The Disruptive Strategist

Marketing material for professional, institutional and accredited investors

Executive Summary

In our Q2 2022 newsletter, members of GAM Investments' Global Equities team cover topics including Q2 in numbers, digitisation as a deflationary force, the role of technology in the future of food, the increasing role played by digital twins, the proliferation of 'Web 3', and stock-based compensation.

Mark Hawtin looks back at Q2, examining what has been the largest H1 equity market decline in history for the S&P 500 and the worst first half in the last four decades for the Nasdaq.

Mark considers the future of food, which, driven by both a chronic global need and a tipping point in technology, looks set to be one of the most exciting prospects for the next 10-15 years.

Kevin Kruczynski explores how companies and organisations are increasingly embracing digitisation and the benefits it can offer, particularly in an inflationary environment.

David Goodman looks at how 'digital twins' can fundamentally change industries by creating living digital simulation models that update and change alongside their physical counterparts.

Wendy Chen examines how 'Web 3' has entered public consciousness and the efforts of some of the internet giants in seizing opportunities in a world of decentralised data ownership.

Pieran Maru discusses some of the challenges of stock-based compensation during a downturn.

Q2 Market Action

By Mark Hawtin

The second quarter of 2022 saw an acceleration of the asset destruction that took hold in the first quarter. Inflation soared, ending the second quarter at 9.1% in the US, up from 7.0% at the start of the year and pushing higher than had been feared. This has led to a great deal of consumer pain, not helped by a sharp rise in mortgage rates in the US to end the quarter at 5.8% for a 30-year fixed. Housing is as unaffordable as it has ever been.

As measured by the major equity indices, the S&P 500 fell 16.5% in the quarter and the Nasdaq 100 by 22.5%. Within these indices, duration continued to take a beating. Cathie Wood's ARK Innovation ETF fell 39.8%, reflecting continued macro selling of duration. The damage or right sizing in this asset category has been comprehensive, as the chart from Bernstein shows below. As measured by price to sales ratios for the top 1500 companies in the US, high multiple names have returned to more normalised levels. While not as attractive as they have been in history, they are clearly no longer wildly expensive.

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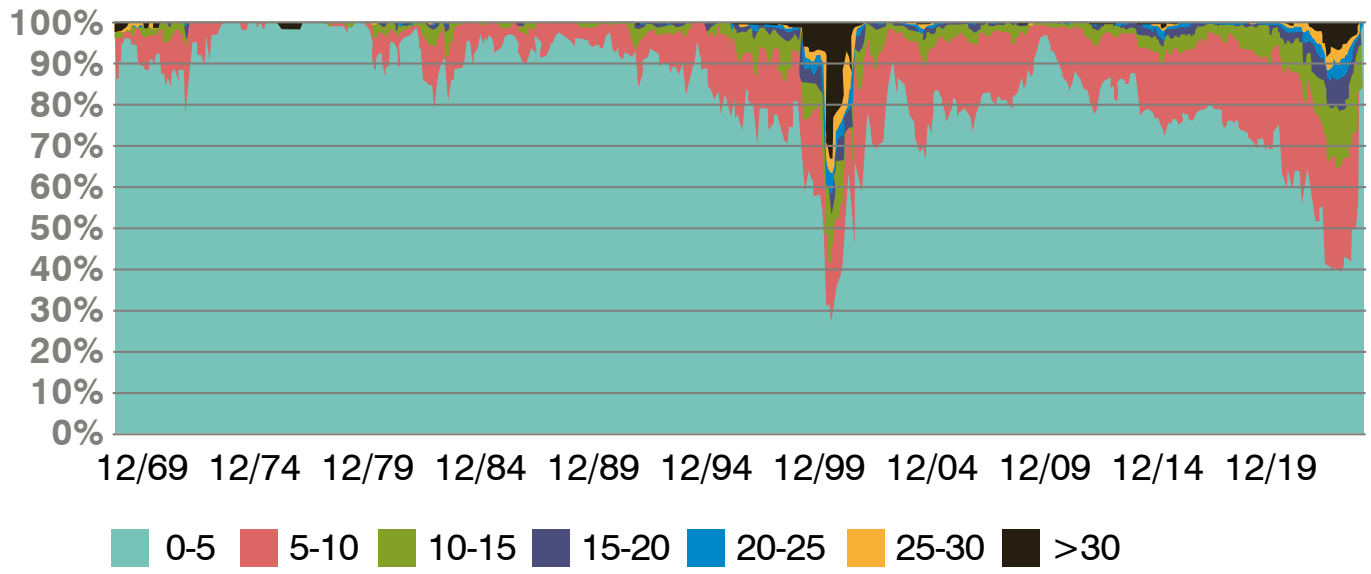
US Largest 1500 Stocks - Technology Sector
Frequency Distribution of Stocks by Price to Sales Ratio 1970 - June 2022



Source: Factset, MSCI, CRSP and Bernstein analysis. For illustrative purposes only. Past performance is not a reliable indicator of future results or current or future trends.

The combined impact of the first and second quarter of 2022 has been to see the largest H1 equity market decline in history for the S&P 500 and in the last four decades for the Nasdaq. The market has been very swift to reprice expectations. For investors, the situation was exacerbated by steep declines in the bond markets. 10-year treasury bonds suffered their worst first half since 1788! Add to the mix a maelstrom of asset price price action and it is easy to see how tough conditions have been. Crypto is well into what is now defined as a Crypto Winter by many; Bitcoin fell 59% in the second quarter and Ethereum by -69%. Crypto equities like Microstrategy (-66%) led losers lists for the quarter and left the evangelistic CEO Michael Sailor needing to dig deep with his investors.

