SCALE AS A SERVICE

August 2020

BAILLIE GIFFORD

RISK FACTORS

The views expressed in this article are those of the Gary Robinson and should not be considered as advice or a recommendation to buy, sell or hold a particular investment. They reflect personal opinion and should not be taken as statements of fact nor should any reliance be placed on them when making investment decisions.

This communication was produced and approved in June 2020 and has not been updated subsequently. It represents views held at the time of writing and may not reflect current thinking.

Stock Examples

Any stock examples and images used in this article are not intended to represent recommendations to buy or sell, neither is it implied that they will prove profitable in the future. It is not known whether they will feature in any future portfolio produced by us. Any individual examples will represent only a small part of the overall portfolio and are inserted purely to help illustrate our investment style.

This article contains information on investments which does not constitute independent research. Accordingly, it is not subject to the protections afforded to independent research and Baillie Gifford and its staff may have dealt in the investments concerned.

All information is sourced from Baillie Gifford & Co and is current unless otherwise stated.

The images used in this article are for illustrative purposes only.

BAILLIE GIFFORD

Calton Square, 1 Greenside Row, Edinburgh EH1 3AN
Telephone +44 (0)131 275 2000 www.bailliegifford.com

CM14096 Scale as a Service WP 0920
Ref: 48862 ALL AR 0144

AUGUST 2020

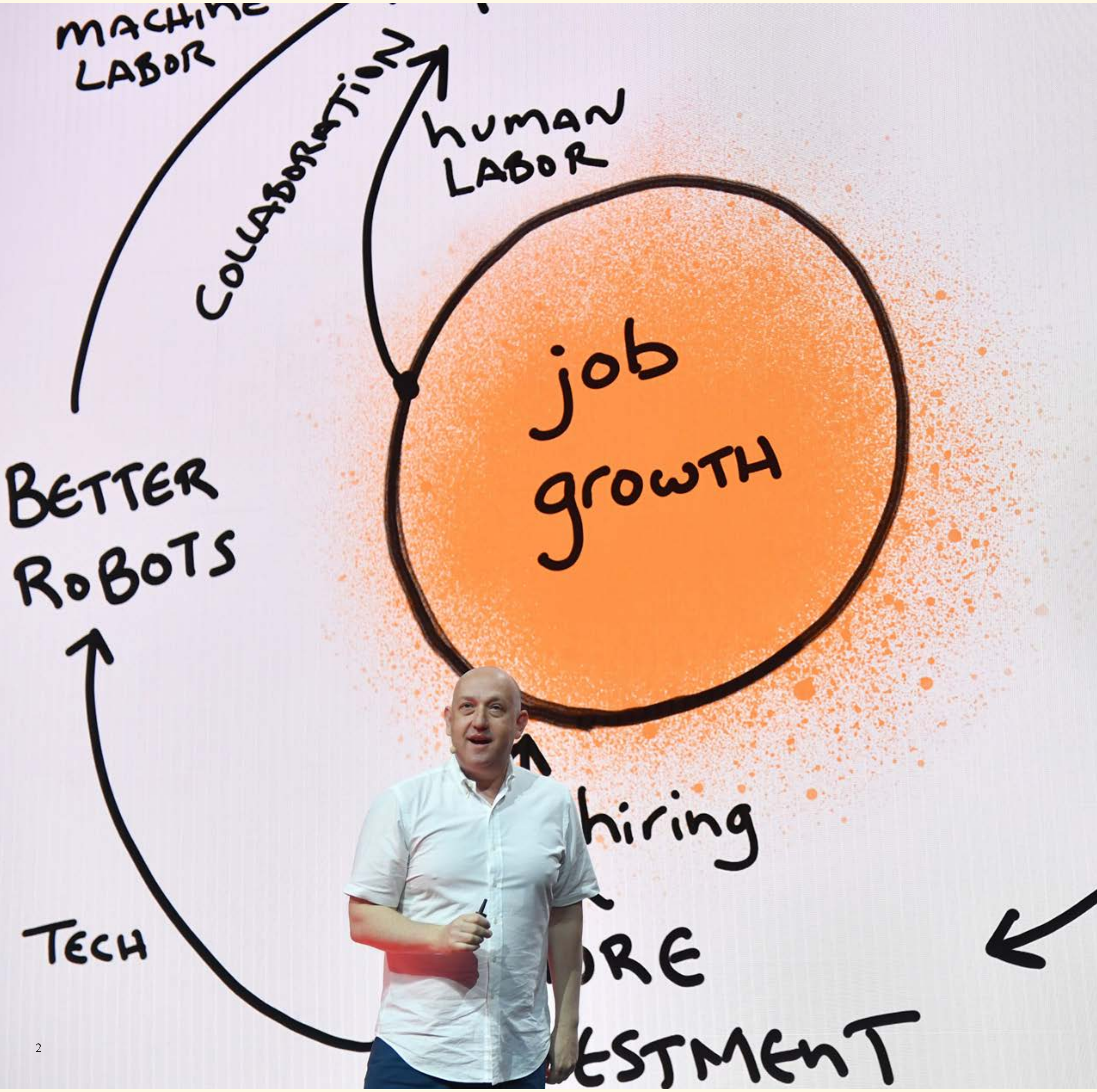
SCALE AS A SERVICE

Scale can be a powerful source of edge in business. Few understood this better than Sam Walton, the founder of Walmart. He built the largest retailer in the United States by opening giant warehouse stores and outmuscling small businesses. One neighbourhood in Chicago saw over 80 of its 300 local stores close in the two years after Walmart arrived in town. This phenomenon is so well known it has its own name: The Walmart Effect.

The impact of scale was good for Walmart, but it is a double-edged sword for the economy. On the one hand, it helps existing companies become more efficient as they grow. On the other hand, it makes it more difficult for start-ups to compete. Small companies are critical to economic health. They contribute disproportionately to breakthrough innovation, job creation, and productivity growth. They are the seeds of the next generation of exceptional growth companies. Given this context, it is notable that fewer new businesses are being created today than 20 years ago. This fact should give us pause for thought.

Walmart's size enabled it to invest in technology to an extent that smaller companies simply couldn't match. It built sophisticated logistics, distribution, and inventory management capabilities. It was early to adopt technologies such as barcodes and Radio Frequency Identification. It used software to connect directly to its suppliers. These initiatives required significant up-front capital investments which Walmart was uniquely well-placed to absorb given its scale.

