinical trial, a positive regulatory decision by the FDA or the launch of a new drug.

The manager believes that the sector – which is largely dominated by US stocks – will benefit from the American tax reforms and the repatriation of offshore cash and thinks that the tax cuts will lead to increased share buybacks, higher dividends and more M&A activity. WWH has generated a ten-year share price return of 559% and the shares are currently trading close to NAV.

Focused approach

BB Healthcare (LON:BBH) raised £150 million when it was floated on the London Stock Exchange in December 2016, but subsequent share issues have boosted its total assets to a more meaningful £368 million. It is managed by Bellevue Asset Management, which also runs a highly successful Swiss-listed closed-ended Biotech fund.

The fund managers have a high conviction 'best ideas' approach and will only invest in a maximum of 35 stocks at any given time, with no single position exceeding 10% of the assets. Their focus is on the long term, with the typical investment period expected to be three to five years.

BBH's maiden results for the period from 2nd December 2016 to 30th November 2017 were impressive, with a NAV total return of 19.3%, which was well ahead of the 14.4% achieved by

Open-ended funds

The largest open-ended healthcare fund, according to FE Trustnet, is **BlackRock GF World Healthscience**, with around $2.9 billion in assets under management. At least 70% of its portfolio is invested in the sector and this has enabled it to generate a creditable five-year return of 109.9%. The biggest Biotech fund is **Franklin Biotechnology Discovery,** with $2.3 billion of AUM. It has returned 110.6% over five years.

"SYNCONA IS A UNIQUE VEHICLE THAT IS BACKED UP BY THE RESOURCES OF THE WELLCOME TRUST AND CANCER RESEARCH UK."

the MSCI World Healthcare Index. During this time it held a total of 40 stocks, with 26 of them generating a positive contribution to the performance.

One of the most unusual aspects of the fund is its dividend policy, with the majority of the money being paid out of capital. For its first financial reporting period it targeted a distribution of 3.5 pence per share with the payments split into two equal instalments. Its policy for future periods is to distribute 3.5% of the NAV as measured at the end of the preceding financial year.

BBH has made a successful start and the shares are currently trading close to NAV, which is due in part to the annual option to redeem them at this sort of level. The target distribution for the current year is 4p per share, which gives the fund an attractive forecast yield of 3.1%.

Life changing treatments

The most unusual fund in the sector is Syncona (formerly BACIT), which launched in October 2012 with the intention of providing attractive returns for shareholders via a portfolio of funds and a growing income stream for the Institute of Cancer Research, by making significant donations to it and other charities in lieu of an annual management fee.

In December 2016, shareholders approved a resolution to change its objective to become primarily a life sciences company and to acquire Syncona Partners from the Wellcome Trust. Syncona Partners had put together a concentrated portfolio of life science investments with the fund also hiring its experienced team of investment managers.

Syncona's new objective is to invest in and build global leaders in life science so as to deliver transformational treatments to patients in innovative areas of healthcare, while also generating superior returns for shareholders.

At the end of March, 44% of its assets were invested in various funds, with 7% in cash and 49% in eight different life science companies, including Blue Earth Diagnostics, which was mentioned earlier. The funds provide a store of capital to support the existing life science portfolio and to invest in the best new opportunities as they come along.

The focus of the life science portfolio is on 'third wave' technologies such as cell and gene therapy as the management team believe that these areas have the most potential to innovate and disrupt. They see a rich pipeline of opportunities, but are highly selective and will only invest where all the conditions are right, with the plan being to establish a portfolio of no more than 15 to 20 businesses.

Syncona is a unique vehicle that is backed up by the resources of the Wellcome Trust and Cancer Research UK. Its life science holdings are developing cutting edge technologies with the potential to provide important new treatments in areas of significant unmet need such as Nightstar's gene therapy for blindness. These are difficult areas to value, but the analysts at Numis believe that its sum of parts valuation is 253p, which is well above the current share price.

About Nick

Nick Sudbury is an experienced financial journalist who has written extensively for a range of investment publications aimed at both private and institutional investors. Before moving into journalism he worked both as a fund manager and as a consultant to the industry. He is a fully qualified accountant and has an MBA with finance specialism.

FUND OF THE MONTH

The investment trust analysts at Winterflood Securities believe that the £495 million **Biotech Growth Trust (LON:BIOG)** is the most attractive way for risk-tolerant investors to benefit from the healthcare and biotech sector. It is managed by OrbiMed, just like WWH, although it has different lead managers who have been in place since May 2005 and provides a significantly different type of exposure.

Biotech Growth has a concentrated portfolio of 35 holdings with the top ten accounting for 69% of the assets. It has the greatest bias towards the small cap end of the spectrum of all the funds operating in this area and, according to an analysis by Winterflood conducted last year, only has about a 28% portfolio overlap with the Worldwide Healthcare Trust.

The managers have put together an exciting portfolio that consists of large biotech stocks with strong earnings and attractive valuations, emerging biotech companies with the potential to benefit from positive catalysts and early-stage businesses that are in the process of developing novel therapeutic treatments.

BIOG has a strong long-term performance record with a share price return of 632% over the last ten years, but over the last three years, it has lagged behind the sector average and its NASDAQ Biotechnology benchmark due to stock specific issues. This has resulted in the shares trading on a 7% discount to NAV, which could represent a buying opportunity for long-term investors.

Fund Facts

Name:	Biotech Growth Trust (LON: BIOG)
Type:	Investment Trust
Sector:	Healthcare and Biotech
Total Assets:	£495m
Launch Date:	June 1997
Current Yield:	0%
Gearing:	9%
Ongoing Charges:	1.09 %
Website:	www.biotechgt.com

BY RICHARD GILL, CFA

FROM ACORNS TO OAK TREES

OPPORTUNITIES IN SMALL CAP HEALTHCARE

As discussed elsewhere in this issue of Master Investor Magazine, the healthcare and biotech sectors provide significant opportunities for investors. It is my job to provide analysis of small cap opportunities, so before heading into my three small cap picks, here are three pointers to look out for when investing in the medical minnows.

Firstly, small cap investors should avoid having too much portfolio exposure to companies whose fortunes rely heavily upon the success of just one drug candidate. Some readers may remember London listed scar reduction company Renovo, whose shares collapsed by 75% in just one day in 2011 after announcing that trials of its flagship product Juvista were unsuccessful. More recently, shares in **Faron Pharmaceuticals (LON:FARN)** collapsed by 86% in one day after data from a Phase III study of its vascular leakage and organ failure candidate Traumakine showed it did not meet its primary endpoint. Remember that while management may be "optimistic" about the prospects of a drug candidate, and that earlier stage trials may have been positive, the key for success is in the Phase III data.

In a related issue, attention should be paid to value. A company might have a potentially world beating product but investors should always ask if it's worth paying the current price given the risks involved. To give one example, **Circassia Pharmaceuticals (LON:CIR)** was valued at a whopping £581 million at IPO in March 2014. The shares subsequently collapsed after a Phase III study in 2016 reported that its cat allergy drug candidate performed no better than a placebo.

Another top tip is to consider a "picks and shovels" strategy by investing in areas such as diagnostics and biotech/healthcare service providers. These companies will earn money regardless of whether their customers' research is ultimately successful. One particular business doing well in this area is antibody developer **Bioventix (LON:BVXP)**, shares in which have risen from 520p to 2,978p since listing on AIM in April 2014.

Noting the points above, here are three interesting small cap healthcare/biotech businesses which I believe are worthy of further investigation.

POLAREAN IMAGING

Polarean Imaging (LON:POLX) is a drug-device combination company operating in the high resolution medical imaging market. Its focus is on developing equipment that enables existing MRI (magnetic resonance imaging) systems to achieve an improved level of imaging when analysing the pulmonary function (respiratory system). It does this by specialising in the use of so called "hyperpolarised Xenon gas" (^{129}Xe), or HPX, as an imaging agent to visualise ventilation and gas exchange. Polarean's technology has been in development for almost 20 years, with the company having built up an IP portfolio based on 29 patents which cover four broad areas and extend into 2034.

> **"POLAREAN IS CURRENTLY TARGETING FDA APPROVAL DURING 2020."**

To give a basic description of how the technology works, prior to an MRI scan a patient breathes in a small amount of inert HPX. This provides an extremely strong signal, c.100,000 times stronger than a conventional MRI signal, which can be picked up by the scanner. This transforms the MRI from a technology that is not applicable to the lungs into one that is able to provide multiple images of the lung structure and function in one 10-20 second breath-hold. This is important as MRI technology can help diagnose lung disease earlier, identify the type of intervention likely to benefit a patient and to monitor the efficacy of treatment.

Pulmonary disease is an area of significant unmet medical need at present, with Polarean's technology providing a novel diagnostic approach, offering a non-invasive and radiation-free functional imaging platform which is more accurate and less harmful to the patient than current methods. Providing significant long-term opportunities for the company, it is estimated that more than 30 million people suffer from a chronic lung disease in the US alone, with it having an economic burden of over $150 billion.

Revenues already flowing

Unlike many life sciences companies, Polarean is a revenue generating business, with current products used as "add-ons" which are compatible with existing MRI systems. Polarean made revenues of $1.24 million in its last financial year, although $0.65 million of this was from grant funding.

Current products include: the polariser, with the latest model being the

Polarean 9820 Xenon Hyperpolariser; HPX gas, which is polarised within the polariser; the dose delivery inhalation bag, made of HPX-compatible impermeable plastic materials and a mouthpiece for ease of inhalation; and the Polarean 2881 Polarisation Measurement Station, which provides a calibrated measurement of the polarisation of hyperpolarised gas within the dose delivery inhalation bag. The company also develops and manufactures high performance MRI radiofrequency (RF) coils which are a required component for imaging ^{129}Xe in the MRI system.

Trial acts as potential milestone

To date, Polarean has generated revenues from selling its gas, polarisers and disposables for research use only to academic medical centres. However, to allow its products to be sold into a wider market, a Phase III clinical trial of the company's technology is expected to begin imminently (as I write) at US research hospitals Duke University Medical Center and the University of Virginia. The trial, which has been agreed with US regulator the FDA (Food & Drug Administration) will include 80 patients and compare Polarean's ^{129}Xe MRI contrast agent with an older nuclear medicine agent, ^{133}Xe, to characterise lung ventilation. It is expected to last for approximately 18 months, including the time required to prepare a New Drug Application (NDA) with the FDA.

Polarean is currently targeting FDA approval during 2020, following which it will be able to begin marketing and sales in the US. A direct sales force is planned to be hired, as opposed to distributors, giving the opportunity for higher margins to be achieved. Providing additional opportunities in the long term, the FDA has also indicated its willingness to accept a very broad indication for use for the company's technology – for the evaluation of pulmonary function – as opposed to its use being limited to any particular pulmonary disease or condition.

One for the long term

Polarean is a recent addition to the markets, having listed on AIM in March this year raising £3 million (£2 million net) to fund the Phase III trial and working capital. Trading in the shares has been light since the IPO, with a range of 14.5p to the current high of 17.5p being seen, a recent boost coming on the back of an investor symposium on 19th June. At the current price the business is capitalised at just £12.85 million.

POLAREAN

The key upcoming driver of the shares will clearly be the results of the Phase III trial. While the trial itself is expected to take around a year, there could be interim data releases to act as a share price catalyst. While current funds look sufficient to complete and report the trial, the company does look like it will need further funds to commence early marketing exercises in the US.

In any case, I believe investors should take a long-term view here. As discussed above, pulmonary disease is an area of significant unmet medical need. The company's products provide an attractive complement to current MRI units, with a large installed base of scanners being in place that can be used to implement Polarean's technology. The US seems a good initial market to go for, with a 2013 study from Kaiser Family Foundation finding that the US has the second highest number of MRI units per million of population, at 35.5, behind Japan, at 46.9.

CARETECH

AIM listed social care services provider **CareTech (LON:CTH)** is a company I have covered a couple of times before in Master Investor Magazine. The first time was in March 2016 at 235p a share and then in June last year at 442p. Following a recent slip back to 387p, I now see another attractive entry point for both new and existing investors.

Founded in 1993 and listing on AIM in 2005, CareTech supports adults and children with more than 292 specialist social care services via the five divisions of adult learning disabilities, specialist services, young people residential services, foster care and learning services. These are provided to end customers via a portfolio of over 215 homes throughout the country, with CareTech being paid for its work by local authorities and health service commissioners.

"CARETECH STILL ONLY HAS A SMALL SHARE OF WHAT IS A FRAGMENTED MARKET FOR SOCIAL CARE."

Growth over the years has been driven by a number of factors including increased outsourcing by local authorities, shortfalls of specialist beds and higher regulatory burdens. But despite annual revenues having grown from £22.5 million to £166 million from 2005 to 2017, CareTech still only has a small share of what is a fragmented market for social care in the UK, estimated by the company to be worth c.£12.6 billion per annum.

Care to grow

In 2017 (the 12 months to September) CareTech had a strong financial year, with the corporate highlight being the raising of £39 million in a "very oversubscribed" placing of new shares. The money was spent on acquiring new additions to the care home portfolio. Overall capacity increased by 215 places to 2,534 by the period end. On the back of that, revenues for the year rose by 11.4% to a record high of £166 million, with underlying EBITDA up by 7.5% at £39.9 million. As a result, the total dividend for 2017 was up by 7% at 9.9p per share.

Decent growth continued in the first half of the current financial year, with revenues growing by 11.2% to £87.6 million in the six months to March 2018 as net capacity edged up to 2,572 places. Underlying EBITDA increased by 6.6% to £19.5 million although earnings fell to 9.2% to 14.86p, largely as a result of the increased number of shares in issue following the placing. Nevertheless, the interim dividend was increased by 6.1% to 3.5p per share, with net assets growing by 6.7% to £208.3 million at the period end.

Time to top up?

Since reaching an all time high of over 450p last June, shares in CareTech have drifted down to the current 387p despite the company's operations ticking on nicely. At the current price the company trades on a historic price to earnings multiple of just 10.2 times, which looks incredibly cheap in my opinion given the company's track record of growth and solid business model. What's more the historic dividend yield is a reasonable 2.56%, with the current market cap of £292 million supported by the £208.3 million of net assets on the balance sheet as at the end of March this year. This included £300 million worth of property assets.

Assuming access to finance is not a problem, I believe that the company can continue to grow market share over the coming years, with the current strategy continuing to focus on attractive bolt-on acquisitions, along with potentially larger deals.

MEDICA GROUP

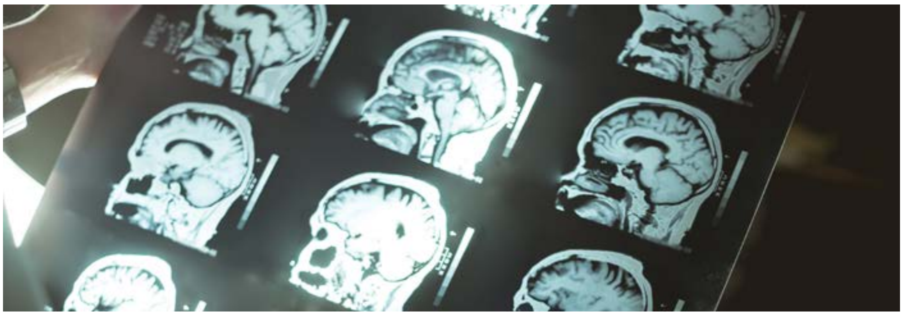
Medica Group (LON:MGP) is the UK market leader by revenue in the provision of teleradiology services. Teleradiology refers to the electronic transmission of radiological patient images, such as x-rays, Computerised Tomography (CT) scans and MRI scans, from one location to another for the purposes of diagnostic interpretation and reporting. Through teleradiology, images can be transmitted from parties that undertake the diagnostic imaging itself, such as a hospital, to a radiologist who can review and report on the images remotely.

> **"REVENUES GREW BY A CAGR OF 27% BETWEEN 2013 AND 2015."**

In the UK, the NHS is the main player in what is a growing teleradiology market. The Royal College of Radiologists, for example, has forecast for England that CT scans will continue to grow at a CAGR of 10.1% between April 2014 and March 2023 and that MRI scans will continue to grow at a CAGR of 12.3% over the same period. This increased number of scans, combined with a shortfall in the supply of radiologists, means that the teleradiology services offered by Medica are increasingly in demand.

Medica currently offers three main services to hospital radiology departments: NightHawk, an out of hours emergency reporting service focused on short turnaround times; routine cross-sectional (Routine CS) reporting on MRI and CT scans, and routine plain film (Routine PF) reporting on x-ray images. Across all three services Medica offers hospital radiology departments the ability to manage their workflow more efficiently and flexibly, providing fast access to specialist consultant radiologists who may not be available to that hospital at the relevant time or not at all.

MEDICA GROUP



Recruitment of new radiologists has been a key focus of the company in recent times, with 318 contracting with the company as at the end of February this year. This represents the largest cohort of consultant radiologists in the UK outside the NHS. Medica also has a bespoke IT platform that provides a link between a hospital's Radiology Information System (RIS) and its consultants. This enables it to provide more than 1.5 million examinations annually across its customer base of more than 100 NHS Trusts, private hospital groups and diagnostic imaging companies that provide it with high quality repeat revenues.

Double-digit growth

Medica listed on the main market of the LSE in March last year, with the IPO seeing £121 million raised at 135p per share, although £106 million was for selling shareholders. The business has performed well in recent years, delivering consistent double-digit growth, with the company reporting in its IPO admission document that revenues grew by a CAGR of 27% between 2013 and 2015, with EBITDA up by a CAGR of 20% over the same period.

However, Medica had a bit of a wobble at the start of 2018, announcing in January that results for 2017 would be slightly behind market expectations due to certain capacity constraints and a softening of demand in the final quarter. The shares subsequently lost around 22% of their value over the two days following the announcement and have gone on to reach an all time low. This looks harsh in my opinion given that the results themselves showed a continuation of the double digit expansion.

For the year to December 2017 overall revenues grew by 18.2% to £33.7 million, driven by sales from Nighthawk growing by 24.1% and Routine CS growing by 19.4%. Pre-tax profits grew by a more pronounced 48.6% to £8.85 million, with earnings up by 39% at 6.92p per share. The net £12.4 million raised for the company at IPO was mainly used to pay down borrowings during the period, with net debt falling from £22 million to just £5 million by the year end. As a result of the good performance Medica announced a maiden final dividend of 1.1p per share to give a proposed total dividend for the year of 1.65p

More recently, a brief statement at the company's AGM in May suggested that 2018 has started well, with performance being in line with expectations and recruitment of radiologists continuing to be strong.

Growth and income

While Medica shares have bounced back from recent lows of 117p, at the current 129.8p they remain below the March 2017 IPO price despite the company having seen a full year of decent growth since then. At the current market cap of £144 million, the shares trade on a multiple of 18.8 times historic earnings, which does not look bad value for a company which has consistently grown revenues and profits in the low to high twenties on a percentage basis over the past few years.

Analysts at house broker Investec have a 210p target price for the stock, implying 62% upside from here. There is also a progressive dividend policy, with a 2.1p payment pencilled in for 2018, equating to a yield of 1.62%.