On an individual stock level, it was the intersection of duration and the consumer that suffered the most with ecommerce highflyers hit hard. Among mega caps, that meant Amazon (-34.8%) but extended to many well-liked names - Wayfair (-60.7%), Rent the Runway (-55.4%), Asos (-47.9%), Zalando (-45.9%) and Etsy (-41.0%). Other favourites also finally started to cave with Tesla, perhaps the most liked mega cap, down 37.5% as a combination of valuation and the antics of its charismatic CEO, Elon Musk, weighed.

The bright spot for equities and for us was China. In the second quarter, we saw a decent comeback for Chinese equities. KWEB (a proxy for China internet) climbed 40% from its trough in early May as the market enjoyed notable rebound amid reopening and fiscal stimulus, while the World Growth Index fell -4% during the same period.

The quarter started gloomily with the spread of the Omicron variant in Shanghai resulting in a two-month full lockdown of China's economic hub. Not only does Shanghai account for 2% of China's population and 4% of its GDP, but it also claims half of China's auto/integrated circuit (IC) industry and is its busiest port. While worries on prolonged lockdown and regional supply chain disruption put further pressure on Chinese equities, we saw this market bottoming in May and poise for the reopening rally, as policymakers worked on damage control to keep GDP growth targets in a crucial political year. The timing played out as Shanghai's June reopening, together with notable fiscal stimulus, flowed into infrastructure and manufacturing, resulting in a robust rebound in electric vehicles (EV), renewables, consumers and tech innovators, significantly benefitting some Chinese companies.

Disruptive technology – A deflationary force in an inflationary world

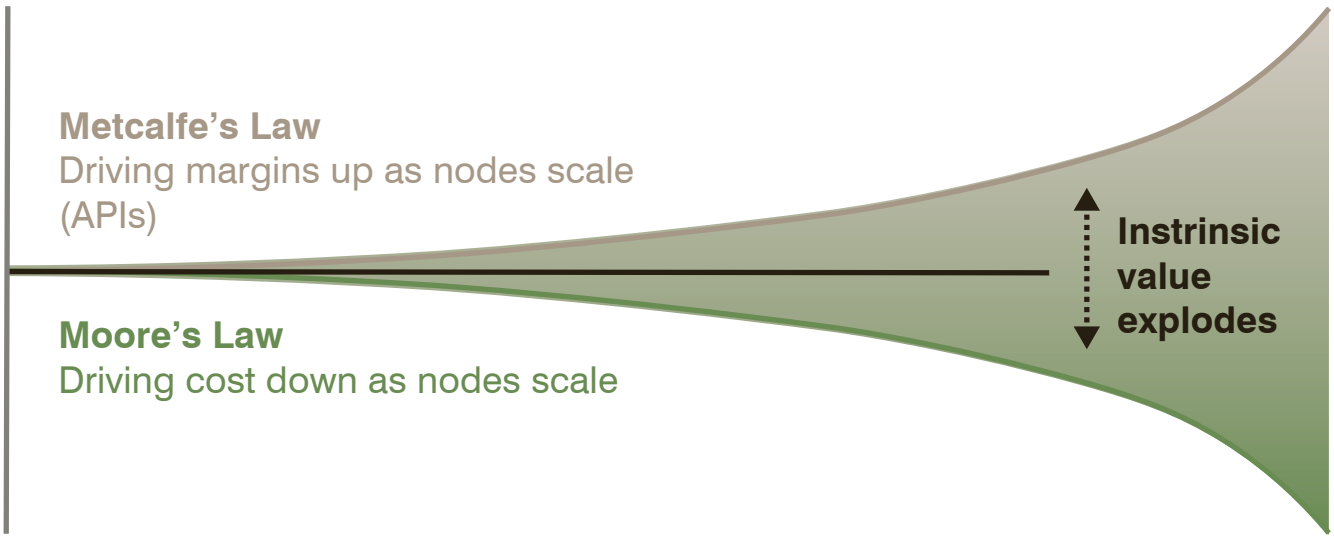
By Kevin Kruczynski

As Satya Nadella, Executive Chairman and CEO of Microsoft, reminded us so succinctly on the last Microsoft earnings call, “Digital technology is a deflationary force in an inflationary economy. Business small and large can improve productivity and the affordability of their products and services by building tech intensity.”

Inflation is a hot topic as we are seeing some of the factors that have suppressed it for many years start to unwind. Several decades of relentless globalisation have led to elongated supply chains and lower production costs, but this began to reverse with the emergence of tensions between major economies, as well as the Covid disruption to trade flows. Similarly, the low commodity price environment which had been fuelled by previous periods of excess investment is also reaching an end as miners and oil companies have listened to their shareholders and are now prioritising capital returns over investment in capacity. This has left very little slack in the system for periods influenced by exogenous events, such as pandemics or wars. In this environment, technological innovation has a vital role to play in helping to enhance productivity, minimise wastage and keep costs down.