However, as Hemant Taneja discussed in his wonderful book, Unscaled, the internet has changed this relationship between scale and access to services. Large up-front commitments like those made by Walmart are no longer required to access leading-edge technologies. Instead, companies can now rent what they need on-demand from cloud providers. One example is Amazon's AWS (Amazon Web Services), a platform which offers computer power and storage capabilities as a service. Cloud infrastructure platforms are also being built in areas such as ecommerce, payments, and communications. In each of these sectors a leader is emerging as the default choice for entrepreneurs. In ecommerce, it's Shopify, in payments it's Stripe, and in communications it's Twilio.



© DEAN LEWINS/EPA-EFE/Shutterstock.

– In the digital economy, the cloud-infrastructure platforms are helping to level the playing field between the largest and smallest.

AWS owns the underlying infrastructure. The other platforms sit on top of networks of third-party infrastructure. All four are like operating systems. They use software to remove complexity and make it easier to manage and consume the underlying services. There are parallels with the electricity grid, except in this case the grid is the internet and the 'electricity' is represented by the tools of the digital transformation. All that entrepreneurs need in order to plug into this 'grid' are a computer and an internet connection. Once connected, they gain access at the touch of a button to powerful tools that would previously have required significant up-front time and investment. For example, instead of building and managing their own data centres, through AWS, companies can consume what they need, when they need it, over the internet. Instead of having to build relationships with a multitude of banks and credit card networks around the world, companies can plug into Stripe's payments platform and accept and send payments globally with a few lines of code.

The complexity of the offline world played into the hands of big companies. In the digital economy, the cloud-infrastructure platforms are helping to level the playing field between the largest and smallest. They are enabling companies of any size to easily and affordably access the tools they need to run their businesses online. They are lowering the costs of starting and scaling a business and increasing the vitality of the economy. The effects are evident in the consumer goods industry, where independent brands such as Allbirds and Gymshark are thriving in a market once dominated by powerful conglomerates. Both companies are built on top of Shopify's ecommerce platform. More quantitatively, the Kauffman Institute's early stage entrepreneurship index has seen a pick-up in the last decade, bucking the downward trend that had held for the prior 15 years. This perhaps marks the start of a period of lower barriers to entrepreneurship.