About Richard

Richard Gill is an investment analyst with over a decade's experience of analysing small/mid cap equities. He is the Head of Research at Align Research. Richard qualified with the Chartered Financial Analyst (CFA) designation in 2012 and was awarded PLUS Markets Financial Writer of the Year at the 2008 PLUS Awards. He has been a judge at the Small Cap Awards from 2013 to 2017.

BY JAMES FAULKNER

MOVERS AND SHAKERS

IT'S IN THE GENES

AN INTERVIEW WITH JOHN DAWSON OF OXFORD BIOMEDICA

Oxford BioMedica (LON:OXB) is one of the UK firms operating at the cutting edge of the exciting gene therapy sector. Master Investor Editor James Faulkner caught up with CEO John Dawson to gain an insight into the space and what it might hold for patients and investors.

James Faulkner: To begin, can you give our readers a brief overview of Oxford BioMedica and its areas of expertise?

John Dawson: *Oxford BioMedica is a leading gene and cell therapy group focused on developing life changing treatments for serious diseases. Oxford BioMedica and its subsidiaries have built a sector leading lentiviral vector delivery platform (LentiVector®), which the Group leverages to develop in vivo and ex vivo products both in-house and with partners.*

The Group has created a valuable proprietary portfolio of gene and cell therapy product candidates in the areas of oncology, ophthalmology and CNS disorders. We have also entered into a number of partnerships, including with Novartis, Bioverativ, Sanofi, Axovant, Orchard Therapeutics, GC LabCell and Immune Design, through which it has long-term economic interests in other potential gene and cell therapy products. Oxford BioMedica is based across several locations in Oxfordshire and employs more than 320 people.

JF: How does a gene-based therapy differ from conventional medicines and why is it superior?

JD: *Gene and cell therapy has the potential to transform medicine, providing long term and potentially curative treatment options for a wide range of diseases. Several highly promising cell and gene therapies have been launched recently, including GSK's StrimvelisTM, Kite/Gilead's YescartaTM, Spark's LuxturnaTM and Novartis's KymriahTM.*

Oxford BioMedica is exploiting its LentiVector® platform to develop its own products and to build partnerships with other companies working with lentiviral vector products. The platform is applicable in many therapeutic areas and has a number of specific advantages. Lentiviral vectors can genetically modify dividing cells, such as T-cells, as well as non- or rarely dividing cells, such as neurons or early progenitor/stem cells, making it a delivery system of choice in gene and cell therapy.

The platform can also integrate genes into non-dividing cells, including in the brain and retina, with ground-breaking long-term studies suggesting gene ex-

About John Dawson

John Dawson joined Oxford BioMedica's Board as Non-Executive Director in August 2008 and he was appointed Chief Executive Officer in October 2008. Previously, he held senior management positions in the European operations of Cephalon Inc., including Chief Financial Officer and Head of Business Development Europe. While at Cephalon he led many deals building the European business to over 1,000 people, and to a turnover of several hundred million US dollars and in 2005 led the US$360 million acquisition of Zeneus by Cephalon. Prior to this time at Cephalon he was Director of Finance and Administration of Serono Laboratories (UK) Limited. He is currently a non-executive director of Paion AG.

"GENE AND CELL THERAPY HAS THE POTENTIAL TO TRANSFORM MEDICINE, PROVIDING LONG TERM AND POTENTIALLY CURATIVE TREATMENT OPTIONS FOR A WIDE RANGE OF DISEASES."

pression may be maintained indefinitely, offering the prospect of permanent therapeutic benefit following a single administration. The platform is also used as a valuable research tool, with applications in transgenesis, stem cell manipulation, somatic disease models, target validation and gene discovery.

JF: The approval of Kymriah, which is being developed by Novartis, was a major milestone for the group. Some commentators criticised you for being too dependent on the Novartis deal. But do you think the string of deals of late will put those criticisms to bed?

JD: *Novartis has been an important partner for many years, but we have been signing agreements with many other companies, including, Sanofi, Orchard Therapeutics, GC LabCell and Immune Design. More recently, in 2018 we also signed agreements with Bioverativ and Axovant.*

I would say that the approval of Kymriah has put the area of gene and cell therapy at the forefront of the sector's mind, and since then we have had a surge in companies wanting to work with us. This has meant we have been able to raise additional funds in the market to further expand our facilities in order to cope with the expected increase in demand.

We are leaders in gene and cell therapy and so we have had discussions with the whole sector and partnerships in place for many years – it is only now though that gene therapy is really happening, treating patients and here to stay.

JF: In your latest results you said that lentiviral vector demand was increasing and that the group was in discussions regarding a range of additional collaborations. Where do you see the main areas of application for this technology, other than those currently being addressed?

JD: *Our technology is applicable in many therapeutic areas and has a number of specific advantages. Lentiviral vectors can genetically modify dividing cells, such as T-cells, as well as non- or rarely dividing cells, such as neurons or early progenitor/stem cells, making it a delivery system of choice in gene and cell therapy. The platform can also integrate genes into non-dividing cells, including in the brain and retina, with ground-breaking long-term studies suggesting gene expression may be maintained indefinitely, offering the prospect of permanent therapeutic benefit following a single administration.*

"WE HAVE HAD A SURGE IN COMPANIES WANTING TO WORK WITH US."

With the increased yield and rates of production due to larger reactors and our proprietary TRiP technology, as well as the potential to reduce the cost of production, we will be able to target new gene therapies that require larger volumes of vector – for example, lung or liver.

JF: June saw a big spike in the share price on the back of the announcement of a $842.5 million deal with Axovant Sciences of the US to commercialise the firm's gene therapy for Parkinson's disease. But given that Axovant has had a rather tumultuous past of late, is it really the right candidate to receive what you yourself have called "the crown jewels" of your portfolio?

JD: *They have had a number of unfortunate setbacks, as do most companies in drug development, but we believe Axovant are the best partner for OXB-102. We were in discussions with a number of potential partners and we had to pick the best partner for OXB-102 for all our stakeholders and patients, based on a number of factors, including commitment to the product and financial terms, and we look forward to working with them.*

Axovant are focused on neurological disorders, so OXB-102 fits directly into their field of focus and expertise. OXB-102 will now be one of their lead pipeline assets, and whilst we would encourage you to ask Axovant about their motivations, the deal terms give an idea of their commitment, enthusiasm and optimism for OXB-102.

JF: Is there any likelihood of licensing the TRiP (Transgene Repression in vector Production) system to anyone anytime soon? If so, what might such a deal be worth?

JD: *We are exploring the best ways to use the TRiP technology and if there were attractive proposals to license the technol-*

"THE SUCCESSFUL FUNDRAISE WILL ALLOW US TO EXPLOIT OUR MARKET LEADING POSITION BY GIVING US THE CAPACITY TO SERVICE THIS RAPIDLY GROWING MARKET, WHICH IS EXPECTED TO BE WORTH $800 MILLION ANNUALLY BY 2026."

ogy, then we would consider this on its merits.

JF: Regarding OXB's 200L bioreactors and the TRiP yield multiplier, and with reference to this article, will that be enough for treatments requiring a lot of vector?

JD: *We are always looking for ways to innovate to keep us ahead of competition in the market. By scaling up the bioreactors and using the TRiP technology we can increase yield and target more therapies in different indications.*

JF: Which of the more early stage assets within the pipeline are you most excited about, and why?

JD: *The Group continues to invest in the identification and early stage development of novel gene and cell therapy products based on the LentiVector® gene delivery platform. This approach is designed to provide an ongoing pipeline of next generation product candidates while also generating new intellectual property to maintain Oxford BioMedica's leadership position in the gene and cell therapy field.*

JF: You recently conducted a placing to raise just over £20 million. How will the funds be put to use?

JD: *The net proceeds of the placing will be used to expand the Company's bioprocessing facilities to include four new GMP vector suites, fill and finish suites and warehouse and office space. The successful fundraise will allow us to exploit our market leading position by giving us the capacity to service this rapidly growing market, which is expected to be worth $800 million annually by 2026. The Placing has provided us with the funds to exploit the current market opportunity, capitalise on the expected increase in demand and future proof Oxford BioMedica to maintain its leadership position. Oxford BioMedica believes it can grow its market share of the bioprocessing market to between 25 per cent. and 30 per cent.*

JF: Finally, how do you see the UK's place in the global biotech arena being impacted by Brexit? Are there any specific implications for OXB?

JD: *We have always received strong support from the UK government and we do not expect this to change. We hope that we are still able to attract the best talent in the world to Oxford BioMedica and so it is important that the UK works closely with Europe to make sure that this still works well for the healthcare sector. Over time, we are sure there are aspects of the business and operations that will change but so far nothing has.*

About James

Our Editorial Director, James Faulkner, began investing in the stock market in his early teens. With over a decade of experience covering the stock market under his belt, he has also been a judge at the Small Cap Awards, and is an Associate of the Chartered Institute for Securities & Investment.

BY FILIPE R. COSTA

THE MACRO INVESTOR

HOW TO INVEST FOR AN AGEING POPULATION

"The aging and declining population will have far-reaching impacts. Declining fertility rates will possibly increase immigration. The structure of family and society will inevitably change."

– Toshihiko Fukui, 29th Governor of the Bank of Japan

Human life expectancy is on a seemingly inexorable ascent. From a meagre 50 years one century ago, life expectancy in the US has been extended to almost 80 years today, and to even more in the UK and Japan. Improving levels of knowledge, education, health and living conditions have all helped extend our expected life beyond levels that a century ago seemed unattainable. Unlike the stock market and the real economy, which frequently suffer from ups and downs, life expectancy seems to be on a relentless uptrend, possibly until humanity attains immortality.

While this is certainly good news for our survival instincts, it comes with severe challenges for social security schemes, labour productivity, growth levels, savings levels, and the whole sustainability of our way of living.

An increase in life expectancy is apparently harmless. It only becomes a serious threat when mixed with a second demographic phenomenon – a decrease in fertility rates. If people live longer and work longer, the population may become older without any material consequences. The real problem arises when fertility rates come down, such that they become lower than replacement rates. When that happens, the population starts ageing and the ratio of retirees to young people starts rising. Such a demographic trend is far-reaching and delivers long-lasting effects for society (in general), and for the economy and the stock market (in particular). While governments and academics discuss the best ways to tackle the problems created by the new demographic trends, investors should start tweaking their portfolios to profit from them.

Demographic trends

The world has witnessed a spectacular increase in life expectancy. Since 1960, around 10 years have been added to life expectancy in the developed world. In the United States, a person was expected to live 69.8 years in 1960, 75.2 years in 1990, and 78.7 years by the end of 2016. In the UK, the trend was similar and life expectancy is now held at 81.0. In Japan, the trend has been even more spectacular, with people now expected to live for 84 years. In less

"WHILE GOVERNMENTS AND ACADEMICS DISCUSS THE BEST WAYS TO TACKLE THE PROBLEMS CREATED BY THE NEW DEMOGRAPHIC TRENDS, INVESTORS SHOULD START TWEAKING THEIR PORTFOLIOS TO PROFIT FROM THEM."

TABLE 1 – LIFE EXPECTANCY AT BIRTH (IN YEARS)

Country/Region	1960	1970	1980	1990	2000	2010	2016	Pct. Chg.
United States	69.8	70.8	73.6	75.2	76.6	78.5	78.7	**12.8**
United Kingdom	71.1	72.0	73.7	75.9	77.7	80.4	81.0	**13.8**
Japan	67.7	72.0	76.1	78.8	81.1	82.8	84.0	**24.1**
European Union	69.3	71.0	72.9	74.9	77.2	79.7	80.6	**16.4**
France	69.9	71.7	74.1	76.6	79.1	81.7	82.3	**17.8**
China	43.7	59.1	66.8	69.3	72.0	75.2	76.3	**74.4**
High income	68.5	70.6	73.2	75.4	77.6	79.8	80.5	**17.6**
Low income	39.1	43.5	47.4	49.9	52.4	59.3	62.5	**60.0**
World	52.6	58.7	62.9	65.4	67.7	70.7	72.0	**37.0**

Source Data: World Development Indicators

than half a century, life expectancy has increased by 24% in Japan.

But, contrary to popular belief, this trend is not just a developed-world phenomenon. When we take the whole world together, we can observe that life expectancy rose from 52.6 years in 1960 to 72 years today – a 37% rise, which is steeper than the trend experienced by Japan. Low income countries observed an increase of 60% in life expectancy in the period, a figure that is almost quadruple that recorded in high income countries. People in low income countries now live an additional 23 years on top of what they were expected to live in 1960.

The rise in life expectancy has been huge. Countries with the highest standard of living now show life expectancy values above 80 years. If we look at gender data, the numbers are even more promising, with women in Japan expected to live 86.8 years.

TABLE 2A – LIFE EXPECTANCY FOR MALE – BEST AND WORST

Country/Region	Male
Switzerland	81.3
Iceland	81.2
Australia	80.9
Sweden	80.7
Leshoto	53.7
Angola	52.4
Central African Rep.	52.5
Sierra Leone	50.1
United Kingdom	**79.4**

Source Data: WHO, World Health Statistics, 2016

We have been particularly good at controlling contagious diseases, at improving healthcare conditions, at reducing the impact of ongoing wars and at expanding food production. All this has had a very positive effect on life expectancy.

The problem with ageing populations

Population ageing is a demographic phenomenon consisting of an increase in the median age of the population. Today, two main trends contribute to the ageing of the population. First of all, we have the aforementioned increase in longevity. If people live longer, the average or median age of the population increases, as the number of surviving older people is now greater. Second, there is a declining fertility rate, which means that the number of births per female is now lower, which reduces the proportion of younger people in the population. This second trend is concerning and is the key reason behind population ageing.

There are several factors explaining population ageing, each contributing more or less depending on the country under analysis. Later and fewer marriages, higher and prolonged education, urbanisation, an increase in nuclear family households, an increase in the participation of women in the workforce, poor work-life balance, and small living spaces – these are some of the demographic and social trends that have reduced the desirability of raising a child. In some way or another, these trends increase the opportunity cost of raising a child. At the same time, the real money available to raise a child seems to have decreased over time. A decline in wages and lifetime employment and a lack of regular employment are often pointed to on that front.

"THE WORLD IS NEARING AN INVERSION POINT IN TERMS OF THE SAVINGS RATE."

Table 3 depicts what has been happening to fertility rates around the world. Global fertility rates halved from 1960 to 2016. In China, the decline was the greatest of all, with the number of births per woman coming down from 5.7 to 1.6 in the period, as the consequence of the one-child policy implemented by the regime. These data alone are concerning and will have a huge impact on the nature of the role reserved for China regarding global growth in 10 to 20 years.

A new normal or a trend to be reverted?

Since 2000, the vast majority of the developed world has been experiencing slow growth rates, high savings rates, low consumption, low inflation, and low interest rates. Many putative explanations for these trends have been advanced, with demographic changes always assuming a central role.

Central banks around the world often justify their policy of zero to negative interest rates with a need to address the current savings glut in a world that seems to be entering a new normal. If, two decades ago, a 4% interest rate was often seen as the normal long-term nominal interest rate, many believe that its current value is 1% or even less. Central banks are reserved a more active role today, buying ever more assets and making investors pay for the privilege of lending money.

A key factor behind the savings glut is the role of the baby boomers. For many years we had an enlarged 25-60 age bracket which saved a lot of money. The generation of the baby boomers

TABLE 2B – LIFE EXPECTANCY FOR FEMALE – BEST AND WORST

Country/Region	Female
Japan	86.8
Singapore	86.1
South Korea	85.5
Spain	85.5
Cote d'Ivoire	54.4
Central African Rep.	54.1
Angola	54.0
Sierra Leone	50.8
United Kingdom	**83.0**

Source Data: WHO, World Health Statistics, 2016

TABLE 3 – FERTILITY RATE, TOTAL (BIRTHS PER WOMAN)

Country/Region	1960	1970	1980	1990	2000	2010	2016	Pct. Chg.
United States	3.7	2.5	1.8	2.1	2.1	1.9	1.8	**-50.7**
United Kingdom	2.7	2.4	1.9	1.8	1.6	1.9	1.8	**-33.1**
Japan	2.0	2.1	1.8	1.5	1.4	1.4	1.4	**-28.0**
European Union	2.6	2.4	1.9	1.7	1.5	1.6	1.6	**-39.2**
France	2.9	2.6	1.9	1.8	1.9	2.0	2.0	**-31.2**
China	5.7	5.6	2.6	2.4	1.5	1.6	1.6	**-71.7**
High income	3.0	2.5	2.0	1.8	1.7	1.7	1.7	**-45.6**
Low income	6.5	6.6	6.6	6.3	5.9	5.2	4.7	**-27.5**
World	5.0	4.8	3.7	3.3	2.7	2.5	2.4	**-51.1**

Source Data: World Development Indicators

"COMPANIES RESEARCHING DEMENTIA, CANCER, PARKINSON'S DISEASE, CARDIOVASCULAR DISEASES, AND JUVENESCENCE PRODUCTS WILL BENEFIT THE MOST."

contributed the most to keeping interest rates low, as they were attempting to save money for retirement. People in their 20s and in their 60s or above do not tend to save money.

What we shouldn't forget is the fact that baby boomers retire. When they do that, the 25-60 age bracket shrinks, as the fertility rates of the newer generations are below replacement rates. The population ages, and the 25-60 bracket loses influence. The savings rate will decrease accordingly. In China, where the decrease in fertility rate is exponential, the decline in savings will be huge. I would argue that the world is nearing an inversion point in terms of the savings rate. Instead of a new normal, we will live with increasing interest rates and inflation rates and eventually an epic crash in bond markets. With this in mind, I believe investors should not rely too much on bonds to save for retirement.

Taking a long-term bet on changing demographics

Recent demographic estimates point out that by 2040, the global population of people aged 65 or above will reach 1.3 billion, double the current figures. The global population of those aged 80 or above, which was mostly non-existent just a couple of decades ago, is expected to more than triple in absolute size over the next 35 years, rising from 1.7% to 4.5% of the population by 2050. In developed countries, those aged 65 or above outnumbered for the first time those aged 15 or less. By the end of this decade, the spending power of those aged 60 or more will hit $15 trillion globally, up from $8 trillion in 2010.

If we also consider the fact that people in the age bracket 65-84 spend twice as much on healthcare than people aged 45-64 and that people aged 85 or more spend twice as much as people in the 65-84 bracket, there is an undeniable opportunity for the healthcare sector. Companies researching dementia, cancer, Parkinson's disease, cardiovascular diseases, and juvenescence products will benefit the most. Companies developing apps and appliances with the elderly in mind, like emergency response pendants, smart pill boxes and retractable tripods, will also do very well.

The easiest way of playing this theme is by investing in health conglomerates like **GlaxoSmithKline (LON:GSK)**, **Roche Holdings (SWX:RO)**, **AstraZeneca (LON:AZN)**, **Johnson & Johnson (NYSE:JNJ)**, **Eli Lilly (NYSE:LLY)**, **Biogen (NASDAQ:BIIB)**, and other blue chips. Many of these are hugely involved in geriatric products and represent lower risks in a portfolio because of their size.