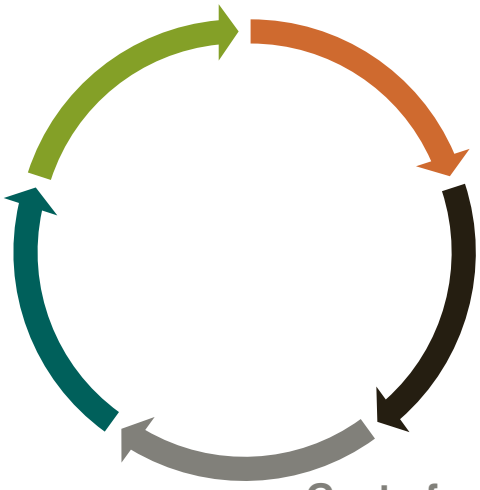
Regular readers will be aware that we often refer to Moore’s Law and Metcalfe’s Law and the influence these have had on lowering compute cost and unleashing a wave of disruptive innovation around the world.

Metcalfe’s Law and Moore’s Law



Source: BCG Analysis. NASSCOM Report: AI, Beyond the Myth & the Hype, McKinsey Global Institute analysis. 2019 SaaS Trends, Blissfuly.com. The views are those of the manager and are subject to change. For illustrative purposes only.

Tech's virtuous Cycle



Innovations & Applications
Software enhanced business models

Cloud Capex
Digital infrastructure buildout

Capacity
Elasticity, demand and data generation

Semiconductors
Faster, more complex, custom silicon solutions

Cost of compute
Moore's Law & efficiencies

Source: Piper Sandler. For illustrative purposes only.

With this backdrop in mind, we would like to highlight some examples of where we are seeing disruption help to ease cost pressures across an array of sectors.

Many healthcare systems in the US have been affected by staff shortages. Omnicell has seen an increase in demand for its pharmacy automation solutions, which help free up nurses' and pharmacists' time for other tasks. Its IV automation system leads to quicker and more accurate dispensing and helps lower costs by approximately 66% - one hospital in the US is saving USD 2.5 million each year by using this solution. Intuitive Surgical's DaVinci Robots allow for less invasive procedures which significantly speeds up recovery, reducing the length of hospital stay. After a robotic assisted prostatectomy, a patient would be expected to leave the hospital within one to two days, whereas for open surgery, it would be three to seven days, thereby freeing up significant bed space and resource in already understaffed wards.

Across the industrial landscape, computer software and services firm PTC helps customers such as Bosch Group and Volvo with their digital transitions, using their leading computer-aided design (CAD), product lifecycle management (PLM), internet of things (IoT) and augmented reality (AR) products to streamline processes, minimise waste and drive efficiencies. The impact varies by solution, but for example, its ThingWorx connected work cell helps manage the flow of information across processes, and generally increases worker productivity by up to 40%, reduces waste by 25%, and lowers training time by up to 65%.

Agriculture and construction are both fragmented and labour-intensive industries that have been slow to adopt technology, but this is changing as worker shortages and high prices of input materials are encouraging companies to consider new solutions. Trimble serves both industries: its connected farm platform assists in optimising agricultural workflows, helping farmers to improve the performance and profitability of their crops. The technology maximises crop yields by providing data on soil conditions and helps plan efficient seed planting, as well as being able to view yields in real-time. Its technology is also used to steer and control tractors remotely and provides precise spraying and irrigation from machinery. For a highly detailed construction project, such as a bridge or airport, Trimble can build an exact digital replica of a modelled original with pinpoint accuracy, guiding heavy machinery with precision. This improvement in accuracy can generate millions of dollars in savings from avoiding project cost overruns, reworks and reducing the overall delivery time.

Other sectors such as transport, fast food restaurants and coffee chains have used cloud based mobile apps, self-service ordering technology and advances on the payments landscape to reduce the need for customer facing staff and cultivate customer loyalty through ease of use and rewards. Starbucks was an early pioneer with its mobile app, then McDonald's followed with its self-service ordering points, and in the UK, the London Underground has removed the need for ticket offices by adopting contactless card technology. All these solutions lower the need for staff and make the customer experience easier and less time consuming.

It is clear that embracing digitisation is getting cheaper and easier, and the benefits are even more apparent in an inflationary environment.

Food as Software

By Mark Hawtin

When we look at investing in disruption, we seek to find themes that have the potential to be substantial and grow at a geometric pace. Food has not, until now, stood out in that regard. However, we believe climate change and the development of technology are now creating a tipping point in food not unlike that of the smartphone in 2007.

Research carried out by Hannah Tucker at Balance Point Ventures suggests there are three potential outcomes for the future of food:

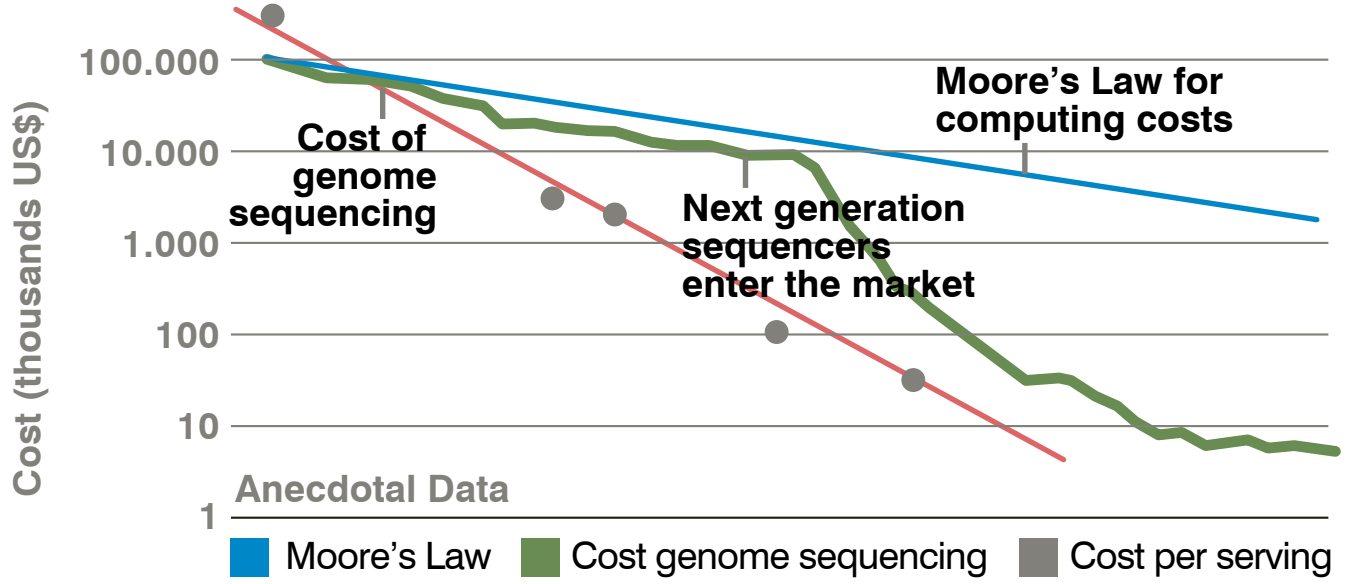
1. A Doomsday scenario, namely the collapse of nature if we do not make seismic change;
2. A synthetic world where nature is controlled; and
3. A regenerative world, where we see a collaboration of new and old to generate better outcomes that are more sustainable and less destructive to the environment.

Clearly the first scenario is not an option; in the words of Ban Ki-moon, there is no Planet B and we believe that the third scenario, while additive, cannot begin to resolve the issues at scale. This means that synthetic foods are going to meet a large part of the requirement for sustainable foods over the next 10-20 years. They are already being driven by the geometric laws that support hypergrowth and thus meet the requirements of disruption that we look to identify.

25% of global emissions are connected to food and a third of food that is created goes to waste. Both these facts are driving the need for change on a huge scale. Further, 99% of fish face extinction as acidity levels rise, coral reefs are destroyed and phytoplankton decline precipitously. In short, ocean and land-based ecosystems must change. Technology is now able to contribute to that change in the same way as it has in other industries, driven by Moore's Law and Metcalfe's Law.

The ability to operate on an electron level allows for developments in the synthetic world that were not viable only a few years ago. In just the same way that Moore's Law has driven down the cost of genome sequencing, it has also driven down the cost of producing synthetic meat, for example. The chart below shows that in the words of Ron Shigeta, the co-founder of science accelerator IndieBioshows, "lab-grown meat is scaling like the internet".

Lab Grown Meat Costs behave like Tech



Source: medium.com/@rshigeta. For illustrative purposes only.

Source: Getty Images. For illustrative purposes only.

There is huge resistance in accepting manufactured substitutes for existing foods like meat and mass adoption will depend on much more than just the need to create sustainable alternatives. One of the most far-reaching pieces of work on the subject has been done by RethinkX, a UK-based think tank, and in its report, Rethinking Food and Agriculture, it estimates that the number of cows in the US will fall 50% by 2030, rendering the cattle industry all but bankrupt. This depends heavily on adoption of alternatives and we believe that this, in turn, depends on a catalyst that will make that change inevitable. This is where Moore's Law kicks in. As the chart above shows, with manufactured meat costs declining rapidly, it will be cheaper to eat alternatives and we believe that will be the tipping point – economic rather than ecologic.

The world of sweeteners offers another insight into the potentially far-reaching impact of food alternatives. Precision fermentation is one of the latest and most rapidly developing fields, garnering huge amounts of venture backing. The ability to analyse and work with organisms at the molecular level allows for many more areas of innovation – DNA sequencing for plants, for example. New plant-based proteins that have all the characteristics of sugar are being discovered and manufactured, although presently only in small quantities. These proteins like Brazzein, Monelin or Miraculin are thousands of times sweeter than conventional sugars or sweeteners and as proteins, they have potential health benefits. The problem is manufacture at scale but with the advances being made in precision fermentation and the belief that (like meat substitutes) these will follow a geometric path of improvement, the prospect of protein-based alternatives is on the verge of commercialisation. They are already being tested by major customers like Coca-Cola and Pepsi. We consistently talk about the polarisation of winners and losers in a truly disruptive world. It is easy to see that in the world of sweet flavours, manufactured alternatives might take over that world, rendering the existing sugar industry redundant. Just imagine the implications for a country like Brazil that is the world's largest producer of sugar!

There are very few ways to invest in this theme in the public markets. Beyond Meat is perhaps the best known, but in our view it does not attack the real disruption coming down the track. Precision fermentation is an extremely exciting prospect that sits either in very small parts of industrial conglomerates like Cargill or in the private world, with names like Perfect Day and Impossible Foods. GFI reports that USD 1.7 billion has been invested in fermentation companies focused on alternative proteins in 2021, double the 2020 number. It is early days but as always, we are looking for the next wave of disruption in readiness for the investment opportunity. This theme, driven by both a chronic global need and the tipping point in technology, looks set to be one of the most exciting prospects for the next 10-15 years.