THE CLOUD ERA

Amazon was one of the pioneers of the cloud-delivery model. In the mid-2000s its infrastructure was struggling to keep pace with its rapid growth. At the time, Amazon was building dedicated IT resources for each individual project. It moved away from this inefficient structure to a services model where IT was pooled as common infrastructure and made available to anyone in the firm as needed. Several years later, Amazon opened its infrastructure up to external parties. It launched its first AWS product, Amazon Elastic Compute Cloud, in 2006. This ushered in a new era of IT, where resources no longer needed to be built from scratch and could instead be accessed on demand over the internet.

AWS has turned IT infrastructure into an operating cost. Rather than building out expensive data centres and investing ahead of growth, start-ups can rent computer power on an as-needed basis. Steve Blank, the founder of the lean start-up movement, has said that the founding of AWS was as important for Silicon Valley as the introduction of venture capital. Indeed, the costs of starting a new internet company have fallen by several orders of magnitude since AWS was launched. However, it's important to note that Amazon is both an enabler of, and competitor to, small businesses. While AWS has been helpful to them, Amazon's ecommerce business is a formidable example of economies of scale in retail.

Given the profound impact of AWS and cloud infrastructure more generally, it's surprising how little attention the trend has attracted. This may be down to the utility-like nature of the service. AWS runs in the background. It performs an essential function, but it is much less glamourous than the start-ups that it is powering. However, its position as the computer infrastructure layer behind the innovation economy makes it one of the most important companies in the world. It is arguably more important from a societal-impact and value-creation perspective than Amazon's ecommerce business.

The power of AWS stems from the fact that its users benefit from the collective scale of all the customers on the platform. AWS can invest more in the development and management of the service than any single customer can do on their own. For example, AWS recently built a new type of software to run its servers and this improved their efficiency by 5–10 per cent. Investments like these have helped Amazon to gradually extend the useful life of its servers, creating savings which have been passed on to customers in the form of lower prices.

AWS builds scale on behalf of its customers. This means that smaller companies are no longer at a disadvantage when accessing computer resources. Taneja called this process 'unscaling'. An apt name for the platforms that are driving this might be 'scale as a service' providers.

IT infrastructure is just one operational area which is moving to a cloud-delivery model. As mentioned earlier, similar shifts are underway in other sectors such as ecommerce, payments, and communications. Shopify, Stripe, and Twilio are three of the most prominent examples of 'scale as a service' platforms in these sectors.

© DEAN LEWINS/EPA-EFE/Shutterstock.

SHOPIFY AND ECOMMERCE

Like AWS, Shopify is a platform which sits behind the scenes, quietly powering a large segment of the digital economy. Last year, it processed over $60 billion worth of goods for one million merchants. The company's origins stretch back to the early 2000s when founder Tobias Lütke was attempting to build an online snowboarding store. Lütke, an accomplished programmer, found that the software tools available for building online shops were poor, so he built his own from scratch. It quickly became clear to Lütke that it would be more valuable to sell software than snowboards, and so Shopify was born.