An interesting smaller company, which I already mentioned in the April edition of Master Investor, and related with the robotisation of the economy, is **Intuitive Surgical (NASDAQ:ISRG)**. The company is a developer of a robotic surgical system for soft tissue procedures. The system is precise and thus needs smaller incisions which heal quicker. The elderly often need small interventions, which may be safer when using this kind of procedure.

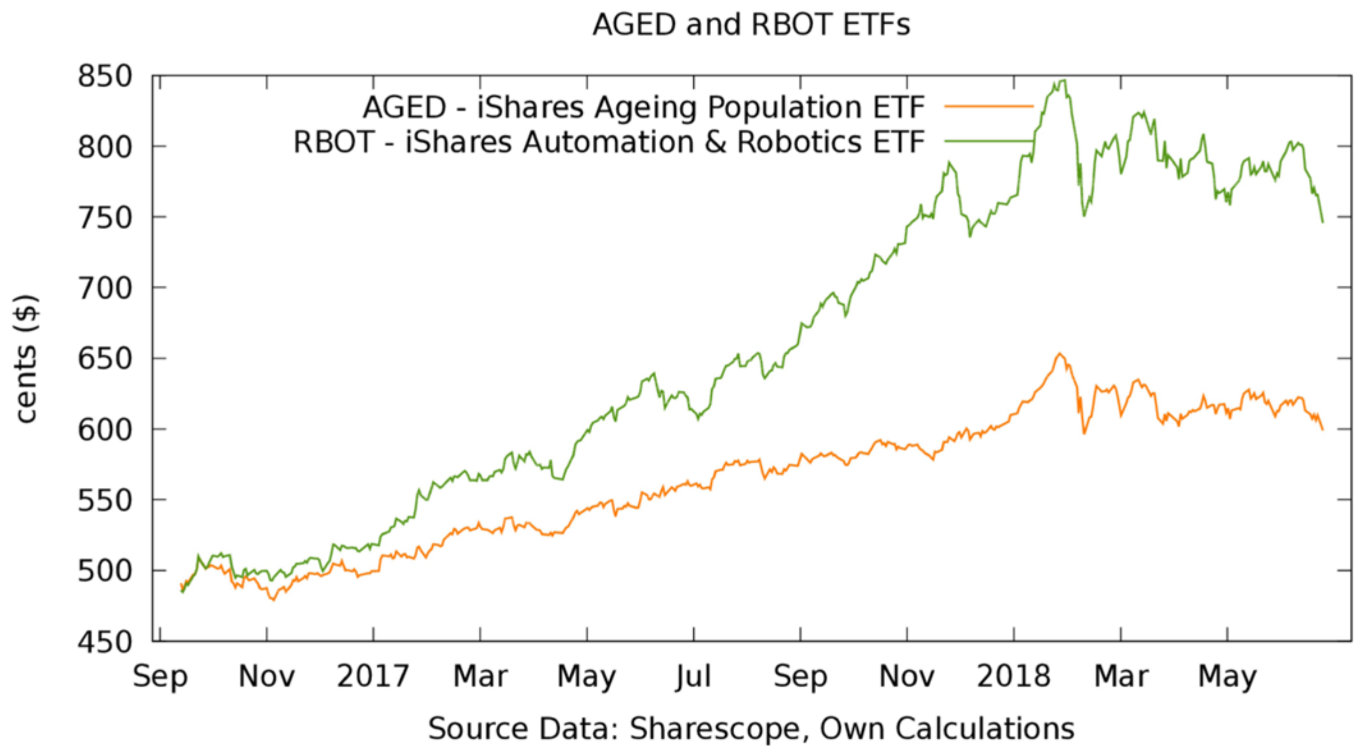
The best alternative to actively picking healthcare stocks is by means of investing through ETFs. Today, the ETF offer is vast. Here, I have selected four ETFs, all from BlackRock, that I believe offer great potential with limited risk.

The first ETF is the **iShares Ageing Population ETF (LON:AGED)**. This product is tailored towards directly playing the demographics theme. The fund is very well diversified, with the largest holding being just 0.57% of the portfolio. It is also well diversified geographically, with its top exposure being 34.6%. As I mentioned above, ageing is not a purely US theme. This fund offers exposure to 22 countries. Top holdings are **Sarepta Therapeutics (NASDAQ:SRPT)**, **Nordic Nanovector (FRA:NN)** and **Rite Aid Corp (NYSE:RAD)**. The inception of this fund was in September 2016 and its benchmark is the iStoxx Factset Ageing Population Index.

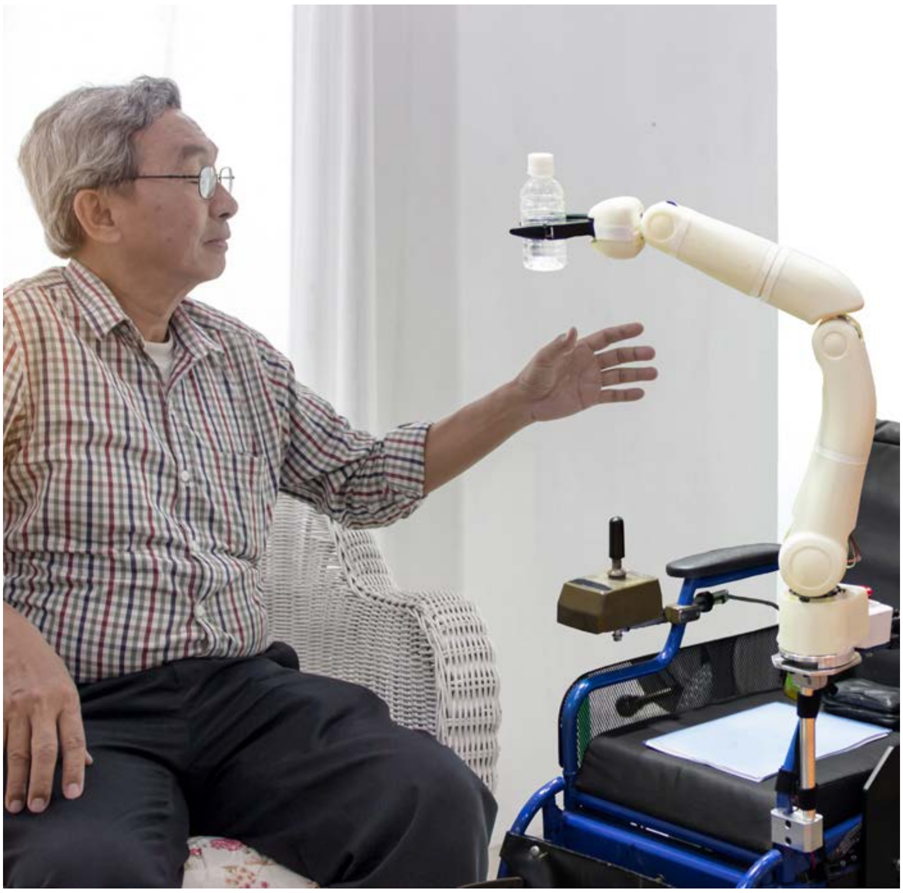
A second ETF is the **iShares Healthcare Innovation ETF (LON:HEAL)**, which focuses on advances in specific aspects of the healthcare industry, including drug treatment, patient care or diagnostic tools. This fund is also well diversified across 83 holdings, with top exposure of 1.36%. But investors should be careful if mixing this ETF with iShares Ageing because there is a high degree of correlation between them. Adding both in equal proportions to a portfolio may be a duplication of holdings to some extent.

A third option is the **iShares Global Healthcare ETF (NYSEARCA:IXJ)**, which is a blue chip fund, holding the most important healthcare conglomerates. This is the plain vanilla bet on the sector for investors willing to take the least risks.

The last option is the **iShares Auto-**



mation & Robotics ETF (LON:RBOT). Many of the companies operating in robotics will directly develop applications for the elderly. Ageing of the population will also lead to a decline in the supply of younger workers, raising the need to find a replacement through automating many work tasks.



Who wants to live forever?

Population ageing, in particular when it is the consequence of declining fertility rates, is a concerning trend that will severely impact future generations. Unlike other macro themes, a demographics theme should be played for the very long term, as its full effects take time to materialise. Many of the effects the current trend will have are already in play. One example is anaemic productivity growth. Another example is the imminent failure of pension schemes that can't finance all the liabilities they accumulated. Investors must prepare for the worst and start saving for a longer-than-expected retirement, as early as possible. Relying on bonds, as many pension funds do, may be an error, in particular at a time when yields are at the lowest ever and there is a high likelihood that this is not a new normal but rather a transitional phase that may end in a crash. But it's not all bad news. New opportunities will open up in healthcare, biotechnology and automation. Tilting a portfolio towards the theme is the best an investor can do at this point.

About Filipe

Filipe has been a contributor to Master Investor since the earliest years. His specialisation is monetary policy, macro issues and behavioural finance where he allies the practical experience of several years of trading with academic credentials. Filipe in fact teaches courses on Financial Markets and Monetary Economics at the University of Oporto Faculty of Economics, helping traders maximise profits and better manage risk.

BY ANDY SMITH

THE REALITY OF DRUG PRICING

In a quote that has been attributed to Oscar Wilde, it is suggested that a cynic is someone who knows the price of everything, but the value of nothing. With all the political rhetoric on drug pricing that seesawed biotechnology and pharmaceutical share prices during the US presidential election, not to mention an imminent presidential initiative on US drug pricing, companies and investors cannot afford to be cynical.

In a study I did last year looking at the full-year 2016 sales of drugs approved by the FDA and EMA five years after launch, 19% of drugs approved by the FDA and a whopping 46% of drugs approved by the EMA had sales of less than $20 million in that fifth year. For all but the most frugal (or not-for-profit) companies, this would probably mean permanent loss-making status and that would not be what their investors would be hoping for unless they are short the stock.

The other recent politically-meditated intervention of relevance to drug and biotechnology companies is the right to try (RTT) legislation. This allows patients to try drugs that are not yet approved in the end-stages of their disease in the hope that these unproven drugs may pull a rabbit out of the hat for a few patients. How much the companies developing these drugs can charge, and whether or not they will be reimbursed by private or public US payers, are little details that, to date, seem to have been overlooked.

"THE PRICING AND REIMBURSEMENT OF DRUGS IS THE NEW HURDLE TO OVERCOME FOR PHARMACEUTICAL COMPANIES."

In both cases then – for drugs that are approved and for access to drugs under the RTT legislation – access to patients by regulatory approval or RTT legislation is much less of a barrier to commercialisation than it used to be. However, the pricing and reimbursement of drugs is the new hurdle to overcome for pharmaceutical companies.

The US: The land of free drug pricing

In the US, companies can charge whatever price they like for their drug. The UK and Germany, which are usually the first two European markets in which drugs are launched, also have what is termed 'free pricing'. While patients can pay out of pocket in these two European markets, use in the NHS in England requires a positive health assessment by the National Institute for Health and Care Excellence (NICE). In Germany, the free pricing period lasts only for the first year and the pricing thereafter is negotiated with the public and private payers. In both cases, companies tend not to prejudice the final pricing by aiming for the stars in the first year.

In other European countries like France and Italy, draconian, fragmented and complicated pricing standards as well as long negotiations are required before access is granted. If you were hoping that your favourite biotech company would cast-off all these pressures and head east to Japan, where traditionally pricing has been more favourable, you would still be disappointed. Japan has a bigger demographic issue with a larger senior population than most other markets and has been envious of the 90% of US prescriptions that are generic (cheap, off-patent). In consequence, the Ministry of Health, Labour and Welfare in Japan imposes bi-annual price cuts for even branded drugs and expects 80% of Japanese prescriptions to be for a generic medicine by 2020.

This brings us back to the US as the land of free drug pricing (the main reason why most drugs launch first in the US). How can investors ensure that the biotech companies in which they are invested aren't developing a drug whose price is an inverse of its clinical benefit and its revenues will be consigned to the less-than-$20-million-five-years-after-launch club? The short answer is that they can't. Few investors have the budget or expertise to commission and deliver a pricing and market access primary research study, but their investee companies could. In many respects, it would form part of their valuation modelling for when they discuss licensing their products to bigger companies, and if they put some of the results in their investor presentations, it would certainly put their investors' minds at rest.

"FEW INVESTORS HAVE THE BUDGET OR EXPERTISE TO COMMISSION AND DELIVER A PRICING AND MARKET ACCESS PRIMARY RESEARCH STUDY, BUT THEIR INVESTEE COMPANIES COULD."

Price discovery for drug companies

How early should a pricing and market access study be conducted by a small biotech company? When I worked in a pharmaceutical company at the end of the last century, we only really started these studies once the product was in Phase III. There is a logical school of thought to suggest that once a company enters Phase III – the most expensive clinical study and what we used to call the investment decision (before I knew anything about financial investment) – it is a bit late to investigate whether the product is commercially viable or not. Today, these studies are done much earlier, and a presentation by a senior executive at Eli Lilly at the end of 2016 described how a limited pricing and market access study was conducted by Lilly for all products entering clinical development.

So now we have determined the need for biotechnology companies to at least get a feel for the pricing and reimbursement status of their molecule before they get too far down the clinical development path, what is involved in such a study? Let's get some tricky terminology defined first because there is not just one price for a drug.

If you have access to the British National Formulary (BNF) or the Monthly Index of Medical Specialties (MIMS), you can look up the NHS price for drugs available in the UK. (Let's leave aside those drugs that are not paid for under the NHS and may only be available under a private prescription.) The NHS price quoted in the BNF or MIMS is the list or gross price. If the drug is prescribed in a hospital, it may not be the price that the hospital pays for the drug – that will be determined after discounts, rebates and even a tender process have been applied – and that lower price will be the net price.

Remember when you look at the top of the income statement for your company and it says 'net revenue', that is total sales net of discounts rebates and returns. So, while the net price is what you need to value the commercial opportunity of your product, for a myriad of competitive reasons, it is rarely – if ever – disclosed. The only way you can find it out is by asking payers what

"IF YOU HAVE ACCESS TO THE BRITISH NATIONAL FORMULARY (BNF) OR THE MONTHLY INDEX OF MEDICAL SPECIALTIES (MIMS), YOU CAN LOOK UP THE NHS PRICE FOR DRUGS AVAILABLE IN THE UK."

their cost is, and this is just one of the questions that are asked of payers in a pricing and market access study.

These studies involve finding suitable payers who are active and have a history of making reimbursement decisions. For hospital products, this can mean discussions with pharmacists or hospital administrators who are on Pharmacy and Therapeutics committees. In the US, whether the drug is prescribed in the community or in hospitals, medical directors from both public (Medicare, Medicaid and the VA) and private (health management organisations and healthcare insurers) are consulted, since both have committees in which clinical data are discussed and pricing and reimbursement decisions are made.

For drugs that are still earlier in development, payers can be presented with a target product profile summarising the performance of a sponsor's drug so that the payer can get a feel for the safety and efficacy in patients alone and in comparison to (the cost of) the standard of care. Typically, price-referencing and discount levels are discussed in payer research as are a set of six questions that, if answered by enough respondents, can present you with a drug's probable price, although these days it is usually described in a 'pricing corridor' in a tried and tested modified Van Westerndorp analysis.

A word to the cynics

If there are cynics among investors or the management of biotech and pharma companies, it might be said that they do not want to ask those tricky questions on drug (or device) pricing and market access because they do not want to know the answers. For companies who do want to determine a value for their pipeline that is justifiable to investors and potential big pharma licensors, a well-conducted pricing and market access study can only help. Many smaller biotech companies would have been put off by the high cost of employing a pricing and market access consultancy to provide them with this important information, but fortunately help is at hand.

After working as a principle in a pricing and market access consultancy, I moved to Edison Investment Research in 2017. Judging from discussions with our clients that were close to either the market or Phase III, the importance of such studies was appreciated. In the spring of 2018, we completed our first pricing and market access study for an Edison client using the same methodologies and generating the same outputs as have been discussed above conducted with US respondents. Because the clients for these studies are Edison clients, the cost will be much more reasonable than engaging in a full-blown consultancy project.

When I first started as an investor in 2000, my heart used to sink whenever I read the phrase 'in the Directors' opinion' as a qualification on how big the market was for their lead drug, because that was all it was: an opinion. For about 17 years as an investor, I had the same feeling when I read the caveat 'in our view' in investment bank research, which was also a qualifier for a number plucked out of thin air. Now, thanks to our ability to conduct pricing and market access studies for Edison Investment Research clients, our clients, their investors and their potential licensors can have a better objective valuation for a reasonable price.

About Dr Andy Smith

Andy joined the Healthcare team at Edison in November 2017 after a period as a senior principal in ICON's Pricing & Market Access consultancy. Prior to ICON he was chief investment officer at Mann Bioinvest and managed healthcare and biotech funds at AXA Framlington, SV Life Sciences, Schroders and 3i Group. Andy is a scientist by training and completed his PhD with Glaxochem after working for ICI and in the NHS. Between working as a lecturer at Guy's Medical School, he worked in R&D management at SmithKline Beecham, before moving to the Strategic Product Development group in SB Pharmaceuticals to be a global product manager. Andy also has an MBA from the University of Greenwich and teaches the finance module on the Master's in Bioscience Enterprise course at the University of Cambridge.

BY VICTOR HILL

OPPORTUNITIES IN FOCUS

CYBER WARS II: THE NEW ARMS RACE

In the June 2017 edition of this magazine, I wrote a piece called *Cyber Wars* about how both states and criminal parties had weaponised the internet. Since then a lot has happened in this arena. We now know that branches of the military in numerous countries have established formal cyber-warfare capabilities. The CIA and Israel's Mossad have even set up investment funds which channel start-up finance to companies active in the field of cyber-security.