Digital Twins

By David Goodman

Over the last decade, usage of digital twin technologies has expanded well beyond manufacturing-use cases, to the world of artificial intelligence, data analytics, and IoT (Internet of Things). The adoption of digital twin technology offers a number of potential advantages, including speeding up the time to get products to market and lower maintenance operation costs, both of which are generating great excitement across multiple business sectors.

What is meant by digital twins?

Digital twin technology enables virtual replicas of physical assets to be created, facilitating a highly effective simulation. It does this by integrating data with artificial intelligence, machine learning and software, creating living digital simulation models that update and change alongside their physical counterparts.

According to Fortune Business Insights, the global digital twin market size is projected to reach USD 96.49 billion in 2029, at a compound annual growth rate (CAGR) of 40.6% 2022-2029 (Source: www.fortunebusinessinsights.com/digital-twin-market-106246).

Image Source: Autodesk. For illustrative purposes only.

How it works
Data-driven digital twins can adapt and respond to different and fast changing environmental or operating conditions. This one-to-one mapping optimises performance by creating a real-time relationship that enables engineers to make immediate corrections to their system and rapidly accelerates new product design. It represents a new era in simulation and predictability.

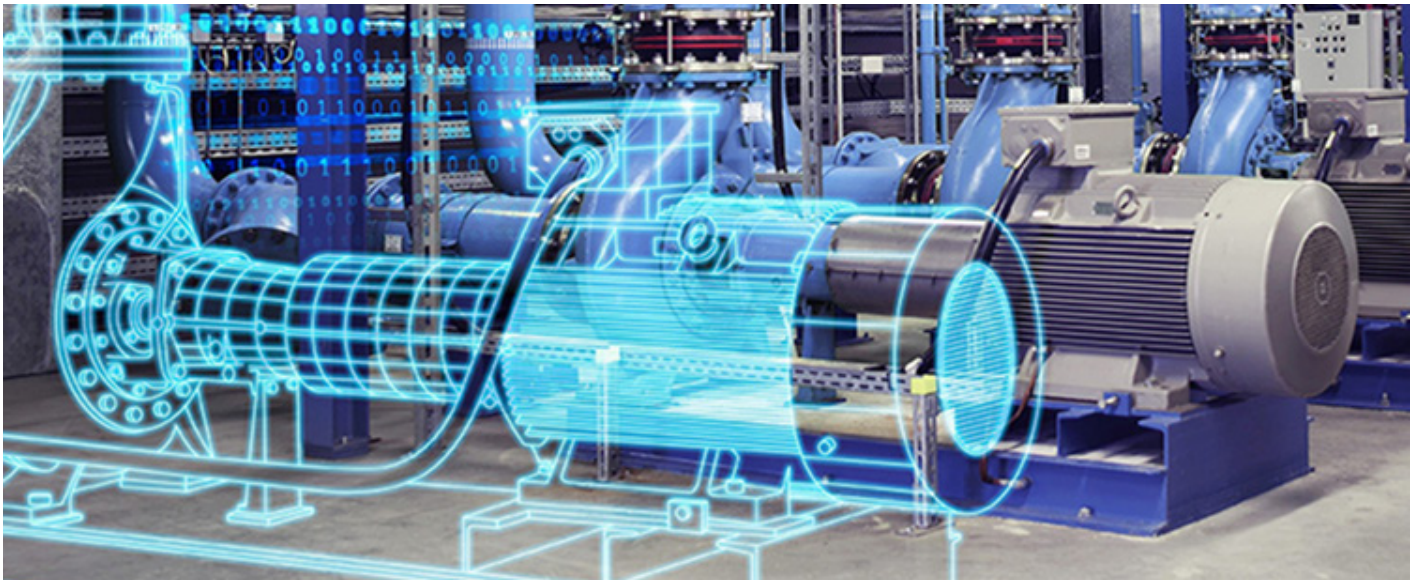


Image Source: Autodesk. For illustrative purposes only.

How will digital twin technology be used?
Digital twins can help in a huge number of areas, from planning, design and construction to operations and maintenance. For example, let us consider a building that has already been designed and constructed – it can have a digital twin of the entire facility, from the roof to the mechanical engineering and plumbing systems. Now imagine that the sensors in the building provide the digital twin with real-time information that updates itself according to the information provided. This enables building owners to view areas where the building is ageing or faulty and make improvements before anything fails or becomes a potential danger. These techniques are already deployed in Norway to manage bridge maintenance lifecycles.

While building digital twins is highly complicated, once set up they offer nearly limitless potential. Every individual component can be digitally replicated, from the way they interact to the environment they exist in. The digital twin then uses artificial intelligence to simulate and demonstrate the impact that changes in design, process, time or conditions would have, without ever having to subject the real-world object to those same changes.

Companies can observe the predicted use and outcomes of their products in real-time, as well as view every "what if" scenario, thanks to the shift from the actual production line to the virtual factory, which supports improved decision making and deeper understanding.