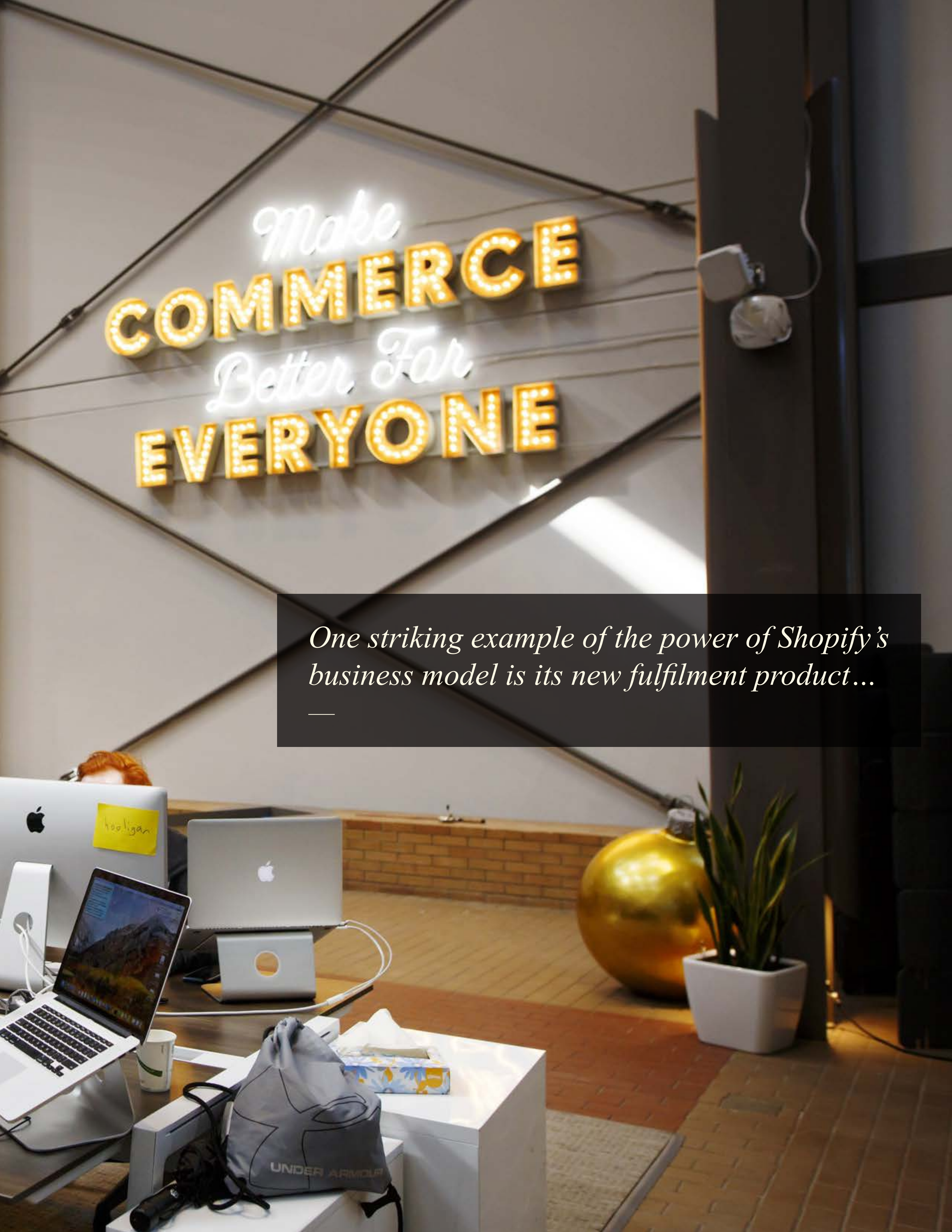
Shopify's platform is like an operating system for retailers. It provides merchants with the tools they need to manage their business across a range of retail channels. Through the platform they can build online stores, run digital marketing campaigns, accept payments, manage inventory, and borrow money. All an aspiring merchant really needs to get going with Shopify is a smartphone and a good idea. Shopify's platform helps with routine tasks, freeing up time for entrepreneurs to focus on brand-building and product-market fit. Indeed, Kylie Jenner famously built her billion-dollar make-up brand on Shopify with just seven full-time employees.

Shopify pools the collective scale of all the merchants that build on its platform. This scale allows Shopify to do two important things. First, it can invest more in technology development than any single merchant. Second, it can extract better terms from third-party infrastructure providers, and pass these saving on to customers. Importantly, Shopify gets stronger as it gets bigger. Each incremental merchant adds scale to the platform without adding materially to its complexity. This results in a powerful flywheel effect, where more scale results in a better platform, which attracts more merchants and so on.

One striking example of the power of Shopify's business model is its new fulfilment product, which provides merchants access to two-day shipping. This is an important leveller between Shopify's merchants and larger retailers such as Amazon and Walmart. Shopify uses software to knit together a network of third-party fulfilment centres. It then applies machine learning to forecast demand, allocate inventory, and route orders on behalf of customers. An individual merchant could attempt to work with these third-party fulfilment centres directly, but it would be expensive, time consuming, and complex. Over and above this, no single merchant would have the data or resources necessary to train machine learning models and build forecasting software as well as Shopify can. Scale advantages like these apply broadly across Shopify's product suite.