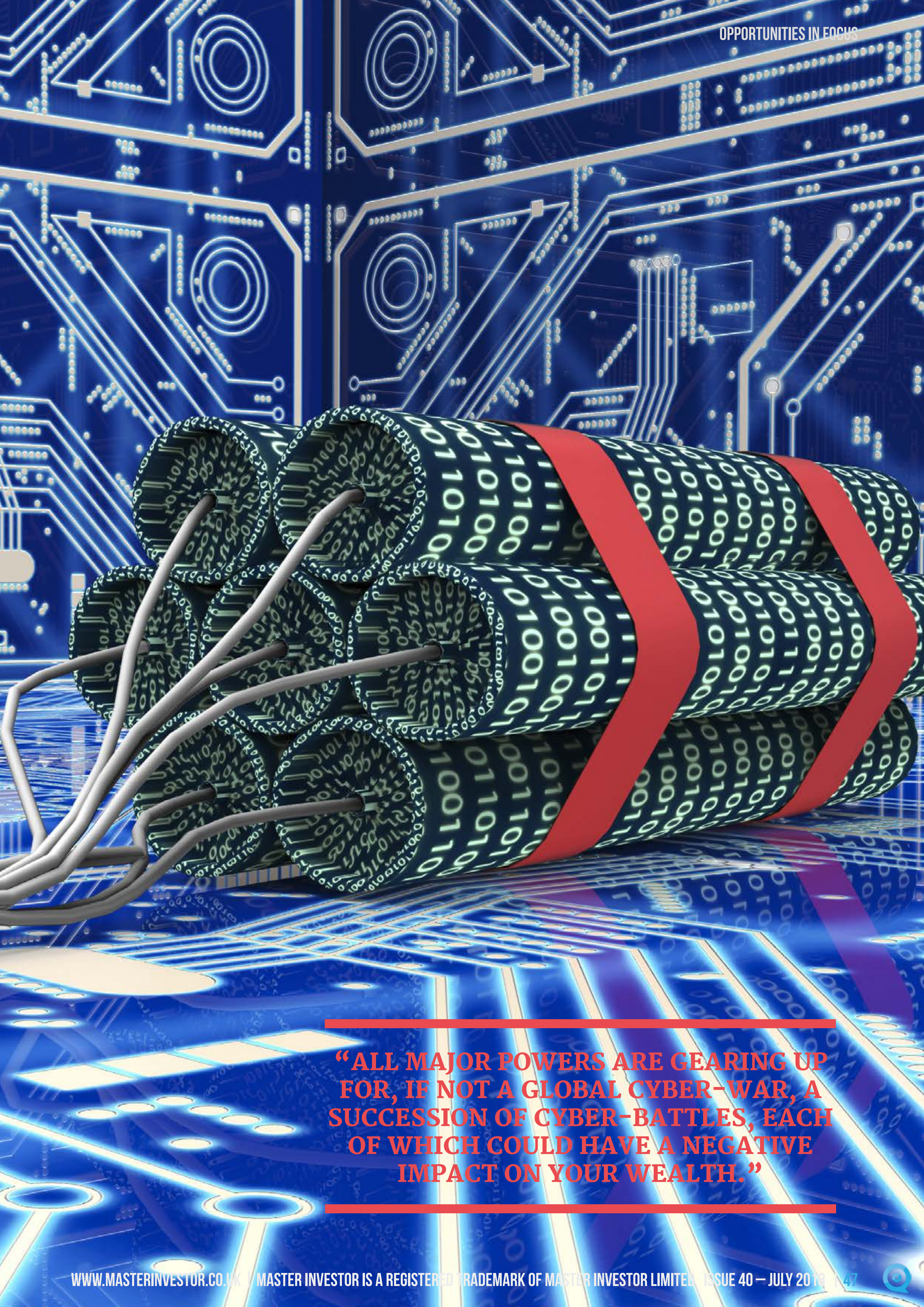
The scale of cyber-warfare already in play is much underestimated. Firstly, the vast majority of cyber-attacks on governments and businesses are never reported but are rather hushed up in order to avoid reputational damage or political or legal repercussions. Secondly, there is no universal definition of what a cyber-attack is; nor are there universally agreed measures of how much damage each one does.

Last month, I considered how the Big 5 US technology companies had established themselves as huge depositories of data – much of it about us, the people who use their products and services – and how they had also become Artificial Intelligence (AI) hubs.

This month, I want to show how the US government regards these five Silicon Valley corporations as part of its national security apparatus. The revelations made by Edward Snowden (who was probably working for the Russians all along) via WikiLeaks back in 2013, fuelled a debate about mass surveillance which, though abated, is still ongoing. The relationship between US security services and the Big 5 poses delicate questions about the balance of security and privacy in a dangerous world.

But the US is not alone, even if its technology is the most advanced. All major powers are gearing up for, if not a global cyber-war, a succession of cyber-battles, each of which could have a negative impact on your wealth.

A cyber arms race has begun. It is time to protect and survive.



"ALL MAJOR POWERS ARE GEARING UP FOR, IF NOT A GLOBAL CYBER-WAR, A SUCCESSION OF CYBER-BATTLES, EACH OF WHICH COULD HAVE A NEGATIVE IMPACT ON YOUR WEALTH."

“THE RELATIONSHIP BETWEEN US SECURITY SERVICES AND THE BIG 5 POSES DELICATE QUESTIONS ABOUT THE BALANCE OF SECURITY AND PRIVACY IN A DANGEROUS WORLD.”

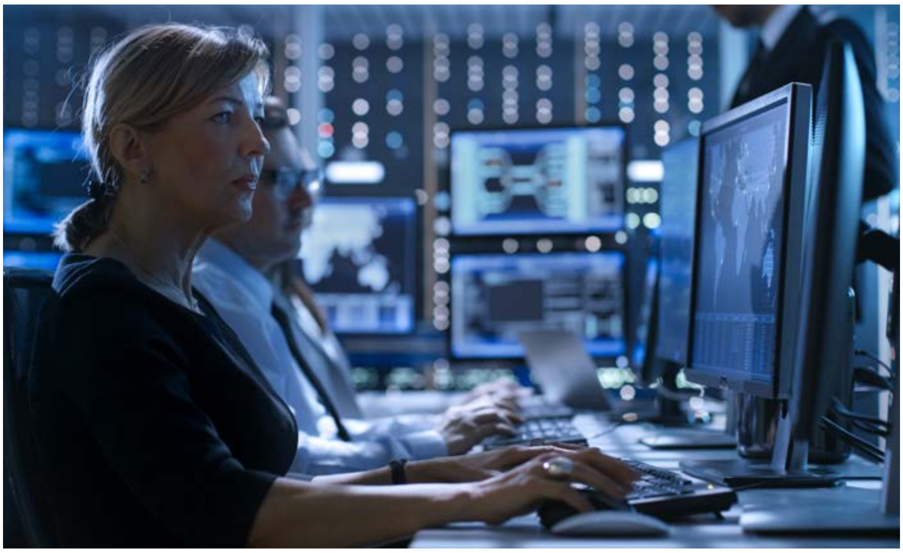
The weapons of cyberwarfare

Both the Republicans and the Democrats in the United States, as well as numerous other political parties elsewhere, have employed data analytics to target ads at swing voters during recent elections. There is absolutely nothing illegal about this – it is just the digital equivalent of canvassing voters in marginal wards by knocking on doors, which all British political parties have been doing for many years.

But, as I have written in the MI portal recently, the extent that people can influence opinion via the internet for good or ill can be considered as just one aspect of cyber-warfare. In the last year or more since the infamous *Black Cyber Friday* events, we have come to think of Cyber-warfare as being waged in three different ways.

First, there are so-called *distributed denial of service type* (DDoS) attacks. Under this approach a computer system can be bombarded with more traffic than it has been designed to handle, to a point where it can no longer cope and it shuts down. This can be achieved by hackers who maliciously plant software on thousands of innocent users' computers which then attack the target computer system. It is sobering to reflect that the laptop you are using to read this article might, without your knowledge or consent, be currently engaged in a DDoS attack.

The most serious DDoS attack to date was the work of the *Mirai botnet*. (A botnet is created by hacking a system of inter-connected devices which can then be controlled by a third party.) Mirai (the Japanese word for "the future") is a form of malware that turns networked devices running Linux into remotely controlled *bots* that can be used as part of a botnet in large-scale network attacks. It primarily targets online consumer devices such as webcams and home internet routers.



In October 2016 this malware attacked a company called Dyn (a subsidiary of **Oracle Corporation (NYSE:ORCL)**) which effectively manages a large part of the internet's infrastructure in the USA. It temporarily paralysed much of the internet across the country. There have been numerous cyber-attacks against Estonia of this nature, the most damaging of which occurred in April 2007.

Second, there are cyber-hacks (often just known as *hacks*) which are designed to steal and then to leak sensitive information. One of the most dramatic of these targeted Sony Pictures, the California-based subsidiary of **Sony Corporation (TYO:6758)**, in November 2014. Hackers, who identified themselves as the *Guardians of Peace* (GOP), leaked confidential personal information about Sony Pictures' employees and their families, emails between employees, information about executive salaries at the company and copies of films which had not been released. The perpetrators then employed a variant of the Shamoon wiper malware to erase Sony's computer infrastructure. The mysterious GOP then demanded that Sony cancel the release of its film *The Interview*, a comedy about a plot to assassinate North Korean leader Kim Jong-un. They even threatened terrorist attacks at cinemas if the film were screened.

Some major US cinema chains chose not to screen the film in response to these threats. Sony cancelled the film's premiere and cinema release, opting to skip directly to a downloadable digital release followed by a limited digital theatrical release the next day. US intelligence officials, after evaluating the software, techniques, and network sources used in the hack, alleged that it was sponsored by North Korea.

The Democratic National Committee's email servers were hacked during the 2016 US presidential election in similar fashion, though it is still not clear who was responsible.

A particularly pernicious form of hacking is characterised by attacks that damage essential devices which are linked to the internet, including computer systems for the logistics, telecommunications and energy sectors. A major malfunction in any one of these could bring a major economy to a state of paralysis. (See the panel below on the Ukraine hacking attack.)

Third, the US military uses the term *information warfare* to refer to any attempt to influence opinion in a country by means of (as I explained in last month's magazine article) what we used to call *propaganda* – but which we now call *fake news*. This could be intended to misinform and confuse ordinary people, or possibly, to undermine their morale and resolve.

Again, the idea behind it is not new. Nazi Germany tried to scare ordinary Britons with the wartime broadcasts of William Joyce – "Lord Haw Haw" whose catchphrase was *Germany calling*...Not that it had any effect on the plucky Brits who, so it is said, found these broadcasts absurd. (Nonetheless, Joyce was captured and hanged after the War for treason.)

Information wars

The information warfare of today is potentially hugely more subtle and effective than Dr Goebbels, the head of Nazi propaganda, could have dreamed. In his book, *The Darkening Web: The War for Cyberspace*, Alexander Klimburg[i] contends that the internet is already the main stage for confrontation between states. In this new arena of conflict, brilliant individual minds and informal networks have the capacity to bring ostensibly stable societies to their knees.

Mr Klimburg thinks that competition for *cyber-power* is a development as complex and troubling as the advent of nuclear weapons during the Cold War – and quite possibly as dangerous for humanity. Algorithms owned, developed and deployed by a relatively few large corporations determine (a) the results of our web searches; (b) the posts and news stories featured in our social media feeds; not to mention (c) the targeted ads, to which we are all exposed continuously.

Facebook (NASDAQ:FB) estimated in April that 11.4 million Americans saw advertisements that had been paid for by Russian parties in an attempt to sway the 2016 election in favour of Mr Trump. A further 126 million people, Facebook disclosed, were exposed to posts by Facebook groups used by Russia. **Twitter (NYSE:TWTR)** also fears that its users may have been subjected to fake news by Trojan accounts run from Russia. But then a prominent Twitter devotee – one Donald J Trump – uses Twitter to accuse others of fake news on an almost daily basis.

Mr Klimburg argues that citizens in Western democracies are especially vulnerable to information wars of this kind. Opinion polls in the USA, the UK and elsewhere show that ordinary citizens have declining faith in their national institutions and in the probity of their politicians. This makes them more susceptible to unfounded allegations.

"COMPETITION FOR *CYBER-POWER* IS A DEVELOPMENT AS COMPLEX AND TROUBLING AS THE ADVENT OF NUCLEAR WEAPONS DURING THE COLD WAR – AND QUITE POSSIBLY AS DANGEROUS FOR HUMANITY."

Corporate governance issues

Even though Facebook and Google are publicly traded companies, their founders can out-vote anyone else. Mr Zuckerberg controls 60 percent of the voting stock at Facebook. Messrs Brin and Page control more than 50 percent of the voting stock at Alphabet-Google. So, total control, then. They are not only billionaires but corporate dictators.

In May 2011 the administration of President Barack Obama unveiled something called the *International Strategy for Cyberspace.* This document postulated that the internet was a space where "the norms of responsible, just and peaceful conduct amongst states and people have begun to take hold". But, after Edward Snowden's revelations about snooping by US intelligence agencies in 2013, the Obama administration became more defensive. Policy advisers argued that the US should define itself as *an advocate of a free internet* in contradistinction to *cyber-sovereignty adherents* such as Russia and China, which aim to control the influence of the internet over their citizens' thought processes.

Cyber-attacks against Iran

Mr Klimburg takes issue with the official US view. He thinks that America's military has always understood the psychological hold of the internet and has wished to dominate it. About a year before Mr Obama's *International Strategy for Cyberspace*, Russia's Kaspersky Lab acquired the *Stuxnet* virus. This malware, it is alleged, was originally developed by the US and Israel to disrupt Iran's efforts to develop a nuclear weapon by corrupting the control systems in Iran's centrifuges (used to purify nuclear fuel). Supposedly, this virus caused Iran's centrifuges to malfunction and even explode – but, inevitably, it spread to other countries.

Under Meir Dagan (1945-2016), the late Director of the Mossad, Israel effectively conducted a hybrid war against

Iran. He organised hit teams who blew up the cars of Iranian nuclear scientists as they set off to work. Fake companies were established in Eastern Europe to sell defective equipment to Iranian agents. Cargo planes mysteriously blew up. And – most effective of all – the *Stuxnet* virus struck. Incidentally, it is worth noting that, in retirement, Meir Dagan was a vocal opponent of Mr Netanyahu's advocacy of an Israeli first-strike against Iran[ii].

In covering its tracks, the US – and possibly other Western states – has used the same information war tactics to bend or blinker opinion. Mr Klimburg is more worried about states using the internet for their own purposes than the Silicon Valley giants, despite the latter's worrying lack of transparency.

On 07 June former British intelligence chief Robert Hannigan told the *Infosecurity Europe* conference at Olympia in London that Iran had already launched cyber-attacks on the UK. That country is likely to launch renewed attacks further to President Trump's decision to pull out of the 2015 accord with Iran, to which Britain is a party. He fears attacks on household routers, supply chains and power supplies. He was particularly concerned about the vulnerability of the City of London and the power generation industry.

Mr Hannigan ran GCHQ until 2017 and now chairs the cyber-security firm BlueVoyant Europe.

Information Wars: the Koch Brothers and i360

The US data analytics company, i360, is owned by the Koch family, owners of Koch Industries, reportedly the second largest private company in the USA. They are known to be important donors to conservative and Republican causes.

i360 has allegedly spent years developing profiles of an estimated 250 million American citizens and using this data to determine what kinds of advertisement will have traction with a given audience. It employs *mobile ID matching* which can link individuals to all the devices they use – unlike cookies which link a user to a given device. i360 has worked closely with both Google (for its *DoubleClick* application) and with Facebook.

The Koch family are accused in the US of using their online influence to promote scepticism about anthropogenic climate change. Some commentators think that the firm wants to develop a comprehensive strategy to influence voters before this year's mid-term elections.

Deep states

The internet as it developed in the USA owes much to the Defence Advanced Research Projects Agency (DARPA). This is a government agency within the US Department for Defence which has been charged with the task of developing new technologies of use to the military. DARPA boasts that it has been instrumental in both speech recognition technology and AI. But then it is a cliché that much of modern technology is simply the commercialisation of military innovations. Weren't *Teflon* non-stick frying pans supposed to be a spin-off from NASA's moon project?

What is of interest to investors is that DARPA offers early-stage funding to researchers to develop new technologies for national security purposes. Then the US government invests in companies that can commercialise these technologies. Driverless cars – scheduled to arrive soon – will utilise technologies first used by the military in missile guidance systems and drones. Some smartphones now employ facial recognition technology developed by special intelligence.

In the US, the Small Business Innovation Research (SBIR) programme, funded overwhelmingly by state agencies, is investing an estimated $2.5 billion annually. The CIA, the Defense Department and NASA all play the role of venture capitalists by investing in promising private companies.

The CIA's investment fund, In-Q-Tel, has been hugely successful. It was the initial sole investor in Palantir Technologies (founded 2003 and still private), a software company backed by Peter Thiel which specialises in the analysis of big data. A subsidiary of Palantir called Palantir Gotham specialises in data analysis for the purpose of counter-terrorism and has won important contracts from the FBI, the National Security Agency and the Centre for Disease Control and Prevention.

Cyber-wars: US versus China

It was reported in June that Chinese hackers stole data from a US navy contractor, including plans for submarine-launched supersonic anti-ship missiles. The breaches took place in January and February this year, US officials told *The Washington Post*.

Most readers of this article will already be users of one of In-Q-Tel's greatest achievements – Google Earth. This began life as a 3-D mapping start-up owned by the National Geospatial Intelligence Agency. Frame, the cloud computing pioneer was jointly financed by In-Q-Tel, Microsoft and Bain Capital Ventures. Infinite Z, another beneficiary of seed capital from In-Q-Tel is enabling computers to interact with 3-D holographic images. Aquifi is producing scanners that can create a colour 3-D model of any scanned image.

The accusation now by people like Professor Tamsin Shaw[iii] is that since many of these hi-tech start-ups end up being acquired by one or other of the Big 5, there is now a symbiotic relationship between big technology and the US military-intelligence complex. Eric Schmidt, a former Executive Chairman of **Alphabet Inc. (NASDAQ:GOOGL)**, now chairs the Pentagon's Defense Innovation Board on which Amazon's Jeff Bezos also once served.

Further, it is alleged that the US government has ultimately defended the monopoly positions of the Big 5 because it believes that America benefits from the soft power they generate. The idea of allowing other countries to become dependent on US-controlled technology is sometimes called "friendly conquest". One example is Microsoft, whose Windows operating system powers the vast majority of PCs all over the planet.

Critics are asking whether the money the CIA invests in start-ups via In-Q-Tel represents a good return for the American taxpayer. True, the government gets to use the technology, but the patents are ultimately owned by the final shareholders for their own financial gain. There is also the fear that foreign parties could buy into this technology.

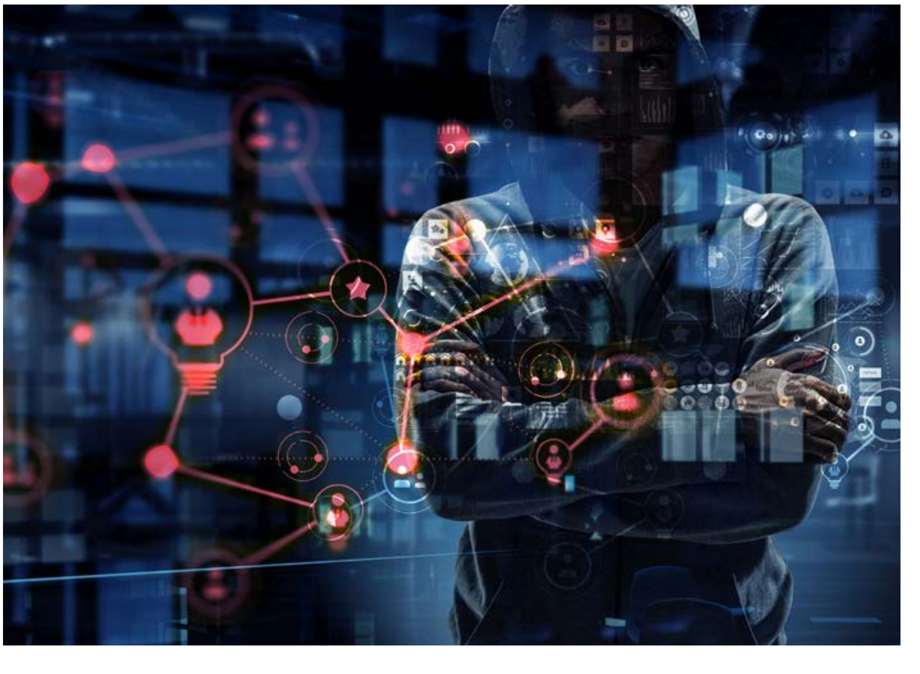
Out of the Big 5, **Apple (NASDAQ:AAPL)** has the lowest R&D budget. The company has largely succeeded by integrating other people's technology into aesthetically designed products. Yet, as is well known, Apple's tax management practices have been sharp, sheltering most of its income in Ireland and holding huge cash reserves in other offshore jurisdictions. At least until now, that is (given Mr Trump's tax reforms).