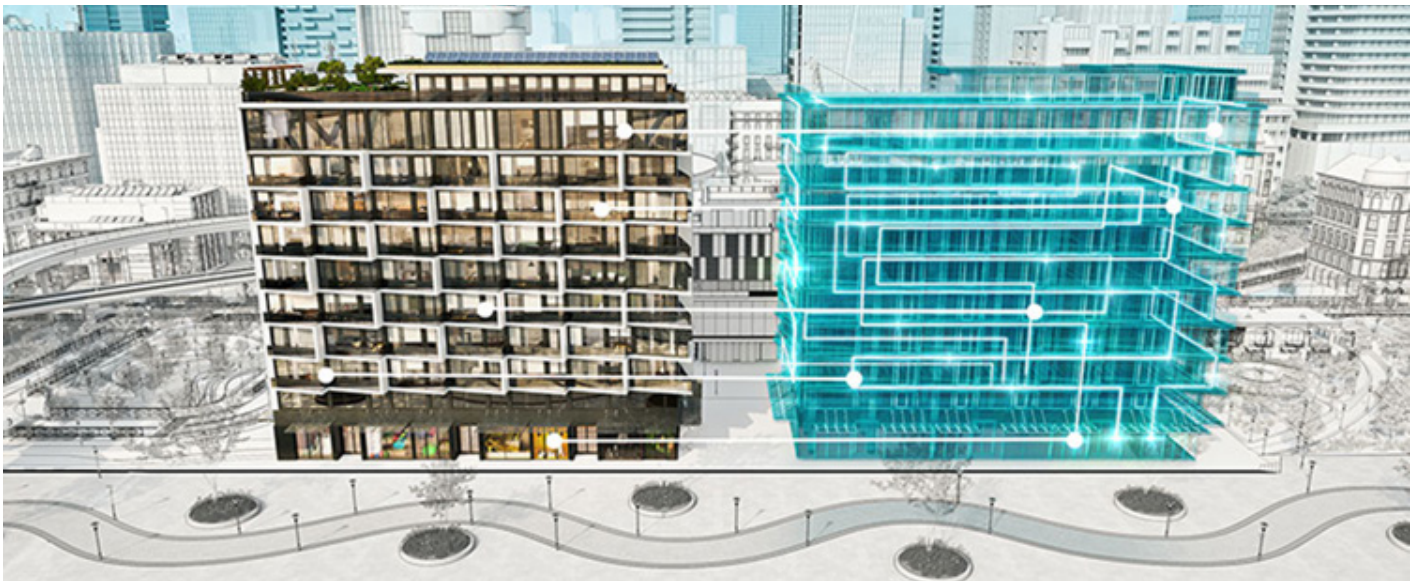


Image Source: Autodesk. For illustrative purposes only.

Case studies
To better comprehend how this works in practice, we will look at some real-world examples of sectors that have already made the leap.

Aviation
Using digital twins' ability to evaluate a complete lifecycle, Boeing integrated a digital twin into its design and production, enabling it to evaluate how materials would function over the course of an aircraft's existence. The results speak for themselves, with Boeing able to increase the quality of some parts by an incredible 40%.

Automobile manufacture
A car's digital twin replicates the functions of both the software and the mechanical behaviour of the vehicle. Through modelling and analysis, many problems can be solved before a car is even made.

Unsurprisingly, Elon Musk has embraced digital twin technology at his Tesla manufacturing sites. His vehicles use digital twins to collect data that can be used to improve design, advance development of driverless vehicles, provide predictive analytics and deliver maintenance information.

Thanks to digital twins' genuine, rather than hypothetical two-way data flow, there is almost certainly a future where vehicles will send data directly to a garage ahead of a service – describing performance statistics, parts that have been replaced, service records and prospective problems picked up by the sensors. This could have a massive time saving benefit, with mechanics able to focus immediately on the problems rather than carry out a timely inspection.

Healthcare
Many healthcare companies have already adopted digital twin technology, benefiting from huge efficiencies in patient monitoring thanks to digital twin sensors and medical device simulation.

Manufacturing
Production line machinery is business critical, expensive and comes with a lot of risk. Large amounts of data are typically necessary for huge machinery to operate efficiently; that data is being harnessed via digital twins for precise prediction of stress points and servicing requirements.

Image Source: Autodesk. For illustrative purposes only.

The time is right
As the benefits of digital twins become ever clearer, savvy companies have already deployed digital twins to manage the entire lifecycle of their products – exponentially increasing efficiencies over time, unlocking additional value from existing assets and dramatically lowering maintenance and operating costs. By using physics and analytics, they are eliminating unplanned downtime.

As momentum builds, it will not be long before digital twin technology is commonplace in most industries, providing data that can help avoid costly product failures and reducing some of the risks to a company's profitability and future.

With the world experiencing an exponential improvement in computing power, storage and bandwidth, the time is right for real-time, data-driven improvements to business efficiency. Digital twin technology is just another example of these efficiencies. The pace of technological advance is unprecedented and shows no signs of slowing.

The Web 3 Endeavours of the Internet Giants

By Wendy Chen

With a focus on decentralisation, openness and user ownership, the term 'Web 3' has been coined by proponents as the next generation of the internet. Unlike Web 1, which focused on getting users online, and Web 2, where centralised entities dominated platforms, Web 3 hands data ownership back to individuals, where platforms are developed, owned and maintained by decentralised users.

Advocated by Twitter co-founder Jack Dorsey, Web 3 has entered public consciousness along with new internet phrases such as metaverse and NFTs (non-fungible tokens). Unlike some conceptional technologies, Web 3 generated notable cash flows for internet giants even before they rushed into this arena. Amazon Web Services (AWS) used to dominate Web 3 cloud services thanks to its SME focus, where crypto players like Binance and OKX contribute hundreds millions of dollars in cloud revenue. Other cloud giants quickly followed suit, with Google Cloud launching a Web 3 special team to compete for customers. Azure and Alicloud also announced solution packages for crypto / NFT enterprises.