An important aspect of the Shopify model is the alignment between the company's interests and those of its underlying merchants. The more successful its merchants are, the more Shopify stands to make as a business. It doesn't compete with merchants. Rather, it empowers them to succeed and, in doing so, grows the pie for all of the stakeholders that interact with the Shopify platform, from the merchants, to the third-party app developers, to the affiliates who help sell and implement the product. Bill Gates has been credited with saying that a true platform is one which generates more value for those who use it than the company that created it. Shopify is certainly a platform in this sense.

© Bloomberg /Getty Images.



One striking example of the power of Shopify's business model is its new fulfilment product…

—

STRIPE AND PAYMENTS

Stripe was also created to solve challenges associated with starting and scaling businesses. The company was founded by brothers Patrick and John Collison. They grew up in rural Ireland, moved to the US for university, and had built and sold their first company by the time they were in their late teens. It was through their interactions with other founders that they came to understand how difficult it was for small companies to accept payments online. The payments world is messy. There is complexity within and between regions. Each geography has its own unique banks, credit card rails, mobile wallets, cultural norms, regulators, and regulations. It is an extraordinarily challenging landscape for any company to navigate, never mind a start-up. This may explain why so many online companies rely on advertising to generate income.

Stripe helps its customers overcome these complexities. Its platform sits above the financial system and interacts with it on their behalf. Its aim is to make sending and receiving money as simple as transferring information. Stripe started out primarily serving smaller merchants, but it has moved up market and now powers some of the largest businesses in the world. Indeed, Shopify's own payments product runs on top of Stripe.

Like Shopify, Stripe's platform benefits from the collective scale of all the companies that use it. Stripe can justify making investments that wouldn't make sense for any single customer. The platform has broad geographic reach. It is available to businesses in 39 countries. Merchants who use it can accept payments from anywhere in the world through a single global integration. Importantly, there is evidence to suggest that when companies move to Stripe they generate higher revenues at lower costs, with higher developer productivity and fewer unplanned outages.

Stripe has expanded its platform by adding tools that run on top of its payment infrastructure. Examples include fraud prevention, subscription management, analytics, and marketplaces. With the marketplaces product, which is called Connect, merchants can set up a two-way platform to accept and make payments in a matter of minutes. Another innovative offering from Stripe is Atlas, which allows entrepreneurs to register their company as a C Corporation in Delaware, regardless of which country they are based in. Since its launch in 2016, founders in over 140 countries have used the service. It costs around $500 and takes about 10 mins to register. The benefits include access to a US bank account, the ability to receive payments in US dollars, and the backing of a strong legal system. It's a valuable service for the many entrepreneurs who are locked out of the internet economy because of their location. It's also an important unlocking step towards Stripe's mission, which is to grow the GDP of the internet. On this there is much still to do, as only around 3 per cent of global commerce is conducted online today.