Hackers: Black Hats or White Hats?

In my article in the June 2017 edition of the MI magazine I focussed on the massive *WannaCry* ransomware cyber-attack that struck 100 countries around the world on 12 May 2017 – widely recalled as *Black Cyber Friday.* Amongst others, NHS hospitals were threatened with computer meltdown unless they paid a sum of Bitcoin then equal to about US$300.

The advance of the malware across the planet was slowed when a British *White Hat hacker* stumbled upon a "kill switch". The brilliant young hero who was known on Twitter as *Malware Tech* worked out that every time *WannaCry* runs, it pings a request to a non-existent address (URL) in cyber-space. This was intended to verify that the malware is genuinely inside a new computer and is not contained within a cyber-security "sandbox". (Sandboxes simulate the internet in such a way as to convince the malware to reveal its evil intentions). If the ping returns from the non-existent web address then the malware works out that it is in a "sandbox" – and then immediately shuts down so as not reveal anything about itself.

Malware Tech identified the non-existent web address in question, registered the domain name (at a cost of



Bank fraud explodes

We don't normally think of bank fraud as a cyber-security issue. Scammers often ring up their victims, often impersonating a bank employee, and trick them into revealing their bank account log-in details using all kinds of vile ruses. Elderly people who live alone are particularly vulnerable. Fraudsters often obtain lists of such vulnerable people from criminal websites on the *dark web*.

In some cases fraudsters use remote log-in software to get control of the victim's computer. If you are familiar with Log Me In you will know that you can give a trusted third party access to your computer at the click of a mouse. Once a third party is accorded such access they can effectively launch a hacking attack of whatever kind they wish. The UK banks are calling for powers that would permit more extensive sharing of information between banks to help them to blacklist known fraudsters.

about £10) and then activated it. In so doing, he convinced every copy of *WannaCry* worming its way through the World Wide Web that they were inside a "sandbox" – and should thus go to sleep.

It was later revealed that Malware Tech was a 22-year old computer specialist named Marcus Hutchins from Devon. On 02 August last year Mr Hutchins was arrested by the FBI while returning from the DEF CON hackers' conference in Las Vegas. He was accused of helping to create, propagate and nurture the malware virus Kronos.

"ROBERT HANNIGAN TOLD THE SUNDAY TELEGRAPH BACK IN JANUARY THIS YEAR THAT UK UTILITIES WERE 'VERY VULNERABLE' TO A CYBER-ATTACK."

Kronos is a Banking Trojan designed to steal banking credentials and personal information from victims' computers, which was sold for $7,000 on a Russian online forum. The FBI accused Hutchins of writing and promoting it online, including via YouTube. Mr Hutchins pleaded not guilty at a court hearing in August 2017 in Milwaukee and was released on $30,000 bail.

As of 06 June this year Mr Hutchins was facing four more charges. He is now also accused of creating a second piece of malware, known as UPAS Kit, and of distributing it with the help of another person. According to the court documents, the malware was created in 2012 to be installed silently and not alert anti-virus software. It is alleged to have collected personal information. Mr Hutchins's lawyer, Brian Klein, described the new indictment as "meritless".[iv]

The UK National Cyber-Security Centre on alert

Mrs May's government has pledged to spend £2 billion over the next several years on cyber-security. The establishment of the National Cyber Security Centre (NCSC), which started formal operations in October 2016, was a watershed. The NCSC, located near Victoria Station in London, comes under the authority of the national spy agency GCHQ.

The NCSC and other UK state agencies have ordered Britain's energy, water and transport companies to strengthen their cyber-security defences amid fears, following the incident in Salisbury on 04 March and its aftermath, that Russian hackers will make revenge attacks on UK infrastructure.

Companies that fail to prepare for a cyber-attack could be penalised with fines of up to £17 million. The measures, announced earlier this year, will apply to all UK electricity, oil and gas and telecoms companies. Robert Hannigan told the Sunday Telegraph back in January this year that UK utilities were "very vulnerable" to a cyber-attack. The problem appears to be that the UK energy sector operates last-generation legacy systems which are now connected to the internet.

In early June the outgoing head of the UK armed forces, Air Chief Marshall Sir

Ukraine: a warning from history

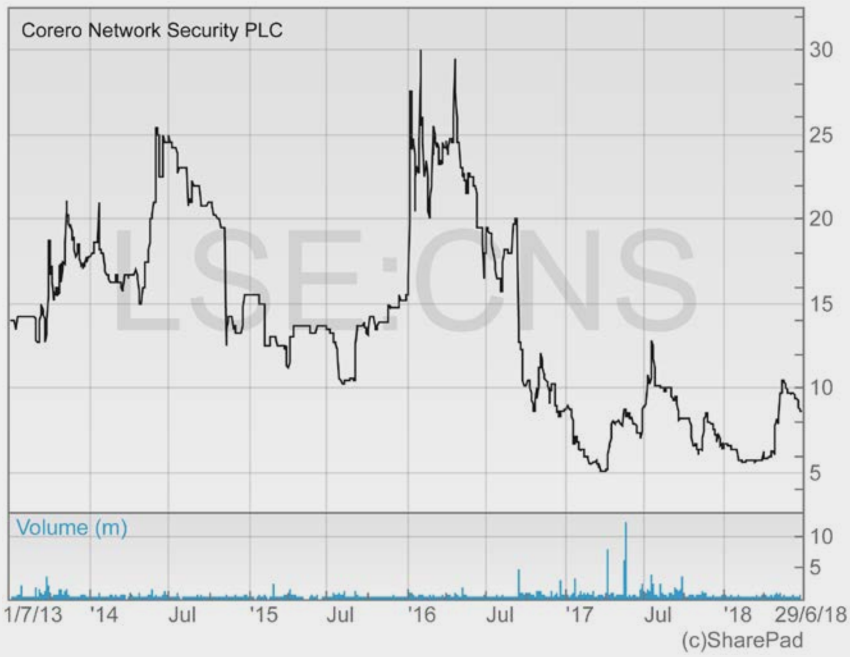
During the night of 23 December 2015 Ukraine became the first country to suffer a verified large-scale cyber–attack on its critical infrastructure. An estimated 225,000 Ukrainians suddenly lost power in mid-winter after a cyber-attack disabled the country's power grid. Power plant operatives reported that their cursors just started to move across their screens of their own accord. When they tried to log back into the system they were barred: someone had changed their passwords…

It later became clear that the cyber-attack has been meticulously planned. The attacker had evidently carried out a forensic reconnaissance of the Ukrainian power grid's maintenance software. Log-in credentials had been stolen. Updated software systems had been rendered unusable. Further there was a DDoS-type attack which made it impossible for Ukrainian households to report outages. When the attack was concluded, the Ukrainian power grid computers were wiped clean so as to render them unusable in the future. All this amounts to an effective military operation. According to experts, however, it could have been much worse.

Cyber-security champions

In the article of 13 months ago I suggested that there were a number of listed niche players in cyber-security whose shares would be worth watching. How did they fare? In a word: disappointingly.

Sophos Group PLC (LON:SOPH) is headquartered in Abingdon, Oxfordshire. After the ransomware attack last year which he described as a "wake-up call", CEO Kris Hagerman revealed that Sophos was adding about 10,000 new customers every quarter. Revenues rose to $640.7 million in the year to 31 March 2018. The company has still not broken even and recorded a loss of $66.3 million for the year. On 28 June the share price stood at 618 pence – up from 448 pence one year earlier. But the chart reveals a high degree of volatility. The share price dropped to a low of 416 pence on 04 April. On 14 June Deutsche Bank rated Sophos a BUY.



Corero Network Security PLC (LON:CNS). In May last year Corero announced that a leading US international website hosting and service provider was now its second $1 million plus customer for its flagship *SmartWall* product. Shares in the company rose by 0.24 pence to 8.99 pence. Since then the company's shares have been on a roller-coaster ride, having been as high as 14 pence and as low as 5.5 pence. At the end of June the share price stood at 8.7 pence. The company had revenues of $8.53 million in the year to 31 December 2017, with losses of about the same amount. Currently it has a market capitalisation of about £33.5 million.

F-Secure Oyj (HEL:FSC1V) is a Finnish cyber security company based in Helsinki, Finland. The company has 20 country offices and a presence in more than 100 countries, with Security Lab operations in Helsinki and in Kuala Lumpur, Malaysia. Through more than 200 partners globally, millions of broadband customers use F-Secure services. Its flagship vulnerability scanning products are Radar Managed Services and its Rapid Detection Service. F-Secure is listed on the Helsinki Stock Exchange. Its shares have traded in the €3.50-€5 range over the last 12 months, exhibiting great volatility.

A firm I did not mention last year is **Micro Focus International PLC (LON:MCRO/NYSE:MFGP)**. In September last year the company completed its $8.8 billion takeover of **Hewlett Packard Enterprises' (NYSE:HPE)** software businesses, including the remnants of Autonomy. The takeover makes the Berkshire-based company the UK's largest tech company, overtaking accounting software group **Sage PLC (LON:SGE)**. On 19 March 2018, Micro Focus' shares fell 55 percent to 849 pence after the company warned of a sharp fall in revenue and its chief executive, Chris Hsu, resigned. The company's shares have had a disappointing run over the last 12 months falling from 2,375 pence at the end of June 2017 to 1,293 pence at the end of June this year. On 17 May Micro Focus International PLC announced that Deutsche Bank AG had built up a 6.6 percent stake in the company. The bank's previous holding in the software and information technology business was not disclosed.

Stuart Peach, used his farewell address to say that he was "quite relaxed" with the idea of recruiting troops with first class cyber-warfare skills who would never see front-line action. Such servicemen and women wouldn't be required to meet the UK armed forces' rigorous fitness tests.

A recurring nightmare: could hackers wrest control of an airliner?

The mystery of flight MH370 has never been resolved. Readers will recall that a Malaysia Airlines (private) flight scheduled from Kuala Lumpur to Beijing on 08 March 2014 mysteriously disappeared – almost without trace. A few scattered fragments of the aircraft have been found including a flaperon washed up on a beach on Reunion Island.

In May, Dr Mahathir Mohammed (then an opposition leader but now the 92-year old Prime Minister of Malaysia) told *The Australian* newspaper that it was possible that the aircraft had been hijacked "remotely"[v]. This is one of many conspiracy theories that have been circulating on the internet for years – but Dr Mahathir is the first politician to have endorsed it publicly.

In his book *Beneath Another Sky: A Global Journey into History*, the distinguished Oxford historian Norman Davies argues that technology designed to prevent another 9/11-style terror attack by allowing planes to be controlled remotely could have been exploited by cyber-spooks. He suggests that MH370, which was equipped with Boeing's Honeywell Uninterruptible Autopilot on-board computer, could have been hacked, reprogrammed and then flown to a secret location.

A twist to the mystery is that MH370 was carrying at least four (some websites say 20) employees of Freescale Semiconductor – a company that may have worked with the US National Security Agency (NSA) to develop surveillance technology, according to Edward Snowden's revelations. Freescale was acquired by NXP Semiconductors of the Netherlands in December 2015.

In response to these concerns **Airbus (EPA:AIR)** and **Boeing (NYSE:BA)** have attempted to install real-time warnings for pilots about perceived hacking attempts in their aircraft. Reportedly, Airbus has engaged **Thales SA (EPA:HO)** and **Raytheon Company (NYSE:RTN)**[vi]. Cockpit equipment that could be a target for hackers is manu-

"PROFESSIONAL INVESTORS SHOULD ASSESS THE CYBER-SECURITY RISKS TO WHICH POTENTIAL INVESTMENTS ARE EXPOSED. UK ENERGY STOCKS SEEM TO BE AT HIGHER RISK THAN OTHERS – AND THIS SHOULD BE REFLECTED IN THEIR SHARE PRICES."

factured by **Honeywell International (NYSE:HON)** and **Rockwell Collins (NYSE:COL)**.

Airlines are also increasingly aware that they are vulnerable during maintenance operations which allow third parties to gain access to their aircraft. In early June the US Department of Homeland Security (DHS) reportedly told a group of experts that a cyber-attack on a commercial aircraft was "only a matter of time"[vii]. **Panasonic Corporation (TYO: 6752)** issued a statement to the effect that hackers could never gain access to flight controls through their on-board entertainment systems.

Action

Cyber-security is a niche sub-sector within the technology sector which has gargantuan growth potential. Cyber-security is a commodity for which the world is prepared to pay top dollar. As well as the smaller niche players mentioned in this article, don't overlook the established tech giants which are active in this space such as **Microsoft (NASDAQ:MSFT), Intel (NASDAQ:INTC), IBM (NYSE:IBM)** and **Trend Micro Inc. (TYO:4704)**.

Last year I suggested that investors who allocate to the technology sector should hold at least one cyber-security stock. Also, keen tech investors should keep an eye on where In-Q-Tel invests – all its holdings are listed on its website.

This year I would go further. As part of their due diligence professional investors should assess the cyber-security risks to which potential investments are exposed. UK energy stocks seem to be at higher risk than others – and this should be reflected in their share prices.

Finally – don't forget to ensure that your own computer systems are adequately protected!

About Victor

Victor is a financial economist, consultant, trainer and writer, with extensive experience in commercial and investment banking and fund management. His career includes stints at JP Morgan, Argyll Investment Management and World Bank IFC.

- i Alexander Klimburg is a former fellow of the Belfer Center for Science and International Affairs at Harvard University.
- ii See: *Israel must decide how it wants to fight Iran*, by Roger Boyes, The Times, 06 June 2018.
- iii Associate Professor at New York University. Her review of Alexander Klimburg's book in the New York Review of Books prompted me to buy the book.
- iv See: https://www.bbc.co.uk/news/technology-44398032
- v See: http://www.theweek.co.uk/mh370/58037/mh370-conspiracy-theories-what-happened-to-the-missing-plane
- vi See: Wall Street Journal, 23 June 2017, New Push to Warn Pilots on Hacks, by Andy Paztor.
- vii See: https://www.independent.co.uk/life-style/gadgets-and-tech/news/cyber-attack-aircraft-hack-dhs-a8389941.html
- viii See: http://www.hl.co.uk/shares/shares-search-results/m/micro-focus-international-plc-ord-gbp0.10/broker-forecasts

BY JOHN KINGHAM

DIVIDEND HUNTER

3 HIGH YIELD CAPITAL-LIGHT COMPOUNDERS

Most investors understand the magic of compound interest. Just put your money into a high yield investment, reinvest the income at similarly high rates of return and watch the value of your investment grow exponentially. One nice feature of the stock market is that you don't even have to reinvest your income to benefit from compound interest. That's because most companies retain a significant portion of their profits even after dividends have been paid. Those retained profits are then re-invested in the business, compounding profits even if you use dividends for income.

The best capital compounders

Some of the best compounders are those that: a) generate high returns on invested capital; b) can invest significant amounts of capital at those high rates of return; and c) require relatively little capital to grow, which means they don't need to borrow to fund expansion and are able to pay significant dividends to shareholders.

To find these companies I restricted my stock screen to stocks with: a) ten-year average ROE or ROCE (depending on the type of business) of more than 15%; b) ten-year growth rates of more than 5%; and c) ten-year capex to profit ratios of less than 50% and debt to five-year average profit ratios of less than 300% (both of which are below average).

> **"IF YOU DO LOOK FOR CAPITAL LIGHT COMPOUNDERS, LOOK FOR EVIDENCE OF COMPETITIVE STRENGTHS WHICH MIGHT KEEP AN ARMY OF NEW COMPETITORS AT BAY."**

I then sorted the remaining stocks by yield and picked three companies with dividend yields of more than 4%. The three companies I chose to look at this month were Admiral (the car insurance company), Dunelm (the homewares retailer) and Telecom Plus (the utility services provider).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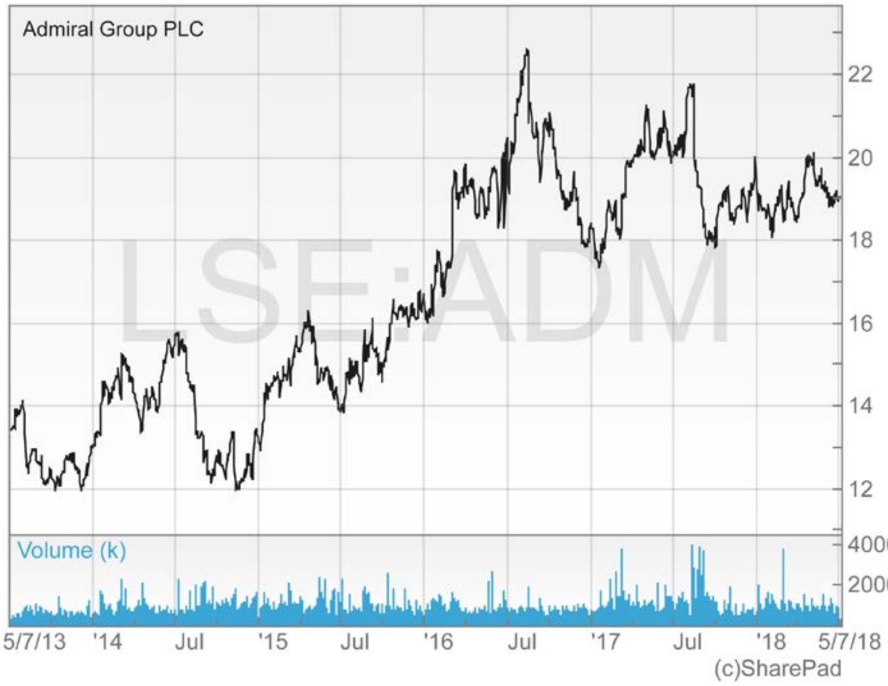
"ADMIRAL HAS GENERATED LOTS OF EXTREMELY PROFITABLE GROWTH OVER THE YEARS, WITH VERY LITTLE USE OF DEBT OR NEED FOR CAPITAL INVESTMENT."