Despite a notable bear market in the crypto world during the second quarter of 2022, the internet giants across ecommerce, finance and even social networks are deepening their quest on Web 3.

- Google and Square have announced the inclusion of Web 3 into company strategic development, with Google Cloud group forming a Web 3 team to capitalise on the booming market;
- Meta expanded its NFT testing to gradually allow NFT creators to cross post between Facebook and Instagram;
- eBay announced the acquisition of Manchester-based NFT marketplace KnownOrigin in June;
- Shopify also included tokengated commerce solutions in its new connect-to-consumer experience in June;
- Mastercard announced a June collaboration with seven Web 3 enterprises (eg Immutable X), providing payment services to NFT purchases on their platforms.

While a decentralised Web 3 trend might appear to disrupt the centralised order of internet giants, it has also created growth opportunities for some of the Web 2 winners in areas such as the well-established cloud service infrastructure, online social networks, e-payment and e-commerce frameworks; all have centralised infrastructures yet all contributed to the rise of millions of Web 3 enterprises. While the idea of decentralised data ownership sheds light on individuals being empowered to utilise the data created by themselves, we think the struggle between equality and accessibility will continue in the foreseeable future.

The perils of stock-based compensation in a downturn

By Pieran Maru

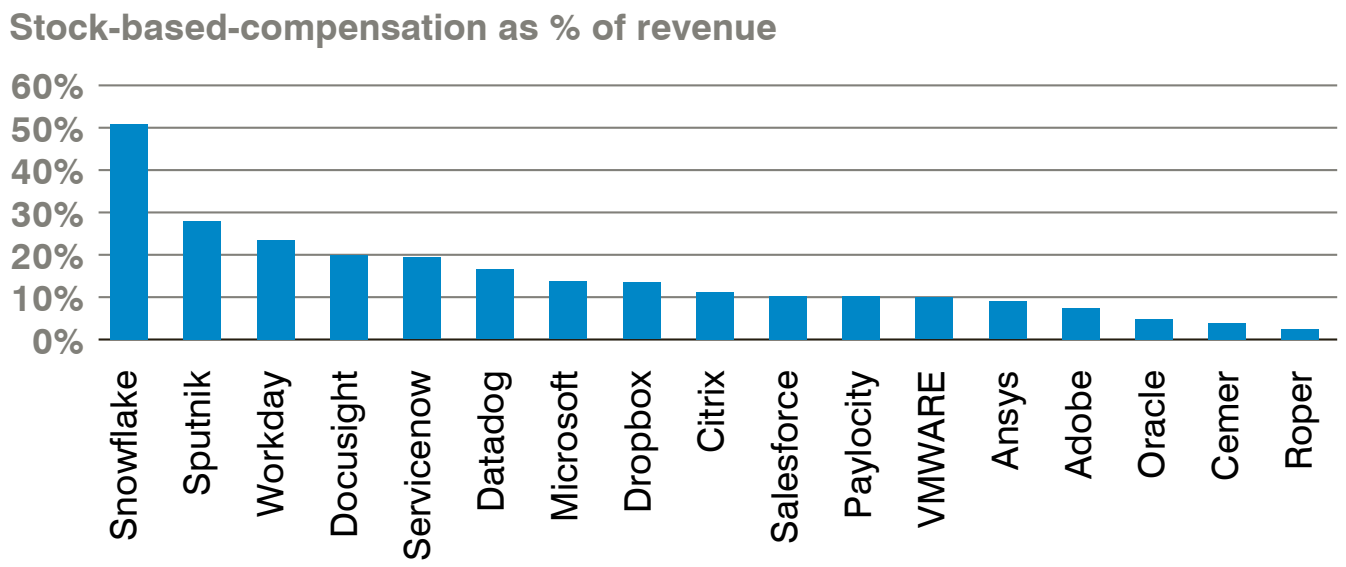
Gaining traction in the mid-1970s, stock-based compensation (SBC) was seen as the golden egg waiting to vest. It allowed companies to reinvest as much cash as possible to further growth today, while attracting and retaining talent by compensating employees in the upside of the future stock price. According to the National Center for Employment Ownership, fewer than one million people were receiving stock options in 1990; jumping to approximately 10 million in 2000. Although negatively impacted by the dot-com bubble and changes to the accounting rules in 2006 which required companies to recognise SBC as an expense, it continued to gain traction, with nearly all listed companies utilising SBC today.

So why are we more cautious of SBC now? While SBC is used to align employees with the employer, a downturn in the stock price, and therefore the value of SBC, can have a reversal impact, further compounded by the current increase in the cost of living. With a tight hiring market for specialist roles in the software industry, employee churn is likely to increase and in turn, pressure for employers to increase the proportion of cash payments for new hires and retention. Higher cash payments would impact margins, earnings per share (EPS) and free cash flow (FCF) negatively, while offering additional SBC to incentivise employees would in turn further dilute the value for shareholders.

SBC comes in a variety of forms. The two most common types are stock options and restricted stock units (RSUs). Stock options grant the employee the right to buy shares at a set price determined on the day the options are given. The employee then has a set period of time to exercise the options, often one year after the grant date. While for RSUs, the employee is granted stock which vests over time. RSUs are often considered the better option for the employee, as there is no cash paid in issuing them.