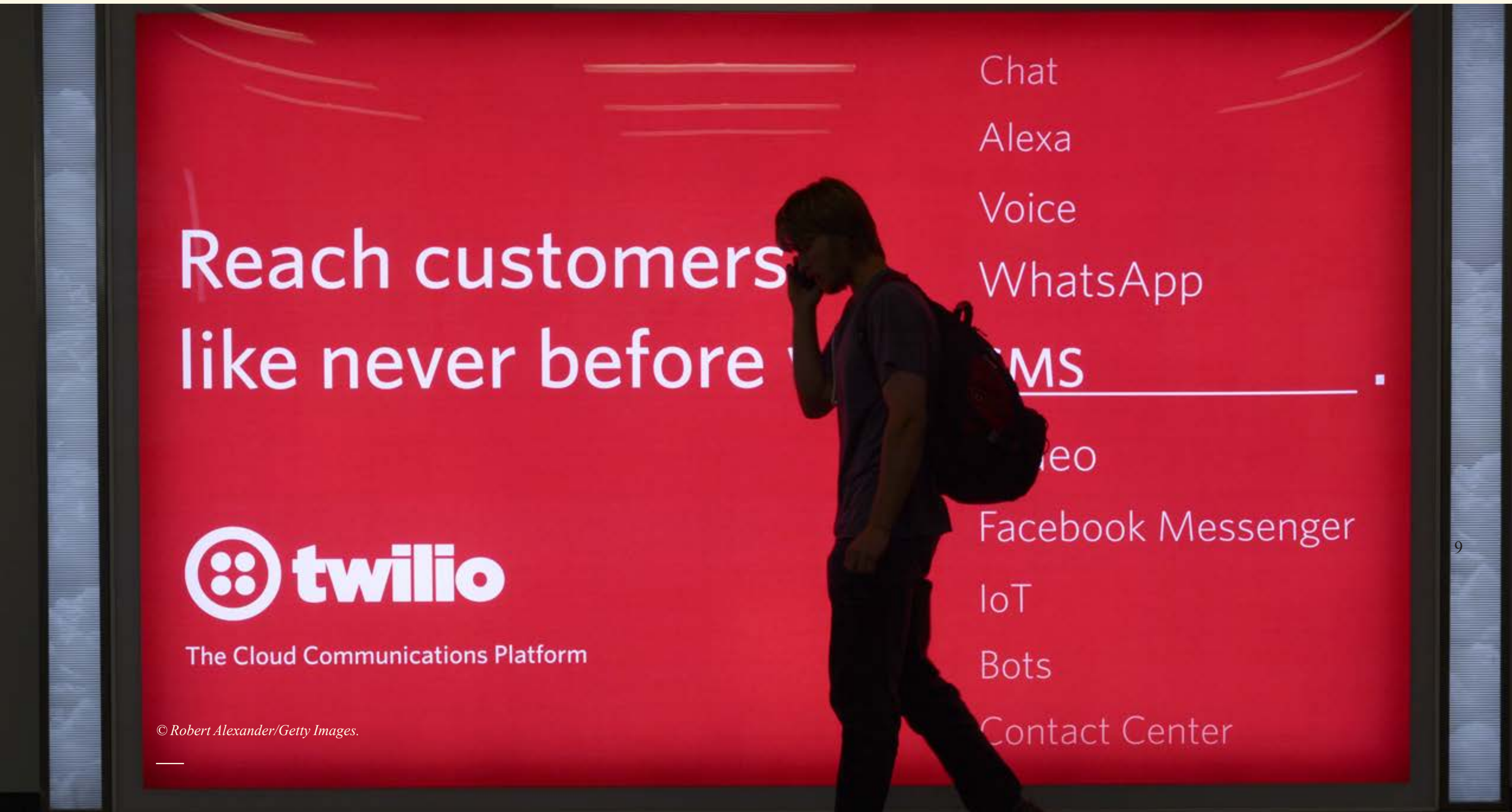
TWILIO AND COMMUNICATIONS

The scale as a service trend is also taking hold in the trillion-dollar communications industry. Twilio has built a software platform which enables developers to integrate communications functionality, for example voice calls or text messages, directly into applications via simple connection points called APIs. Uber uses Twilio to communicate with its customers via text message. New York City uses Twilio to power the communications in its Covid-19 contact tracing scheme.

Founder Jeff Lawson started three companies prior to Twilio. In all three cases, communications were a central part of the customer proposition and in all three cases it was a struggle to build in the desired functionality. The integrations required relationships with telecoms carriers, proprietary hardware, and a team of specialists to run the systems. It was expensive and time consuming, often costing millions of dollars and taking years to implement. This made it very difficult for small companies to access, and experiment with, communications technology.

Twilio is attempting to solve this problem through software. Again, its platform sits above the infrastructure of the communications industry and interacts with it on behalf of customers. Instead of spending huge sums on up-front capex, Twilio’s customers only pay for what they use and, in stark contrast to the old model, can experiment freely without incurring costs.

The shift online has in many ways made customer engagement more challenging for businesses. Consumers use myriad messaging apps and these apps vary from country to country. Twilio’s globally distributed communications network covers a broad range of channels so that developers can lean in to whichever ones their customers are responding to. Twilio’s users need only to integrate with the platform once and, as the communications landscape continues to evolve, Twilio’s network will evolve with it. It’s a gateway which has the potential to make communications as accessible to small start-ups as it has historically been to the largest companies.