Admiral Group (LON:ADM): The capital-light insurer

- **Share price: 1912p**
- **Dividend yield: 6.0%**
- **10-Year ROE: 52**
- **10-Year Growth: 8%**
- **10-Year Capex/Profit: 9%**
- **Debt/Five-Year Profit: 7%**



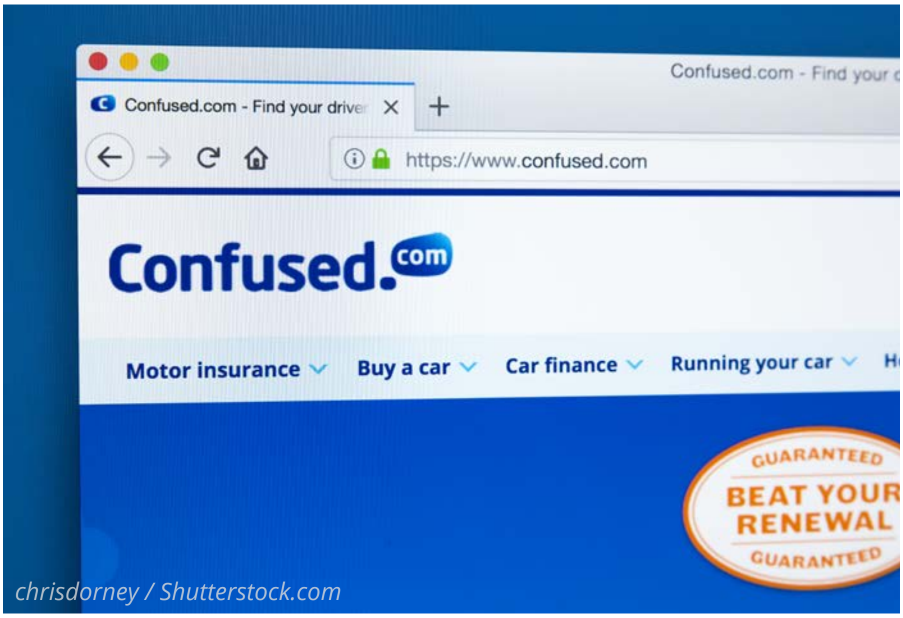
Admiral Group is the company behind the well-known Admiral car insurance brand and the confused.com insurance comparison website. It's one of the UK's leading car insurers, with significant overseas operations as well.

Its basic business model is to access customers directly through comparison websites such as its own confused.com, rather than through traditional insurance brokers.

For this to work, Admiral must be price competitive and so cost efficiency has been at the core of the business since the very beginning. An obvious example of cost efficiency was its decision to locate its offices in Wales. A more fun example is the story of the photocopier push-ups, where staff had to do one push-up for every sheet of paper they used in the photocopier (I'm not sure if the company still does this because it sounds like a discrimination case waiting to happen).

With this business model, Admiral has generated lots of extremely profitable growth over the years, with very little use of debt or need for capital investment. In fact, I've written about Admiral on and off for years, precisely because it's long had the sort of growth, quality and income characteristics I like. So, what exactly is it that makes Admiral a high-quality capital-light compounder?

Being an insurer certainly helps. Insurance companies don't need big factories, machines or other expensive capital infrastructure. All they need is a few desks, some phones and a small number of extremely clever underwriters. This is why Admiral's capital expenses are typically less than 10% of its profits – an exceptionally low amount.



chrisdorney / Shutterstock.com

There's more to it than that though; Admiral is capital light, even for an insurer. Another definition of capital for insurers is the amount of cash they need to keep in the bank to pay future claims. The more insurance Admiral writes, the more profit it can make, but it also needs to put aside (or reserve) more cash to cover future claims, so there is a clear relationship between profits and claim reserves.

To boost the amount of profit it generates relative to those claim reserves, Admiral uses a few tricks. One trick is to pass insurance policies on to other insurers in exchange for a fee, via co-insurance and reinsurance contracts. This allows Admiral to generate additional revenue without needing to have additional capital. It also helps Admiral build scale more quickly, and scale is absolutely necessary if you're going to be profitable as a low-cost insurer. Another trick is to run insurance price comparison websites such as confused.com and compare.com (a newer US-based alternative). These not only acts as a route to market for Admiral by disrupting sleepy insurance broker-based markets, but they also generate a useful amount of non-insurance returns from other insurers who are on the platform.

This combination of relentless cost efficiency, plus coinsurance, reinsurance and non-insurance profits is key to Admiral's success as a capital light compounder, and it's why I've been a shareholder since 2013.

Dunelm (LON:DNLM): The capital-light retailer

- **Share price: 526p**
- **Dividend yield: 4.8%**
- **10-Year ROCE: 39%**
- **10-Year Growth: 13%**
- **10-Year Capex/Profit: 46%**
- **Debt/Five-Year Profit: 160%**

Dunelm is the UK's number one homewares retailer, selling more than 300,000 household items (cushions, lamps, etc.) primarily through 160 out-of-town superstores and its Dunelm.com website. The company also moved into furniture retailing recently with the acquisition of Worldstores, a previously struggling online furniture retailer.

What's interesting about Dunelm is that this isn't exactly a new market. Dunelm isn't trying to disrupt anybody, and it isn't selling previously unheard-of products like electric self-driving cars or phones that will make you a cup of tea. It sells cushions, which people have been selling for thousands of years, so it's a pretty mature market. For me, that makes its ten-year growth rate of 13% all the more impressive.

Part of the reason for its success has been its long-term focus on large, low cost out-of-town superstores. This isn't exactly a new idea, but Dunelm was early to the out-of-town party with its first superstore opening in 1991, just seven years after its first high street store (prior to that it operated as a market stall). These superstores are cheap to build, cheap to run and have economies of scale that smaller high street stores can only dream of. That's why supermarkets used them to expand during the great Supermarket Space Race of the 1990s and 2000s.

While Dunelm's ten-year average return on capital employed is an impressive 39%, some investors would argue that the true figure is far lower. That's because Dunelm's superstores are not counted on its balance sheet because it rents them. If it owned them then they would show up as a fixed capital asset, and that would increase Dunelm's capital employed and lower its ROCE.

Some investors will "lease-adjust" capital by multiplying rent by seven (or thereabouts) and adding that amount to the company's fixed capital. I can understand why some investors do that, but I don't. I think there are pros and cons to it, and as long as you're consistent it probably doesn't really matter. For example, I don't lease-adjust capital employed for any retailers and on my stock screen only W H Smith and Next are more profitable than

> **“RETAILERS AREN’T EXACTLY THE FLAVOUR OF THE MONTH AT THE MOMENT, WHICH IS WHY DUNELM HAS A DIVIDEND YIELD OF ALMOST 5%, DESPITE ITS HIGH PROFITABILITY, LOW DEBTS AND IMPRESSIVE GROWTH RATE.”**

Dunelm. Both those companies are generally thought of as extremely efficient operators, so I think the standard ROCE ratio works just fine (or at least that's what I'll think, until its proven otherwise).

Of course, retailers aren't exactly the flavour of the month at the moment, which is why Dunelm has a dividend yield of almost 5%, despite its high profitability, low debts and impressive growth rate. Mr Market is very pessimistic about UK cyclicals, particularly retailers, at the moment, but Mr Market has a long track record of occasionally being very wrong and this could well be one of those times.

Like Admiral, Dunelm is another company I've owned for a few years and, as things stand today, I expect to be a shareholder for at least a few more.

Telecom Plus (LON:TEP): The capital-light utility

- **Share price: 1154p**
- **Dividend yield: 4.6%**
- **10-Year ROCE: 30%**
- **10-Year Growth: 11%**
- **10-Year Capex/Profit: 27%**
- **Debt/Five-Year Profit: 250%**

Telecom Plus is an unusual business. It trades as the Utility Warehouse, offering a wide range of utility services such as gas and electricity, phone and broadband services and more recently, home and boiler insurance. That may not sound unusual given that many utility companies are looking to provide a wider range of services, including those mentioned above; but there are two things that Telecom Plus does differently:

The first is its long-held policy of not providing any of the infrastructure needed to supply its products. Its gas and electricity are supplied through pipes and wires owned and operated by other companies, and the same goes for its phone and broadband services. And as far as I can tell, even its insurance services are provided by another company.

So, what does Telecom Plus actually do? It provides the necessary customer-facing services. It has a sales force (which I'll comment on in a moment), a customer support team and it sends out bills and accepts payments. So, it does all of the customer-facing activities, but the actual service – the gas, electricity or insurance – is provided by other companies.

The second thing that makes the "Utility Warehouse" different is that it's run as a discount club. As a club it doesn't advertise and it doesn't have an employed sales force; instead, existing members of the club (i.e. customers) can become Partners and earn an income by bringing new members into the club. This is effectively a multi-level or network marketing system, where Partners earn a percentage of the revenues generated by members they bring into the club. If those new members go on to become Partners and introduce yet more members, then the original Partner earns a percentage of those revenues too.

This is a legitimate business model, but it does sound a bit like a Ponzi or Pyramid Scheme and it has had a lot of bad press recently, especially with Herbalife (the world's largest nutrition network marketing business) receiving a $200 million fine for operating as a pyramid scheme. There is a difference though. Telecom Plus's compensation structure incentivises Partners to sell services to customers, whereas Herbalife's compensation structure incentivised their version of Partners to simply bring in more Partners rather than customers who actually use the end product (e.g. electricity or broadband in the case of Telecom Plus, nutrition products in the case of Herbalife).

So why is Telecom Plus such a capital light company? The main reason is that it doesn't build or own any energy or telecoms infrastructure. Vodafone (which I also own) has recently paid out vast sums of money to build a leading 4G network, and that will soon have to be upgraded to 5G. That will then have to be upgraded to 6G and the cycle of heavy investment in expensive physical infrastructure goes on, seemingly without end.

Telecom Plus completely sidesteps this and effectively rents infrastructure from companies like BT (which I definitely don't own). This is still a cost of course, but as long as Telecom Plus can provide the non-infrastructure-related services (i.e. those customer-facing services) more cheaply than the infrastructure owner, it can undercut them on pricing. And this really is the core of Telecom Plus's business.

By lumping together energy, telecoms, insurance and other services, Telecom Plus gathers a larger number of customers over which to spread its customer services costs. Add in a relentless focus on technology-driven cost efficiency, plus a low-cost method of acquiring new customers/members (the network marketing model rather than advertising) and the result is services that are consistently cheaper than most of its previously state-run monopoly competitors.

There are risks of course, primarily in the deals it negotiates with infrastructure owners. But so far that hasn't been a problem and this business model has produced excellent results: double-digit annual growth over the last ten years and an average return on capital employed of 30%.

"AS LONG AS TELECOM PLUS CAN PROVIDE THE NON-INFRASTRUCTURE-RELATED SERVICES (I.E. THOSE CUSTOMER-FACING SERVICES) MORE CHEAPLY THAN THE INFRASTRUCTURE OWNER, IT CAN UNDERCUT THEM ON PRICING."

And yes, Telecom Plus is another one of my holdings, precisely because of its attractive growth rate, profitability and yield. So entirely coincidentally, I own all three of these companies. And while I don't think capital light companies automatically make the best dividend stocks, it's usually a nice feature to have.

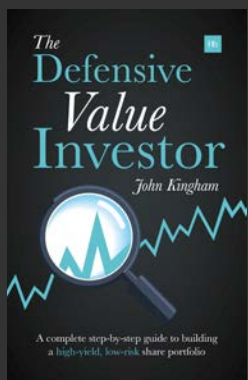
But there are downsides, primarily the fact that it's usually easier for new competitors to compete against capital light companies than it is to compete against capital intensive companies. That's why there are so many tech start-ups; because the capital investment required to make software is tiny. This is good for competition, but bad for incumbents. So, if you do look for capital light compounders, look for evidence of competitive strengths which might keep an army of new competitors at bay.

About John

John Kingham is the managing editor of UK Value Investor, the investment newsletter for defensive value investors which he began publishing in 2011. With a professional background in insurance software analysis, John's approach to high yield, low risk investing is based on the Benjamin Graham tradition of being systematic and fact-based, rather than speculative.

John is also the author of *The Defensive Value Investor: A Complete Step-By-Step Guide to Building a High Yield, Low Risk Share Portfolio*.

His website can be found at: www.ukvalueinvestor.com.



BY DAVID JONES

CHART NAVIGATOR

AN AUTOMATED APPROACH FOR PICKING RECOVERY SHARES

There has been much talk in recent years about the effect that robots are going to have on our working lives. Some have painted a somewhat scary view of the future – with the late Stephen Hawking telling WIRED magazine that he believes artificial intelligence will eventually become so advanced it will essentially be a "new form of life that will outperform humans."

We are not there yet, but plenty has been written about the advancement of automated techniques in financial markets: from "robo-advisors" trying to balance the risks in your pension, to algorithms reading the news and executing high-frequency trades in nanoseconds.

Those of us of a certain age are maybe still a little old-fashioned in our approach and appreciate the human touch. But a little automation can still help filter the opportunities in the thousands of shares listed on the world's exchanges – and so that is the topic for this month's charting column. There is no reason why you cannot automate some of the donkey work of picking potential investments – and you don't need to be a rocket scientist to do it.

Defining the start of a recovery

I often write in the magazine about the importance of identifying and following trends. Plenty of investors get seduced by the call of the counter-trend and attempt to call a bottom in a falling market – the fabled *catch a falling knife* approach. Occasionally, of course, this can work – but a lot of the time the investor learns to realise that the share price was falling for a reason and this continues, and the losses mount up.

But even the most dyed-in-the wool chartist recognises that trends do not go on forever – to mangle a famous market saying: *the trend is your friend – apart from the bend at the end.* One simple way of defining a recovery is a share that was going down and has now started going up. Remember – we do not want to be buying into a share that is still falling – it has to at least have shown some degree of sustainable strength.

“WE DO NOT WANT TO BE BUYING INTO A SHARE THAT IS STILL FALLING – IT HAS TO AT LEAST HAVE SHOWN SOME DEGREE OF SUSTAINABLE STRENGTH.”


CAD
CHF
SEC
RUS
RMY 19.86 - 0.2%
SMZ 12.87 - 0.58%
DIN 17.37 - 2.41%

The time periods used can be subjective – but as we are focussing on investing rather than trading, I tend to define significant weakness as a share price that has slid for a year. And the start of a recovery? If the price is currently higher than it was three months ago, we have the start of a more robotic approach to coming up with an investing shortlist that saves us the leg work of having to flip through many charts.

For this article I have used ShareScope's software and based the list on the FTSE350. There were 97 companies that had fallen for the last year but risen over the last three months. From this list, the share that had gained the most over the previous three months was **Capita (LON:CPI)**.

Managing the risk

On the face of it, this does fit our criteria – it has fallen really heavily but there has been something of a bounce back. In fact, this has been an incredibly strong recovery – the share price has doubled from its three-month low, and therein lies the problem for me from a risk point of view.

"STOP LOSSES ARE NOT JUST FOR TRADERS AND ARE STILL SOMETHING I RIGOROUSLY USE ON LONGER-TERM INVESTMENTS."

It is a question of managing the risk – stop losses are not just for traders and are still something I rigorously use on longer-term investments. If we are looking for a recovery play, we have to accept it may not go in our desired direction immediately. In fact, given the size of the decline and the strong bounce back, there could well be a high degree of "noise" – choppy trading. I do not want to get taken out in all of this chop, so the logical place for a stop-loss is below the three-month low. But in this example, that would mean I would end up losing 50% on the share if I get stopped out. So, it is time for another filter.

"THERE IS NO REASON WHY YOU CANNOT AUTOMATE SOME OF THE DONKEY WORK OF PICKING POTENTIAL INVESTMENTS – AND YOU DON'T NEED TO BE A ROCKET SCIENTIST TO DO IT."

The earlier stages of recovery

To eliminate the shares that have recovered a little too far without me, another filter is applied. Again, this is a simple one – the share price must be no more than 20% above its three-month low. This way, the likes of Capita (that have admittedly done very well) get excluded. This brings the shortlist down slightly from 97 shares to 79. This represents a solid list of shares where the price action is suggesting that maybe the worst of the slide is behind the price, and a list such as this can throw up interesting looking charts such as **Severn Trent (LON:SVT)**.

Clearly, it has not been the best 12 months for holders of Severn Trent, with the price sliding from above 2,500p per share to below 1,700p. But that strength seen over recent months has managed to break out of the trend line highlighted on the chart – often a suggestion that sentiment is shifting. Of course, just because a trend line breaks it does not mean a market is about to set off at a lightning pace in the direction of the new trend – there can often be the "chop", as referred to above. This is what we have seen in Severn Trent. But a stop loss below those absolute lows from February at 1,645p is about 15% away from the current price, which is much more sensible when it comes to managing risk. If this is the start of a more longer-term recovery for the share price, then that major low really should not be broken. It gives a very obvious level to get out if things do not go to plan.

Recoveries often happen slower than you expect

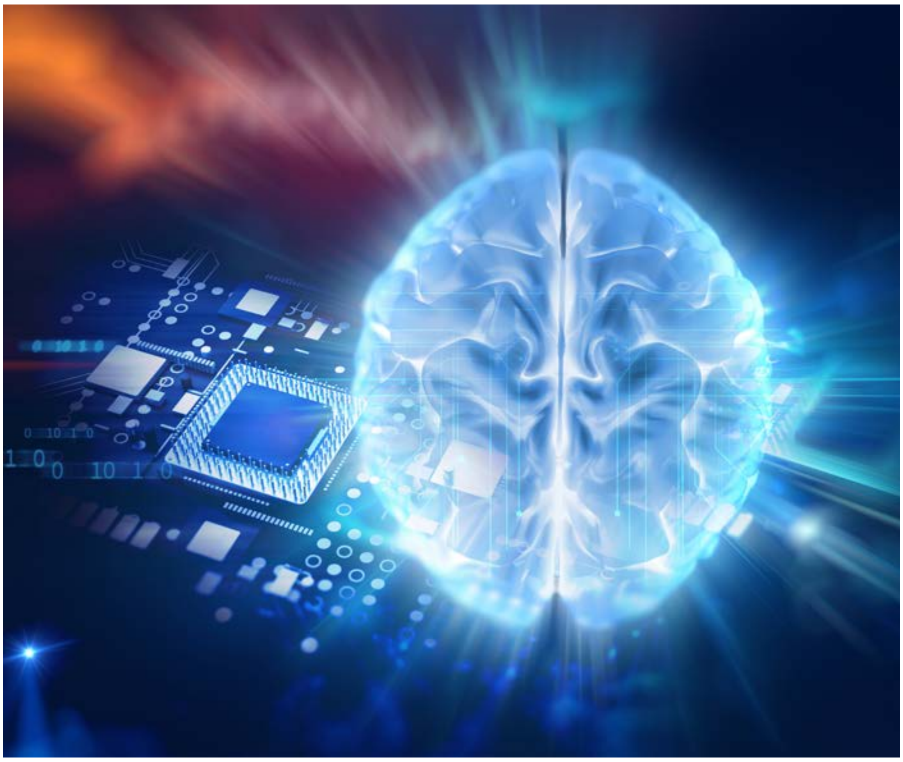
Whilst we all wish our shares would start on an immediate recovery a few minutes after we buy them, this is, unfortunately, rarely the case. It can take some time for positive sentiment to come back. Another possible filter involves getting paid to hold the shares whilst waiting for them to claw their way back higher. This is some simple criteria based on the historical dividend yield for the share price – if it goes nowhere for a year, at least I can hopefully expect to see some income for having my money tied up. Applying the requirement of at least a 3% dividend yield to the list reduces the shares that meet the criteria to 50. Severn Trent still makes the cut, with a historical yield of more than 4% at the time of writing – and a quick scroll through the list can highlight interesting longer-term charts such as **Imperial Brands (LON:IMB)**.