Figure 1 highlights the prevalence of SBC not only in high growth software names such as Snowflake, whereby SBC consists of an outsized ~50% of revenue, but also in more value style names such as Cisco where SBC is hitting double digits. This shows just how impactful SBC can be in the wider software market.

Figure 1: SBC as % of revenue varies massively with the value names using much less SBC



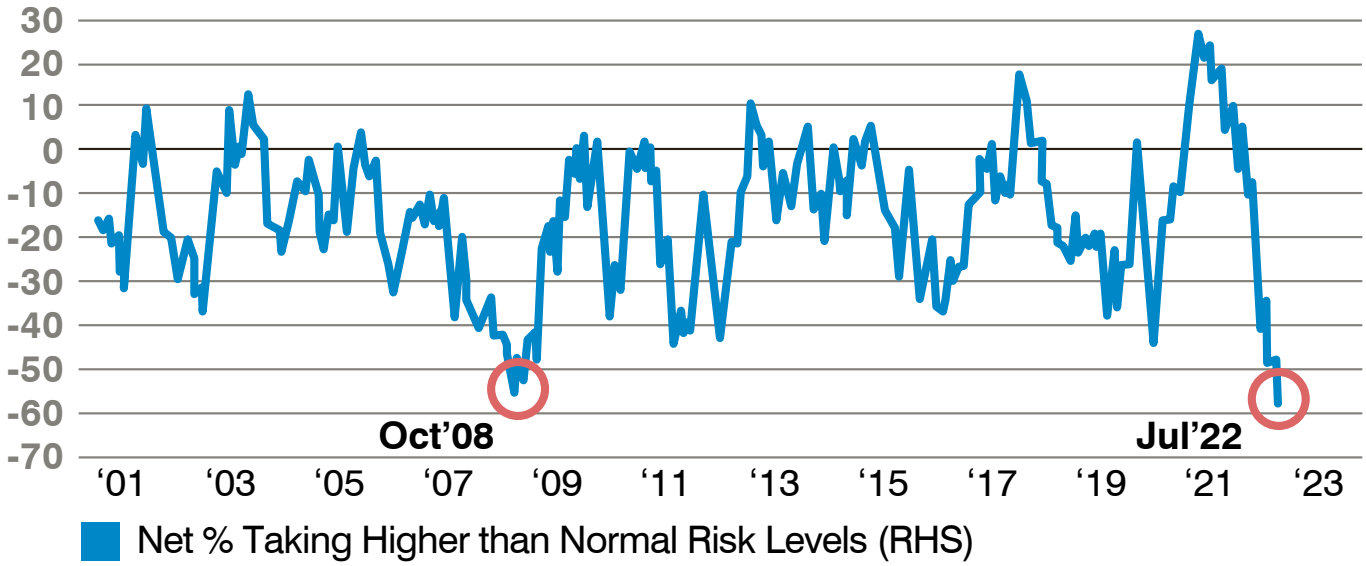
Source: Bernstein. For illustrative purposes only. There is no guarantee that forecasts will be realised.

Overall, we continue to see SBC as an integral part of high growth software companies. However, we expect firms to tighten control of SBC. In preparation for a potential economic downtown, a number of large cap technology companies have already announced a slowdown or pause on hiring which in turn should assist in reducing the rate of SBC growth.

2022 Outlook

We believe the outlook for growth equities for the second half of 2022 and beyond is bright. As we have seen in previous cycles, duration is often hit hardest and fastest in times of volatility and concern, particularly when economic growth is considered at risk. It is a misplaced view that then suggests that where economic growth goes, so do growth equities. Past cycles have shown clearly that genuinely disruptive growth companies can grow successfully through downturns and can end up recovering fastest and quickest too. Positioning has become extreme in this downturn, in our view.

Where's Lehman? – Net % taking higher than normal risk levels



Source: BofA Global Fund Manager Survey. For illustrative purposes only. There is no guarantee that forecasts will be realised.

The above chart from the BofA Fund Manager Survey shows that investors' risk levels are down to those not seen since the Lehman Crisis. This is surely extreme? As a result, and according to Goldman Sachs, their basket of non-profitable disruptive names has fallen to 1.8x EV/Sales. That is lower than the 2.2x registered at the trough following the Covid outbreak in March 2020. At the same time their basket of expensive software as a service (SaaS) names trades at about 10x revenues, again moderate by the standards of the past few years. We have started to see private equity circling the public markets with take-privates. Zendesk was taken private in July and rumours abound that New Relic has been approached too. It is reminiscent of the second quarter of 2016 when takeover activity surged. At that time, Marc Benihoff of Salesforce said, "We've never seen more deals". The market was, at that point, in a mini trough with software languishing after a sharp Q1 sell-off when investors could not run away fast enough.

We believe that valuations are very compelling, that the right growth businesses will grow through any downturn and that there will be substantial returns to be made from these levels. The only uncertainty, in our view, surrounds the exact timing and depth of any further falls, not the ultimate return profiles. For this reason, we believe it makes sense to start buying quality disruptive names at attractive prices in anticipation of the longer-term opportunity. As Warren Buffett said, "Be fearful when others are greedy, be greedy when others are fearful." The chart above clearly shows where the fear gauge currently stands.

For more information, please visit GAM.com

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