© Robert Alexander/Getty Images.

LOWERING BARRIERS TO ENTREPRENEURSHIP

Each of the platforms mentioned in the previous sections has a distinctive approach, but there are common threads that cut across all of them. They can all be thought of as operating systems which sit above complex networks of institutions or infrastructure. They use software to remove complexity, making it easier for the underlying infrastructure services to be managed and consumed. Their platforms pool the collective scale of their customer bases. This means they can invest more in product development and extract better terms from suppliers. Their business models transform capital costs into operating costs and enable their underlying customers to run more flexible and leaner operations. They deliver their services over the internet, some of them via APIs. Importantly, they all make the process of starting and scaling a business easier and less capital intensive.

Collectively, ‘scale as a service’ companies such as AWS, Shopify, Stripe, and Twilio have the potential to profoundly impact entrepreneurship. It’s fascinating to note that they were all created to solve problems that their founders had faced when building companies. They have their roots in serving start-ups and have been designed to be easy to use and scale. Their success is aligned with their underlying customers. Their services are deployed through the cloud and are accessible to anyone with a computer and an internet connection anywhere in the world. Indeed, some of Shopify’s customers run their entire business from their smartphone.

The platforms themselves ought to be very valuable businesses. They operate in large markets of $1 trillion or greater. Their business models generate flywheel effects, causing them to get stronger as they grow. They are well aligned not only with their customers but also with the broader ecosystem of developers, suppliers, and partners which build on top of them. Each is founder-led, mission-driven, innovative, and run for the long term. In lowering barriers to entrepreneurship, they are performing a critical societal role and increasing the vitality of the global economy. We believe they have all the ingredients to be exceptional growth companies.


PowerEdge

IMPORTANT INFORMATION

Baillie Gifford & Co and Baillie Gifford & Co Limited are authorised and regulated by the Financial Conduct Authority (FCA). Baillie Gifford & Co Limited is an Authorised Corporate Director of OEICs.

Baillie Gifford Overseas Limited provides investment management and advisory services to non-UK Professional/ Institutional clients only. Baillie Gifford Overseas Limited is wholly owned by Baillie Gifford & Co. Baillie Gifford & Co and Baillie Gifford Overseas Limited are authorised and regulated by the FCA in the UK.

Persons resident or domiciled outside the UK should consult with their professional advisers as to whether they require any governmental or other consents in order to enable them to invest, and with their tax advisers for advice relevant to their own particular circumstances.

Baillie Gifford Investment Management (Europe) Limited provides investment management and advisory services to European (excluding UK) clients. It was incorporated in Ireland in May 2018 and is authorised by the Central Bank of Ireland. Through its MiFID passport, it has established Baillie Gifford Investment Management (Europe) Limited (Frankfurt Branch) to market its investment management and advisory services and distribute Baillie Gifford Worldwide Funds plc in Germany. Baillie Gifford Investment Management (Europe) Limited also has a representative office in Zurich, Switzerland pursuant to Art. 58 of the Federal Act on Financial Institutions ("FinIA"). It does not constitute a branch and therefore does not have authority to commit Baillie Gifford Investment Management (Europe) Limited. It is the intention to ask for the authorisation by the Swiss Financial Market Supervisory Authority (FINMA) to maintain this representative office of a foreign asset manager of collective assets in Switzerland pursuant to the applicable transitional provisions of FinIA. Baillie Gifford Investment Management (Europe) Limited is a wholly owned subsidiary of Baillie Gifford Overseas Limited, which is wholly owned by Baillie Gifford & Co.

HONG KONG

Baillie Gifford Asia (Hong Kong) Limited 柏基亞洲(香港)有限公司 is wholly owned by Baillie Gifford Overseas Limited and holds a Type 1 licence from the Securities & Futures Commission of Hong Kong to market and distribute Baillie Gifford's range of collective investment schemes to professional investors in Hong Kong. Baillie Gifford Asia (Hong Kong) Limited 柏基亞洲(香港)有限公司 can be contacted at Room 3009-3010, One International Finance Centre, 1 Harbour ViewStreet, Central, Hong Kong. Telephone +852 3756 5700.