Chart of the Month – IMI (LON:IMI)

For this month's chart I have stuck with the criteria we have been examining throughout the article. Namely, a share price that has declined for the past 12 months, has moved higher over the past three months but no more than 20% above its low and with a historical dividend yield of at least 3%.

I liked this for a few reasons. First of all, that is a clear downtrend from the January 2018 high around 1,450p. This decline found support just ahead of 1,000p in April of this year and the subsequent rally broke the down trend. Since that April low, it has been trying to build a new uptrend. Over the past couple of weeks, the price has weakened – but no market moves in a straight line. If this is going to be the start of a recovery, then that old low at 1,000p should not be taken out. At the current price of 1,140p this gives a stop loss under 13%, which is an acceptable amount to risk when trying to catch the start of a much longer-term recovery. And finally, a dividend yield of 3.4% seems reasonable too.

The share price has dropped by around 40% in less than two years. It has been negative over the last 12 months but has gained around 14% over the last three months and has an historical yield of over 6% at current prices. From a really long-term perspective this has had an incredible trend going back to the beginning of the year 2000. So, some chartists may view the recent run of weakness as bringing the share price back to its historical longer-term trend.



Automation – the future of investing?

"Probably not", is the quick answer to that one! By the very fact you are reading this magazine it probably means that you are someone who still wants to be actively involved in their own investing decisions. But hopefully the approaches outlined here show that it is possible to blend both techniques – you do not have to have a strategy that is exclusively one thing or the other. A lot of the initial searching for a suitable investing short-list can be easily automated if you have definite criteria – leaving you with a much more manageable list of companies to examine in further detail without having to wade through many hundreds of price charts.

About David

David Jones qualified as a technical analyst in 1995 and started his City career as a currency analyst. He then went on to work for trading companies CMC Markets and IG Group as Chief Market Strategist. Since leaving the industry in 2013 he has been a presenter on BBC Radio 5 Live's Wake up to Money programme and the Chartist for Shares magazine. He is an active trader and private investor.

BY DAVID JONES

FORENSIC FOREX

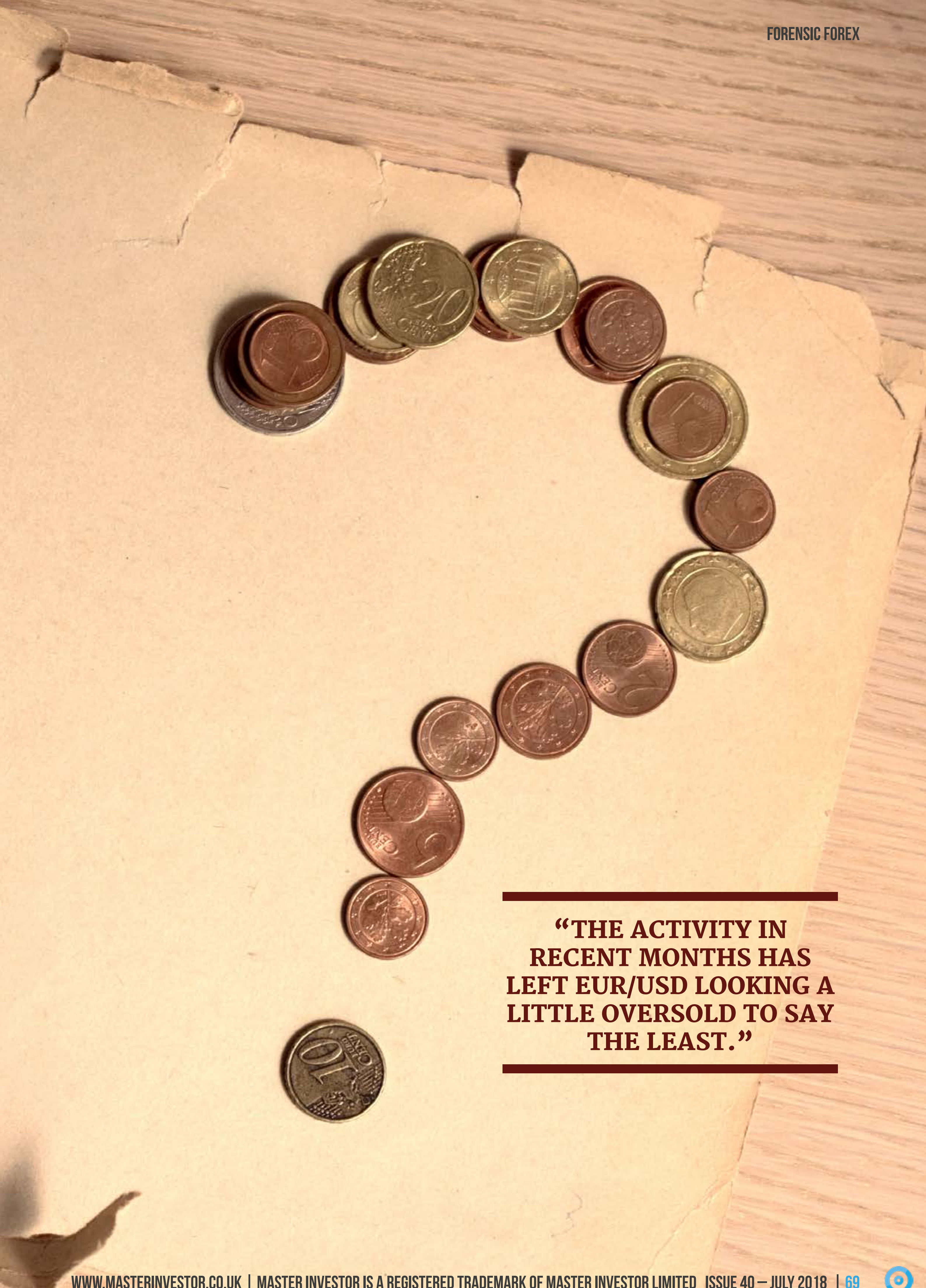
WHAT NEXT FOR THE EURO?

If you are not an avid follower of the foreign exchange markets, you may not be aware of the major swings there have been in the euro over the past 18 months. On top of this, June saw the biggest one day move for the single currency versus the US dollar in two years, on some very long-awaited news from the European Central Bank – it announced plans to finally end its quantitative easing programme. It stated that it would wind-down its asset buying programme from September and stop it completely in December. This does suggest the central bank believes the economy is now robust enough to look after itself - so what next for the euro?

Some recent history

It can often feel that sentiment towards the future of the euro is always at an extreme. When the market is falling there seems to be a lot of commentary suggesting that it is going to hit parity with the US dollar – where one euro is worth one dollar. It came close in late 2016 where a euro was only worth $1.03. But, just as sentiment was at its most pessimistic, the euro had an incredible 14 months and was more than 20% higher in February this year, trading above $1.25.

2017 was one of the worst years for the US dollar in more than a decade - and once again, following this ex-



"THE ACTIVITY IN RECENT MONTHS HAS LEFT EUR/USD LOOKING A LITTLE OVERSOLD TO SAY THE LEAST."

"THIS IS A CLEAR MESSAGE OF CAUTION FROM THE CENTRAL BANK."

treme move, plenty of commentary at the beginning of the year was expecting more of the same. But so far there has been something of a comeback for the US dollar and, as can be seen from the chart above, the euro has slipped back about 10 cents from those February highs.

What does the European Central Bank decision mean?

Since the financial crisis, central banks around the world had been providing support to economies and markets - somewhat cynically referred to by some as effectively just printing money. There are some estimates that the actions of the central bank in Europe added as much as 0.75% per year to its annual growth rate of 2.25%. The fact that the ECB has decided to stop this would on the face of it show it has confidence in the state of the European economy – it does not need that safety net anymore. Viewed in isolation it could be seen as a bold move – although one that has been awaited for quite some time.

But, as is often the case with central bank decisions, it is not quite as black and white as that. Copying the approach of many people when talking about the financial future, ECB president Mario Draghi engaged in a little bit of fence-sitting! He said that the risks surrounding growth in the eurozone were broadly balanced, but there were still global uncertainties, particularly when it came to the subject of potential trade wars and tariffs. But it was what was being suggested regarding interest rates that knocked the euro – and underlined its biggest fall for two years. The withdrawal of the QE programme suggests a positive outlook for the economy – but it was also signalled that interest rates will not rise until the middle of next year. This is a clear message of caution from the central bank.

What next for EUR/USD?

It is time for me to follow the central bank's lead and indulge in some fence-sitting. I think at the moment there are two clear scenarios – one shorter term and one that looks at the bigger picture. Let's take a look at the short term first.

This year has seen a resurgence for the US dollar against most major world currencies. As mentioned above, coming into this year, sentiment was once again at an extreme in the forex market with plenty of institutions and commentators pessimistic with their outlook for the greenback. It is at these sorts of extremes when the market does completely the opposite – and that is what we have seen. It is clear from the fall in the euro in the chart above since February how strong the US dollar has been.

But maybe, in the short-term at least, this move is overdone. EUR/USD pulled back to its lows from November 2017, an area that proved to be the launching pad for a 1,000 point move to the February highs. Admittedly it has briefly poked through these lows as shown by the arrows on the chart, but so far, the 1.15 area has brought the buyers back in. It would not be too much of a stretch to see some sort of euro recovery from here, at least to back above the 1.20 zone. No market moves in a straight line forever and the activity in recent months has left EUR/USD looking a little oversold to say the least. So, the short-term expectation for some sort of bounce back does not look overly pessimistic.

If, however, you are a euro "perma-bear" – i.e. you are expecting ongoing weakness in the single currency – then the very long-term picture helps your argument.

For the last ten years, the broader direction for the euro has been down. From July 2008 when it was trading at 1.60, to its late 2016 low around 1.03, the euro lost a third of its value versus the dollar. The strength seen over the last year, if you believe this longer-term trend is going to stay intact, is just a blip before the next move finally targeting parity with the dollar. To change this trend, the euro needs to break above 1.26 at the very least.

Markets are of course fluid – a lot can change month to month. The biggest change in the euro's fortunes would probably be a decision by the ECB on interest rates. If it thought the economy was more robust, there is always the chance that the move to start raising rates could be brought forward and that would normally be expected to lift the euro. For now, at least some sort of recovery does not seem out of the ordinary – just don't get too over-optimistic about how far any potential bounce could run.

About David

David Jones qualified as a technical analyst in 1995 and started his City career as a currency analyst. He then went on to work for trading companies CMC Markets and IG Group as Chief Market Strategist. Since leaving the industry in 2013 he has been a presenter on BBC Radio 5 Live's Wake up to Money programme and the Chartist for Shares magazine. He is an active trader and private investor.

BY RICHARD GILL, CFA

BOOK REVIEW

THE GEOMETRY OF WEALTH

HOW TO SHAPE A LIFE OF MONEY AND MEANING

BY BRIAN PORTNOY

The modest library I have put together over the years probably contains over 300 books on the topic of finance. From the dry as a bone *The History of Interest Rates*, to the expletive laden, fictional alien jaunt *The Bankers Who Sold the World*, I have a cornucopia of titles to choose from. The vast majority of my finance related books, however, are mainly aimed at making the reader a better investor. Whether by providing a review of financial theory, the latest investment techniques or analysis of an investment philosophy, most authors are hoping their books will help make readers more wealthy or 'rich'.

For these authors, the concept of wealth, or accumulating as many assets as you can, is not elaborated upon, or just assumed to be the ultimate achievement in itself. So it was refreshing to come cross *The Geometry of Wealth*, a unique effort from author Brian Portnoy which focuses on what being wealthy truly means and how wealth has the ability to underwrite a meaningful and ultimately happy life. The core concept is that financial decisions and having a joyful life are complementary, not separate things, and that just aiming to become rich in itself can be ultimately unsatisfying.

> **“LIKE BEING ON A NEVER-ENDING TREADMILL, THE QUEST TO BE RICH DOESN’T HAVE AN END.”**

Portnoy is a clever fellow, having a PhD and the Chartered Financial Analyst qualification, and is billed as being an expert at simplifying the complex world of money. He has 25 years' experience in money management and as an academic, with his current day job being Director of Investment Education at Virtus Investment Partners, an investment company with $80 billion under management. Portnoy is also a regular financial blogger and has previously authored *The Investor's Paradox: The Power of Simplicity in a World of Overwhelming Choice*, a road map for navigating the complex landscape of countless investment strategies.

Shape Your Future

For many, money can be a difficult, and even taboo, subject, not talked about over the dinner table with friends or even family. It can cause a range of emotions from excitement to despair and, at times, be complicated to understand. As a result, we tend to focus on only the practical matters of finance and ignore the bigger, more philosophical questions about money, such as, "can it buy you happiness?" In The Geometry of Wealth, the author tackles these issues and attempts to make sense of the relationship between money and meaning, also offering a plan for anyone who wants to grow – and stay – wealthy.

We then move on to the triangle, which represents the *priorities* we must set to help make better financial decisions. While we might already know what will make us happy, we now need to plan how to build up the resources to get us there. The triangle represents three steps of basic financial planning, with Portnoy suggesting we should first *protect* our wealth by considering risk, *match* our resources to meet our goals and then at the top of the triangle build on what we have achieved and *reach* for more. A second triangle then illustrates what drives good investment decisions, with individual *behaviour*, *portfolio* construction and *parts* of the portfolio (individual assets) being the three components.

To begin with, the distinction between being 'rich' and being 'wealthy' is made. Being rich focusses on having 'more'. But like being on a never-ending treadmill, the quest to be rich doesn't have an end. Wealth, however, is described by Portnoy as being "funded contentment". In other words, having the financial resources to underwrite a meaningful life. This is achievable for many, the author argues, even for those people who think that wealth is well out of their reach, as long as they have the right plan and the right mindset.

Following the brief introduction and background discussion of the role of money, the core text of the book comes in three parts, each concentrating on a particular shape – a circle, triangle and square. These represent the path the reader must take to achieve funded contentment.

The start of the journey begins with the circle, which represents how we figure out our *purpose* in life. The circle itself illustrates the ever-changing, flexible and never-ending nature of purpose, with us constantly adapting to our circumstances through life and redefining what it is that gives us purpose and makes us live a meaningful life. Once we know our purpose and what makes us happy, then money enters the equation. After all, we need to know if we can afford to purchase the things that give us contentment.

There then follows a very interesting discussion on whether money can buy us happiness. The answer to this age old question is complicated and often conflicting. *"Money can't buy me love"*, so sang The Beatles. That may be true, but on the other hand American novelist Gertrude Stein once said, *"whoever said money can't buy happiness didn't know where to shop"*. The basic conclusion seems to be that while money can contribute towards increased happiness, happiness can also be achieved independently of money. After all, the 'rich' can be miserable just as easily as the 'poor' can be content.

Finally, the square looks at the *tactics* of how to strive for decent outcomes, covering the four quantitative elements of investment – returns, volatility, correlation and liquidity. The square's focus on these important factors will help to set expectations of how our capital might grow and drive us towards funded contentment.

Be a Square

Overall, this is a truly enlightening, thought-provoking and refreshing book which teaches readers how to think about wealth in terms of what is important to them. Portnoy is a master of his craft, blending together finance, economics, philosophy, psychology and even neuroscience, in an entertaining and readable manner. One of the best books I have read so far this year, *The Geometry of Wealth* is a great compliment to the library of any investor.

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About Richard

Richard Gill is an investment analyst with over a decade's experience of analysing small/mid cap equities. He is the Head of Research at Align Research. Richard qualified with the Chartered Financial Analyst (CFA) designation in 2012 and was awarded PLUS Markets Financial Writer of the Year at the 2008 PLUS Awards. He has been a judge at the Small Cap Awards from 2013 to 2017.

BY TIM PRICE

THE FINAL WORD

STOCKS FOR THE LONG RUN?

"Larry Fink [the CEO of BlackRock] was having lunch with the CEO of one of the largest sovereign wealth funds and the CEO of the sovereign wealth fund said, "Our goal as investors is to think generationally. We're not thinking about this quarter or next year or even the next 10 years, we're thinking about the next generation and the generation after that." And Larry Fink said, "Great, how do you measure returns?" And the CEO said, "Monthly."

- From Morgan Housel, *What Other Industries Teach Us About Investing*.

Why do so many financial advisers favour stocks?

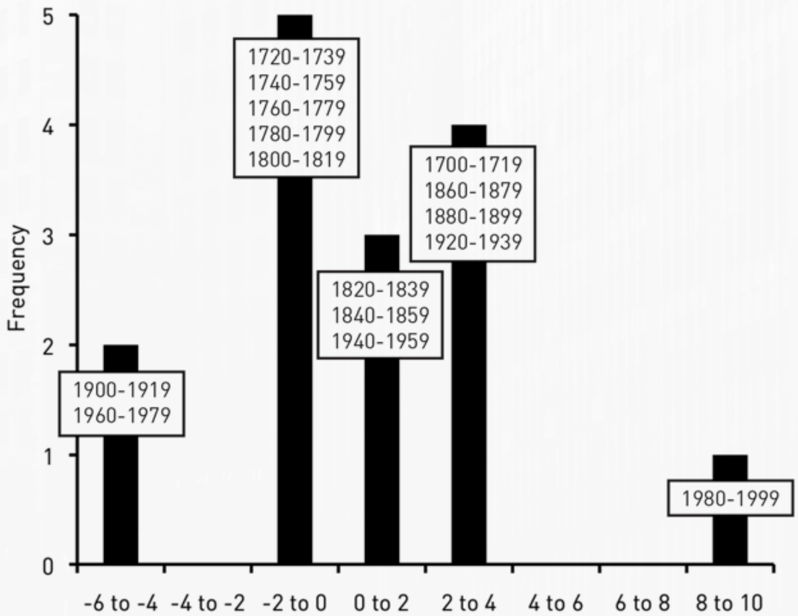
That phrase you can hear marching predictably and relentlessly towards you is 'stocks for the long run'. We are all taught, seemingly from the cradle, that equities outperform all other asset classes over the long run. Well, up to a point, Lord Copper.

The chart on the right shows you the long run performance of the UK stock market, going back to 1700. It shows the average annualised returns of discrete 20-year periods, after inflation.