SOUTH KOREA

Baillie Gifford Overseas Limited is licensed with the Financial Services Commission in South Korea as a cross border Discretionary Investment Manager and Non-discretionary Investment Adviser.

JAPAN

Mitsubishi UFJ Baillie Gifford Asset Management Limited ('MUBGAM') is a joint venture company between Mitsubishi UFJ Trust & Banking Corporation and Baillie Gifford Overseas Limited. MUBGAM is authorised and regulated by the Financial Conduct Authority.

AUSTRALIA

This material is provided on the basis that you are a wholesale client as defined within s761G of the Corporations Act 2001 (Cth). Baillie Gifford Overseas Limited (ARBN 118 567 178) is registered as a foreign company under the Corporations Act 2001 (Cth). It is exempt from the requirement to hold an Australian Financial Services License under the Corporations Act 2001 (Cth) in respect of these financial services provided to Australian wholesale clients. Baillie Gifford Overseas Limited is authorised and regulated by the Financial Conduct Authority under UK laws which differ from those applicable in Australia.

SOUTH AFRICA

Baillie Gifford Overseas Limited is registered as a Foreign Financial Services Provider with the Financial Sector Conduct Authority in South Africa.

NORTH AMERICA

Baillie Gifford International LLC is wholly owned by Baillie Gifford Overseas Limited; it was formed in Delaware in 2005 and is registered with the SEC. It is the legal entity through which Baillie Gifford Overseas Limited provides client service and marketing functions in North America. Baillie Gifford Overseas Limited is registered with the SEC in the United States of America.

The Manager is not resident in Canada, its head office and principal place of business is in Edinburgh, Scotland. Baillie Gifford Overseas Limited is regulated in Canada as a portfolio manager and exempt market dealer with the Ontario Securities Commission. Its portfolio manager licence is currently passported into Alberta, Quebec, Saskatchewan, Manitoba and Newfoundland & Labrador whereas the exempt market dealer licence is passported across all Canadian provinces and territories. Baillie Gifford Investment Management (Europe) Limited ('BGE') relies on the International Investment Fund Manager Exemption in the provinces of Ontario and Quebec.

OMAN

Baillie Gifford Overseas Limited ("BGO") neither has a registered business presence nor a representative office in Oman and does not undertake banking business or provide financial services in Oman. Consequently, BGO is not regulated by either the Central Bank of Oman or Oman's Capital Market Authority. No authorization, licence or approval has been received from the Capital Market Authority of Oman or any other regulatory authority in Oman, to provide such advice or service within Oman. BGO does not solicit business in Oman and does not market, offer, sell or distribute any financial or investment products or services in Oman and no subscription to any securities, products or financial services may or will be consummated within Oman. The recipient of this document represents that it is a financial institution or a sophisticated investor (as described in Article 139 of the Executive Regulations of the Capital Market Law) and that its officers/employees have such experience in business and financial matters that they are capable of evaluating the merits and risks of investments.

QATAR

This strategy is only being offered to a limited number of investors who are willing and able to conduct an independent investigation of the risks involved. This does not constitute an offer to the public and is for the use only of the named addressee and should not be given or shown to any other person (other than employees, agents, or consultants in connection with the addressee's consideration thereof). Baillie Gifford Overseas Limited has not been and will not be registered with Qatar Central Bank or under any laws of the State of Qatar. No transactions will be concluded in your jurisdiction and any inquiries regarding the strategy should be made to Baillie Gifford.

ABOUT THE AUTHOR

GARY ROBINSON
Investment Manager, US Equities Team

Gary is an Investment Manager in the US Equities Team. He graduated MBiochem in Biochemistry from the University of Oxford in 2003 and joined Baillie Gifford the same year. He spent time working on our Japanese, UK and European Equity Teams before moving to the US Equities Team in 2008. Gary is a generalist investor but retains a special interest in the healthcare sector dating back to his undergraduate degree. Gary is also a member of the Global Stewardship Portfolio Construction Group.

CURIOUS ABOUT THE WORLD

bailliegifford.com/thinking

Calton Square, 1 Greenside Row, Edinburgh EH1 3AN
Telephone +44 (0)131 275 2000 / www.bailliegifford.com