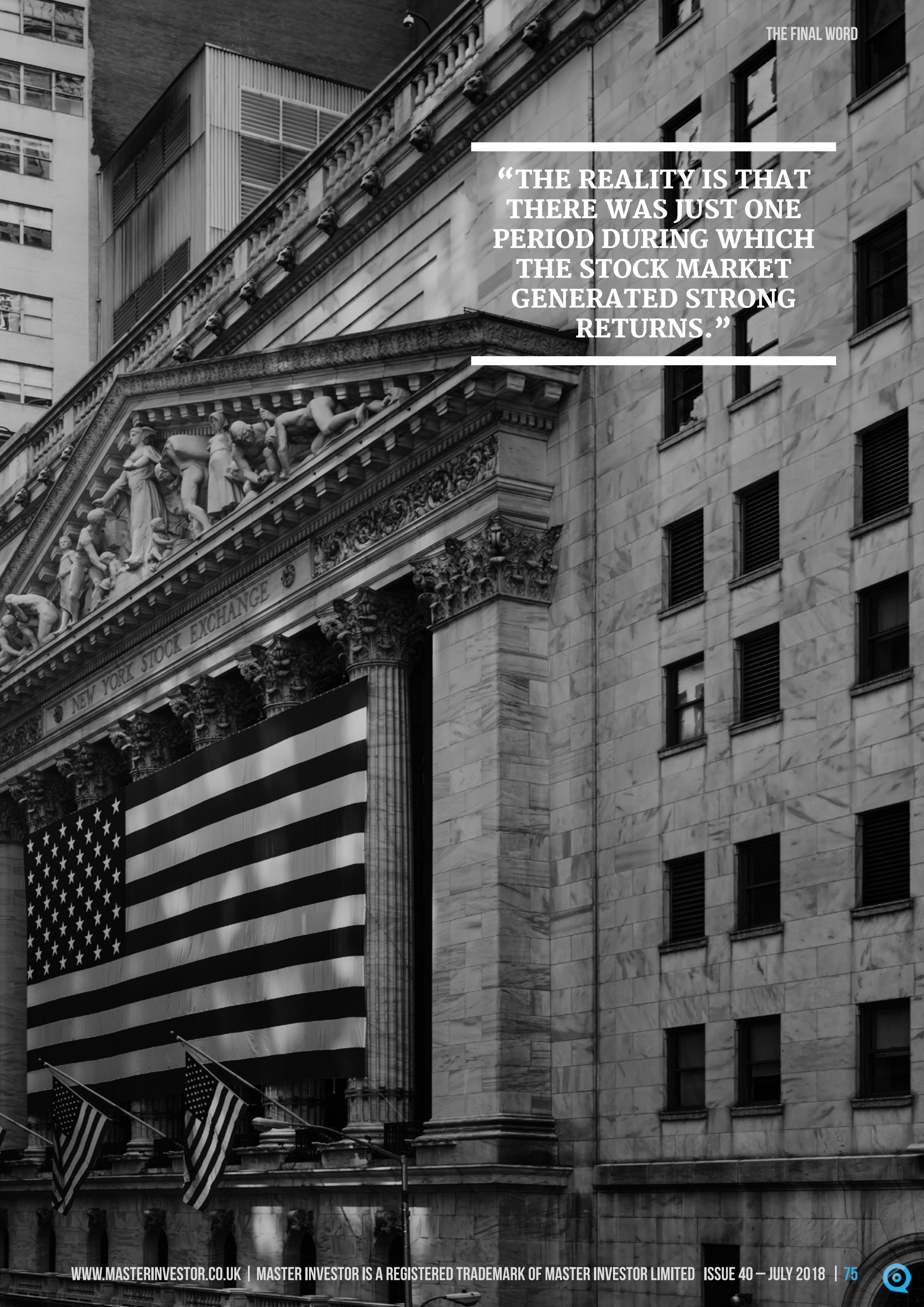
Surprising, isn't it?

Although it looks like our old friend the bell curve, the reality is that there

Chart 1: annual 20 year returns for the UK stock market



Source: Global Financial Data, Datastream



"THE REALITY IS THAT THERE WAS JUST ONE PERIOD DURING WHICH THE STOCK MARKET GENERATED STRONG RETURNS."

was just one period during which the stock market generated strong returns (between 8% and 10% per annum, on average). That period was 1980-1999. Otherwise, the average return from stocks over the last three centuries, after inflation, was something either side of zero. To answer the question: *Why do so many financial advisers favour stocks?* I offer: because almost all of them lived through that 1980-1999 period during which the market delivered strong absolute returns. But in the context of three centuries' worth of data, that period was a one-off. Perhaps 'stocks for the long run' is a big over-simplification, and one heavily skewed by recency bias?

Argument #2 for the prosecution. The second chart shows 100 years' worth of data drawn, this time, from the US stock market (lest you accuse me of home country bias).

Each two-digit data point represents a year, between 1890 and 1990. The x-axis shows the price/earnings ratio for the S&P 500 stock index for each year in question, and the y-axis shows subsequent ten-year returns.

The two figures ringed (top left and bottom right) represent 1919 and 1929.

In 1919, the US market was almost literally bombed out, having been heavily impacted by the privations, sacrifices and capital redeployments associated with the First World War. As a result, it was cheap, trading on a p/e of roughly 6 times. By dint of buying it cheaply, investors in 1919 did well over the subsequent decade, enjoying returns of nearly 20 percent per annum.

In (you guessed it) 1929, on the other hand, the US market was objectively expensive by any historical measure, trading on a p/e of nearly 30 times. By dint of buying it expensively, investors in 1929 didn't do anywhere near so well. They earned roughly nothing, per annum, for a decade.

As I point out in my book, *Investing Through the Looking Glass* (from which these two examples are drawn), 1929 wasn't even the worst period to be a buyer of US stocks. Take a look at the years 1909, 1910, 1911 and 1912. In 1911, for example, the market wasn't particularly expensive, trading on a p/e of roughly 14 times – and yet investors who bought the market in 1911 still suffered subsequent annual returns of roughly *minus 4 percent for the next decade*.

The importance of valuations

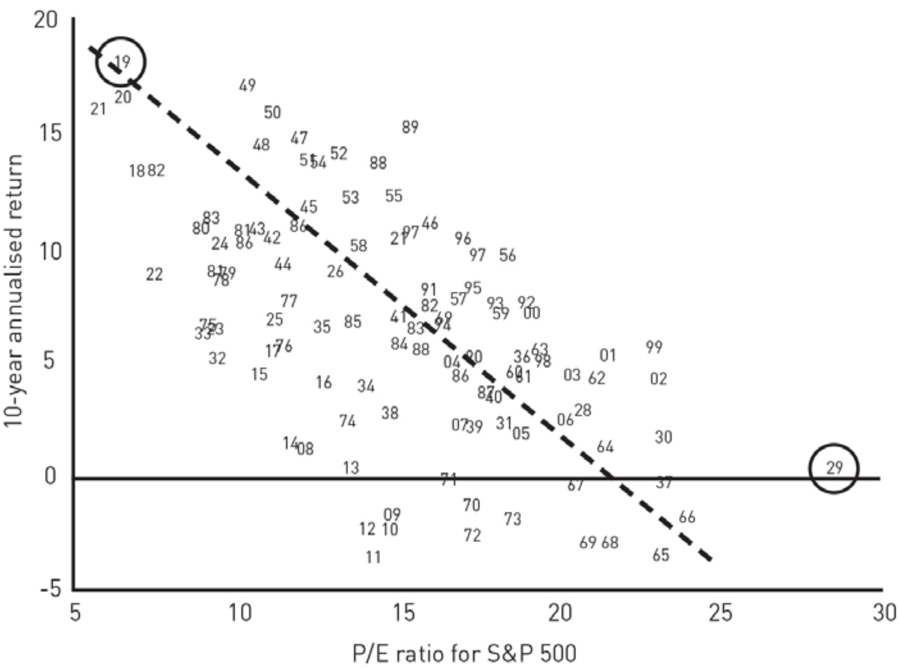
Turns out 'stocks for the long run' needs some refinement to constitute practical advice. I suggest: 'stocks for the long run, acknowledging that starting valuations are important, and that investors can still be unlucky'. After all, as the authors Marsh, Daunton and Dimson point out in their highly respected statistical analysis of stock market returns over the very long run, *Triumph of the Optimists*, a) Anglo-Saxon (that is to say, US and UK) stock markets have tended to outperform most other stock markets, at least over the last century, and b) there are examples of other countries' stock markets that closed during a crisis, *never to re-open*.

One final chart, which brings us up to date.

Chart 3 shows us Robert Shiller's "cyclically adjusted" p/e ratio for the US stock market, taken by using an average of prior ten-year corporate earnings in order to smooth out the vagaries of the business cycle. Note that on this analysis, the US stock market is more expensive than it has ever been over the past 140 years, other than during the dotcom bubble. Does that make you feel more or less relaxed about buying US stocks today? Bear in mind that the US stock market accounts for roughly 60% of the global stock markets by market capitalisation in the leading global benchmark, the

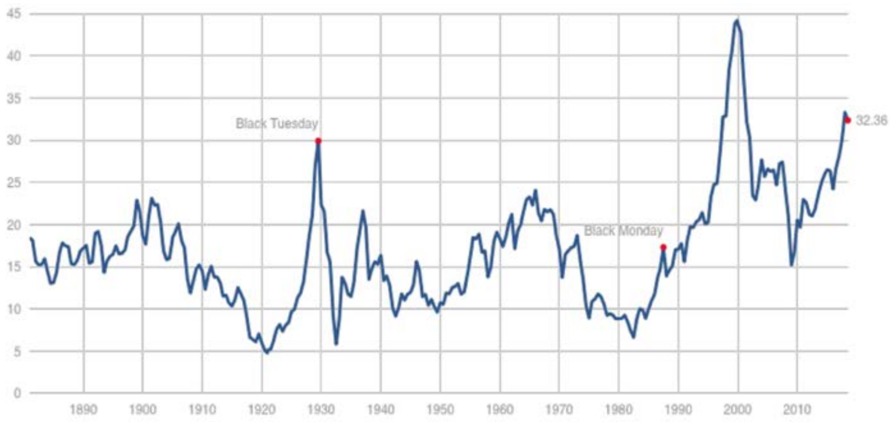
"IF YOU HAVE MONEY MANAGED BY A GLOBAL EQUITY FUND MANAGER, THE CHANCES ARE THAT YOU NOW HAVE A SHED-LOAD OF US MARKET EXPOSURE."

Chart 2: Shiller's scattergram



Source: Robert Shiller, Irrational Exuberance (Princeton 2000)

Chart 3: Shiller p/e for the US stock market, 1880 - 2018



Source: http://www.multpl.com/shiller-pe

MSCI World Equity Index. To put it another way, if you have money managed by a global equity fund manager, the chances are that you now have a shedload of US market exposure whether your manager even likes prospects for the US market or not. Such are the unintended consequences of index-tracking – a problem exacerbated by the rise of (almost exclusively passive) exchange-traded funds.

A tale of two investors

This is not to say that 'stocks for the long run' no longer has validity, subject to the caveats or refinements offered above. I particularly liked, for example, Morgan Housel's presentation 'What other industries teach us about investing', which you can watch here, and which begins with a terrific anecdote about the merits of patient, long term investing:

Grace Grahner... was born in 1909, just right outside of Chicago nearby. And she had kind of a hard life. She was orphaned as a child, she began her career in the bottom of the Great Depression. Finally found a career as a secretary, where she worked her entire life. Never married, never had kids, never learned how to drive a car. Lived almost her entire life in a one room house, not far from here.

By all accounts, she was a lovely lady, but lived kind of a sad life. And Grace Grahner died in 2010, she was 100 years old. And everyone who knew her was completely shocked to learn, when she died, that she had seven million dollars to her name, that she left all of it to charity, and that began kind of a search among the people who knew her, that said, "How does this humble secretary accumulate seven million dollars?" And her secret was, she really had no secret at all. She saved what little she could, she put it in the stock market, she let it compound for 80 years and that was it, end of story.

The second investor I want to talk about today is a guy named Richard. Save his last name, because you're not supposed to criticize people in public. Although I do a lot. Richard had almost the exact opposite background of Grace Grahner. Born into a wealthy family, went to the University of Chicago, got his MBA at Harvard Business School, went to work on Wall Street, worked his way up at some of the biggest investment firms, became the vice chairman of one of the largest investment banks and without exaggerating was one of the most powerful people in global finance.

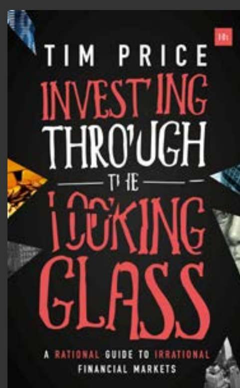
The day after Grace Grahner died, Richard filed for personal bankruptcy. He told the bankruptcy judge that the financial crisis completely wiped him out, he had no more assets, no more income and he was fighting to save foreclosure on his house. And what's interesting about these stories, I think, is that in no other industry except finance are those stories possible. There's no other industry in which someone with no education, no background and no experience can vastly outperform someone with the best background, the best education, the best experience.

It's unthinkable that Grace Grahner could have performed heart surgery better than a Harvard-educated cardiologist, or built a skyscraper better than the best construction company. It's completely unthinkable that that could ever happen, but it happens in investing. And what I think it shows is that investing is not necessarily about what you know, it's about how you behave.

The full presentation is well worth watching – it's one of the best I've ever seen on the business of investing. But on the topic purely of equity investing, we all need reminding about that commitment to the long run as displayed by Grace Grahner. As the Canadian value investor Peter Cundill once remarked: *The most important attribute for success in value investing is patience, patience, and more patience. THE MAJORITY OF INVESTORS DO NOT POSSESS THIS CHARACTERISTIC.*

About Tim

Tim Price is manager of the VT Price Value Portfolio (www.pricevaluepartners.com) and author of 'Investing Through the Looking Glass: a rational guide to irrational financial markets'.



JULY 2018

INVESTOR EVENTS DIARY

WEDNESDAY, 4 JULY

Event:	SR Live
Organiser:	SyndicateRoom
Time:	12:30
Place:	Webinar
Link for tickets:	https://www.syndicateroom.com/events/sr-live

WEDNESDAY, 11 JULY

Event:	SR Live
Organiser:	SyndicateRoom
Time:	12:30
Place:	Webinar
Link for tickets:	https://www.syndicateroom.com/events/sr-live

TUESDAY, 17 JULY

Event:	Oil & Gas Investor Evening with Malcolm Graham-Wood ('Malcy') and AIM-listed CEO's
Organiser:	London South East
Time:	18:00
Place:	Brewers Hall, Aldermanbury Square, (Off London Wall), London, EC2V 7HR
Link for tickets:	https://www.eventbrite.co.uk/e/oil-gas-investor-evening-with-malcolm-graham-wood-malcy-and-aim-listed-ceos-tickets-46763627268

WEDNESDAY, 18 JULY

Event:	SR Live
Organiser:	SyndicateRoom
Time:	12:30
Place:	Webinar
Link for tickets:	https://www.syndicateroom.com/events/sr-live

TUESDAY, 24 JULY

Event:	Netwealth investor event with Gerard Lyons
Organiser:	Netwealth
Time:	18:30
Place:	60 Charlotte Street, London W1T 2NU
Link for tickets:	https://www.netwealth.com/events

WEDNESDAY, 25 JULY

Event:	SR Live
Organiser:	SyndicateRoom
Time:	12:30
Place:	Webinar
Link for tickets:	https://www.syndicateroom.com/events/sr-live

THURSDAY, 1 NOVEMBER

Event:	Master Investor: Investing in the age of longevity
Organiser:	Master Investor
Time:	10:00
Place:	Wellcome Collection, 183 Euston Rd, Kings Cross, London NW1 2BE
Link for tickets:	Register interest by emailing amanda@masterinvestor.co.uk

FRIDAY, 9 NOVEMBER

Event:	Master Investor: Manchester
Organiser:	Master Investor
Time:	17:30
Place:	Mercure Manchester Piccadilly, Portland Street, Manchester M1 4PH
Link for tickets:	Register interest by emailing amanda@masterinvestor.co.uk

MARKETS IN FOCUS

JUNE 2018

GLOBAL EQUITIES

Index	Last Month %	YTD%	Proximity to 52w High*
S&P/ASX 200	3.0	1.9	
IBEX 35	1.7	-4.2	
NASDAQ 100	1.1	9.8	
S&P 500	0.5	1.3	
Nikkei 225	0.5	-4.2	
Euronext 100	-0.4	0.3	
FTSE 100	-0.5	-1.8	
Dow Jones	-0.6	-2.3	
Russian TSI	-0.9	0.1	
CAC 40	-1.4	-0.7	
DAX Xetra	-2.4	-5.3	
Hang Seng	-5.0	-3.2	
Bovespa	-5.2	-4.8	

COMMODITIES

Commodity	Last Month %	YTD%	Proximity to 52w High*
Crude oil (Light Sweet)	10.7	22.9	
Crude oil (Brent)	2.0	18.5	
Cocoa	-0.1	35.5	
Iron Ore	-0.2	-4.9	
Natural Gas	-1.1	-1.2	
Silver	-1.7	-5.8	
Palladium	-3.4	-10.6	
Copper	-3.4	-10.1	
Gold	-3.8	-4.2	
Sugar (No. 11)	-4.2	-10.3	
Platinum	-5.8	-8.0	
Coffee	-6.4	-3.9	
Cotton	-9.2	12.3	

FOREX

Pair/Cross	Last Month %	YTD%	Proximity to 52w High*
USD/JPY	1.8	-1.6	
EUR/JPY	1.7	-4.9	
GBP/AUD	1.5	3.9	
USD/CAD	1.5	5.1	
USD/CHF	0.6	2.2	
EUR/GBP	0.6	-0.5	
EUR/CHF	0.5	-1.2	
EUR/USD	-0.1	-3.3	
GBP/USD	-0.6	-2.8	
AUD/USD	-2.1	-6.4	

CENTRAL BANKS - RATES & MEETINGS

Central Bank	Key Rate	Next	After
BOE	0.50%	Aug 02	Sep 13
ECB	0.00%	Jul 26	Sep 13
FED	2.00%	Aug 01	Sep 26
BOJ	-0.10%	Jul 31	Sep 19
SNB	-0.75%	Sep 20	Dec 13
BOC	1.25%	Jul 11	Sep 05
RBA	1.50%	Jul 03	Aug 07
RBNZ	1.75%	Aug 09	Sep 27
BOS	-0.50%	Sep 05	Oct 23
BON	0.50%	Aug 16	Sep 20

FTSE 350 TOP

Sector	Last Month %	YTD%	Proximity to 52w High*
Inmarsat PLC	46.8	10.9	
Entertainment One Ltd	22.5	9.5	
Auto Trader Group PLC	20.8	19.4	
Rolls-Royce Group PLC	19.8	15.1	
Capita PLC	18.0	-35.1	

FTSE 350 BOTTOM

Sector	Last Month %	YTD%	Proximity to 52w High*
McCarthy & Stone PLC	-23.8	-36.8	
Indivior PLC	-20.3	-8.1	
Brown (N) Group PLC	-18.2	-36.7	
Dignity PLC	-17.2	-44.7	
KAZ Minerals PLC	-16.8	-9.0	

FTSE 350 SECTORS TOP

Sector	Last Month %	YTD%	Proximity to 52w High*
Aerospace & Defense	6.9	12.6	
Fixed Line Telecom	5.9	-20.2	
Food & Drug Retailers	4.7	28.9	
Leisure Goods	3.5	34.6	
Media	3.2	8.5	

FTSE 350 SECTORS BOTTOM

Sector	Last Month %	YTD%	Proximity to 52w High*
Oil Equip, Serv & Dist	-5.3	3.2	
Construction & Materials	-5.1	-2.8	
Life Insurance	-4.3	-7.5	
Industrial Metals	-3.7	17.2	
General Industrials	-3.5	4.6